Primary Health Care: Knowledge Development and Application in Papua New Guinea

by

Carol Patricia Davy

Bachelor of Management

A thesis submitted for the degree of

Doctor of Philosophy

International Graduate School of Business

University of South Australia

16th January 2009

Contents

#

CONTENTS ..... **I**#

LIST OF FIGURES ..... **VII**#

LIST OF TABLES ..... **VIII**#

GLOSSARY ..... **IX**#

SUMMARY ..... **X**#

DECLARATION ..... **XII**#

ACKNOWLEDGMENTS ..... **XIII**#

CHAPTER 1 AN OVERVIEW ..... **1**#

1.1 Introduction ..... **1**#

1.2 Contributions to Date ..... **3**#

1.2.1 Medical Literature ..... 4#

1.2.2 Human Information Behaviour Literature ..... 10#

1.3 The Need for a New Theoretical Approach ..... **12**#

1.3.1 Through the Lens of Belief Systems ..... 12#

1.3.2 Information in its Broadest Sense ..... 13#

1.4 The Key Contribution ..... **14**#

1.5 The Research Question ..... **14**#

1.6 Study Design ..... **14**#

1.6.1 From the Perspective of PHCWs in PNG ..... 15#

1.6.2 Methodological Principles ..... 17#

1.7 Content ..... **18**#

1.8 Key Definitions ..... **21**#

1.9 Summary ..... **23**#

CHAPTER 2 CONTENDING WITH DIVERSITY ..... **24**#

2.1 Introduction ..... **24**#

2.2 *Pasin Bilong Ples* – History, Language and Indigenous Knowledge ..... **25**#

2.3 *Taim Bilong Masta* – A Colonial Legacy ..... **27**#

2.4 *Yumi Iet* – Turning Towards the Future ..... **34**#

2.4.1 The Current Health Context ..... 36#

2.5 Summary ..... **43**#

CHAPTER 3 CONCEPTUAL FRAMEWORK ..... **44**#

3.1 Introduction ..... **44**#

3.2 Disciplines and the Human Perspective ..... **44**#

3.2.1 Human Information Behaviour ..... 45#
3.2.2 Knowledge Management ..... 45#
3.2.3 Communication Processes ..... 46#

3.3 Defining the Objects of Interest ..... **47**#

3.3.1 Data and Information ..... 47#
3.3.2 Knowledge ..... 49#

3.4 Processes that Develop these Objects ..... **51**#

3.4.1 The Knowing Process ..... 52#
3.4.2 The Informing Process ..... 53#

3.5 Influences on the Recipient ..... **56**#

3.5.1 External Factors ..... 56#
3.5.2 Individual Factors ..... 58#
3.5.3 Multifaceted Factors ..... 59#

3.6 Developing a Framework ..... **61**#

3.6.1 The Context ..... 62#
3.6.2 The Informing Process ..... 63#
3.6.3 The Knowing Process ..... 64#
3.6.4 The Outcomes ..... 65#
3.6.5 An Interconnecting Framework ..... 65#
3.6.6 Recipients are the Key to the Informing and Knowing Processes ..... 67#

3.7 Summary ..... **68**#

CHAPTER 4 STUDY DESIGN AND METHODOLOGY ..... 70#

4.1 Introduction ..... 70#

4.2 Primary Methodological Principles ..... 71#

4.2.1 World View ..... 72#
4.2.2 Cross-Cultural Rigour ..... 74#

4.3 Developing the Interview Method ..... 76#

4.4 Selecting Participants ..... 79#

4.5 Entering the Field ..... 82#

4.5.1 Formal Approval ..... 82#
4.5.2 Informal Acceptance ..... 83#
4.5.3 Conducting the Interviews ..... 84#

4.6 Analysing and Interpreting the Data ..... 86#

4.6 1 Analysing the Data ..... 87#
4.6.2 Interpreting the Data ..... 89#
4.6.3 Key Considerations ..... 91#

4.7 Summary ..... 93#

CHAPTER 5 RESULTS AND DISCUSSION – THE CONTEXT ..... 94#

5.1 Introduction ..... 94#

5. 2 Working within the PNG Primary Health Care System ..... 97#

5.2.1 Initial Training ..... 97#
5.2.2 Formal Roles and Actual Responsibilities ..... 98#
5.2.3 Resources and Infrastructure ..... 100#
5.2.4 Supervision and Management ..... 101#
5.2.5 PHCWs in Rural Aid Posts ..... 102#
5.2.6 Feelings about the Formal Health Care System ..... 104#
5.2.7 Summary of Results Pertaining to Formal Health Care System ..... 105#

5.3 Alternative Paradigms ..... 105#

5.3.1 Indigenous Knowledge ..... 106#
5.3.2 Christianity ..... 107#
5.3.3 Summary of Results Pertaining to Alternative Paradigms ..... 110#

5.4 A Variety of Belief Systems ..... 110#

5.4.1 Exposure to Multiple Belief Systems ..... 111#
5.4.2 Legitimate and Powerful ..... 114#

5.4.3 Conflicting Messages ..... 116#
5.4.4 Summary of Discussion ..... 117#

CHAPTER 6 RESULTS AND DISCUSSION – THE INFORMING PROCESS ... 120#

6.1 Introduction ..... 120#

6.2 Providers of Information ..... 122#

6.2.1 The Patient ..... 123#
6.2.2 Standard Treatment Manuals (STMs) ..... 125#
6.2.3 Colleagues at the Facility Level ..... 127#
6.2.4 Social or Neighbourhood Communities ..... 129#
6.2.5 External Colleagues ..... 131#
6.2.6 Ongoing Professional Training ..... 132#
6.2.7 Computers and the World Wide Web ..... 134#
6.2.8 Summary of Results ..... 135#

6.3 Accessibility of Information ..... 136#

6.3.1 Information Sources ..... 137#
6.3.3 Availability of Source ..... 139#
6.3.2 Willingness to Share ..... 140#
6.3.4 Consideration by the Recipient ..... 141#
6.3.5 Methods of Interacting ..... 144#
6.3.6 Summary of Discussion ..... 147#

CHAPTER 7 RESULTS AND DISCUSSION – THE KNOWING PROCESS ..... 149#

7.1 Introduction ..... 149#

7.2 Knowledge ..... 154#

7.2.1 Patient Centred Problems ..... 154#
7.2.2 General Knowledge ..... 161#

7.3 Solving Patient-Centred Problems ..... 168#

7.3.1 Limited Information ..... 170#
7.3.2 Developing a Knowledge Portfolio ..... 172#
7.3.3 Coping with Complexity ..... 174#
7.3.4 A Unilateral Perspective ..... 176#
7.3.5 A Multilateral Perspective ..... 179#
7.3.6 A Continuum of Receptivity ..... 185#
7.3.7 Summary of Discussion ..... 187#

CHAPTER 8 RESULTS AND DISCUSSION – OUTCOMES ..... 190#

8.1 Introduction ..... 190#

8.2 Outcomes ..... 193#

8.2.1 Outcomes for PHCWs ..... 193#
8.2.2 Outcomes for Patients ..... 196#
8.2.3 Outcomes for the Formal Health Care System ..... 197#
8.2.4 Summary of Results ..... 199#

8.3 Freedom to Choose ..... 200#

8.3.1 Limitations of the Formal System ..... 200#
8.3.2 Possibilities and Opportunities ..... 203#
8.3.3 Summary of Discussion ..... 210#

CHAPTER 9 CONCLUSION ..... 214#

9.1 Introduction ..... 214#

9.2 Research Question and Purpose ..... 214#

9.3 Principals and Framework ..... 216#

9.4 Summary of Research Findings ..... 217#

9.4.1 The Legitimacy of Conflicting Belief Systems – Chapter 5 ..... 218#
9.4.2 Accessibility of Information – Chapter 6 ..... 219#
9.4.3 Breadth of Association – Chapter 7 ..... 220#
9.4.4 Freedom to Choose – Chapter 8 ..... 221#

9.5 Research Limitations ..... 222#

9.6 The Theoretical and Practical Contributions ..... 223#

9.7 Recommendations for Practice ..... 227#

9.7.1 Gain an Understanding of the Various Other Legitimate Belief Systems that Operate within the Context. ..... 227#
9.7.2 Incorporate Wherever Possible Other Legitimate Belief Systems into the Information Provided. ..... 228#
9.7.3 Consult with the experts in Other Legitimate Belief Systems before Disseminating the Information. ..... 229#
9.7.4 Ensure Appropriate Accessibility to the Information. ..... 229#
9.7.5 Attempt to Understand how the Information is being Utilised in the Field. ..... 229#
9.7.6 Saving the Benefits of Alternative Belief Systems ..... 230#

9.8 Recommendations for Future Research ..... 232#

9.8.1 Understanding that Multiple Legitimate Belief Systems can Function Simultaneously. ..... 233#

9.8.2 Understanding how Multiple Legitimate Beliefs Influence Human Information Behaviour. ..... 235#

9.8.3 Understanding that Belief Systems other than the Biomedical Model are Becoming more Acceptable in Western Health Care Systems. ..... 235#

9.9 In Conclusion ..... 236#

APPENDIX A KEY DEFINITIONS ..... 239#

APPENDIX B SEMI STRUCTURED INTERVIEW SCHEDULES ..... 242#

APPENDIX C INFORMED CONSENT ..... 245#

APPENDIX D ETHICAL APPROVAL AND SUPPORT ..... 250#

REFERENCE LIST ..... 255#

List of Figures

Figure 1	Map Distinguishing German Occupied New Guinea from British Occupied Papua	28
Figure 2	Staff Working within Primary Health Care Facilities	38
Figure 3	An Aid Post	39
Figure 4	A Sub-Health Centre	39
Figure 5	Inside a Health Centre	40
Figure 6	One Example of a Rural Community	42
Figure 7	Human Information Behaviour Framework	68
Figure 8	Map Identifying Data Collection Sites	80
Figure 9	Human Information Behaviour Framework – Highlighting the Context	95
Figure 10	Human Information Behaviour Framework – Highlighting the Informing Process	121
Figure 11	Human Information Behaviour Framework – Highlighting the Knowing Process	150
Figure 12	A Continuum of Receptivity	186
Figure 13	Human Information Behaviour Framework – Highlighting Outcomes	190
Figure 14	Human Information Behaviour Framework	217
Figure 15	A Continuum of Receptivity	218

List of Tables

Table 1	Participants and the Facilities that Participated	 81
Table 2	Availability of Infrastructure in Participating Primary Health Care Facilities	 100
Table 3	List of Most Recently Published Standard treatment Manuals in PNG	 125
Table 4	Perceived Level of English for PHCWs in this Study	 142
Table 5	Belief System Preference	 175

Glossary

CHW	Community Health Worker
EBP	Evidence Based Practice
HEO	Health Extension Officer
PHCW	Primary Health Care Worker
PNG	Papua New Guinea
STM	Standard Treatment Manual
WHO	World Health Organization

Summary

Research into the use of information by health care professionals has generally been conducted in countries dominated by the biomedical model. In these contexts, illness is considered to have a scientifically identifiable physical cause, and treatment practices within the formal health care sector are prescribed and managed in accordance with this definition. Yet there are also contexts where other belief systems inform and guide the way that people think about their health. In comparison to the biomedical model, these contexts have contributed very little to our understanding of how health professionals develop their knowledge. This research investigates how primary health care workers (PHCWs) in one such context, Papua New Guinea (PNG), develop their knowledge about the health services they provide.

In order to discover and understand the differing views of these PHCWs, 69 semi-structured interviews were conducted in three culturally and geographically diverse regions of PNG. In explaining the diagnostic and treatment practices they use, these participants provided insights into not only how PHCWs engage with information but also how it informs their professional practice. These data were analysed, interpreted and discussed using a framework consisting of four, primary but interconnecting aspects: the context in which information was provided, the interactions with the sources of information, the processes by which information was understood, and the outcomes realized as a result of the information being used.

Findings indicated that the majority of participants in this study acknowledged, if not incorporated, information pertaining to biomedicine, Christianity and Indigenous belief systems into their diagnostic and treatment practices. Even when these belief systems clearly contradicted each other, PHCWs did not in general feel the need to make a conscious choice between them. From their comments it would appear that four factors contributed to this ability to incorporate diverse and often conflicting ideas into the way that patients were cared for. First, all of the belief systems were considered legitimate by at least one group of people connected to the community in which the PHCW worked. Second, although varying in degrees of availability and accessibility, members of these groups were able to disseminate information pertaining to the belief system they supported.

Third, the PHCW had no particular affiliation with any one of these groups but instead regularly interacted with a range of different people. Lastly, the PHCW worked in situations where health practices were not generally well supervised by their employers and therefore they were relatively free to choose between various diagnostic and treatment practices.

The qualitative interpretive approach adopted in this thesis contributes to the field of human information behavior by affirming that conflict is in the eye of the beholder. When a number of belief systems coexist and all are considered legitimate, information about them is freely available, and the recipients actions are neither constrained by their own dogma, nor imposed upon by others, individuals may quite comfortably embrace diverse beliefs. These findings may also contribute to a better understanding of health management practices in developing countries by suggesting that health professionals are not merely personifications of a biomedical model. Instead, the study demonstrates that multiple belief systems can be combined by PHCWs, and that in turn this benefits the formal health care sector through increased treatment options that are both appropriate and effective in such circumstances.

Declaration

This thesis presents work carried out by myself and does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; to the best of my knowledge it does not contain any materials previously published or written by another person except where due reference is made in the text; and all substantive contributions by others to the work presented, including jointly authored publications, are clearly acknowledged.

Carol Patricia Davy

Signature: Date: 16/01/2009

Acknowledgments

My sincere thanks firstly go to the Papua New Guinea Institute of Medical Research and in particular Professor Peter Siba (current Director), Professor John Reeder (previous Director) and Dr Ivo Mueller (Scientific Head), all of whom have assisted, guided and encouraged me throughout this PhD. Without their support in particular but also the organisation as a whole, this study could never have been undertaken.

Equally, the support of my supervisors Associate Professor Margaret Patrickson and Dr Mary Bambacas has been invaluable. In particular, I am grateful to Margaret for her patience, kindness and continuous encouragement during my time in Papua New Guinea, and the wonderfully passionate discussions which challenged my thinking during the interpretation and write up stages of my thesis – many thanks to both Margaret and Mary.

In addition I am also extremely grateful to my partner who has never failed to fully support my choices in life, and has been extremely patient with my frequent trips between countries. It has, at times been an exhausting and therefore emotional journey, throughout which he has continued to be a stable rock, always providing just the right amount of understanding, support and advice.

Most importantly, however, I would like to thank the participants, all of whom openly shared their thoughts, feelings and ideas. The courage and tenacity of these people in providing health care services in often very difficult circumstances is admirable. I very much appreciate their time and enthusiasm.

My thanks also go to a wonderful group of fellow PhD students and in particular our inspirational and dedicated group facilitator Dr Wendy Bastalich. It is unfortunate that not all PhD candidates are given the opportunity to belong to be part of a group where feedback can be provided within a respectful, friendly and supportive environment.

Lastly, I would also like to acknowledge the guidance received from various editorial teams including those associated with the Journal of Health Organization and Management, Knowledge Management Research and Practice Journal, Information Technology in Health Care Conference 2007, Papua New Guinea Medical Symposium 2006, Australian Centre for Research, Employment and Work Conference 2006, and Australia and New Zealand Academy of Management Conference 2005.

While not always easy, I have loved every moment of this process and while I now look forward to new challenges, it is with some regret that I will leave behind this part of my life.

CHAPTER 1

An Overview

1.1 Introduction

This thesis will investigate how multiple understandings of health and well-being contribute to the way in which health workers in developing countries perform their tasks. In particular, the focus is on how these individuals engage with and utilise the information they need to deliver quality health services. While information is being transferred to these individuals at an ever-increasing rate, research shows that useable and applicable information, an essential component for the development of professional knowledge, is often either unavailable or under-utilised.

In attempting to understand how individuals in developing countries engage with information, previous researchers have tended to focus on social or what is sometimes referred to as contextual influences. Perhaps because most of the health information is developed in the west (Guilford 1984; Holmes & Crossley 2004), social differences between the information provider, often located in western countries and recipients in developing countries have been highlighted. Reade-Fong and Gorman (2005) for example, suggest that the lack of appropriate infrastructure in developing countries can determine whether people are even able to access, let alone utilise, information. Other identified contextual factors that affect information behaviour in developing countries include the attitudes and customs of local communities (Jutting et al. 2006; Katseli 2006), political interference (Young, J 2005), inadequate communication infrastructure (Sciadas 2005), geographic difficulties associated with isolation (McAnany 1980) and whether or not the information is culturally appropriate (Schech & Haggis 2000; Myers & Tan 2002; Adam & Myers 2003).

However, a second theoretical perspective centres more on individual characteristics or capacities. Researchers from this perspective suggest, for example, that especially high levels of illiteracy in developing countries prevent people from making use of almost all written information that is made available (Nicholson 2002; Oronje 2006). Similarly,

many people often do not have the language skills required to understand information that is provided in English (Edejer 2000). In other cases, people may be unaware or do not perceive that they have a need for the information that is being made available (Aguolu 1997; Walsham & Sahay 2005).

A third group of researchers include both individual and social factors within the same discussion. For example, information transfer is thought to be moderated not only by cultural differences, but also by the individual's cognitive preferences (Bhagat et al. 2002). Morrison and Jutting (2005), for example, found that women in particular are often less able to access the information. Yet the problem appears far more complex than simply one of gender and access. '[I]nadequate infrastructure and human resource capacity, fragmented donor policy, and lack of policies' (Kimaro & Nhampossa 2005, p. 273) are all believed to be reasons why information is either not available, or cannot be retrieved. The ensuing suggestion is that information providers should consider a variety of issues when transferring information to developing countries, including the political climate, levels of poverty, local priorities, as well as the motivation of the people concerned (Dosa 1997, Chapter 1). Simply put, the focus should be on the individual, as they exist within a particular group or society, rather than just the broader cultural context (Walsham & Sahay 2005).

While incorporating a combination of both individual and social factors has to some extent broadened our understanding, researchers are still focusing largely on the transfer of information from the developed to the developing world (Shiva 2000). Very little is known about, nor consideration given to, the way in which any local Indigenous Knowledge may not only directly contribute to the way in which health services are provided to individuals in developing countries, but also how health information originating from aboard is understood.

This issue of information transfer and utilisation, the core focus of this investigation, will be examined through the particular perspective of primary health care workers (PHCWs) in Papua New Guinea (PNG). PHCWs are ideal subjects for three reasons. First, as frontline workers in the provision of health services, they alone are responsible for using information in order to diagnose and treat illness. While there are of course many different factors that can potentially affect the quality of patient care, being able to access and utilise appropriate information is believed to be one of the most important contributors to improving health care delivery (Lown, Bukachi & Xavier 1998; World Health Organization 2004). This thesis is therefore specifically interested in understanding how

PHCWs engage with the type of information that can assist with the diagnosis and treatment of patients.

In particular, this study considers the information behaviour of PHCWs in PNG. As one of the 'least developed' nations within the Asia Pacific region, PNG chiefly relies on their primary health care system to provide services not only to people in urban centres but perhaps more importantly, to over 80 per cent of the population who still reside in rural and remote communities (National Statistical Office of Papua New Guinea 2003). PHCWs in these types of facilities are charged with providing health services in accordance with the formally sanctioned biomedical model. However, other understandings of health and well-being also exist. For example, community-based Indigenous Knowledge, and various Christian ideologies all suggest ways in which not only physical but also spiritual ailments should be treated. A variety of belief systems, based on one or more of these paradigms, have both legitimacy and credibility within the PNG context.

Before going on to consider the influence that these belief systems may have on the information behaviour of PHCWs in PNG, this chapter begins by reviewing what is already known about how information is both accessed and utilised by health professionals working in more or less mono-belief systems. The chapter then goes on to consider the research that has already identified a number of unique problems that are particular to health workers in developing countries. Two extensions to this research are then introduced; namely, a focus on multi-belief systems, and a broadening in the definition of information; which together will lead to a better understanding of the way in which health workers in developing countries both obtain and utilise information. The chapter concludes with a summary of the study design and content of the remaining chapters.

1.2 Contributions to Date

Two areas of literature contribute to the current understanding of how health workers in any context engage with information. First, the medical literature including that relating to the nursing profession has investigated how information influences professional practices and health service outcomes. A second perspective is provided by researchers adopting theories pertaining to human information behaviour who have also been interested in understanding of how information is used by health care providers (Case 2007, p. 265).

1.2.1 Medical Literature

The primary focus of studies reported within the medical literature is to identify where health workers most commonly seek information. They have found, for example, that most people within the medical profession prefer to obtain information from local or personally known sources of information such as other colleagues and/or patient records (Corcoran-Perry & Graves 1990; Blythe & Royle 1993). Nevertheless, the medical literature also acknowledges that health workers do regularly consult other sources including journals (Haig 1993), the patients they are treating (McKnight 2006), drug reference manuals, text books and protocol manuals (Cogdill 2003).

Researchers have also been interested in understanding why health professionals choose particular sources of information. Dee and Stanley (2005) specifically investigated whether the amount of training that nurses receive influences the type of information sought. Their findings suggest that while students do tend to use the internet slightly more than fully-fledged nurses do, given a choice both groups show a strong preference for information from either their colleagues or a familiar text book. Yet, in comparison other studies suggest that a greater use of electronic or written sources of information is associated with seniority. Higher levels of education in addition to being in a position of authority were positively associated with being more likely to obtain information from the internet, text books and journals (Kosteniuk, D'Arcy & Barbara 2006).

Consideration has also been given to the reasons why information is or is not sought. For example the idea of uncertainty has been explored, with findings (French 2006) suggesting that nurses experience both implicit and explicit uncertainty. Nevertheless, only explicit uncertainty that can be articulated by the health worker is ever addressed by purposeful information seeking. Other self-reported reasons for not seeking information from sources such as books or the internet are a perceived lack of time and a perception that reading texts or searching for information through the internet is not part of a nurse's role during working hours (McKnight 2006).

Medical research has also found that many health workers are overwhelmed with facts, which they often do not have the time or the inclination to consider. Consequently, there has been a call for a new type of health professional who is able to analyse and synthesise all of the information that is available, ready for immediate and practical use (Davidoff & Florance 2000). Commonly referred to as an 'Informationist' (Rankin, Grefsheim & Canto 2008, p. 194), these people would not only need to be clinically competent but also

understand how health workers develop and utilise knowledge within their professional practice.

1.2.1.1 The Focus on Evidence-Based Content

To a certain degree the 'Informationist' (Rankin, Grefsheim & Canto 2008, p. 194) already exists in the guise of evidence-based practice (EBP) guidelines. Over the past few years, EBP has become extremely influential in determining how health professionals provide services to patients (Grypdonck 2006). The EBP process begins with a carefully designed review of the published literature and reports, using pre-defined search and examination criteria (Rychetnick et al. 2004). Outcomes from these reviews are used to develop a set of standards or guidelines that are provided to health workers to ensure that their diagnostic and treatment decisions are based on a 'synthesis of latest research' (Honor Society of Nursing 2005). It has also been suggested that these same EBP guidelines can also be used by health managers to assess outcomes, including the quality of services provided to patients (Coopey & Nix 2006).

Yet, despite the meticulous way in which EBP guidelines are developed, criticisms still exist. In particular the philosophies underpinning the idea of EBP are regularly questioned. One criticism pertains to the idea that it may not always be possible to easily transfer research outcomes into a 'real life' situation (Grypdonck 2006). Unlike many controlled research trials, 'real life' situations are comprised of a set of complex and often uncontrollable individual, environmental, demographic and cultural factors, which can work against the successful implementation of even the most efficacious treatment practices.

Second, because published research is the primary basis from which EBP guidelines are developed, information from other credible sources such as unpublished reports and personal experiences are frequently ignored. Recent studies suggest that valuable knowledge may be lost when a health worker's clinical expertise is not acknowledged and this should therefore also form part of, or at least be formally recognised within the EBP guidelines (Rycroft-Malone et al. 2004; Hudson et al. 2008). The suggestion being that EBP guidelines may not be the only solution, and perhaps should instead be treated as one of many potential resources available to health workers.

A third interconnecting issue pertains to the power that EBP guidelines now seem to wield. This is believed to over-emphasise the benefits that scientific research can provide to patient care, and correspondingly downplay the more experience-based grounding of

judgements within the western health care system. The understanding is that 'scientific knowing is superior to other knowledge forms' (Wall 2008, p. 41), thus further devaluing certain aspect of for example, the nurse's role within the health care environment.

Given this almost unquestioned acceptance of EBP guidelines by many in the formal health care sector, researchers are particular keen to discover why they are not always implemented successfully. For example, nurses have been criticised for not valuing the research upon which the EBP was based, or not being willing to change their practices and procedures in line with the new guidelines (Funk 1991). A lack of involvement in or understanding of research, inferior information seeking skills, limited education, and socioeconomic constraints have all been blamed for the poor compliance (Estabrooks et al. 2003; Michie et al. 2005). A recent study, however, found that two individual factors in particular appeared to contribute to EBP guidelines being at least partially ignored. First, health workers who do not regularly use the internet for professional purposes, and second, those that report a high level of emotional exhaustion, are less likely to fully implement EBP guidelines within a practice setting (Estabrooks, Midodzi & Cummings 2007).

More often than not, researchers also recognise that many of the reasons given for not implementing EBP guidelines are not necessarily only connected to the individual health worker, but are also connected to the context in which they work (Wall 2008). For example, the individual's skill or educational levels to some extent depends on whether or not their employer supports professional development activities, and similarly opportunities for research experience depend on the organisation's aims and objectives. It may well be therefore that a complex range of interconnecting factors pertaining to not only the individual health care worker but also the social context in which they work and reside, can either assist and/or hinder the implementation of EBP guidelines within a particular context (Haines & Rogers 1998).

1.2.1.2 Evidence-Based Practice in Developing Countries

Nonetheless, despite the various challenges to the implementation of EBP guidelines in western countries (Kitson et al. 2008), they continue to be thought of as the panacea for improving the quality of health care services (Swinkels et al. 2002; Isetta 2008). Therefore, EBP guidelines are now also widely distributed to health workers in developing countries, with similar hopes for a significant improvement in health outcomes (Olatunbosun & Edouard 1997). The World Health Organization (WHO), whose aim it is to address global health issues, for example, pours a great deal of time and money into

gathering information on ‘accepted good practice, which in recent decades has meant ‘evidence’ coming from scientific studies’ (Barrett et al. 2005, p. 39).

Unfortunately, research has shown that many of the EBP guidelines provided to developing countries are neither sustainable, nor particularly useful in these types of contexts (Buekens et al. 2004). In addition to the challenges experienced by their counterparts in the west, health workers in developing countries also experience a set of unique problems. For example, research suggests that while the PHCW are doing their best to adhere to these practices, more often it is the patients who are not willing to comply with the treatment regimes. Neither are some governments particularly good at developing the policies or providing resources, which are required to support their implementation (McMichael, Waters & Volmink 2005). In particular the communication infrastructure needed to transfer the EBP guidelines to health workers in developing countries is often not available (Martis, Ho & Crowther 2008) and the supervision and management practices that would normally be used to monitor or police their implementation are often missing (Marquez & Kean 2002).

With so many potential barriers (Haines, Kuruvilla & Borchert 2004), it is not perhaps surprising that no consensus has been reached as to which factors in particular are important for the successful and sustainable implementation of EBP in developing countries. Studies conducted in PNG (Ashwell & Freeman 1995) and Kenya (Rowe, SY et al. 2007) found that the provision of in service training and supervisory visits were not significantly associated with an increase in adherence to EBP guidelines, whereas studies in Bangladesh (Hadi 2003) and Uganda (Kafuko, Zirabamuzaale & Bagenda 1996) suggested quite the opposite.

1.2.1.3 Questioning the Use of Evidence-Based Medicine in Developing Countries

There is also a concern that the content of EBP guidelines which are based on a western biomedical model may not always be appropriate for use in developing countries (Kale 1994). However, very few publications that often provide the material upon which EBP guidelines are based highlight non-western practice. Medical journals, for example, are more likely to include the work of western authors than those from developing countries (Lown, Bukachi & Xavier 1998; Horton 2000). Various reasons have been suggested for this bias, including a lack of support or mentors that would otherwise encourage researchers from developing countries to publish. However, language barriers, high subscription and publication charges, and even an editorial preference for the more well

known western researchers, may also discourage authors from developing countries (Horton 2000). In addition rules pertaining to scientific integrity, methodological rigour, policy and practice relevance, which are used to ensure the quality of contributions, sometimes make it even harder for their contributions to be accepted (Palafox et al. 2002). Whatever the reason, the results are still the same. The voices of researchers from western countries are far louder and heard more often than are their developing country counterparts.

A prime example of how much western medical research dominates global health knowledge was provided by the Commission on Health Research for Development who identified that in 1990 as little as 5 per cent of the limited funds available for health research were being used to help improve the health of over 90 per cent of the world's population'. The understanding was that the 90 per cent figure was predominantly made up of people in developing countries. Despite the overall pot of money for health research growing since that time, a similar imbalance still exists today (The Global Forum for Health Research 2008). This suggests that many health researchers are primarily interested in the health concerns of people in western countries. EBP guidelines, which rely on their research, are therefore likely to show a similar level of bias (Walshe & Ham 1997; Davies & Nutley 1999).

According to Schech and Haggis (2000) examples like these also imply that 'knowledge for and about development is something the west has and the rest needs to get' (p. 210). In terms of health, this western knowledge is primarily based on a biomedical perspective, which assumes that disease or illness is an unnatural state attributable to a breakdown of the physical body (Nettleton 2006, p. 2).

> The Critically Methodological mindset is characterized by applying epistemological rules which are cyclical and self-correcting; which value impersonal canons of experience, understanding and judgement; and which imply a commitment to objectivity in knowledge and practice (Gesch 2007, p. 18).

Consequently, the western biomedical model rarely acknowledges the benefits of other belief systems (Wright & Walley 1998; Shiva 2000), and often attempts to displace them. This even pertains to Indigenous Knowledge that may have been developed over thousands of years (Roberts 1998; Dei, Hall & Rosenberg 2000; Shroff 2000). Beliefs that are not based on scientific understandings are thought to be irrational, certainly inferior and therefore of lesser value than that developed in the west (Abdullah & Stringer 1999). As a result, information generally flows from western contexts to developing countries, with

any potential gains from Indigenous Knowledge usually ignored by the developed world (Briggs, J & Sharp 2004).

1.2.1.4 Embracing Information from Other Beliefs

The presumption within the medical literature appears to be that if health workers require and use information developed within a scientifically developed biomedical model, services will improve. This may be primarily true for western countries where biomedicine dominates at least the formal health care system (Nettleton 2006, p. 2). Yet there are also contexts in which health professionals either intentionally or accidentally encounter information based on other ways of understanding health and well-being. For example some health professionals in China and Hong Kong also recognise the benefits of eastern medicine, which is 'radically different from Western notions of diseases and treatments' and has been practiced for over 5,000 years (Roxana 2000). Other examples include a recent study that describes how 'eastern and western concepts of medicine coexist' in parts of Russia (Darieva 2008, p. 26), and the revival of practices based on Mayan medicine, within Guatemala (Peren 2007).

PNG provides another example of a context where multiple understandings of health and well-being coexist. For example, despite the introduction of biomedical practices in the early 1900s, many Papua New Guineans, particularly in rural areas, still rely on traditional medicine (Ambihaipahar & Rai 2004; Attenborough 2007; Macfarlane Accepted for Publication in 2009). Even formally educated people including medically trained doctors have been shown to attribute the cause of illness to both traditional spiritual and/or supernatural forces as well as physical factors (Gesch 2007). In fact, three categories of illness have been identified within the PNG context (Koka 2004); that caused by sorcery or witchcraft, sickness pertaining to the environmental or seasonal changes such as malaria or flu, and problems introduced by the 'white man' (p. 56) referring to newly introduced diseases such as cancer and diabetes. However, understanding concepts of health and well-being in PNG is even more complex than this suggests, as each region or even community as a unique cultural group, may develop their own belief system that includes a distinctive understanding of health, as well as their own particular treatment practices (Jenkins 1984; Lepowsky 1990). While the existence of these belief systems has been well documented (Macfarlane 2005; Hermkens 2007; Wilde 2007; Bergendorff 2008), very little is known about how they contribute to the way in which PHCWs in PNG develop and utilise professional knowledge.

Thus, simply sending or making biomedical information available to health workers in developing countries, may not necessarily lead to the development of an appropriately skilled and knowledgeable workforce (Davy & Patrickson 2005). While researchers continue to identify many individual and social factors that can contribute to the reasons why information such as EBP guidelines is not always utilised, it is clear that focusing solely on 'western content' constrains this understanding (Rowe, AK et al. 2005). Instead, another perspective may be helpful in understanding the role that various belief systems play in influencing how health workers develop and utilise knowledge, in their professional activities.

1.2.2 Human Information Behaviour Literature

Similar to the medical literature, human information behaviour studies have also shown an interest, both the way in which information is being made available to health workers, as well as the many challenges to providing it. Just like the medical literature, studies suggest that health professionals prefer to obtain information from personal sources such as colleagues or journals to which they have referred before (Wakeham 1992). They also demonstrate that observations and experience play as great if not a greater role in providing information to health workers, in comparison to for example, text books or even other colleagues (Urquhart 1998). Once again, the suggestion is that health workers may at times become overwhelmed when their busy schedules do not allow time for reading, talking, considering and/or digesting large quantities of data during working hours. Instead they often return to specific sources and types of information on a regular basis (Gorman et al. 2002) However, this type of research tends to limit itself to listing the information used, and investigating the potential challenges to using it.

Yet there are also many unique contributions that have been made by researchers within the field of human information behaviour. For example, the idea that environmental scanning (Choo 1998, p. 86) can be used by health workers to obtain critical information about adverse events in order to either minimise or if possible mitigate the potential for them occurring again in the future (MacIntosh-Murray 2001). In addition, Fisher (nee Pettigrew) (1999, 2000) focuses on the idea that health facilities are a type of 'information ground' (Fisher 2005, p. 185), where ideas are equally shared by both patients and health professionals alike. McKenzie (2006) also considers how the social context of a health facility can influence an individual's actions, suggesting a diverse set of 'relations, regulations and conventions' (p. 90) found within the context, come together to afford and to some extent mediate the outcome of a health worker's information behaviour.

Researchers have also been interested in the way in which information shapes the identity of health professionals. For example, Sundin (2002) believes that there are two complimentary philosophies that speak to the role of a nurse. One pertains to a theoretical understanding of the biomedical model with the corresponding implementation of purely scientifically proven practices and procedures. In comparison, there is also a focus on the role of nurses as caring for others. This perspective places a greater emphasis on the understandings gained through experience and human contact. Sundin (2003) argues that over the past few years there has been a gradual shift from this caring 'practical know how', to a more medically-based 'theoretical orientation' (p. 170). Thus, information pertaining to the biomedical model is judged by not only other members of the health profession but also the nurses themselves, to be 'more important than [their] experiences' (Johannisson & Sundin 2007, p. 212).

The literature pertaining to human information behaviour research has in particular tended to focus on the social construction of information, identifying 'how people need, seek, manage, give and use information in different contexts.' (Fisher, Erdelez & McKechnie 2005, p. xix). Some of the more well known of these theories include Chatman's (1999) study, which investigated how implicit understandings, existing within each and every context, influence the way in which information is understood. Dervin and Nilan (1986) also commenced work on the concept of sense-making which focuses on how individuals make sense of information within a particular social context. At around the same time, Bandura (1986) suggested that along with cognitive factors, social influences such as the actions of others (p. 49) contribute to the way in which people make sense of and learn from the information they receive. However, he was also quick to point out that it is not an objective analysis of these social factors that is important, but instead their subjective assessment (p. 454).

In addition to focusing on how individual perceptions and social contexts contribute to the construction of meaning, human information behaviour theories have also broadened the very definition of information. For example Erdelez (1997) suggests that the information obtained accidentally or unexpectedly can be as valuable as that deliberately sought and should therefore not be ignored. In developing an integrative framework for information seeking for example, Bates (2002) gives equal attention to both actively sought, and passively obtained information from a variety of institutional, multimedia and personal sources.

The framework of human information behaviour has the potential therefore to go beyond simply identifying sources and/or the barriers to transferring information. It also address questions pertaining to how information is understood, and meaning constructed by individuals within a particular social setting (Diwan, Sachs & Wahlstrom 1997). Yet, despite the fact that human information behaviour research has the potential to broaden the understanding of information and incorporate aspects pertaining to how it is social constructed and understood, it has been up until now limited in scope by the fact that previous studies have been primarily conducted in western countries (Case 2007, p. 265), where the dominant biomedical model is strong enough to virtually eliminate the influence of other belief systems.

1.3 The Need for a New Theoretical Approach

Nevertheless, theories pertaining to human information behaviour may be able to better contribute to the understanding of how health workers in developing countries obtain and utilise information for two reasons. First, unlike the medical research, the human information behaviour theories do not necessarily privilege a biomedical understanding of health and well-being. Instead, they permit and even encourage researchers to consider all information that exists within a particular social context. This is assisted by a second yet interconnecting issue that pertains to the definition of information. Human information behaviour theories broaden our understanding of information, away from that provided by formal institutions to incorporate a more general consideration for everyday encounters and interactions, within which information pertaining to a variety of belief systems may be shared.

1.3.1 Through the Lens of Belief Systems

> It is important to consider the ways of knowing that exist in indigenous communities when developing research methods (Cochran et al. 2008, p. 22).

Thus, the first and perhaps most significant theoretical difference offered by this thesis, relates to how belief systems contribute towards what information is obtained and how it is utilised. Focusing on the belief systems within a particular culture provides a better insight into the values, knowledge and ideas that are considered to be true and correct (Sandstrom, Martin & Fine 2006, pp. 57-58). These are the things that not only help people to decide whether something is right and wrong but also what actions are likely to be considered as a consequence (Blumer 1969, p. 5). Belief systems are therefore an important factor in influencing how information is not only judged and interpreted but also the way in which it is utilised, if at all.

However, this thesis will not accept that belief systems directly determine a person's actions. While people learn about belief systems through interactions with those around them (Fine 1979, 1987; Sandstrom, Martin & Fine 2006), not everything communicated is automatically embraced. Instead, some people's beliefs will be judged more acceptable than are others (Faules & Alexander 1978, p. 47). In comparison, the thoughts of everyone else may be ignored or considered flawed or faulty (Merton 1972). Therefore, uniformity, even within the same cultural context, can never be assumed.

1.3.2 Information in its Broadest Sense

The second significant theoretical difference pertains to the definition of information. As individuals observe and interact with a broad range of people on a daily basis, opportunities for exchanging information are almost incalculable. Despite this, research examining the information behaviour of health workers in developing countries has tended to focus on only that provided by or through, the formal health care organisation (Chinnock, Siegfried & Clarke 2005; McMichael, Waters & Volmink 2005; Schneider 2006).

Information acquired informally can be just as important as any obtained through institutionalised channels. Accidentally overheard conversations, observations of other people or even written information left lying around for others to read, provide important yet sometimes unrecognised opportunities for communication. This informally or accidentally obtained information may be just as likely to significantly contribute to the individual's development and utilisation of knowledge (Erdelez 1997).

Information in this thesis therefore will encompass anything that has the potential to alter the way in which people think (Dervin & Nilan 1986). This means that the study will address the information obtained not only through official channels including initial training, colleagues at work and/ or supervisors, but also through various other people such as friends, family and community members. In doing so, this thesis will accept the commonly held belief that informal and social groups play a particularly significant role in influencing the way in which government services, such as health care, are provided and accepted in developing countries (Soysa & Jutting 2006).

In this way, two particular theoretical approaches will extend this study. By first considering how belief systems influence the way in which individuals interpret and utilise information, and second by expanding the definition of information to accept both formal

and informal sources, a broader sense of the information behaviour of health workers in developing countries will be examined.

1.4 The Key Contribution

While the problem of successfully transferring information to health professionals in developing countries is well articulated in the literature, and some of the barriers including a lack of resources and insufficient training have already been identified, the specific role that belief systems play in how information is received, interpreted and utilised has not as yet been explored. In addressing this particular gap, the thesis will contribute to existing knowledge in three ways:

- First, the thesis aims to contribute to the theory of human information behaviour by identifying the outcomes realised when individuals are confronted with information developed within a variety of different belief systems.

- Second, the thesis also aims to enhance the understanding of health management in developing countries by identifying how multiple understandings of health and well-being can influence the way in which health professionals in particular, develop and utilise knowledge.

- Third, at a practical level the thesis will provide an insight into the consequences of transferring information that is developed within one belief system into a context in which other understandings of health and healing also exist.

These contributions together with recommendations for both researchers and practitioners are presented and fully discussed in Chapter 9 (see sections 9.6 and 9.7)

1.5 The Research Question

These contributions lead to the specific question to be investigated; that is how do PHCWs in PNG engage with and utilise information that will assist them to diagnose and treat patients.

1.6 Study Design

The principle source of data which will assist in answering this question will be obtained from in-depth, semi-structured interviews with PHCWs who are working within the formal health care system in PNG. In addition, other individuals, chosen for their ability to provide contextual information on the primary health care system in PNG, will also be

interviewed. Once translated and transcribed all of the interviews together with the recorded field observations will be entered into NVivo software for initial coding and analysis, prior to a careful and comprehensive interpretation (Chapter 4, section 4.6).

1.6.1 From the Perspective of PHCWs in PNG

Looking at how PHCWs in a developing country such as PNG, engage with information from their perspective is important because they alone evaluate, define and ultimately accept or reject the information made available (Dervin 1992). Rather than placid receivers of information, PHCWs are active participants, influencing every aspect of the human information behaviour process; just as they in turn are influenced by it. This integrated view is sometimes neglected by some researchers, who tend to take a more linear, circular or stepped approach to understanding human information behaviour (Foster 2004; Kuhlthau 2004, p. 82; Wilson, TD 2005).

PHCWs in PNG will be especially useful in helping to explore how health workers in developing countries engage with information, for three key reasons. The first reason is that various belief systems inform the way in which Papua New Guineans currently understand concepts relating to health and healing. For example, over 80 per cent of the population lives in rural areas where strong insular communities not only continue to use their own local language but also live their lives according to locally based Indigenous Knowledge. In addition to the many hundreds of different types of Indigenous Knowledge systems that exist within PNG, western concepts including Christianity are also readily accepted, by many Papua New Guineans. For example at the last census, 96 per cent of the population considered themselves a member of a Christian organisation (National Statistical Office of Papua New Guinea 2003). The environment in PNG therefore provides an opportunity to study the effect that multiple belief systems may have on how health workers engage with information.

The second reason for selecting these particular participants is that primary health care services are critical to the survival of people in developing countries and these employees represent the very front line in health care. Recent reviews of the literature conducted by the WHO (Atun 2004; Gilson et al. 2007) found that health outcomes are considerably better in countries with a strong primary health care system. In particular primary health care is thought to provide improved equity and better access to health services, in comparison to contexts within which a more specialised hospital system dominates (World Health Organization 2008). In recognition of these benefits, a division to specifically

address rural practices has been formed by the World Family Doctors Caring for People (Strasser 2003), in order to support rural health by integrating practitioners into primary health care facilities (World Organization of Family Doctors 2004). AusAID, as the governing body for Australian aid together with the Government of PNG, concur with the importance of a strong primary health care system noting in the PNG National Heal Plan 2001-2010 that these facilities are crucial for improving the health of all Papua New Guineans (Ministry of Health 2001b; AusAID 2004).

However, in addition to these national and international acknowledgements (Ministry of Health 2001a; World Organization of Family Doctors 2004; World Health Organization 2008), primary health care has also attracted a considerable amount of criticism. One of the key complaints is that health improvements, including those that should address 'the main health problems in the community, providing promotional, preventive, curative and rehabilitative services' (International Conference on Primary Health Care 1978, p. 2) are not being realised, with thousands of people still dying from preventable diseases every year (Black & Morris 2003; World Health Organization 2005a; 2008, p. 66). A recent WHO report (2008) suggests several reasons why primary health care may not be living up to original expectations, including an inadequate allocation of funding, and shortages of staff, resources and essential infrastructure (p. 105). In PNG, PHCWs are hampered by an additional lack of appropriate supervision, training and communication infrastructure (Temu & Danaya 2000; World Health Organization 2006).

Although there is never one single solution to improving primary health care, providing access to and encouraging the utilisation of appropriate information by health workers is thought not only to be one of the most cost effective ways of improving health services (Lown, Bukachi & Xavier 1998; World Health Organization 2004) but may also assist in the developing better work practices (Rowe, AK et al. 2005), and lead to the generation of much needed local solutions to the many problems that exist (Pakenham-Walsh 2000). A skilled and knowledgeable workforce is one of the most important components of a primary health care system (Sandiford 2004; McAuliffe & MacLachlan 2005; Gilson et al. 2007, p. 37), and providing information that is of value to PHCWs is crucial to the development and application of knowledge (Pakenham-Walsh 1997).

1.6.2 Methodological Principles

An interpretive methodology based on Symbolic Interaction will be used to understand how these PHCWs engage with and utilise information they need to diagnose and treat patients. Symbolic interaction, a social psychology perspective is particularly concerned with how interactions between people, that is communication within a particular social context creates understandings (Sandstrom, Martin & Fine 2006, p. 2). Although Herbert Blumer first developed the term Symbolic Interactionism, George Herbert Mead is usually credited as its founding father (Blumer 1969, p. 1) and led the way by focusing on how language expressed in communicative interactions, stimulated thinking, as well as further actions or reactions (Aboulafia 1991).

Symbolic Interaction specifically lends itself to understanding communication activities (Faules & Alexander 1978, p. vii), which are of course essential for obtaining information. Yet Symbolic Interactionists are also interested in how individuals interpret this information and in turn what actions arise from the meanings they develop (Sandstrom, Martin & Fine 2006, p. 4). Lastly and perhaps most importantly, the Symbolic Interaction methodology does not ignore the social context within which the individual resides. In fact it plays homage to and stresses the importance of cultural elements including the belief systems, which contribute to every communicative activity. Symbolic Interactionists understand how through interactions, people not only learn about but also 'produce and reproduce' (Griffin 2006, pp. 61-62) their cultural identities and icons. While Chapter 3 provides a detailed explanation, the conceptual principles that will guide this study include:

- **Information** in its broadest sense, is transferred as people interact with each other (Chapter 3, section 3.6.2)
- **Knowledge** relies on this information being analysed and interpreted by each individual through a process of internal reflection and analysis (Chapter 3.6.3).
- **Outcomes** are to some extent dependent on the knowledge developed as well as the context in which the individual resides (Chapter 3, section 3.6.4).
- **The context** in turn comprises of both external influences, such as the people around them, and individual factors including the person's own skills and experience, which together influence but never determine how the information will be interpreted or the emerging knowledge used (Chapter 3, section 3.6.1).

- **The individual's perception** of the information, knowledge, outcomes and the context in which they reside is more important than an objective definition (Chapter 3, section 3.6.6)

Appropriate to the tradition of Symbolic Interactionism, this study will use a methodology based on ethnography to collect, analyse and interpret the data (Denzin 2004). Data will be collected through both in-depth interviews as well as field observations. While some considerations may need to be made for the sometimes inaccessible and even dangerous environments in which the study takes place, the following primary ethnographic principles will guide the design of the study (O'Reilly 2005, p. 25).

- This study will not predefine a hypothesis or make any assumptions. Rather interview schedules will be left intentionally very broad and flexible (Chapter 4, section 4.3), so that relevant issues can be followed as they arise.
- The researcher as much as practicable will immerse herself within the context, spending a considerable amount of time with the participants at their place of work (Chapter 4, section 4.5).
- While semi-structured interviews will be the primary data source, the actions and interactions of the participants will also be observed and carefully recorded (Chapter 4, section 4.5.3).
- Throughout the study, a process of reflecting and writing will assist with the development of key concepts (Chapter 4, section 4.6.2).
- The researcher recognises her own role in the process of collecting, analysing, interpreting and even writing about the findings that emerged from the stories of these PHCWs (Chapter 4, section 4.6.3).
- Most importantly, the focus will be on providing a rich descriptive and insightful understanding which emerges from the data, and the relevant theory (chapter 4, section 4.6.3).

1.7 Content

In order to discuss how PHCWs in PNG engage with information, this thesis has been divided into two parts. Chapters 2 to 4 will provide a background to the context, and explain the philosophical underpinnings, thinking and contextual issues within the study. Later, Chapter 5 to 8 build on this foundation by presenting and discussing the stories provided by these PHCWs, respecting and honouring the important role that they perform within the PNG primary health care system. Rather than resorting to problematising

Indigenous culture as something that requires fixing (Cochran et al. 2008), or painting a gloomy vision of failure and despair (Hughes 2002), this thesis instead will attempt to show how, if understood correctly, the process of engaging with information developed within a variety of belief systems provides opportunities for not only for patients but also the formal health care sector. A brief summary of the thesis chapters is presented below.

Chapter 2 – PNG a Short History

Starting from the time in which humans first inhabited PNG, this second chapter provides a historical overview, focusing on the development and/or introduction of belief systems and practices pertaining to health. Not only is the introduction and development of the formal health sector examined, but the contributions made by both Indigenous Knowledge and Christianity to general health service delivery are also considered. An overview of the current primary health care system concludes this chapter.

Chapter 3 – Conceptual Framework

Chapter 3 explores how the theory of Human Information Behaviour and to some extent Knowledge Management and Communication contribute to an understanding of how individuals engage with information. Processes of knowing and informing, which respectively develop knowledge and provide information within particular contexts are also introduced and discussed. The chapter then presents a Human Information Behaviour Framework based on Symbolic Interactionism which focuses on the individual's perception of these processes. This framework is not only used to collect, analyse and interpret the study data, but also forms the structure for presenting and discussing the study findings.

Chapter 4 – Study Design and Methodology

Data collection, analysis and interpretation techniques were appropriately designed around the concept of ethnography, which aims to understand and interpret the actions of individuals within a particular context. This chapter describes how individuals; in this case PHCWs, within a particular cultural context; namely the PNG primary health care system, are selected, approached and interviewed in order to collect the data required. In turn, the chapter also addresses issues relating to both analysis and interpretation.

Chapter 5 – Results/Discussion: The Current Context

Chapter 5 is the first of four combined result/discussion chapters. This chapter focuses on the context within which the PHCWs live and work, and demonstrates that a diverse range of belief systems based loosely on biomedicine, Indigenous Knowledge and/or Christian principles, currently inform the way in which health and well-being are understood in PNG. However, just because they coexist, does not mean that they necessarily always complement each other. For example, while beliefs pertaining to the biomedical model tend to attribute most illnesses to a physical ailment, many of the Indigenous Knowledge systems believe that health relies on an equal balance of the social, spiritual and physical selves. In turn, Christianity, while not dismissing the biomedical model, is much more focused on the relationship that an individual has with God.

Chapter 6 – Results/Discussion: Informing Process

PHCWs in PNG obtain information pertaining to these belief systems through external interactions with various sources. The formal health care system is for example, responsible for providing biomedical information, while Indigenous Knowledge and Christian principles are usually passed on either intentionally or accidently through interactions with community members. This chapter suggests that to some extent the amount of information PHCWs receive is not only dependent on information being made available, but also on how accessible it is to PHCWs in PNG. Accessibility in turn suggests two things. First, that the information source must be willing to share the information they have, and second the PHCW should be interested enough to take notice or consider the potential opportunities being offered. Face-to-face interactions in particular are found to encourage accessibility.

Chapter 7 – Results/Discussion: Knowing Process

However human information behaviour does not stop with this externally focused informing process. Instead these PHCWs are shown to reflect on and then make decisions about how or even if they will utilise the information that is accessible. For example, while a few PHCWs in this study prefer information based on one particular belief system, at least half of the participants acknowledged if not utilised information based on various other points of view. This concept led to the development of a new Continuum of Receptivity, whereby the PHCWs who tended to prefer one particular belief system are

placed toward the unilateral end, while in comparison those at the multilateral end, tended to be more open and responsive to differing ideas and suggestions. That is they are more 'receptive' to information based on a wide range of different perspectives.

Chapter 8 – Results/Discussion: Outcomes from Human Information Behaviour

Chapter 8, the last of the combined result and discussion chapters focuses on what happens when information is obtained and reflected upon. In particular because of a lack of supervision by the formal health care sector, many PHCWs are free to choose the treatment practices that they feel are most appropriate within a given situation. Therefore, PHCWs at the multilateral end of the continuum are able to utilise the knowledge they have developed from information pertaining to a variety of different belief systems, while those at the unilateral end are relatively free to use the treatment practices based on their particular preferred belief system.

Chapter 9 – Thesis Conclusion

The final chapter revisits the primary aim of the thesis and demonstrates that a contribution has been made to theory pertaining to both Human Information Behaviour and Health Management in Developing countries. The chapter also summarises the primary findings discussed in Chapters 5 to 8, demonstrating individuals are more likely to acknowledge the benefit of, if not utilise information from, multiple belief systems if:

- all of the belief systems are considered legitimate by at least one group operating within the context in which the recipient resides;
- information about each of the belief systems is available;
- the recipient does not have a particular preference for or association with any particular group; and
- the recipient has a degree of freedom that enables them to choose how they alone will act.

1.8 Key Definitions

In presenting and discussing these findings, the thesis uses terms that without further explanation may cause confusion. While more comprehensive definitions can be found in Appendix A, the following provides a brief explanation of the particular meaning utilised within this thesis.

Knowledge – First introduced in Chapter 3 (3.3.2), the term knowledge in this thesis refers specifically to a subjective concept comprising of a person's truths, beliefs, concepts, judgements and expectations (Wiig 1993, p. xvi).

Information – Also introduced in Chapter 3 (3.3.1), for the purposes of this thesis information refers to anything that can be transferred, shared or communicated to another person (Buckland 1991).

Beliefs – This concept is first introduced in Chapter 5 (5.1) and relates to the values, knowledge and ideas that are considered to be true and correct within the context in which the individual is located (Sandstrom, Martin & Fine 2006, pp. 57-58).

Belief System – Also introduced in Chapter 5 (5.1) a belief system relates to the set of interconnecting beliefs – that is the values, knowledge and ideas pertaining to a particular issue of concern.

Biomedicine/Biomedical Model – First discussed in Chapter 5 (5.4) the biomedical model developed predominantly by the west, primarily revolves around the concept that every disease has a biological cause and that the body is best fixed through scientifically proven treatment methods (Nettleton 2006, p. 2).

Christianity – An overview of the particular contribution that Christian Churches make to the development of PNG is provided in Chapter 2 (see section 2.4.1 in particular). However the concept that Christian principles such as the idea of one true God having the power to heal all, contribute to the way in which people come to understand health and treat illness is first discussed in Chapter 5 (5.4).

Indigenous Knowledge – Rather than referring to one standard concept, this thesis recognises that each region or even community in PNG may have developed their own unique Indigenous belief system (Koka 2004, p. 58). An overview of how this Indigenous Knowledge contributes to the way in which Papua New Guineans understand health and treat illness is first introduced in Chapter 2 (see section 2.2). For current understandings also see (5.4).

1.9 Summary

Of primary importance in this first chapter was the identification that previous studies have failed to consider and therefore investigate that health workers in some contexts may be influenced by belief systems, other than the biomedical model. There are potentially many reasons for this oversight including studies reported in the medical literature that tended to privilege the biomedical model that dominants many of the western countries.

By broadening the definition of information to incorporate that provided by both formal and informal sources, the study contributes to current theory in three particular ways. First, it explores how a variety of information developed within various belief systems can inform an individual's understanding. Second, it contributes to the knowledge pertaining to how multiple belief systems can influence what type of treatment is provided by the formal health care system, and third it provides practitioners with practical examples of what happens when information is transferred between paradigms.

This chapter also describes how these contributions were achieved, in particular noting the choice of participants, namely PHCWs in PNG. Chapter 2 continues with this theme, providing a more detailed historically account of PNG, with particular reference to the development of various health and treatment practices.

CHAPTER 2

Contending with Diversity

2.1 Introduction

In order to provide a background to how PHCWs in PNG currently engage with and utilise information, this chapter focuses on issues pertaining to the early development of both formal and informal health systems in PNG. Yet, because the people of PNG have traditionally relied on oral communication that relied on storytelling to hand down information from one generation to the next, providing an authentic Papua New Guinean perspective has proven difficult. Most of the written information about PNG has been written by westerners, and concentrates primarily on their experiences of moving to and living within a country that was and continues to be so different from their own. Historical records produced by Papua New Guineans are scarce, and almost impossible to find (Hastings 1969). Consequently, the following description of PNG as an evolving country relies predominantly on western literature. When available, however, perspectives from Papua New Guinean authors have been included.

One such Papua New Guinean author, Dr Michael Mel in his presentation to the 2001 National Education conference referred to three periods of time for the Papua New Guineans: 'Pasin Bilong Ples' or the connection with Papua New Guinean history, language and customary knowledge; 'Taim Bilong Masta' referring to colonial settlement; and finally 'Yumi Iet' being now or in the present as people look towards the future (Mel 2001, p. 14). This chapter utilises all three concepts as a way of understanding how PNG has evolved as a nation. Though rather than seeing them as three distinct interludes, they are treated as layers upon which new periods in history are continually formed.

2.2 *Pasin Bilong Ples* – History, Language and Indigenous Knowledge

> Does the past play any role in what we do? Of course it does, but not so much because it has shaped our personality, but because *we use it in our definition of the present* (Charon 2004, p. 129).

The island of New Guinea has always been extremely volcanic, sitting squarely within an area known as the Pacific Ring of Fire. As the world's second largest island, New Guinea has a central mountainous spine running almost directly east to west, which rises in some places to nearly 15,000 feet above sea level. Magnificent mountain ranges, great river systems, dense tropical rainforests and beautiful coastal areas, provide a treacherous but varied land for its people. However, things were somewhat different when man first came to this island (Hastings 1969).

Persistent and diverse are perhaps the two best words to describe the early inhabitants of New Guinea. Over 40,000 years ago a land bridge crossing New Guinea provided a path to the Solmons, New Hebrides, Fiji and Australia. Along the way, some of these immigrants decided to make a home for themselves along the more habitable coastal regions of the island (Hastings 1969). New waves of migration not only brought more people, but also with them a variety of different resources (Hope & Haberle 2005). The Papuan dog, for example, was an early addition to the island, and shortly afterwards primitive Malays brought with them subsistence farming techniques, and introduced pigs and fowls as well as yams and taros to the early inhabitants. As people became better resourced they started to move inland and by 30,000 years ago, the mountainous highland regions of New Guinea were also inhabited. The people developed sophisticated farming techniques that were essential for this move included terracing, irrigating and composting, and in some places up to 4,000 people were able to live quite comfortably on just one square mile of usable land.

However, for the most part, New Guineans formed small self-sustaining communities or villages between 300 and 500 people, and even though these communities were often quite isolated, carefully regulated interactions between groups were developed in order to trade and exchange goods such as shells between even highland groups and people of the coastal areas (Hastings 1969). Despite the many opportunities for peaceful trade, however, tribal warfare was also very much a part of the social context, which rather than integrating communities, tended to encourage segregation (White 1972).

Living in these relatively isolated small communities, New Guineans developed over 800 languages and distinct cultures, most of which are still in existence today (SIL International 2005). Decisions were made, customs developed and disputes settled at the local level (Bonney 1982). Nevertheless, despite the relative isolation some similarity can still be found between regions. One practice common to many communities is that of 'big men' or leaders who earned their position by building relationships based on the generosity they showed to others (Strathern 1971, p. 1; Rivers 1999). Another practice shared by many communities was the lack of codified law. Being an oral society meant that customs, rules and historical events were passed down from generation to generation through story telling (Hastings 1969). Finally but perhaps most importantly in terms of traditional Indigenous Knowledge, many Papua New Guinean communities saw no separation between nature, life and spirituality (Lawrence 1971; White 1972) (see also Strathern 1984; Madden, Bryson & Palimi 2006). However, despite these very broad similarities, the details and their application at an individual community level was extremely different. For example, often even very close neighbouring tribes would have their own unique language and set of spiritual beliefs (Pauka 2001).

Perhaps because of this cultural and geographic diversity, it is difficult to generalise about the health of early New Guineans. Some historians suggest that chronic diseases ran rampant and the life span of most Papua New Guineans was very short (Hastings 1969; White 1972; The World Bank 2007, p. 39). However, others describe a systematic village health care system where minor ailments were treated with herbs and first aid methods known by everyone within the community and specialist Indigenous healers available for more serious conditions (Maddocks 1978). Nevertheless, tribal fighting (Godelier 1986, p. 3) and malaria predominantly in the coastal areas, would certainly have added to the mortality figures. Other significant health concerns would no doubt have included infections, accidental trauma and snake bites. In some areas a high dependency on staple crops with very few sources of protein, would also have contributed to sickness and deformities, particular in children (Attenborough 2007).

It was many years before the first European explorers ventured as far as New Guinea (Hope & Haberle 2005). The Portuguese first sighted the island around 1511 and over the next two centuries there were numerous landings by the Spanish, Portuguese, Dutch and British navigators. In the 18th century the British discovered the Duke of Yorks and the Gulf of Papua and Manokwari; and were able to map most of the coast line. By the 19th Century traders and whalers were making regular voyagers to the area. However, while

the people of New Guinea did trade with these sea farers, most of the interactions resulted in blood being spilled on both sides, and therefore was generally to be avoided wherever possible. In 1849, the first missionaries a French Marists Brothers sect, also tried to make contact with and even settle on the Woodlark Island. Nevertheless, like the whalers and traders, they were quickly driven out (Hastings 1969).

In 1871, a German firm of Johann Cesar Godeffroy und Sohon was, however, successful in establishing a shore base on the Gavelle Peninsula in order to obtain copra, turtle shell and trochus. This prompted some British subjects with interests in the Australian colony to think about laying claim to at least part of the island. Three reasons were thought to contribute to their call for colonisation. Some believed that New Guinea held untold riches including gold, which could be easily be extracted and transported back to Australia or even England. Others were concerned with the German interests in the area that could jeopardise the security of their Australian holdings, and lastly a few of the landholders in Australia realised that the people of New Guinea could provide an untapped cheap labour source, particularly for the large cane fields of North Queensland. The British Government was however, reluctant to get involved, and therefore, at least the southern side of the New Guinea Island remained relatively unscathed for a few more years (Hastings 1969).

Thus, up until colonisation New Guinea remained primarily in the hands of the people who had originally migrated across the land bridge. Forming relatively small self-sustainable communities, these early Papua New Guineans not only developed their own quite sophisticated farming methods but also village based Indigenous health systems that often included the use of herbs as well as spiritual beliefs (Pep 2004). While many coastal people had already interacted with Europeans this had no far reaching effect on any of these traditional practices or beliefs (Hastings 1969), and even up to the late 19th century a large number of highland people had never heard or seen a white person (Jenkins 1988).

2.3 *Taim Bilong Masta* – A Colonial Legacy

> [P]ersons, not history, make history; but … the histories that individual make are not always of their own making (Denzin 1994, p. 24).

When PNG was eventually colonised, the land and its people were irretrievably changed forever. The colonisers took a land of many separate and diverse communities and attempted to form firstly several primary regions and then distinct countries, which were based primarily on western systems of government, education and health services. Not only did colonisation result in a forced nationhood but also resulted in the importation of

many other ethnic and culturally diverse people (Giddens 2001), primarily to begin with from western countries such as England and Germany. The nation of Papua New Guinea therefore 'in large part [was] created by contact with Western industrialism, which has undermined earlier, more traditional systems' (p. 37).

The colonial masters originally divided the island of New Guinea into three colonies (see Figure 1). The Dutch began colonising the western side of the island in 1828 (The Columbia Encyclopedia, 2008), while north east New Guinea came under German, and south east Papua under British rule in 1884 (Hastings 1969). This thesis is however, only interested in the German and British colonies that in later years formed what is now referred to as PNG.

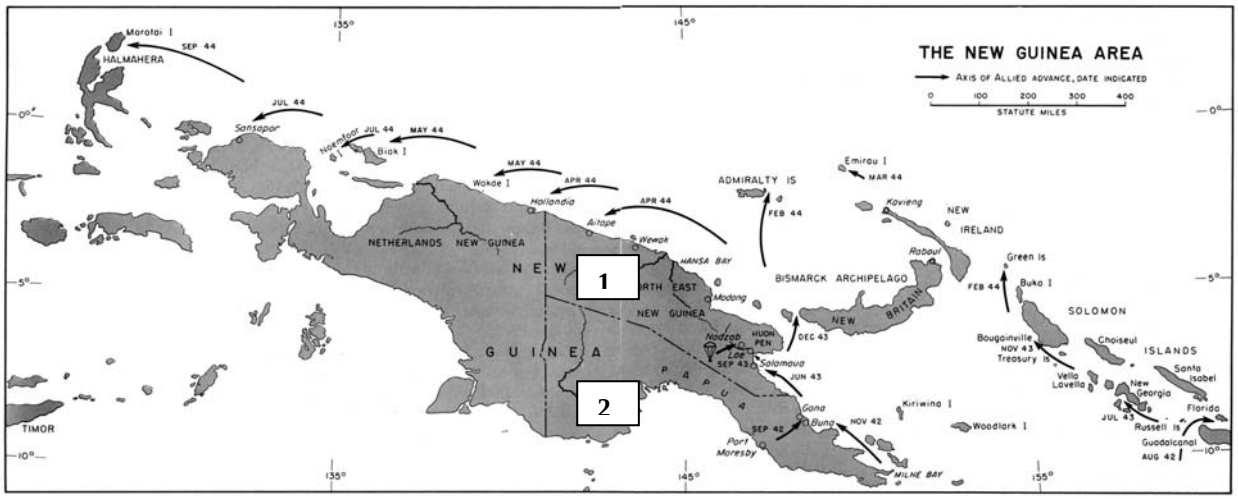


Figure 1 – Map Distinguishing German Occupied [1] New Guinea from British Occupied Papua [2]. Used by permission of the University of Texas Libraries, The University of Texas at Austin

The focus of the German colony known as New Guinea was from the start very different to that of the British colony referred to as Papua. New Guinea was administered through the Neu Guinea Kompagnie a private company whose primary purpose was to exploit the resources and labour thought to be available within this region. The company that was based firstly in Finschhafen was allowed under its agreement with the German Government, to freely acquire land and recruit labour. However, their exploits were not particularly successful, with the German Government taking over the administration of New Guinea in the late 1800s. Soon afterwards Rabaul became the capital of the German occupied New Guinea, and from there they administered their colony through a system of travelling patrols headed by a white person or kiap. These patrols would inspect each

village handing out justice, advice and health services as the kiap saw fit (Nelson 1982). Between patrols, a village constable or native official was charged with these responsibilities (Hastings 1969). The Germans did eventually at least partially achieve their main aim of exploiting New Guinean labour establishing successful copra and coconut plantations, and discovering small pockets of gold that they exported back to Germany (Maddocks 1973).

In comparison to German rule, the British in Papua developed a more paternalistic administration. Aware that both British subjects with Australian connections, planned to exploit the people, they developed a protectionist ideology and as a result the colony was closed off to white settlement until 1888. Rather than exploiting a potential labour force, the job of the very first Papua administrator, William McGregor, was to establish a plan for exploration, pacification and assimilation of the Papuan people into western ways. The laws of the colony were also administered through a system of mobile patrols and village officials, although Papuan village officials were not given the same powers or responsibilities as their German ruled counterparts. Instead they were treated more like village spies, reporting misdemeanours to the travelling Magistrates who were judge, jury and administrator of penalties (Hastings 1969).

While McGregor and the early colonial officials were relatively tolerant and paternalistic toward the local Papuans, later administrators increased discipline and control. For example, some Papuans were prevented from leaving their villages to settle on unclaimed land and others were forced to rebuild their villages, where and how they were told to by local magistrates (Hastings 1969). The English led Papuan and the German ruled New Guinean people were therefore in the end subjected to similar levels of control by their colonisers, although potentially for different reasons.

In 1906, Australia accepted full responsibility from England as administrators of Papua and after World War I they also took control of the previously German administered New Guinea. This would be their first and only colonial venture. However, it was not until 1942 that the two colonies, Papua and New Guinea were joined to form what we now refer to as PNG. The rather surprising failure to combine the two separate entities was hotly disputed by some, such as Murray the Chief Judicial Officer, at the time. However, the strict and to some extent profitable system of exploiting labour in New Guinea was too irresistible to the new Australian administrators, and they did not want to jeopardise expected profits by changing any systems that had been put in place by the previous German regime (Hastings 1969).

The Australians also changed the tradition of paternal protectors in Papua shortly after the British handover. One reason given for the change was that the Papuans were under employed and thus potentially trouble makers. To overcome this problem they were indentured for up to three years at a time, and employed at very low wages to do reportedly meaningless tasks. While some of the people who provided employment for these indentured people were considered humane and just, others frequently exploited even the most basic conditions set down by the Australian colonial power, often beating and starving their workers (Hastings 1969). Papuans and New Guineans, or Papua New Guineans as they eventually became known, were segregated, looked after, legislated for and exploited.

Nevertheless, Papua New Guineans did not just passively accept the conditions imposed upon them. For example, tribes around Madang in 1904 and Kokopo in 1905 united and rebelled against the colonial powers and plantation owners, while in 1929 people in Rabaul held a general strike, in protest of conditions (Hastings 1969). There were also examples of small outbreaks of discontent relating to land dealings. For example, a dispute over land used for plantation in the Paparative area resulted in the killing of the plantation owner's wife and family, after which their homestead was looted and destroyed (Nelson 1982). Between 1885 and 1910, an unheard of 55 white people died as a result of native reprisals (White 1972), which then resulted in retaliations by the whites. While the number of white deaths attributed to these skirmishes were relatively low, it is difficult to estimate how many Papua New Guineans ended up with a similar fate, as the white colonisers were known for their swift and bloody retribution (see for example Nelson 1982, p. 24).

The people of PNG also did not necessarily immediately accept and adopt the knowledge and practices of the whites, including those pertaining to Christianity. The first missionaries arrived on the coastal areas in the 19th Century, with the British Empire bringing Anglican and Methodist beliefs to the southern shores and the Germans introducing the Lutheran church to the North East (Hauck, Mandie-Filer & Bolger 2005). By the end of World War II (WWII) many conservative evangelical and fundamental Christian missions had also established themselves in the country, each fiercely competing for converts, as new areas were settled. In an attempt to gather new members, missionaries opened up many of the remote regions in PNG (Hauck, Mandie-Filer & Bolger 2005) acquiring at the same time, land for the use of the church (Mrossko 1986).

Yet, despite these enthusiastic attempts to spread Gods word, traditional spiritual practices based on their own Indigenous Knowledge continued to determine how people led their daily lives. While the Goodenough people called themselves Christians, they still based many of their decisions on the underlying belief of the spirit world (Young, MW 1981). Likewise the people of Pangai, even today still adhere to the belief that spirits and sorcery role in both life and death. It is also interesting to note that even in areas such as Mendi and Tambul where people had supposedly abandoned traditional practices; evidence of Indigenous beliefs still exists. For example, in order to comply with the churches request they buried their traditional sacred objects in order to ensure that the spiritual powers that they were believed to contain, did not cause any sort of distress or calamity to community members (Strathern 1984). Instead of abandoning the beliefs and practices based on Indigenous Knowledge systems, there are many such examples where even today Christian teachings are combined with, interpreted through or incorporated within the Indigenous Knowledge that has been handed down by their ancestors (Rambo 1990, pp. 66-67; Bartle 2005).

The first formal health care services that were originally established in coastal areas before gradually moving inland (Connell, J 1997) were treated in much the same way. Biomedicine became available to the people of Papua at a native health centre in Port Moresby in the early 1900s (Maddocks 1978). However it was not until 1957 that the first hospital was constructed in the capital, while the highlanders had to wait until 1966 before they were able to obtain services from a hospital based in Goroka (Connell, J 1997). Outlying communities continued to rely on travelling magistrates or *kiaps* who combined their duties of police officer, magistrate and jailor with those of providing basic health measures and sanitary instruction (Bonney 1982). Simple medicine such as penicillin however, still made a considerable difference to the health of these Papua New Guineans, particularly in rural areas where easily treatable conditions such as yaws, skin ulcerations and pneumonia were prolific (Maddocks 1973).

Mission health facilities also became at least an informal part of the early health care system in about the late 1800s (Hauck, Mandie-Filer & Bolger 2005). On occasions missionaries even used the lure of health services to gain the trust of the Papua New Guinean people (Hauck, Mandie-Filer & Bolger 2005). For example the Wesley Mission encouraged the local communities to adopt Christianity with promises of supplies including biomedical drugs not usually available. The Catholic Church however, provided much larger tangible inducements, such as entire health facilities and staff (Strathern

1984). Not surprisingly perhaps, some mission health facilities were somewhat paternalistic in their treatment of patients. In Wailagi for example, children were often admitted for even simple procedures, rather than relying on the parent to administer treatment (Young, MW 1981).

Eventually, Papua New Guineans were provided with opportunities to work in both mission and government run health facilities. For the first time in 1903 Papuan health workers known as Tutuls (Essai 1961, p. 200) were trained and offered positions at the Port Moresby Hospital, later being deployed as part of the patrols to outlining rural districts (Radford & Speer 1986). Taking over from these Tutuls, Aid Post Orderlies were first educated in the late 1950s (Kolehmainen-Aitken 1990) and upon graduation they were sent to rural communities establishing and providing simple front line health services at small out posts referred to as Aid Posts. One of the benefits of training Papua New Guinean as Tutuls and eventually Aid Post Orderlies was that to other Papua New Guineans they were a lot less threatening in comparison to the white kiaps or patrol officials who were known to 'line up the villagers, handle them cursorily and select some for removal to a hospital' (Maddocks 1973, p. 968).

Basic nursing skills were initially taught to Papua New Guineans in the 1920s at the Salamo Hospital. In 1952 their qualifications were eventually recognised when a Certificate in Nursing by the PNG Department of Health was awarded to each successful graduate. These certificates eventually lead to formal nursing qualifications and in 1959 the registration of nursing schools by the Department of Health. In 1964, the Nursing Council of PNG was formed and candidates were able to either undertake a general nursing course (Kettle 1979, p. 310), or a shorter nurses' aid program (Putney 1988 cited in Ashwell & Freeman 1995).

The qualification of Doctor was not available to Papua New Guineans until the early 1950s when three trainees were sent to the Central Medical School in Fiji. By 1962, ten fully fledged doctors had graduated and were practicing in PNG. In 1960 the Port Moresby Papuan Medical College had opened, and was training physicians with an emphasis on rural practice. Eventually, the College became part of the University of Papua New Guinea, which opened in 1966 (Maddocks 1973). It is interesting to note that while the early lecturers tried to adapt the courses to meet local needs, the students were keen to obtain the same training as their Australian-based counterparts (Nelson 1982, p. 207).

While PNG doctors were beginning to graduate, the formal health care system still primarily relied on a small number of expatriate professionals to provide many of the health services. The entire trained health staff immediately after WWII for example, consisted of just five doctors, four Australian trained nurses and 23 European Medical Assistants (Nelson 1982). Despite the lack of staff, there were, however, some very positive results during this early period, including an increased life expectancy of approximately ten years between 1946 and 1966 (Attenborough 2007, p. 268). Nonetheless, not all of the news was positive, with modern diseases including hypertension infiltrating PNG for the first time. In addition, malaria once contained to low lying, swampy conditions was being reported in the central highlands, probably because of the greater movement of people between coastal and highland areas (Attenborough 2007).

Most Papua New Guineans however, still did not rely on or have access to this formal health system. Instead, they continued to rely on various Indigenous health practices including sorcery to meet their needs. This was despite legislation that made it a criminal offence to conduct any form of witchcraft (Hastings 1969). Even in cases where biomedical practices were utilised, many people believed that it was just another type of magic and in this way it became part of their own Indigenous Knowledge. At the same time as receiving medical attention from a formal health care facility, people would also continue to practice sorcery (Spark 2005). Even in urban areas such as Port Moresby the use of Indigenous medicine and sorcery continued unabated, sometimes in parallel with biomedical practices, and sometimes in isolation (Owen & Urai 2004).

Whether from Britain, Germany or Australia, colonisation brought new and vastly different information to PNG. This information however, did not necessarily result in a replica of the knowledge and practices that were introduced. Some Papua New Guineans accepted the colonial rule, embracing the new information and attempting to change their lives accordingly. Others combined it with their own traditional Indigenous Knowledge incorporating certain aspects and rejecting others. Still others discarded any form of western information outright, no matter what the consequences. Whatever their choice, both Indigenous Knowledge and the biomedically based health practices played a significant role in the health and well-being of Papua New Guineans as their country moved towards independence.

2.4 *Yumi Iet* – Turning Towards the Future

> [K]nowledge and wisdom are not lost but are accumulated (Charon 2004, p. 63).

By the early 1970s PNG as a nation had been colonised for almost 90 years. However, the entire region was not subjected to colonial rule all at once. People in the highlands, for example, did not see white people until after WWII (Strathern 1984). Moreover, while some of the more remote communities knew that changes were taking place, they chose to avoid any direct contact until the early 1980s (Jenkins 1988). However, by independence most Papua New Guineans were aware of and affected in at least some small way by western systems of government, education and health that had been implemented in most areas. Up until independence however, Papua New Guineans themselves played only small role within these systems, often being directed in their duties and responsibilities by their white masters (Edmiston 2002).

The colonial parliamentary system was a prime example of how Papua New Guineans were often excluded from positions of authority. After many years of non-participation, in 1951 three Papua New Guineans were appointed as unofficial members of the Legislative Council. In this new role, Papua New Guineans did not have any say in decisions and dealings of the Council, but were instead just onlookers who were expected to listen and learn. In the early 1960s, however, things did begin to change. Six Papua New Guineans out of the total 61 members were chosen to play a slightly more active role in parliament, and gradually this involvement increased. This council was eventually disbanded altogether in 1964, in favour of the first Papua New Guinean elections, which brought to power Mr Michael Somare as the first Papua New Guinean leader (Hastings 1969).

Local councils were another feature of the gradually developing political system. Mr Hasluck, Minister of External Territories in those early years, saw the local government councils as a way of familiarising the Papua New Guinean people with the western political system. By the first Papua New Guinean election in 1964, 142 councils representing 8,000 villages and 1.82 million people had been formed (Hastings 1969). Yet, they remained for the most part ineffective and in some cases had to be wound down because of corruption and general mismanagement (Bonney 1982). Many areas instead, remained under local magistrate or kiap rule until independence (Hastings 1969).

Three events led to the external push for independence, which occurred well before the Australian colonisers had anticipated (Davis 2002). First a report written by Professor David Derham in 1960 recommended that Papuan New Guineans should be subjected to

the same laws as that imposed on the rest of the population and that the judicial system '[o]ught to provide for native participant both in the incidental administrative aspects of their functioning, and in Court membership' (Derham 1960, p. 36). Then the 1962 United Nations Trusteeship Council Visiting Mission headed by Sir Hugh Foot recommended that political control be handed over to the Papua New Guineans through a newly formed centralised government as soon as possible (Foot 1964, pp 212-213). Finally the World Bank's 1964 report suggested changes to the development efforts in PNG, including a 'shift in emphasis towards policies giving greater responsibilities to the people' (Downs 1980, p. 254).

Whatever the reason or combination of reasons Papua New Guineans gained independence in 1975 with Somare at the helm (Strathern 1984). However, this independence brought both positive and negative outcomes for the people of PNG. For example, unlike some developing countries, PNG has not been ravished by wars, dictatorships or mass civil unrest. Instead despite the large number of extremely diverse and sometimes conflicting cultural groups (Rivers 1999), a people who were not always familiar with this Westminster style of government, as well as the dire warnings of impending disaster from other countries, PNG is a relatively stable country (May 2006). Papua New Guineans have maintained one of the longest democracies on record for a developing country (Reilly 2006). Since independence PNG has had just fourteen governments and six Prime Ministers, a free and vibrant press operates successfully and apart from small incidences, the PNG Government has developed reasonable relationships with a vast number of their neighbouring countries (May 2006). In addition, to begin with at least there was a strong commitment by the newly elected government to rural development including the expansion of social services such as health and education (Hinchliffe & Allan 1983).

However, Papua New Guineans have also experienced many problems during the last 30 years. Tribal fighting that was contained to some extent during the colonial period has again become a feature of some communities (Strathern 1984). Crime is on the increase with murders, rape, abduction and kidnapping common in areas such as Port Moresby (Koczberski, Curry & Connell 2001) as more and more people move from rural communities to become part of the urban poor (Freeman, Thomason & Bukenya 1992). Criminals commonly referred to as Raskols often go unpunished by a police force that is inadequately trained and resourced (May 2006). Part of the problem is believed to stem from the fact that there was a shortage of qualified staff to take over the reins of government at the time of independence, but a declining economy since the 1980s has also

contributed (May 2004, p. 263) Closure of major mining interests, lack of real overseas investment, reduced government revenue and financial mismanagement have all added to the lack of available funding, which is needed to support the social infrastructure and resources required by a growing population base (May 2006). In addition, there are many reports of corruption within the government, and ministers charged with using their position to benefit themselves and their own communities. This is believed to some extent to have stemmed from traditional village politics where men became leaders only because of the relationships built with their constituents partly through gifts and exchanges (Davis 2002). One result from this upheaval and turmoil is that the United Nations Committee for Development has now designated PNG as a Least Developed Country (2006). It is within this climate of economic and social downturn that a national PNG Health System currently operates.

2.4.1 The Current Health Context

The health system at independence was quite different organisation to that which operates today. A colonial administration had set up a centralised hierarchy, with the PNG Department of Health overseeing all of the health facilities across the country. From the time of independence however, the Somare lead Government focused on decentralisation, in 1983 handed over responsibility including operational management to each of the nineteen provincial governments (Thomason 1988). This decentralisation was intended to disseminate decision-making responsibilities and funnel resources directly to those who were closer to the coal face. However, decentralisation has also not been without its own problems. For example provincial governments were not properly resourced with even less expertise and experience than the original national Government (Kolehmainen-Aitken 1992).

Despite these problems the Government continued with its bid to ensure local decision-making, with further decentralisation down to a District and in some cases the Local Level Governments in 1995 (Ministry of Health 2001b). While this move was promoted as a way of disseminating power to communities, it has also been argued that it was also a way in which the Department of Health could take back at least some of the responsibility for planning and monitoring that they had given away in 1983, by re-establishing control of the purse strings (Edmiston 2002).

In addition to focusing on decentralisation, the newly elected Somare government also introduced the concept of Primary Health Care to the PNG Health System (Connell, J 1997). The principles of primary health care, which have been accepted by many countries are set out in the Declaration of the Alma Ata and include a health system that focuses on 'the overall social and economic development of the community' (International Conference on Primary Health Care 1978, p. 1), rather than specific disease states. The intention is that primary health care provides not only a first level of contact for individuals seeking health services but also promotes the involvement of communities in planning and taking responsibility for their own health care (International Conference on Primary Health Care 1978, p. 1-2). The shift to a primary health care system in PNG was officially recognised in the 1974-78 National Health Plan (Connell, J 1997).

Therefore the current formal health care system is organised so that services are provided firstly through primary health facilities and then when required major hospitals which are located in each of the nineteen provinces (Connell, J 1997). The Department of Health is responsible for overall management of primary health care facilities with regard to policy and standards development, national planning, technical advice and the provision of specialist medical equipment and pharmaceutical supplies. They are also responsible for overseeing and registering health professionals that work within the facilities, although many of the courses including the Diploma of Nursing introduced in 2002 are run by churches.

Hospitals that also operate under the auspices of the Department of Health through the Public Hospitals Act are in turn responsible for supporting primary health care facilities through activities such as providing general advice as well as in service training to PHCWs (Ministry of Health 2001c). Finally District Governments working with Local Level Governments in the case of Aid Posts coordinate and disseminate the funds for all primary health care services in their district.

The current National Health Plan 2001-2010 (Ministry of Health 2001a) focuses on the following priority areas for all primary health care services (p. 1):

- health promotion;
- family health, with a focus on women's and children's health;
- elimination, eradication and control of priority diseases;
- health protection;
- human resource management;

- strengthening district health and hospital services;
- improving access to medicines and medical supplies;
- strengthening partnerships.

However, given the problems with funding as well as a lack of appropriately trained staff and other resources, a second more focused plan was developed. Instead of very broad all encompassing goals, the 2006-2008 Strategic Plan focuses specifically on four priority health areas (Department of Health Papua New Guinea 2005, p. 3):

1. Fully immunise every child under 1 year old
2. Reduce malaria prevalence in high malaria endemic Districts
3. Reduce maternal mortality in the districts with high maternal deaths
4. Reduce rate of increase of HIV and STI

Three types of PHCWs are together responsible for providing services in order to improve these four priority areas (see Figure 2). Health Extension Officers (HEOs) who bridge the gap between doctors graduate after four years of training; nursing officers who now receive a nursing diploma after three years; and Community Health Workers (CHWs), previously trained as either Aid Post orderlies, or nursing aids with two years of basic training, staff the primary health care facilities in PNG (Papua New Guinea Health Services Support Program Pty Ltd 2004).

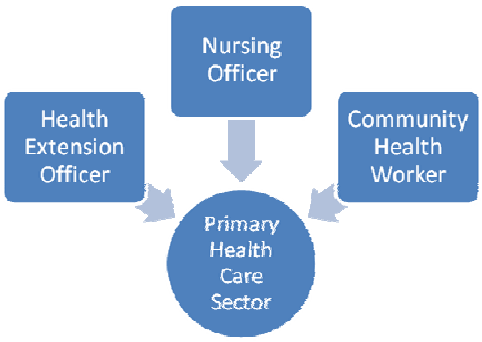


Figure 2 – Staff Working within Primary Health Care Facilities

In turn, these PHCWs work in one of three types of primary health care facilities (Department of Health Papua New Guinea 2005). At the Aid Post level (see Figure 3), usually one CHW is responsible for providing basic health services, educating and promoting the community on hygiene, sanitation and disease prevention, reporting outbreaks of diseases to the Health Centres, and recording basic health and population data including births and deaths in the community.



Figure 3 – An Aid Post – Photo Taken by Author

Sub-Health Centres (see Figure 4) often provide many of the same types of services as an Aid Post, but as the facility is usually better equipped and has a range of qualified staff on hand including at least one nursing officer and several CHWs, the types of treatments available to the community at these facilities are usually more extensive. Sub-Health Centres may also supply Aid Posts with basic medicines and will be responsible for conducting outreach mother and child clinics and health promotion activities on a regular basis. In addition, they are required to collect basic health data on a regular basis including the number and type of patients seen according to various prescribed criteria (Ministry of Health 2001b).



Figure 4 – A Sub-Health Centre – Photo Taken by Author

The Health Centre (see Figure 5) is the largest of the primary health care facilities often employing a HEO, several nurses and CHWs. They not only care for outpatients but may also have inpatient facilities. In addition to responsibilities that are much the same as an Aid Post or Sub-Health Centre including data collection, health promotion and education activities, regular patrols to outlying communities and notification of disease outbreaks. The Health Centre is also responsible for the supervision of Sub-Health Centres Aid Posts within their area, including the dissemination of information and general staff support (Ministry of Health 2001b).

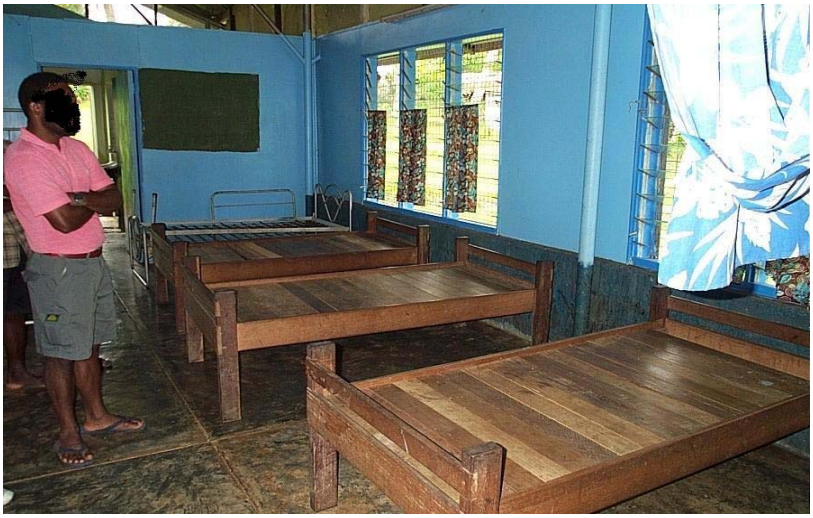


Figure 5 – Inside a Health Centre – Photo Taken by Author

Churches continue to be a major provider within the health sector, at present running approximately 45 per cent of all health facilities and 49 per cent of rural health facilities (Ministry of Health 2001b). The government provides funding or subsidies to each facility based on type, size and location, although how these subsidies are actually spent is not known (Hauck, Mandie-Filer & Bolger 2005). However, church-run facilities are generally more productive and provide a higher quality of service (Thomason & Kolehmainen-Aitken 1991) which perhaps explains why they are also better utilised by the community in comparison to government facilities (Mitchell et al. 1991).

However, a better quality services may also come at some cost. For example, the church is sometimes criticised for promoting certain lifestyle choices, determining for example appropriate dress, sexual and health practices, the most controversial of which relates to the distribution of condoms. At present condom distribution is banned or at least limited in some church-run health centres (Wilde 2007), which is of particular concern with the incidence of HIV/Aids on the increase and condoms not freely available elsewhere. People

are often left with few choices other than complete abstinence from sexual activity. One church pastor purported that HIV/Aids 'is God's punishment' (p. 61) for the people's sins and therefore refused to distribute condoms.

Despite the efforts of the PNG Government, as well as various church organisations, the country still faces many problems in providing health services to the Papua New Guineans (The World Bank 2007, p. 43-46). For example, real health expenditure per head of population has declined rapidly since independence (Thomason & Kolehmainen-Aitken 1991), and there are often shortages of drugs and other resources. A more worrying trend however, is the closure of many rural and remote facilities. A conservative estimate suggests that at least 22 per cent (Ministry of Health 2001b), with some sources estimating that up to 50 per cent (Pincock 2006) of Aid Posts, are currently left unattended. In addition many of the staff that are working are not supervised or supported (Thomason & Kolehmainen-Aitken 1991), health data is often inaccurate and cannot be relied upon for long term planning (Cibulskis & Hiawalyer 2002), and in most cases information either does not flow at all or flows from the top down in a particularly prescriptive manner through managers who are often not interested in hearing from either front line health workers or community members (Welsch 1986). As a result of these and many other issues, there has been both a decline in staff morale (Kehalie 1999) and also the quality and availability of services (Pincock 2006). Proof of these problems can best be demonstrated by the recent increase in child mortality and morbidity figure, as well as a decrease in overall life expectancy to just over 50 years (World Health Organization 2006).

Perhaps because of the problems experienced by the formal health care system, there is also an active and sometimes even flourishing informal sector that many of the 5.9 million people now living in PNG still use. The belief in the benefits of Indigenous medicine in conjunction with in some case sorcery and/or other spiritual practices, is, however, particularly prevalent in rural communities (Pauka 2001) (see Figure 6 for example) where up to 87 per cent of the population live (World Health Organization Papua New Guinea & Department of Health Papua New Guinea 2005). These practices exist despite the Government's past refusal to recognise that Indigenous health practices play a role in the provision of health services within PNG (Alto 1996), or more recently have at best been 'relegated to the background in preference to modern medicine' (Pep 2004, p. 5). One prime example of how Indigenous Knowledge is still relevant relates to childbirth. Indigenous childbirth practices continue to be practiced in many rural areas (Garner, Lai & Baea 1994). In Machik for example, women still deliver alone or with the aid of a female

relative, refusing the help of local PHCWs (Jenkins 1984) and a recent study in Tari participants suggested that there is little interest in biomedical practices concerned with family delivery methods because their traditional values and methods are still so important (Vail 2002).



Figure 6 – One Example of a Rural Community – Photo Taken by Author

This informal health system is not only limited to customary practices and herbal cures but also involves a sophisticated degree of skills and knowledge in specialty areas such as 'bone-setting and trepanning, and above all in the etiologies and cures' (Connell, J 1997, p. 281). This Indigenous Knowledge not only suggests treatment methods but also provides a platform from which other beliefs can be assessed and even incorporated into their practices. People from a village in the Wosera area of the East Sepik province for example, distinguish between the sickness caused by breaking taboos that requires spiritual intervention, and sickness caused by other things which can be treated by biomedicine (Connell, J 1997), and that people understand the biomedical model to be just another form of sorcery or magic (Spark 2005). In some cases Indigenous health practices have openly embraced and even learnt from the formal health care sector by for instance competing with pharmacies and hospitals through the sale of herbal cures on the streets of even the main cities such as Port Moresby (Koczberski & Curry 1999).

With such a wide variety of beliefs and practices, independence has not necessarily been easy for the people of PNG. While they have achieved remarkable results in some areas such as maintaining democracy and relatively stable governments, the people are also dealing with a variety of challenges (Reilly 2006) including a lack of funding, violence and corruption, which have also affected the formal health care system today. In addition to

these challenges, there are also many partners (Ministry of Health 2001b) with sometimes competing interests who are all interested in ensuring the funding they provide is used to meet their particular aims and objectives. However, there is also a flourishing informal health sector (Pauka 2001) comprising of many different Indigenous beliefs and practices, which despite not being recognised by the government of the day also contributes to and plays a significant role in providing health services to Papua New Guineas.

2.5 Summary

It is perhaps not surprising that PHCWs in PNG experience so many difficulties (Boulton-Lewis et al. 2002). Papua New Guineans, including the PHCWs who are the focus of this study, have grown up in a country that has been through some incredible changes within a relatively short amount of time. This has resulted in a variety of beliefs including those imported by western countries as well as the many already established Indigenous Knowledge systems intermingling and sometimes even blending together to form what is known as the context of PNG today (Pauka 2001). However, even the blending has definitely not led to one homogenous group of people. Instead PNG is very much a country of diversity, where a sense of any real national identity is still forming (Mel 2001).

From the very introduction of biomedicine by the first colonisers, both formal and informal health sectors have been at the very coal face of this change. Instead of replacing Indigenous Knowledge with what the colonisers judged as a better health system, however, biomedicine has tended to provide yet another perspective (Alto 1996). This meant that at times Indigenous Knowledge may replace or at least is combined with biomedical practices; and in addition may be used as a lens through which biomedicine is understood.

This diversity of beliefs is what makes the context of primary health care in PNG so different. The principles of this study that will be discussed in the next chapter need to ensure that, in an attempt to address the question of how PHCWs in PNG engage and utilise information, this complexity is not lost.

CHAPTER 3

Conceptual Framework

3.1 Introduction

The purpose of this chapter is to establish the principles that guide this study (Dervin 1999), which examines how PHCWs in PNG engage with and utilise information in order to diagnose and treat patients. While a detailed explanation of the study design and methodology will be provided in Chapter 4, this chapter begins by outlining the primary disciplines that have informed these choices. In particular, an overview of the 'human' perspective within the disciplines pertaining to information behaviour is provided and reasons given for why this particular viewpoint has been chosen.

In addition, due to the high degree of ambiguity and confusion surrounding the definition of primary the objects associated with information behaviour, namely knowledge and information in particular (Jashapara 2004), this chapter then goes on to explain how these terms are used in this thesis. Furthermore, the processes of informing and knowing, which respectively provide information and develop knowledge, are also discussed. Finally, a framework encompassing the above assumptions is presented which will not only be used to collect, analyse and interpret the study data, but will also form a structure for presenting and discussing the findings in the subsequent chapters of this thesis.

3.2 Disciplines and the Human Perspective

While both knowledge management and communication theories also lend themselves towards an understanding of how individuals engage with the information, the primary research area, which contributes most to answering this particular question is the theory of human information behaviour.

3.2.1 Human Information Behaviour

Human Information Behaviour is a sub discipline of Information Science and it focuses on 'how people need, seek, give and use information in different contexts' (Pettigrew, Fidel & Bruce 2001, p. 44). While Information Systems research focuses more on the systems side of information usage, Information Behaviour concentrates on the 'human' aspects. The 'human' perspective is particularly relevant to this thesis because the aim here is to understand the recipient, rather than other aspects such as content, or the media used to transfer it.

Elfreda Chatman, one of the first information behaviour researchers to fully appreciate the importance of looking at the 'human' aspect (Fulton 2005), explored how individuals and their context determined information behaviour (Chatman 1999). However, she was not the first to consider information behaviour from a 'human' perspective. Dervin (1992), for example, described how people make sense of their worlds and all the things contained therein, through the available information. People's interpretation of the information used within this sense-making process is believed to be influenced not only by their emotions and feelings, but also the opinions of others that can make, reinforce, challenge and alter their 'world view' (Dervin 1999, p. 731). This is illustrated by Nan Lin (2001) in describing social capital through inclusion of not only material goods but also non-tangible resources such as information that can aid social cohesion and interaction (Johnson, CA 2005). Another writer (Allen, 1996) in turn considered the social and contextual aspects of the information transfer process, noting that 'information needs happen to individuals who are embedded in a range of social situations' (p. 88) and therefore the individual, various groups as well as situational/social characteristics, can all influence an individual's information behaviour.

3.2.2 Knowledge Management

One further category to emerge out of Information Science was Knowledge Management (Land, Amjad & Nolas 2006). This relatively new area of research aims to understand 'the uses of knowledge in order to effectively deal with the practical tasks that involve knowledge based activity' (Aarons 2006, p. 167). Traditionally focusing more on the technology associated with transferring, managing and storing knowledge, researchers are now only just beginning to explore the 'human' aspects of knowledge management (Land, Nolas & Amjad 2006). Nonaka and Toyama (2005), for example, described how interactions between individuals within an organisation can assist in creating new

knowledge, while Patriotta (2004) suggests that an individual's narratives aid the dissemination of knowledge through social discourse.

While Ted Wilson (2002) considers Knowledge Management to be a fad, or Spiegler (2000) nothing more than a sub-discipline under the Management and Information Systems banner, the field continues to expand. In addition to examining what people need, seek, give and use, which are the primary areas considered by researchers within the discipline of Information Behaviour (Fisher, Erdelez & McKechnie 2005), Knowledge Management also includes the additional processes of development and storage within its ontology (Holsapple & Joshi 2006).

3.2.3 Communication Processes

Similarities between Knowledge Management and Human Information Behaviour include a reliance on communication, and a dependence on language to transfer, interpret and understand the information provided. One of the main problems with traditional communication theories according to Griffin (2006), is that people were often far too simplistic in their understanding of the process. Generally, they considered communication to be a one way linear action in which one person provides information to a target or audience, and at best discussed the possibility of and consideration for a feedback loop. Another criticism directed towards traditional communication theory is that it often focused on methods of transmission or transportation, rather than on the dialogue involved (Dervin 1999).

Griffin (2006) further states, however, that communication should instead be thought of as a complex process, involving both verbal and non-verbal symbols, and multiple contexts, which play significant roles, influencing the individuals involved and therefore affecting the outcome/s of the communication process. This point of view is shared by other Human Information Behaviour researchers (Allen 1996; Chatman 1999; Dervin 1999) as well as researchers within the field of Knowledge Management (Patriotta 2004; Nonaka & Toyama 2005). In general, they agree on the need to look beyond limited areas of content and media to a more holistic information and knowledge framework which considers the individuals involved, as well as the contexts in which they reside.

Focusing on the work of researchers who primarily consider the 'human' aspect of information behaviour, this thesis draws firstly upon the theory pertaining to Human Information Behaviour as well as Knowledge Management and Communication to better understand how recipients such as PHCWs in PNG engage with information.

3.3 Defining the Objects of Interest

One primary difference between the three disciplines of Human Information Behaviour, Knowledge Management, and Communications, is the way in which the key object or objects of interest are defined. While Knowledge Management primarily uses the term 'knowledge' to describe the object that is created, discovered, captured, stored, transferred, shared, used and/or maintained (Ribiere 2006; Sanchez 2006), the literature associated with Communications as well as Information Behaviour tends to refer to 'information' (Buckland 1991; Bates 2005). There have also been many occasions when the terms 'information' and 'knowledge' are used interchangeably and/or ambiguously (Jashapara 2004; Jakubik 2007). For example, while defining knowledge as 'information embedded in routines and process which enable action', Baskerville and Dulipovici (2006, p. 84) also suggest that it 'originates and is applied in the minds of the 'knowers'' (p. 84). Similarly, Alavi and Leidner (2001) suggest that 'knowledge is information possessed in the mind of individuals' (p. 109) and yet within the same paper they refer to knowledge as something able to exist outside of an individual being 'embedded in and carried through multiple entities including organisation culture and identity, routines and policies' (p. 108).

Yet the terms information and knowledge are not the same (Davenport & Prusak 1998, p. 5) and should not for the purposes of this thesis be either interchangeable or ambiguous. It is therefore necessary to clarify their meaning before proceeding (Mingers 2008). In doing so this thesis does not attempt to provide 'the definition'; instead it offers an explanation of how the terms 'information' and 'knowledge' in particular are used within this context.

3.3.1 Data and Information

According to Spiegler (2000, p. 8) '[a]ny definition of knowledge must start from data and information' and in this thesis we consider data to refer to facts and figures that do not depend on context or even meaning for their existence (Jashapara 2004). Data provide little in the way of additional thoughts about relevance or purpose for their existence (Davenport & Prusak 1998, p. 2). For this reason data are often believed to be the basis for far more complex objects like information and knowledge. Thus data in comparison to information and knowledge generally requires the least amount of effort to create (Tsoukas & Efi 2001).

Information, on the other hand is thought to be created by interpreting data within a particular framework and requiring some form of judgement by an individual for its existence (Tsoukas & Efi 2001). The development of information is therefore brought

about when an individual provides some addition of their own thoughts about the relevance, purpose (Jashapara 2004), organisation (Bates 2006) and even context of the data, so that it may be more useful to the person receiving it (Lloyd, B 2007). Information can also be thought of as combining several types of data including facts and figures on a topic of interest with other types of contextual data such as that associated with a particular place, time and/or other descriptives (Jashapara 2004). While it is created by an individual and therefore not a replication of reality *per se* (Dervin 1980, 2003), it is an object that can stand alone and does not rely on that individual for its continued existence (Wilson, TD 1981). Therefore, information can be transferred, shared, communicated, disseminated (Bates 2006) and certain types of information can even be measured (Buckland 1991).

Unlike some definitions that tend to preference information developed by experts (Dervin 1999, p. 738) in this thesis the term refers to information created and/or disseminated by anyone, including that developed by members of the informal sectors, which in the case of PHCWs in developing countries might include traditional healers, community members and even individuals who practice witchcraft. Information from these sources often referred to in reference to developing countries as Indigenous Knowledge (United Nations Information Technology Service n.d.) is particularly important to this thesis because although it contributes to the development of skills and knowledge (Briggs, J & Sharp 2004) it is rarely acknowledged as a valid or valuable in its own right (Wright & Walley 1998; Shiva 2000).

This thesis also does not discriminate against information that is not actively sought by or provided to the recipient. While traditionally researchers studying information behaviour focused on formal information seeking (Solomon 1997a), individuals can also often discover information that could be useful to meeting future needs without actually conducting formal searchers (Solomon 2002). '[I]t is not unreasonable to guess that we absorb perhaps 80 percent of all our knowledge through simply being aware, being conscious and sentient in our social context and physical environment' (Bates 2002, p. 4) This thesis therefore expands the understanding of information to include that obtained accidentally, with or without the recipient realising what is occurring.

3.3.2 Knowledge

> If data becomes [sic] information when they add value in some way, then information becomes knowledge when insight and understanding is added (Spiegler 2000, p. 8).

Just as data is believed to be the building block for information, information is thought to be one of the key ingredients to the development of knowledge. Knowledge has even been described as information that has been 'guided, managed, controlled or manipulated for a desired outcome' (Land, Nolas & Amjad 2006, p. 856), which is in accordance with Lloyd (2007) who describes knowledge as information that has been used in some way.

Out of these three terms, data, information and knowledge, conceptualising the object referred to as knowledge is thought to be the most difficult. Even though there have been many attempts at developing a consensus the various definitions presented are often controversial and even ambiguous (Spiegler 2000; Lee, Foo & Goh 2006). According to Wickramasinghe ancient Greek philosophers saw 'knowledge as truth' (2006, p. 327). However, knowledge has also been described as a 'justified true belief' (Nonaka 1994, p. 15) which suggests a less objective definition than that proposed by the early Greek philosophers. Yet, others have talked about it in terms of 'increas[ing] an individual's capacity to take effective action' (Alavi & Leidner 1999, p. 5), the incorporation of an individual's total understanding (Ackoff 1989) or just simply as what we know (Wilson, TD 2002). These more recent definitions suggest that at least to some degree knowledge is a subjective term, constructed by and therefore dependent on the individual for meaning.

Mead, referred to as the father of Symbolic Interactionism (McPhail & Rexroat 1979), suggests that all of our knowledge or meaning is developed through past experiences, and unless those past experiences are challenged new knowledge cannot be developed (Mead 1964d). He particularly emphasised the everyday interactions and communications that provide opportunities for people to adjust their responses and develop meaning (Mead 1974, p. 78). Mead believed that knowledge primarily was social in nature, in that individuals are born into a world of pre-defined knowledge (Hewitt 1991, p. 5). This knowledge, however, is not an absolute handed down by society, but instead is continually being adjusted by the individual concerned as their situations change (p. 8).

Blumer who coined the phrase Symbolic Interactionism (McPhail & Rexroat 1979) on the other hand, spoke more about knowledge or meaning emerging through the interactive process. However, what some researchers appear to miss is that this process involves two distinct steps. First an external interaction with another person or object, and second an

internal interaction whereby the individual may notice, reflect on and analysis what was presented to them (Blumer 1969, p. 5).

Habermas continued within this pragmatic tradition by considering how meaning is developed through interaction. For example his theory of Communicative Action suggested that validation for calling something 'knowledge' came through a process of communicating whereby individuals were able to justify their beliefs (Mingers 2008). In 2003 he added to this theory with the idea that objective proof was impossible, and in addition, that knowledge can only be justified for a particular period in time as in the future the knowledge or truth may change (Habermas 2003).

In addition to defining knowledge whether as objective or as the above definitions suggest more subjective in nature (Jakubik 2007), researchers have also tried to categorise knowledge in a number of ways (Alavi & Leidner 2001; Ein-Dor 2006). One of the most cited categorisation systems was developed by Polanyi (King 2006), who considered that all knowledge '[e]ven the most exact sciences' rely on a tacit component (Polanyi & Prosch 1975, p. 31). The tacit component of knowledge according to Polanyi (1958, 1966) refers to the component of knowledge that an individual cannot express, sometimes referred to as perception (Polanyi & Prosch 1975, p. 38) or intuition (p. 60). In contrast, explicit knowledge is thought to be easy to express and therefore can be transferred to other people (Polanyi 1958, 1966). Many current researchers still refer to theories using Polanyi's work. Nonaka (1994), for example, suggests that tacit knowledge is best transferred through metaphors, enabling the recipient to understand what is being communicated by referring to their own similar experiences. Polanyi, however, never purported that tacit knowledge could be easily turned into explicit knowledge, nor did he suggest that it could be transferred. Instead, he talks about not being able to express most of what we know, indicating that a large part of knowledge must remain silent and hidden within the individual who developed it. According to Polanyi, tacit knowledge underpins most of our communication and therefore there is always an element of what we know that can never be communicated (Polanyi 1966). 'All knowing is personal knowing – participation through indwelling' (Polanyi & Prosch 1975, p. 44).

Knowledge in this sense is therefore a very personal concept, comprising of a person's truths, beliefs, concepts, judgements and expectations (Wiig 1993, p. xvi). Davenport and Prusak (1998) described six key very similar components of knowledge. The first component refers to 'Experience' (p. 7) or the individual's history, which is used to define the available information and data. A second component is what Davenport and Prusak

refer to as ‘Ground Truth’ (p. 8) or an individual’s experience about what works and what doesn’t in particular situations. The third component ‘Complexity’, (p. 9) describes the individual’s ability to deal with difficult situations. ‘Judgment’ (p. 10), a fourth component, discusses how well the person is able to analyse or make sense of information as it is presented to them. Rule of Thumb and Intuition make up the fifth component, referring to an ability to develop guides for and short cuts through complex situations. The sixth and last component alludes to the values and beliefs of an individual that guide all of their actions and interactions. Once again these components highlight the subjective nature of knowledge, suggesting that unlike data and information that ‘exists independently of living beings’ (Bates 2006, p. 1034), knowledge can only be developed by, and exist within an individual. The individual can never hope to impart all of these components to another person and therefore knowledge can never be transferred, shared, disseminated or dispersed by any means to any other party (Wilson, TD 2002). According to one scholar:

> Strictly speaking, knowledge can never be shared. Because knowledge exists in a context, the receiver interprets it in light of his or her own background (Jacobson 2006, p. 507).

For the purpose of this thesis, data and information are objects that can exist independently of an individual and can therefore be shared and/or transferred. In comparison the term knowledge refers to a personal construct (Renzl, Matzler & Hinterhuber 2006), or the meaning that is developed by and only able to exist within the individual responsible for its development. Since of the many tacit components that are built-in to the ‘knowledge’ an individual develops, including various experiences, judgements and beliefs, it is impossible for them to share their knowledge *per se* (Polanyi & Prosch 1975, pp. 61-62). Instead individuals are limited to expressing a variety of facts and figures or ‘data’ (Jashapara 2004) with, if they so choose some degree of meaning, contextual background and/or judgement; in other words ‘information’ (Davenport & Prusak 1998, p. 3).

3.4 Processes that Develop these Objects

While clearly delineating between data, information and knowledge, the above discussion does, however, also suggest a link between these constructs. Spiegler (2000) agrees with this, noting that ‘yesterday’s data are today’s information, which will become tomorrow’s knowledge, and knowledge, in turn, recycles down the value chain back into information and into data’ (p. 18). Tuomi (1999) also suggests a similar top-down process in which knowledge becomes information and data emerges from the information. However, more recently recognition has been given to the concept that development can occur in either

direction with data and information influencing the development of knowledge as much as the knowledge influences what data and information is made available (Mingers 2008). In fact, a continuous process of creation and development at all levels could potentially exist (Dervin 1999).

3.4.1 The Knowing Process

The 'process of knowing' was first described by (Polanyi 1969a, p. 126). This phrase, however, has only recently been used in the Knowledge Management and Information Behaviour literature. Blackler (1995) for instance strongly disagrees with any attempt to see knowledge just as an object. Instead he suggests that researchers should focus instead on the 'knowing process' (p. 1029). According to Blackler this process is mediated through language, technology, collaboration and control. It is time and space specific, constantly developing and changing, purposive and object oriented, but is often contested by others (p. 1040). By looking at the knowing process rather than the object referred to as knowledge, Blackler feels that researchers can gain some understanding of both the complexity and subjectivity of how individuals develop knowledge.

Antonacopoulou (2006) also demonstrates that in order to understand knowledge we need to turn towards the process of knowing and learning. She believes that it is during this process that an individual, influenced by personal and contextual factors, develops new knowledge. In highlighting the process employed, Antonacopoulou suggests that 'knowing is about the interaction between the knower and the world' (p. 10) and therefore it is important that researchers 'seek to reflect the indeterminate nature of knowledge and learning and the complexity underpinning their relationship' (p. 8).

It has been suggested that this knowing process can occur somewhat externally to the individual within existing groups of people as they interact with each other. Often referred to as 'Communities of Practice' (Lave & Wenger 1991; Wenger 1998), these groups are believed to provide opportunities to directly share knowledge and encourage learning. For the purposes of this thesis, however, these Communities of Practice share information, albeit perhaps complex information during their interactions rather than knowledge, as the members that make up these Communities of Practice can never hope to share their knowledge built from a myriad of experiences and a vast amount of information collected over a lifetime (Ehrlich & Cash 1994; Hara & Kling 2002).

The knowing process involves combining new information, obtained through activities such as communicating with other people, observing life in general and/or identifying patterns within data, with the individual's existing knowledge (Becerra-Fernandez, Gonzalez & Sabherwal 2004; Wickramasinghe 2006). It is a reflexive process, an internal interaction within oneself (Blumer 1969), during which time the individual recipient considers a variety of factors, any of which could influence the outcome(s) (Davenport & Prusak 1998, pp. 5-6; Dervin 1999; Spiegler 2000).

3.4.2 The Informing Process

Information is one of the key foundations of knowledge and therefore the 'knowing process' (Spiegler 2000; Lloyd, A 2005; Land, Nolas & Amjad 2006) and consequently, researchers have been particularly interested in the process of seeking, transferring or in any way encountering information (Sonnenwald 1999). Davenport and Prusak (1998, p. 3) and Nonaka (1994) also refer to a process of becoming informed, which they describe as a series of messages sent from a provider to a recipient.

A 'system of informing events' (Chatman 1999, p. 209) or as referred to in this thesis, the 'informing process', is thought to comprise various activities most of which usually centred around some form of communication or interaction with others (More 1999). Furthermore, it is through communication that information may be actively sought, routinely gathered and/or accidentally encountered. However, the informing process does not necessarily stop there. Once accessed and analysed, in other words the knowing process is performed, the individual may go on to seek more, dispute, disbelieve and/or ignore the information that has been encountered (Godbold 2006).

Spink and Cole (2006) identified four primary interdisciplinary approaches to studying the informing process. The everyday life information seeking-sense-making approach assumes that individuals seek information in order to make sense of the world around them. An information foraging approach on the other hand is 'concerned with the searching efficiency of cognitive systems' (p. 27), focusing on how individuals seek and retrieve information, while a problem solution perspective is believed to encapsulate information seeking as part of a process of solving problems or attaining goals. A fourth perspective was developed by the authors themselves and focuses on how individuals use information as opposed to how they seek, forage or make sense of it. Rather than competing approaches, however, Spink and Cole view each of them as representing different parts of the same information behaviour continuum and therefore their primary

contribution to Information Behaviour discipline has been to combine the four approaches into one integrated process model.

Kuhlthau's (1991) Information Search Process model is one of the more cited examples (Pettigrew, Fidel & Bruce 2001) of what Spink and Cole (2006) referred to as a problem solution approach. The model is based on six stages of information searching, namely initiation, selection, exploration, formulation, collection and presentation, and for each of these stages Kuhlthau describes the actions, feelings and thoughts that might be experienced by an individual at each stage of the process. In 1993, Kuhlthau updated the model, splitting the last stage of presentation into the two stages of closure and writing, and adding a description of the strategies and moods that might be associated with each stage (Kuhlthau 1993). In developing this theory, Kuhlthau found that individuals 'actively and constantly construct their view of the world by assimilating and accommodating information with what they already know or have experienced' (Kuhlthau 1991, p. 362). The Kuhlthau Information Search Process model therefore describes how an individual through the informing process can develop knowledge.

Wilson also uses a problem solution approach to develop several information behaviour process models (Spink & Cole 2006). He described the first of these models as a 'macro-model or a model of the gross information-seeking behaviour' (Wilson, TD 1999, p. 252). In 1997, Wilson updated this model incorporating various types of information needs, activating mechanisms as well as information barriers that may influence the information seeking process (Wilson, TD 1997). In 1999 Wilson made further changes incorporating Kuhlthau's 1991 Search Process Model into his framework. In addition, he turned his focus towards the hierarchy of information behaviour, developing a separate model that showed information searching behaviour as a subset of information seeking and information seeking as part of information behaviour in general (Wilson, TD 1999).

An example of what Spink and Cole (2006) described as the seeking-sense-making approach to information can be seen by looking at the work of either Solomon (1997a) or Dervin (1999). Sense-making is a theory that explains how individuals engage with information in order to better understand and make sense of their worlds (Spink & Cole 2006). It incorporates activities involved in the processes of informing and knowing, leading ultimately to the development of knowledge (Dervin 1999). It considers not only the recipient's cognitive abilities, feelings and emotions, dreams and aspirations but also the contextual influences that may affect the process. In this way, every piece of information is open to multiple and continually evolving interpretations (Godbold 2006).

Information foraging, the final external approach described by Spink and Cole (2006) is a relatively new theory based on the idea of gathering the most amount of information using the least amount of energy. The premise suggests that individuals will be guided by their wish to expend the least amount of energy for the most amount of benefit, and that this guides their decisions about what problems should be solved and what criteria should be used in solving these problems (Pirolli & Card 1999).

While providing a broad understanding of how information is sought, provided and/or obtained, these types of models are, however, criticised because they tend to imply that the informing process is linear in nature (Solomon 1997a; Godbold 2006). In recognising this flaw, Godbold (2006) developed a non-linear model incorporating the work of both Ted Wilson (1999) and Dervin (1999). This new model also describes the possible options an individual has if confronted with a gap in their information as building a bridge, closing the gap and/or taking another path. Godbold (2006) believes that it is important to identify the available information and any past experiences that can contribute to the way in which knowledge is developed. Three important points arise from Godbold's work. First, the informing process is not linear in nature; instead each part of the process can potentially impact upon the other parts. Second, understanding the point of view of the recipient is necessary in order to understand the process. Third, and perhaps most important for this thesis, is the idea that recipients are not passive but active members of the informing process, bringing, as in Godbold's example, their prior experiences to the interaction.

Therefore in addition to the importance of defining the potential objects that are involved when PHCWs in PNG engage with information, namely data, information and knowledge, this thesis seeks to understand the processes implicated in developing these objects. In particular, it explores how information is provided through an informing process that is characterised by external interactions, and in turn how this leads the recipient of information to develop and utilise new knowledge, a process that is reflexive in its nature (Blumer 1969). From the perspective of the above literature and this thesis, the recipient is the key to information behaviour (Davy 2006), actively engaging with information in order to create new knowledge.

3.5 Influences on the Recipient

The informing and knowing processes in which these recipients participate are never isolated activities. Not only do many different informing and knowing processes happen simultaneously, but they also at the same time take place in many different contexts depending on where the recipient is at any one time. A myriad of factors influence how recipients define information and develop knowledge (Polanyi 1969b). For example, a recipient may be working as a journalist from home, while simultaneously contending with the role of a parent. Alternatively, they could be conversing with a friend who also happens to be a powerful member of the national government. All of these factors, significant others in various contexts, and even the recipient themselves as they act out their various life roles, have the potential to influence the way in which the informing and knowing processes play out.

3.5.1 External Factors

The external context or contexts, for example, may influence the recipient in a number of ways. Researchers who develop a social or humanistic approach to information behaviour are particular interested in social contexts and how relationships between two or more people and/or a society as a whole influence the informing and knowing processes (Pettigrew, Fidel & Bruce 2001). Chatman's work on information poverty discovered, for example, that individuals from poorer communities tended to display self-protective behaviours such as secrecy and self-deception when seeking information. Drawing upon the work of Tuominen and Savolainen (1997), Pettigrew considered society to be a major influence on an individual's information behaviour. She developed a 'social community-based context' (Pettigrew 1999, p. 811), describing settings where people come together to construct information.

Other information theories that draw upon the social approach for their foundation include the theories of social networking and social capital (Lin 2001). Consisting of a group or groups of people, social networks exist in various contexts. These networks are both influenced by and in turn influence an individual's information behaviour and their subsequent actions (Sonnenwald 1995). Although it is clear that these relationships exist, it is often difficult to determine what affect they have in each given situation (Johnson, CA 2005).

Nan Lin's (2001) theory of social capital extends the notion of social networking, describing both the tangible and non-tangible resources including information, is considered or perceived to be valuable within each social network. Together, theories of social networking and social capital imply that a group or groups define amongst themselves what is considered important, which in turn influences what fellow group members believe to be important and worthy of consideration (Johnson, CA 2005).

The social networks or groups, to which individuals are exposed, depend to some extent on the context or contexts in which they exist. Although difficult to define (Sonnenwald 1999), contexts are believed to be multi-dimensional (Dervin 1997), subject to significant change over time (Johnson, DJ 2003) and can exist at the macro-level environment such as the world, the nation or the region, as well as at a more micro-level, i.e. organisations, communities and groups (Johnson, DJ 2003). What makes it even more complex is that a recipient resides in and therefore potentially can be influenced by all of these contextual levels at the same time (Sonnenwald 1999). It is believed, however, that contextual factors at a micro-level such as their own community's dominant beliefs and values have a greater influence than the dominant beliefs and values of communities in another country or even a region of it (Shils 1957). This may be because they are the easiest to obtain (Zipf 1949) or possibly because the people to whom they are closest tend to have the best understanding of the recipient and can cater to their particular needs, wants and desires (Solomon 1997c).

In addition to contextual factors, Sonnenwald (1999) also discusses influences emanating from each particular situation. Situations are thought to be a group or set of activities that are somehow connected such as the attitude of the person providing the information or the communication system chosen to deliver a particular message. Therefore a 'context is somehow larger than a situation and may consist of a variety of situations; different contexts may have different possible types of situations' (p. 3).

An 'information horizon' (Sonnenwald 1999, p. 176) is another way of looking at the various factors that influence the informing and knowing processes. Information horizons encompass all of the possible resources that assist people to disseminate information either purposefully or accidentally in particular social contexts including the social networks, documents, information retrieval tools, information retrieval systems, experiments and observations that are available to potential recipients. Limiting a recipient's information horizon by taking away the tools required for transfer, can reduce the amount of information that is available to a recipient, therefore potentially restricting their choice and limiting their ability to create new knowledge (Sonnenwald 1999).

The recipient, in searching and/or selecting information from their information horizon, may also be influenced by a number of other external factors including the task they are undertaking, and/or the systems and structures available to communicate with others (Solomon 2002). Vakkari (1999) suggests that the type of task, the degree of complexity involved in undertaking it and the individual's prior knowledge, all influence which resource an individual will use. In turn, the availability of communication resources for a particular task situation can also influence how people communicate with each other (Solomon 1997c). These communication resources include not only the means and media that can both aid and limit the informing processes such as meetings, information technology, etc. but also the '[s]hape and structure of texts that people learn to employ as an aid in focusing attention on critical elements as they use a text' (Solomon 2002, p. 240).

This thesis does not disregard the important role that these external factors play in influencing an individual within the informing and knowing processes, particularly the powerful influence social groups and significant others may have on how an individual acts (Sonnenwald 1995). However, it does contend that individuals are free to make choices, and therefore can choose to consider these external factors or alternatively, ignore them at will. In addition, the relationship between external factors and the recipient in this thesis is seen as a reciprocal one. Recipients are not only influenced by, but also in turn influence external factors such as contexts, situations, societies, networks, information horizons, tasks, systems and even the content of information (Blumer 1969, pp. 57-59; Boissevain 1974, p. 6). This view differs from the social approaches described above, which do not focus on or necessarily highlight the reciprocal nature of recipients participating in the informing and knowing processes. Instead, they tend to believe that 'an individual's reality is a socially constructed reality' (Chatman 1999, p. 215).

3.5.2 Individual Factors

While external factors are important, individuals also influence themselves. A recipient both consciously and subconsciously affects their own actions within both the informing and knowing processes. 'Self gives the human being the basis for action and the distinct character of interaction' (Faules & Alexander 1978, p. 42).

Kuhlthau's (1991) information search processing model describes various cognitive influences that make up the self, such as an individual's attitude, motivations and judgement skills that can potentially influence how a recipient searches for information. Updating the model in 1993 Kuhlthau incorporated several more individual influences

including the recipient's feelings, thoughts, actions, strategies and moods, which are also thought to significantly impact on the informing process. She further noted that the level of an individual's 'uncertainty due to lack of understanding, a gap in meaning, [or] a limited construct initiates the process of information seeking' (Kuhlthau 1993, p. xxiii).

In studying the information behaviour of blue collar workers, Chatman (1991) also discovered that a number of individual factors or characteristics influenced a recipient's information choices. For example, people who believed in fate or luck rather than planning for the future, tended to limit their information searches. The reason for this was the belief that they felt that the any additional effort might not change anything. Chatman also found that these participants preferred information sources that they were familiar with, and information that related to their immediate day-to-day concerns, rather than news from further afield. She referred to this type of information as 'first level knowledge', comparing it to 'second level knowledge [which] is knowledge about that which does not yet exist in one's immediate awareness of things' (p. 440).

Another set of individual influences that should be considered is the past experiences and/or history of the recipient. However, instead of treating the past as a stable entity, this thesis accepts Mead's (1929) argument that 'the past is not only continually being redefined in light of the present, but that it has a structuring effect on what is likely to occur in the present' (Maines 1977, p. 244). Therefore the recipient is truly an influence unto themselves as they define and then redefine all of their life experiences, even as they engage with information and create new knowledge.

3.5.3 Multifaceted Factors

Just as there are multifaceted approaches to information behaviour (Allen 1997), external and individual factors are also often combined in order to provide a broader explanation of how the informing and knowing processes are influenced. A later study by Chatman (1996) found, for example, that individual, group and organisational factors all affect an individual's information behaviour. Dervin (1992) also demonstrated this concept in her sense-making model, noting that external social factors, as well as individual cognitive influences such as ambitions, fantasies and dreams, contribute to outcomes of the informing and knowing processes.

Ted Wilson (1981) another researcher who combined external and individual factors in his model, suggests that information is obtained through an individual's own personal experiences and/or provided by an external social network. However, Wilson goes on to

point out that even the information provided by external parties requires a recipient to have the suitable cognitive abilities in order to understand and utilise the information provided. Wilson (1997) also lists both individual cognitive and external contextual influences as barriers to information seeking in his 1997 model. He suggested that cognitive barriers including emotional distress; low levels of education; lack of appropriate skills and an inability to understand complex issues influenced the information seeking process. External barriers are believed to consist of factors such as: a lack of information; economic factors including the high cost of searches; social/interpersonal factors that take account of other people who may be present and involved; environmental factors such as the amount of time available and remote geographic locations; and finally those associated with information source characteristics including reliability and richness of the media used.

Sun and Scott (2005) divided these types of barriers into several groups or levels. Individual barriers included a fear of losing control of unique knowledge or concerns associated with challenging their own beliefs. Conversely, team level barriers included whether or not the process of informing others was attached to any type of reward, and whether the information being transferred challenged the team's existing beliefs. It was also found that organisational transfers depended on the strength of existing relationships within teams and between individuals, and lastly inter-organisational transfers depended on strategic alliances (Larsson et al. 1998).

Dervin (1999), however, believes that researchers have focused far too much on the barriers to obtaining information, be they individual or external in nature. She argues that this has led to recipients being blamed for many of the information transfer failures. Instead Dervin advocates an approach that attempts to understand the informing and knowing processes. This is not to suggest, however, that either individual or external influences are nonexistent or not worthy of noting. Rather it challenges the researcher to allow the recipient a voice for defining the factors that are important to them. According to Dervin every context and given situation is unique.

In discussing both the individual and/or external influences, researchers have tended to describe them as impacting on the informing or knowing processes or alternatively as influencing the outcomes of the process. For example, Ted Wilson (1999) refers to barriers that impact on information seeking, Kuhlthau's (1991) model talks about the individual influences that influence each stage of the information seeking process and Dervin looks to 'the human, a body-mind-heart-spirit living in a time-space…' (1999, p. 730) to understand how people use information to make sense of a particular situation.

While this thesis has taken up Dervin's (1999) challenge to understand both the potential external factors such as the contexts, situations and social networks in which the recipient is involved, as well as individual factors such as belief, attitudes and preferences, the emphasis is on how these factors influence the recipient (Blumer 1969). PHCWs in PNG who engage with information through the informing and knowing processes are therefore the primary focus of this study, rather than the information or the way that it is transferred.

3.6 Developing a Framework

The primary principles presented and addressed in this chapter suggest that it is important to consider information behaviour from the recipient's point of view. However, while other researchers have focused on the recipient, they have stopped short of fully examining the complexity of the recipient's role, limiting themselves to understanding within a structured process model or to specific areas impacting on how people engage with information. Elfreda Chatman, for example, developed several information behaviour theories focusing on how context in particular could influence the recipient's use of information (Chatman 1996, 1999; Hersberger 2005). Others, such as Ted Wilson (1999), see information behaviour as one continuous sequential process, beginning with a context and ending with information processing and use, which in turn leads back to the beginning. Brenda Dervin also provides more of a sequential idea of information seeking, suggesting that the process starts with a knowledge gap, which in turn prompts an individual to seek information in order that they may once again make sense of their world (Dervin 1999). This way of looking at how people engage with information also excludes any information obtained for reasons other than to fill a knowledge gap or accidently. All of these have therefore in some way not fully explored their understanding, either because they view information behaviour as a strictly sequential process where one step always follows the next, and/or because they limit their research to one particular area. The aim of this study is to broaden that understanding, by not presuming that one area can be studied in total isolation or that it involves a sequential and well ordered process.

In order to further deepen our understanding of the recipient's key role as they engage with information, existing literature has been used to develop a dynamic framework that might enable a more thorough analysis of not only how recipients obtain information but also how that information is used, if at all, to develop knowledge. This unfolding framework does not depict a process but instead suggests a set of four interconnecting aspects that all contribute in some way to any individual's information behaviour. The framework, however, is not intended to be procedural in nature because any, some or indeed all of the

aspects may play a part in how individuals engage with information at any time. For example a contextual factor such as geographical isolation may influence not only the ability of a person to implement any new knowledge created but also contribute to the act of acquiring the necessary information in the first place; therefore there is no specific beginning or end to this framework. Described in detail below, this framework will be used not only to collect, analyse and interpret the data but also as a structure to present the findings in the subsequent chapters of this thesis.

3.6.1 The Context

While the framework has no particular beginning or end, for the purposes of this description we begin with the context. The context is, however, particularly important to the way that individuals engage with information because no one exists or acts in isolation. Instead, people utilise and are also influenced by a variety of both external and individual influences (Chang, JH 2004, pp. 407-408) which can contribute to how they obtain information and develop knowledge (Snow 2001).

External influences are those that are on the individual's periphery; that is they affect but do not directly originate from or within the individual concerned. One group of particularly important external influences is the societies, communities and groups with whom we associate with or to which we belong (Mead 1974, p. 152). These types of external social influences are particularly important because while interacting with fellow members we learn about and reaffirm the rules, values and beliefs that influence our actions and interactions in a given situation (O'Brien & Kollock 1997, p. 73). In addition, external influences may also include features of the geographical and demographic environment; in fact anything external to the individual that influences how they act or interact at any given time is of interest (Foster 2004). However, because of the individual's free will, external influences should not be thought of as directly causing an individual's actions (Giddens 2001, pp. 29-30). They may best be considered as things that can potentially impact on the individual. Instead the focus should be on how an individual feels about such external influences. 'If men define situations as real, they are real in their consequences.' (Thomas, WI 1928, p. 572).

Individual influences in contrast, can be defined as those that emanate from the person themselves and include the character of the individual concerned, their personality, past experiences, positions they hold in society and the formal and informal roles they perform in any area of their life (Mead 1974, pp. 131, 199, 200, 202, 216 and 247). Some of the

most significant individual influences are those that were formed at an earlier age (Sandstrom, Martin & Fine 2006, p. 39) and while they may provide relatively stable internal benchmarks against which new information is compared, they do change as individuals experience life (p. 37). Again, however, individual influences do not directly determine people's actions, but instead contribute towards the development of meaning or knowledge (Blumer 1969, pp. 11-12).

These external and individual influences, however, are not stand alone entities. Instead they affect and influence each other (Mead 1974, p. 50; Sandstrom, Martin & Fine 2006, p. 2). For example, how much support an employee is shown may affect how they feel about and what they do at work (O'Brien 2006). Nonetheless, despite the fact that external influences are so often closely tied to how individuals think and act, it is not the object or interaction itself, but the individual's perception or understanding of these things that are most important (Wiley 2003, pp. 1 and 28; Sandstrom, Martin & Fine 2006). Individuals observe or monitor how they feel (Charon 2004, p. 47) and therefore are aware, for example, that when they come across certain people or objects they are comfortable, confident and secure with, or alternatively worried, hesitant or unsure. It is possible to think of these observations as an inner conversation with themselves, a process of thinking through each situation and giving it definition or meaning (Mead 1972, pp. 47-48; Lindesmith, Strauss & Denzin 1975, p. 98 note 8).

Whether considering individual or external factors, this context in relation to the informing and knowing process is 'the past'. It may be a relatively near or subjectively distant past. Nevertheless, everything we do to some extent is affected by and in some sense emerges from this past. It should not be assumed that the past dictates or determines the present. There is always a degree of freedom in every act where in this case, recipients are able to respond to and make choices between the information available (Mead 1974, p. 99).

3.6.2 The Informing Process

Whatever the context, how we obtain information always involves some sort of interaction between the recipient and the provider (Mead 1964b, p. 123). If, for example someone starts to talk to PHCWs about a new method for treating patients, they are signalling that they want them to listen as well as consider and even use this new information. This does not imply that the recipient will necessarily comply with the provider's expectations (Blumer 1966; 1969, p. 15). In fact, they may turn away or provide other signals that

demonstrate a degree of disinterest. Whatever happens, communication has been initiated and a response has been elicited (Mead 1964b, p. 131).

It is not always the case that providers and recipients are able to communicate with each other face-to-face. Other media such as the written word in the form of books or newspapers or technology including radios and telephone may also be used to communicate information. The type of media used may influence the communication in various ways. For example, subtle gestures such as frowns and smiles, or hand movements, which also convey information are often not seen when telephones or radios are used. In addition the ability to ask questions and provide feedback is often reduced, and in the case of newspapers, books and newsletters often may not exist at all. The result is that recipients may make judgements and develop knowledge with far less information than they may have had in situations where they are able to talk to a provider face-to-face (Bavelas & Chovil 2000).

Within this informing process meanings of the information may be suggested by the provider and even negotiated with the recipient (Blumer 1969, p. 12). For example, a recipient may comment on the information, allowing the provider to either confirm their understanding or provide additional information in order to clarify their intention.

3.6.3 The Knowing Process

However, this does not imply that the informing process encompasses everything about how PHCWs develop knowledge. Nor does it imply that knowledge or meaning is directly transferred or even developed exclusively during the interaction. Instead, meaning or knowledge is only developed when the recipient 'selects, checks, suspends, regroups and transforms' (Blumer 1969, p. 5) what they perceive to have been communicated, depending on the particular situation or reason for obtaining the information.

The outcome of this internal knowing process is that the recipient develops a unique understanding of the information (Blumer 1969, pp. 110-111; Newsom 2007, p. 17), depending to some extent on their reason for acquiring the information and developing the knowledge in the first place. This in turn adds to or causes them to adjust what they already know to incorporate this new information into an existing schema (Blumer 1966).

Throughout this process a recipient may also obtain information and make judgements about the person providing the information as well as the content, and in turn these judgements may influence the meanings or knowledge developed. For example, recipients

may take into account the provider's social status, gender, age and ethnicity (Sandstrom, Martin & Fine 2006, pp. 39-44) and use these to determine the value of the information. In making these judgements recipients may also ask themselves or even the provider questions such as; why is this information being provided and what is expected from me?

3.6.4 The Outcomes

In order for information to be obtained and new knowledge developed, individuals need to be receptive to the information being transferred (Blumer 1969, p. 97; Lewis 1991, pp.124-125). Studies suggest that information is often ignored because the recipient perceives some sort of risk associated with obtaining the information, the individual does not feel they have time to do so and/or they do not believe that the outcomes are worth the effort needed to obtain it (Godbold 2006).

Yet, if the PHCWs choose to use the information, the resulting outcomes may be numerous and impact not only on the present situation but also have ramifications for the broader context in which they operate (Blumer 1969, pp. 11-12). This thesis argues that learning, for example, is one of many possible outcomes of engaging with information and in many ways this framework is similar to the adult learning theory proposed by Illeris (2003, 2004) who also identifies two interconnecting processes he calls 'Interaction' and 'Acquisition' (p. 170). These respectively correlate with the informing and knowing processes noted in sections 3.4.2 and 3.4.1 above. Similar to the act of informing, Illeris describes interaction as an external process, while acquisition involves an inner reflection. He also considers the importance of cognitive, emotional and social-societal dimensions that correspond with the individual and external influences in any context. Therefore, engaging with information may also be viewed as a learning process where information is obtained, reflected on and used to develop new knowledge or meaning.

3.6.5 An Interconnecting Framework

The above framework does not in any way intend to imply that the above four aspects of human information behaviour, namely the context, informing and knowing processes, and outcomes, are in any way sequentially ordered or even clearly separable. In reality these four aspects are inseparable as they continually interact with each other. For example the context may affect the ability to implement any outcomes realised, in the same way as the outcomes when implemented change the context in which people operate.

There are, however, theoretical differences and benefits in artificially separating these four aspects for the purposes of further investigation. For example, the informing process involves interaction with an external social object (person or otherwise), while the knowing process is centred within the individual concerned (Blumer 1966). While the informing and the knowing processes are always intertwined they may be influenced by different factors. The external informing process, for instance, is particularly focused on the interaction itself as well as the context in which the interaction occurs. In comparison, the internal knowing process is more likely to be influenced by factors such as how much time the recipient has to reflect on the information provided or any preconceived ideas the recipient has about the content that has been provided. Both processes and the factors that influence them are nonetheless important to how individuals engage with information, and therefore should be considered.

In turn, the meaning or knowledge that an individual develops from these processes helps them to make decisions about what actions they will take in the future (Charon 2004, p. 135). For example if a recipient cannot understand the information provided they might in theory move from a process of internal reflection or the knowing process, to an informing process where the recipient may once again interact with the provider in order to gain further clarification. After seeking this clarification they may then use various criteria, including previous interactions and experiences in order to decide whether or not the information is appropriate and useful. This demonstrates the use of contextual factors such as subjective assessments based on whom they trust and who they feel most comfortable consulting, may therefore affect their decision and any outcomes realised (O'Brien & Kollock 1997, p. 57).

These outcomes affect not only future informing and knowing processes but also the context in which these processes occur. The recipient therefore is both 'influenced by' and also an 'influencer of' their own future (Bandura 2002). By choosing to utilise information made available to them, the recipient develops knowledge, which in turn becomes the base from which a recipient assesses information obtained in the future. For example, a PHCW may receive information about a new safe birthing technique, and after reflection decide the suggested changes to current practice would be beneficial. This would then become the basis from which additional information on safe birthing techniques is potentially analysed. If the change in practice was successful then the PHCW may be more open to receiving similar information in the future. In comparison, however, if the changes were difficult to implement the PHCW may revert to previous practices, or similarly if the

information was considered inappropriate to begin with, then any future information based on the new safe birthing technique may not make sense and/or simply be ignored. In this way, the four aspects, namely context, informing and knowing processes, and any outcomes are therefore always interconnected.

While in reality no division actually exists, for the purposes of theoretically investigating and deepening the understanding of how recipients engage with information it is useful to separate and consider the four aspects individually. However, in doing so it is also important to appreciate the influence that each aspect has on the other three. In this way a far more complete understanding of how particular recipients engage with information can be formed.

3.6.6 Recipients are the Key to the Informing and Knowing Processes

The concept that it is the recipient's perception of these aspects is more important than anyone else's ideas or any attempt at an objective viewpoint of the context, the informing and knowing processes or any outcomes. For example, the outcome from both the informing and knowing processes depends entirely on the recipient's perceptions (O'Brien & Kollock 1997, p. 57; Fine 2001), a personal construct (Renzl, Matzler & Hinterhuber 2006) that relies almost exclusively on the subjectivity of the recipient. However, it is not just the outcomes that are subjectively determined. Instead, the context in which the recipient resides, any interactions they decide to participate in, and even how the future might change through their particular actions must all be considered from a recipient's point of view, in order to better understand how they engage with information. External influences such as the information provider or another person for that matter can only influence to a limited extent the recipient's perceptions and therefore actions. Therefore, the individual recipient is the key to the informing and knowing processes as illustrated by the following Human Information Behaviour Framework (see Figure 7).

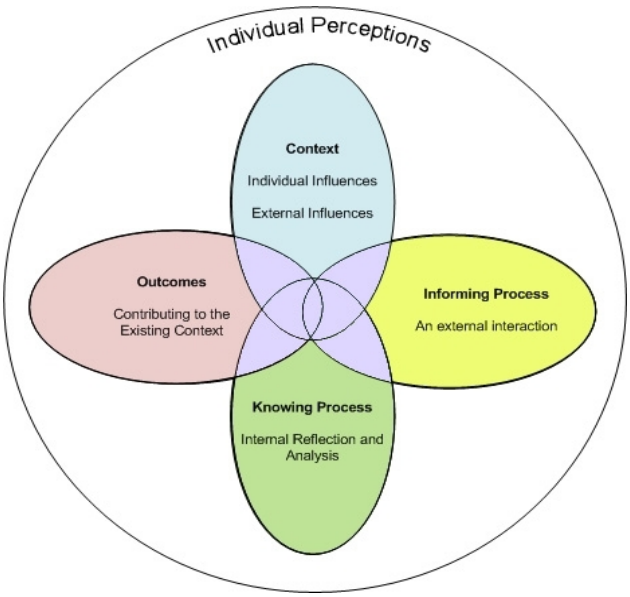


Figure 7 - Human Information Behaviour Framework

3.7 Summary

This chapter began by outlining a set of principles, theoretical assumptions (Dervin 1999) and definitions of the primary objects used in engaging with information, namely data, information and knowledge, suggesting that while data and information can be transferred or shared, knowledge is a personal construct and can only reside within the individual who has created it (Renzl, Matzler & Hinterhuber 2006). While recent literature suggests that the recipient plays an important role in how information is obtained, other researchers have tended to limit their understanding of the recipient's role by either attempting to consider information behaviour in terms of a structured process and/or concentrating on only one area of interest such as the context or reason for obtaining the information (Chatman 1996, 1999; Dervin 1999; Wilson, TD 1999).

In attempting to better understand how individuals engage with information, a Human Information Behaviour Framework has been developed. This framework not only separates the processes of informing and knowing for the purposes of better understanding how PHCWs engage with information and develop new knowledge, but also in addition considers the context in which these processes take place and their subsequent outcomes. What it specifically does not suggest is that this is a sequential process. Instead the four aspects overlap and are therefore interconnected.

The key message highlighted by the framework and reinforced through the thesis is that recipients of information, rather than its content or context, are the key to the informing and knowing processes (Davy 2006). While a number of external as well as individual factors (Wilson, TD 1997) can affect the recipient's actions, these free thinking individuals are able to accept or reject the information, and if accepted define and use it in any way they choose (Morris 1967; Lal 1995). Consequently, this framework provides a useful way of examining in far more detail than before, how individuals engage with information and it will be used to analyse and interpret the data, as well as provide a structure for the remainder of this thesis.

As discussed in Chapter 1, gaining an understanding of these recipients is especially important when the cultural, social and/or professional gap between the recipient and the provider is particularly wide (The World Bank 1999). In particular, what happens when information developed primarily in the West is implemented in a context where health professionals often use multiple belief systems to interpret information has not previously been investigated. For this reason, Chapter 5 to 8 will provide an understanding of how participants in this study perceive their context, the informing, knowing processes they participate in, as well as any outcomes that emanate from engaging with information. However, prior to considering and discussing these study results, the next chapter will describe the study design that led to the particular findings described in this thesis.

CHAPTER 4

Study Design and Methodology

4.1 Introduction

In Chapter 1 the medical and human information behaviour literature pertaining to the transfer of information to health care workers in developing countries was examined, and in order to address the gaps that were identified the research question 'How do PHCWs in PNG engage with and utilise information' arose. Chapter 2 provided a historical account of the context within which this research was to be undertaken, in particular noting the diverse range of beliefs that inform the way in which Papua New Guineans have come to understand the notions of health and well-being. Chapter 3 then went on to develop a conceptual framework that could comprehensively explore this complexity, acknowledging that the perceptions of individuals as they interact within particular contexts, are key to both the informing and knowing processes. Using this conceptual framework as a foundation, this chapter will provide a description of the study design, articulating in particular the overarching methodological principles that informed this process.

This chapter begins by describing the world view, embraced by this study which is based on the principles of Symbolic Interaction. For example, while reality is assumed to exist, the focus is on understanding how people interpret this reality, rather than attempting to obtain some objective point of view. In addition, it is recognised that any reality comprises of not only physical but also inanimate objects such as rules, feelings and emotions (Mead 1972, p. 272; Charon 2004, p. 173), and that these interpretations and understandings are constantly evolving.

The chapter then goes on to discuss the ethnographic methodology chosen for its ability to meet the specific challenges of this study. Most importantly issues pertaining to cross-cultural research are addressed. Because the researcher and the participants were embedded within not only geographically, but perhaps more importantly culturally different contexts (Cushner & Brislin 1996, pp. 1-30) particular consideration was given to cross-cultural issues to ensure that the findings of this type of research are both reliable and

credible (Im et al. 2004). For example, while the researcher in this study had worked in PNG for the previous five years, the context in which the participants operated was still relatively unknown, and therefore the study design needed to incorporate ways in which the researcher could respectfully enter their environment, allowing time to build relationships and a rapport with the PHCWs who were subsequently invited to participate in the study.

In order to fully explore and understand, rather than just identify the factors that contribute towards how PHCWs engage with and utilise information, an interpretive methodology (Maxwell 2005, pp. 22-24), based on Symbolic Interaction was specifically chosen. Symbolic Interactionism is particular useful for this type of research because it is primarily concerned with how communication contributes to the development of meaning. It also encourages the researcher to not only investigate how the social context can influence a person's actions but in addition also reminds them of the role that individual perceptions play the way in which people for example, engage with and utilise information (Giddens 2001, pp. 17-18).

The data, upon which the study was based, primarily consisted of stories and accounts provided by PHCWs in PNG. These were obtained from 58 PHCWs and eleven individuals associated with the primary health care system in PNG, using in-depth, semi-structured interviews. By collecting and analysing these data, together with extensive field observations, the study aimed not only to understand the role of the recipient based on their own perceptions, but also how the context contributed to, and what outcomes emanated from the informing and knowing processes. The analysing and interpretation of this data examined through and in contrast to existing theory (O'Reilly 2005, p 199), provided a platform upon which the research question – how do PHCWs in PNG engage with and utilise information to assist with diagnosing and treating patients – could be answered.

4.2 Primary Methodological Principles

Building on the conceptual framework outlined in Chapter 3, two types of methodological principles were used in designing a study that would answer this research question. First, a particular 'world view' was used to not only guide the choice and use of research methods but also evaluate the findings (Blumer 1969). In addition, given the cultural differences between the researcher and participants concerned, particular attention was paid to ensuring that the research was relevant to potential participants, respectful of their culture, and that appropriate methods were used to collect, analyse and interpret the data given the

particular social worlds in which they reside (Im et al. 2004). How this cross cultural rigour was attained, together with an outline of the world view utilised in this study will now be discussed.

4.2.1 Symbolic Interaction

Based on the principles of Symbolic Interaction, this study firstly accepted that an empirical world or reality exists and that this reality can therefore be explored and examined. Understandings of this reality are not fixed, but instead change as new discoveries are made (Blumer 1969). A well known example of how new discoveries can update our understanding of reality in the world of science is Thomson's (1897) study of atoms, which found that they were not in fact the smallest non-divisible unit, but were instead composed of even smaller particles. While Thomson's discovery did not change the existence or reality of atoms, it did demonstrate how our understanding of objects can change as new information is revealed.

Second, this study recognised that this empirical world or reality is made up of not only tangible matter like atoms, but also intangible objects such as rules, feelings, emotions; and of particular interest to this study, information and knowledge (Mead 1972, p. 272; Charon 2004, p. 173). In this sense therefore objects are defined as 'anything that can be indicated or referred to' (Blumer 1969, p. 11), and because they are part of the empirical world can be explored and researched, eventuating not only in results such as Thomson's discovery of smaller particles (1897) but also more generally, in new understandings of existing concepts (Blumer 1969, p. 5; Sarantakos 1998, p. 38).

The third methodological principle used to guide the design of this study suggests that how one individual sees an object may be very different from how another individual sees the same object (Blumer 1969, p. 5; Gusfield 2003; Charon 2004, Chapter 3). In this way, definitions or understandings are subjective (Sarantakos 1998, p. 40), with definitions depending to some extent on a personal relationship between the object and the individual concerned (Morris 1938, p. 7; Mead 1974, p. 131 n). However, this personal relationship is also in guided by the 'social, political, cultural, economic, ethnic, age, gender and other contextual characteristics' (LeCompte & Schensul 1999, p. 49) of the people, with which they interact. Differences in understandings and definitions come about not so much from changes to the objects themselves, as they tend to remain relatively stable, but as a consequence of an individual's interpretations. Interpretations are not only developed and re-developed as people interact with the object concerned, but also as they interact with the

rest of society (Mead 1964a; Charon 2004). For example, if a person comes across new information they will probably attempt to understand it to a degree that satisfies their needs. In developing this meaning, they may choose to reflect on how other people have previously acted towards or used the information, and/or they may rely on past experiences with a similar type of information (Blumer 1969; Faules & Alexander 1978, p. 92). They may also consider associated aspects of the information (Snow 2001), such as who provided it, or how it was provided. Within this process they test out different ideas until finally they develop a meaning that fits their needs (Cook 1991).

The result is that there will usually be some commonality between the definitions of people within the same context, whether that is members of a small community, an organisation, or even a larger geographical region. Despite these influences, individuals can and do define things differently and they use these definitions to determine how they will act (Blumer 1969, p. 5). As a result people's actions may vary as much as the definitions, they develop (Mead 1974, pp. 126-127). For example if a recipient defines the information as difficult to use, then it is likely they will ignore or avoid referring to it. However, despite these social influences, individuals ultimately define and therefore act in accordance with their own free will (Blumer 1966).

Therefore, in order to understand the definitions and actions of these individuals, the study sought accounts directly from the people involved, namely in this case PHCWs in PNG (Blumer 1969, p. 22). Trying to answer this question based on someone else's point of view, would only have elicited another person's definition of how they think PHCWs may have or should have, acted.

> [O]ne would have to see the operating situation as the actor sees it, perceive objects as the actor perceives them, ascertain their meaning in terms of the meaning they have for the actor, and follow the actor's line of conduct as the actor organizes it (Blumer 1966, p. 542).

The study is therefore interested in obtaining the accounts of the actors concerned; namely PHCWs in PNG, about how they define and then act towards information. In doing so, the contexts in which these PHCWs reside were also considered, as ignoring this aspect would have meant that important guides, contributors and influences to the informing and knowing processes may have gone unnoticed (Denzin 1994). Consequently, both the accounts of these PHCWs, as well as observations of their social worlds (Blumer 1969, p. 32) were used in order to understand how PHCWs in PNG engage with information.

4.2.2 Cross-Cultural Rigour

As an 'outsider' (Chambers 1983, p. 2) the researcher recognised that both obtaining and understanding these PHCWs' accounts would be difficult. Firstly, participants may have been reluctant to share their thoughts with someone from a different background (Briggs, CL 1986) and secondly different languages, rules, systems and beliefs meant that the researcher might not always understand the unspoken or inherent meaning within the data collected (Im et al. 2004). Therefore additional methodological principles specifically relating to cross-cultural rigour needed to be included within the study design.

One of the primary contributions to ensuring cross-cultural rigour, was the researcher's previous experience working in PNG for over five years (Briggs, CL 1986). This experience which included the management of other field studies, added to the rigor of the study in three essential ways. First, the research question emerged from conversations with not only other health researchers in PNG but also PHCWs, ensuring the relevancy of the research to potential participants. This not only demonstrated a respect for their particular situation but also encouraged PHCWs to participate, feeling that the findings could potentially benefit their profession (Machet 1996).

Second, the researcher's experiences were also crucial in developing appropriate data collection, analysis and interpretation methods, most of which had been successfully used in similar studies within PNG. Interview questions were worded in such a way that they made sense to the potential participants, minimising the possibility that they could be misinterpreted (Wengraf 2001). For example, the primary question reflected an understanding of a common complaint with which PHCWs were often faced. In addition, these experiences meant that the researcher had some knowledge of the social worlds in which these PHCWs resided, providing contextual information that contributed to the analysis and interpretation of the data.

In designing the data collection method, particular attention was paid to establishing a respectful relationship between the researcher and participant. For example, experience showed that some PHCWs might possibly become overwhelmed by the interview process viewing the researcher as a 'powerful white person' who was there to tell them what to do. To address this particular issue (Meleis 1996), the researcher met with each participant at least once prior to the interview making a special effort to build a rapport or relationship with the potential participant. It was then easier to conduct the interview that began with

an informal conversation before proceeding with the questions outlined in the interview schedule (see Appendix B and section 4.3 in this chapter).

This time spent on informal conversation at the beginning of the interview also provided an opportunity for the researcher to evaluate the participant's preferred communication style. Unlike Mill and Ogilvie's (2002) study that identified only one predominant type, the researcher's previous experience had shown that PHCWs in PNG exhibited many different communication styles, depending on for instance their gender, position in the community and local culture (Im et al. 2004). For example, while some PHCWs were very straightforward and direct in providing information, others were quite shy and preferred to suggest or imply meanings. In these later cases, additional time was made available not only to ensure that the participant felt as comfortable as possible but also to allow these participants to consider their responses, and answer in their own time. Recognising that these different communication issues existed meant that the study was designed in a way that considered the needs and preferences of the participants, rather than running to a particular schedule (Briggs, CL 1986; Meleis 1996).

Flexibility was therefore extremely important not only for the purpose of cross-culture rigour but also to ensure that the research methods and tools were the most appropriate for answering the particular research question (Richards, L 2005). For example, flexibility was built into the schedule allowing additional time to build relationships and communicate appropriately (Mill & Ogilvie 2002). Flexibility in how and when interviews took place was also required in order to work around the personal and work commitments of some participants (Meleis 1996). However, flexibility in how data was collected was also required as through the analysis process the need for changes to direction or method were identified. For example small changes to the research question were made according to the needs of the interview, and the sample size was increased as additional areas for investigation were identified once the initial data had been analysed (Richards, L 2005). While these changes were never substantial, they were however essential in order to gather all of the data needed to answer the question (see section 4.6 in this chapter).

Consideration was also given to whether or not the results of this research should be provided to participants in order to gain their thoughts on the findings (Kardorff 2004). However, although the research appreciated that there are several benefits, this procedure was rejected. Primarily, this decision was made because in order for this to be more than just a token step, the data would need to be presented to participants orally which would have required monetary and human resources that were not available. In addition as most

areas were closed during the wet season, presentation of the thesis would have been delayed for several months. For this reason, while it is intended that the results will be made freely available to PHCWs through their provincial and district offices, the researcher is unable to deliver and receive direct feedback from participants.

Together, all of these methodological principles were used both to inform not only the choice but also the use of particular research methods. First, in the tradition of Symbolic Interactionism this study accepted that a world of objects including information and knowledge exists and can therefore be studied. However, individuals interpret and therefore act towards these objects in different ways, dependent to some extent on the various structures, rules and systems contained within the social world in which they reside. Therefore, only accounts from the PHCWs themselves in relation to their social worlds could help to understand how they engage with information (Blumer 1969, see Chapter 1; Denzin 1994). Secondly, issues arising from the cultural differences between the researcher and participants such as the potential for misunderstanding or misinterpreting the findings, and reluctance of PHCWs to talk to an 'outsider' (Chambers 1983, p. 2) were minimised by applying the principles of cross-cultural rigour (Machet 1996). In particular, consideration was given to ensuring that the research was relevant, respectful relationships were developed and methods of communication appropriate (Im et al. 2004). All of these principles contributed to the design of this study including the development of the interview schedule and sampling processes, as well as data collection, analysis and interpretation, each of which will now be discussed in more detail.

4.3 Developing the Interview Method

> Since people are symbolic creatures, they can interpret and talk about their inner experiences, such as their thoughts or desires, making them observable if only indirectly (Blumer 1969, p. 51).

The primary means of understanding how PHCWs in PNG engage with information, was through the data collected from in-depth, semi-structured interviews. Two types of interview schedules were developed, one for the primary group of participants namely PHCWs currently working within the PNG primary health care system, and another for a secondary group of participants, being supervisors and managers associated with the primary group of participants. Both interview schedules (see Appendix B) were developed prior to commencing data collection and used as a guide to data collection. However, from time to time small changes were made as identified through the data analysis process (Richards, L 2005).

Semi structured interviews were chosen as the primary means of collecting data in this study because in comparison to other methods, such as structured interviews, they were flexible enough (Wengraf 2001) to allow the participant to 'speak for him –or herself' (Lal 1995, p. 421), to explore and share personal perceptions and feelings (Flick 2002) and to discuss their experiences (Rubin & Rubin 2005, p. 37). At the same time however, the semi-structured interview provided enough structure to ensure that the interview focused on specific activities (Berg 2007); namely in the case of this study the PHCW's account of how they engage with and utilise information.

In designing the interview schedule, the researcher was particularly careful to ensure that the research questions were relevant, that only words likely to be familiar were used, and that the interview situation was setup to ensure that the participants would feel comfortable (Im et al. 2004, p. 898). The resulting interview schedule (see Appendix B) used to guide the semi-structured interviews with PHCWs comprised of three parts. Part One contained a set of simple questions that not only provided additional time for the participant to become comfortable with the interview process, but also elicited demographic and contextual data. First, participants were asked for their staff level to gain an understanding of the type of responsibilities they may be expected to undertake. Second, they were asked about the highest health qualification they had attained and in what year it was completed. The third question related to their place of birth and finally they were asked to describe any other facilities they may have worked in. Answers to these questions were used within the data analysis and interpretation process in an attempt to compare and better understand how levels of education, cultural backgrounds, experiences and responsibilities may contribute to the way these participants engaged with information.

In contrast, Part Two focused on the primary interview question. Originally this question asked participants to describe a recent experience in which they were responsible for treating a patient and were not sure of the diagnosis. The intention was to obtain the participant's account of how they had developed a diagnosis within a real life situation, taking note of and then discussing in-depth the information they had used in order to do this. It was, however, clear that most participants were uncomfortable, unwilling or could not remember instances where they were unsure of a diagnosis, and therefore the primary interview question was changed after the first ten interviews to:

> 'If a patient came into this facility with a stomach ache and you were not sure what was wrong with them, what would you do?'

This change from personal accounts to a hypothetical scenario provided three primary benefits. First, the participants appeared more relaxed as their personal performance was not in question and therefore they were comfortable in providing long and detailed accounts of the types of steps they would take to diagnose and treat this complaint. Second, because this was a familiar and well understood scenario there was less chance of a participant misinterpreting the question (Machet 1996). Third, because stomach complaints can be diagnosed in many different ways, participants were not constrained by a particular disease type or treatment process and finally by not referring directly to any specific kind, the door was left open for the PHCW to identify the types of information they accessed as part of their normal work practice. This hypothetical question method proved successful as many varied and unexpected sources of information were identified and could then be discussed in more depth. As the participant told their story, the researcher made a mental note of all references to any type of information mentioned, however it was obtained or wherever it came from. For example, references to patients, carers and community members providing ideas and thoughts would be investigated to the same degree as, more formal information such as that received from the PNG Department of Health. In addition, information not identified, if obvious to the researcher was also noted and discussed.

In comparison to the middle section, Part Three of the interview schedule was completely unstructured and flexible (Wengraf 2001) allowing the researcher and participant to explore various issues raised during Part Two. So as not to interrupt the flow of the story, the researcher would at an appropriate time invite the participant to share their thoughts on any information that had, or in some cases had not been discussed. While questions varied between interviews, the intention of these probing questions was to clarify and understand particular issues (Berg 2007) relevant to the participant's role within both the informing and knowing process as well as how contextual factors influenced and what outcomes emanated from these processes. Lastly, participants were asked about issues that they themselves may have raised but not as yet discussed including ease of access and whether or not the information met their particular needs.

A second interview schedule was also developed to guide the semi-structured interviews involving individuals who were able to provide background information on primary health care in PNG. In a similar fashion to the interview schedule developed for PHCWs the schedule was divided into distinct parts. Part A contained the opening demographic questions including how they were associated with the PNG primary health care system,

for example, who their employer was and what their current position involve. Part B was completely unstructured and the questions posed depended entirely on the type of association they had with PHCWs in PNG.

Both interview schedules, which concluded with the researcher thanking the participant provided a framework that ensured the semi-structured interviews collected data which could be used to better understand how PHCWs in PNG engage with and utilise information. While initial questions provided demographic and geographic data that was later used within the analysis and interpretation processes to compare findings between various groups, the primary interview question for PHCWs focused on describing how in its broadest terms information was obtained and utilised within a typical scenario. The issues raised and in some cases not raised but pertinent to the research question, were then explored in order to understand how PHCWs engaged with information.

4.4 Selecting Participants

While primary source for obtaining these accounts was therefore PHCWs in PNG, it was extremely difficult to ascertain the exact population for this group. The 2001-2010 Health Plan, however, does provide estimates based on 1998 figures that suggest that 233 Health Extension Officers, 2,920 Nursing Officers and 3,926 CHWs work in health and Sub-Health Centres. In addition, 1,816 Aid Posts which are usually staffed by one CHW were also believed to be operating during that time.

From within this population, a selective sampling technique was utilised to identify PHCWs who were at the time of data collection (2005-2006) were working within the primary health care system in PNG (see section 2.4.1 for more information pertaining to the various levels of PHCWs). In addition eleven other individuals who held management positions with the PNG Department of Health or alternatively and associated organisation, were chosen for their ability to provide contextual information on the primary health care system in PNG were also interviewed.

This initial sample also included PHCWs from all types of primary health care facilities operating in PNG (see section 2.4.1 for an in-depth description of the PNG health system and structures). The participating PHCWs working within a Health Centre, Sub-Health Centre or Aid Post, were located in one of three provinces, namely the Eastern Highland Province, Madang Province and East Sepik Province (see Figure 8). Data collection commenced in the Eastern Highlands Province primarily because of the researcher's familiarity with not only the area but also the primary health care facilities that operated

there. Interviews were then conducted simultaneously in both the Madang Province and the East Sepik Province.

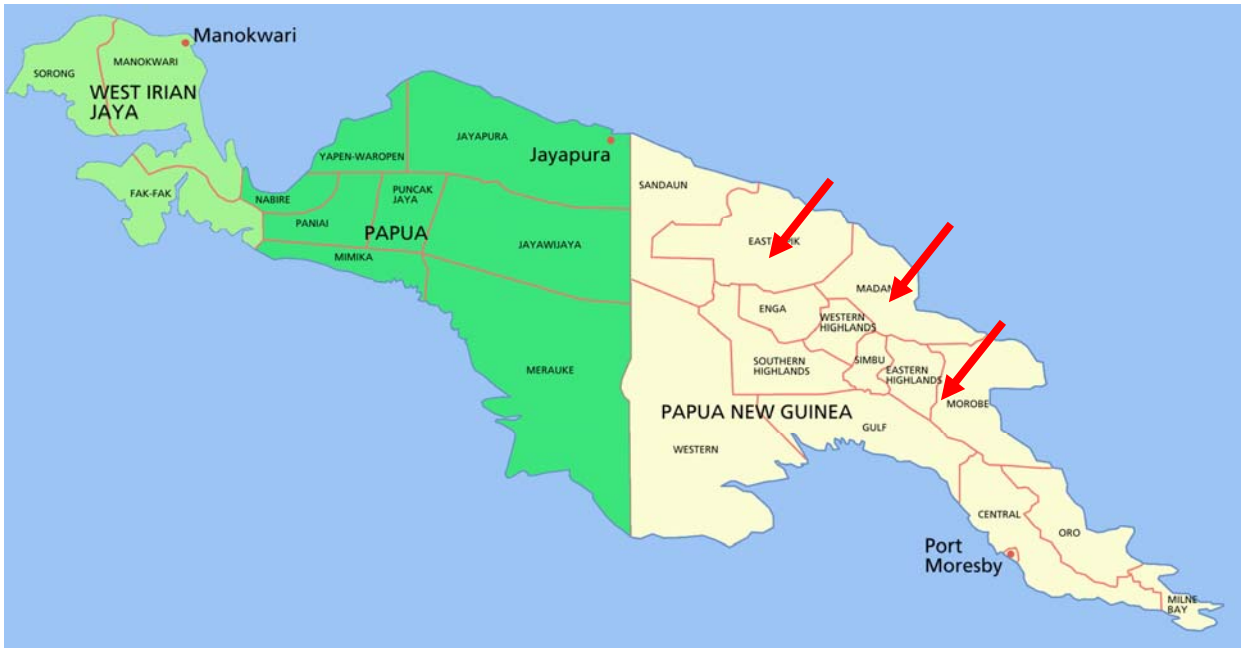


Figure 8 - Map Identifying Data Collection Sites (*Map of the Island of New Guinea* 2006). This image has been copied under a GNU Free Documentation License, Version 1.3; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts.

This selective sampling method also allowed accessibility and safety issues to be considered when identifying potential participants. Some of the more remote primary health care facilities for example, were not accessible by motor vehicle and would have required several days walk to reach. This, together with safety issues relating to inter-tribal fighting in some areas and the potential for hold-ups or road blocks in other areas, meant that obtaining a truly representative sample would have been impossible. However, while participants were also chosen on the basis of how accessible their facilities were, this sampling method ensured that PHCWs that worked in both urban and rural facilities were approached, and that all staffing levels operating within each type of the facilities were invited to participate.

Once participants from this initial sample had been interviewed, a method known as '[c]ontinuous adjustment or 'focusing' of the sample was used to extend the sample size' (Lincoln & Guba 1985, p. 202). This involved analysing the data that had already been collected to identify particular areas of interest or missing information, which was then used as a basis for selecting future participants (Glaser 1978, see Chapter 3; Strauss & Corbin 1998; Jeon 2004; Corbin & Strauss 2008, p. 144). For example, some recent

PHCW graduates suggested that CHWs trained prior to the 1980s were not interested in what they termed 'modern methods' and 'would never change their traditional ways'. In order to first find out if this was correct and if so why, CHWs who had been trained prior to 1980 were deliberately sought out and invited to participate. This process of focusing the sample continued until no new information relating to the study question came to light (Flick 2002; Merkens 2004).

A second group of participants comprised of eleven individuals associated with the primary health care system, such as senior provincial and district level health officials, nursing educators, and doctors. This group was selected because of their ability to provide contextual data. For example, District Health Officers in charge of several primary health care facilities provided information on overall district structures, health educators based at several teaching facilities described the content of both current and previous training courses; and senior medical practitioners responsible for liaising with primary health care facilities identified the difficulties in accessing and supporting primary health care facilities. Once again, a selective sampling method was chosen in order to pinpoint specific individuals that were either experts in their field (Rubin & Rubin 2005, pp. 64-68) or could provide background information (Schatzman & Strauss 1973). A brief demographic summary of all participants interviewed is provided in Table 1.

	Health centre	Sub-Health Centre	Aid Post	Other	Total
CHW	7	14	20	0	41
Nurse	10	5	1	0	16
HEO	1	0	0	0	1
Health Managers	0	0	0	11	11
Totals	**18**	**19**	**21**	**11**	**69**

Table 1 – Participants and the Facilities that Participated.

While the initial selective sampling method guaranteed that all levels of PHCWs from the three different facilities types were represented in the primary group (Schatzman & Strauss 1973), focusing of the sample ensured that particular questions and topics emerging from the original data could be explored (Corbin & Strauss 2008, pp. 145-146). Data obtained from the 58 PHCWs in PNG interviewed, was supplemented by a second group of eleven participants who could provide contextual and background information allowing for a deeper understanding of the primary data (Schatzman & Strauss 1973).

4.5 Entering the Field

Preparations to enter, or in this case re enter the world of these PHCWs began in mid-2005, well before any of the selected PHCWs were approached. Drawing upon the previous experience of the researcher, the first concern was to obtain not only ethical approval but also permission to undertake the research from all of the relevant authorities. While obtaining formal approval was an essential step in gaining access to the potential participants, it was also recognised that informal acceptance by PHCWs themselves would be needed prior to commencing data collection. This acceptance based primarily on trust (Schatzman & Strauss 1973) and respect would help to ensure that participants felt confident and comfortable in sharing their accounts (Im et al. 2004).

4.5.1 Formal Approval

In the first instance, ethical approval for the study was sought and obtained from both the Medical Research Advisory Committee in PNG as well as the University of South Australia Human Ethics Committee. These applications focused on the relevancy of the research question to PHCWs in PNG, demonstrating a shift away from the more traditional 'research for research's sake' applications (Hermes 1998). They also included details about how fully informed, and most importantly voluntary consent would be obtained prior to participation, as well as how anonymity would be protected through the removal of all participant and facility identifiers prior to publishing. A full description of the study including the informed consent forms (see Appendix C) and both interview schedule, was approved by the MRAC in June 2005, followed by the University of South Australia Human Ethics Committee (see Appendix D). The initial applications were followed up with annual interim progress reports. In addition, formal permission to conduct the study was obtained from each of the respective PNG Provincial Health Advisors. They in turn wrote a letter of introduction to the District Health Officers who after an initial meeting also provided permission to approach the head of each primary health care facility involved. This concluded the first stage of the formal approval process.

The researcher then approached the officer in charge of each facility in order to seek permission to meet with their staff. Once permission was granted, a time was arranged with staff to provide verbal information, answer any questions and hand out a copy of the informed consent that was available in both Tok Pisin (primary language used within the three participating provinces) and English. Several key messages were highlighted to all potential participants at that meeting and in addition were noted on the informed consent

form. First the researcher emphasised that participation was voluntary and that there would be no consequence if staff chose not to take part. In addition the researcher explained that all interviews would be taped, however, only the researcher and the transcriber would have access to those tapes. While it was expected that potential participants might see this as an additional invasion of their privacy (Rubin & Rubin 2005, p. 99), only one PHCW refused to participate for this reason. Lastly, it was made clear that they and the facility in which they worked would not be identified in any way other than by noting whether it provided services to an urban or rural community, and the province in which it was situated. Staff were not required to sign the informed consent at that meeting however the researcher explained that a signed informed consent was required if they wished to participate. At the end of this second visit, a time was arranged to return and conduct interviews with those staff who wished to do so. Thus, the formal approval process was complete.

4.5.2 Informal Acceptance

However, it was recognised that formal approval did not necessarily equate to accessibility. To gain true accessibility the researcher recognised the need to ensure that a relationship with the participant based on trust (Burgess 1984, pp. 38-51) and respect (Im et al. 2004) was established, in order for them to feel comfortable in sharing thoughts, feelings and personal experiences (Wolff 2004). This involved more of a personal approval of the researcher, by the participant rather than a formal process of gaining consent. While in most cases the researcher felt accepted and trusted, there were times when a sense of distance between the participant and the researcher was still felt. This was believed to emanate from the cultural gap discussed within the Cross-Cultural Rigour section (see section 4.2.2 of this chapter). To minimise the impact of these differences, the researcher spent time building a rapport with each participant during both the initial meeting and prior to commencing the interview. In addition, the researcher felt that being a middle aged woman assisted in overcoming some of the issues. Male PHCWs did not appear threatened by a woman interviewer and in fact indicated a sense of pride in being asked for their stories and opinions. This outcome was similar to the situation in Mill and Ogilvie's (2002) study, in which participants felt honoured that someone from another country was interested in their thoughts. In comparison to the male participants, the bond between the female participants and the researcher who was often able to empathise with their plight of being a 'working mum' was beneficial in building trust and acceptance. It was recognised however that despite having designed the study to take account of cross-cultural issues (see

section 4.2.2 of this chapter) the researcher who did not grow up in PNG, was not a PHCW and was far wealthier than most PHCWs in PNG, would always be an 'outsider' (Chambers 1983, p. 2).

4.5.3 Conducting the Interviews

The PHCWs' place of work was chosen as the setting for these semi-structured interviews for three primary reasons. Not only was this often the most convenient meeting place for participants but it also provided an opportunity for the researcher to observe the participant's social worlds that included the external factors that could contribute to the informing and knowing processes (Blumer 1969, p. 52). Observing their working environment also provided contextual information that was later used to understand further the accounts of these individual, for '[n]o phenomenon can be understood out of relationship to the time and context that spawned, harboured, and supported it' (Lincoln & Guba 1985, p. 189). Lastly, these settings helped direct the thinking of participants toward the primary question namely, how they engage with and utilise information within their work. Had the interviews been conducted at home instead of work, for example, the participant may have focused on informing and knowing processes relating to family and/or personal issues. Conducting interviews at work however may also have biased the data collection process by suggesting to the participant that the researcher was particularly interested in the dominant working structures and belief systems inherent within their working environment may have swayed the participant's thinking and therefore the accounts they provided (Briggs, CL 1986). The researcher was therefore particularly careful to listen for and explore issues that related to both outside as well as within the dominant work framework.

Once a private place at the participant's place of work had been identified (Briggs, CL 1986), the interview commenced with personal introductions, together with informal conversation that set the scene for a relaxed interview moving gradually through interview schedule (see section 4.3 of this chapter). However, at times due to the nature of the work at a primary health care facility, it was necessary to delay or interrupt the interview as the PHCW was called to a patient requiring care. Rather than viewing this as a problem, interruptions were welcomed because they allowed for further observations of the participant at work, using various types of information as they diagnosed and treated the patient concerned. In these cases, short field notes were immediately recorded, which were later expanded in order to capture all relevant points (Berg 2007). In addition, the interruption provided an opportunity to see how the participant interacted with both the

patient and other staff members who were both important providers of information (Charon 2004). Lastly, however, an interruption also allowed the researcher additional time to reflect upon the interview that had already taken place and identify areas where additional questions were required.

In addition to the interview data and observational notes, general field notes were also collected. These detailed contextual information (Briggs, CL 1986; Berg 2007) relating to the facility in which the PHCW worked, such as the type and appearance of facility, total number of staff, infrastructure and other vital supplies available, conditions of road and distance to nearest hospital. Notes about staff morale, degree of team work and where possible how staff interacted with patients and other staff members were included. These notes were written immediately after each visit and became an important additional source of contextual data (Briggs, CL 1986).

Data from the second group of participants, namely individuals associated with primary health care in PNG, were also collected in a similar manner. Once the Provincial Health Advisors had provided approval, the researcher sought permission from their immediate manager to approach the identified individual and invite them to participate. Once again a full explanation of the study was provided verbally and they were left with an informed consent form. After agreeing to participate, a further appointment was made to conduct the semi structured interview which was also taped. In addition, field notes were made about where they were located, and any other contextual information that was believed at the time to be useful.

It was clear that participants valued these interviews for various reasons, which in many cases were different to the aims of this study (Briggs, CL 1986). Some participants used the interview as a chance to unload their stress, discussing many of the problems associated with providing primary health care services in PNG. Others used the interviews as an opportunity to promote their own skills and ability, even leading to questions about employment with the PNG Institute of Medical Research. While the researcher was quick to explain the purpose of the interview and attempted to bring the conversation back to the question whenever the participants strayed a long way from the topic, for the most part participants were left to discuss what was important to them. This was considered important because it pointed to relevant issues that may not have been considered had the discussion been curtailed (Wengraf 2001). For example, in many cases the participant seemed to exaggerate their exceptional skills and knowledge, comparing their abilities to other co-workers. Rather than dismissing this, as exaggerations that did not pertain to the

topic at hand, this information was used to understand the skills and knowledge that this particular participant considered important or felt may have been important to other people, leading to further questions about how these perceptions came about.

The data from both groups of participants were analysed (see section 4.5.3 of this chapter) throughout the data collection stage in order to identify weaknesses and improvements that needed to be made to the method of collecting data (Morse 1998). This process of continuous improvement included listening to the audio tapes as well as reading the transcripts, to ensure that the questions posed made sense to the participant as well as addressing the primary issue of how PHCWs engage with information (Sandelowski 1995; Rubin & Rubin 2005, pp. 204-205). If required, the ways that questions were asked were changed in order to improve the data collection method.

Data was therefore obtained from the accounts and observations of PHCWs as well as other individuals associated with primary health care in PNG. The process began with formal approval from the appropriate ethical committees as well as senior managers of the primary health care system in PNG. Care was also taken however to gain informal acceptance (Burgess 1984, Chapter 2), through discussions with PHCWs encouraging them to accept the researcher as someone who would listen openly to their stories. At the same time observations and field notes were recorded to supplement and add context to the accounts provided by these participants (Briggs, CL 1986; Berg 2007).

4.6 Analysing and Interpreting the Data

The accounts provided by the PHCWs, together with the observations and field notes became the data, which was both analysed and interpreted in order to explore the role of PHCWs within their particular social worlds (Wengraf 2001) as they obtained information and developed knowledge. This focus on developing an understanding through the participant's accounts as they interacted within their social worlds, fitted well with not only the tradition of qualitative research (Flick, Kardorff & Steinke 2004), but also Symbolic Interaction that seeks to understand 'the biographies and lived experiences of interacting individuals' (Denzin 2004, p. 83) from the point of view of the individuals involved.

While most of the interviews were conducted in English some participants preferred to partially or fully converse in Tok Pisin, one of the primary languages of PNG. Therefore at times data analysis began with a translation as well as a transcription of the taped interview. As the researcher had worked in PNG for over five years and was fluent in Tok Pisin, she assumed responsibility for both processes which was beneficial for three reasons.

First because each tape was transcribed as soon as possible after completing the interview, the researcher became familiar with the data, which ensured that any requirement to alter data collection techniques was identified at the earliest opportunity (Wengraf 2001; Richards, L 2005). Second, as discovered by Twinn (1997), using the same person to conduct the interviews, as well as to transcribe and translate all of the tapes, ensured consistency, and thirdly, the researcher was able to compliment the transcription by attaching additional memos to the transcripts, which described the gestures and signals made by participants, such as smiles, frowns and hand movements that were evident at the time of the interview and added to the meaning of the dialogue (Briggs, CL 1986). To ensure the entire account was captured, grammatical errors, exclamations and even the words used to stall the conversation such as 'um' and 'ah' were also included (Rubin & Rubin 2005, p. 204). An employee of the PNG Institute of Medical Research experienced in transcribing and fluent in both Tok Pisin and English then checked all transcriptions against the original interview tapes to ensure that the meaning rather than just the words of the participant were recorded within the final transcript (Temple, Edwards & Alexander 2006). This step in particular ensured a more accurate representation of the dialogue (Twinn 1997).

4.6 1 Analysing the Data

Initially, each transcript together with the associated observation and field notes were analysed as one complete document, in order to gain an overall perspective of the interview (Richards, L 2005). In particular, content was examined to identify all significant factors that may have had some bearing on the construction of the interview as a whole (Briggs, CL 1986) and these together with any additional thoughts, ideas or responses were noted in a memo and attached to the transcript (Glaser 1978, Chapter 5). For example during one interview an intoxicated patient entered the interview room quite unexpectedly demanding treatment. The interview was immediately suspended and the patient treated before recommencing. However, the episode changed the entire atmosphere and the participant as well as the researcher was anxious to complete the interview in case the aggressive patient re-appeared. In another case, a participant was so keen to express their concerns and worries, that the researcher was not able to follow the interview schedule. The dialogue, while extremely pertinent for the most part to answering the research question, was therefore seen more as a debriefing session rather than a story of what they would do if a patient with a stomach ache approached their facility. While affecting a significant part of the data collected, factors such as these would not necessarily

have been evident once individual sections of the data were isolated and analysed, if additional memos had not been attached.

Transcripts together with the associated field notes and memos were then imported into NVivo, a qualitative analysis software package that not only served as an electronic storage facility, but also assisted with assigning various typologies and codes to the text, which could then be retrieved and explored in-depth at any time (Richards, L 2005). Utilising NVivo as a tool, entire transcripts were allocated to various groups or typologies (Berg 2007) according to the demographic and contextual data collected in Part A of the interview schedule (see 4.3) such as gender, years of service and level of qualifications attained.

Topics as well as analytical coding systems were used to further analyse the data (Richards, L 2005). As the large quantity of text, (69 interviews averaging 45 minutes per interview plus additional field notes and memos), sections of the data were firstly allocated to one or more of the four primary aspects of the Human Information Framework, first described in Chapter 3; namely, participants' perspectives on the informing and the knowing processes, as well as descriptions of the context and any outcomes realised (see Figure 7 in Chapter 3). In this way all of the text relating to a particular topic area could be extracted and investigated in its entirety at a later date.

Rather than reductionism, this strategy enabled a more in-depth analysis of the data with the aim of 'uncover[ing] patterns of human activity, action, and meaning' (Berg 2007, p. 304) within each of the four aspects. For example, the topic labelled as 'informing process' included all data relating to instances where PHCWs described interactions with others, which lead to them obtaining information. These included not only face-to-face communication, but also arms length interactions through media such as radios or written information. While a little more difficult to isolate, the 'knowing process' included PHCWs discussing how they developed new knowledge or skills. The 'context' incorporated data pertaining to instances where either the informing or knowing processes were influenced by an external factors such as a breakdown of a radio or individual influences such as the existing skills and abilities of the PHCW concerned. Lastly, the topic labeled 'outcomes' included data pertaining to how knowledge was used.

In many cases data could be allocated to more than one primary topic. An example related to data describing the interaction between a PHCW and the local church official, talking about the use of condoms. While clearly an example of an informing process, it also

highlighted the role of an external factor, namely the church. Rather than limiting the analysis process therefore, initial grouping of the data around primary focus topics allowed for a more detailed examination of the data.

An analytical coding system was then used to examine each of these four topic areas in greater detail (Strauss & Corbin 1998). The purpose of this system was to sort the text according to what it said about a particular primary focus area, and separate codes were therefore developed for each suggested meaning (Berg 2007). Common experiences were of primary interest although individual differences were also investigated to identify why they may have occurred. Again, in many cases the data related to two or more analytical codes. For example one section of text under the topic of 'context' could be labeled as both sorcery as well as church if the participant had referred to both. Each analytical code was then again investigated to ensure that all of the various meanings were identified and separated, with the aim of 'explor[ing] all possible aspects of issues and ideas' (Jeon 2004, p. 253) relating to each particular aspect of the primary focus topic.

While in the first instance there were many analytical codes for each topic area, it soon became obvious that some codes were related or linked and therefore could be grouped around themes. These themes in turn were analysed and grouped together into even larger themes where appropriate (Glaser 1978, Chapter 7), which were then used as a basis for recoding the already existing data, as well as any new data as it became available, deepening the exploration and understanding of each primary theme (Jeon 2004). This became a circular process, with new codes emerging as data was added which in turn were analysed to identify commonalities and differences with primary themes being added and adjusted until all of the data had been analysed (O'Reilly 2005, p. 176).

4.6.2 Interpreting the Data

> [N]o amount of simply observing behaviour from the outside will provide an understanding of actors' views of their social world, and hence, an understanding of their conduct. The use of procedures allowing sympathetic introspection is part of the methodology of most symbolic interactionists (Manis & Meltzer 1978, p. 9).

Written summaries describing the properties of, and issues relating to each primary topic area were then developed. For example within the topic labelled 'outcomes', themes pertaining to freedom, authority and rules were identified, and within the knowing topic themes included unilateral and multilateral viewpoints. All of the summaries were then explored in order to identify how they could contribute to the understanding of how PHCWs engage with and utilise information, either in light of the role of the PHCW in the

informing or knowing processes or the contribution of internal and/or external contextual factors.

The process of writing and reflecting upon these summaries, assisted by identifying key concepts, incomplete ideas or missing information (Richardson 1994) pointing to areas requiring re-examination in order to better understand the participant's account together with the contextual information relating to each theme. Interactions between the four primary topics were also considered. In this way the concepts were developed from, and were further informed by the data (Corbin & Strauss 2008, p. 274). Any data that did not fit, or completely contradicted an emerging theme was also investigated to establish why this might be the case, and how it may further enrich the understanding of the findings (Rubin & Rubin 2005. p. 193). Further depth was added by comparing themes (Huberman & Miles 1994) between the groups or the typologies that had previously been setup (Berg 2007). For example, specific motivations described by male PHCWs were compared with those described by female PHCWs, or the perceptions of geographical barriers experienced by Eastern Highland Province PHCWs were compared with accounts from PHCWs in Madang. Themes were also investigated to identify potential links and relationships (Rubin & Rubin 2005, p. 234). For example, did PHCWs accounts indicate a link between certain parts of the informing process, and an external factor such as religious ceremonies? These types of general concepts were discussed with fellow PNG researchers who were not involved in the study but were familiar with and had conducted research in primary health care facilities in PNG, allowing for other perspectives to be heard and considered in light of initial interpretations (Lincoln & Guba 1985, p. 308).

The established theory was particular important for understanding each of the identified themes (O'Reilly 2005, p. 199). When for example, authority was found to contribute to the way in which PHCWs utilised information, the theory relating to perceptions of authority, control and power was considered in order to make sense of this finding. However, the theory in many cases also highlighted areas that required further investigation. For example, in considering the literature pertaining to authority the concept of rules emerged and was considered in light of the data that had already been collected.

In order to assess whether the conclusions contributed to answering the research question, findings as they emerged were therefore examined in light of new accounts from other participants, observational and field notes, as well as the existing theory. This process of cross-examination was an important part of the study design, which involved analysing and interpreting the data as it was collected. Returning to the field to collect further accounts

from other PHCWs provided further opportunities to question and reflect upon the findings as they emerged (Blumer 1969, p. 28).

4.6.3 Key Considerations

Throughout both the analysis and interpretation processes three key issues were considered. First, attention was paid to any pre-conceived ideas that the participant may have formed that could have affected the development of the interview discourse (Machet 1996). Participants would have formed a particular view of the researcher and her purpose for being there based on their prior knowledge, as well as the researchers performance during the first, second and third meetings (Goffman 1971; Murray 2003). For example, the prior official approval of the MRAC, the Provincial and District Health Advisors and the officers in charge of each facility may have suggested an association with authority figures and despite being reassured about confidentiality and provided with information about the purpose of the study may have been reluctant to discuss controversial issues with the researcher. In many instances, however, the participants indicated that they saw the researcher as a confidant. One CHW in a remote Aid Post suggested that '*there is nobody looking at our hard work and doing something to help us. Only you have come*'. Other participants saw the researcher as an expert, someone who could provide them with information. This was possibly because the researcher was associated with the PNG Institute of Medical Research, or even possibly because she was white. The result was that on occasions participants asked questions about medical concerns such as how to deal with HIV and similar diseases. The researcher in these circumstances was very quick to point out that she had no medical knowledge. Throughout the analysing and interpreting processes, an attempt was therefore made to identify and understand how a participant's particular preconceptions were involved in constructing the data that was obtained.

Secondly, it was recognised that data can never be collected, analysed and interpreted from a completely neutral stance (Rubin & Rubin 2005, pp. 31-32; Berg 2007). The researcher acknowledges that their previous experiences, feelings and motivation for undertaking the study are inherent in both the data and outcomes of the study (Wengraf 2001). Some of these have been made explicit in Chapter 3 and assisted with the initial data analysis as noted above. In addition, because of the long involvement with health research in PNG the researcher has developed specific ideas and perceptions about primary health care and in particular how PHCWs engage with and utilise information, well prior to the analysis of data and even the design of the study. For example, the particular research question chosen is an indication of how important the researcher believed and still believes information is

to PHCWs (Berg 2007). A great deal of reflection therefore went into both the analysis and interpretation processes in order to not only identify the researcher's pre-conceived ideas and values but also to understand how they contributed to the findings. The idea was not to neutralise them, because even if this was possible, other perceptions would simply take their place. Instead, the aim was to identify their presence and understand their role within the construction, analysis and interpretation processes (Corbin & Strauss 2008, pp. 80-82).

However, these were not the only contributing factors that influenced how the interaction developed. Therefore, thirdly what questions and how they were asked or even not asked, were considered for their ability to guide the construction of the data (Baker 1984; Silverman 1993). Rapley (2001) for example, shows how the tactic of remaining silent could invoke anxiety in some participants, forcing them to contribute something or anything to the conversation. In analysing the data particular attention was therefore also paid to how both the participant's and the researcher's dialogue, together constructed a story (Silverman 1993; Rapley 2001; Hermanns 2004).

While some studies are particularly concerned with the truthfulness of a participant's account, wanting to 'weed out "inaccurate" descriptions' (Silverman 1993, p. 91), this study was interested in all accounts and stories, even if they were considered fictitious. While it is not easy to identify these fictitious accounts (Wolf 1987), there were some obvious markers. For example, in this study one participant initially spoke about the wonderful process they had created for in house training that was available to PHCWs, and that had produced extremely good results. However, later in the interview they went on to say that there was little if any funding for the program and therefore training had not occurred over the previous two years. Where obvious, these types of inaccuracies, exaggerations and/or sometimes even contradictions were considered in the context of being an important analysis tool, pointing to areas of particular sensitivity or issues that the participant did not feel comfortable enough to speak about. Therefore, in analysing and interpreting the data an attempt was made to identify and then understand the reasons for constructing a particular image or 'face' (Goffman 1971, p. 15) by telling their these stories in this particular way (Nachman 1984). The belief was that '[l]ies are a form of communication, not its negation' (Salamone 1969, p. 121).

Corresponding to the data collection process, the analysis and interpretation processes also emphasised an understanding the question of how PHCWs from PNG engage with information from the perspective of the participant as they reside within their social

worlds. Analysis involved a gradual process in which the participant's accounts were firstly considered as a whole story, before individual sections of the text were grouped first by primary focus topic and then analytically coded (Richards, L 2005) in order to understand what the data was saying about each of these topic areas (Strauss & Corbin 1998). The primary themes that emerged from this data were then summarised in order to further explore the main concepts as well as, identify missing information or incomplete ideas. In analysing and interpreting the data, it was recognised that the preconceptions of the participant and the researcher, as well as the way the interview was structured contributed to its formation. Therefore, the process of identifying emerging themes and concepts relied not only on identifying and understanding them but also on a reflective process that considered how they were the various players contributed to their construction (Murray 2003, p. 379).

4.7 Summary

The methods used in this study demonstrated an example of both the informing process and the knowing process in action. In this instance, the informing process primarily involved conducting semi-structured interviews with 58 PHCWs and other eleven individuals associated with primary health care in PNG, in which personal accounts and stories were obtained. It was accepted that in providing these accounts, participants could never pass on all that they knew, as knowledge in its entirety can never be transferred. In addition it was also recognised that they could never provide a so-called objective truth, instead their accounts were a reflection of a 'particular conversation that occurred at a particular point in time' (Wengraf 2001, p. 1). This information together with field observations was then analysed and interpreted in order to understand and develop new knowledge about four previously identified primary topic areas (see Chapter 3, section 3.6); namely the role of PHCWs in the informing and knowing processes together with pre-existing contextual influences and the outcomes the emanated from these processes. In doing so particular attention was paid to the role that preconceived ideas of the researcher, as well as the interview structure itself, played in developing the original accounts. In applying these research methods, this study was able to gain a deeper understanding of how PHCWs in PNG engage with information, which will now be explored in the following four results/discussion chapters.

CHAPTER 5

Results and Discussion – The Context

5.1 Introduction

Using the Human Information Behaviour Framework developed in Chapter 3 as a structure (see section 3.6), Chapter 6 addresses the informing process, Chapter 7 the knowing process and Chapter 8 the outcomes that flow from PHCWs engaging with information in PNG. However, to begin the combined results and discussion section, this chapter concerns itself with the context, demonstrating that PHCWs in PNG currently operate within a primary health care context in which a variety of often conflicting beliefs not only exist, but are considered by many Papua New Guineans to offer legitimate options for understanding health and treating illness. Primarily these beliefs could be grouped under three broad labels. Biomedicine is the principle belief system sanctioned by the Department of Health, with all training and resources provided to PHCWs based on this biomedical model. Nevertheless, PNG society also embraces practices based on both Indigenous and Christian belief systems in order to maintain healthy communities.

Because individuals engaging with information never do so in isolation (Pendleton & Chatman 1998) understanding the primary contextual factors that influence their behaviour is especially important. Within any context, a broad range of factors exist including both external influences such as societal views or the availability of resources and infrastructure, as well as individual characteristics including a person's own experiences, skills and knowledge (Chang, JH 2004, pp. 407-408) (see Figure 9). All can potentially influence how not only the individual obtains information but also interprets and uses it (Snow 2001). For example if a person cannot read or does not understand the information provided, valuable ideas may be lost to them forever. Alternatively, if a person does not have the resources to implement the ideas they may also go unused.

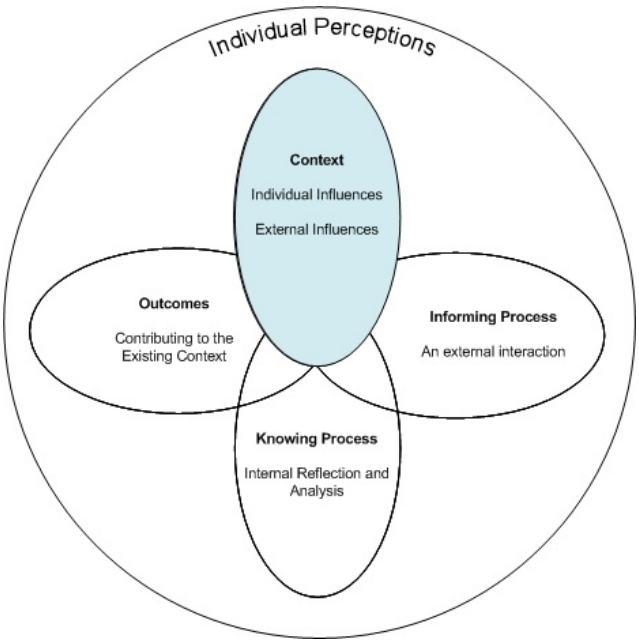


Figure 9 - Human Information Behaviour Framework – Highlighting the Context

A person's beliefs pertaining to health and illness greatly influence health care behaviour (Nettleton 2006). Beliefs are the values, knowledge and ideas that are considered to be true and correct within the context in which the individual is located (Sandstrom, Martin & Fine 2006, pp. 57-58). They not only help a person decide whether something is right and wrong but also what actions should be considered as a consequence (Blumer 1969, p. 5). For example, if an individual believes that another person is providing them with incorrect information they may ignore it or seek to correct it in some way. In comparison, when they believe something is right they are more likely to embrace and even utilise the ideas. What a person believes to be right or wrong is often influenced by their interactions with other people. Through communication, ideas are shared, altered and sometimes even formed. Existing beliefs may therefore be reaffirmed and or alternatively challenged. The ideas discussed are then interpreted by the individuals concerned, who may or may not incorporate them into the way that they view and therefore act towards the world around them (Blumer 1969, pp. 4-5).

Groups are ideal platforms for both developing and sharing beliefs (Shibutani 1955; Turner 2006). As members generally interact on a regular basis, they come to not only understand, but also develop ideas about the things that are of mutual importance (Fine 1979, 1987; Sandstrom, Martin & Fine 2006). For example, a group of health professionals may discuss the benefits or pitfalls associated with a new treatment method, concluding that it appeared easy to implement and would be of benefit to their patients. In this way, beliefs are shared and perhaps even endorsed by other members of the group.

Together these interconnecting beliefs are referred to in this thesis as a belief system – that is the values, knowledge and ideas pertaining to a particular issue of concern.

The groups within which these belief systems are developed come in many different shapes and sizes. For example, the entire scientific community, the PNG Department of Health and even staff at one particular primary health care facility could all be referred to as groups. Many groups could also be referred to as subgroups. For example, the Catholic Church is a subgroup of the broader Christian community. In addition, groups could also be defined by whether they are formally constituted by an act of parliament or informally shaped, with membership depending on such things as birth right as in a particular village, or community of people. What differentiates a group, 'from a collection of individuals' (Harrington & Fine 2000, p. 313) is the sense of cooperation between group members (Znaniecki 1939) who are continually sharing (Baron & Byrne 1991, p. 438) and even defining and redefining beliefs about what the group is and even what it is not about (Putnam & Stohl 1996, p. 149).

As members usually know, observe and interact with each other on a regular basis, smaller groups are often better at influencing a member's thoughts and actions in comparison to larger groups or organisations such as the formal health care sector, where people do not always know each other (Harrington & Fine 2000). As members come together and interact they develop a unique understanding of their broader society (Fine 1979), thereby 'linking social structure and individual action' (Harrington & Fine 2000, p. 313). Although Catholicism is a form of Christianity, the Catholic Church has developed its own unique belief system on issues such as divorce and abortion. Likewise, while the Catholic Church as a whole embraces these beliefs, each congregation may assume a slightly different interpretation. In some cases divorce is not permitted while in other contexts it is allowable under certain conditions. Individual members in turn tend to take their cue from the congregation that they frequently associate with rather than Christianity as a whole.

To begin this contextual chapter the various belief systems developed by the smaller groups that exist within the PNG context are considered. First, the influences associated with the formal health care sector that sanctions treatment practices developed in accordance with the biomedical model are discussed. Attention then turns to the other belief systems based on Indigenous Knowledge and/or Christianity, which also contribute to the way in which Papua New Guineans treat illness. These findings demonstrate that PHCWs in PNG operate in a context where biomedicine, Indigenous knowledge and Christianity all potentially inform the way in which people understand health.

5. 2 Working within the PNG Primary Health Care System

PHCWs begin their professional careers by completing an initial training course on biomedical practices. Once they commence work, however, many find that this training has not completely prepared them for their roles as PHCWs. Often their responsibilities are much greater than what they had been led to believe and in addition, they do not have the resources or support to practice in accordance with what they had been taught. Though many participants reported similar experiences, they also recognised that due to the extreme isolation, the plight of CHWs working in Aid Posts were often far greater than for example, PHCWs in larger urban centres.

5.2.1 Initial Training

While most people in PNG are introduced to the primary health care system as children, PHCWs receive their formal introduction to the principles of a biomedical model through an initial training course, which consists of either four years of training to become an HEO, three years of training to become a nursing officer, or two years to become a CHW. These courses are regularly redeveloped and upgraded. For example, until the early 1980s Aid Post Orderlies were trained to look after rural Aid Posts, while Nurses Aids worked in hospitals and urban health centres. More recently Aid Post Orderlies and Nurses Aids have been replaced by one CHW training course. The nurses training course has also recently been upgraded from a certificate to diploma level.

> At the moment we are doing the diploma. We were doing the certificate course, and the last group went through the supplementary exams last year. So that program has finished… It is the same length but the diploma is at the university level and the certificate is more hospital based. [Manager – Nursing School.]

Those few participants who were critical about their initial training wished they had received more practical experience before being employed within a primary health care facility, believing that hands on experience would have made them far more confident and capable.

> So we don't learn much from the practical experiences [during initial training]. So when we come out after graduating and when I come out and I work as a nursing officer in the field, I learn much better than when I am in school. School is very limited and we don't learn much. [Nurse – Mission Run Health Centre Madang Province.]

While some participants would have preferred more practical experience, initial training was generally perceived to be an enjoyable and fulfilling experience. Interviewees suggested that they often referred back to and relied upon the information obtained and

knowledge developed during this period. In addition, although different levels of PHCWs received different types of training, they all learned to use the STM which became the primary reference point for diagnosing and treating patients once they obtained a position within a primary health care system.

5.2.2 Formal Roles and Actual Responsibilities

Once their initial training was completed, the new PHCW applied for a place in either a government or church-run primary health care facility. This was discussed by many participants as a difficult transition mainly because their new roles and responsibilities were not particularly well defined. They suggested that one of the reasons for this was that while job descriptions had been developed by District and/or Provincial health officials, managers at a facility level did not necessarily distribute or refer to them in any way. Instead, PHCWs appeared to rely primarily on daily directions from senior staff or their own discretion. The result appeared to be that many of the staff undertook roles they were not necessarily trained for.

> Don't have separate job description because we don't have enough nursing officers. So when someone is rostered in one section, he or she has to do everything, admission, giving medication. [HEO – Mission Run Health Centre Madang Province.]

The above quotation may imply that the mixing of roles and responsibilities is an occasional occurrence of no major significance but as the following example suggests, even in urban areas CHWs are regularly performing roles way beyond what is formally expected of them.

> Oh yeah, I ah, before I hear the story for many times when doctor, nursing officers are not around, CHWs they take everything in their hands, they deliver babies, they give medicine like doctors do in the rural areas, so CHWs in the rural areas, they do most of the work like doctors. In that case coming to them, they would just try any drug that is suitable for the stomach ache. They will treat the patient. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Some participants were particularly concerned, as CHWs were never trained to undertake these additional responsibilities. They felt that in these cases patients were put at risk as CHWs tended to experiment on their patients.

> Now all this new CHW they know how to use the blue book and they follow. But the old ones, they are unable to. In the Aid Posts you will find some old CHWs, men they don't go through these books. They just, I don't know how they treat their patients in the remote areas, all these APOs. [CHW – Mission Run Health Centre Madang Province.]

A majority of participants tended to blame the increased responsibilities and excessive workloads on a lack of staff. However, staff shortages were also given as reasons for a myriad of other problems at a facility level including long patient waiting times, closure of some smaller facilities and also as a reason for not having the time to actively seeking out new, and/or utilise existing information that could potentially inform their work.

> But if they just leave it for the patients, or if the clinic is so busy that they think they don't have the time to look, that is another thing I find. 'oh what is happening with your treatment or what is happening with your Standard Treatment are you going systematic'. 'No we have too many clients so we can't just waste time seeing this when we have the crowd waiting and then they are impatient about you taking time with the patients.' [Manager – District Level.]

Two reasons were given for this staff shortage. First, position vacancies were not always filled particularly in rural areas, leaving facilities closed or operating with reduced staff numbers. However, the high rate of absenteeism amongst existing staff was frequently acknowledged by participants as the major contributing factor. In either case, the result was that other PHCWs needed to fill the gap, even if they did not have the appropriate training and qualifications.

> They are employed but fail to attend to duties, so there is one that is supposed to be with us here but he is not here. So we are working ourselves, nurses and CHWs, nursing officers. [Nurse – Government Run Health Centre Eastern Highlands Province.]

Many of the older PHCWs who had worked or were currently working in Aid Posts at the time of being interviewed appeared, however, to be very happy with the prospect of autonomy and these additional responsibilities. Some relished the challenge of working by themselves, without being subjected to the orders or scrutiny of others.

> I mean working in the town when doctors are nearby, so we are working under them so we don't need to committing the treatment but when we are at the health centres there is no doctors, there is no nursing officers so we as the community health workers we, examine the patients, we diagnose the patients and then we treat ourselves. I like that way. [CHW – Government Run Aid Post Eastern Highlands Province.]

However, in comparison, recently graduated PHCWs appeared to feel the strain of these additional responsibilities. They felt nervous, worried and often talked about the consequences, including the fact that they may need to face a village-based court if they made a mistake. These individuals preferred to be guided in their work and valued any type of support that was available.

> Sometimes we are scared in doing things because professional people are not around to help us. And there is not as much learning at learning school. At least we know that too but to really practice it is really limited, very limited. [Nurse – Mission Run Health Centre Madang Province.]

Thus, while senior staff from the Department of Health may have defined specific roles for each of the different types of PHCWs in PNG, namely HEOs, nurses and CHWs; in reality these delineations do not exist. When HEOs and nurses are not available either because they are absent for a period or because they are not allocated to facilities such as Aid Posts, CHWs who receive far less training, take over these responsibilities. Even though some CHWs relish the additional responsibilities, relying on their experience and initial training to carry them through, others realise their own limitations and the potentially negative consequences for patients as well as themselves, should something go wrong.

5.2.3 Resources and Infrastructure

As well as dealing with increased responsibilities, a majority of participants were also coping with inadequate or out of date infrastructure, insufficient resources and a lack of the drugs required to treat patients in accordance with the provided in the STMs and/or taught during initial training. Therefore, in these cases providing treatment strictly in accordance with the prescribed biomedical model was impossible.

Rapid communications in or out of many of the primary health care facilities, but particularly those in remote areas was extremely difficult. None of the Aid Posts and few of the Sub-Health Centres involved in this study had access to a radio, and while many of the larger health centres had UHF radios, they were normally used for administration matters. In addition, only the largest facilities in primarily urban areas tended to have access to a motor vehicle and therefore any mail was collected on an *ad hoc* basis (see Table 2). Effectively this not only meant that updated information was not being passed onto staff at a facility level but also that PHCWs were unable to seek advice from other health professionals in an emergency situation.

Type (number of participants)	Radio	Access to a Motor Vehicle	Electricity (Generator, Solar or Mains)	Water (Tank or Mains)
Aid Post (21 participants)	0 per cent	9 per cent	27 per cent	55 per cent
Sub-Health Centre (19 participants)	0 per cent	72 per cent	100 per cent	93 per cent
Health Centre (18 participants)	94 per cent	83 per cent	100 per cent	100 per cent

Table 2 - Availability of Infrastructure in Participating Primary Health Care Facilities

Doctors and other senior health professionals rarely visited and even when a UHF radio was installed, local staff were often unable to contact remote senior staff for advice and/or direction because often when they radioed a hospital for assistance there wasn't a doctor available to talk to them.

> I rang [Name of Hospital Removed] because that is where the patient will be sent to. And I had a mother, I have a mother and that mother worked for a long time over night, she is still expecting, she has not delivered. So we ring anti natal and tried to talk. Just still have a question mark, but they didn't give the answer. And then last Friday I tried three times to get through to [Name of Hospital Removed] on Friday. On Friday all of the working men go, because when we ring through to ask the doctors sometimes they say the doctors are busy at the ward. But that person we wanted to talk to, that person in the medical ward in the surgical ward, on ward one they are always busy so the staff on the radio say we can not disturb them and get them to the radio for our silly business here. [Nurse – Mission Run Sub-Health Centre Eastern Highlands Province.]

In addition, equipment such as thermometers, beds and stethoscopes were often missing or never provided in the first place. Many participants explained that because these things were essential to diagnosing and treating patients in accordance with the STMs, serious mistakes may often result from these shortages. For example, participants suggested that when hanging scales required to weigh young babies were not provided to smaller facilities, staff have to guess the weight of babies. Since information contained in the STMs often stipulated dosages according to weight, guessing the weight of an infant could result in over or under dosing.

> We don't have operating equipment, instruments. All these things that we need, to give, to provide better services here. [Nurse – Government Run Health Centre Madang Province.]

Observations made by the researcher support these findings. Interviews often concluded with a walk through the facility and in many cases drug shelves were all but bare, equipment looked old or was abandoned because it was broken and buildings were badly in need of maintenance and repair. PHCWs in this study spoke with a great deal of frustration and anger at not being able to access the types of resources that were needed in order to comply with instructions contained in their STMs and provided during initial training.

5.2.4 Supervision and Management

In addition to inadequate infrastructure, insufficient resources and a lack of the required drugs, a majority of PHCWs in this study received little or no support from anyone outside of their own facility. Participants felt that one of the primary responsibilities of a District

Medical Officer and in the case of Aid Posts the Officer in Charge of the nearest Health Centre was to provide leadership and support to their more junior staff. However, only one PHCW in this study reported receiving a regular visit from their external supervisor.

> Since 5 years, I have been here nobody has visited. When I need anything or when I see that something is a problem then I walk myself to see them. I talk to them but they don't make an attempt to come and see by themselves. [CHW – Government Run Aid Post Madang Province.]

Even the managers and other senior health officials interviewed for this study agree that PHCWs are often left to their own devices. While they understand that it is very difficult and demoralising for PHCWs to work without this type of encouragement and guidance they too are constrained by limited budgets and additional responsibilities.

> Nobody comes to correct them, or teach them otherwise. There is not stimulation to make it better for them. Also not from the government is there. Not a really good support from the government towards health centres. I think that can also depress morale. [Manager – Provincial Hospital Staff.]

It is not, however, within the scope of this study to delve into the reasons why PHCWS in PNG experience a shortage of resources, difficult working conditions and/or a lack of supervision and support. What these findings do suggest is that many PHCWs in PNG are sometimes not able to operate in accordance with their initial training and the STMs both of which are based upon a biomedical model.

5.2.5 PHCWs in Rural Aid Posts

While these difficulties were reported by many of the PHCWs interviewed, it was also widely recognised that the lower a PHCW is on their professional scale, the less support they will usually receive. For example, participants believed that opportunities for professional development generally went firstly to HEOs, and then to nursing officers. CHWs were the last class of PHCW to be considered.

> There is no chance for junior officers there who want. There are not courses for CHWs. People like us we are out here in the field with the people... So they don't look at us, care to help us in training, in service or workshop, nothing. [Nurse – Government Run Health Centre Eastern Highlands Province.]

There is also a perception among many of the participants that CHWs in charge of remote Aid Posts are by far the most disadvantaged group. These CHWs work almost entirely by themselves and because of their remote location generally operate without the possibility of any additional support.

> But in the area where I was working I had two Aid Posts that were government Aid Posts. The APOs had been there for 12 years and they had never once had a supervisory visit of any kind. [Manager – Nursing School.]

In addition, many of the CHWs working in these isolated Aid Posts are nearing or sometimes even past retiring age. Since they are unlikely to have received any ongoing training after graduating it was suggested by participants that these PHCWs relied entirely on their ability to remember what they were told during initial training, and their own personal experiences.

> For example like when I wasn't born and these people have graduated first. At this times now it is problems to then now because changes come every time with, education changes, everything changes at the times. During the time things came in simple ways, and it was possible for them. Then, not really hard, they learned the simple ways. But at this times now things are getting higher and it is getting harder and sometimes it is hard for them to read and understand. [CHW – Government Run Aid Post Madang Province.]

Moreover, it is not just ongoing training and supervision that is lacking. Being in a remote locality made it even more difficult to obtain the medicines and other resources they require. For example, one CHW in this study explained that to obtain supplies for their Aid Post they needed to place an order with the nearest health centre. The health centre then adds this request to their order and a PHCW from the health centre takes the order to the centrally located Provincial Medical Store. Once the Provincial Medical Store has completed the order the health centre picks it up, and then the Aid Post is required to go back to the health centre to obtain their share of the supplies. When the Provincial Medical Store, as often happens is unable to fill an order, the health centre will determine how the available supplies are divided up. Given that Aid Posts do not have access to a motor vehicle and in remote areas public transport is difficult to come by, it is not surprising that this process can take up to several months to complete and in addition that Aid Posts are often the first to miss out when stocks are low.

> I go to the health centre and the Health Centre would supply me with very little only a week supply. I get upset because I have rather a small population in the six communities that surrounds this Aid Post to look after and the small supply of drugs that I get is just not enough. Like it makes me feel how can I get help and from whom? [CHW – Government Run Aid Post East Sepik Province.]

PHCWs in these circumstances suggest that in many cases their only option is to refer the patient to larger facilities. However, because public transport is often scarce and only a few people will have access to a motor vehicle, referring patients is at times not practical or even impossible.

> So the only way that party will have to die. Ah that snake bite will have to die. Or a return placenta or a mother we assist them for delivery sometimes if I'm stuck with the problem because of lack of communication and transport. That at the Aid Post level. [CHW – Government Run Aid Post East Sepik Province.]

Ultimately it is the patient that suffers. However, CHWs in charge of Aid Posts were also extremely disadvantaged with more responsibility and fewer resources, in comparison to their urban colleagues. In addition, they were often the oldest of workers who had received the least amount of initial training, had few opportunities for professional development and very little external support and supervision. CHWs in charge of remote Aid Posts were by far the most disadvantaged PHCW in PNG.

5.2.6 Feelings about the Formal Health Care System

Understandably many participants whether they worked in urban or remote locations felt abandoned by their supervisors, their managers and even abandoned by the general health care system. 'Nobody comes' was a common phrase used by PHCWs in this study. Even though some of the supervisors and managers are aware of these problems and many wanted to make changes, this was rarely communicated to the PHCWs concerned who based their judgements on the fact that nobody took an interest in what they did and nobody cared about the conditions under which they worked.

> Because we are alone and nobody goes around, even our OICs, or whoever is looking after us, they don't go around or something like that and give us the notice that new drugs are coming out, are coming out. Here we are just out here by our self. [CHW – Government Aid Post Madang Province.]

These were not just the perceptions of CHWs in charge of remote aid posts. Even in urban health and Sub-Health Centres where there were teams of PHCWs working together, some participants also expressed their sense of abandonment.

> But if we are left alone we just… same old thing over and over. It's what we don't like. It is because our government doesn't have the money, or doesn't budget for it or they can't do these things. They just left us to work. You know you have to tools you want us to, you must sharpen it to use or find out about. If not you can't use at work. All of us must get school or short courses, about all the general work here all of must talk about. Some of the things I have failed to do. We must also have been writing and we are going to spoil people's life. [CHW – Government Run Health Centre Eastern Highlands Province.]

Many participants believed they were not given the respect they deserved. They felt like second class citizens within the formal health care system, where hospital staff received all of the benefits including additional funding, better infrastructure and more resources.

> They use us like a tool. We are just a tool to do whatever they want. [CHW – Government Run Aid Post Madang Province.]

It is not that PHCWs did not want to improve. Some dreamed of a better future, where they are able to keep abreast of new practices and receive the support they need. Many participants believed that improvements in these areas would make a big difference to how dedicated they are to providing a better quality of health care. Senior supervisors and managers agreed with this analysis.

> And in some cases it is like what I was saying earlier, it is just a normal way of health worker. Once we don't go out there and visit them for supervisory visits or we don't bring them in for in service, they tend to feel they are not recognised. Nobody is interested in them. So they only do the basic things. Treatment and go home. If there is patient at the Aid Post, they come for treatment and sometimes they are not interested in their work also, so they go home. [Manager – Provincial Level.]

5.2.7 Summary of Results Pertaining to Formal Health Care System

PHCWs in PNG are currently operating under very difficult conditions. Within the formal health care system a lack of ongoing training, resources, infrastructure and supplies make it almost impossible at times to implement what they have been taught during initial training or provide treatment in accordance with the guidelines contained in the STMs. Once initial training has been completed, few opportunities exist for ongoing training, managers rarely visit facilities and even when radios are installed, advice from health professionals outside of their facility is hard to come by. Complying therefore with the biomedical model is at times particularly difficult.

5.3 Alternative Paradigms

Perhaps because of the difficulties that PHCWs face in strictly complying with the prescribed biomedical model, participants also discussed other ways of working. Influences from outside of the formal health care system, appeared to permeate through the primary health care context. Two broad groupings were mentioned by participants; Indigenous Knowledge and Christianity.

Before presenting findings that suggest practices originating from one of the many Christian sects are used to treat illness and maintain health, the following section will firstly focus on Indigenous Knowledge, being those practices originally developed by Papua New Guineans well before the introduction of biomedicine.

5.3.1 Indigenous Knowledge

While the biomedical model guides not only the content of initial training but also the STMs, which are developed as a reference guide for use by health workers, participants spoke about a variety of Indigenous health practices that were also considered by many Papua New Guineans to be valid options for treating or preventing illness.

> Many people still believe their traditions. [Nurse – Mission Run Health Centre Madang Province.]

> All of them [referring to the general community], the same standard [beliefs]. And they were believing in sorcery and all that. [Nurse – Mission Run Sub-Health Centre Madang Province.]

Considering Indigenous health practices as a valid option for treating or preventing illness meant that in some cases community members did not access formal health care services at all.

> I can say most of the patients are a bit scared. Maybe because of the different places or their Tambus (Taboo or customs). You know what I mean "Tambu". They don't speak openly. Most of them keep things secretly. [Nurse – Mission Run Health Centre Madang Province.]

> Yes, they [community members] do use herbs. They think it is waste of time coming here. When they feel the herb does not help then they come here for help. [CHW – Government Run Aid Post Madang Province.]

Indigenous knowledge also influenced the way in which some patients accepted or adhered to treatments provided by the formal health care facilities even when they attend.

> So when they get medicine for at least two or three days they [think] they must be healed. They don't understand. So when they see they are not cured from the illness they go back to the herbs. [Nurse – Mission Run Health Centre Madang Province.]

> Sometimes they just go and leave them and say one tablet, you feel alright you forget about the other medication then the fault is in you. When the sickness comes again then you believe, you twist everything and say it is the Sanguma that possible you diagnosed. [CHW – Missiong Run Sub-Health Centre Eastern Highlands Province.]

In some cases Indigenous health practices were often available within a person's local village and therefore easier to access than the formal health care facilities. A couple of participants provided examples of how PHCWs sometimes referred patients directly to Indigenous practitioners rather than to another formal health care service.

> Because I know that this hospital, do have medicine and cant help them. An also a sickness that is called a pigbel or bel solap, bel tait. Because that we find it really hard treatment them here [health centre], I refer them to my village. [CHW – Government Run Health Centre Eastern Highlands Province.]

Indigenous beliefs were still intrinsically intertwined into the lives of many Papua New Guinean as demonstrated by the following participant who was particularly surprised when further clarification about a certain practice was sought.

> Just our beliefs. If people die we make some sign or other somethings, that we also find that they allow because they are black. Or they find out some ways, that make them compensate for the dead body, or sometimes they send the women must go back to her place. Or if the men then they must compensate for the dead body. So, when they find out, from there they can pay up, find one of the Sanawa, Sanawa is like a flys or dragon and they protect them from the dead. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

Indigenous health practices in PNG are both complex and diverse, often comprising of a variety of different but interconnecting beliefs, which may or may not be used simultaneously. Many of the PHCWs in this study explained that while there are circumstances where plants are used for their healing properties, treatments can also incorporate spiritual elements that may be just as important. In addition, participants were quick to point out that there are many different Indigenous belief systems in PNG, each region or even community developing an often unique set of beliefs about how to treat as well as avoid a variety of ailments and other misfortunes of life.

> It varies from place to place. But in my place I am speaking, they don't advise the mother to get food during the labour. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Rather than being obsolete, participants suggested that Indigenous health practices are still considered by many people in PNG to provide legitimate options for both diagnosing and treating patients. Despite their initial training and the STMs, based on the biomedical model, some PHCWs share this view and do not completely dismiss the benefits that Indigenous health practices might provide. Moreover as PHCWs move between facilities, they are exposed to and therefore have an opportunity to learn about the Indigenous health practices of different regions.

5.3.2 Christianity

In addition to embracing their particular Indigenous belief system, many Papua New Guineans have also adopted Christianity, with most people claiming membership of any one of a number of Christian sects that have been established in PNG. These same churches may also be responsible for the provision of health services through the administration and management of the local primary health care facility. Several participants in this study suggested that Christianity plays a significant role in the provision of health services to local communities, with Christian principles informing if not directly

contributing to the treatment of patients in primary health care facilities. These practices include treatments such as prayer and the laying on of hands. However, Christian principles are also used in the counseling of patients on for example sexual practices and/or birth control.

While not necessarily denouncing Indigenous belief systems, the majority of people in PNG have adopted Christianity. The local church is often the central feature in many villages and church leaders are generally among the most respected and therefore powerful members of local communities. Christian holy days and festivals are strictly adhered to, and many official gatherings whether or not they are directly related to religious worship, open with a prayer. Christianity is a dominant force in the lives of many Papua New Guineans.

> There are many Christians, most people are Christians. When you come down to the plantation there is one church … many churches close to each other. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

The church also plays a significant role in the provision of health services to many communities through the administration and management of local health and Sub-Health Centres. Of the 59 facilities involved in this study, nineteen were run by a church organisation, and many participants where ever they worked suggested that the facilities operated by the churches generally provided a better quality of service, in comparison to those run by the government. Two primary reasons for this were suggested, both of which involved greater supervision and/or management. First the officers in charge of the church facilities tended to have more autonomy to hire and fire staff, in comparison to government counterparts. In turn, however, they were also more accountable for how the facility operated. Second, some of the PHCWs in church facilities felt an additional responsibility directly to God who was watching and taking an interest in their work.

> Yes different. The staffs morale is different from the government because we try to start work with a prayer and then starting with the word of God you know. Gods work first and then we have something to, and we fear God and that is why our fear motivates us to service our clients, our patients in a way that they have satisfaction. [Nurse – Mission Run Sub-Health Centre Eastern Highlands Province.]

> Yes ah, we usually have every outpatients everyday. We have devotion first and then health education. [Nurse – Mission Run Sub-Health Centre Madang Province]

PHCWs working in church-run facilities were more likely to apply Christian principles. For example some PHCWs in Catholic run centres suggested that sexual abstinence should be taught rather than the use of condoms. However, Christian rituals including the laying

on of hands, devotions and prayers were at times also directly incorporated into the treatment offered to patients.

> Most times we, firstly we screen them and give treatment, they go out and they see no reaction, and when they come again we pray with them and give us some sort of prayer. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

> For me when I treat patients and they are not getting well, something like that I pray and say bible lessons. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

Nor was the use of Christian principles and rituals limited to church facilities. Approximately 25 per cent of the PHCWs who worked in government facilities also mentioned God, Christianity or a Christian belief when talking about diagnostic and/or treatment practices.

> I had a vision and the Lord showed me in my vision that there were two dead men on the bed and I said to them 'I said to you get up and walk in the name of Jesus' and they got up and walked. And I believe the good Lord has given me this job. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

> To me it is important so we have to pray with them first because I can give the mother advice. The real healing power is in God. Healing power is the medicine to do good. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

One participant suggested that some of her patients were frightened about coming to Christian facilities, particularly if they had previously used an indigenous health practice.

> Most of them they come but every day it might be hard because we are in the mission you see. They might be hiding, they never mentioning these things. Everybody they come, even in the night they tell me, light the lamp and they come. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Nevertheless, many participants suggested that patients appreciated the use of Christian rituals as part of the treatment they received, and the study data included several reports of patients going out of their way to seek treatment from a primary health care facility where PHCWs were sympathetic to their Christian beliefs.

> Like from Kainantu they always go down to Kasa, because they there they look after the body and spiritual as well. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

As Christianity plays such a major role in the lives in many Papua New Guineans it is not perhaps surprising that Christianity sometimes permeates or contributes to treatment practices in primary health care facilities. Christian rituals such as prayer, devotions and even the laying on of hands are believed by some PHCWs to assist in alleviating illness,

and advice given to patients is sometimes based more on Christian principles rather than a purely biomedical model.

5.3.3 Summary of Results Pertaining to Alternative Paradigms

Thus, rather than a context in which the scientifically tested biomedical model dominates, multiple belief systems including various Indigenous health practices and Christian beliefs also contribute to how people in PNG treat illness and maintain health. Further, despite the fact that PHCWs are trained and resourced at least to some extent, to practice in accordance with the biomedical paradigm, each of these belief systems was found to influence how at least some patients were treated in primary health care facilities. For example, Christian principles and rituals including prayer, laying on of hands and devotions, as well as Indigenous health practices including herbal remedies and spiritual practices were acknowledged and in some cases used by PHCWs in the diagnoses and/or treatment of their patients.

5.4 A Variety of Belief Systems

Broadly defined, biomedicine, Christianity and Indigenous Knowledge are all examples of belief systems developed by groups that contribute to the way in which local societies function. The biomedical model stemmed primarily from the work of the western scientific community. Although there is much debate and even disagreement about particulars, generally members of this very large group agree with basic ideas such as 'every disease is caused by a specific, identifiable agent' (Nettleton 2006, p. 2). Likewise, Christianity is defined by a body of Churches in which both broad disagreement but also consensus around the existence of one true 'God', exist (Pargament 2002; Pargament, Magyar-Russell & Murray-Swank 2005). Indigenous Knowledge in PNG is, however, slightly different in that this refers to a group of diverse belief systems (Koka 2004, p. 58). Small and until relatively recently rather isolated communities develop and maintain their own particular set of beliefs including those pertaining to the understanding of health and well-being.

Using the NVivo Software Package the data set entitled 'Context' was examined to identify how these belief systems contributed towards the way in which PHCWs in PNG obtained information. Results from this analysis confirmed the historical findings presented in Chapter 2, as detailed below. That is, in addition to the biomedical model, participants also spoke about how Indigenous Knowledge and Christianity contributed to the way in which Papua New Guineans maintained their health. Yet the analysis also

uncovered additional ways in which Christianity and Indigenous Knowledge contributed to the primary health care context in PNG.

5.4.1 Exposure to Multiple Belief Systems

PHCWs begin their career by receiving training in accordance with the biomedical model (Ministry of Health 2001a). They are then in many cases provided with or have access to at least some of the STMs which are also based on the same belief system. Despite this biomedical grounding, PHCWs are not always able or sometimes choose not to apply these treatment methods for two primary reasons. First, the biomedical model was originally developed for use within western countries where health facilities are generally better resourced and the practices of PHCWs both supported and supervised. PHCWs in such contexts are therefore both able and encouraged to use the biomedical model for diagnosing and treating illness. In comparison, while their training may be similar, PHCWs in PNG do not always have the resources required to provide the same type of services (see section 5.2.3. of this Chapter), and are often left to make their own decisions about what practices are appropriate (see section 5.2.4, of this Chapter).

In addition, however, patients in western countries expect to be treated in accordance with the biomedical model when seeking treatment at a formal health care facility. Patients in PNG, however, do not necessarily have this same expectation and often choose between a variety of different diagnostic and treatment practices (see section 5.3.1, of this chapter). The type of context in which a group exists will very much influence how members act towards information (Putnam & Stohl 1996). Given the two entirely different contexts (Fine 2001), it is not surprising that people's beliefs about and actions towards maintaining health were completely different.

PHCWs' interactions, however, were not limited just to people within the formal health care facility. Individuals interact with many different types of groups every day (Fine & Kleinman 1979; Putnam & Stohl 1996). For example, some participants also talked about associating or interacting with friends and/or family members (see section 5.3.1 and section 5.3.2, of this chapter). While all of these associations presented opportunities for exposure to a variety of different belief systems, not all had the same degree of influence over a PHCW's thoughts and actions (Shibutani 1961, p. 257). A few PHCWs in this study also spoke about the beliefs and practices of their village. As lessons learned in the formative years are so entrenched, they often continue to influence to some degree the way that a person thinks and acts throughout their life (Mead 1974, pp. 368-369). In PNG the

belief systems embraced by their extended family and other village members are particular powerful, primarily because Papua New Guineans continue to maintain strong community links (Edoni 1986). Therefore, instead of diminishing in influence overtime, the belief systems practised by family members continued to be a significant influence in their lives with participants suggesting that they still interacted with many members of their own village.

The belief systems of their village were extremely complex, incorporating Indigenous, Christian as well as biomedical beliefs (Koczberski & Curry 1999). While many PNG communities knew about and sought the assistance of drugs or other biomedical practices when sick, they also continued to value and use Indigenous health practices. In turn, these Indigenous health practices often incorporated both physical and spiritual components, stemming from their religious beliefs (Koka 2004).

PHCWs by the very nature of their work also interacted with members of other communities bringing them into contact with a variety of perhaps very different Indigenous belief systems (see section 5.3.1 of this chapter). Nearly 60 per cent of the participants in this study were at the time of the interview working away from the village in which they were born. In addition, 81 per cent of participants reported that they had in the past, worked in other facilities. Therefore, the majority of participants would have already lived and worked in other communities. Similarly, to their own village these communities will have developed their own belief system that PHCWs reported learning about as they observed or interacted with community members.

> Yeah they usually have this leaves, herbs and all these things. And they are talking to their spirit to heal and all these things…. This area [Indigenous health practice] has been very popular. [Nurse – Mission Run Health Centre Madang Province.]

The data also suggested that Christianity played a significant role in the lives of many Papua New Guineans (Bartle 2005, p. 66), with the church being the centre point of village life. Many of the participants were members of more formally constituted groups including churches (see section 5.3.2, of this chapter). Christianity in its various different forms is the dominant religion in many Papua New Guinean communities and plays a significant part in the lives of many people (Bartle 2005, p. 66). For example, only four percent of the population do not identify themselves as a Christian. Of the 96 percent who belong to a Christian church, twenty eight percent are Roman Catholics, twenty percent are Evangelical Lutherans, twelve percent belong to the Uniting Church and approximately ten percent are Seventh Day Adventists. Another twenty six percent of the population belongs

to one of a number of evangelical or other Christian sects (National Statistical Office of Papua New Guinea 2004).

In addition many of the primary health facilities are managed by one of the Christian organisations operating in PNG. Therefore, PHCWs often interacted with other church members and participated in the various rituals that would have continually reaffirmed their membership of this particular group (O'Sullivan et al. 1994, pp. 267-270). Being a Christian was particularly important to some participants and attending their local church provided them with many opportunities to share, reinforce and even further develop their Christian beliefs, with likeminded people.

> Also on the spiritual aspect of it we have a woman groups, youth groups and ah, the whole church people there. [Nurse – Mission Run Sub-Health Centre Eastern Highlands Province.]

In addition to learning about different belief systems, PHCWs in associating with various groups may also have challenged and even contributed to the changing views of others. As people move from one group to another they distribute information about other ways of seeing or understanding (Putnam & Stohl 1996). While it may be automatically embraced, any new information could potentially contribute to small shifts and changes in the way that people think. Iteanu (2004) for example, describes how a young Papua New Guinean on returning home from studying law, attempted to incorporate new ideas into a traditional exchange ceremony. While some people in his village were upset, also many accepted the changes and continued to incorporate them in later ceremonies. Likewise, participants in this study who interacted with various groups also shared a variety of beliefs pertaining to illness, health and well-being, which they believed might be incorporated into the existing belief systems.

> The way they [village people] live, how they do things. So that you must be like them first, and then from these changes say no this is not quite true let's go like this, just little by little you can change people. [Nurse – Mission Run Health Centre Madang Province.]

Interviewees suggested that many people in PNG embrace aspects of all three paradigms in seeking treatment for an illness (Macfarlane 2005). Village members are not necessarily constrained by one particular viewpoint but instead consider all of the options available to them. Therefore, belief systems within communities may only be limited by firstly what individual members know (Fine 1979) and secondly by what understandings emerge when information is shared with other people in the group (Bergendorff 2008).

This does not suggest however, that all three paradigms are equally legitimate or influential. In some cases, Indigenous belief systems as well as Christianity may have had a particularly strong influence on the way in which community members as well as PHCWs treated illness and maintained health. First, biomedical services were not always available or easily accessible (see section 5.3.1 of this chapter). Second and perhaps more importantly, religious beliefs whether Indigenous or Christian tend to be extremely powerful in influencing all aspects of a person's life (Smart, N 1996, p. 2). The religious belief system that a person develops may be so compelling that it acts as the primary 'meaning system' (Silberman 2005, p. 641) or lens through which many other ideas and suggestions are judged (Emmons 2005).

In summary, PHCWs in PNG are not operating within a mono-culture where a biomedical model dominates. Instead, Christianity and Indigenous Knowledge also contribute to the way that society functions (Hamnett & Connell 1981; Lepowsky 1990; Koka 2004), providing answers to questions such as what is important to the community and what is appropriate and correct for each given situation (Sandstrom, Martin & Fine 2006, pp. 57-58). As PHCWs socialise or interact with other people, these beliefs are often shared and the practices that are perceived by society to be suitable are reinforced. In turn however these same interactions can also lead to belief systems whether they are based on the biomedical model, Indigenous Knowledge and/or Christianity being challenged, and on occasions, new attitudes or beliefs may emerge (Blumer 1969, p. 2).

5.4.2 Legitimate and Powerful

While a Traditional Medicine Policy was ratified in 2007 that acknowledged certain Indigenous health practices and encouraged dialogue with traditional healers (Department of Health Papua New Guinea 2007), the biomedical model remains the primary belief system officially sanctioned by the PNG Department of Health, for both the prevention and treatment of all illness in PNG primary health care facilities (Ministry of Health 2001a; Ambihaipahar & Rai 2004). Consequently, it is the biomedical model that is used for the training of PHCWs in PNG and also informs the development of the STM, being the most commonly used information resource developed for use in the field. However, these data suggested that many Papua New Guineans also recognised other belief systems including Christianity and Indigenous Knowledge as beneficial for informing the way that they thought about and maintained their health. Therefore, this thesis argues that while only the biomedical model is officially sanctioned, belief systems based on any of the three paradigms may have offered legitimate ways of understanding health in PNG.

In order that something is considered legitimate it must be socially recognised as appropriate (Nettleton 2006, p. 7; Peren 2007). The legitimacy of a belief system is therefore not dependent on a written document or a formal statement but instead is a mindset where most people within a particular situation or group believe it to be true, right or correct (Ostrom 2005, p. 21). One way to identify if something is considered legitimate is to look to the actions of the people involved. For example, the beliefs of all religions are often reinforced and legitimized through the rituals, methodology, doctrine, ethical, social and experiences of its members (Smart, N 1996).

Christianity could therefore be considered a legitimate treatment practice, as on many occasions, PHCWs and the family members of patients were observed gathering together for prayers and devotions to help a person overcome an illness (see 5.3.2). Rituals such as these were first introduced by the Christian missionaries who were very keen to ensure that as many Papua New Guineans were converted to what they believe was the only true faith (see 2.3). However, to some extent this practice of conversion still exists today with people learning about the power of God as well as religious rituals as they attend their local congregations (Smart, N 1996).

Participants also talked about Papua New Guineans using various Indigenous health practices to treat many of their illnesses (see 5.3.1). People not only often sought herbal remedies passed down from generation to generation in order to gain relief from various ailments but also attributed at least some of their ailments to sanguma (witchcraft). Rituals including the practice of certain burial rights, reinforced Indigenous belief systems.

In many cases it is almost impossible to disentangle religious or spiritual elements from the way in which people make sense of everyday life (Silberman 2005). Due to the magnitude of many health problems, religious or spiritual beliefs tend to become even more important to people (Durie 1994). In many Indigenous communities in particular, spiritual practices are often a major component if not the most important part of any treatment practice (Tarakeshwar, Stanton et al. 2003).

Actions including the use of prayer, herbal remedies and rituals to counteract sanguma (witchcraft) as described by the participants in this study testified to the legitimacy of various belief systems. Individuals believed that their actions would make a difference (Smart, N 1996, p. 11; Pendleton & Chatman 1998) and therefore these were considered to be acceptable for improving health and treating illness.

5.4.3 Conflicting Messages

However, simply because multiple legitimate belief systems exist within the same context, does not mean that they will necessarily complement each other. Nor can it be assumed that all of the ideas within one particular belief system will become operational. The primary health care context in PNG consists of not only diverse but also in many cases conflicting beliefs.

A common characteristic of biomedicine, Christianity and Indigenous belief systems, is their incompatibility. For example, Christian and Indigenous belief systems have very different understandings of the world at large; each with its own definition of what is good and evil as well as ideas about what is considered appropriate as well as inappropriate behaviour (Edoni 1986). Each has its own truth, reinforced through rituals, ceremonies and narratives (Smart, N 1996, p. 421).

In particular, while many churches in PNG are respectful of Indigenous Knowledge, some spend an inordinate amount of time attempting to change the way that people think (Bartle 2005, pp. 50-65).

> Sanguma and other social problems will not disappear overnight, but as churches unite in prayer and work together, they can see these problems disappear from their villages and become things of the past (Bartle 2005, p. 330).

In addition, the fundamental basis for the biomedical model stands in direct opposition to the spiritual basis of Indigenous Knowledge and Christianity (Nettleton 2006, p. 3). For example, while Indigenous practices believe in treating the spirit or mind as well as the body (Koka 2004), the biomedical model is primarily concerned with ensuring a person's physical health (Nettleton 2006, pp. 2-3). The belief being that if the power of God or a spirit cannot be observed or tested in an experiment then it does not exist (Rhodes 1985, p. 3).

Yet data showed that in at least some PNG communities' beliefs pertaining to Indigenous Knowledge, biomedicine and/or Christianity were combined within the same belief system (see section 5.4.1, of this chapter). People may seek the assistance that pills and potions under a biomedical model can provide. In addition, they are also prepared to pray for the sick and ill, while at the same time seeking out the assistance of a traditional healer. This phenomenon is not unique to PNG. Even in developed countries many people 'hedge their bets' by seeking out complementary and alternative medicines, and/or turning to religion, at the same time as consulting their doctor (Mueller et al. 2008). The significant difference between these contexts and PNG is that there is an expectation and understanding by both

patients and health professionals alike, that broadly speaking formal health care services will be provided in accordance with a biomedical model. Alternative therapies may compliment but can never dominate the service. In PNG, however, there does not appear to be as clear a distinction between biomedical and other practices. Communities mix and match to a certain extent appropriate therapies, as they believe appropriate.

Primary health care services in PNG are therefore provided within a context in which there are a significant number of conflicting viewpoints. The biomedical model is based on the understanding that all illness has a scientifically identifiable physical cause (Nettleton 2006, p. 2). Christianity although not denouncing the biomedical perspective, is based on the premise that God has the ultimate power to heal (Bartle 2005, p. 68). While it would be impossible to speak for all Indigenous health practices, the common element is that they are neither interested in scientific verification nor believe in the one true God (Aerts 1998, pp. 6 and 20). Nonetheless, many communities in PNG manage to not only embrace but also utilise the benefits of all three paradigms within their belief system. Therefore, primary health care is a context where not only multiple legitimate but also somewhat incompatible and seemingly conflicting belief systems are accepted and even utilised to understand health and treat illness.

5.4.4 Summary of Discussion

Unlike Chatman's model (1999) that suggests that individuals are constrained by the small world in which they live, the data in this study demonstrated that PHCWs in PNG operate in very large and complex environments. In some ways, their context could be viewed as consisting of multiple interconnecting macro- as well as micro-worlds, which ensured a degree of both diversity and complexity.

At a macro level biomedicine, Christianity and Indigenous Knowledge, all contribute to different understandings of health. The biomedical model relies on scientifically tested practices (Nettleton 2006, p. 2), Christianity on the power of a one true God (Pargament 2002; Pargament, Magyar-Russell & Murray-Swank 2005) and Indigenous Knowledge often incorporates aspects of spiritual as well as physical well-being (Bartle 2005, p. 24). Broadly speaking, these are the prevailing influences that contribute to rather than dictate how people define and maintain health in PNG.

However, PHCWs in PNG also associate with and exist within smaller worlds or groups that influence how they think and act (Harrington & Fine 2000). First as employees of the formal health care system, PHCWs are trained in and given responsibility for providing health services in accordance with a biomedical model. Second because of the strong Christian following in PNG as well as the heavy reliance on Christian organisations in the running of primary health care facilities, they may also be exposed to the beliefs pertaining to particular Christian sects who consider rituals such as the laying on of hands, prayer and/or devotions as appropriate ways of treating illness. Findings, however, also suggest that Papua New Guineans in general tend to maintain strong relationships with and therefore continue to be exposed to the belief systems of their own village throughout their adult lives and that the belief systems developed by many of these village communities often incorporate aspects of biomedical, Christian as well as Indigenous Knowledge into their understanding of and beliefs about health and well-being.

Together the members of these groups, develop, redevelop and maintain a set of commonly held beliefs (Mead 1974, p. 161), which are affirmed and therefore legitimised as members of the group think and act as if they are right, true and correct (Nettleton 2006, p. 7). The actions of community members for example attest to the fact that many communities believe that Indigenous Knowledge, Christianity and biomedicine are all beneficial for the treatment of illness. Church members also demonstrate their belief in certain healing rituals by coming together in songs of praise, prayer and devotions. Moreover, even the formal health care sector demonstrates a belief in the biomedical model by sanctioning its use.

However, while Indigenous Knowledge, Christianity and biomedicine may all contribute in some way to how people understand health in PNG, they are not necessarily compatible. For example, the primary premise of Christianity being that the one true God has total control over the well-being of each individual, is in direct opposition to many of the Indigenous belief systems which worship a variety of spiritual beings are worshipped. Moreover, the biomedical model bases everything on beliefs that can be scientifically observed and/or tested. Instead of harmony and agreement, PHCWs in PNG operate within a context where legitimate beliefs often conflict.

Nothing, however, is constant. As individuals interact with each other, new ideas challenge old ways of thinking and seemingly rigid belief systems change (Blumer 1969, pp. 18-20). This chapter therefore provides not so much an understanding of 'the' Papua New Guinean primary health care context, but instead a participant's perception of what existed at the time they were interviewed. It demonstrates a degree of complexity comprising of multiple legitimate, yet conflicting belief systems, dependent to some extent on the organisations and the general community for existence. However, perhaps more importantly this chapter set the scene for understanding the informing and knowing process by suggesting information pertaining to and knowledge of various belief systems may influence how PHCWs in PNG engage with information.

CHAPTER 6

Results and Discussion – The Informing Process

6.1 Introduction

While a complex set of contextual factors including the belief systems that have been developed and the groups that develop them can influence how PHCWs in PNG engage with information, these factors do not in themselves determine how information is obtained nor knowledge developed. Instead, outcomes rest primarily with the processes of informing and knowing, for it is within these processes that individuals develop meaning or knowledge (Blumer 1969, p. 2).

The following two chapters focus on these informing and knowing processes, demonstrating that rather than acting separately, the informing and knowing processes in practice interact with each other. However, for the purposes of investigation and analysis they have been addressed independently, as there are clear theoretical differences between the two. The informing process is outward looking and depends on some type of interaction with another party, be that through reading, talking or simply observing other individuals. The knowing process on the other hand belongs solely to the individual, having been described as an inner conversation involving both reflection and interpretation (Mead 1974, p. 90).

While the knowing process is specifically discussed in Chapter 7, this chapter focuses on the findings from the study that pertain to the process in which information may be obtained (see Figure 10). Although, this information is generally thought of in more of a formal sense, for example patient charts, policies and guidelines or conversations with other health professionals, this thesis embraces a far broader definition that not only encompassing many different types of information but also recognising the vast number of ways in which it can be obtained. In effect, people usually learn more through informal exchanges such as casual conversations at social gatherings or even while observing the actions of others, than through the more formal channels (Bates 2002; Case 2007, p. 289). In this sense, individuals are constantly being informed (Erdelez 1997; Solomon 1997b) as

sources either intentionally or even unintentionally convey messages (Bates 2006). Talking, reading, observing and experiencing are therefore for the purposes of this thesis, all considered potential conveyors of information.

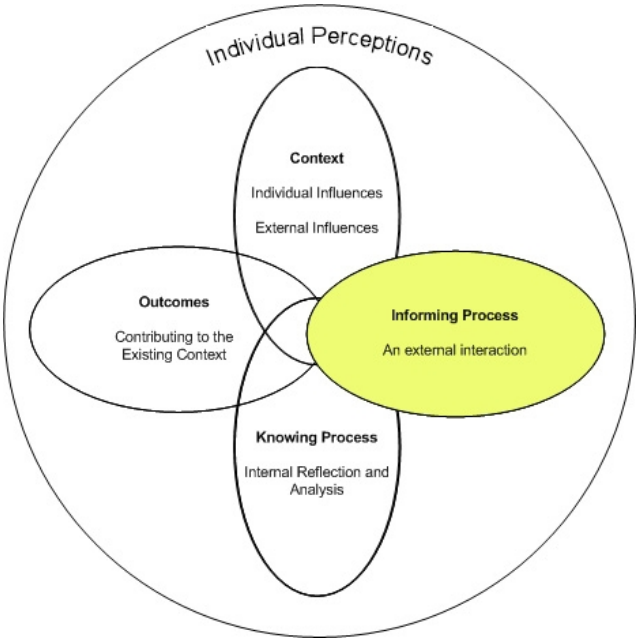


Figure 10 - Human Information Behaviour Framework – Highlighting the Informing Process

Not all methods of providing information are however equally effective (Daft & Weick 1984). People may prefer personal methods of communication for conveying messages, particularly if the ideas are either new and/or complex (Julien & Michels 2000). Face-to-face communication that incorporates both verbal as well as non-verbal cues (Newsom 2007, p. 45) is a particularly popular method for information provision. One reason for this preference may be because both parties share a common space, and therefore will be more likely to understand the particular nuances that may influence how information is received and utilised in that context. In addition, however, face-to-face communication provides opportunities for interaction where both parties have the ability to truly interact with each other. Perhaps most importantly, face-to-face communication allows for almost immediate feedback. While this feedback may not always be entirely indicative of a person's true feelings, through the nod of a head or a perplexed expression one may gain a general perception as to how the other party is feeling about what is being said (Goffman 1967, pp. 5-6).

The success or effectiveness that can be attributed to any informing process is subjective. From the point of view of the provider success may be measured in many ways. For example they may be satisfied if the recipient simply receives the information. Though in other cases the provider may be more interested in ensuring the message from their perspective is understood in the way they intended, and perhaps even acted upon (Davenport & Prusak 1998, Chapter 5). As some degree of ambiguity is normal and two parties will never understand information in exactly the same way (Eisenberg 1984), a recipient may be more interested in ensuring that the information meets their particular needs (Dosa 1997, Chapter 3).

While the knowing process addressed in Chapter 7 will address how PHCWs in PNG come to understand or make sense of the information provided, the focus of this chapter is on how they obtain it. In particular, the discussions below will focus on information pertaining to the various belief systems identified in Chapter 5, demonstrating that information is disseminated by three primary sources. Information pertaining to Christian principles is easily accessible through local Churches. Members of village communities in many cases provide information about aspects of their particular Indigenous knowledge, although to some extent this is dependent on the relationship they have with the PHCW. However, the formal health care sector is perhaps the least successful at providing easily accessible information, which may explain why PHCWs in PNG also consider information from other sources.

6.2 Providers of Information

PHCWs describe interacting with a range of people and objects on a daily basis in order to obtain the information they required. While there were few opportunities for routinely gathering information about the biomedical model, information from colleagues and members of the general community was both easier to access and often more appropriate for the context in which they worked. The most common providers of information for PHCWs in this study were the patients themselves. In every description pertaining to the treatment of patients, participants described asking for and using the information provided by the patient as a basis for making diagnostic and treatment decisions.

6.2.1 The Patient

Every participant described how diagnosis and treatment started with and primarily depended upon the interaction between the patient and the PHCW. In providing information about their health related problem, the patients also to some extent supplied clues about a possible solution. Thus the face-to-face encounter with the patient was an opportunity to not only gather a wide variety of information about their current symptoms, but also to understand what sequence of events led up to the complaint.

> History taking is the first thing we do, and then we find out whether he has taken something or he has an injury or the illness has lasted him some time. A thorough examination before we come up with the proper diagnosis……. So history taking we find, history taking is the best thing that helps us to make a good proper diagnosis before treating the patient. [Nurse – Mission Run Health Centre Madang Province.]

Many PHCWs appeared to be well aware of the importance of these face-to-face interactions noting that they not only provided an opportunity to obtain information verbally but also using other senses such as touch and sight in order to become better informed about the condition of the patient.

> We see them as they come. Eye contact. What we see them, we find out, we already know. We have worked out in our mind what they already have. You see, at the end we given them. Just from looking, or looking at the patient. And sometimes we hearing, hear, smell, we use five senses. All of these five senses, we use. Smell, we see, or hear. [Nurse – Government Run Sub-Health Centre Eastern Highlands Province.]

However, despite articulating the need to encourage patients to talk, the researcher often observed that PHCWs were abrupt and even at times dismissive of their patients. For example, on one occasion when a patient showed up at the facility during an interview, the PHCW turned them away, telling them to come back later when they had finished taking part in the interview. This was despite the researcher strongly protesting that the interview could be stopped until the patient had been treated.

In a few very isolated instances, the informing process also extended to various diagnostic tests including taking the patients temperature, and analysing blood and urine samples. However, the equipment required for even these basic tests was rarely available to PHCWs.

> We don't have other things like laboratory, checking up the blood or like for the investigation of TB or those things. [Nurse – Mission Run Health Centre Madang Province.]

A written account of the patient's medical history in the form of a Health Book may also have been available. These small book kept by the patient rather than the facility provide the only written record of any previous treatment. Participants described three primary problems with this way of maintaining a written record. First, PHCWs did not always remember to write up the details of the treatment they had provided into the patient's health book. Second, when they did remember it was often illegible or not detailed enough to be of any real use. Third, the health books were often not available because a patient had either lost or forgotten to bring them to the facility. Since many facilities would not treat a patient without a health book, patients who had forgotten to or had lost their health book purchased a new one, and therefore several written records often existed for each patient.

> It is the first thing you ask from the patient, the clinic book. But the difficulty with the clinic book is that people lose them and the medical history has just vanished and they come with the new clinic book. Or they don't want to show that there was a fight before because that is also in your clinic book. So they don't want to show it so they say 'oh yeah I lost it, but I have a new one'. There are difficulties with the clinic book. [Manager – Hospital Staff.]

Despite best efforts, sometimes it was also difficult for the PHCW to get a clear picture of even why the patient had come to the primary health care facility. In many cases the patient may have been fearful, especially if they have tried another type of treatment prior to coming to the primary health care facility. However, in some cases the patient was also worried that a PHCW from another area may not know of their beliefs and therefore inadvertently or even deliberately break a traditional custom.

> I can say most of the patients are a bit scared. Maybe because of, the different places, or their Tambus, you know what I mean '*Tambu*' [Taboo] customs. They don't speak openly. Most of them keep things secretly. [Nurse – Mission Run Health Centre Madang Province.]

Information from the patient however was often the most important and sometimes the only resource PHCWs had to assist them with solving patient-centred problems. Interactions with patients therefore were the primary and most important way of obtaining vital information upon which diagnostic and treatment decisions are made. Other types of information including the STMs were described in terms of adding to and/or complimenting the information provided by the patient.

6.2.2 Standard Treatment Manuals (STMs)

Unlike patients who predominantly provided information verbally, STMs were the primary written reference developed for use by PHCWs. The small booklets that have been developed by the PNG Department of Health contain the rules or guidelines for treating many of the primary diseases found in PNG.

First introduced to PHCWs during their initial training (see Chapter 5 section 5.2.1) many participants spoke very highly of all the STMs, suggesting that they see them as guides that can fill in for senior staff when they were not available. Written by doctors and specialists from PNG, they elicited a great deal of respect.

> They are very helpful. It is like a clinical, it helps us. The Standard Treatment Books are like our second bible. [Nurse – Mission Run Health Centre Madang Province.]

However, two problems relating to the availability of this resource were observed in many of the facilities. First, quite a few of the manuals were out of date. Some participants were using STMs dating back to the mid-1970s. In addition, many facilities did not have all or, in some cases, any of the STMs that had been developed (see Table 3 for current editions).

Title	Most Recent Edition
Pediatrics Standard Treatment Manual	2007
Adult Standard Treatment Manual	2003
Obstetrics and Gynecology Standard Treatment Manual	2000
Family Planning Standard Treatment Manual	2000

Table 3 – List of Most Recently Published Standard Treatment Manuals in PNG

Some participants believed that the STMs were not always available in their facility for a variety of reasons, including not enough copies being printed, copies not being distributed by the PNG Department of Health, facilities left out of the distribution plan and staff taking the manuals home for their own use. Whatever the reason, many of the PHCWs only had a few of the STMs (whether or not they were current copies) and in many of the Aid Posts STMs were not available at all.

The most common complaint about STMs related to the way the information was presented. First, the STMs are written in English, which for many Papua New Guineans was their second or even third language. However, it was also noted that older members of the profession who often had limited English were at a particular disadvantage.

> But with this written information it is very hard to send, to read across, some who can read and assess. Some of them, they are old timers. [CHW – Government Run Aid Post East Sepik Province.]

> I mean the procedures of going about doing this checklist. Like they are about 1960 training of Aid Post, of grade five or more like grade four education. So the means of understanding this is a bit difficult for them. [Manager – District Level.]

Other forms of written information were also produced. From time to time circulars for example were sent out. However, there reference to this type of information was rare and when discussed, similar language difficulties were mentioned.

> Well all these means and ways of communications have good sides and bad sides. Some people are good at reading papers, some people are not good at reading papers they are good at listening to radios. [Manager – Provincial Level.]

To overcome these language barriers, many of the participants believed that as much information as possible should be provided through face-to-face communication. In particular, they felt that providing information only in writing meant that PHCWs were unable to ask questions about any of the content.

> So I think, myself sometimes I have a questions about new things, and don't understand the treatment Books or something. And how the treatments are given, I sometimes have a question, so best whatever new drugs coming in and whatever is not concerning the standard treatment, or what is concerning the standard treatment it still needs to be if someone knows very well about it, that is give us, explain what is in the Standard Treatment Books so we have a clear understanding of what is right in them in the Treatment Books. [CHW – Mission Run Health Centre Madang Province.]

Therefore, while generally spoken of with respect, the STMs were not always suitable for use in all situations and there was some indication that a minority of PHCWs did not use them at all. Participants that discussed this particular issue suggested three reasons for this. The first relates primarily to the availability. In many cases, some or all of the STMs were missing from facilities. Second, the copies of the STMs that PHCWs did have were frequently out of date. Third, due to the long lead times in publishing new versions particularly in the case of the family planning and obstetrics STMs there is a general perception that the information contained within even the latest STMs may not necessarily be useful. Lastly, however, and perhaps most importantly, participants spoke about the problems associated with the STMs only being available in English, a second or even third language for many people in PNG. Perhaps for these reasons participants also spoke about their preference for face-to-face communication where they could ask questions about the information provided.

6.2.3 Colleagues at the Facility Level

In addition to every day transactions with patients and the written information contained in the STMs, PHCWs in larger facilities also had the opportunity to interact with their colleagues. The degree to which PHCWs interacted with their colleagues varied between facilities. In some cases, informal peer networks worked extremely well and staff talked about helping each other out.

> We are working together because we have been working for so long together and all the people even the CHW, they when they feel something is difficult they come to the nursing officers or sister in charge everybody here is open to each other and so friendly. We can always ask question from each other. [Nurse – Mission Run Health Centre Madang Province.]

In particular, the younger PHCWs in this study who did not have a lot of experience found the support they received from their fellow colleagues extremely valuable.

> When I come to see a patient that comes with a problem that I can't assist for diagnosis. I always refer the patient to a nursing officer or a HEO. I always refer to someone else. [CHW – Government Run Health Centre Eastern Highlands Province.]

As well as being a ready source for information, collegial networks also acted at times as a checking mechanism by highlighting problems. This sometimes encouraged PHCWs to be more vigilant in their diagnostic and treatment practices because they did not want their colleagues to think that they were unprofessional or unskilled.

> In the health centre it is because the nurses are aware that other people are watching and also if the other nurses see that this child is not treated according to the weight, they go back and say this child has not been treated properly, so we have to start all over again. [Nurse – Mission Run Health Centre Madang Province.]

Collegial networks were not, however, necessarily confined to the sharing of information about the biomedical model. Information pertaining to Indigenous health practices and Christian beliefs was also exchanged.

> We are from different backgrounds and places and our people do that every day and we do involve ourselves too, we do it to so. We don't say no to them because we have seen it and we have done it ourselves. We just accept our Taboos and customs. [Nurse – Mission Run Health Centre Madang Province.]

> We must put God first. This is a big thing. In our workplace, I like to show that Christian. We must be truthful and talk well about God. I worry about the Nurses fellowship. This fellowship must stay in the [Name removed] Health Centre. That's my biggest thought, that's my plan. It is my wish. [CHW – Government Run Health Centre Eastern Highlands Province.]

Informal collegial networks were not however available to all. As previously discussed, the Aid Posts participating in this study were staffed by one CHW who very rarely saw other colleagues, particularly when they were in remote areas. Though, even in health centres a lack of time or staff shortages discussed in Chapter 5 (see section 5.2.2) was reported at times to prevent staff from successfully interacting with each other for the purposes of supporting each other and sharing information.

> I want to pass on the information to my staff but we are all occupied, with patients, seeing patients and doing this and that, and there is no time left so we could teach the others. The problem I see here is that we are understaffed. [Nurse – Government Run Health Centre Madang Province.]

In addition, a small number of participants suggested that PHCWs were also reluctant to pass on information. There was a perception that by passing on information the other person would gain some sort of additional benefit such as being rewarded for knowledge and skills that really belonged to the information provider. Information was considered by some to be powerful, valuable and therefore treasured. Participants did not openly admit to withholding information, but some gave this as a reason why they could not always rely on their colleagues to help them out.

> Mainly because we have different statuses with the people at the top. For they may have their own personal differences regarding their positions or so they don't disclose all of this information. [Nurse – Government Run Health Centre Eastern Highlands Province.]

Nonetheless, when available, these informal networks for exchanging information between colleagues were reasonably successful, as there were very few examples of formalised venues for exchanging information. Although staff often talked about holding facility meetings once a week or even in some cases once a day, the purpose was usually to discuss matters relating to administration and/or for morning devotions and prayer rather than providing an opportunity to exchange information pertaining to the practices of their profession. Therefore, it was perhaps not surprising that when colleagues were absent or did not want to share information, participants talked about turning to other sources.

> Because I don't have another person like a nursing officer, HEO or doctor here. So I depend heavily on this treatment book. [CHW – Government Run Aid Post Eastern Highlands Province.]

It is, however, the CHWs in Aid Posts who are most affected by this lack of collegial support. Working primarily by themselves, they are the front line of health care in PNG and therefore often need to deal with very complicated cases without even the resources that can be found in health centres (see Chapter 5 section 5.2.3). These individuals did not

benefit from either informal or formal collegial networks, or in some cases even the STMs that were often not distributed to Aid Posts.

6.2.4 Social or Neighbourhood Communities

Yet while participants recognised initial training, colleagues and/or the STMs as sources of information about the biomedical model, they also talked about their communities in terms of providing information pertaining to other belief systems. Defined for the most part by geographical boundaries, within these communities a PHCW could find 'experts' on a variety of topics including Indigenous health practices and Christian religious beliefs. Typically there is nothing formal about how this information was provided and there was no schooling or teaching of any sort involved. Instead individuals learnt about these beliefs through daily interactions without sometimes even realising they were doing so.

For example many of the PHCWs found out about the Indigenous health practices of their particular village as they grew up, by observing their parents and other family members.

> I know from my people about herbs and I go there myself and get this, and I know about this. [CHW - Government Run Sub-Health Centre Eastern Highlands Province.]

Obtaining information about Indigenous health practices did not cease just because they moved away from their own village. Instead, information pertaining to the beliefs within their village was shared and reinforced, as it was customary to maintain very strong relationships with the people in their village. However, it was also the case that they learnt about other belief systems through moving between and working within various other communities. Again, though there did not appear to be a direct intention to provide information, the informing process occurred through casual conversations

> Because we all come from our own villages and some of the practices are not common. So if… some don't know about it. At the moment some children are being brought up in towns, so if their parents are not using it, or even if the villages, and if it is not a practice in their villages then, the nurse doesn't know. But the others by overhearing what they are say, it is a good thing to do. [Nurse – Mission Run Health Centre Madang Province.]

At times information was also obtained as they observed the work of other community members.

> Some mothers they usually help. Special mothers in the village, help mothers to deliver babies, three or four, I think four of them. They were here first before I came in, so one of us can work with to help the mother... With them. [CHW – Government Run Aid Post Madang Province.]

Two participants, however, spoke about deliberately setting out to discover further information about the various treatments used within the community that they work in. The reason given for these deliberate attempts was that they believed that it was important to obtain information pertaining to Indigenous health practices for the future.

> Because I once attended a study with the mothers, and I studied about herbs, drugs and I have studies with them and learned some from them. I have copied a lot of notes and I have them with me. [CHW – Government Run Aid Post Madang Province.]

Participants pointed out that Indigenous health practices were not the only type of belief system used to treat or prevent illness. As discussed in Chapter 5 (see section 5.3.2) many of the communities also turned to their Church for assistance during an illness.

> She [a Catholic Sister] talks with God and she advises a lot of people by giving them Godly words and that helps them cure their sicknesses. She informs that in order to be safe from this sickness you are to remain with one partner only [CHW – Government Run Sub-Health Centre Eastern Highlands Province]

However, to some extent obtaining information from community groups depended on the relationship the PHCW had with that community. Should these relationships become strained a few participants described how the PHCW may be ostracised from community life, eventually resigning or looking for work in another community. There were many reasons given for these relationship breakdowns including the PHCW having 'a big head', the community not appreciating or even wanting the services provided, and also the difficulties experienced when a PHCW was originally from a village that historically did not get along with the community in which they worked.

When, however, a healthy relationship existed between the PHCW and the community in which they worked community members were potentially valuable sources of information about both Indigenous and Christian belief systems. As noted in Chapter 5 (see section 5.3), these practices varied considerably between regions and therefore as PHCWs moved from one facility to another, they could potentially develop a vast array of knowledge about many different belief systems though observing, working with and talking to members of each community.

6.2.5 External Colleagues

While community members are to some degree relatively accessible, PHCWs often found it difficult to obtain information from health professionals outside of their own facility. Despite an extensive radio network that has been installed in all hospitals and most health centres, many participants working in health facilities often reported not being able to contact the doctors and other medical specialists when they required additional assistance.

> There is supposed to be a doctor available in [name of hospital removed] so like our case here, we have no ambulance here, so we cannot transport these patients who are very ill, so we need a doctor's help and I go and call on the radio. … They say at the [name of hospital removed] they make one medical officer available for radio calls, radio hotlines, but that hasn't been done. [HEO – Government Run Health Centre Eastern Highlands Province.]

In addition although outreach visits where teams of doctors, other specialist staff, as well as health managers and supervisors would visit health and Sub-Health Centres, were often planned, in reality they rarely occurred.

> So towards the end of last year we had meetings regarding the outreach program for 2006. And the Director of services for [name of facility removed] was tasked to do a program for the whole area. And that has been done and approved and should have been in process, put in place. What has been drawn up. But now we are in the process of 5 months down the track, half the year. None of the funds and we have not gone out on a rural outreach program. [Manager – Hospital Staff.]

This added to the feeling of frustration and abandonment expressed by many PHCWs. According to many participants in this study, it was bad enough that no one came but for promised visits to never eventuate seemed to them a lot worse.

> When they come I think it would be helpful, but mostly they don't come so we are left alone, with the problems. And we cannot tell them about our problems because they are not coming up to the area. [HEO – Mission Run Health Centre Madang Province]

Aid posts are of course far more isolated from external professional assistance than other facilities. They did not have access to radios, colleagues and even when outreach visits are planned Aid Posts are never included on the list of facilities to visit. In these isolated facilities, the only way of getting information through was to pass on messages by word of mouth.

> Whom you know, that is how we communicate. Like even this worker, I just only heard he in here. And then we have meetings in here and then he can go back. Easy access for the day to day planning. But like we do now, then he goes back. For the others, it is through the people only, through who you know you send letter. That is normally how we handle it. [Manager – District Level.]

In some remote places community radio stations or even newspapers were also used to pass on messages to PHCWs. For example, in one area a local health official broadcast a message through the community radio to notify health workers that this study was being conducted. Unfortunately in this instance, the communication was not particularly successful as some of the PHCWs, either did not have a transistor radio or had not been listening to the local radio station at the time that the broadcast.

Sometimes a circular was also used to tell PHCWs about for example a new drug or a change to practice guidelines. Once again, PHCWs were not always able to understand the information because they found it difficult to read English or because particular words used are unfamiliar to them. However, many participants suggested that PHCWs often simply chose not to read the information provided. Keeping up to date by reading circulars, guidelines and other information is not a practice common to PHCWs in PNG.

> But sometimes the circular sits on the board and no one bothers to read and I mean some people are informed but others are not informed because they haven't read the information. [Nurse – Mission Run Health Centre Madang Province.]

Despite this, participants regretted in many cases the loss of any opportunity to further their understanding of the biomedical model, with most keen to make contact with doctors and other health professionals who could advise and assist them with the diagnosis and treatment of their patients. As radios were never installed in aid posts and outreach visits did not extend past Sub-Health Centres, CHWs in these facilities were, however, once again the most disadvantaged group. For these people in particular, any type of information from outside the facility depended very much on the establishment of informal communication channels, with messages passed on through radio programs or other community members.

6.2.6 Ongoing Professional Training

Of perhaps most concern for nearly all of the participants in this study was the lack of any ongoing professional development. In most cases, once initial training was complete there was almost no prospect of any further training.

> For a long time we have come to work, and for many years without going to school and learning and this type of patient doesn't come here. We lose knowledge. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Many participants talked about the consequences of these lost opportunities, believing that the world was moving on without them as new health practices and procedures are developed.

> We don't know about all of these new treatments and so forth, we are stuck onto these old ones. Old treatment groups and all of these. We haven't gone through. What we like just came in from starting from the time I came in here four years ago. [CHW – Government Run Health Centre Easter Highlands Province.]

A number of reasons for the lack of ongoing training were suggested. For example, a few participants said that even when workshops are run, supervisors did not always notify their staff. A couple of PHCWs in this study also believed that participants for training courses were selected according to who they knew rather than on need or merit. However, most of the participants appreciated the fact that there was little if any funding for ongoing training. This perception was also confirmed by a health manager in one of the primary provinces.

> The budget that comes from the province is very very minimal. A classic example is for this year [2006] I have been given 20,000 [kina approximately AU$10,000]... yes for the whole of the province but then it is divided into in service, post basic and specialty trainings… We had one [nurse] that went to Moresby and it cost about 8,000 [kina], it costs about 8,000 and we are just providing 30 per cent of that and the officer is meeting the rest…We have been lucky because we had had donor after donor. Dealing with these areas… But now the donors have also stepped down and there are some things we cannot do. [Manager – Provincial Level.]

According to a few participants in this study, if at any time a training place became available they firstly went to hospital staff and then to those working in the larger health centres. CHWs in general but specifically those in Aid Posts were rarely given an opportunity for training.

> It was not so much of aid post orderlies. Aid Post orderlies no. It was only nursing officers and HEOs that were brought in for these things [training courses]. [Manager – District Level.]

Every PHCW in this study spoke about how they would value any opportunity to develop skills and knowledge. In particular, they would appreciate the opportunity for face-to-face training noting how in these circumstances they were not only able to ask questions but also practice skills and obtain feedback. This was believed to be particularly important when new information was being presented.

> It would be best to either talk to the staff, you actually sit down talk, discuss and explain and then the staff is not that clear you can go over it again and explain the procedures or whatever is there to tell the staff. It may take some times for the staff to understand, so a follow up again to find out, or maybe get them to explain how they understand it, to repeat what you say so that you make sure that they understand what you are saying. [Manager – District Level.]

Many people outside of the primary health care system were heard by the researcher to say that PHCWs like training workshops chiefly because it provided them with a chance to travel and receive additional allowances. However, findings from this study discredited

this suggestion, as participants were keen to hold training workshops in their place of work because this would enable all of the staff to attend at one time.

> This is just a suggestion. How about in services, coming in giving us in services. I think that would be the best way of doing it. [Nurse – Mission Run Health Centre Madang Province.]

Thus training was therefore seen by PHCWs in this study as a valuable way of improving general skills and knowledge about the biomedical model. In particular they spoke about wanting to ask questions, practice new skills and obtain feedback about their work. However, while the potential for providing information through training was recognised perhaps because of funding constraints, PHCWs in general but particularly those CHWs who work in remote Aid Posts are rarely provided with these types of opportunities.

6.2.7 Computers and the World Wide Web

One type of media must be referred to, not because of an overwhelming amount of evidence, but because of a surprising lack of data. Only one participant in this study referred in any way to computers, the internet or any other form of digital information.

> Because this [nationality removed] doctor was here and we went through the information and he had access to the computer and so we would go and look it up at the company and he said let's do it like this and like this… So I said oh if only I had a computer I would just sit down and flip through and see what treatment to give and how it happens, I just want to know. [Nurse – Government Run Health Centre Madang Province.]

However, it should also be noted that the attempt to obtain appropriate information from the internet in this above example was unsuccessful.

> And we tried and then we couldn't manage it and so we sent down to [name of hospital removed]…… I think they put some treatment, I think it was aspirin like we have here. But we didn't know how to use it on the patient. But we didn't' know. [Nurse – Government Run Health Centre Madang Province.]

Despite the fact that many of the participants talked about how they would like to receive information in the future, the internet was generally not discussed. This may be because computers were so far removed from their reality that they could never imagine using one. Only a couple of the facilities had access to a phone line and not even one computer was installed. Even during initial training PHCWs in PNG have very few opportunities to see a computer let alone use it.

> We are not using the internet at all... We do a sheet of handouts. So medical surgical rely a lot on the handouts and then they use the texts from the library and they are late 90s or early 2000s. But there is only a few copies, not many to go around. [Manager – Nursing School.]

6.2.8 Summary of Results

While the internet is not at present a viable option, PHCWs are able to obtain information from a variety of other sources and/or providers within the facility in which they worked. Primarily, participants suggested that the patients themselves provide most of the information used for diagnostic and treatment decisions. Obtaining all of the appropriate information can be complicated, particularly when a patient is worried or scared about talking to PHCWs. Second, written STMs developed by the PNG Department of Health are a well respected source of written information, although this does not necessarily mean they are always available or used. Some facilities were not provided with copies of the STMs and even when they were, participants reported that older PHCWs in particular could not access the information because they are written in English. Lastly, some PHCWs could also rely on colleagues working within their facility to provide information. While the younger less experienced PHCW were particularly grateful for these interactions, some reports suggest that these more informal networks could not always be relied upon because colleagues did not have the time or did not want to share the information with others. Data suggest that some colleagues either did not want to, or did not have the time to share information. However, it is also the case that many CHWs working by themselves in remote Aid Posts do not have colleagues with whom to interact.

Nonetheless, many opportunities exist for PHCWs to obtain information from providers outside of their own facility. In most cases, any external interactions involved members of social and neighbourhood communities including those that they grew up in and those in which they now work. Through relatively informal in nature, PHCWs were able to obtain information pertaining to a variety of different Christian and Indigenous belief systems on a regular basis. What was mostly missing, according to PHCWs in this study was the ability to obtain information from external colleagues, including doctors and other senior health professionals. Outreach support teams that in the past had provided this type of access were no longer in operation and ongoing professional training places were extremely limited. Therefore, while in the past there may have been a variety of information providers that existed both within and outside of the facility in which the PHCW works, the variety of external providers is now limited in many cases to the members of social and neighbourhood communities.

6.3 Accessibility of Information

Broadly defined, information can be obtained at any time and from anyone. Everyday life situations provide numerous opportunities for information to be disseminated to or shared between people they directly encounter through face-to-face interactions, or mediated exchanges using the written word. However, while everyone is a potential 'source' and information flows intentionally and/or accidently between people, the more frequently that people interact the more opportunities there are for information to be shared (Erdelez 1997; Solomon 1997b; Bates 2006).

In order to better understand this very complex process, the data within the theme entitled 'informing process' was extensively analysed using the NVivo Software package. As key sub-themes emerged, they were individually explored and reflected upon in order to gain an overall sense of how participants obtained the information they needed for providing diagnostic and treatment services to patients (see Chapter 4 section 4.6 for a full explanation of the method used to analyse and interpret the data).

The following discussion begins with the first finding emanating from this process, which suggests that information was potentially available from a variety of sources. For example, community members passed on information about the particular Indigenous health practices and the Christian beliefs that their community embraced, church leaders preached the Christian principles and the STMS provided guidelines for treating patients in accordance with the biomedical model. However, simply having someone who can provide the information does not always mean that it is necessarily always accessible (Hargittai & Hinnant 2006; Burnett, Jaeger & Thompson 2008). The second finding supports this view by suggesting that these informing processes may have been hampered in any one of four ways. First, some sources were more available than were others. Second, not all sources were as willing to share the information they had. Third, some PHCWs were not always able or interested in the information provided. Lastly, the way that the information was presented did not always encourage or allow a PHCW to make use of it. The result being that not all of the information available was equally accessible to PHCWs in PNG.

6.3.1 Information Sources

As described in Chapter 5 (see section 5.4.1), PHCWs in this study associated with and were also members of many different groups. However, the messages these groups provided were not always consistent between and even within, the various belief systems themselves. For example, while the formal health care sector for the most part was following a biomedical model and churches upheld Christian principles, many of the communities had incorporated Indigenous, Christian and biomedical ideas into the one belief system that both informed the way in which health was understood, as well as guided the way in which illness was treated.

As community members interacted with PHCWs, these groups all in some way had the potential to pass on information pertaining to their particular belief system. Participants described how the Department of Health being the most formal of these groups disseminated information to PHCWs through initial training courses and resources such as the STMs (see section 6.2.2 of this chapter). The information disseminated pertained to what was considered to be 'best practice' in terms of diagnosing and treating patients. However, either because the context was not conducive to implementing the practice, the information did not cover the particular condition of the patient, or the health worker did not have the skills to implement them, prescribing specific and often inflexible procedures was not always helpful (Kitson et al. 2008). This meant that in some cases either the information provided through training courses or STMs was not appropriate, or alternatively it did not address a particular situation sufficiently, for the PHCW to utilise nor even consider it.

> And it is about skin problems. Now too many babies are coming in with skin conditions, different types of skin conditions and we don't have that in our Standard Treatment Books. [Nurse – Mission Run Health Centre Madang Province.]

Instead, much of the information that participants in this study received was provided either accidentally or at least less formally. For example the language spoken by a patient told a PHCW where they came from. Likewise arriving in a motor vehicle suggested the patient had some degree of wealth, or a connection to an income source. Providing information therefore, does not simply rely on the spoken word but also occurs through non-verbal observations (Hall, MF 1965). One non-verbal way of providing information is through modelling (Bandura 1986, p. 47). While other research demonstrates the idea of modelling as a way of imparting Christian principles (Oman 2003), this study found that modelling was also used effectively by other groups. Community members demonstrated

various health practices based on Indigenous Knowledge and in addition. PHCWs learnt a lot about their profession by watching colleagues. In contrast, to the STMs that prescribed particular practices, modelling contributed to the use of diverse and often context specific methods for understanding health and treating illness (Forgarty & Dirsmith 2001).

> Yes, we answered questions and this, so when we know it from just learning and writing only but I want to be, to do it our hands and see it what is like we are doing at work and that is much better. [CHW – Government Run Aid Post Madang Province.]

In addition to hearing about various belief systems pertaining to health, PHCWs also found out about how others defined their role. These role definitions may however to some extent be influenced by the particular beliefs of a group (Collier 2001). For example, Churches saw the role of PHCWs as one that incorporated and supported Christian principles.

> From there and then we change, we see and we send them for the good change, in many part. So they have to get rid of everything they are believing in and then they work and they church. That is why the church is in this place. [Nurse – Mission Run Health Centre Madang Province.]

In turn, the formal health care sector believed that PHCWs were responsible for providing services primarily in according to the biomedical model. However, many of the communities according to participants differed in their definition of a PHCW. Some saw them as a knowledgeable individual and valued their contribution to the community's well-being, while others believed their primary role was to hand out drugs as suggested by this conversation retold by one participant [CHW – Government Run Aid Post East Sepik Province.]:

> Patient: I want amoxicillin.
>
> PHCW: For what purpose?
>
> Patient: I have a headache.
>
> PHCW: I will treat you with something else.
>
> Patient: No, stop looking at my affairs. You don't know what you are doing. I had better go looking somewhere else.

Therefore, these sources did not just provide PHCWs with information pertaining to different ways of looking at and understanding health but also different ways in which their role in diagnosing and treating patients may be perceived. It was not to say that everyone within a church, a community or even the formal health care sector had identical thoughts about what a PHCW should do or be. However, 'common pattern[s]' (Collier 2001, p. 220) will emerge between members of the same group.

6.3.3 Availability of Source

Before information could be considered, however, a source needs to have made it available to the PHCW. Some sources, such as members of the community in which they worked or the congregation, to which they belonged, were highly visible and often encountered by PHCWs on a daily basis. By comparison many participants in this study felt abandoned by the formal health care system primarily because they received little or no support from supervisors and other health professionals outside of their own facility (see Chapter section 5.2 6). Once initial training had been completed, the opportunity to obtain information about biomedicine is limited almost entirely to the STMs, a few circulars from time to time and colleagues within their own working environment.

This problem of making biomedical information available to health workers is not unique to PNG but is instead experienced by many developing countries (Godlee et al. 2004). One of the suggested solutions is to utilise online journals and other IT based media (Walsham & Sahay 2005). However, it is difficult to imagine how this might be of assistance to PHCWs in PNG given their limited access to and knowledge of computing. Similar to many developing countries (Martinez et al. 2005) the facilities visited in this study did not have the infrastructure or funding to install or maintain a computer system. However, there are two additional issues that explain why IT solutions *per se* may be of little value, at least in the short to medium term. The first issue relates to content. Much of what is currently available on the web or through online journals is produced in and for the developed world (Langer et al. 2004). In addition, the information made available through online journals is vast and overwhelming. While even people in developed countries find it particularly difficult to decide on what is of value and what should be ignored, in a developing country such as PNG where many of the PHCWs have never used a computer this task would be particularly daunting (Smart, P 2004; Chan & Costa 2005; Krishma & Walsham 2005).

Many of the participants were aware of the disparity that exists between the 'world out there' where other health workers knew and were provided with not only basic but often highly sophisticated resources that they believed were well beyond their reach. The perceived gap between themselves and the rest of the world was both obvious, very large and for them extremely disheartening.

> Like in your country [Australia] you have all of these advance technologies. You can diagnose the cancer at the early stage and put them on treatment and get cured. But in my country we do not. [Nurse – Mission Run Health Centre Madang Province.]

In comparison to the biomedical model however, individuals within the community in which they worked and/or lived were nearly always available. Participants heard about various Indigenous health practices from community members who sometimes swapped this information with their PHCW colleagues. Similar to Indigenous Knowledge, sources of information about Christian principles were often available as they attended their locally based churches (see section 6.2.4 of this chapter).

Akin to what Pettigrew (now Fisher) described occurring within 'Information Grounds' (Pettigrew 1999, p. 811), primary health care facilities, local communities and churches may all be viewed as settings in which information was shared, through regular social exchange (see also Pettigrew 2000). While not specifically set up for the purposes of sharing information, all three contexts involved people gathering. For example, at a primary health care facility PHCWs came to provide and patients to receive treatment. Members of a church came to worship and community members gathered to sell food. Despite the lack of intention, information pertaining to many different topics including ways of treating illness was deliberately and/or unintentionally shared (Fisher, Durrance & Hinton 2004; Fisher 2005).

Yet while biomedical information may have been hard to find, PHCWs in PNG could not be considered 'information poor' (Fisher et al. 2004, p. 1). Instead, much information was made available to participants almost accidently, while interacting with people in a variety of contexts including community gatherings, church services and through working with other colleagues.

6.3.2 Willingness to Share

While various contexts facilitated the inadvertent or accidental flow of information, how much information was intentionally made available may depend to some extent on the type of relationship the PHCW had with a source (Polanyi 1959, p. 68; Dawson & Chatman 2001). In many cases people preferred to exchange information with others who held similar views, and were perceived to be trustworthy and generally respected (Chatman 1999). However, even in these circumstances people may withhold some information, particularly if the status of the source is not equal to that of the recipient (Solomon 1997b).

Some participants in this study reported that the relationship between communities and their PHCWs had in cases become particularly strained (see 6.2.4). Community members in these circumstances appeared to be particularly reluctant to share any sort of information with the PHCW concerned. In such cases apart from interactions with patients, the PHCW

was completely ostracised from all aspects of community life. This not only made it uncomfortable for the PHCW because they often lived in or near the communities in which they worked, but also meant that opportunities for intentionally exchanging any type of information were severely limited.

Even so, a good relationship between community members and their PHCW would not necessarily have ensured full and frank disclosures. Communities in PNG are often reluctant to share their Indigenous Knowledge not only with people from other regions, but also within the same community. The dissemination of certain beliefs may be strictly controlled, with rules formulated for who is the keeper of what knowledge and how it is passed on from one generation to another (Pataki-Schweizer 1985; Welsch 1985; Macfarlane Accepted for Publication in 2009). Some participants highlighted this point when talking about some patients unwilling to provide frank and honest accounts of their illness. It was suggested that these patients may not be able to talk about certain customs or taboos or alternatively they may be embarrassed or shy about discussing treatment practices previously sought outside of the primary health care facility.

Reluctance to share information was not confined to communities. For very different reasons, participants also reported that their colleagues were also somewhat hesitant see 6.2.3). First, there was a perception that in sharing information a person would lose some of their power. This, however, is not a new finding as other research have demonstrated how similar perceptions influence what information is shared (Sun & Scott 2005). For many people information is an object or a resource, which if shared with others diminishes in value (Lee, Foo & Goh 2006). Nonetheless, some participants in this study held a different viewpoint, realising that information *per se* cannot further a PHCW's career or assist patients. Instead, as will be explored in Chapters 7 and 8, it is the knowledge that is developed and applied by an individual that is important.

6.3.4 Consideration by the Recipient

Simply providing information does not mean that it will necessarily be utilised. How prepared an individual is to avail themselves of any information may depend on both external influences relating to the environment in which they work, as well as the recipients own skills and abilities (Hargittai & Hinnant 2006). For PHCWs in this study, language skills, lack of time and familiarity with the source, all appeared to be involved in the choice of whether or not PHCWs considered the information that was made available to them.

First, language appeared to influence whether or not a PHCW would be interested in seeking out and using information contained within the STMs. Many participants reported that older CHWs in particular often could not read English. However, as indicated in Table 4 even though quite a few participants claimed to have a good understanding of the English language, an assessment made by the researcher at the time of the interview suggested that skill levels fluctuated dramatically between participants. While these findings should be treated with some caution because the researcher was not qualified to assess language competency, they do suggest that many PHCWs in PNG may have difficulty communicating in English.

Level of English	CHW	Nurse	HEO	Total
None	11	0	0	11
Poor	9	0	0	9
Reasonable	17	7	0	24
Very Good	4	9	1	14
	41	16	1	58

Table 4 - Perceived Level of English for PHCWs in this Study

Therefore, even though STMs were available in at least some of the facilities involved in this study, the information may not have been used because of the difficulties that some PHCWs experienced in reading the content (Burnett, Jaeger & Thompson 2008).

> They [older CHWs] find it more difficult to read and understand. Sometimes they talk a lot on their experiences. And they argue with us, about what changes are coming in now and we are trying to cope with the changes, like this. [CHW – Government Run Aid Post Madang Province.]

Language difficulties also influenced communication between PHCWs and some community members. Within PNG over 800 individual languages are spoken, (see Chapter 2 section 2.2), many by a small group of people within a particular contained area. While many Papua New Guineans have also learnt one or more of the other commonly used languages – firstly Tok Pisin or Motu depending on the region, and sometimes also English – some either prefer to use or only know their locally developed language. Therefore as PHCWs move from community to community they may need to seek the assistance of another community member to help with translation.

> The language here I can't understand it…I am beginning to learn a little. [HEO – Government Run Health Centre Eastern Highlands Province.]

Merely translating either English or a local language will not provide the same depth of understanding as that held by a natural speaker. Language is a complex combination of not only symbols but also tacit meaning that can only truly be understood within the culture in which it was developed (Sapir 1970). Despite many of the PHCWs having learned English and at least attempting to understand the local community languages, by not having been immersed in these cultures they may have missed out on the small nuances that go well past a direct translation of the vocal or written word. Therefore, 'the ability to speak a language fluently does not necessarily confer a linguistic knowledge of it' (Whorf 1956, p. 211). While the process by which meaning is developed and attributed will be discussed in Chapter 7 it may be suffice to say here that even when PHCWs were somewhat fluent in English they often found the combination of words difficult to comprehend (O'Brien & Kollock 1997, p. 66).

Second, a perceived lack of time was also suggested by some participants as a reason for not seeking out or considering the information that was available. People generally do not want to expend a lot of energy in undertaking this task. If someone close at hand can provide an answer that is perceived to be satisfactory, that will often suffice (Bates 2005, p. 4). The findings in Chapter 5 (see section 5.2.2), suggest that this may apply to PHCWs in PNG, with many participants reporting that they were over worked and therefore had little time to seek out or share information.

> I think they do understand but some staff are reluctant to look into the books. If they want to read, there are so many patients they is overload, and there is only one person and he won't have enough time to look into the books. [HEO – Mission Run Health Centre Madang Province.]

Third, the data also suggest that PHCWs tended to seek information from sources with whom they were most familiar such as colleagues at work (see Chapter 6 section 6.2.3) or family members (see Chapter 6 section 6.2.4). This supports the findings of many other studies that have found that people prefer to seek information from family and friends because they are more likely to hold similar views, understand the context and/or empathise with the problems that exist (Brodersen 1971; Solomon 1997c; Fisher et al. 2004). In this study, for example, many of the CHWs and even some of the nurses spoke about preferring to ask a colleague rather than approach a doctor even when a doctor was available. These participants expressed a degree of shyness or were fearful about the prospect of talking to Doctors who were considered far more superior and powerful.

> Sometimes I will be afraid and sometimes they [doctors] will tell me they are too busy and I am only a nurse. [Nurse – Mission Run Sub-Health Centre Eastern Highlands Province.]

Thus simply making information available does not necessarily mean it was used by PHCWs. Instead, they were limited or hampered to some degree by the variety of languages that were used at times to communicate messages. In addition they felt they also did not have the time needed to seek information beyond what was easy accessible and in most cases this meant that they ended up and settled for obtaining information from the colleagues they knew as well as family and friends.

6.3.5 Methods of Interacting

Not only has 'ordinary speech' (Cooley 1902, p. 32) and direct contact been considered over the years to be the primary mechanism for learning as a young child (Lavelli & Fogel 2005), but it also remains one of the most influential ways of persuading someone to consider a particular point of view (Bavelas & Chovil 2000). Findings however also suggest that PHCWs prefer to obtain information from sources that are able to communicate with them on a personal face-to-face level (see Chapter 6 section 6.2.6). This is not in itself a new idea as many people prefer to receive information in this way (Julien & Michels 2000; Dobbins, DeCorby & Twiddy 2004; McCaughan et al. 2005), and historically in every culture it was the primary way of sharing information (Bates 2002). Despite the adoption of IT based media, the benefits of face-to-face communication are, however, still evident and applicable in today's information environment. One reason may be that written information is static and inflexible, while face-to-face communication allows for change and can be tailored to suit a particular audience. Likewise, while written information often does not provide opportunities for an immediate response, face to face communication may often encompass the ability for a recipient to provide feedback. In addition, written information relies solely on the ability of the reader to understand a particular language, while face-to-face communication because it incorporates both symbols and gestures can consider the needs of people who do not share the same language (Bavelas & Chovil 2000).

Until relatively recently PNG was primarily an oral culture (Ambihaipahar & Rai 2004) with a preference for face-to-face communication so the preference in this context may be far stronger. While in many western societies generations of people have used written material as a way of informing, entertaining and educating people, everything in PNG is obtained through word of mouth where very intricate traditions and social structures have

been developed in order to ensure that information is communicated effectively. For example, hierarchies exist where certain members of the village are respected for their knowledge and time is made available so others can listen to their stories (Madden, Bryson & Palimi 2006).

Nowadays Papua New Guineans are in a period of transition from the former purely oral society, to one that is somewhat dependent upon the written word (Smith 1995). Unlike many of their parents, children learn from texts at school and professional training relies on the written word for reference. However, the traditions and structures associated with their oral past are still apparent. People take time to communicate and participants in this study generally preferred to provide stories rather than just answer questions. While these stories are not necessarily fictitious, they do incorporate colourful contextual descriptions of the characters and situation. Most of the participants are not interested in giving facts or short answers to the interview questions. They wanted the researcher instead to understand their situation and the only way this could be done from their perspective was to tell a story complete with all of the background information. In turn, they may also have sought the same level of detail from their information providers.

> Because I want you to talk to me face-to-face so I can understand properly. Because sometimes in the book I don't understand. So the best thing is communication, you must be here, face-to-face is the best. [CHW – Government Run Aid Post Madang Province.]

While this predominantly oral culture in its own right might explain the PHCWs preference for face-to-face communication, there may be other interconnecting reasons. First, the majority of PHCWs felt that information provided through face-to-face communication tended to better meet the requirements of their particular context. For example, while STMs referred to resources and supplies that were often not available (see Chapter 5 section 5.2.3), the same complaint was not made about any of the information supplied by either the colleagues within their own facility or communities who were able to see clearly what was and was not available.

Second, face-to-face communication would force the source to at least consider the potential language barriers that arose when PHCWs struggled with the English language (see section 6.3.4 this chapter). Yet even when a PHCW was fluent in English, face-to-face communication may still have been beneficial. English is often a second or even third language for nearly all Papua New Guineans and therefore even though many PHCWs were able to communicate effectively in English, some still found it particularly difficult to grasp the meaning of what was being said (Faules & Alexander 1978, p. 37). In many

cases, during the interviews even though a common language was used (either English or Tok Pisin), the meaning of a question or answer was misunderstood. In these circumstances, gestures or non verbal communication appeared to be just as important to the development of a common understanding as the actually words that were spoken (Rimé et al. 1984).

Lastly, face-to-face communication allows the PHCW to not only obtain information orally, but also use other senses such as touch, hearing and sight (Newsom 2007, p. 45). Physical characteristics such as how the person smells, the colour of their skin and even the way they move all added to and further enhanced the information provided verbally (Faules & Alexander 1978, pp 38-39; Bavelas & Chovil 2000; Newsom 2007, p. 45). For example, in the case of a sick patient the PHCWs talked about deliberating through observing the colour of a patient's skin, taking their temperature and listening to their heartbeat, which together with the verbal explanation was used to diagnose the patient. However, participants in this study also discussed the importance of someone demonstrating or showing them a new practice rather than just telling them about it. Demonstrating a new concept provides additional information, in comparison to just writing about or telling the PHCW what to do. Even better, according to these participants, was the cases in which PHCWs were allowed time for hands on practice so that they could gain a degree of confidence and 'feel' [Nurse – Government Run Health Centre Madang Province] what should be done.

Information that comes from personal face-to-face interactions with people we respect and relate to, such as colleagues, family and friends, is perceived to be more reliable and trustworthy then information delivered by other media such as newspapers or books (Fisher et al. 2004). Face-to-face communication is therefore a very popular way of sharing information and used extensively throughout the health profession. For example, it is the most often utilised way in which English nurses exchange information on a ward (Lamond et al. 1996), the predominant way in which student and clinical nurses in England learnt about new procedures and practices (Dee & Stanley 2005) and the most popular method for obtaining assistance with diagnostic and treatment decisions in English community health care settings (Luker & Kenrick 1992). Like their overseas counterparts, PHCWs in PNG appeared to prefer face-to-face communication for transferring information. Face-to-face communication particularly when it is with people we admire or look up to continues to exert the most influence over the beliefs and actions of an individual (Newsom 2007, pp. 4-7).

6.3.6 Summary of Discussion

It should not therefore be assumed that just because an information source existed, that PHCWs had equal access to the information they could potentially provide. The findings suggest that both the amount and the depth of information obtained by a PHCW depended to some extent on the availability of the source, their willingness to share information with the PHCW, the ability or interest the PHCW in considering the information and the method used to present it.

First, the more accessible the source the more likely it was that the PHCW would seek information from them. For the most part information from the health sector, once initial training had been completed was the hardest to obtain. By comparison, church and community groups were close at hand and therefore information pertaining to Christian beliefs and Indigenous Knowledge was far more available.

Second, the source needed to be willing to provide the information. While there was nothing to suggest that the formal health care sector as an organisation was unwilling to provide information about the biomedical model, certain members of the community particularly if they had no strong relationship with the PHCW may not be so forthcoming. This is not always a result of poor relationships but also may relate to their own belief system in that some parts of Indigenous Knowledge for example, were only kept by specific people within a community.

Third, the PHCWs own ability and interest in obtaining the information influenced to some extent the outcomes. This covered areas pertaining to such things as how comfortable they were approaching the source. Primarily, participants reported not having the time to seek out information, but there were also suggestions that some PHCWs may feel uncomfortable communicating with those professionals who they believed may be of higher rank than themselves.

Lastly, the method by which the information was transferred was particularly important. In the case of PHCWs in PNG, face-to-face communication was by far the most preferred method for transferring information. Several interconnecting reasons may account for this. Papua New Guinea has been up until quite recently a culture based on oral communication. However, in addition to this, participants also suggested they prefer face-to-face communication because it provides an opportunity to ask questions and receive feedback as well as considering the needs of the PHCWs who may have little or even no English language skills.

While other research suggests that patients or consumers of health services regularly obtain information informally or accidentally from family, friends and even magazines (Dienes, Morrissey & Wilson 2004), the same type of practice has not been as widely explored in terms of health workers. This is despite the fact that health workers are also members of the same communities in which the patients reside, and therefore have access to similar types of information. While it may well be that in other countries health professionals stick rigidly to sources that provide information on a biomedical model, PHCWs in PNG did not appear to feel as constrained. However, it may also be that the concept of health workers seeking out or obtaining information on belief systems other than a biomedical model has not previously been considered and/or fully explored.

Whatever the case it is clear that PHCWs in PNG were able to obtain information on a variety of different belief systems including those based on Christianity and Indigenous Knowledge, as well as the biomedical model. The question that is explored in Chapter 7 relates how PHCWs develop knowledge from the information they obtain.

CHAPTER 7

Results and Discussion – The Knowing Process

7.1 Introduction

The thesis now turns specifically to the 'Knowing Process', which is the third aspect to be highlighted by the Human Information Behaviour Framework. Previously, Chapter 5 considered the context in which information was obtained. Multiple belief systems contribute to the context in which health services are provided in PNG. For example, while only the biomedical was sanctioned by the formal health care system, PHCWs in this study reported that various forms of Indigenous Knowledge and Christianity were also thought by sections of society to provide legitimate approaches to health and healing. Incorporation of multiple belief systems added a sense of complexity to this context particularly as the various belief systems sometimes contradicted each other. For instance, Christianity embraced the concept of one true God, while many Indigenous belief systems were deeply connected with concepts of both balance and harmony among the spiritual and physical worlds (Keck 1991). In comparison to these spiritual perspectives, the biomedical model is more concerned with a person's physical well-being (Nettleton 2006, pp. 2-3).

Chapter 6 considered the second aspect of the Human Information Behaviour Framework that focused on how PHCWs obtained information pertaining to each of these belief systems. Two findings in particular contributed to understanding this externally centred informing process. First, information about each of the belief systems was available from a variety of sources. For example, community members were potentially a source of information on their own Indigenous belief system. Church groups actively sought to educate people about Christianity, and the formal health care system provided PHCWs with information pertaining to the biomedical model.

The second finding in Chapter 6 suggested that both the source and the individual PHCW contributed to whether or not information was gathered. For example, some sources including members of the local communities and/or even colleagues at work were not always willing to share the information they had. Nor were PHCWs always comfortable

with asking for information, nor did they necessarily have the skills required to make sense of it. In addition, participants showed a strong preference for receiving information through face-to-face communication, which was usually only available from individuals within their own facility or immediate community. While therefore sources of information pertaining to all three belief systems were generally available, it did not necessarily follow that the information they provided was accessed by PHCWs.

This chapter will now consider how PHCWs deal with the information they do receive. Because information is always interpreted through an internally focused knowing process this third aspect of the Human Information Behaviour Framework (see Figure 11 suggests that PHCWs may not simply accept what they see, experience or are told (Manis & Meltzer 1978). Instead, they develop their own interpretation, through a process more broadly referred to as 'thinking' (Mead 1974, p. 47) whereby the recipient digests, reflects, analyses and interprets information in order to develop their own unique understanding (Mead 1974, p. 166; Manis & Meltzer 1978). The result is that no matter how much time or effort an information provider may expend on advocating for and explaining their ideas, the recipient will always develop their own unique interpretation of the information provided.

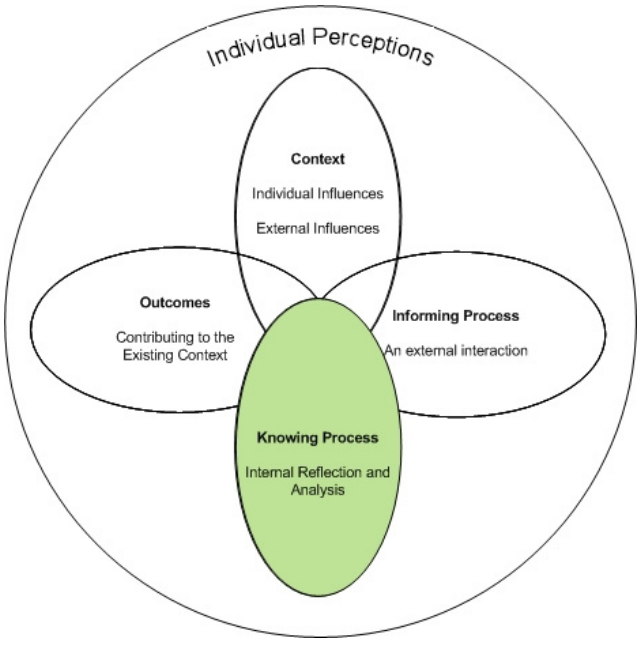


Figure 11 - Human Information Behaviour Framework – Highlighting the Knowing Process

As it would be impossible to cope with every bit of information that comes their way, individuals selectively tune into those things that they consider interesting (Bandura 2002). This in turn is influenced by a number of factors. First, people tend to focus on their future

goals. Whatever will help them in the present to attain these future goals will be of particular interest to them (Bandura 1986; 1998, pp. 469-479). The emphasis here is very much on the goal, rather than the process, while a number of different means may be employed to accomplish their future goals (Burke 2004). To some extent, what individuals seek to achieve in the future is influenced by the past (Bandura 1977, 1998). Past experiences in turn, depend to some extent on the present, as they potentially can be redefined with every new encounter (Fine 2001). For example, if a PHCW has previously received incorrect information from a particular source, they may not be interested in anything else they have to offer. However, if the source is able to redress this negative perception then the PHCW may be happy to re-evaluate their previous judgement.

The second factor relates to the individual's assessment of their own skills and abilities. If a PHCW has previously experienced problems with a new treatment, they may be less willing to try out something else. Instead a safer option (Bandura 1998; Stajikovic & Luthans 1998) or something they know they will not have difficulties with, may be chosen. Therefore, when information comes along about a new practice, the individual's assessment of their own capabilities may influence whether or not it will be considered or ignored (Bandura 1997, p. 37).

Lastly, individuals are more likely to be interested in receiving information from an authority on the subject of interest. Figures of authority are those who are both respected for their knowledge within a given field and can pass on their expertise to other people. This is not an objective assessment but instead relies on the individual's personal perceptions, which can also be influenced to at least some degree by previous experiences. Likewise, who is considered an authority may also depend to some extent on the opinion of others (Wilson, P 1983, Chapter 2). For example, a church leader may be considered an expert in Christian beliefs, a village leader the holder of Indigenous Knowledge, and in terms of biomedicine STMs may be considered an authoritative source.

Once information is recognised and acknowledged as being worthy of further consideration, individuals can then reflect on, analyse and interpret its meaning (Kolb 1974). It is this process that allows them to not simply accept but also think through what has been presented (Mead 1974, p. 119) in light of not only what the information suggests but also what they already know (Mead 1974, p. 100). To be more precise, the knowing process involves a reflection on the individual's perception or response to the information, as opposed to the information itself (Mead 1964c; Wilson, P 1983, p. 3). This in turn provides the individual with an opportunity to firstly check and then adjust any of their

initial and often habitual and/or emotional responses (Mead 1974, pp. 173-178). Reflection allows the individual to consider whether their initial thoughts and feelings that arose as a consequence of acknowledging the information were appropriate for a given situation and/or according to societal norms (Turner 2006).

The knowing process can therefore be thought of as a type of internal conversation (Manis & Meltzer 1978). Not in terms of any audible sounds or words but through ideas and even emotions being recognised, organised and processed (Turner 2000, pp. 108-111; 2006). This inner conversation eventually results in the identification of numerous possible courses of action that the individual may take and subsequently a choice or a readiness to act or respond in a particular way (Mead 1974, pp. 98 and 117).

Part of this internal conversation involves a person interpreting the information that is considered in a meaningful way. In turn meaning depends on what the individual already knows, feels, thinks and/or believes. '[T]he perception and designation of objects [such as information], are strongly influenced by the condition of the organism' (Hewitt 1991, p. 80).

Existing knowledge is often used to interpret new information, and in doing so new information is often combined with existing knowledge. Overall, this is a relatively easy process particularly when the individual concerned has already developed a broad understanding of the subject involved. In these circumstances, it is more likely that the reflection will involve simply deciding whether new information sits comfortably with what they already know. For instance, the replacement of one malaria drug for another does not involve a significant paradigm shift for most health workers. However, in other instances, individuals may know nothing about the subject involved, and therefore the new information may significantly challenge their existing ideas (Illeris 2003; 2004, p. 58).

This internal knowing process does not stand in isolation from other aspects of life. In reflecting on any information provided an individual may consider how the particular situation (Fine 2001) such as the availability of resources and/or infrastructure, may affect their decisions. In reflecting on and analysing their own thoughts, feelings and reactions the individual may concerned with how they will be judged by others (Bandura 1986; 1998, p. 454). For example, a PHCW may be worried that consulting a STM during a patient consultation may be seen as unprofessional. This does not imply, however, that the individual attempts to evaluate what everyone thinks. Instead, the more significant the

individual or group is to the individual, the more likely it is that their judgements and expectations will be considered (Bandura 1986, p. 454).

Reference groups in particular are very good at taking on this role (Blumer 1969, p. 188). Not every group an individual comes across however has the potential to become a reference group. For example, sources of information only become reference groups when 'when attitudes of group members towards us become reflected in our self-concept' (Hill et al. 2007, p. 67). To be defined as a reference group, PHCWs need to not only consider but also embrace their beliefs (Shibutani 1955; Therborn 2002; Charon 2004, Chapter 2; Horwitz 2008). Nevertheless, reference groups do not determine behaviour, as the individual still has the ability to accept or reject the beliefs in light of each particular situation. In addition, the individual will also reflect upon the perspectives of the group and to some degree create their own unique understanding of what they mean (Fine 2002).

Thus, what is important is the individual's perception of their external context, which means that one objectively constructed viewpoint is never a possibility. Instead, each individual will develop their own particular and somewhat unique view of their world (Mead 1982b, p. 176). Therefore, once again rather than attempting to identify the facts, this chapter highlights and emphasises the perceptions of the PHCWs in this study.

In discussing the perceptions of these participants, this chapter will demonstrate that there is a tendency for PHCWs in PNG to address multiple belief systems and the sometimes conflicting information, in two ways. For example, half of the PHCWs in this study sustained a multilateral view of health care, acknowledging the benefit of, and even utilising a variety of, different belief systems in order to diagnose and/or treat patients. In comparison, less than a quarter of participants assumed a slightly more unilateral stance, preferring one particular belief system above all others. The strength of association with a potential source of information appeared to be the difference between whether or not PHCWs tended toward the more unilateral or multilateral perspectives. Those PHCWs at the unilateral end for example, suggested that they preferred information from one source in particular and that the belief system of this source greatly influenced their understanding of health. By contrast, the data collected from those PHCWs who tended to embrace multiple belief systems did not imply a similar strength of association with any one particular source of information. Nor did these PHCWs appear to even acknowledge that there was a conflict between any of the belief systems.

However, how PHCWs develop these understandings is not visible to the naked eye and therefore it was impossible for the researcher to observe and often even difficult for the individual themselves to describe. Nevertheless because there is 'a kind of consistency between what a person knows or believes and what he does' (Festinger 1957, p. 1), to some extent the study was able to rely on reported uses of information as a way of determining what happened during this knowing process. Therefore, despite the fact that Chapter 8 will also address 'outcomes', in this chapter the use of the knowledge that has been developed must speak for what happens when the PHCWs digest, analyse and interpret the information in order to further develop their knowledge (Turner 2006).

7.2 Knowledge

Knowledge was captured and internalised by PHCWs in this study for two primary reasons. Primarily, all participants discussed using knowledge to solve patient-centred problems. This type of knowing process involved information provided by the formal health care system and therefore developed within a biomedical model. However, often this type of information was not available, they did not have access to it, could not use it or it was out of date. This led to the suggestion by many that PHCWs often relied on their own general knowledge developed through experience over time. Unlike the information provided by the formal health care system, their own general knowledge often incorporated information developed within a variety of belief systems including Indigenous health practices and Christianity. This general knowledge therefore became the link or conduit by which knowledge pertaining to belief systems other than the biomedical model was used to treat patient-centred problems.

7.2.1 Patient Centred Problems

The primary reason for PHCWs to come to work was to solve patient-centred problems. A typical answer to the initial question of 'What is your role?' [Researcher] was: 'to diagnose patients, come in and treat the patient.' [CHW – Government Run Aid Post Madang Province.]. Even though PHCWs are also meant to deal with the proactive promotion of healthy lifestyles, nearly every participant reported that they were so busy dealing with the day-to-day concerns of 'illness' that any additional duties were very much a 'secondary concern' and often not attended to at all.

> They are not doing clinics because there maybe not enough staff. So what they are doing instead of proactive, they are becoming a place for treating people that come to the centre. [Manager – Hospital Staff.]

Solving patient-centred problems was described by participants in this study as a two-step process. First, the patient is diagnosed which is usually limited to obtaining background information from the patient themselves. Second, a treatment for that particular condition is administered. Findings relating to this two-step process with a focus on the knowledge required for each of these steps will now be presented.

All of the participants agreed that in order to treat patients correctly, an appropriate diagnosis must be made. Deciding on a diagnosis involved two things. First, the signs and symptoms were identified by talking to the patient or their carer.

> When we see very sick children, we interview the mother and then ask about. They give us the story and then we treat whatever we think, and she answers. Then we look at it and after that we diagnose and treat the baby. [CHW – Government Run Aid Post Madang Province.]

This involved asking the patient or patient's carer to provide details about the problem being experienced. Standard questions such as 'how do you feel' 'where does it hurt' and 'when did the problem start', were some of the initial questions that PHCWs reported using in order to start the process. The PHCW would reflect upon the answers to these questions and then decide what, if any additional questions needed to be asked. For example, if the patient complained about a stomach ache, the PHCW may ask what they had eaten recently, or whether or not they had blood in their urine. A minority of PHCWs also described seeking additional information by looking at the colour and condition of the patient's skin, and if they had the right equipment, taking the patient's temperature and/or monitoring their heart rate. In this way the PHCW entered into a process of gathering and reflecting on the information. This process was commonly referred to by participants as 'history taking'.

> I examine him, I check him and ask him and the patient has to explain symptoms of how he feels. And he explains things and I check things and I look for signs of how he feels. [CHW – Government Run Aid Post Madang Province.]

Second, the PHCW considered all of the signs or symptoms observed and/or mentioned by the patient. The PHCW then compared this with what they already knew. For example if the patient complained of fever, the PHCW would consider the possibility of malaria, because they had been taught that one of the key symptoms of malaria was fever. Alternatively, if someone complained of a stomach ache then participants suggested they may think about the possibility of worms or food poisoning.

7.2.1.1 Making a Diagnosis

Primarily PHCWs talked about learning how to take histories and interpret those histories, during their initial training. In addition, they also believed that experiences gained from working as PHCWs helped them to identify signs and symptoms from what the patients said, and then match those to particular conditions. When questioned about how they knew something, a typical response was 'We know the work.' [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.].

Nevertheless, some participants also spoke about asking other colleagues for assistance. Rarely, however, did PHCWs talk about consulting health professionals outside of their own facility. The very few exceptions to this situation occurred in facilities that had radio communication and where a doctor was willing to talk to them. In these very few cases, those PHCWs involved really valued the information that was provided.

> Dr [name removed] he was teaching us last year. So when he hears that [name of health centre removed] is calling you, he quickly comes to the radio and asks me Steven what is your problem… The others I am not really used to them. But they are around if I contact them they will do that. They have got some excuses and they will not turn up quickly, they just wait. [Nurse – Mission Run Health Centre Madang Province.]

However, in considering what potential conditions that could account for a patient's particular signs and symptoms, a few PHCWs also took into account belief systems other than the biomedical model. While there were some participants for whom the idea of non-biological causes to an illness was completely out of the question, many did not completely dismiss this idea and others openly spoke about sorcery as a potential cause of some illness.

> Or because we have some cases where one person has been accused of sorcery and they have been injured and they don't want to, some nurses don't want to touch them because they are a witch. [Manager – Church Health Organisation.]

They also in turn, however, reflected upon and made judgements about not only the information provided by the patient but also about the patients themselves.

> If there is illness that means [the patient's] home is not clean when [the patients] are coming to the health centre … That means [their] home is not clean. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

> They don't go for church … they sit around gambling and they feel tired and making home brews. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

> They [patients] are not that smart enough to look after their children. [Nurse – Mission Run Health Centre Madang Province.]

Their personal opinions were not limited to those concerning patients, nor were they always negative. They also influenced the way that information from other sources was considered. Senior colleagues and external health professionals were often regarded with a great deal of awe and respect, and therefore information from these providers was almost automatically considered far more valuable in comparison to that supplied through other sources.

> Whatever the doctor said if there is a antibiotic or treatment that we give here. [Nurse – Mission Run Health Centre Madang Province.]

Diagnosis did not therefore just rely on obtaining patient information but also included a process of comparing and interpreting what was received based to some extent on personal opinions and their own general knowledge about health practices. Diagnosis is, however, only the first step to solving a patient-centered problem. In order to be of any help to patients, the PHCW must also decide on and provide the appropriate treatment.

7.2.1.2 Deciding on a Treatment

According to many participants in this study, PHCWs are taught that once they have diagnosed the patient's condition they must then consult the appropriate STM. Providing that the STMs are available, the process by which information was obtained from a STM began by identifying the correct manual to use. The diagnosis was then identified in a small table of contents located at the back of each STM, which in turn referred the PHCW to the page/s containing information about the treatment of that particular condition. The most important step in the process therefore was to ensure the original diagnosis was correct. If the PHCW had wrongly diagnosed a patient then they may be referring to information that is inappropriate for the actual condition and create additional problems for the patient.

> For the Standard Treatment Book to be of value they have got to get their diagnosis right and therefore find the right page and then they have to be able to interpret what it says. [Manager - Nursing School.]

What makes it particularly difficult according to senior health professionals is that many of the disease for example 'typhoid and malaria' [ex nursing officer/physiotherapist] have similar symptoms. In these circumstances, a PHCW's past experiences in diagnosing these types of conditions or alternatively having a senior staff member around, was almost essential.

> I went over to the HEO and he did the general check and found out that he had an enlarged liver [a common symptom of malaria]. And he called me over and he had to go through this, and I learnt something from him. [CHW – Government Run Health Centre Eastern Highlands Province.]

Even when the correct diagnosis has been made and the appropriate pages located within the STM, the information may still not be used. PHCWs in this study suggested four reasons as to why the STMs could not be used. First, as discussed in Chapter 5 (see section 5.2.3) resources and infrastructure used to treat patients are not always available and/or adequate for a particular task. For example, participants reported that information contained in the STM referred to drugs that were out of stock. Second, the STMs did not contain the information that the PHCW believed they required (see Chapter 6 section 6.2.2). Third, STMs are written in English and PHCWs did not always have the skills required to understand this language. Just being able to read English was not however always sufficient. In addition, they also needed to be able to understand the meaning given to the particular words used within the text (see Chapter 6 section 6.3.4).

Lastly however, many participants also hinted that understanding the information contained within a STM also required a certain level of existing knowledge and experience. In particular, the newly graduated participants talked about needing to look to more experienced PHCWs to assist them with or at least confirm the decisions they made. They wanted reassurance and support, which again would not be available were they working in more isolated circumstance. As one participant pointed out, 'we cannot ask the book'. The book cannot answer our questions' [CHW – Government Run Health Centre Eastern Highlands Province.].

Yet even when they were able to, some participants in this study still suggested that there were cases in which PHCWs chose not to refer to the STM. For example, rather than a permanent part of the treatment decision process some PHCWs used them more as an occasional reference source, only referring to them when they couldn't remember or weren't sure about a particular treatment. Not one participant openly criticised the STMs or the information contained within them. Instead, they spoke about not being able to, not having the time to and/or not needing to use them on every occasion because they already knew what to do.

> If the clinic is so busy that they think they don't have the time to look, that is another thing I find. 'Oh what is happening with your treatment or what is happening with your Standard Treatment are you going systematic'. 'No, we have too many clients so we can't just waste time seeing this because'. It is time consuming, they say it is time consuming going through. [Nurse – Mission Run Health Centre Madang Province.]

A very small number of participants hinted that they did not always trust the STMs. Primarily, this was because PHCWs felt that even the contents in the most current versions were outdated. However, the problem was further exacerbated for those PHCWs who had to rely on older versions. For example, some participants were using a version of the Paediatric STM which had been published before 1990, knowing that there had been many subsequent versions since that time (see Chapter 6 section 6.2.2).

> And those that produce books and those that thought of these ideas, they should be put in gaol because these books are not reaching to the people who attended for. I mean why you keep all these books in Port Moresby in Waigani, when they are supposed to be distributed all over PNG. [Manager – Hospital Staff.]

Many of the participants spoke about the older CHWs workers in particular who preferred not to use the STMs at all; relying instead on their own knowledge and experience. In their opinion, this was sufficient and perhaps even much better than the information provided by others.

> They know they are supposed to be reading this book but they think they know more so, just for, no reading the book. They can use their heads, but they have been in the field for so long, they think they, they can just use their heads and give the particular treatment. Some, some its, it is due to lack of proper application. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

However, a small number of participants reported that even when STMs together with the necessary resources were available, some of the more senior PHCWs who were both well trained and had a good understanding of the English language still chose to rely on their own experiences. Sometimes it was suggested that they do not have the time but sometimes it was also suggested that they lacked total confidence in what information the STMs provided.

> I think people get into a rut, I think they think they know what to do and don't need the book. [Manager – Nursing School.]

Despite STMs not always being used to ascertain the treatment of all patients, PHCWs in this study were quick to point out two things. First, that the inability to obtain appropriate information from the STM did not mean that the patient was simply sent away, and second, not being able to use the STM was not the only reason that PHCWs sought alternative providers of information. While in some cases it is true to say that a lack of resources meant that PHCWs were forced to look for other advice, there are also instances where PHCWs preferred and even welcomed information from other providers.

Whether by necessity or choice, participants in this study used more than just information from the patient and the STMs before deciding on a diagnosis or treatment. For example, the few PHCWs who felt able to contact and ask questions from health professionals from outside of their facility were very appreciative of and valued the information they provided. As mentioned in Chapter 6 (see section 6.2.5), this depended to some extent on how confident they felt about talking to doctors, the communication infrastructure available and in addition a doctor able and willing to talk to them. Colleagues within their own facilities were also asked to provide opinions and advice about both the diagnosis. However, as previously described formal gatherings to share information between staff were rare and informal collegial networks could not necessarily be relied upon either because they did not have the time and/or some staff were not willing to share information(see Chapter 6 section 6.2.3).

Due to the lack of information or support, participants were often particularly reliant on a system of trial and error to identify the best treatment for a particular patient. In these instances the PHCW relied on past experience to prescribe a certain treatment that they thought might help, telling the patient to return in order for them to see what affect this had on their condition. The information gained from watching the reactions of patients was then used to decide whether the same treatment should be continued, or alternatively changed.

> Because sometimes these people they tell us that … the treatment you gave me helped me and they told us that they are feeling a little bit better. So we thought the same treatment may help them if they continue for another week or so. [CHW – Government Run Health Centre Eastern Highlands Province.]

Regardless of whoever else was consulted all of the PHCWs in this study therefore described in some form or another, relying their own knowledge and/or experiences to treat patients. This general knowledge was used to both interpret from for example, the STM, or to actually make diagnostic and/or treatment decisions. When asked 'How do you know?', PHCWs spoke about remembering things they learnt during their initial training, or from treating a similar condition. They also recalled being told by other colleagues and/or having observed or heard about a certain condition in the past.

> [W]e use our skills and experiences from which treatment we give the patient and then, we see they are healed and from that past experience we give the same treatment over. [CHW – Government Run Health Centre Eastern Highlands Province.]

One of the reasons that PHCWs may have relied on their general knowledge to both diagnose and treat patients, could be because they had few resources other than the STMs and other colleagues at work, to whom they could refer. Moreover, despite the fact that STMs were developed specifically to provide information on what treatment should be given to patients in PNG, participants reported that they are not always able to, and in some cases choose not to use them. Even when information was available, participants still described how they relied on their general knowledge and experience to understand and interpret its meaning.

7.2.2 General Knowledge

In order to understand how PHCWs make diagnostic and treatment decisions it was therefore most important to understand how PHCWs developed their own general knowledge. General knowledge in this context is the knowledge that these PHCWs had already developed prior to being confronted with a patient-centred problem. It not only encompassed their initial training but also all of the previous and subsequent information and experience picked up either formally and informally that could have potentially contributed to the way that they solved patient-centred problems. This included but was not limited to information obtained from observing other individuals, talking to people about various treatment methods, as well as their own experiences of diagnosing and treating patients.

7.2.2.1 Developing Knowledge about the Biomedical Model

The information used to develop general knowledge can potentially emanate from a variety of different sources, each with their own particular belief system. In some cases, PHCWs may have discussed different treatment methods advocated by the formal health system with colleagues in their own facility, observed or talked to community members about using Indigenous health practices to treat particular illnesses, or witnessed the purported benefits of incorporating Christian beliefs into treatment practices (see Chapter 6 section 6.2.4).

Yet when talking about the development of general knowledge, many participants limited their interview content to information obtained through the formal health system that pertained specifically to the biomedical model. No one referred directly to other types of information, such as information about Indigenous health practices and Christian religious rituals. In addition, because the information available on biomedical was relatively scarce,

many participants believed that they were not developing their knowledge base about health practice in accordance with a biomedical model.

> You want to you know, some refresher courses or so forth, we will come in and do our work here. But if we are left alone we just same old thing over and over. It's what we don't like. [CHW – Government Run Health Centre Eastern Highlands Province.]

Some participants felt that the lack of information about biomedicine resulted not just in a status quo but in a reduction in their general knowledge. They believed they were forgetting what they already knew from initial training for example, but also in some cases, what other health professionals had told them in the past.

> For a long time we have come to work, and for many years without going to school and learning and this type of patient doesn't come here. We lose knowledge. So if we go for learning now, for training now, for school now, it will come back. Information will come back. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

'It was different in the past' [Nurse – Mission Run Health Centre Madang Province], was a common response. A few participants talk about this 'past' with fondness. A time when training was available, supervisors visited them and doctors shared information. However, in the opinion of many PHCWs in this study things have changed. Regular ongoing professional training that was described as a link to the outside world was no longer accessible to them.

> Nobody comes and gives me, share ideas on what's new coming out at the health department, or health department is giving out. So I find it hard to communicate to know or learn new things: that is the big problem. [CHW – Government Run Aid Post Madang Province.]

7.2.2.2 Developing Knowledge about Indigenous Health Practices

Unlike biomedicine, people who could provide information pertaining to Indigenous health practices seemed to be at least readily available (see Chapter 6 section 6.3.3). Several participants spoke about how this type of information was incorporated into the lives of many Papua New Guineans as they grew up. Whenever they were sick as children, their parents or a relative treated their condition in accordance with their particular village practices and beliefs. Sometimes this involved the application of herbs and at other times, spiritual customs were involved, depending on the nature of the complaint. They also spoke about hearing other colleagues talk about the Indigenous health practices developed within other communities. This resulted in a type of cross-fertilisation of information.

> Because we all come from our own villages and some of the practices are common. So if, some don't know about it. At the moment some children are being brought up in towns, so if their parents are not using it, or even if the villages and if it is not a

> practice in their villages then, the nurse doesn't know. But others by overhearing what they are say, it is a good thing to do. [Nurse – Mission Run Health Centre Madang Province.]

Many of the PHCWs in this study also reported learning about Indigenous health practices from members of the community they served. As PHCWs often lived within the community in which they worked, opportunities for interactions with fellow community members were frequent.

> Some mothers they usually help. Special mothers in the village, help mothers to deliver babies, 3 or 4, I think 4 of them. … Sometimes they take a lime and rub it on their tummies. This special leave too they usually give to give the patient to drink to stop the pain. [CHW – Government Run Aid Post Madang Province.]

The relative ease with which information about Indigenous health practices was passed along did not necessarily result in all PHCW acknowledging its worth and/or adopting these methods for either diagnosing and/or treating patients. Instead nearly a quarter of participants in this study suggested that they did not see any benefit in the use of Indigenous health practices, usually because they felt the ideas were backward, and that the people who held these beliefs were at best uneducated and at worst sinners who were in cahoots with the devil.

> One mother was in labour and her old relatives would say, we bring the red tanget. They said, we want to throw it across the house where the mother was in the labour. She would throw it across the building and then me and my missionary we were there and we said, 'in the name of Jesus we rebuke the work of the Devil, don't do that. And then they listened to us and they didn't do it'. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

However, many of the PHCWs were not as quick as to completely dismiss the ideas. While not necessarily accepting Indigenous health practices as a viable way of diagnosing and/or treating patients, they did tolerate their use in combination with other belief systems. Approximately half of the PHCWs in this study believed that they caused no direct harm, and in fact some benefits could be seen including a sense of comfort and psychological wellbeing for the patient. Some of these PHCWs were therefore prepared to listen to those people who spoke about Indigenous health practices but did not necessarily use the information to inform their own general knowledge about diagnostic and treatment procedures.

> That is what they believe. One time they were sitting there … It helps in some ways. Like family support. Maybe psychological and emotional for the parents. And also when the child wakes up from his unconsciousness he can also see the family there and it is a good thing. [Nurse – Mission Run Health Centre Madang Province.]

Yet a small number of participants still strongly believed that Indigenous health practices not only had a place in providing health services to the community but spoke openly about this belief system as a preferred option. One PHCW in this study even promoted the use of Indigenous health practices in preference to all other treatment methods.

> Because that we find it really hard treating them here [Sub Health Centre] and so I refer them to my village. Because I have one sister that does this work. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

7.2.2.3 Developing Knowledge about Christian Religious Rituals

Similarly to Indigenous health practices, sources who were able to provide PHCWs with information pertaining to Christianity were also close at hand (see Chapter 6 section 6.3.3). In certain mission run centres for example PHCWs began every day with a meeting where prayers, devotions and even bible readings were a primary part of the agenda, if not the entire reason for the gathering.

> We usually have every out patients every day. We have devotion first and then health education. [Nurse – Mission Run Health Centre Madang Province.]

As described in Chapter 5 (see 5.3.2), the officers in charge of mission health centres are responsible for the complete running of their facility and consequently have been provided with far greater powers than their government counterparts have. This enables them to develop and enforce particular rules and regulations pertaining to the conduct of their staff and the procedures for diagnosing and treating patients. In some cases participants suggested that religion had become a mechanism that prescribed to some extent the actions of the staff.

> When the Church runs it [a health facility] they run it with Godly fear. [Nurse – Mission Run Sub-Health Centre Eastern Highlands Province.]

The data in this study also suggested that some PHCWs in mission run facilities are first and foremost a Christian rather than just a PHCW. This point was brought home by one supervisor in a mission facility who described his staff as ‘Christian Health Workers’ [Nurse – Mission Run Health Centre Madang Province.], and many of the PHCWs in mission run facilities spoke about the need to counsel patients and bring them round towards God.

> One thing I would like to say also, we must put God first, for work. I lead them in worship. Worshiping God. We must put God first. This is a big thing. In our workplace, I like to show that Christian. [Nurse – Government Run Health Centre Eastern Highlands Province.]

While not spoken about specifically, the researcher observed the dominant role that the church occupies throughout PNG (see Chapter 5 section 5.3.2). The importance of the church in everyday life for some PHCWs is evidenced by the how they spoke about their faith in God, whether or not they worked in a mission run facility.

> One thing I would like to say also, we must put God first, for work. I lead them in worship. Worshipping God. We must put God first. This is a big thing. In our workplace, I like to show that Christian. We must be truthful and talk well about God. [CHW – Government Run Health Centre Eastern Highlands Province.]

For some participants their religious beliefs and service to their church were the primary reasons for becoming a PHCW.

> I believe the good Lord has given me this job. The sick people in my houseline do not just come to me at the health centre but they also come to me when I go down to my house in the village during the weekends too. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Of the participants in this study who spoke strongly about their religious beliefs, many were not terribly tolerant when patients chose to use an Indigenous health practice. In many instances these PHCWs spoke about their intention to convert or lead patients and the community in general towards a Christian life style, through their work.

> And we share with them bible verses and we bring their minds away from these beliefs and we bring them closer to God and we help them to get straight. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

Yet there were also signs that even in mission run facilities, not all of the PHCWs were necessarily as intent on imposing their Christian beliefs on other people. Instead, participants spoke about listening to, accepting and even tolerating other ideas. And at times, even PHCWs working in mission run health centres used, or at least tolerated the use of, Indigenous health practices to treat patients.

7.2.2.4 General Knowledge – The Synthesis

Whether or not they formally recognised it, PHCWs were exposed to information based on a variety of belief systems. And this in turn led to the development of a general knowledge base which was used to assist in diagnosing and treating patients. However, this general knowledge was not just a synthesis of information provided by a variety of different sources. It also encompassed a degree of personal experience including what had worked for them in the past.

There are two ways in which PHCWs in this study described their experience. First, they treated experience as a noun. That is, they talked about experience in the same way they talked about knowledge. Experience therefore for them was knowledge, to be drawn upon either entirely or in conjunction with other information to make decisions about how patient-centred problems were solved.

> For this is nothing for me. Like any other cases, obstetrics or surgical cases or any other patients I would screen patients, this and the rest here. I think I have a lot of experience, so I do not need to find a HEO or nursing officer. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

In comparison, experience was also seen as a means to an end and therefore in this instance used as a verb. That is participants described the act of experiencing leading to the development of their knowledge. 'Many things I learned from my experience' [CHW – Mission Run Health Centre Madang Province] summarised the feelings of quite a few participants. This knowledge can then also be used to solve patient-centred problems.

> That then is from just how many years of experience working we can really tell the difference during history taking of each sickness and to give the right treatment. [CHW – Government Run Health Centre Madang Province.]

When talking about 'experiencing' they referred mostly to the experiences relating to diagnosing and/or treating of patients, which in turn involved a degree of knowledge developed from initial training and perhaps various other types of information that they had picked up along the way. Each time a PHCW diagnoses and treats a patient however, it is yet another experience that can add to their general knowledge.

> I can still tell whether it is TB or not, because from my experience. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Yet some participants also suggested that other types of experiences contribute to the building of knowledge. For example, some talked about learning from the experiences of their fellow colleagues. Observing their work and listening to what they say. Even then they were to some degree relying on 'experience', be that the experiences of a colleague.

> When I came here I learnt a lot from the very experience people here. From them I learn from others to do new things. So this makes me confident to work as a nursing officer. [Nurse – Mission Run Health Centre Madang Province.]

Members of the general community also shared their experiences with PHCWs. They talked together about the types of herbs and spiritual practices that were used in the area to treat illness, and at times PHCWs are able to observe the use of these, first hand.

> …and there is a woman and she uses some kind of coconut oil. She rubs it on the place of the broken bone and the bone is joined. So I think herbs is alright too. I only went and helped with a bit of amoxcyline. So they sort of work together. [CHW – Government Run Aid Post East Sepik Province.]

Participants also talked about other life experiences, as contributing to their knowledge base. General knowledge about not only the culture of the people but also the physical environment helped a PHCW to better understand the needs of their patients.

> The cold climate, from the upper side of the Goroka district, and maybe Asaro too, but I haven't been to Asaro so I wouldn't say anything more about Asaro, but in Goroka district I know that in the bush area at the foot of this Mount Otto it is cold, very very cold and therefore I have experienced this one. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Many participants indicated that relying totally on experience was not the most desirable method for understanding how to solve patient-centred problems. Unfortunately, many of the CHWs in remote Aid Posts were given very few other options. As one participant pointed out, PHCWs will never know what they don't know.

> Well there are new things that are coming up which we don't know yet. Some of the new treatments that are in place for the sicknesses [and] problems that arises. [Nurse – Mission Run Health Centre Madang Province.]

Conversely, many participants also believed that experience was an essential part of their work, and was something that should be valued and respected even when it comes from a colleague who did not have the same level of initial training.

> Now she knows so much that when the young residents [students] come if they miss something or did something not quite right she may just alter it to what she knows is right. And she has had years more experience, than the new young residents that come out. [Manager – Nursing School.]

Most importantly, however, experience contributed to the way that new information was used. For example, PHCWs needed to have gained particular experiences within a community in order to know whether a patient is likely to provide them with the information they need. Most importantly however, the developers of the STM assumed that PHCWs have the necessary knowledge and experience to use the resource effectively.

> So when we are experienced, like for some years we have been working of these things, from this we know about the Standard Treatment Books or other information books around, we know it is important to give the right diagnosis to treat the patient. [Nurse – Mission Run Health Centre Madang Province.]

Nonetheless, some participants were also aware that similar to the older versions of the STMs, their own knowledge and experiences might be outdated. This was of more concern to the younger PHCWs in this study who realised just how rapidly things were changing.

> Like for the green adult the common Illnesses, there have been changes on the treatment on dosages but I am still using it. Like as time goes on the technology goes on with newer changes taking place. [CHW – Government Run Aid Post East Sepik Province.]

7.2.2.5 Summary of Results

Whether or not it was out of date, PHCW relied on their general knowledge in order to solve patient-centred problems. A PHCW's general knowledge was not only developed from biomedical information obtained during initial training, but also may have incorporated beliefs pertaining to Indigenous Knowledge and Christianity. In turn, this general knowledge was used to interpret new information made available by the patient and through the formal health care sector by way of the STMs. However, in some cases general knowledge replaced these STMs because the PHCW was either unable to or chose not to utilise written guidelines. Therefore not only was a PHCW's general knowledge always a project under construction but in turn it contributed at least partly to every diagnostic and treatment decision.

7.3 Solving Patient-Centred Problems

Solving patient-centred problems was the essence of what participants believed their work was all about. In this problem solving process PHCWs were no different from many other individuals in that they started by clarifying the problem, obtaining information, focusing on possible courses of action, reflecting on that information, deciding on an action and then acting in the way they thought would provide the best outcome (D'Zurilla & Goldfried 1971; Mead 1972, p. 82). However, in PNG, PHCWs were often hampered by limited information pertaining to the formally sanctioned biomedical model. Perhaps as a consequence, but also sometimes because of a conscious choice, PHCWs turned to their own general knowledge portfolio to assist with solving patient-centred problems. In turn this general knowledge was developed both from a variety of information sources and through their own life experiences.

Using the NVivo Software Package, the first step to understanding how PHCWs utilised information to develop knowledge involved returning to the data attributed to the theme entitled 'knowing'. Three initial findings emanated from an analysis of this coding

exercise. First, PHCWs obtained information to develop two types of knowledge; knowledge to solve a patient-centred problems and in addition a more general knowledge portfolio. The difference between the two being that knowledge to solve patient-centred problems pertained to and was developed specifically in order to effectively treat a particular patient. For example, a PHCW may have sought advice from a colleague or referred to a STM when they were unsure about the signs and symptoms of a particular patient. In comparison the development of general knowledge, as the label suggests is far more wide-ranging and collected to contribute to a general data bank on that type of condition and treatment.

The second finding related to how information from different sources contributed to the development of each of these knowledge types. For example, PHCWs tended to refer to information provided through the formal health care system when attempting to solve a patient-centred problem while, depending on the PHCW concerned, general knowledge may have been both built and enhanced through information from a variety of different sources. For example one PHCW observed how local mothers used lemon grass to treat the symptoms of a cold. Lastly, a common link existed between the two types of knowledge. It was found that general knowledge could also become a valuable source of information when dealing with patient centred problems. This meant that a variety of belief systems might have been used to solve patient-centred problems.

As the findings suggested that PHCWs were not only exposed to (see Chapter 6 section 6.3.1) but also utilised information from a variety of different sources the data was re-coded using the NVivo Software Package in order to identify how PHCWs coped with the complexity that could potentially arise from using multiple legitimate yet sometimes conflicting information. The final discussion presented in this knowing chapter identifies that only a quarter of PHCWs showed a distinct preference for one particular belief system, while at least half of participants suggested that they were reasonably comfortable with acknowledging if not using information from multiple belief systems within their general knowledge portfolio. Rather than noticing the contradictions or conflicts, these PHCWs saw them as possibilities and further opportunities for solving patient-centred problems.

7.3.1 Limited Information

In the first instance the information that framed and detailed the patient-centred problem was obtained directly from the patient, with participants reporting that in all cases, diagnostic and treatment procedures commenced with 'history taking' [see section 7.2.1 of this chapter]. Yet, while the information obtained from the patient framed the problem, it did not provide the solution. Instead, the PHCW mostly relied on their general knowledge in order to reach a specific diagnosis, which then led them towards a decision on what treatment to apply. If the PHCWs followed the procedure taught during initial training, they would turn to the relevant STM, and proceed with the recommended treatment. Correctly diagnosing the patient's problem therefore is essential to being able to ascertain an appropriate solution (Phye 1997).

Although at the beginning of most interviews the majority of participants suggested that they always consulted the STM, as the interview progressed it often became apparent that this was not necessarily the case. The reason for this inconsistency may have been that STMs were part of their formally sanctioned belief system, and were well respected, being described by participants as their 'bible' or 'teacher' [CHW – Mission Run Sub-Health Centre Easter Highlands Province.]. Therefore, PHCWs may have found it difficult to admit that they were not always able to or sometimes chose not to utilise them.

Once they were comfortable with admitting that the STMs were not always used, participants started to suggest why this might be the case. First, to recap previously reported findings.

- PHCWs did not always have access to the relevant STMs (see Chapter 6 section 6.2.2)
- PHCWs did not have the resources or infrastructure necessary for following the prescribed procedure (see Chapter 5 section 5.2.3).
- PHCWs did not understand the information contained within the STM. Either the particular words or combination of words used were not familiar to the PHCW or they could not read English (see Chapter 6 section 6.3.4).

However, some participants also felt it was unnecessary to refer to the STMs every time, as they already knew what to do (see section 7.2.1.2 this chapter). This may not be surprising as often people only refer to information when they want to find out about something they are not familiar with (Wilson, TD 1999), to make sense of a situation that they do not completely understand (Dervin 1980; 2003, p. 204) and/or to provide confirmation about a

particular decision they have already made (Faules & Alexander 1978, pp. 91-93; Kuhlthau 1991, 1993). That is in any situation where knowledge is lacking or inadequate (Belkin 1980).

In cases where clarification or confirmation was required and the STMs were not available, some PHCWs turned to their fellow colleagues for assistance. However, this source of information was only available to PHCWs who worked in larger facilities and even in these circumstances colleagues were sometimes too busy and/or did not want always want to share information (see Chapter 6 section 6.2.3) Very few PHCWs sought information to solve a patient-centred problem from people outside of the own facility. Other health professionals were not generally consulted primarily because they weren't available but also in some cases because the PHCW were too scared or felt too awkward about approaching them (see Chapter 6 section 6.2.5).

Despite this lack of information, there were no reports of PHCWs directly contacting other sources of information such as members of their local communities or church organisations to seek information during the diagnostic or treatment process (see section 7.2.1 of this chapter). PHCWs in this study may not have felt comfortable consulting members of the public for example, because the expectation of at least the formal health system was that they would provide treatment according to the biomedical model. Therefore, to contact people outside of the formal health care system would have meant deliberately disregarding their employers. The only indication that a source of information outside of the formal health care sector was sought during a treatment process was when participants spoke about sending patients directly to an Indigenous health practitioner. This did not appear to happen often and was more of a direct referral.

> Others [traditional healers] they know how to cure this. So they know the special treatment which they apply to the person, they take [spells] and they heal them up by using something. They know. But ourselves, we don't know anything we can't help the patient. [CHW – Government Run Aid Post Madang Province.]

These findings suggest therefore that in order to solve patient-centred problems PHCWs only sought information from providers recognised as legitimate by the formal health care system. For example talking to patients was an acceptable way of seeking information about the problem to be solved, STMs provided information on how to treat the problem and interactions with other health professionals even though they did not occur very often were an accepted way of obtaining information about the biomedical model. The danger was that information from these providers was not always sufficient, appropriate and/or

accessible. Therefore, PHCWs for the most part needed to rely on their own general knowledge to solving patient-centred problems.

7.3.2 Developing a Knowledge Portfolio

While not always of immediate use (Krikelas 1983), the advantage of general knowledge is that it is stored and can be recalled and utilised at a later stage (Savolainen 1995). In terms of biomedicine, the PHCW's initial training provides the best example of early general knowledge development. Once this initial training had been completed, there were few additional opportunities for PHCWs to obtain further information based on a biomedical model. In comparison information pertaining to Indigenous health practices and Christianity could be obtained through face-to-face communications with and observations of sources of information that were generally fairly close at hand (see Chapter 6 section 6.3.5).

All of the PHCWs in this study described obtaining general information by talking to members of their community. Some participants described attending church services that would have provided many opportunities for them to associate with fellow congregational members and both observe and discuss various religious rituals including prayer and the laying on of hands. Quite a few participants described employing these very same rituals at a later date to treat patients. In other examples PHCWs deliberately obtained information from community members in order to understand more about Indigenous health practices. For example, one participant spoke about how they often spoke to their friends about the use of local herbs to cure the common cold. Exchanges of information and opportunities to develop knowledge about health practices were not therefore limited to the PHCW's working environment but instead were readily available within a number of different social settings (Gerner 1991, p. 342).

> Because I once attended a study with the mothers, and I studied about herbs, drugs and I have studied with them and learned some from them. I have copied a lot of notes and I have them with me. [CHW – Government Run Aid Post Madang Province.]

However, information was not always sought deliberately. Instead, their general knowledge was also developed through accidental encounters (Krikelas 1983; Erdelez 1997). That is to say that many of their everyday life experiences including the simple act of communicating with other people in their community involved in some way the sharing of information. PHCWs in PNG may, as they walked through their village may observe a community member using pawpaw seeds to treat a fever or boiling lemon grass in order to cure a cold. They may also have witnessed or heard about a spiritual ceremony to rid

someone of a spell that was believed to cause a particular illness. Living in the community in which they worked provided many opportunities to observe the ways in which fellow community members utilised various belief systems in order to maintain their own health and wellbeing.

As the above examples suggest, the development of general knowledge is not reliant just on information provided through verbal and/or written communication. Individuals also learn by observing the actions of others (Bandura 2001b, 2003). These observations not only directly provide information in their own right but also support other types of information presented in the form of verbal and written exchanges by offering tangible examples of what is being communicated (Rosenthal & Zimmerman 1978, p. 210; Bandura 1986, pp. 70-74). It is not so much that individuals mimic the actions of others however, but instead that they access the information stored from their observation to assist them with their own problem solving and decision-making (Bandura 2001b).

Once again the local communities and the church based reference groups rather than the formal health care system, are best placed to transfer information by observation. Both sources of information are usually highly visible to the PHCWs living and working in the same area. In addition this visibility allows PHCWs to regularly witness the activities of these sources and the more often an individual observes particular actions the more likely they are to be influenced by them (Monahan, Murphy & Zajonc 2000). For example the continued observation of community members using herbs to help a woman in labour may be more influential than a once off training session on a new birthing technique.

A further method of developing general knowledge may not necessarily entail provision of information through either direct communication or even observation. Personal experiences, both pleasant and unpleasant may also contribute to a person's general knowledge (Illeris 2003) Personal experiences no matter how or when they take place, create the very essence of who a person is and therefore how they think (Piaget 1952; Kolb 1984, p. 17). The experiences of a PHCW are therefore not constrained to encounters and interactions pertaining just to work. Instead, PHCWs will have started by accumulating general knowledge from childhood, into their adolescent years and will continue to do so throughout their adult lives (Piaget 1952; Giddens 2001, pp. 27-28). These types of experiences are very powerful at influencing the way that people think and act in every type of situation (Rueda & Moll 1994).

While many of their experiences could possibly have been similar, each PHCW would have reflected upon, analysed and even understood them differently (Mead 1974, p. 326; Giddens 2001, p. 29). Personal experiences, just like all other types of information are reflected on and analysed according to the individual's particular perspective (Rosenthal & Zimmerman 1978, p. 208). For example, many PHCWs in this study experienced a situation where they were without the necessary resources or the support. However, while some gave up and became despondent (see Chapter 5 section 5.2.6) other PHCWs demonstrated a remarkable resilience making additional efforts to fill the void, perhaps by seeking out information from other sources, or improvising and making do with what they had.

> That's what happens. When you don't have the resources we just improvise what we learn from school. [Nurse – Government Run Health Centre Eastern Highlands Province.]

Rather than limiting themselves to just the biomedical model, information obtained deliberately as well as encountered accidentally, through observations, experience as well interactions with a variety of other people, contributed not only to what PHCWs knew but also how they acted (Sonnenwald 1999; McGivney 2006). In turn, the knowledge they developed itself, influences to some extent what information is sought and how it is used in the future (Foster 2004). Information gathering and general knowledge development is therefore a normal part of everyday life (Illeris 2004, p. 227). In some sense, individuals such as these PHCWs in PNG cannot help but be affected by and therefore build a 'General Knowledge Portfolio', which may encompass a variety of different belief systems apart from just the biomedical model.

7.3.3 Coping with Complexity

Associating with many different information sources throughout one's life is true for all. The family, a sporting club and team at work each with their own particular dominant point of view, are all examples of sources that can suggest how an individual should think and act. Shibutani (1955) believes that in order to cope with this, individuals have become very good at compartmentalising their lives. At home, they are influenced by the rest of the family, while at work they may be happy to go along with the dominant ideas and norms of their colleagues and/or bosses. The development of and need for PHCWs in PNG to rely so much on their general knowledge suggests that for any one given situation they may be faced with a variety of information from multiple, yet all legitimate sources of information, each one with its own unique and potentially conflicting set of messages.

In order to ascertain how PHCWs coped with these potentially conflicting messages the data were re-examined to establish an acknowledgement of or preference for any one particular belief system; either based on biomedicine, Christianity or Indigenous Knowledge. For example statements such as 'giving them Godly words and that helps them cure their sicknesses' [CHW – Government Run Sub-Health Centre Eastern Highlands Province.] were interpreted as tending towards a preference for a Christian belief system. In contrast, PHCWs who reported treating patients in accordance with the biomedical model but in addition allowing family members to practice Sanguma because 'It helps in some ways…like family support.' inferred that the PHCW concerned was at least open to the benefits of more than one belief system. Using the NVivo package each interview was coded according to the belief system or systems for which the participant showed a preference (see Table 5). While it was initially envisaged that each of the participants would demonstrate a clear preference for one particular belief system, detailed examination suggested that half of the PHCWs tended to be comfortable with and even used more than one of the identified belief systems in order to solve patient-centered problems.

Preference for Type of Belief System	Preference Type Total Number of Participants
Biomedical Model	6
Indigenous Health Practices	1
Christianity	7
Comfortable with Mixing Belief Systems	29
No Specific Preference Mentioned	15
Total	58

Table 5 – Belief System Preferences

These tendencies will now be investigated further in order to better understand why some PHCWs were comfortable with acknowledging the benefits and even using information from multiple reference groups (a multilateral perspective) or alternatively developed a leaning towards one particular belief system (a unilateral perspective).

7.3.4 A Unilateral Perspective

Almost a quarter of the PHCWs in this study were inclined to focus their attention on the information from one particular belief system. For example, seven of these PHCWs showed a preference for Christian beliefs and advocated for treating patients with prayer and similar rituals. Six participants believed that treatment developed within a biomedical model was the best course of action, with only one participant focusing on the use of Indigenous health practices. However, participants also described how other PHCWs they knew relied on one primary belief system in order to diagnose and treat the patients.

> The older ones do what they want. They don't know much about the new medicine. They use their old ways and this is a problem. They don't follow the… Books or their training. [Manager – Provincial Level.]

7.3.4.1 A Hierarchy

Reported tending towards a unilateral perspective should be treated with some caution as it is not to say that these PHCWs never used information based on other belief systems. Rather that, a particularly strong preference was noted by the researcher during interviews. Therefore, instead of considering these PHCWs as using only one belief system to solve patient-centred problems, it may be that their choices are determined in accordance with their own hierarchical system of information sources, with one in particular being preferred above all others (Lewis 1991, p. 132). Some PHCWs, spoke about the importance of prayer and its primary role in helping to solve patient centre problems, but did not completely rule out the use of biomedicine. In fact the biomedical model always appeared to play some role in the diagnostic and treatment practices of all PHCWs in this study, possibly because it is the only sanctioned belief system.

7.3.4.2 Reference Groups

All those PHCWs who tended toward a unilateral perspective demonstrated a preference for the information provided by one particular information source. Not only did they know about, but they also accepted and wherever possible appeared to use the information provided by that particular group. For example, some participants were highly motivated by Christian principles.

> We fear God and that is why our fear motivates us to service our clients, our patients in a way that they have satisfaction. [Nurse – Mission Run Sub-Health Centre Eastern Highlands Province.]

Others held such a strong faith in biomedical practices that they continually attempted to persuade others to use this particular method.

> But the good news is that we tell them and talk kindly to them and explain to them how disease, the step of disease it comes through bacteria, and if they don't clean their areas and all these. … So you have to find a way to bring the people, their mind comes straight after, their mind meet you, so they understand why. [CHW – Mission Run Health Centre Madang Province.]

Often people who strongly associate with a belief system based on, for example, a religion find it very difficult to objective and impartial about other people's world views. Similarly those who have denounced religion may also be unable to consider another person's point of view (Smart, N 1996, p. 2).

It was perhaps not surprising that some of these PHCWs who demonstrated such a strong commitment to the beliefs developed by a particular group of individuals were or had recently connected with members of that group. For example, two of the seven PHCWs who described the benefits of using Christian rituals for treating patients were also pastors, and the other five attended church on a regular basis. Four of the six PHCWs who preferred information developed within a biomedical model had only recently completed initial training, and the CHW who suggested a strong preference for the use of Indigenous health practices also spoke about a strong connection with his village that was very close to where he or she worked. The more that contact that an individual has with another group of people the more likely they are to identify with them and form judgements based on how these individuals think and act (Fine & Kleinman 1979).

A strong association with one particular information source may therefore be one primary reason why these PHCWs tended to develop a sort of hierarchy where one preferred belief system is used above all others, as a first choice (Lewis 1991, p. 132). As these PHCWs not only identified with, but also accepted and incorporated at least some of the group's beliefs into their own way of thinking, these groups acted as a type of reference group (Newcomb, Turner & Converse 1975, pp. 145-146) 1965). Small groups such as a local community, the congregation belonging to a particular and even the classes attended through initial training, are considered particularly beneficial for influencing the thinking or behaviour of individuals. This is simply because members not only know each other personally but also are often able to observe regularly each other's actions, providing opportunities to model appropriate behaviour and also impose sanctions when a person's behaviour is considered inappropriate (Fine 1979; Harrington & Fine 2000).

These reference groups not only share information pertaining to their own belief systems, they also provide lessons in how to evaluate the beliefs held by individuals outside of their group. Generally, people learn to evaluate or judge all information in accordance with their reference group/s belief system (Burnett, Jaeger & Thompson 2008). Information that supports the reference group's beliefs will usually be judged more acceptable, while in comparison anything that contradicts what the group believes may be labelled as 'worthless, inaccurate, or even dangerous' (2008 p. 59). For example, four of the seven PHCWs who preferred to base their practices on Christian principles suggested that *sangamu* (witchcraft) was evil and therefore wrong.

To some extent, the fact that reference groups define themselves in opposition to other reference groups (Tajfel & Turner 1986; Brown 2000, p. 312) highlights any conflict or opposing points of view in the eyes of every member of the reference group, strengthening a resolve in their own beliefs. For example, one participant who held a strong preference for Christian principles described other people who embraced Indigenous beliefs as backward or 'lazy' [CHW – Mission Run Sub-Health Centre Eastern Highlands Province] for not believing in the one true God.

It should not be assumed from this that PHCWs who tended toward a unilateral perspective did not associate with or even belong to other reference groups. Instead, it is perhaps more likely that they were better able to compartmentalise their lives, choosing to embrace certain belief systems at certain times. For example while attempting to solve patient-centred problems some preferred to use the biomedical model. While at other times such as during family and community celebrations these same individuals may have been more tolerant of or even acted in accordance with other belief systems (Shibutani 1955). Even the PHCWs who tended to prefer one particular belief system may therefore have been quite flexible in their outlook. The belief systems of a reference group whether a local community, church or the formal health care sector, therefore acted more as a guide rather than a rule, and accepting the beliefs of one reference group did not necessarily preclude the consideration of others. How beliefs are applied if at all, will be something that is decided by the individual within each given situation (Fine 2001). Reference groups therefore guide rather than determine whether information is accepted or even considered worthy of attention.

Thus, in analysing the data pertaining just to the PHCWs who showed a preference for one particular belief system, two important findings were established. First, a tendency towards a unilateral perspective may indicate a strong association with a particular

reference group, which could not only suggested what is appropriate and inappropriate but also how the beliefs of other groups should be judged (Shibutani 1955). It was not so much that potential reference groups were available however, but instead that the individual perceived that associating with them would be of some value. Second, the preference for one reference group and their belief system/s did not preclude the acknowledgement or even use of others. Instead, a hierarchy of preferences may have been formed with one dominant belief system at the peak.

7.3.5 A Multilateral Perspective

Not all the participants in this study showed a preference for one particular belief system. Nor do they find it necessary to adopt one set of beliefs, guides, rules and/or norms as lens through which everything was judged (Wilson, P 1983, p. 6; Depken 1994; Silberman 2005). Half of the PHCWs in this study appeared comfortable with acknowledging the value of and often utilising information from a variety of belief systems even though at times contradictions and conflicts appeared to occur (see Chapter 5 section 5.4.3). Some PHCWs even saw an advantage for both themselves and their patients in using information developed within multiple belief systems because it provided them with a variety of options for solving patient-centred problems.

While findings suggested that PHCWs with a unilateral perspective tended to strongly associate with one particular reference group, those with a multilateral perspective appeared to show no such association. For these PHCWs, an analysis of the data suggested that information was obtained from a variety of sources. For example, one participant mentioned showed how information from a variety of different sources contributed to their final decision about how to treat a patient with malaria. First, they consulted the patient noting that symptoms of malaria had been present for several days. Despite the fact that their edition was nearly 10 years old, they referred to the STM which suggested a course of chloroquin. However, through trial and error the PHCW knew that most of the community was 'resistant to chloroquin' and therefore this probably would have little effect. Therefore, in addition to the chloroquin, the use of pawpaw seeds was also prescribed, a treatment commonly used by many Papua New Guineans.

> So I can use my language too. Because some mothers, they are village mothers. They don't know that, pigeon or others. So I communicate with them with no troubles. And then they tell me their story... For my area they use this traditional herbs. They use the pawpaw seeds. [CHW – Government Run Aid Post Madang Province.]

As suggested by the above example, many of the participants with a multilateral perspective were happy to swap between the treatment options offered by various belief systems, as required. For example, on certain occasions participants reported using information from one type of belief system, while at other times they selected something completely different. In comparison to those at the unilateral end, they were more likely to describe using whatever they felt was appropriate for each particular situation.

> Because most of them we are running out of IV lines we can hardly get the IV lines here. We ask them to gives us IV lines, we have asked to give us 10, for 2 months. And 10 IV lines we use in one year in this health centre because we have so many patients. So you see a very dehydrated child come in here and needs to be drug induced very quickly, needs to rehydrate quickly and you don't have any IV lines. So what the next thing you do? You go and break the leave flowers from there and break them and come and give the juice to stop the diarrhoea, because we can't do anything. [Nurse – Government Run Health Centre Madang Province.]

On other occasions, some of the PHCWs with more of a multilateral perspective used or at least paid homage to, information from several different belief systems simultaneously. Again, it appeared to be a matter of what they felt was most effective given the particular situation they were faced with.

> No the delivery was done in their own village and in our custom it doesn't permit another clan. That man's wife is from another clan and we don't have to stick our nose into their affairs, it always. But in my case, I as a health worker I have to go and see, because they have been calling for me. They know I am a health worker so I have to go in there. So I ask the relative, the husband of the woman and I was permitted to get into the delivery room and I did the massage of the abdomen and the bleeding was able to slow down and I did the pack. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

For other PHCWs, it appeared to be more about acceptance. They accepted that alternative treatments could also be of some benefit and should not be completely dismissed, if for no other reason, than to ensure the patient's psychological wellbeing.

> Nurses usually close their eyes if another relative enters in. Or if they invite a local healer to come in they will probably not object. [Manager – Church Health Organisation.]

It is not just that multiple sources of information were available, but instead that the individual PHCW was open to receiving, incorporating and utilising information developed within a variety of different belief systems. These there were no barriers between themselves and any potentially beneficial information. Instead, they at least acknowledged if not embraced a variety of different points of view.

7.3.5.1 Coping with Multiple Belief Systems

The suggestion that individuals are able to cope with multiple belief systems is not new. Mead (1974, p. 157) noted that individuals are influenced by many different reference groups and even sub-reference groups. Shibutani (1955) also suggested that individuals usually refer to particular reference groups according to the situation in which they find themselves. This however leads to a 'segmentalized life' (p. 567) where for example, at home the family becomes the preferred reference group, whereas at work their peers and/or supervisors suggest how things should be done. These viewpoints suggest that conflicts between the various belief systems will tend not to occur or at least not be particularly noticeable because they are never considered within exactly the same situation.

The lives of many PHCWs in PNG are however far more complicated than this compartmentalised view of life. In PNG, a PHCW could be faced with information from multiple belief systems all at the same time and all of which are considered by at least parts of society to be legitimate, within the same situation (see Chapter 5 section 5.4.2). However, to add to the complexity in some cases the information provided by one source may contradict what another provider says. As described in Chapter 5 (see section 5.4.3), Christian and Indigenous belief systems have differing principles. While both suggest that spirituality is at the heart of a person's well-being, their definition of spirituality is completely different (Edoni 1986). In turn, the biomedical model stands in direct opposition to the spiritual basis of both Indigenous Knowledge as well as Christianity (Nettleton 2006, p. 3)

Mead (1964d) suggests that where these types of conflicts exist, three things could potentially happen. One is that the person acts automatically or habitually without any forethought and because of this does not even acknowledge the options and therefore the potential for conflict. This first possibility does not appear to apply necessarily to PHCWs in this study as although everyone acts out of habit to some extent, participants demonstrated that they often consider and decide upon a course of action when confronted with patient-centred problems. Second, the person realises the conflict but applies one particular belief system, ignoring any internal conflict. As previously discussed this is the type of strategy that the PHCWs with a unilateral perspective may have used. The third possibility that Mead suggests is that individuals analyse and evaluate each option, and if they find them all to be valid temporarily abandon all previously held notions, developing instead a new belief that mitigates or minimises the conflict. While beliefs and practices change over time (Blumer 1969, p. 12; Lal 1995) there was no indication that those

PHCWs in PNG with more of a multilateral perspective were experiencing any sort of inner turmoil or a sense of having to develop new options in order to avoid a conflict. Many of these PHCWs regularly and without any sign of anxiety or internal discord, swapped between different belief systems often accepting that in some way all had their place in solving patient-centred problems.

> For me when I treat patients and they are not getting well, something like that I pray and say bible lessons. Like if the hospital comes and takes him, then joint pain I think the already illness, then the Panadol will help. I just help. I can't take care of everyone so we have to send him the Goroka Base Hospital. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Gesch (2007) describes a similar phenomenon when talking to a Papua New Guinean medical doctor who explained the process he went through to diagnose and treat patients. At the beginning, the doctor defined illness within a biomedical model, however, before long a range of other belief systems entered into the discussion including the possibility that a patient's sickness was due primarily to *sangumu* or witchcraft. That, in turn this was brought about because their relationship with another person was out of balance.

7.3.5.2 Without Anxiety

This suggestion that conflicting messages may not necessarily cause stress or anxiety for the recipient, may contradict the theory of cognitive dissonance. The principles of cognitive dissonance theory is that when individuals are forced to consider and even use information that conflicts with their own beliefs, they will develop a sense of 'discomfort' (Festinger 1957, p. 2) sometimes leading to anxiety or stress (for example see Zanna & Cooper 1974; Elliot & Devine 1994). This motivates the individual to reduce any inconsistency or resolve the conflict (Losch & Cacioppo 1990) which can be achieved in many ways including for example changing the way they think to suit the new information, or continuing to seek out information that will confirm their existing point of view (Festinger 1957, p. 264).

However, this study suggests that individuals do not necessarily have to view things in terms of conflict and contradictions. As the PHCW did not recognise the conflict, there was no reason to seek ways of reducing it. Belief systems are themselves not concrete entities and therefore are open to interpretation. Rather than defining what must be done, they suggest or prompt a particular thought or action. In this way, the belief systems are open to negotiation, allowing some scope for personal perspectives and interpretation (Fine 2001). The recipient's perception or definition of conflict, rather than the conflict itself

was of most importance. Where the researcher observed contradictions, many of the participants in this study saw options and opportunities.

Three potentially overlapping reasons may point to why many PHCWs were not aware of the contradictions. One reason might be because they do not have a particular vested interest in upholding any one point of view or belief system (Pollis 1968). Not everyone will have the same level of commitment or attachment to one particular reference group and their associated belief system, as the PHCWs with more of a unilateral perspective. Therefore, the degree of commitment and attachment that a PHCW feels to a particular reference group or groups may influence how likely they are to appreciate that conflict exists.

Second, regular association with many different sources of information may be the key to PHCWs being able to maintain a 'repertoire' (Wicklund 1999, p. 669) of different belief systems. Those PHCWs who are willing to accepting different viewpoints and did not form a preference for just one particular belief system, adopted a more pragmatic stance (Bandura 2001a), allowing them to adapt their behaviour to suit each particular situation (Snyder & Campbell 1982). By moving between and/or interacting with various reference groups individuals maintained a connection with multiple points of view (Wicklund 1997). Moreover, when varied diagnostic and treatment practices are used without any form of penalty or adverse reaction the practice's legitimacy and value increases (Wicklund & Brehm 2004).

In this way, these PHCWs have created in their own yet another belief system; one that values multiplicity and complexity, and does not try to come up with the one way of solving all patient-centred problems. In some sense the formal health care sector in its absence, has approved of its use.

The third reason, why a variety of belief systems could be relatively easy for many PHCWs in PNG to accept is that other Papua New Guineans are also very good at dealing with complexity in this way. While western concepts tend to define all illness under a biomedical model, Papua New Guineans choose between various treatment options according to what they believed caused or could potentially cause an illness (Koczberski & Curry 1999). For example, some participants in this study at their own or their community's discretion were able to determine which illnesses were due to witchcraft and therefore required alternative intervention, and those that would benefit from treatments developed within the biomedical model. In addition, as PNG moves from a rural society

based on locally developed belief systems, into a nation that embraces a more western perspective, many people becoming more familiar with and learning about Christianity and a biomedical model (Macfarlane 2005, Accepted for Publication in 2009). As explained in Chapter 2 (see sections 2.3 and 2.4) the colonisation of PNG saw a gradual introduction of western ideology not only for concepts such as health and healing but also in areas such as agriculture and politics. Many Papua New Guineans have been particularly successful at integrating western concepts into their lives and this is a primary feature of the emerging society.

As a result many of the communities have developed belief systems that incorporate Indigenous Knowledge, Christianity and biomedicine into how they understand health (see Chapter 5 section 5.4.1), and in addition utilise understandings from all three in order to treat illness. Therefore, accepting and utilising information developed within a variety of belief systems may be commonplace, and therefore provides a socially acceptable response in many situations (Therborn 2002). In some way therefore the PHCWs with more of a multilateral perspective may have used society as a 'reference group', using their definition of what could be considered normal and therefore also acceptable behaviour (Horwitz 2008). Society may have demonstrated how various belief systems can be integrated, and that swapping and changing between belief systems, even when the messages conveyed sometimes contradicted each other is perfectly acceptable. From this point of view, embracing multiple belief systems could be thought of as a learned behaviour (Fine 2001).

The idea of segregating belief systems into various categories, such as biomedicine, Indigenous health practices and Christianity may not always prove helpful in these circumstances. The grouping of like beliefs under specific labels may in a sense be setting up dichotomies (Waite 2002) that for some individuals, simply do not exist. Individuals who are comfortable with accepting various belief systems may not be interested in whether or not the ideas contradict each other. Instead, they may be more concerned with what types of opportunities they bring to any given situation. The value came from whether or not the information they obtained and the knowledge that was developed, met their particular needs. These different beliefs may then be incorporated into their general knowledge portfolio that could be used to assist in solving patient-centred problems at any later point in time. The individuals who embraced complexity were able to move comfortably between perspectives in order to come up with an appropriate solution, demonstrating a significant degree of flexibility. Unlike those individuals who preferred one particular belief system, their choice was based more on a pragmatic assessment of

each particular situation (Wicklund 1999) rather than the influences of any particular reference group.

However, PHCWs in PNG may not necessarily be as unique as initially suggested by the findings in this study. Other research has also hinted at the idea that people have the ability to hold several different conflicting beliefs simultaneously without any distress or anxiety (Wicklund & Brehm 2004). For example, Boissevain (1974, p. 50) believes that when individuals are faced with two conflicting courses of action they will base their choice on what they believe is best given the particular situation rather than a preconceived set of beliefs. Baldwin and Holmes (1987) also demonstrated that individuals have no difficulty in swapping between conflicting values and perspectives, according to a particular situation. Rather than uni-dimensional and static, some individuals not only value but have also demonstrated that flexible ways of viewing themselves and others provides more tools for dealing with a variety of complex situations (Sande, Goethals & Radloff 1988).

7.3.6 A Continuum of Receptivity

The fine line between those PHCWs with a unilateral and those who held more of a multilateral perspective may have had more to do with the participant's certainty about the benefits of their preferred belief system above all others, rather than what they actually practice. For example one participant who had just finished administering a biomedical treatment proceeded to speak about the need to always pray with the patients and that this above all else was the best way to cure patients.

> To me it is important so we have to pray with them first because I can give the mother advice. The real healing power is in God. Healing power is the medicine to do good. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

In turn, the certainty or degree to which the beliefs of one particular group became a lens through which all other information was evaluated may be a consequence of two specific factors. The first is the strength of the individual's commitment to a particular group and the second is the frequency by which the individual interacts with other group members (Fine 1979). Both of these factors are demonstrated to some extent by those PHCWs who tended toward a unilateral perspective. For example, some of these participants were pastors of a church and lead the congregation in services every Sunday, while others had recently left initial training where they had been able to mix not only with fellow students but teachers who were regularly providing information pertaining to a biomedical model (see section 7.3.4 of this chapter). In comparison while some of the PHCWs who tended

toward a multilateral perspective would may have also regularly interacted with church and community groups, their commitment to one particular source of information did not appear to be as strong (see section 7.3.5 of this chapter).

Nevertheless, PHCWs could not be cleanly divided between those that did embrace only one particular belief system and those that accepted and utilised information from multiple belief systems. Instead the results suggested a continuum (see Figure 12) whereby the PHCWs toward the unilateral end (approximately fourteen) tended to prefer one belief system to inform their practice methods, while towards the multilateral end PHCWs tended to embrace the benefits of multiple belief systems, as or when they believed appropriate (29). The remaining fifteen participants did not indicate a strong preference for either the use of one particular or alternatively, multiple belief systems.



Unilateral Perspective (Tending to prefer one belief system)

Multilateral Perspective (Tending to accept multiple belief systems)

Figure 12 – A Continuum of Receptivity

The Continuum of Receptivity is based on the suggestion that the more value an individual sees in being associated with a particular group of people, and the more time they spend interacting with that group, the more likely it is that they will tend to embrace a unilateral perspective. That is the individual will be more likely to analyse, judge and interpret information based on the belief system developed by that particular group of people (Ledgerwood & Chaiken 2007). In comparison, the less value an individual sees in being associated with any one particular group, and the more time they spend interacting with a variety of people, the more likely it is that they will tend to adopt a more multilateral perspective, basing their analysis and interpretation of information on a pragmatic assessment of each situation. Individuals who sit towards the multilateral end tend to be more open and even responsive to different ideas, suggestions and information more, and therefore 'receptive' to information based on a wide range of different perspectives.

Nonetheless, individuals cannot be placed definitively at either end of the continuum, as the circumstances of each situation will always influence their judgements. For example, while some PHCWs in this study believed that God had the ultimate power to cure the

sick, they still relied to some extent on biomedically based treatment practices. In addition, even though a PHCW comfortably used a variety of different treatment methods to treat patients, if they believed that a person's illness was due to witchcraft or *sangumu* they immediately called upon the expert in this area.

This raises the question of whether or not there are any individual differences that contribute to an individual tending to strongly associate with a particular group of people. Once again, the attributes and nodes within NVivo were examined to identify anything that could be related with this individual choice. However, apart from the previously mentioned openness toward receiving, incorporating and utilising information from a variety of different sources, there were no other apparent distinguishing factors that separated the participants who tended towards a multilateral perspectives and those that showed a preference for one particular belief system. As is discussed further in chapter nine this is one area that would benefit from further investigation, later.

7.3.7 Summary of Discussion

There was no suggestion that PHCWs deliberately sought to contravene the formally sanctioned belief system by deliberately seeking information outside of the biomedical model. Rather a need to rely on their own particular general knowledge became the vehicle through which other belief systems, including Indigenous health systems and Christianity, were considered and sometimes used to solve patient-centred problems. As a PHCW's general knowledge was developed over time and incorporated not only their own life experiences but also the interactions they had with a variety of people, different sources of information had various opportunities to contribute information pertaining to their own perspective of how patients should be diagnosed and treated. In this way general knowledge could be likened to a continuously evolving picture that is 'constructed from materials provided by others' reports and observations, as well as by one's own direct experience, and memories of previous occurrences' (Wilson, P 1983, p. 9).

In developing this general knowledge portfolio, some participants did, however, show a particular preference for a single belief system while others were happy to at least acknowledge, if not utilise information from various belief systems. Nevertheless, it was impossible to divide PHCWs into one group or another. Even the PHCWs who reported a preference for one particular belief system still utilised diagnostic and treatment practices based on other beliefs. For example, PHCWs who held a strong belief in the power of God to heal the sick also provided treatment in accordance with a biomedical model. Even

PHCWs with a preference for the biomedical model had no choice but to accept that in some circumstances patients would at times utilise Indigenous Knowledge alongside treatment provided at the primary health care facility. Instead the results of this study suggested a Continuum of Receptivity (see Figure 12) whereby some PHCWs at the unilateral end preferred to use one belief system to inform their practice methods, while others at the multilateral end tended to embrace the benefits of multiple belief systems.

The first clue as to why PHCWs may fall into the unilateral or alternatively multilateral end of the continuum came from the interviews with participants who preferred one particular belief system. There was the suggestion that a strong association with one particular reference group may have led to this unilateral perspective. While the rules and regulations imposed by the formal health care sector were not necessarily enforced (see Chapter 5 sections 5.2.2 and 5.2.4), other reference groups may have been more successful in influencing at least the behaviour of some PHCWs. For example PHCWs who were Christians would normally have had a close association with other Christians who could model the behaviour that was considered appropriate by that particular church (Bandura 2003).

In comparison, the PHCWs that tended to embrace a multilateral perspective were more open to and in regular contact with a variety of information sources. In turn, this multilateral perspective may have been reinforced as appropriate because many of the communities in which they worked were likewise comfortable with developing belief systems based on a combination of Christian, Indigenous and biomedical principles (Macfarlane Accepted for Publication in 2009).

The common factor therefore for determining both preference for one, and the acceptance of multiple perspectives, was the strength of association with various sources of information. Those individuals that belonged to or had a strong association with one particular source tended to adopt their belief systems in reflecting on and interpreting all other information. In comparison those individuals who did not associate with any source in particular, did not necessarily recognise the contradictions and conflicts that others saw and were therefore more open to various points of view and the opportunities that multiple belief systems could provide.

However, rather than focusing on reasons why or why not multiple belief systems were embraced it may in fact be more important for information providers to recognise that many PHCWs often move with a relative degree of ease between belief systems in order to solve patient-centred problems. The question therefore that the results discussion chapter will tackle relates to what outcomes can be expected, when multiple belief systems are used to inform the way in which PHCWs diagnose and treat patients.

CHAPTER 8

Results and Discussion – Outcomes

8.1 Introduction

This chapter focuses primarily on outcomes or what PHCWs do with the information they obtain and the knowledge they develop (see Figure 13). On the one hand, because each person develops knowledge using their own unique internal framework, no two outcomes will ever be the same. On the other hand, however, similar responses may result when individuals share a similar context, past experiences or even the same information (Shariq & Vendelo 2006).

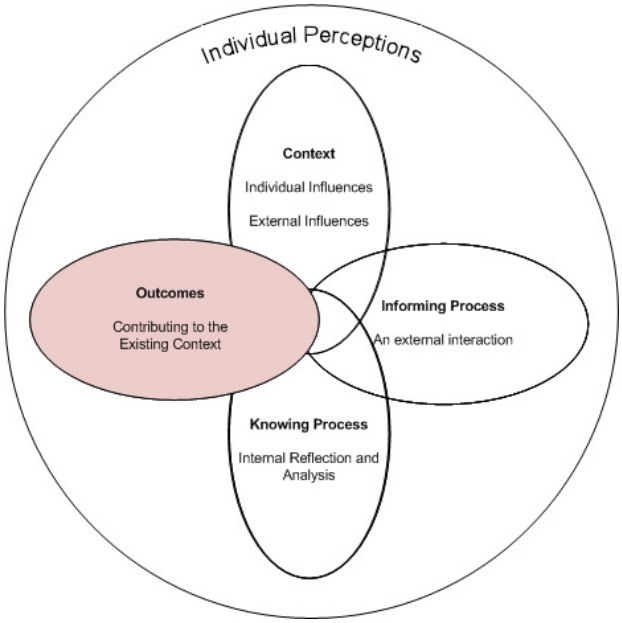


Figure 13 - Human Information Behaviour Framework – Focusing on Outcomes

Earlier chapters addressed how PHCWs operating in PNG, develop knowledge from the information they obtain. Chapter 5 specifically considered the context in which this happens, noting that multiple legitimate belief systems based on a biomedical model, Indigenous Knowledge and/or Christianity play a significant role in informing how health in PNG is understood. While only the biomedical model was formally sanctioned by the PNG government at the time of collecting data for this study, Papua New Guineans also

discussed the use of Indigenous Knowledge as well as Christianity as legitimate ways for treating illness and maintaining well-being. Yet, in some cases the beliefs were incompatible principally because the fundamental beliefs pertaining to Christianity, Indigenous Knowledge and biomedicine upon which many of the belief systems relied, often contradicted each other.

Chapter 6 demonstrated how PHCWs could obtain information about the various belief systems from a range of information sources. For example, the Department of Health disseminated biomedical information, members of local communities were sometimes happy to talk about their Indigenous Knowledge, and church organisations promoted Christianity as a way of helping the sick. However, again the mere fact that potential sources were available did not necessarily mean that information was provided to PHCWs. Instead the willingness of the source, the interest that the PHCW, and the way in which it was provided, all contributed whether or not PHCWs were even able to consider the information.

Chapter 7 then discussed how PHCWs developed knowledge from the information they did obtain. The primary conclusion of this chapter was that half of the participants tended to embrace a multilateral perspective, which led to many PHCWs at least acknowledging if not utilising information from many different sources and not necessarily aware of any contradictions or conflicts that existed. Instead, these participants for the most part appeared to value the increased options that the multiple belief systems provided for diagnosing and treating patients. Three primary and perhaps interconnecting reasons were suggested for this tendency. First, many PHCWs did not demonstrate any strong association with a particular reference group and therefore may have been more willing to listen to other people's points of view. Second, they freely associated with a variety of different sources and therefore were exposed to many different points of view. Lastly, many PHCWs may be comfortable with using information from multiple belief systems because other people in PNG also move easily between perspectives (Bartle 2005, p. 24). There is no reason to think that PHCWs have not also developed a similar open perspective to differing points of view. The concluding remarks in Chapter 7 therefore suggest that compartmentalising or labelling belief systems such as the biomedical model, Indigenous Knowledge or Christianity may hold no particular relevance for Papua New Guineans who appear to be more concerned with the outcomes such as solving patient-centred problems, than how these are achieved.

This chapter addresses the question of how multiple legitimate yet at times conflicting belief systems operate within a formal health care context. Outcomes are not, however, something that can be easily predicted. Even in the most meticulously planned action, there will always be an unknown or unanticipated element affect what actually takes place. Outcomes are never therefore known until they happen (Mead 1974, pp. 177-178) and unexpected surprises or complications often contribute to or affect an individual's intended actions (Mead 1972, p. 25). For example, patients may refuse treatment, resources can run out and infrastructure may break down. All of these are to some extent outside of the PHCW's control.

The findings in this chapter firstly demonstrate the potential for unexpected outcomes by suggesting that the formal health care sector has very little control over the way in which PHCWs diagnose and treat patients. For example, in many of the facilities but particular those in remote Aid Posts, supervisors and managers have little if any contact with staff, and therefore these PHCWs were relatively free to use whatever means they felt were appropriate to solve patient-centred problems. Other reference groups were sometimes more powerful at influencing a PHCWs behaviour. For example, several participants suggested that communities sometimes ostracised a PHCW for not respecting a community's belief system and the Church was reported to use the fear of God to ensure that PHCWs worked within a Christian framework.

This chapter will also demonstrate that the use of multiple legitimate belief systems has the potential for both desirable as well as undesirable outcomes. For example, patients benefited when PHCWs were at least open to their particular viewpoint and appreciated flexible treatment options. For PHCWs, additional points of view also increased treatment options. However, it was also noted that this flexibility concealed to some extent the lack of resources, ongoing training and other supports that should have been available in order for the primary health care sector to operate at a basic level.

The fact that outcomes depend to some extent on resources, supervision or training, demonstrates the key idea behind the Human Information Framework. While for the purposes of this theoretical examination each aspect (see Figure 13) including 'Outcomes' has been treated separately, in practice they are very much interconnected and therefore extremely difficult to separate. For example, while an individual's actions depend on the meaning they develop during the knowing process (Mead 1982a, p. 159; Todd 1999), the knowing process is dependent on both the information the PHCW receives and the context in which they work (Gusfield 2003). In turn, the choices that PHCWs make and the

outcomes that result are experiences from which an individual can gain further knowledge, in addition to potentially altering the context in which they reside and therefore influencing any future outcomes (Olsson 2005).

8.2 Outcomes

Outcomes to some extent depend on the PHCW having the freedom to be able to make a choice about how they will diagnose and treat patients. Freedom to listen, reflect and utilise any of the information they come across; freedom from punishment for not adhering to the organisational requirements and/or rules; and freedom to act as they choose. In some circumstances, PHCWs openly advocated for and used Christian beliefs. Other PHCWs referred to Indigenous health practices in order to treat patients. Whatever belief system or combination of belief systems were used, the operation of the organisational framework associated with the formal health care system permitted these choices to be made.

Freedom however came at a price. Most of the participants suggested that freedom often reflected a lack of organisational support and resources, as well as in some cases additional responsibilities when senior staff were not there to advice the PHCW about difficult treatment decisions (see Chapter 5 section 5.2.2). The price paid by patients on the other hand was that the type and quality of primary health care service often fluctuated between facilities and sometimes even between PHCWs in the same facility. Therefore, freedom became a double-edged sword, with benefits as well as consequences for the PHCW, their patients as well as the formal health care sector.

8.2.1 Outcomes for PHCWs

For every PHCW in this study there were always options for diagnosing and treating patients. On the one hand, they had the biomedical model, even though at times poorly resourced and supported. On the other hand, alternative ways of providing health service, such as Indigenous health practices and Christianity also existed (see Chapter 5 section 5.3.2). The biomedical model, however, was at the time of collecting the data, the only belief system sanctioned for use by the formal health care sector (see Chapter 5 section 5.4.2) and as employees of this organisation PHCWs should have been diagnosing and treating patients in accordance with this belief system (Ministry of Health 2001a).

8.2.1.1 Practicing under a Biomedical Model

Many of the PHCWs in this study, as well as the few supervisors, and managers interviewed, described the formal health care sector in less than glowing terms. They believed that it was not only unable to provide appropriate resources and infrastructure, but had also failed to support and provide the information required in order for PHCWs to practice in accordance with the prescribed biomedical model (see Chapter 5 section 5.2.3).

There was also a sense among many of the participants that the outside world had overtaken them, suggesting two reasons as to why this situation would become more problematic in the future. One was new diseases are being experienced by people in PNG every year; HIV/Aids and new strains of drug resistant malaria being relatively recent editions to this list. Second, they believed that while scientists in the west knew how to treat these things, the information was not getting through to them in PNG. Therefore, their work became more difficult every year, and as a result, lives were being lost.

> What is the latest, we should know. Instead of being left behind like thrown out. Like nobody, we just say, like some treatment we are treating blindly in some of the sicknesses that we face where the treatments have been changed already. [Nurse – Mission Run Health Centre Madang Province.]

Even though most participants recognised that they always had the knowledge developed during their initial training to fall back on, they were also worried that this would be forgotten over time. Many participants described knowledge as an object that could be both obtained and lost.

> For a long time we have come to work, and for many years without going to school and learning and this type of patient doesn't come here. We lose knowledge. So if we go for learning now, for training now, for school now, it will come back. Information will come back. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Some participants in realising they were losing their knowledge, chose to do only what they were comfortable with, steering away from uncertainty. Rather than making a mistake, these participants talked about referring the patient to other facilities when possible, or not doing anything at all just in case.

> You can put it in the book and people can read it, the staff can read it but they will never do it because they are afraid. They don't have the experience and maybe a fear. They say 'no I don't want to do this'. [Nurse – Government Run Health Centre Madang Province.]

When a PHCW considered the patient's condition was not too serious or alternatively a PHCW was able to overcome their fear of trying something new, many participants reported relying on a system of trial and error to find the best treatment for the patient's condition.

> Yes I think going through the medicine and this treatment books, and if they don't respond to one treatment then we have to change the treatment, so that is where the books [come in]. Sometimes we follow our experience and other things. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

Sometimes this method of trial and error led to practices which were not always considered appropriate by their colleagues, but without any support or supervision went unchallenged. Older PHCWs in charge of Aid Posts were often accused of relying on their own interpretation of what they were taught and in so doing changing treatment methods to suit themselves.

Many PHCWs were not confident and therefore worried about what would happen if they did something wrong. They talked about their fear of giving the wrong drug or the wrong amount. They were not so much concerned about their employer punishing them, but instead the retribution that could be sought by patients through the locally administered village court.

> This is one of the problems, a problem area. People already are starting to realise what is happening. I think in other areas people are already suing health workers for wrong treatments. [Nurse – Government Run Sub-Health Centre Eastern Highlands Province.]

For the most part PHCWs in this study reported that their battle to practice biomedicine using sometimes inappropriate information or no information at all left them feeling inadequate, anxious and abandoned (see Chapter section 5.2.6). PHCWs, however, were either forced to use the biomedical model knowing that if things went wrong the patients or local community members may seek retribution, or alternatively identify another way of solving patient-centred problems.

8.2.1.2 Using Alternative Health Practices

There is no doubt that one of the benefits of using alternative belief systems such as Indigenous health practices and/or Christianity was that it provided PHCWs with more options for treating patients, given the lack of resources and infrastructure (see Chapter 5 section 5.2.3), biomedical information (see Chapter 6 section 6.3.3) and support from senior managers (see Chapter 5 section 5.2.4).

A couple of PHCWs therefore believed they had very little option, other than to improvise with alternative practices. In particular, the data provided many examples of cases where treatments based on Indigenous Knowledge took the place of biomedical practices simply because resources were not available.

> While waiting for stock to comes in we improvise. We ask mothers to bring in things or we use what we know. Some things that people from the village know we also use here. [Nurse – Mission Run Health Centre Madang Province.]

At other times, Indigenous Knowledge or Christian beliefs were simply used because the PHCW believed it was the appropriate or right thing to do. Primarily, their decision to use an alternative belief system in these cases came about for two reasons. Either they believed that the biomedical model could not solve the particular situation, for example, when the illness was caused by witchcraft, or because they believed the alternative belief systems provided as good if not better treatment options.

> Herbs are very useful in the remote areas. I have seen it, and I believe it helps. It can help a lot of people. Like the fellow with pneumonia. [CHW – Government Run Aid Post East Sepik Province.]

Therefore, the outcomes for PHCWs who obtained and reflected upon a variety of information developed within multiple belief systems was twofold. On one hand the lack of information about and support for the biomedical model left them feeling abandoned and unsure. On the other hand, the freedom to consider and use information based on alternative belief systems provided opportunities to consider and sometimes use alternative diagnostic and treatment options.

8.2.2 Outcomes for Patients

Although this study did not interview any patients or potential users of the primary health care system, the participating PHCWs provided the following thoughts from their own perspective as to how the use of multiple belief systems affected patients who sought treatment through the primary health care system.

8.2.2.1 A Reduced Quality of Biomedical Services

Ultimately, most of the participants in this study agreed that because of not receiving up to date information about and support for practicing in accordance with the biomedical model, they did not develop the skills and knowledge required to provide a quality health service. In turn, the lives of patients were put at risk.

> We are going to spoil people's life. Short courses like this we can learn something that we can come back and help people here. That is what I think. That's the problem I think we have throughout these communities here, especially the health workers. [CHW – Government Run Health Centre Eastern Highlands Province.]

Some participants in this study believed that this lack of understanding had already resulted in mistakes and incorrect patient care choices being made.

> So it is very dangerous when sometimes we don't give them the proper treatment. So this is what happens. So Educational Level is very very involved. [Nurse – Government Run Sub-Health Centre Eastern Sepik Province.]

8.2.2.2 Increased Treatment Options

However, at the same time, a benefit for the people of PNG who still had some connection with one of the many Indigenous belief systems was that those PHCWs who tended to at least acknowledge the benefits of multiple belief systems were often empathetic if not willing to consider alternative treatment options.

> So most of the herbs are used in the remote areas. Where there is no services provided. But the area where there is services provided they want things to help them like drugs. I can see a lot of people at [name of hospital removed]. [CHW – Government Run Aid Post East Sepik Province.]

Likewise, those community members who had a strong association with a Church may also have experienced the same type of empathy and willingness to include their belief systems into the way that they were treated at a health care facility.

> There are many Christians, most people are Christians. When you come down to the plantation there is one church …. Many churches close to each other…… We pray with these people. Help them. [CHW – Mission Run Sub-Health Centre Eastern Highlands Province.]

Therefore, while the patients were on one hand not always receiving the best possible biomedical care, the additional benefits of allowing the majority of PHCWs the freedom to practice as they chose, meant that it was possible for them to consider the patient's belief systems in deciding how to diagnose and treat their conditions.

8.2.3 Outcomes for the Formal Health Care System

The news, however, is not quite so good for the formal health care sector that sanctions the use of practices based on the biomedical model in their primary health care facilities. The findings of this study suggested that PHCWs have been complimenting and sometimes replacing biomedicine with alternative belief systems (refer section 8.2.2 of this chapter). One reason this may have occurred according to many of the participants in this study, is that no one was there to stop it.

8.2.3.1 Directives, Rules and Guidelines Not Adhered To

All of the supervisors as well as many of the PHCWs interviewed for this study noted that directives from senior members of the Department of Health were often ignored or only partially implemented. In particular, many of the participants said that they were not aware of what was in the National Health Plan, often did not receive any of the circulars that were sent around from time to time, and had never received a job description of any sort. While information may have been produced, it did not always filter down to the facility level. This may be because the PHCWs rarely found out about these requests. Only a small number of middle managers ever visited the facilities and just a few facilities had a radio that could be used to send messages (see Chapter 5 section 5.2.4).

> So this is the breakdown [in providing information], the major cause of the breakdown, the decentralisation to the districts, and the financial power is being taken away from the Provincial Health. So nobody, those people there, they don't know what they are doing. I mean it is not their fault. [Manager – Provincial Level.]

Nonetheless, while certain types of information such as the National Health Plan did not filter through to PHCWs, all of the participants were aware of the requirement to refer to and treat patients in accordance with the STMs through their initial training. Yet, still the STMs were not always used (see Chapter 6 section 6.2.2) and participants reported that no one outside of their facility every attempted to reinforce their use. Supervision from senior health professionals was at best sporadic depending to some extent on the facility as well as the individual PHCW.

> Yeah I think we have a program manager for health, for that I think he should come maybe monthly because we have staff problems and shortage of drugs and this and that and all sorts of things pop up in the middle. [Nurse – Government Run Health Centre Madang Province.]

This inability to reinforce the organisational rules did not just apply to how patients were diagnosed and treated. High absentee rates and the misuse of resources and infrastructure were other examples of how infrequently rules and regulations were policed and therefore reinforced.

> And when I arrived the fridge was not there, and the nurses told me it was in the bosses house. That is a common problem from the government run health services. [Nurse – Mission Run Health Centre Madang Province.]

A number of participants did however note one glaring exception to this situation. Some health centres run by churches appeared to have a tighter control over the actions of their staff. As previously discussed, the officers in charge of these particular facilities tended to

have far more autonomy and power in comparison to those people running government facilities (see Chapter 5 section 5.3.2).

8.2.3.2 Complacency

While most of the PHCWs in the majority of primary health care centres visited were upset about not receiving visits from supervisors, not being provided with ongoing professional development training and not having adequate resources and infrastructure, their expectations for improvement were on the whole quite low.

> Nobody comes and gives me, share ideas on what's new coming out at the health department, or health department is giving out. So I find it hard to communicate to know or learn new things. That is the big problem. [CHW – Government Run Aid Post Madang Province.]

The lack of support and guidance in many facilities led to feelings of disillusionment. A few participants gave this as a primary reason for needing to learn and maintain their knowledge about alternative belief systems. They felt that as the formal health care sector continued to decline, resources would become harder to find and the use of alternative methods particularly some forms of Indigenous health practices would need to be used.

> But when there is a shortage [of drugs or other supplies] here, then people start to look for treatment, help themselves. Sometimes, some can use their own, all this herbs these traditional medicine. [CHW – Government Run Aid Post East Sepik Province.]

8.2.4 Summary of Results

While the formal health care system may be neglecting some of its workers, the use of multiple belief systems did provide them with some support. Primarily this was by way of providing additional treatment options. However, the use of multiple belief systems could also result in both positive and negative outcomes for PHCWs and their patients. Despite the fact that PHCWs were often hampered by insufficient resources and support, they were also given a great degree of freedom to choose the belief system that they thought was most appropriate. According to the PHCWs in this study, while patients may not always have received the best quality of care under a biomedical model, the freedom that a PHCW had allowed them to consider the wishes of the patient and even incorporate other belief systems as required into treatment options.

8.3 Freedom to Choose

PHCWs in PNG cannot therefore be seen as merely practicing solely biomedicine but instead they obtain information from, develop knowledge about and utilise a variety of belief systems in order to solve patient-centred problems. This to some extent, this contradicts the findings of other studies that suggest a dichotomy between the Papua New Guinean community who use various belief systems to treat illness and maintain well-being; and the PHCW who adhere to a biomedical model (Macfarlane 2005, Accepted for Publication in 2009). However, while participants noted the benefits of working with multiple belief systems such as increased diagnostic and treatment options, there were also some disadvantages. One primary example is that patients may not have been receiving all of the benefits that biomedicine could offer. Nonetheless, the use of multiple belief systems in some parts of the primary health care sector has become quite acceptable, and therefore it may not be possible nor would many Papua New Guineans necessarily wish to see, alternative practices restricted or banned altogether in favour of a purely biomedical model.

8.3.1 Limitations of the Formal System

One reason that multiple belief systems could be used by PHCWs was that the formal health care system did not always reinforce the use of the biomedical model. This statement is not intended to imply or lay blame on any particular individual or group as it is fully recognised that there are many reasons why resources, supervision and support, particularly to Aid Posts in remote areas are not always possible. Nevertheless, deficiencies may have contributed toward to information from and knowledge about alternative belief systems being utilised.

8.3.1.1 Authority

While the internally centred knowing process may never be controlled by another person, the consequences of the application of that knowledge in a social situation can be to some extent influenced by external parties (Giddens 1984, p. 283). Therefore, although it may have been difficult to prevent PHCWs obtaining information and developing knowledge pertaining to multiple belief system, a certain degree of freedom was needed before they could apply the knowledge they had developed.

One way of reducing a person's freedom is through the imposition of rules and regulations, whereby one party has the power to control another person's actions (Blumer 1954). The emphasis here is on the ability to 'control, dominate, persuade, [and/or] manipulate' (Prus

1995 cited in Hall, P 1997, p. 404). There are two ways a person can do this. First, they must either be in a position of authority, whereby the power they wheeled is generally supported by others and socially accepted. Alternatively, they need to be in control of scarce resources including money, equipment or information that can be used as an incentive to motivate or encourage others to act in a particular way (Newcomb, Turner & Converse 1975, p. 484; O'Sullivan et al. 1994, p. 236).

While there was no indication that scarce resources were ever used to persuade PHCWs to conform to rules or regulations the supervisors of some church-run facilities were particularly successful in using their authority to impose certain rules and regulations. The reason for their success may possibly stem from the fact that they were given a greater degree of autonomy to run the facility (see 5.3.2). Using this authority, these supervisors were able to take any action they thought necessarily including suspending or even dismissing staff to ensure that their rules were adhered to. In this sense authority is not so much an end point that is reached but instead develops though actions of and interactions between the individuals concerned (Hallet & Ventresca 2006).

Yet, many of the participants suggested that supervisors of government facility did not have this same degree of authority. If they were not satisfied with the performance of a staff member the only thing they could do was to put a case forward to their managers asking for a punishment to be imposed.

> When you see the reports the churches actually do a better job than the government. One will based on supervision and one other underlying force is the discipline the staff from the churches is you know, the manager or whoever is looking after it has the power to and fire on the spot, whereas in the government system is very, what is the term, there is a lot obstacles. [Manager – Provincial Level.]

At a district or provincial level, communication between the management on one side and the PHCWs on the other appeared to exacerbate further any attempt to impose any degree of authority. Participants in this study reported that in many cases little if any interaction occurred between themselves and managers external to their facility. This perception supported by the findings of the Annual Health Sector Review which noted that less than 49 per cent of health centres and very few Aid Posts had received even one visit from an external manager during 2007 (Monitoring and Research Branch 2007). A lack of direct communication may have affected the ability of managers to ensure that rules and regulations were adhered in two ways. First, communication has a 'ritualstic' (Mosse & Nielsen 2004, p. 1) role to play in organisational life. As individuals interact with other employees they reaffirm not only they membership but also their position within society

(Carey 1989, p. 18). Without regular communication or any sort of contact with their external managers, in the eyes of the PHCWs concerned, the organisation stopped at the facility level and the rules and regulations suggested by people outside of the facility may have been of little interest.

Second, there is also practical aspect to communication (Carey 1989, p. 15; Mosse & Nielsen 2004). By not visiting the primary health care facilities and talking directly to staff, external managers gave up any ability they might have had to control the behaviour of PHCWs. A lack of communication means that managers are unable to provide information on or remind staff about the need to follow the rules and regulations of the organisation. In addition, managers who do not interact with their staff loose the opportunity to reward acceptable and/or even punish deviant behaviour (Hechter 1984; David Luckenbill cited in Hall, P 1997).

This is not to imply however that rules and regulations were not followed because PHCWs were unaware of their existence. Nor is it implied that they were in any way they were deliberately flaunted. Instead, for some participants the use of multiple belief systems became the norm, rather than an unusual event (Coleman, JS 1990, p. 258; MacLean 2008). Both the continued lack of support required for the implementation of a purely biomedical model (see Chapter 5 section 5.2.4), together with a lack of resources (see Chapter 5 section 5.2.3) and the acceptance by some PHCWs that alternative practices can be beneficial (see Chapter 7 section 7.3.5.2) may have contributed to this outcome. Therefore, despite being taught otherwise during initial training, PHCWs are given the freedom to and in some cases perceive benefits from using multiple belief systems (Coleman, JW 1995).

8.3.1.2 Rule Effectiveness

Yet even in those church-run facilities where supervisors have the authority to impose controls, there was no evidence to suggest that one standard set of practices existed. For example, some PHCWs in these facilities were particularly keen on introducing a Christian perspective to solving patient-centred problems while others stuck primarily to the biomedical model. And in some cases limited use of Indigenous health practices, particularly those relating to herbs was apparent. Even imposed and monitored rules therefore cannot be thought of as stable entities that will guarantee standardisation throughout the organisation. Instead, a rule is also a form of information that may be analysed and reflected upon by an individual prior to application. While managers can

potentially guide behaviour through rewards and punishments, rules are still therefore very much open to interpretation and are often changed or adjusted as individuals interpret their meaning (Whiteley 2006).

Another reason that the imposition of rules may not necessarily result in the provision of a standardised health care system, is that the patients themselves also demonstrated their type of freedom. Many of the participants in this study described how patients actively made choices about when and what type of treatment they would seek, dependent upon many variables including how they were treated. At times therefore, patients chose not to utilise a health service where their personal belief systems were not at least acknowledged and treated with respect.

> Sometimes, some can use their own, all this herbs these traditional medicine, but as we have mentioned, it depends on how we help them. [CHW – Government Run Aid Post East Sepik.]

To some extent, the formal health care system could therefore be said to be its own worst enemy in terms of not providing the resources or support required to ensure biomedical practices are followed. The breadth of freedom that these PHCWs had to interpret and apply the rules as they saw fit meant that there was very little hope of establishing a set of standardised procedures across the primary health care sector. Either because they had few other options or because they believed it to be appropriate, the acknowledgment and even use of alternative practices was a normal practice in many of the facilities included in this study. However, the formal health care system is not in itself solely responsible for the use of alternative belief systems. Other sources including community and church groups as discussed in Chapter 6 (see section 6.3.3) have proved particularly capable of providing information on and even promoting alternative diagnostic and treatment practices to PHCWs.

8.3.2 Possibilities and Opportunities

Previously studies have tended to depict PHCWs as an epitome of the biomedical model, assuming that they would naturally dismiss all other contradicting beliefs. For example one study conducted in PNG warns against some PHCWs, ‘compet[ing] with traditional healers’ (Lepowsky 1990, p. 1060), assuming that they had turned their backs on any type of Indigenous belief. Another PNG study (Koczberski & Curry 1999) assumes that PHCWs only promote a biomedical model, and asks the question - why are traditional medicines still widely used when PHCWs spend so much time educating the population about western medicine? A final example (Alto 1996)suggests that PHCWs in PNG are

cut off from some community members because primary health care refuses to acknowledge and embrace Indigenous health practices (see also Holdsworth 1975; Young, MW 1981). The PHCWs at the Multilateral end of the continuum, who listened to and utilised the information from various sources were in some way breaking free of this ill defined PHCW role. Rather than taking their cues as to how their role should be performed from one particular reference group (Hill et al. 2007, p. 72), instead they were able to explore and incorporate the expectations of various groups (Gergen 1991, pp. 15-16), including those of their local community and/or church. This provided the degree of flexibility that PHCWs needed to deal with the wishes of their patients and also the various environmental difficulties with which they were faced.

8.3.2.1 Multiple Options

In some sense, the introduction of biomedicine contributed to the variety of different treatment options in PNG today. First, as countries like PNG were colonised, people started to move away from traditional societies that tended to be far more socially controlled to urban centres where they were faced with more options and a greater sense of freedom (Dei, Hall & Rosenberg 2000). In some ways colonisation provided a kind of freedom that was not present in a village environment. Second, colonisation also brought with it very different perspectives on life including those based on western science and religion. That is not, however, to suggest that Papua New Guineans gave up their traditional roots altogether, neither were they isolated from these different points of view (Giddens 2001, pp. 30 & 37). While colonisation reduced social controls, it also increased the types of information available to people.

The greater the number of perspectives anyone has the chance to consider, the more options they have for solving problems (Guilford 1984; Wang, Dogan & Lin 2006). Multiple ways of looking at the same problem need not be threatening to the individual concerned but instead can provide opportunities that may not have previously been considered (Carr & Borkowski 1987). Rather than necessarily having one set of beliefs by which everything is judged, previous research has shown that individuals are capable of and do simultaneously hold many sometimes conflicting points of view (Baldwin & Holmes 1987; Wicklund 1999; Wicklund & Brehm 2004). Papua New Guineans are perfectly capable of embracing Christianity while still adhering to their Indigenous spiritual beliefs (Bartle 2005, p. 16). Further, as has been demonstrated by this study, many PHCWs have also demonstrated to accept and utilise information based on multiple yet sometimes conflicting belief systems, to treat patients (see Chapter 7 section 7.3.5).

In particular, two individual characteristics in particular may contribute to how comfortable a person is in accepting what may seem to be conflicting ideas. The first factor pertains to the idea of 'security (Wicklund & Brehm 2004, p. 358) and suggests that the more secure a person feels in their own abilities the more likely they are to want to explore different concepts, thereby expanding the knowledge they have about a particular issue.

The second factor that may encourage the individual to accept conflicting viewpoints is the idea of ownership (Wicklund & Brehm 2004, p. 359). If an individual not only considers information but also analyses it, reflects on it and incorporates it into their general knowledge portfolio, they may feel that they own those views. In turn, this sense of ownership is believed to be stronger than any need to mitigate or minimise conflict. There are of course many examples in this study where a PHCW's general knowledge portfolio consisted of what would appear to some to be contradictory or even conflicting ideas (see Chapter 7 section 7.3.5), which suggests that in addition to 'owning' these viewpoints they also were particularly comfortable with their own abilities as PHCWs.

8.3.2.2 Negotiating Options

While additional viewpoints may add to the available options, individuals will usually still have to negotiate their use in any given situation (Fine 2001). In the case of treatment options, this negotiation process involved the PHCW concerned as they thought about, compared and contrasted the various treatment alternatives. However, the opinions, wishes and understandings of other people including colleagues as well as patients may have also been considered (Blumer 1966). In addition previously established or developed ideas about what is considered acceptable may influence or suggest how this negotiation process should proceed (Pruitt & Carnevale 1993, Chapter 8). For example, because PHCWs were seen by many in the community to be educated professionals, their patients tended to defer primarily to whatever they felt was best. In comparison, where the patient was a village leader and used to imposing their ideas upon all community members, the PHCW may have been expected to at least listen to, if not consider what they had to say.

> If the leaders have some, I mean if they don't cooperate together with the health workers. If they have some dispute or some bad feelings about a particular health workers, that is when the community looses interest. [Manager – District Level.]

PHCWs at the Multilateral end of the Continuum of Receptivity who were relatively flexible in their approach to and use of multiple belief systems (see Chapter 7 section 7.3.5) may also have been more willing and able to negotiate an outcome that respected the

opinions of others. Many of the participants in this study demonstrated an ability to not only consider but also respect the beliefs of others, negotiating rather than impose outcomes. In these types of circumstances, the final decision is more likely to be mutually developed and agreed upon by both parties (Horne 2001).

> They know I am a health worker so I have to go in there. So I ask the relative, the husband of the woman and I was permitted to get into the delivery room and I did the massage of the abdomen and the bleeding was able to slow down. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

In comparison, it is possible that those PHCWs at the Unilateral end of the continuum may have been less inclined to listen to or even respect the opinions and ideas of others. While in the minority, these PHCWs tended to exhibit more of a paternalistic attitude. They often spoke about doing what they believed was 'right', no matter what the patient wanted. This in turn may have turned some patients away.

> We educate them [patients] more, but we don't know why. Some they do, but some they don't [get what we tell them]. They don't care about their kids, lives or their lives. We talk and talk and sometimes we feel like we must give up. That is quite useless. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Unlike the formal health care system which rarely imposed sanctions for not listening to supervisors or abiding by the rules and regulations, sometimes dismissing other belief systems came at a cost. A couple of participants in particular suggested that penalties were sometimes imposed by community or even church groups to encourage a respect for their particular belief system. For example a study based in the Central Province of PNG (Owen 2004; Owen & Urai 2004) found that one particular church 'banned' any person involved in sorcery from attending services. However, penalties of sort could also be imposed community groups if they were not happy with the PHCW's actions.

> If they [the community] have some dispute or some bad feelings about a particular health workers, that is when the community looses interest. Because a leader has to be more supportive and give advice and get the people to participate in the health facility, in the health activities like programs. [Manager – District Level.]

In order to avoid some sort of punishment in these circumstances, individuals often feel pressured into doing something they may be altogether comfortable with (Hechter 1984; Coleman, JS 1990, pp. 242-243). However, the degree of pressure that can be applied and any outcomes are to some extent based on the individuals own perceptions and beliefs. It is possible to apply pressure with no result. PHCWs, for example, may not have necessarily been worried about being ostracised from parts of the community or not allowed to go to a church service if they did not value their membership of such groups. If a person does not accept the authority of the group to impose a punishment or, alternatively

does not perceive something to be a punishment then these types of actions will have little or no affect on behaviour (Horne 2001).

In turn, how likely an individual is to acknowledge and utilise the belief system may depend on how much they want to be accepted by people (Shibutani 1955). Once again, this refers to the idea of reference groups and to some extent rewards that a person may feel they gain from being accepted by particular individuals. If a PHCW truly wants to be accepted by a community then they may be more likely to acknowledge the belief systems that have developed. Likewise, if they see a benefit in belonging to a church, they are more likely to accept and act in accordance with certain Christian teachings. In this way, appropriate behaviour brings its own particular rewards (Therborn 2002).

8.3.2.3 Change at a National Level

Belief systems however change over time (Giddens 2001, pp. 40-43). To some extent, in PNG this appears to have come about through the very fact that multiple belief systems exist. For example, the introduction of a biomedical model has challenged the efficacy of Indigenous health practices, and has made a considerable contribution to the way in which illnesses is treated in PNG. However, the existence of alternative belief systems such as Indigenous health practices and/or Christianity has also changed the way in which biomedical services are provided.

One dramatic example was the recent recognition of some Indigenous health practices by the formal health care system. Stemming from suggestions made by the WHO that Indigenous Knowledge should be incorporated into primary health care (International Conference on Primary Health Care 1978; World Health Organization 2005b, p. iii) a workshop was held in 2004 by the Department of Health, to discuss the development of a traditional medicines policy (Pep 2004). This National Policy on Traditional Medicine, which was ratified in June 2007, recognises the benefits that may be realised from the use primarily of herbal remedies (Department of Health Papua New Guinea 2007).

However, this policy specifically does not condone the use of witchcraft and other forms of spiritual practices. This is despite the fact that spiritual practices are often intricately bound to the concepts of illness and well-being in many parts of PNG (Owen 2004; Owen & Urai 2004). In fact the formal health care sector is very adamant that not only sorcery and witchcraft are harmful and wrong but also practices including ‘divination, dream interpretation or related visions will not be recognised’ (Department of Health Papua New Guinea 2007, p. 7).

Already the National Policy on Traditional Medicine (Department of Health Papua New Guinea 2007) has segregated Indigenous health beliefs into two categories. While the use of herbs by traditional healers has been elevated in status, spirituality as a means to solve patient-centred problems has been demonised. Whether or not this new policy is accepted will depend firstly on whether the various individuals and communities as a whole hear about or obtain access to the policy. Second, however, just like other forms of information, the actions of these individuals will be based to a large degree on the knowing process that is how they personally analyse, reflect upon and judge this information (Blumer 1969, p. 5).

While it is unlikely that any of the participants in this study would have been involved in or even have known about the development of this policy on traditional medicine at the time they were interviewed, some did express a desire for Indigenous Knowledge to be incorporated into the primary health care in PNG. One participant who supported the use of Indigenous health practices for example attempted to persuade the researcher that a scientist should be sent to investigate formally the efficacy of herbs and spiritual practices used in their area.

> Yeah, so some of them in here ask us if they can teach us how to do herbal medicine so we could also use in the hospital but most of us think like unless there is confirmation on what was done. If there is a proof of what had been done then we would take you to work together here and concentrate on the area where the antibiotic cannot do [anything], then you can use herbs because you have proven [the validity of the herbs] yourselves. [CHW – Government Run Aid Post East Sepik Province.]

The newly developed National Policy on Traditional Medicine (Department of Health Papua New Guinea 2007) as well as the participants who advocated for Indigenous health practices to be investigated could be responding to a fear of losing a valuable asset. There is no doubt that in many areas village elders who are the traditional keepers of Indigenous Knowledge are not able and in some cases may be unwilling to pass on the information they have to the next generation. In addition, both the introduction of the biomedical model as well as the influence of some churches who have denounced the use of Indigenous Knowledge has led to a reduction in the use of these types of practices (Owen 2004; Owen & Urai 2004).

It appears that in being acknowledged by the formal health care sector, Indigenous health practices are changing. First, as mentioned above they will be separated into parts that are acceptable such as herbal remedies and parts that are not such as witchcraft. Second, prior to acceptance by the scientific community, they will need to go through a process of

rigorous evaluation and testing. Western researchers (Richards, P 1980; Chan & Costa 2005; McDowell et al. 2005) as well as the WHO (2005b) have already called for Indigenous Knowledge to be validated through these scientific methods. However, scientific validation is not a part of Indigenous Knowledge and the question has therefore been asked; Why should western science be 'the ultimate arbiter of knowledge'? (Agrawal 2004, p. 5; Lor & Britz 2004).

8.3.2.4 Change at a Local Level

Change is not confined to the development of policies at a national level but often occurs in much more subtle ways through individual actions (Blumer 1969, pp. 17-18). For example, when participants used several belief systems simultaneously, sometimes either or both the original belief systems needed to change ever so slightly. In some sense, the outcome was a mixture or combination of various belief systems. For example this particular PHCW combined an Indigenous belief that babies should be carried as much as possible within the traditional *billum* or bag, with a clinically defined illness even though it was not something that is either in the STMs or is taught during initial training.

> Mothers they carry their babies in the billum, they don't get sick. A few others they put them in the laplap or what, they carry them round and they get sick because they breathe the dust easily, and when cold airs come, when they come or what, they don't get it, because it comes and goes through the billum. This we know. It is something that our mothers taught us. Carry your baby in a billum and it will be safe. So they won't catch it quick. But when you are carrying them, on your hand like they are breathing in dust. Any cold that comes they just get it, and pneumonia develops. [CHW – Government Run Sub-Health Centre Eastern Highlands Province.]

Permutations also came about because of a need to overcome difficulties with using one particular belief system, as in the case of this PHCW who reported being forced to improvise, when resources within their facility were simply not available.

> Most of the nursing sisters, health facilities here in [name of area removed], they don't have much equipment, plenty of drugs, the treatment we would use on the patients, the right kind of treatment. Also we just, we just attend to patients using, improvising things. [Nurse – Government Run Health Centre Eastern Highlands Province.]

Participants also noted that changes occurred when CHWs were left to practice by themselves in remote Aid Posts.

> In the Aid Posts you will find some old CHWs, men they don't go through these books. They just, I don't know how they treat their patients in the remote areas, all these APOs. [CHW – Mission Run Health Centre Madang Province.]

Any of these newly developed or redesigned actions if successful and acceptable may in turn become another option that could be used by the individual who developed them, in the future. Broad dissemination and acceptance of new ideas does not however automatically take place. The likelihood of other PHCWs considering new ideas to some extent relies on who has already embraced the change, what rewards and/or punishments are in place to encourage its use, and how well it fits with already existing social norms of practice (Hechter & Opp 2001). For example, if a PHCW heard about a herb that was being used to relieve symptoms of the common cold they may have been more inclined consider the information if more than one person supported its application. Uptake may also depend on whether or not an individual is likely to be punished or rewarded for using it (Therborn 2002) and lastly people may be more be ready to consider new ideas if they are similar to what is already in use (Illeris 2004, pp. 29-31).

To some extent all of the various parties who interacted within the health care system influenced and in turn were influenced by these types of changes. Members of the formal health care sector for example were able to develop and implement policies that in the future PHCWs may need to follow. However, adherence is not automatic and the success of these policies depends to some extent on the corporation and goodwill of not only the PHCWs but also other stakeholders such as the patients involved who always have the option of refusing treatment. Therefore, changes like rules are not something that can necessarily be strictly and rigidly imposed (Whiteley 2006), particularly when support and supervision is at best inconsistently applied. However, the PHCW who successfully redesigns or combines various different ideas or methods for treating patients may not only provide additional options for them but without any conscious intention change the way that other PHCWs think or act in the future. As they talk about the new ideas, word spreads and gradually practices change.

8.3.3 Summary of Discussion

First and foremost the relatively high degree of freedom that many of the PHCWs in this study enjoyed allowed them the choice of treatment options. While no doubt inadvertently provided, this freedom came from the fact that the formal health care sector was unable to ensure that the rules and regulations they developed were implemented. While it is not the intention of this study to criticise the organisation that operates under particularly difficult circumstances, it is important to take note of two things that have contributed to this freedom that PHCWs in PNG enjoy. First, supervisors, particularly those in government facilities were not provided with the authority to control the behaviour of their staff.

Second, there was very little interaction between external managers and the facilities they were responsible for which meant that not only did the PHCW not see themselves as belonging to the larger organisation but they were also often left without the direction of senior managers.

By comparison, some communities and church groups were very successful in influencing the behaviour of some of the PHCWs. Through various types of rewards and/or punishment, some participants described how the community could control a person's behaviour. However, to some extent this power also depended on whether or not the individual valued what was being either offered or denied. Therefore, if a PHCW was not a Christian, ostracising them from the church for not complying with Christian principles may have had little effect.

One of the primary outcomes resulting from the use of multiple belief systems was that health practices were changing. At a national level for example the PNG Department of Health has recently formally recognised the benefits of some Indigenous Knowledge. However, despite the fact that often the very basic principle of these belief systems is the holistic principle of a physical and spiritual harmony, the new National Policy on Traditional Medicine separates these two halves. In addition, there appears to be a tendency to 'westernise' the Indigenous Knowledge by ensuring that it is validated in accordance with western scientific principles.

However, change has also occurred at more of a grass root level. The mere fact that multiple belief systems exist in the same environment has led to small differences. For example, some people have interpreted Christian principles and biomedicine through an Indigenous lens and sometimes belief systems have been altered in some small way in order that they may be used simultaneously with another belief. These changes in turn will become the new context through which information will be obtained, reflected upon and utilised in order to solve patient-centred problems in the future.

Together with the previous three results and discussion chapters, the above discussions demonstrate that multiple belief systems are very much a part of not only Papua New Guinean society as a whole but also inform the way the PHCWs in PNG solve patient-centred problems. In particular:

- Chapter 5 found that while only one was officially sanctioned by the formal health care sector, there were many other belief systems that were considered legitimate by at least parts of the society in which PHCWs worked. However,

just because they operated within the same context did not mean that all of the belief systems were necessarily compatible. In particular, the beliefs pertaining to Indigenous Knowledge, Christianity and biomedicine often contradicted each other, and yet in some cases three were used by communities to inform their understanding of health and treatment of illness.

- Chapter 6 in turn discussed how PHCWs were able to obtain information pertaining to these belief systems from various sources. Nevertheless, simply making information available did not necessarily equate to it also being accessible. Instead, the findings suggested that issues pertaining to the sources willingness to provide information, the PHCWs interest in obtaining it, as well as the way in which it was communicated all contributed to whether or not it was ever considered by PHCWs.
- Chapter 7 began by discussing the information that was considered, but instead of examining the external interactions it considered the internally focused knowing process demonstrating how information was analysed, interpreted and reflected upon in order to develop a general knowledge portfolio. While findings from this study suggested that a quarter of PHCWs in developing this portfolio tended to prefer one belief system above all others, half of the participants were more receptive to acknowledging if not utilising the benefits of multiple perspectives. Rather than being confused or stressed by having to cope with potentially conflicting beliefs, these PHCWs saw the use of multiple belief systems as a way of creating additional opportunities for solving patient-centred problems.
- The key finding of this final chapter was that the freedom experienced by many PHCWs contributed to their ability to choose between various treatment practices. However, this in turn became a double edged sword. For many PHCWs, freedom also meant that they were left unsupported by their organisation. For patients, it meant that while many PHCWs may not have completely dismissed alternative treatments they wanted to try, the standards pertaining to the provision of at least biomedical treatments varied considerably between facilities.

The final chapter will now discuss these findings in more detail, focusing specifically on how they contribute to the existing information behaviour and health management theory. In addition, recommendations for further research and health management practitioners will also be presented.

CHAPTER 9

Conclusion

9.1 Introduction

PHCWs in PNG operate within a particularly complex environment in which multiple legitimate yet sometimes contradictory belief systems come together to inform the way in which people understand health and well-being. While only the biomedical model is officially sanctioned by the formal health care sector, Christianity and Indigenous Knowledge are also considered by some participants to provide legitimate treatment options. Even when these belief systems contradicted each other, not everyone saw the need to make a conscious choice between them.

The study investigated how PHCWs in such a complex context engage with information. In particular, it identified how they obtained information pertaining to each of the belief systems, then developed knowledge from and coped with the contradictions that sometimes arose. In addition, it also explored the outcomes that were realised, when information based on a variety of different belief systems was made available.

This final chapter begins by reconsidering the original purpose of the study and the methodological principals that oversaw the data collection, analysis and interpretation processes. The key findings are then summarised and the study's contribution to theory discussed. Finally, this chapter concludes with recommendations both for further research, as well as practical suggestions for those involved in providing information to health workers in developing countries.

9.2 Research Question and Purpose

The study set out to explore how PHCWs in PNG engage with and utilise information pertaining to their role in health care delivery. The question was left intentionally broad and as is appropriate in this type of qualitative ethnographic research there was no predefined hypothesis, propositions or assumptions. Instead the specific direction of and findings from the study emerged from the data as it was collected, analysed and

interpreted. This study therefore adhered to the perspective that qualitative research need not 'begin from a predetermined starting point or proceed through a fixed sequence of steps' (Maxwell 2005, p. 3) but instead it is a process whereby the literature, principles and data continually interact together to inform the findings.

Recent research and reports published by global organisations such as the WHO triggered the impetus for this study. This literature suggested that there was substantial investment being made in the provision of information to health workers in developing countries (World Health Organization 2008). Yet in contrast, the health of people in developing countries such as PNG was if anything declining, to the extent that PNG in particular has recently been classified under the label of least developed nation (United Nations 2006).

While previous medical research has sought to address why the provision of health information to developing countries has not always resulted in a corresponding increase in the quality of health services, it has primarily focused on the transfer of information developed within a biomedical paradigm (Ashwell & Freeman 1995; Kafuko, Zirabamuzaale & Bagenda 1996; Hadi 2003; McMichael, Waters & Volmink 2005; Rowe, SY et al. 2007; Martis, Ho & Crowther 2008). Likewise, because much of the research pertaining to human information behaviour theory has been conducted in contexts dominated by the biomedical model, it too has failed to appropriately address how multiple belief systems affect an individual's information behaviour (Wakeham 1992; Urquhart 1998; Gorman et al. 2002; McKenzie 2006).

Dawson and Chapman (2001) first flagged the possibility of and the need for further research into how multiple reference groups and their various belief systems may affect the individual's choice and use of information. Regretfully, from the viewpoint of this study, however, Dawson and Chatman specifically contained their argument to the influence of one particular reference group in each separate situation, for example, the family in the context of home or fellow colleagues at work. In this study the focus is extended to consider contexts where multiple legitimate reference groups and belief systems coexist.

To date therefore the literature that could have been expected to address how the existence of multiple belief systems may influence human information behaviour in developing countries, has not done so. Two reasons may have contributed to this gap in knowledge. First health workers in western countries work in a context where there is predominantly one legitimate belief system; that is the biomedical model. While other belief systems such as complementary and alternative medicines are becoming more popular with

consumers (Mueller et al. 2008), individuals employed by the formal health care sector are still expected to comply with a set of rules based on this biomedical model. Due to these controls, there is less opportunity to study how health workers in a western context, deal with multiple belief systems. In comparison, the actions of PHCWs in PNG are not as constrained by rules and regulation and therefore there are more opportunities to investigate how existing multiple belief systems influence the way in which they engage with information.

The second reason why this gap may not have been previously addressed emanates from the first reason. That is, access issues in developing countries can make these types of studies far more complicated. For example, the difficult terrain in PNG often means that areas are only accessible by plane or on foot. In addition, safety issues can make field research hard, with decisions about whether or not to go into a particular area needing to be made on a daily basis. Without the assistance of a locally based research organisation such as the PNG Institute of Medical Research (see Appendix D) that supported this study, this kind of research may not have been possible. Not only did the Institute support the study by providing transport, escorts and other resources but also their local staff were essential in making initial contact with PHCWs.

9.3 Principals and Framework

In order to better understand how these PHCWs engage with information, a framework based on literature within the area of symbolic interaction was developed (see Chapter 3 section 3.6). Symbolic interaction was chosen because it not only focused on the very communication activities (Faules & Alexander 1978, p. vii) within which information is transferred, but also on how individuals, interpret and utilise this information within their particular social context (Sandstrom, Martin & Fine 2006, p. 4).

In turn, the Human Information Behaviour Framework developed specifically for this study, embraces each of these perspectives within the four interconnecting aspects; namely the context, the informing process, the knowing process and the outcomes emanating from the human information behaviour. None of these aspects was an object to be investigated in itself but instead, the study sought to understand them through the eyes or perspective of the participant, in this case PHCWs in PNG. This framework was adopted not only as a basis for analysing and interpreting the data but also a structure for presenting the four result/discussion chapters (see Figure 14).

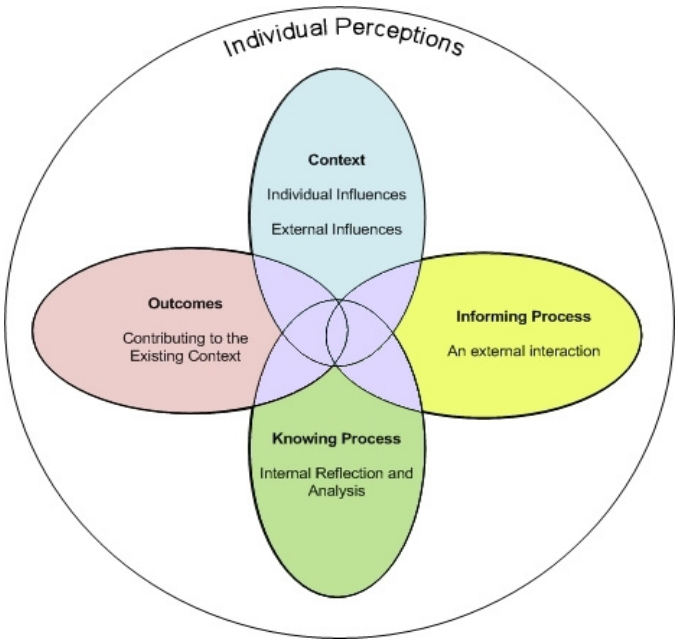


Figure 14 – Human Information Behaviour Framework

9.4 Summary of Research Findings

This ethnographic study found that information from multiple belief systems that appears to be contradictory need not always be a source of stress or anxiety for the individual concerned. Instead, recipients may view even conflicting information in a positive manner, seeing the possibilities and opportunities that alternative options provide. While many PHCWs in this study tended to accept this multilateral perspective, some, however, did demonstrate a preference for one particular belief system above all others, and therefore were considered to hold more of a unilateral perspective.

There were participants, however, who could not easily be labelled as either multilateral or unilateral. Even PHCWs with a strong preference for one particular belief system suggested that they also resorted to other treatment methods. Likewise, some PHCWs while not dismissing the benefits of other belief systems, tended to stick in most cases to certain tried and true treatment methods. Therefore instead of two specific groups, the results suggested a Continuum of Receptivity (see Figure 15) whereby PHCWs toward towards the unilateral end tended to prefer one belief system to inform their practice methods, while individuals who sit towards the multilateral end tend to be more open and responsive to different ideas and suggestions. That is they were more ‘receptive’ to information based on a wide range of different perspectives.



Unilateral Perspective (Tending to prefer one belief system)

Multilateral Perspective (Tending to accept multiple belief systems)

Figure 15 – A Continuum of Receptivity

Four primary conditions together, lead to the ability of information recipients to feel comfortable about using multiple belief systems. The study found that if:

- all of the belief systems are considered legitimate by at least one group operating within the context in which the recipient resides;
- information about each of the belief systems is available;
- the recipient does not have a preference for or association with any particular group; and
- the recipient has a degree of freedom that enables them to choose or decide how they alone will act;

then it is possible that people will tend to embrace a multilateral perspective, viewing information from various belief systems as something to be valued rather than a source of conflict and anxiety. Each of these findings will now be discussed in more detail.

9.4.1 The Legitimacy of Conflicting Belief Systems – Chapter 5

Many different belief systems are used by people in PNG to inform the way in which they understand concepts pertaining to health and healing. The biomedical model for example was introduced in PNG at the time of colonisation (Connell, J 1997) and has been up until mid 2007 the only belief system formally sanctioned by the formal health care sector in PNG. Many Papua New Guineans avail themselves of these types of these types of health service, with for example an average of 59 per cent of children under one receiving a measles vaccine (Monitoring and Research Branch 2007).

Nevertheless, various types of Indigenous health practices are also widely used, particularly in rural and remote communities where well over 80 per cent of the population reside (National Statistical Office of Papua New Guinea 2003). Each region or community may have developed particular diagnostic and treatment methods based on their own

Indigenous Knowledge. This often encompasses both spiritual as well as medicinal aspects, with some practices such as the use of common medicinal plants often widely used by all member of the community while other customs including those pertaining to witchcraft known only by certain individuals (Lepowsky 1990).

Christianity also plays a significant role in how health is maintained and illness is treated (Spector 2004, see Chapter 5). This study has identified that healing practices including the use of prayer, counselling and in some cases hands-on techniques were used by not only many people in the community but also by staff in primary health care facilities. Therefore, the suggestion is that like the biomedical model and Indigenous health practices, Christianity also contributes to the melting pot of different beliefs that influence how people in PNG understand the concept of health and treat illness.

The mere fact that at least some groups of people in PNG believe and act as if these belief systems provide plausible and acceptable ways of treating illness, legitimises their use (Chatman 1999). It is not necessary that they are formalised in any way (Hill et al. 2007, p. 69), as informal associations such as communities that live together can be just as successful at signalling legitimacy as any type of institution (Ostrom 2005; Soysa & Jutting 2006). Just by acting as if they are right, true and correct, Papua New Guineans are giving legitimacy to their belief systems that are based on the biomedical model, Indigenous Knowledge and/or Christianity (Charon 2004, p. 168).

Yet, whilst multiple legitimate belief systems inform the way in which people understand health and well-being, it does not necessarily follow that they are all compatible. Instead, each one in some way appears to contradict the basic principles of the others. For example, the prime objective of the biomedical model is to cure the physical body (Nettleton 2006, p. 2), while in comparison Christianity and Indigenous Knowledge are more interested in the spiritual needs of an individual. Yet, there are also some fundamental differences between these two belief systems, including the Christian principle that only one true God exists, while many of the Indigenous beliefs incorporate a range of very different spiritual entities (Bartle 2005, see Chapter 1).

9.4.2 Accessibility of Information – Chapter 6

In order for PHCWs to consider the use of various belief systems, information needs to be made both available and accessible. In PNG, information pertaining to the various belief systems is developed within as well as being used and disseminated through two primary sources. First, the formal health care sector provides information about the use of the

biomedical model. Information is chiefly disseminated through initial training as well as the STMs which are the primary reference material for PHCWs once they take up a position in one of the primary health care facilities. On the other hand, information pertaining to Indigenous health practices and Christianity is usually provided informally or even accidently, by members of local communities. In turn, these local sources are generally well known and readily available to the PHCW.

However, simply making the source available to PHCWs does not automatically ensure that the information is accessible. The two important factors that determined the accessibility of information relate to the willingness of the source to provide, and the interest of the PHCW in receiving the information. In addition, this study also confirms the findings of other studies and theoretical discussions (see for example Clark & Wilkes-Gibbs 1986; Bavelas & Chovil 2000; Connell, N, Klein & Meyer 2004) which imply that face-to-face communication is the preferred method of communicating. This therefore suggests that community groups are in a far better position to pass on information in comparison to the formal health care system that relies primarily on the written STMs, to guide the practices of PHCWs.

9.4.3 Breadth of Association – Chapter 7

However, PHCWs did not just accept all of the information they came across, but instead judged, analysed and interpreted this as part of the more internally focused knowing process. In this way each individual develops to some extent their own unique meaning about the information provided, based to some extent on the current context, their past experiences and any prior knowledge that they felt was relevant to the information that they received.

While it is not possible for an individual to consider every bit of new information that comes their way (Wicklund & Brehm 2004), approximately half of the PHCWs in this study acknowledged and sometimes even utilised information from multiple belief systems. These PHCWs, demonstrating a multilateral perspective, tended to be more open to and even utilise various points of view according to a pragmatic assessment of the situation. This is in comparison to approximately a quarter of PHCWs who valued or preferred wherever possible, to utilise one particular belief system.

The only identified difference between the tendency towards one perspective or another was that those tending to form a unilateral perspective also demonstrated a strong association with one particular information source. In doing so, this source became a

reference group for the PHCW, supporting and reinforcing their own particular understanding of health and well-being. The more they associated with this source, the more their ideas and values were reinforced.

The belief systems developed within and advocated by such groups became a lens through which all other information was considered. A strong association with a particular reference group tended to mean that PHCWs were less comfortable with and preferred not to use information from other belief systems. Both the strength of commitment to a particular group and the frequency of interaction with its members may contribute to the degree to which an individual is able to feel comfortable with a multilateral perspective (Fine & Kleinman 1979).

9.4.4 Freedom to Choose – Chapter 8

One of the differences between PNG and a western context such as Australia, appears to be the degree of autonomy that PHCWs have to choose the type of treatment they will provide to patients (Hargittai & Hinnant 2006). Very few supervisors in PNG have the authority to control the behaviour of their staff, and external managers rarely visit the primary health care facilities they manage. Therefore, staff are seldom rewarded, or alternatively punished for not adhering to the formally sanctioned biomedical practice. They are instead free to choose the treatment that they believe is most appropriate within each given situation.

While there are many disadvantages that come with this sense of freedom, including a lack of professional support and a feeling of abandonment, there are also benefits. These may include increased treatment options, welfare and happiness of the patient, and the respect and acceptance from members of community in which they work. Therefore, unless an individual has a particular strong association with one particular reference group, there are many reasons for and very few against considering information developed within multiple belief systems in order to solve patient-centred problems.

To some extent, previous research has hinted at each of these findings. China for example is perhaps one of the few countries where patients within the formal health care sector can choose between treatments based on either Indigenous health practices or the biomedical model (Hesketh & Zhu 1997). However, in this vastly different context the four requirements that support the use of multiple belief systems still appear to hold true. Chinese and biomedicine are both considered legitimate, information is readily available about both belief systems, and health workers have no particular preference for either

practice. In addition they also have the freedom to use either Chinese or biomedical practices, in this instance, through rather than in spite of the formal rules and regulations. Therefore, despite the fact that holistic Chinese medicine is so different from and is believed to be 'alien to Western scientific thinking' (p. 115), some health workers in China still appear like PHCWs in PNG, to be able to effectively combine or move between what may be seen by others as conflicting or contradictory belief systems.

9.5 Research Limitations

Three primary limitations to this study's findings were noted. First, while every attempt was made to tell the stories of these participants through their particular perspective, the thesis was constructed through the researcher's lens. Just like any other informing event the belief systems that were dominant within the researcher's context, influenced the way in which she obtained the information and developed the knowledge used to construct this thesis (Miles & Huberman 1994, p. 8; Denzin & Lincoln 2000). This meant that although every attempt was undertaken to identify and take account of any bias, the findings also incorporate the researcher's own particular perspectives and understandings.

Therefore, to some extent all of the data was viewed from and/or in comparison to the researcher's western perspective as a whole as well as the experiences and knowledge they had already gathered within from working in PNG. In addition, because very little has been published by Papua New Guineans, much of the literature including that used to develop the Human Information Behaviour Framework and interpret the data was developed in a similar context. Therefore, this thesis must be viewed as a western perspective on a part of the PNG culture. What values, beliefs and perceptions embedded within this research may be very different from those of PHCWs in PNG (Bandura 2002). This does not however necessarily lessen its value for much of the information provided to PHCWs in PNG, as well as the funds that go into making this information available originate from the west and therefore this thesis may act as a conduit between these providers and the PHCWs, providing a voice for their stories to be heard.

The second limitation that requires acknowledgement and explanation is the generalisation of findings. There are over 800 language groups in PNG (National Statistical Office of Papua New Guinea 2003, p. 51) and if as research suggests each language group develops a distinct culture (Moran 2001, Chapter 4), there could almost be as many culturally distinct communities. This study however only looked at three regions and in addition only considered the participant in terms of their role as a PHCW. This is hardly

representative of a country as diverse as PNG and not even perhaps of the region, or the individual who will embrace many different and equally important roles as, for example, daughter, mother and/or wife (Bandura 2002). However, the research does suggest certain tendencies which may contribute towards the advancing the theory of how health workers in many developing countries engage with information.

Third, the study did not attempt to identify whether or not there was any association between the degree of receptiveness to multi-belief systems and the quality of health service provided. Primarily this was because it was beyond the scope of the study. In addition, however, the researcher did not have the expertise that would have been required to make such judgements.

It is not to say that researchers could not argue for the inclusion of other limitations however discussion about the choice of principles (Chapter 3), study design (Chapter 4) and focus on belief systems (see Chapter 1 section 1.2) have been presented in previous chapters. Nevertheless, the importance and potential impact of these three additional limitations are worth special consideration.

9.6 The Theoretical and Practical Contributions

Notwithstanding these limitations, this study contributes to two interconnecting theoretical perspectives. These are addressed below, first in terms of the contribution of the Human Information Behaviour Framework developed for this study and secondly in terms of new understandings arising from multiple yet conflicting belief systems.

9.6.1 Contributions to Human Information Behaviour

The Human Information Behaviour Framework addresses three primary issues not previously considered together. First, information use is recognised as an important aspect of human information behaviour. Although included within many of the common definitions of human information behaviour (Wilson 1981; Pettigrew, Fidel et al. 2001; Fisher, Erdelez et al. 2005), information use for the most part been neglected (Vakkari 1997). The term itself is not particularly well defined in human information behaviour research (Savolainen 2009), however, this thesis suggests that it should encompass outcomes from the way in which information is used, if for no other reason than they contribute to future human information behaviour.

Second, rather than seeing one continuous process, the Human Information Behaviour Framework acknowledges the non linearity of human information behaviour. In the past, many studies have described human information behaviour as a progression with one stage following another from start to finish, allowing in some cases for various feedback loops (Krikelas 1983; Wilson 1996; Vakkari 1997; Dervin and Clark 1999; Wilson 1999; Spink and Cole 2004; Savolainen 2006; Davy 2007). Foster's (2006) approach breaks these previous moulds in that he identifies three core processes, opening, orientation, and consolidation which are influenced by three levels of contextual interaction being cognitive, internal and external contexts, suggesting a "complex dynamical system" (p. 156). Nonetheless, despite suggesting otherwise, there is still a component of linearity in Foster's model with movement progressing from the opening to orientation and then to consolidation.

It is clear that human information behaviour does not necessarily need to be articulated as a linear process. Williamson's (1998) Ecological model of information seeking provides one of the few examples of a non linear human information behaviour model, with a user's needs met by various institutional and social sources. Likewise, a study of academics (Palmer and Neumann 2002) showed that in an attempt to understand the information provided, academics will return to a text several times as they write. In addition the study also demonstrated that at the same time academics also actively sought out the opinions of respected colleagues on several occasions in order to test out and/or understand a particular problem.

Third, the Human Information Behaviour Framework places the recipients and their perceptions as key to the informing and knowing processes (Davy 2006). While a number of external as well as individual factors (Wilson, TD 1997) can affect the recipient's actions, individuals are viewed as free thinkers who are able to accept or reject the information, and if accepted define and use it in any way they choose (Wilson 1981) (Morris 1967; Lal 1995). Many of the human information behaviour theories that have previously been developed did not necessarily fully explore the critical role played by the information recipient. The primary exception to this is Dervin's sense making (Dervin & Nilan 1986; Dervin & Clark 1999) and Williamson's Ecological Theory of Human Information Behaviour (Williamson 1998). Yet, even these researchers did not appreciate the importance of the individual's perception or subjective assessment of the context, informing and knowing process, as well as even the outcomes.

The benefit of these three theoretical contributions is twofold. First, researchers now have a framework within which they can anchor their particular research within the human information behaviour perspective. For example, barriers to human information behaviour can be investigated from the perspective of the interactive informing process or across all four aspects as in Sun and Scott (2005). Following on from this understanding, the framework also brings forth the nature of human information behaviour as one of complexity and interconnectedness. For example, the recipient is both 'influenced by' and also an 'influencer of' their own future (Bandura 2002).

Thus the Human Information Behaviour Framework expands the understanding of human information behaviour, not so much in terms of developing completely new theoretical constructs but instead by drawing together and giving equal recognition to the process by which information is internalised, understood and used within particular contexts. The Human Information Behaviour Framework therefore goes someway to answering calls for a holistic understanding (Fisher and Naumer 2006; Spink, Park et al. 2006, p. 137) where information is both socially and cognitively constructed (Olsson 2005).

9.6.2 Contributions to Receptivity of Belief Systems

Prior to this study, human information behaviour has predominantly addressed only information behaviour within a mono-belief system; that is a context in which one belief system dominates. Therefore, this thesis also broadens contextual aspects to include consideration of how multiple legitimate yet what might appear to be at times contradictory or conflicting belief systems can influence what and how information is obtained and in turn how knowledge is developed and utilised.

In doing so the study provides an insight into how health management operates in developing countries. It aids in understanding the way in which information from various belief systems can influence how health workers develop and apply their knowledge.

> Lay [and, this thesis argues, health workers] beliefs, are not simply diluted versions of medical knowledge; rather, they are shaped by people's wider milieux, such as their structural location, cultural context, personal biography and social identity. (Nettleton 2006, p. 34)

The idea that multiple legitimate belief systems may exist and be used simultaneously is not entirely new. Early research suggested that in order to cope with any contradictions individuals tended to compartmentalise their lives by only referring to one reference group in each context (Shibutani 1955). For example belief systems about the family influence how a person acts at home, while belief systems pertaining to work influence this sector of

a person's life. At about the same time other researchers focusing on cognitive dissonance were discussing the possibility that when individuals were faced with conflicting multiple beliefs they may feel the need to change the way they think and/or change the external environment in some way to minimise or mitigate the conflict (Festinger 1957).

More recent theoretical discussions suggest that contradictory beliefs can 'exist side-by-side' (Wicklund & Brehm 2004, p. 358), depending to some extent on how secure a person is about their own abilities and whether or not they truly own the belief or just consider it as a potential alternative. There are many researchers (Eisenberg 1990; Barrett 1998; Hatch 1999; Gergen 2000) who reject the idea that people have one stable identity through which they view the world. Instead each of these researchers 'celebrates the "multiplicity of selves"' (Eisenberg 2001, p. 537). It may well be the case that one true self is a fallacy. Instead individuals shift the lens through which they view the world to suit a particular circumstance and/or context. 'Science has shown us that a fixed self is not necessary for mind…' (Varela, Thompson et al. 1991, p. 80)

This study has added to this theoretical discussion by demonstrating that multiple belief systems even when they provide conflicting or contradictory messages can be considered as equally relevant, without the individual necessarily having to always make a conscious choice to accept one and reject all others. The conflicts that might be readily perceived by people trained in the more rigid biomedical model are not always recognised by people who have lived in communities where a range of health belief systems operate and mutually co-exist.

It has also been acknowledged that multiple belief systems do influence the way that people think about health and well-being. For example, it has long been recognised that beliefs about illness are both individually and socially constructed (Herzlich 1973, p. 1). Nevertheless, it should not be assumed that these constructions are static. Instead, people's perceptions and accounts change overtime, and what one says today will not necessarily hold true for tomorrow (Drummond & Mason 1990). It may not therefore always be important to understand exactly why these multiple viewpoints exist, but just to recognise that they do (Stainton-Rogers 1991, Chapter Two). People, whether they be patients or as this study suggests health workers, are very good at 'creat[ing] order out of chaos and moment to moment make sense of their world amid the cacophony (Stainton-Rogers 1991, p. 10).

Both researchers and practitioners alike may need in some circumstances to rethink the standard perspective that views these health workers as purely representing or epitomising the biomedical model. The fact that, at least some health workers may be influenced by and in turn influence the development of multiple belief systems either out of necessity or choice, does not seem to have been previously considered. This is despite the literature that cites many examples that suggest that other members of developing societies often continue to embrace and utilise Indigenous Knowledge.

In summary therefore, while the Human Information Behaviour framework has contributed to a holistic understanding of the way in which PHCWs in PNG engage with information, the primary contribution of this research rests with the fact that there is a potential for multiple legitimate belief systems to simultaneously influence a PHCW's perceptions of their world. These perceptions often then in turn, contribute to the way in which they engage with information.

9.7 Recommendations for Practice

Many researchers have already recommended or called for improvements to the formal health care sector in developing countries including increased support as well as the provision of adequate resources and infrastructure (Godlee et al. 2004; Chinnock, Siegfried & Clarke 2005; McAuliffe & MacLachlan 2005; Davy 2007). The PNG Department of Health has also come under fire for not providing adequate funding for health services and appropriate facilities and conditions for their staff (Thomason & Newbrander 1991; Pincock 2006). Even with the best intentions the magnitude of these changes, means that nothing will happen overnight. Therefore, the following recommendations for practice aim to start from a more pragmatic and practical point of view, targeting for the most part, sources of information who may be in a better position to make small but often quite important improvements to the way in which they can better assist PHCWs in PNG to engage with the information they are providing.

9.7.1 Gain an Understanding of the Various Other Legitimate Belief Systems that Operate within the Context.

> The experience of health systems is always context-specific and so **contextual factors need to be considered** when applying learning to other settings [author's emphasis]. (Gilson et al. 2007, p. vii)

While some researchers call for all attempts at development to be generated from within the context under development (Elabor-Idemudia 2000), this may not always be possible. Even though the STMs, being the primary reference source for PHCWs, are developed

within PNG, the belief system upon which they are based emanated from the west. The result being that these resources do not fully acknowledge the context in which they are used, either the actual shortage of resources and infrastructure that prevents their use, or the presence of alternative belief systems that may compliment or replace the information they provide.

An important first step for any information provider may therefore be to understand the context in which the intended recipients are operating. This may involve two steps. First, whether the potential recipients will see the information being provided as coming from a legitimate belief system. Second, what other legitimate belief systems exist within the context. It should never be assumed that because something is appropriate in one context, it will automatically be appropriate for another (Newsom 2007, p. 45).

Providers of information should recognise that there has always been, and with the recent development of the PNG National Policy on Traditional Medicine (Department of Health Papua New Guinea 2007) will no doubt continue to be more than one belief system operating within the formal health care sector. Therefore, as a first step, providers need to be not only cognisant but also ensure that the information they make available considers the various understandings that already exist within this context.

9.7.2 Incorporate Wherever Possible Other Legitimate Belief Systems into the Information Provided.

Once understood, information should be tailored to the needs of the potential recipients within that context. This will include being cognisant of the other belief systems that operate and even including or perhaps referring to them appropriately as part of the messages being developed. Information about the biomedical model could for example, incorporate ideas about how Indigenous beliefs can be incorporated into the treatment practices. Alternatively, if Christianity is widely practiced in the area, it may be appropriate to consider the importance of providing opportunities for spiritual guidance to occur during the suggested treatment procedure. Where the use of other belief systems is believed to be harmful, this too should be explained.

9.7.3 Consult with the experts in Other Legitimate Belief Systems before Disseminating the Information.

> Failure to involve key players may result in rapid demise of an initiative as a result of active or passive opposition (Haines & Rogers 1998, p. 151)

One way of gaining a better understanding of the context as well as ensuring that the information includes issues pertaining to the use of other belief systems, is to involve local experts. Community members, who are knowledgeable about Indigenous health practices and Christian principles, should also be involved in the development of information (Cochran et al. 2008). The benefits that could be realised from involving local experts, would not just relate to ensuring that information is contextually relevant, but also that these people might end up supporting the implementation and usage of the information once provided. Recent reports have already suggested that ignoring the role of individuals from both formal and informal institutions can dislodge or be detrimental to the success of any new initiative (Jutting et al. 2006; Soysa & Jutting 2006).

9.7.4 Ensure Appropriate Accessibility to the Information.

The method for providing information to recipients should also be carefully considered. In PNG face-to-face communication in certain circumstance may be more successful than the written text. In particular, face-to-face communication provides an opportunity for people to ask questions, confirm understandings and provide feedback on whether or not the information meets their particular needs. In addition, face to face communication allows providers to augment their speech with facial expressions, hand movement or even pictures in order to better explain certain concepts. In cases where complex and/or new ideas are involved, face-to-face communication may therefore be the best method for ensuring that the information is both available and accessible.

9.7.5 Attempt to Understand how the Information is being Utilised in the Field.

Where face-to-face communications occur within the health care facility, the provider may also gain more of an understanding of how the information may be applied. For example, providers may be able to see whether other belief systems, the lack of resources and/or infrastructure, will affect the use of the information they are providing. In particular, this thesis has demonstrated that a provider can never assume that information will be either understood or utilised as intended.

9.7.6 Saving the Benefits of Alternative Belief Systems

These recommendations are deliberately geared towards maintaining a context in which the benefits of multiple legitimate belief systems may continue to be available to PHCWs in PNG. The argument being that even if the use of alternative belief systems, either Christianity or Indigenous Health Practices could be completely stamped out, in doing so the provision of health services may be jeopardise as Indigenous Knowledge and Christianity play a significant and vital role in the provision of health services to many Papua New Guinean communities.

However, many scientists continue to advocate for the use of treatments based on scientifically validated practices (Laing, Hogerzeil & Ross-Degnan 2001), believing that alternative treatments may be detrimental to the patient. This study responds with two counter arguments. First, it may not be possible to stop the use of these alternative practices. Therefore, no matter whether ignored or acknowledged, they will remain at least for the time being a part of how people understand health and therefore treat illness. Second, the view or perspective of these scientists has been developed within a biomedical model, where certain assumptions lead to particular findings (Holmes & Crossley 2004). It may be possible that these assumptions over time will prove to be flawed or not appropriate for every particular situation (Rycroft-Malone 2002).

9.7.6.1 Maintaining Indigenous Health Practices

The PNG Department of Health has recently acknowledged the potential benefits that may be realised from Indigenous Knowledge by recently ratifying the National Policy on Traditional Medicine (Department of Health Papua New Guinea 2007), particularly with regard to the low cost of herbal remedies which is believed to a primary driver of this development (Ambihaipahar & Rai 2004). However, as previously alluded to, the policy only acknowledges the benefits of certain types of Indigenous health practices. In addition, this requires that these practices be validated through a scientific model.

Indigenous Knowledge however, cannot be split into spiritual and medicinal practices (Koka 2004) for three reasons. First, while theoretically it may be possible to separate the spiritual from the medicinal element; in practice this would be impossible. '[T] he traditional village mindset derives from a whole way of life with religious and practical dimensions' (Gesch 2007, p. 27). The spiritual practices are often part of the herbal medicine and one may not exist in isolation from the other.

Second, people will believe what they want to believe and without any specific controls, will practice what they want to practice. The Department of Health issuing a policy (2007) that says that some forms of traditional medicine are legitimate while others are not, will probably not change a thing. In countries such as PNG where many of the people live in rural and remote areas, formal institutions such as the government often have very little influence over how their citizens think and behave. Instead, people look to fellow community members in order to understand and evaluate the actions of themselves and others (Soysa & Jutting 2006).

Third, the suggestion that any Indigenous belief system (Rai 1989) could be scientifically evaluated is doubtful. The questions being asked about this particular suggestion include: How does one evaluate one belief system based on the premises of another? If this were possible, should not Indigenous health practitioners also demand that biomedicine submit to thousands of years of observation before it is fully accepted?

It is not the recommendation of this study that Indigenous health practices fall completely under the umbrella of the formal health care sector. Instead it is important that the knowledge about and control of Indigenous health practices remain with the communities in which it was developed (Gesch 2007). However, it is also recognised that communities do need to be supported to ensure that this knowledge does not die out as people move out of communities and the elders pass away (Powan 2003; Vera 2001; Toban 2001, cited in Ambihaipahar & Rai 2004, p. 9). Therefore, the role for the formal health care sector may be more about supporting communities to ensure the continuity of their knowledge.

9.7.6.2 Maintaining Christianity

Christianity as a method for treating patients is not subjected to the same level of scrutiny as Indigenous Knowledge. This may be because primarily it does not overtly interfere with biomedicine. Even though not formally recognised as a treatment practice, PHCWs in this study reported that patients did benefit from the use of prayer and the laying on of hands. Therefore where appropriate the study recommends that its use continue. However, while currently not contested, it may be important to ensure that these benefits are also not lost in any change to the formal health care sector and primary health care services. If for example, the biomedical model were to become the dominant paradigm, Christianity as a method of healing along with Indigenous health practices may be relegated to an insignificant corner or disappear from treatment practices altogether.

This thesis therefore recommends that the formal health care sector recognise the existence of and work with experts from other belief systems (Ambihaipahar & Rai 2004), allowing and even supporting PHCWs in their use of a multilateral approach to the treatment of illness and understandings of health and healing. Primarily because Indigenous health practices take such a different approach by treating the person rather than the illness (Koka 2004), this may involve working in tandem with Indigenous health practitioners, rather than integrating alternative belief systems into the primary health care system. Perhaps however most importantly this must be in collaboration with members of the local community or communities who are availing themselves of the services provided (Beier & Semrau 2008).

9.8 Recommendations for Future Research

Future research on the other hand may benefit from investigating how individuals in general are able to comfortably incorporate contradictory beliefs. This thesis demonstrated that the newly developed Human Information Behaviour Framework suggests a way in which human information behaviour within particular contexts can be explored. In this particular instance, the framework assisted in understanding that information developed within multiple legitimate belief systems not only exists but was at times used without the recipient feeling the need to necessarily accept or reject it on the basis of any predefined criteria. However, further research may not only increase the understanding about how multiple legitimate belief systems influence individual's thinking and also their actions but may also lead to a more holistic understanding of human information behaviour per se.

9.8.1 Understanding Human Information Behaviour

In recent years there has been a general push to develop a holistic, multi disciplinary understanding of human information behaviour (Olsson 2005; Fry 2006; Spink, Park et al. 2006; Widen-Wulff, Ek et al. 2008). It appears however that "holistic frameworks for conceptualizing human information behaviour are still evolving" (Spink, Park et al. 2006, p. 137) and it is possible that their development may have been limited by a previous overemphasis on separating ideological approaches (Olsson 2005). For example, some researchers (Krikelas 1980; Krikelas 1983; Wilson 1999; Wilson 2000; Wilson 2001; Wilson, Ford et al. 2002; Wilson 2005; Wilson 2006) have tended to take a more cognitive approach to human information behaviour, while others such as Dervin (1997; 1999; 2003; 2005) focused their attention upon the social factors that impact on how people engage with information (Savolainen 2007). The Human Information Behaviour Framework

presented in this thesis presents a possible way forward for acknowledgine the contributions from both the cognitive and social approaches.

9.8.1.1 Exploring Linkages

Nevertheless, while this study does go someway towards developing a holistic model of human information behaviour which incorporates both cognitive and social points of view, further work is required in order to understand the inter-linkages between and within each of the four primary aspects, namely the context, the informing and knowing processes and the outcomes. For example, how can one best understand the impact an individual's perception of their context has on both outcomes and the informing and knowing processes. Likewise, where does the informing process end and the knowing process begin.

Without giving full consideration to the potential interplay within and between all of the aspects of the newly developed Human Information Behaviour Framework, the tendency may be to over simplify how individuals engage with information. Instead, researchers need to investigate the complexity that led to the most important theoretical contribution made by this thesis.

9.8.2 Understanding Other Contexts

The Human Information Behaviour Framework should not, however, be restricted to the study of human information behaviour in either health and/or development contexts. Instead, it could also be useful for researchers who wish to understand the factors that affect how any individual engages with and utilises information, particularly where there are conflicting viewpoints of what constitutes the most relevant, valid or reliable information from that available. For example, in today's multicultural society the ability to understand and empathise with a variety of viewpoints is considered to be a valuable skill which should be fostered (Eisenberg 2007).

> Rigid attachment to one's worldview on one hand and openness to reinvention on the other are ends of a continuum along which people of various cultures, personalities and perspectives can be placed. (Eisenberg 1998, p. 106)

9.8.2 Understanding that Multiple Legitimate Belief Systems can Function Simultaneously.

The notion that individuals encounter many different belief systems in their lifetime has been known for some time. The suggestion was, however, that people compartmentalise their lives so that different reference groups and associated belief systems dominate in different contexts (Shibutani 1955). Recent literature also appears to support and build

upon this premise, presuming that individuals associate themselves with a particular point of view associated with a significant other and/or reference groups, and in turn that this point of view will always tend to influence the thoughts and therefore conduct of an individual (Ledgerwood & Chaiken 2007).

However, in other cases including research conducted in the field of psychology (Wicklund 1999; Wicklund & Brehm 2004), it has been suggested that it may also be possible for individuals to entertain multiple perspectives or consider several different points of view at the same time. Similarly, sociologists have focused on the possibility that individuals may not necessarily be bound by one particular definition of their role in work for example, but instead are able to reflect on and develop their own meaning, based on what they perceive to be appropriate for a given time and place (Orrange 2003).

Researchers would do well to further explore what happens when apparently conflicting beliefs exist simultaneously within an individual. While 'a person confronted with stress, anxiety or strong drive states cannot be expected to tolerate and represent multiple perspectives' (Wicklund 1999, p. 671), little is known about what happens when these types of emotions do not exist and multiple yet conflicting belief systems inform an individual's understanding and actions.

9.8.2.1 Exploring the Concept of Receptivity

As suggested in chapter 7 (see section 7.3.6), exploring why some individuals are more receptive to different perspectives would benefit from further exploration. While this study was limited in exploring all of the possible influences on the degree to which a certain perspective was adopted, further research may elicit a richer understanding of this emerging concept. For example, researchers may be interested in understanding whether older more experienced health workers are more likely to be more or less flexible in their outlook and in turn why this might be the case. Alternatively, the relationship between an individual and their colleagues at work may be worth exploring as another potential contributing factor.

9.8.2.2 Exploring the Perceptions of Quality of Care

As mentioned in the limitations section (see section 9.5 this chapter) no attempt was made to understand whether PHCWs who tended to be more receptive to information based on a variety of belief systems provided a better quality of care. Researchers in the future who are interested in considering this connection may need to consider two additional concerns. These are first, who defines the term quality and second, how it is evaluated. It may, for

example be difficult to demonstrate a link between quality and health care outcomes such as average life years. Alternatively, if health care is evaluated through only through a biomedical lens, then the benefits of alternative treatments would not be recognised. However, if the quality of care were to be determined from the subjective viewpoint of the patient or even the provider then they may not be accepted by some members of the scientific or medical community.

9.8.3 Understanding how Multiple Legitimate Beliefs Influence Human Information Behaviour.

The sub discipline of human information behaviour in particular would benefit from further work on how various belief systems influence the way in which individuals obtain information and develop knowledge. To some extent this has already been highlighted as a potentially important area of research. For example, Dawson & Chapman (2001) suggested that the impact that reference groups have on how individuals obtain and use information is an under-explored area within the human information behaviour theory. While this literature has already acknowledged the influence that social systems have on the individual's actions, the tendency has been to once again view the society as containing one harmonious set of beliefs, which dominates the thinking and actions of people within that group (Pendleton & Chatman 1998). This study adds to the literature by recognising the possibility that some individuals are able to utilise information from multiple belief systems within the same context, and view even conflicting information in a positive manner. Future researchers may be interested in exploring other contexts in which multiple belief systems exist, in an attempt to identify other factors which tend to influence whether an individual is more likely to hold a unilateral, or alternatively a multilateral perspective.

9.8.4 Understanding that Belief Systems other than the Biomedical Model are Becoming more Acceptable in Western Health Care Systems.

Although at present the biomedical model still dominates the formal health care sector in developed countries, this may be changing as the public are given more responsibility and are even encouraged to contribute to their own health (Nettleton 2006, p. 233). Consumer demands for alternative treatments may be driving this shift. For example, the use of Chinese Medicine as well as what are commonly referred to as complementary and alternative medicine (Thomas, KJ, Nicholl & Fall 2001; Van Haselen et al. 2004). The WHO is already calling for both developing and developed countries to consider incorporating the benefits of Indigenous medicines into their health system (World Health

Organization 2005b). Therefore, PHCWs in PNG may in some way be pointing the way forward as the acceptance of and demand for alternative belief systems grows. Thus, in the future, health managers and policy makers may need to think about how multiple yet sometimes conflicting belief systems can be incorporated into their strategic health plans.

As the world appears smaller and information is disseminated in ever widening circles, people's exposure to and knowledge of different belief systems is increasing day by day. Therefore, therefore further interest and research into how individuals are able to acknowledge if not utilise opportunities from a variety of coexisting belief systems, may in fact be inevitable.

9.9 In Conclusion

On reflection, a number of contributions and recommendations have therefore beensuggested. At a theoretical level, the thesis has shown how individuals are able to use multiple legitimate yet at times, what would appear to be contradictory belief systems without necessarily experiencing any great degree of anxiety or stress. It may well be that the conflict, or conflict as it might be perceived by people in one context, may not always be recognised and/or dealt with in the same way as those in an alternative setting. In addition, the thesis has also generated and utilised a Human Information Framework which may also prove to be a valuable tool for other researchers wishing to understand how the many interconnecting aspects including the influence of multiple belief systems, affect the way in which individuals obtain and utlise information.

Perhaps the most important contribution pertains to the issue of how health workers in developing countries engage with and utilise information. This has led to some practical recommendations for those practitioners who are charged with improving the standard of health care in these settings. Nevertheless, in acknowledging the enormity of the task faced by these practitioners, these recommendations are limited to pragmatic and practical solutions, ranging from the need to gain an understanding of the various belief systems that exist within a context, to the suggestion that information developed in alternative contexts should at least acknowledge if not pay homage to the opportunities that other belief systems, such as Indigenous Knowledge can provide.

However, by far the most important contribution of the thesis has been to enhance our understanding of how health workers, who are not constrained by the biomedical model, actually discharge their professional responsibilities. As mentioned at the beginning of this thesis, health workers in PNG operate within a context in which multiple belief systems

inform the way in which people understand health and well-being. In addition, these individuals are often charged with responsibilities that go well beyond their initial training, often without the assistance of appropriate infrastructure, resources or support. While the data shows that many of these individuals perform their responsibilities quite heroically, it also identifies the role that multi-belief systems play in moderating how information is received, interpreted and applied. As such, it highlights for us, that those health workers in such settings who are receptive to information from multiple belief systems, may potentially become more powerful by making use of the additional opportunities and options that information from multiple belief systems can provide.

Appendices

APPENDIX A

Key Definitions

Key Term	Definition Used in This Thesis
Beliefs	Beliefs are considered to be the thoughts, ideas, opinions and judgements that an individual holds to be true. However, the individual is not solely responsible for the development of their beliefs but relies instead rely on a 'process of socialisation' (Blumer 1969, p 2) whereby people within the groups or communities a person belongs to or associates with, can influence the types of beliefs that a person eventually decides to adopt. > Human beings acquire beliefs and preferences by means of the process of socialization – an ongoing, interactive process through which individuals develop identities and learn the ways of thinking, feeling, and acting that characterize their society (Sandstrom, Martin & Fine 2006, p 57 - 58). The beliefs held by a particular person may in turn, be used by them to assist in making decisions about any future action (Blumer 1969, p. 5). Religious beliefs, for example, are thought to greatly influence the behaviour of individuals by suggesting a sense of ethical and/or moral responsibility to others (Ryan, Rigby & King 1993). Therefore, beliefs may influence people's thinking as well as their actions.
Belief System	The term belief system in this thesis is used to refer to a set of interconnecting beliefs pertaining to a particular topic or issue. Similar to individual beliefs, belief systems are also developed and maintained through the process of socialization. Perhaps the most influential context within which this occurs is a person's family. Nevertheless, belief systems are also formed by other informal social groups of people (Thompson & Fine 1999, p. 289) as well as formally structured organizations.

	> Formal elements of an organization's structure, as well as many aspects of its social processes, such as socialization practices … reaffirm and reproduce its cultural belief system (Forgarty & Dirsmith 2001, p. 249)
Biomedicine / Biomedical Model	Biomedicine or the biomedical model is primarily a concept developed by western countries which focuses on repairing the body, which is generally believed to be quite separate from the mind or spirit of a person (Attkinson 1988). > A further assumption inherent in Western medicine is that it is based on an objective science, which in turn involves empirical observation and induction. Medicine thus claims to offer the only valid approach to the understanding of disease and illness (Nettleton 2006, p. 3).
Christianity	Christianity for the purposes of this thesis is defined by a belief in one true 'God'. > Christianity has had the idea of a shared life in a community of which Christ is the head. There is an almost universal conviction that God is active in the Church, guiding it into truth, though Christians differ widely among themselves as to the instruments by which the guidance is given (Walls 1984, p. 59). Approximately 96 per cent of the population in PNG claims to be a Christian, with membership spread over many different religious organisations. While 28 per cent of the population, for example, is a member of the Roman Catholic Church, the remaining population belongs to a diverse range of Christian organisations including various Evangelical and Pentecostal churches. (National Statistical Office of Papua New Guinea 2004). However, within each of these Christian organizations, Papua New Guineans have developed their own particular understanding of religious teachings, which often differs to that held by people belonging to similar organizations in western countries (Aerts 1998; Bartle 2005).

Indigenous Knowledge	Indigenous Knowledge refers to the knowledge which has been developed and maintained over thousands of years by the indigenous peoples of a particular region (Roberts 1998; Dei, Hall & Rosenberg 2000; Shroff 2000). It may encompass topics as diverse as climate conditions, environmental management, animal husbandry and importantly for the purposes of this thesis, health and well-being (Posey 1988). > The knowledge valued in aboriginal societies derives from multiple sources, including traditional teachings, empirical observation, and revelation. These categories overlap and interact with one another (Castellano 2000, p. 23) Rather than referring to one homogenous concept, however, this thesis recognises that in PNG, each region or even community may have developed their own unique Indigenous Knowledge (Koka 2004, p. 58).
Information	Information for the purposes of this thesis is considered to be data which has been added to (Jashapara 2004), organised (Bates 2006) or altered in some way so that it is more useful or meaningful to the person receiving it (Lloyd, B 2007). Information can also be thought of as combining several types of data including facts and figures on a topic of interest with other types of contextual data such as that associated with a particular place, time and/or other descriptive (Jashapara 2004). While it is created by individuals, it is an object that can stand alone and does not rely on any particular person for its continued existence (Wilson, TD 1981). Therefore, information can be transferred, shared, communicated and/or disseminated (Bates 2006).
Knowledge	While information can be shared, the term knowledge in this thesis refers to a purely personal concept, and is likened to information that has been 'guided, managed, controlled or manipulated for a desired outcome' (Land, Nolas & Amjad 2006, p. 856) by the individual concerned. > Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers (Davenport & Prusak 1998, p. 5)

Semi Structured Interview Schedule

Primary Health Care Workers

Part One – Background Information and Interview Focussing

General introductions and discussions followed by information on the research:

> *In order to assist in providing information that meets your needs I would like to find out about the information you use to make diagnostic and treatment decisions.*

Collection of the following background information through observation and initial informal discussions:

1. *Is the respondent male or female?*
2. *What is the position of the respondent within the facility?*
3. *Who is the respondent's manager/supervisor?*
4. *How many people report to the respondent?*
5. *What formal qualifications does the respondent posses?*
6. *When were the respondent's qualifications obtained?*
7. *How long has the respondent worked at the facility?*
8. *How long has the respondent worked at other health facilities (if any)?*

Part Two - Data Collection

> *If a patient came into this facility with a stomach ache and you were not sure what was wrong with them, what would you do?*

Part Three – Unstructured Data Exploration

In relation to the list of information obtained the types of questions that may be asked include:

- *Did the information help you to make a decision? Why/why not?*
- *Was the information easy to understand? Why/why not?*
- *Was there enough information in order for you to make a decision? Why/why not?*
- *Did you trust the information? Why/why not?*
- *Where did the information come from?*
- *Did you find it easy to access? Why/why not?*
- *Was there any cost involved in obtaining the information?*
- *After you made the treatment decision, were you confident that this would improve the patient's condition? Why/why not?*
- *Did the patient's condition improve? Why/why not?*
- *Would you have liked more or less information? Why?*

To identify other types of information that could be used by the participant, additional questions may include:

- *Are there any other types of information that you use to make treatment and diagnostic decisions? If so what are they?*
- *How helpful is this information? Why/why not?*
- *What sources of information do you prefer to use if available? Why?*
- *How would you prefer to access/receive the information you need? Why?*

Managers and Supervisors

Part A – Introduction and Background Information

General introductions and discussions followed by information on the research:

> *In order to assist in providing information that meets the needs of health workers in your district I would like to find out about the information available to make diagnostic and treatment decisions.*

Collection of the following background information through observation and initial informal discussions:

- *Is the respondent male or female?*
- *What is the position of the respondent within the facility?*
- *Who is the respondent's manager/supervisor?*
- *How many people report to the respondent?*
- *What formal qualifications does the respondent posses?*
- *When were the respondent's qualifications obtained?*
- *How long has the respondent worked at the facility?*
- *How long has the respondent worked at other health facilities (if any)?*

Part B – Unstructured Data Exploration of Main Themes Previously Identified by Primary Health Care Workers where relevant

With specific relation to <Theme #> the questions may include:

- *Do you think <Theme #> affects access to information to health workers in your district? Why/why not?*
- *If it does, what affect does it have?*
- *Do you think <Theme #> affects whether or not this information is used by health workers in your district? Why/why not?*
- *If it does, what affect does it have?*

APPENDIX C

Informed Consent

While both Tok Pisin and English versions were provided to all participants, Appendix C includes only the English versions of the following documents:

- Information Sheet for potential PHCW participants
- Information Sheet for potential Manager and/or Supervisor participants
- Informed Consent Form

Information Sheet – Primary Health Care Worker

Primary Health Care Knowledge Development and Application in Papua New Guinea

Division of Business, International Graduate School of Management
University of South Australia, North Terrace, Adelaide SA 5000

Dear Primary Health Care Worker

You are invited to participate in a study which aims to understand what you perceive to be the factors that influence access to and utilisation of information for diagnostic and treatment decisions. Outcomes from this study will assist health information managers and providers, to improve information available to primary health care workers.

Your participation is completely voluntary and you may withdraw from the study at any time, without any consequences.

What would you be asked to do?
If you agree to participate, you will be asked to spend approximately 1 hour, at a time nominated by you, talking to the researcher about the types of information you use. The researcher will tape this conversation, only for the purposes of ensuring that what you say is accurately recorded.

Ensuring that what you tell us is confidential
All records containing personal information including the tape recording will remain confidential and no information which could lead to the identification of any participant will be released. Records will be kept for a period of seven years by the researcher, in a secure locked cabinet, located at the residence of the researcher, at all times.

At the end of the study
At the end of the study, we will provide you with a copy of the report and recommendations, which will also be sent to other interested parties such as health information managers and providers.

Further information
This study has the approval of the Papua New Guinean Medical Research Advisory Committee and the University of South Australia Human Research Ethics Committee. Any person with concerns or complaints about this study can contact the Chair of the Papua New Guinean Medical Research Advisory Committee Associate Professor Peter Siba on Ph: +675 732 2546, email peter.siba@pngimr.org.pg or Human Research Ethics Committee University of South Australia, Executive Officer, Ms Vicki Allen on Ph: +61 8 83023118, email Vicki.allen@unisa.edu.au. General information on the study can be obtained from Ms Carol Davy Ph: +61 8 83741309, email: davcp001@students.unisa.edu.au.

The purpose of this study is the researcher's Master by Research Program, supervised by Associate Professor Margaret Patrickson Ph: +61 8 83020433, email Margaret.patrickson@unisa.edu.au.

Thank you for considering this invitation.

Information Sheet – Senior Health Official

Primary Health Care Knowledge Development and Application in Papua New Guinea

Division of Business, International Graduate School of Management
University of South Australia
North Terrace, Adelaide SA 5000

Dear Sir/Madam

You are invited to participate in a study which aims to understand what primary health care workers perceive to be the factors that influence access to and utilisation of information for diagnostic and treatment decisions. Outcomes from this study will assist health information managers and providers, to improve information available to primary health care workers.

Your participation is completely voluntary and you may withdraw from the study at any time, without any consequences.

What would you be asked to do?

If you agree to participate, you will be asked to spend approximately 1 hour, at a time nominated by you, talking to the researcher about the types of information you may provide to primary health care workers. The researcher will tape this conversation, only for the purposes of ensuring that what you say is accurately recorded.

Ensuring that what you tell us is confidential

All records containing personal information including the tape recording will remain confidential and no information which could lead to the identification of any participant will be released. Records will be kept for a period of seven years by the researcher, in a secure locked cabinet at all times.

At the end of the study

At the end of the study, we will provide you with a copy of the report and recommendations, which will also be sent to other interested parties such as health information managers and providers.

Further information

This study has the approval of the Papua New Guinean Medical Research Advisory Committee and the University of South Australia Human Research Ethics Committee. Any person with concerns or complaints about this study can contact the Chair of the Papua New Guinean Medical Research Advisory Committee Associate Professor Peter Siba on Ph: +675 732 2546, email peter.siba@pngimr.org.pg or Human Ethics Committee University of South Australia Ms Vicki Allen on Ph: +61 8 83023118, email Vicki.allen@unisa.edu.au.

General information on the study can be obtained from Ms Carol Davy Ph: +61 8 83741309, email: davcp001@students.unisa.edu.au.

Thank you for considering this invitation.

Consent Form

Project Title Primary Health Care Knowledge Development and Application in Papua New Guinea

Researcher's name **Ms Carol Patricia Davy**

Supervisor's name **Associate Professor Margaret Patrickson**

I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.

I understand the purpose of the research project and my involvement in it.

I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.

I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential.

I understand that the tape will be accessible only by the researcher. The tape will be stored for a period of seven (7) years in a locked filing cabinet located at the residence of the researcher, after which time it will be destroyed.

I understand that I will be audio taped during the interview.

I agree to maintain the confidentiality of focus group discussions and preserve the identification of focus group participants.

Participants under the age of 18 normally require parental consent to be involved in research. The consent form should allow for those under the age of 18 to agree to their involvement and for a parent to give consent.

Name of participant…….....

Signed…….**Date**…….

I have provided information about the research to the research participant and believe that he/she understands what is involved.

Researcher's signature and date……...

Ethical Approval and Support

The following documents included in Appendix D were provided as proof of ethical approval and support for this study to be conducted in Papua New Guinea.

- Ethical approval from the University of South Australia Human Ethics Committee
- Ethical approval from the Papua New Guinean Medical Research Advisory Council
- Letter of support from the Papua New Guinea Institute of Medical Research

Please Note: The study now entitled 'Primary Health Care Knowledge Development and Application in Papua New Guinea' was original referred to as 'Strategies for Better Information Utilisation in Papua New Guinean Health Care'.

Davy, Carol Patricia - davcp001

From: Melissa Alagich on behalf of Vicki Allen
Sent: Thursday, 21 February 2008 10:00 AM
To: Davy, Carol Patricia - davcp001
Cc: Margaret Patrickson
Subject: Application to extend ethics approval – Ethics Protocol P101/05 "Strategies for Better Information Utilisation in Papua New Guinean Health Care"
Attachments: Conditions.March 2004.doc

Dear Carol

Re: **Application to extend ethics approval – Ethics Protocol P101/05 "Strategies for Better Information Utilisation in Papua New Guinean Health Care"**

I am pleased to advise that your ethics approval has been extended to 20 February 2009.

HREC can only give 12 months extension per application, therefore please submit a further application for extension or a project complete report as appropriate as the research proceeds in the context of this ethical approval before 20 February 2009.

Please regard this email as formal notification of extension approval.

Ethics approval is always made on the basis of a number of conditions detailed in the attachment; it is important that you are familiar with, and abide by, these conditions. It is also essential that you conduct all research according to UniSA guidelines, which can be found at http://www.unisa.edu.au/res/ethics/default.asp

Best wishes for your research

Regards

Vicki Allen
Ethics and Safety Officer
University of South Australia
Research and Innovation Services
Mawson Lakes Campus
Mawson Lakes Boulevard
Mawson Lakes SA 5095
Tel: +61 8 8302 3118
Fax: + 61 8 83023921
Email: Vicki.Allen@unisa.edu.au
CRIS Provider No. 00121B

Please consider the environment before printing this email

UNIVERSITY OF SOUTH AUSTRALIA

CONDITIONS FOR ETHICS APPROVALS

Human Research Ethics Approval is always made on the basis of a number of important conditions:

- **Your research MUST NOT commence until the University's Human Research Ethics Committee has granted full approval.**

- **Any serious or unexpected adverse effects on research participants must be reported immediately to the Ethics Officer.**

- **Any unforseen events that might affect the continued ethical acceptability of the research project must be reported immediately to the Ethics Officer.**

- **The Ethics Committee must be notified of, and approve, any changes to the original protocol.**

- **The Ethics Committee must be notified of any changes in membership of the research team.**

- **In Australia there is a legal obligation for raw data arising from human research to be held securely.** The University requires that research data be retained for a period of seven years. If your school does not store your data, the school must be aware of its location.

- **Information for participants should include the name of the Executive Officer of the UniSA Human Research Ethics Committee** as a person who is able to discuss any ethical concerns about the research project. These details should read:
  The University of South Australia's Human Research Ethics Committee has reviewed this study. Should you wish to discuss the project with someone not directly involved, in particular in relation to matters concerning policies, information about the conduct of the study, or your rights as a participant, please contact the UniSA Ethics Officer, Ms Vicki Allen on 8302 3118; fax 8302 3921; email: Vicki.allen@unisa.edu.au

- **Approval is for a period of twelve months only.**
  Researchers, including Masters by Research and PhD students, must make annual requests for extension using the Application for Extension form available at
  http://www.unisa.edu.au/res/ethics/human.asp#forms

- **A project completion report** must be made to the Human Research Ethics Committee or Divisional Ethics Committee (whichever granted the original approval) within three months of the project's completion. The Project Completion form is available at
  http://www.unisa.edu.au/res/ethics/human.asp#forms

March 2004

GOVERNMENT OF PAPUA NEW GUINEA
MEDICAL RESEARCH ADVISORY COMMITTEE
Department of Health

Telephone: +675 301 3650
+675 301 3660
Facsimile: +675 323 0022

PO Box 807
Waigani, NCD 131
Papua New Guinea

13th May 2005

Ms. Carol Davy
4 Donnybrook Road
Bellevue Heights
SA 5050
Australia

Dear Ms. Davy,

This is to certify that the proposal:

Strategies for better information utilization in PNG health care

Submitted by you and your colleagues has been examined by the Medical Research Advisory Committee of Papua New Guinea and assigned **MRAC No. 05/06**. The proposal was approved and given ethical clearance for it to be carried out in Papua New Guinea.

The Medical Research Advisory Committee of Papua New Guinea act as the National Ethical Clearance Committee and as the Institutional Ethical Committee for the Papua New Guinea Institute of Medical Research and so there is no further bar to this project being carried out in Papua New Guinea.

Investigators are reminded of the importance of keeping provincial health and research authorities informed about their study and its progress, and of submitting progress and outcome reports to the Medical Research Advisory Committee.

With best wishes

Yours sincerely

Dr Gilbert Hiawalyer
Chairperson

Cc: Professor John Reeder
PNGIMR, Goroka

PAPUA NEW GUINEA INSTITUTE OF MEDICAL RESEARCH

PO BOX 60, GOROKA, EHP 441, PAPUA NEW GUINEA

Telephone: Enquiries: (675) 732 2800 Director: extension 204

Administrative Manager: extension 205 Facsimile: (675) 732 1998

Online: http://www.pngimr.org.pg E-mail: john.reeder@pngimr.org.pg

Wednesday, March 02, 2005

To Whom It May Concern:

Institutional support for research by Ms Carol Davy

Following close discussions with Ms Davy on her proposed research, into strategies for better information utilization in PNG health care facilities, I am pleased to confirm the willingness of the PNG Institute for Medical Research to offer her its support. We note that she has already gained the written support of the provincial Health Advisor, under whose authority the health facilities operate.

We are happy to offer Carol affiliation to the institute and to extend to her an invitation to use the facilities of our Goroka Headquarters. This is a useful and potentially important piece of health systems research and we look forward to seeing her eventual report.

If you have any further questions pertaining to this arrangement, do not hesitate to contact me at the above address or on john.reeder@pngimr.org.pg.

Yours sincerely,

Professor John Reeder
Director

Reference List

Aarons, J 2006, 'Epistemology and knowledge management', in *Encyclopedia of Knowledge Management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 166-172.

Abdullah, J & Stringer, E 1999, 'Indigenous knowledge, indigenous learning, indigenous research', in *What is Indigenous Knowledge*, vol. Two, eds. LM Semali & JL Kincheloe, Falmer Press, New York, pp. 143-155.

Aboulafia, M 1991, 'Introduction', in *Philosophy – social theory, and the thought of George Herbert Mead*, ed. M Aboulafia, State University of New York Press, Albany, NY, pp. 1-17.

Ackoff, RL 1989, 'From data to wisdom', *Journal of Applied Systems Analysis,* vol. 16, pp. 3-9.

Adam, MS & Myers, MD 2003, 'Have you got anything to declare? Neo-colonialism, information systems, and the imposition of customs and duties in a third world country', paper presented at the Working Conference on Information Systems Perspectives and Challenges in the Context of Globalization, Athens, Greece.

Aerts, T 1998, *Traditional religion in Melanesia,* University of Papua New Guinea Press, Port Moresby.

Agrawal, A 2004, 'Indigenous and scientific knowledge: some critical comments', *IK Monitor*, vol. 2005, no. 3, viewed 11th June 2008. Available at: http://www.nuffic.nl/ciran/ikdm/3-3/articles/agrawal.html

Aguolu, IE 1997, 'Accessibility of information: a myth for developing countries?' *New Library World*, vol. 98, no. 1, pp. 25-29.

Alavi, M & Leidner, DE 2001, 'Knowledge management and knowledge management systems: conceptual foundations and research issues', *MIS Quarterly,* vol. 25, no. 1, pp. 107-136.

Alavi, M & Leidner, DE 1999, 'Knowledge management systems: issues, challenges and benefits', *Communications of the Association for Information Systems,* vol. 1, pp. 2-28.

Allen, B 1996, *Information tasks: toward a user-centered approach to information systems,* Academic Press, San Diego.

Alto, WA 1996, 'Primary health care in Melanesia: problems and potentials', *PNG Medical Journal*, vol. 39, pp. 315-320.

Ambihaipahar, U & Rai, PP 2004, *Traditional medicine in Papua New Guinea (2001 - 2010): achievements, plans and projections*, Department of Health, Port Moresby, pp. 8-13.

Antonacopoulou, EP 2006, 'Modes of knowing in practice: the relationship between knowledge and learning revisited', in *The future of knowledge management*, eds. B Renzl, K Matzler & H Hinterhuber, Palgrave MacMillan, Basingstoke, pp. 7-28.

Ashwell, HE & Freeman, PA 1995, 'The clinical competency of community health workers in the Eastern Highlands Province of Papua New Guinea', *PNG Medical Journal*, vol. 38, pp. 198-207.

Attenborough, R 2007, 'Health changes in Papua New Guinea: from adaptation to double jeopardy?' in *Health change in the Asia-Pacific Region: biocultural and epidemiological approaches*, eds. R Ohtsuka & SJ Ulijaszek, Cambridge University Press, Cambridge, pp. 254-302.

Attkinson, P 1988, 'Discourse, descriptions and diagnoses: reproducing normal medicine', in *Biomedicine examined*, eds. M Lock & D Gordon, Kluwer Academic Publishers, London, pp. 179-204.

Atun, R 2004, *What are the advantages and disadvantages of restructuring a health care system to be more focused on primary care services?*, WHO Regional Office for Europe Health Evidence Network report, Copenhagen.

AusAID 2004, *Meeting the challenge: Australia's international HIV/AIDS strategy*, Australian Government, Canberra.

Baker, CD 1984, 'The "search for adultness": membership work in adolescent-adult talk', *Human Studies*, vol. 7, pp. 301-323.

Baldwin, MW & Holmes, JG 1987, 'Salient private audiences and awareness of the self', *Journal of Personality and Social Psychology*, vol. 52, no. 6, pp. 1087-1098.

Bandura, A 1998, 'Health promotion from the perspective of social cognitive theory', *Psychology and Health*, vol. 13, pp. 623-649.

Bandura, A 2003, 'On the psychosocial Impact and mechanisms of spiritual modeling', *The International Journal for the Psychology of Religion*, vol. 13, no. 3, pp. 167-173.

Bandura, A 1997, *Self-efficacy: the exercise of control*, W.H. Freeman and Company, New York.

Bandura, A 1977, 'Self-efficacy: toward a unifying theory of behavioral change', *Psychological Review*, vol. 84, no. 2, pp. 191-215.

Bandura, A 2002, 'Social cognitive theory in cultural context', *Applied Psychology: An International Review*, vol. 51, no. 2, pp. 269-290.

Bandura, A 2001a, 'Social cognitive theory of mass communication', *Media Psychology*, vol. 3, pp. 265-299.

Bandura, A 2001b, 'Social cognitive theory: an agentic perspective', *Annual Review Psychology*, vol. 52, pp. 1-26.

Bandura, A 1986, *Social foundations of thought and action*, Prentice-Hall Inc., Englewood Cliffs, NJ.

Baron, RA & Byrne, D 1991, *Social psychology: understanding human interaction*, Allyn & Bacon, Boston.

Barrett, F 1998, 'Creativity and improvisation in jazz and organizations: implications for organizational learning', *Organization Science*, vol. 9, pp. 605-622.

Barrett, M, Fryatt, B, Walsham, G & Joshi, S 2005, 'Building bridges between local and global knowledge: new ways of working at the World Health Organization', *Knowledge Management for Development Journal*, vol. 1, no. 2, pp. 31-46.

Bartle, N 2005, *Death, witchcraft and the spirit world in the highlands of Papua New Guinea. Developing a contextual theology in Melanesia*, The Melanesian Institute for Pastoral and Socio-Economic Service Inc., Goroka, Papua New Guinea.

Baskerville, RF & Dulipovici, A 2006, 'The theoretical foundations of knowledge management', *Knowledge Management Research and Practice*, vol. 4, pp. 83-105.

Bates, MJ 2006, 'Fundamental forms of information', *Journal of the American Society for Information Science*, vol. 57, no. 8, pp. 1033-1045.

Bates, MJ 2005, 'An introduction to metatheories, theories, and models', in *Theories of Information Behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 1-24.

Bates, MJ 2002, 'Toward an integrated model of information seeking and searching', *The New Review of Information Behaviour Research Studies of Information Seeking in Context,* vol. 3, pp. 1-15.

Bavelas, JB & Chovil, N 2000, 'Visible acts of meaning: an integrated message model of language in face to face dialogue', *Journal of Language and Social Psychology,* vol. 19, no. 2, pp. 163-194.

Becerra-Fernandez, I, Gonzalez, A & Sabherwal, R 2004, *Knowledge management challenges, solutions and technologies*, Pearson Prentice Hall, Upper Saddles River, New Jersey.

Beier, M & Semrau, T 2008, 'Collaborative networks – a beneficial perspective on health care in developing countries', in *Health capital and sustainable socioeconomic development*, eds. PA Cholewka & MM Motlagh, CRC Press. Taylor & Francis Group, Boca Raton, pp. 33-48.

Belkin, NJ 1980, 'Anomalous states of knowledge as a basis for information retrieval', *The Canadian Journal of Information Science,* vol. 5, pp. 133-143.

Berg, BL 2007, *Qualitative research methods for the social sciences*, Sixth edn, Pearson Education Inc., Boston.

Bergendorff, S 2008, 'Cultural complexity and religion: persistent interaction and conceptual order in Mekeo society, Papua New Guinea', *Culture and Religion*, vol. 9, no. 2, pp. 109-124.

Bhagat, RS, Kedia, BL, Harveston, PD & Triandis, HC 2002, 'Cultural variations in the cross-border transfer of organizational knowledge: an integrative framework', *Academy of Management Review*, vol. 27, no. 2, pp. 204-221.

Black, R & Morris, S 2003, 'Where and why are 10 million children dying every year?' *Lancet,* vol. 361, pp. 2226-2234.

Blackler, F 1995, 'Knowledge, knowledge work and organizations: an overview and interpretation', *Organization Studies,* vol. 16, no. 6, pp. 1021-1046.

Blumer, H 1954, 'Social structure and power conflict', in *Industrial conflict*, eds. A Kornhauser, R Dubin & AM Ross, McGraw-Hill Book Company, Inc., New York, pp. 232-239.

Blumer, H 1966, 'Sociological implications of the thought of George Herbert Mead', *The American Journal of Sociology*, vol. 71, no. 5, pp. 535-544.

Blumer, H 1969, *Symbolic interactionism – perspective and method*, Prentice-Hall Inc., New Jersey.

Blythe, J & Royle, JA 1993, 'Assessing nurses' information needs in the work environment', *Bulletin of the Medical Library Association*, vol. 81, no. 4, pp. 433-435.

Boissevain, J 1974, *Friends of friends. Networks, manipulators and coalitions*, Basil Blackwell, Oxford.

Bonney, N 1982, 'Local Government and political development in Papua New Guinea', *Public Administration & Development*, vol. 2, pp. 113-127.

Boulton-Lewis, G, Pillay, H, Wilss, L & Lewis, D 2002, 'Conceptions of health and illness held by Australian Aboriginal, Torres Strait Islander, and Papua New Guinea Health Science Students', *Australian Journal of Primary Health*, vol. 8, no. 2, pp. 9-16.

Briggs, CL 1986, *Learning how to ask. A sociolinguistic appraisal of the role of the interview in social science research*, Cambridge University Press, Cambridge.

Briggs, J & Sharp, J 2004, 'Indigenous knowledges and development: a postcolonial caution', *Third World Quarterly*, vol. 25, no. 4, pp. 661-676.

Brodersen, A 1971, 'The dimensions of the social world', in *Alfred Schutz. Collected papers studies in social theory*, vol. II, ed. A Brodersen, Martinus Nijhoff, The Hague, pp. 20-63.

Brown, R 2000, *Group Processes*, Second edn, Blackwell Publishers Ltd, Oxford.

Buckland 1991, 'Information as thing', *Journal of the American Society for Information Science*, vol. 42, no. 5, pp. 351-360.

Buekens, P, Keusch, GT, Belizan, J & Bhutta, Z 2004, 'Evidence-based global health', *Journal of the American Medical Association*, vol. 291, no. 21, pp. 2639-2641.

Burgess, RG 1984, *In the field: an introduction to field research*, George Allen & Unwin, London.

Burke, PJ 2004, 'Identities and social structure: The 2003 Cooley-Mead Award Address', *Social Psychology Quarterly*, vol. 67, no. 1, pp. 5-15.

Burnett, G, Jaeger, PT & Thompson, KM 2008, 'Normative behavior and information: the social aspects of information access', *Library & Information Science Research*, vol. 30, pp. 56-66.

Carey, JW 1989, *Communication as culture: essays on media and society*, Unwin Hyman Inc., New York.

Carr, M & Borkowski, JG 1987, 'Metamemory in gifted children', *Gifted Child Quarterly*, vol. 31, pp. 40-44.

Case, DO 2007, *Looking for information: a survey of research on information seeking, needs, and behavior*, Second edn, Academic Press, Amsterdam.

Castellano, MB 2000, 'Updating Aboriginal Traditions of Knowledge', in *Indigenous Knowledges in Global Contexts. Multiple Readings of Our World*, eds. GJ Dei, BL Hall & DD Rosenberg, University of Toronto Press, Toronto, pp. 21 - 36.

Chambers, R 1983, *Rural development - putting first last*, Prentice Hall, Essex.

Chan, L & Costa, S 2005, 'Participation in the global knowledge commons: challenges and opportunities for research dissemination in developing countries', *New Library World*, vol. 3, no. 4, pp. 106-134.

Chang, JH 2004, 'Mead's theory of emergence as a framework for multi level sociological inquiry', *Symbolic Interaction*, vol. 27, no. 3, pp. 405-427.

Chang, S-JL 2005, 'Chang's browsing', in *Theories of Information Behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 69-74.

Charon, JM 2004, *Symbolic interactionism: an introduction, an interpretation, an integration*, Eighth edn, Pearson, Prentice Hall, Upper Saddle River, New Jersey.

Chatman, EA 1996, 'The impoverished life-world of outsiders', *Journal of the American Society for Information Science*, vol. 47, no. 3, pp. 193-206.

Chatman, EA 1991, 'Life in a small world: applicability of gratification theory to information-seeking behavior', *Journal of the American Society for Information Science,* vol. 42, no. 6, pp. 438-449.

Chatman, EA 1999, 'A theory of life in the round', *Journal of the American Society for Information Science,* vol. 50, no. 3, pp. 207-217.

Chinnock, P, Siegfried, N & Clarke, M 2005, 'Is evidence-based medicine relevant to the developing world? Systematic reviews have yet to achieve their potential as a resource for practitioners in developing countries', *eCAM,* vol. 2, no. 3, pp. 321-324.

Choo, C 1998, *Information management for the intelligent organization: the art of scanning the environment,* Information Today, Medford, New Jersey.

Cibulskis, RE & Hiawalyer, G 2002, 'Information systems for health sector monitoring in Papua New Guinea', *Bulletin of the World Health Organization,* vol. 80, no. 9, pp. 752-758.

Clark, HH & Wilkes-Gibbs, D 1986, 'Referring as a collaborative process', *Cognition,* vol. 22, pp. 1-39.

Cochran, PA, Marshall, CA, Garcia-Downing, C, Kendall, E, Cook, D, McCubbin, L & Gover, RM 2008, 'Indigenous ways of knowing: implications for participatory research and community', *American Journal of Public Health,* vol. 98, no. 1, pp. 22-27.

Cogdill, KW 2003, 'Information needs and information seeking in primary care: a study of nurse practitioners', *Journal of the Medical Library Association,* vol. 91, no. 2, pp. 203-215.

Coleman, JS 1990, *Foundations of social theory,* The Belknap Press of Harvard University Press, Cambridge.

Coleman, JW 1995, 'Motivation and opportunity: understanding the causes of white-collar crime', in *White-collar crime: classic and contemporary views,* eds. G Geis, RF Meier & LM Salinger, Free Press, New York, pp. 360-381.

Collier, P 2001, 'A differentiated model of role identity acquisition', *Symbolic Interaction,* vol. 24, no. 2, pp. 217-235.

Connell, J 1997, 'Health in Papua New Guinea: a decline in development', *Australian Geographical Studies,* vol. 35, no. 3, pp. 271-293.

Connell, N, Klein, JH & Meyer, E 2004, 'Narrative approaches to the transfer of organisational knowledge', *Knowledge Management Research and Practice*, vol. 2, pp. 184-193.

Cook, GA 1991, 'The development of G. H. Mead's social psychology', in *Philosophy - social theory and the thought of George Herbert Mead*, ed. M Aboulafia, State University of New York Press, Albany, NY pp. 89-105.

Cooley, CH 1902, *Human nature and the social order*, Schocken Books, New York.

Coopey, M & Nix, MP 2006, 'Translating research into evidence-based nursing practice and evaluating effectiveness', *Journal of Nursing Care Quality*, vol. 21, no. 3, pp. 195-202.

Corbin, J & Strauss, AI 2008, *Basics of qualitative research 3e: techniques and procedures for developing grounded theory*, Sage Publications, Los Angeles.

Corcoran-Perry, S & Graves, J 1990, 'Supplemental-information-seeking behavior of cardiovascular nurses', *Research in Nursing and Health*, vol. 13, pp. 119-127.

Cushner, K & Brislin, RW 1996, *Intercultural interactions: a practical guide*, Second edn, SAGE Publications, Thousand Oaks.

D'Zurilla, TJ & Goldfried, MR 1971, 'Problem solving and behavior modification', *Journal of Abnormal Psychology*, vol. 78, no. 1, pp. 107-126.

Daft, RL & Weick, K 1984, 'Toward a model of organizations as interpretation systems', *Academy of Management Review*, vol. 9, no. 2, April 1984, pp. 284-296.

Darieva, B 2008, 'Health, gender, and religion in a Russian province in transition', in *Health capital and sustainable socioeconomic development*, eds. PA Cholewka & MM Motlagh, CRC Press, Taylor & Francis Group, Boca Raton, pp. 19-32.

Davenport, TH & Prusak, L 1998, *Working knowledge*, Harvard Business School Press, Massachusetts.

Davidoff, F & Florance, V 2000, 'The informationist: a new health profession?' *Annals of Internal Medicine*, vol. 132, no. 12, pp. 996-998.

Davies, H & Nutley, S 1999, 'The role of evidence in public sector policy and practice: the rise and rise of evidence in health care', *Public Money and Management,* vol. 19, pp. 9-15.

Davis, TW 2002, 'Governance and uncertainty: the public policy of Australia's official development assistance to Papua New Guinea', Department of Political Science, PhD thesis, University of Melbourne.

Davy, CP 2007, 'Embracing Standard Treatment Manuals: information transfer to primary health workers in Papua New Guinea', paper presented at the Information Technology in Health Care, Sydney, Australia.

Davy, CP 2006, 'Recipients: the key to information transfer', *Knowledge Management Research and Practice,* vol. 4, no. 1, pp. 17-25.

Davy, CP & Patrickson, M 2005, 'Problems with knowledge utilisation in Papua New Guinea: the case of health care workers', paper presented at the ANZAM, Canberra.

Dawson, ME & Chatman, EA 2001, 'Reference group theory with implications for information studies: a theoretical essay', *Information Research,* vol. 6, no. 3, viewed 20th April 2007. Available at: http://InformationR.net/6-3/paper105.html

Dee, C & Stanley, EE 2005, 'Information-seeking behavior of nursing students and clinical nurses: implications for health sciences librarians', *Journal of Medical Library Association,* vol. 93, no. 2, pp. 213-221.

Dei, GJ, Hall, BL & Rosenberg, DD 2000, 'Introduction', in *Indigenous knowledges in global contexts – multiple readings of our world*, eds. GJ Sefa Dei, BL Hall & DD Rosenberg, University of Toronto Press Incorporated, Toronto, pp. 3-16.

Denzin, NK 2004, 'Symbolic interactionism', in *A companion to qualitative research*, eds. U Flick, Ev Kardorff & I Steinke, SAGE Publications Ltd, London, pp. 81-87.

Denzin, NK 1994, *Symbolic interactionism and cultural studies – the politics of interpretation*, Blackwell Publishers, Cambridge, Massachusetts.

Denzin, NK & Lincoln, YS 2000, 'Introduction: the discipline and practice of qualitative research', in *Handbook of qualitative research*, eds. NK Denzin & YS Lincoln, Sage Publications, Thousand Oaks, California, pp. 1-28.

Department of Health Papua New Guinea 2007, *National Policy on Traditional Medicine*, National Department of Health, Port Moresby, p. 17.

Department of Health Papua New Guinea 2005, *Strategic plan: for the Papua New Guinea health sector 2006-2008*, Department of Health, Papua New Guinea, Port Moresby.

Depken, D 1994, 'Wellness through the lens of gender: a paradigm shift', *Wellness Perspectives*, vol. 10, no. 2, pp. 54-70.

Derham, DP 1960, *Report on the system for the administration of justice in the Territory of Papua and New Guinea*, University of Melbourne, Melbourne.

Dervin, B 1980, 'Communication gaps and inequities: moving toward a reconceptualization', in *Progress in communication science*, vol. II, eds. B Dervin & M Voigt, Ablex Publishing Corporation, Norwood, New Jersey, pp. 73-112.

Dervin, B 1992, 'From the mind's eye of the user: the sense-making qualitative-quantitative methodology', in *Qualitative research in information management*, eds. JD Glazier & RR Powell, Libraries Unlimited, Englewood, pp. 61-84.

Dervin, B 1997, 'Given a context by any other name: methodological tools for taming the unruly beast', in *Information seeking in context*, eds. P Vakkari, R Savolainen & B Dervin, Taylor Graham, London, pp. 13-38.

Dervin, B 2003, 'Mass communicating: changing conceptions of the audience', in *Sense-making methodology reader: selected writings of Brenda Dervin*, eds. B Dervin, L Foreman-Wernet & E Lauterbach, Hampton Press, Cresskill, NJ, pp. 197-214.

Dervin, B 2005, 'What methodology does to theory: sense-making methodology as exemplar', in *Theories of information behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Melford, New Jersey, pp. 25 - 29.

Dervin, B 1999, 'On studying information seeking methodologically: the implications of connecting metatheory to method', *Information Processing and management*, vol. 35, pp. 727-750.

Dervin, B & Clark, KD 1999, 'Exemplars of the use of the sense-making methodology (meta-theory and method): in-depth introduction to the sense-making issues of the Electronic Journal of Communication', *Electronic Journal of Communication*, vol. 9,

no. 2, viewed 28th October 2004. Available at: http://www.cios.org/www/ejc/v9n23499.htm#Introduction

Dervin, B & Nilan, M 1986, 'Information needs and uses', in *Annual review of information science and technology*, vol. 21, ed. ME Williams, American Society for Information Science, Washington DC, pp. 3-33.

Dienes, CL, Morrissey, SL & Wilson, AV 2004, 'Health care experiences of African American teen women in eastern North Carolina', *Family Medicine*, vol. 36, no. 5, pp. 346-351.

Diwan, VK, Sachs, L & Wahlstrom, R 1997, 'Practice-knowledge-attitudes-practice: an explorative study of information in primary care', *Social Science & Medicine*, vol. 44, no. 8, pp. 1221-1228.

Dobbins, M, DeCorby, K & Twiddy, T 2004, 'A knowledge transfer strategy for public health decision makers', *Worldview on Evidence-Based Nursing*, vol. 1, no. 2, pp. 120-128.

Dosa, M 1997, *Across all borders: international information flows and applications*, The Scarecrow Press, Inc., London.

Downs, I 1980, *The Australian trusteeship: Papua New Guinea 1945-75*, Australian Government Publishing Service, Canberra.

Drummond, DL & Mason, C 1990, 'Diabetes in a social context: just a different way of life in the age of reason', in *Readings in medical sociology*, eds. S Cunningham-Burley & NP McKeganey, Tavistock/Routledge, London, pp. 37-54.

Durie, M 1994, *Whaiora: Maori health development*, Oxford University Press, Auckland.

Edejer, T 2000, 'Disseminating health information in developing countries: the role of the internet', *British Medical Journal*, vol. 321, pp. 292-800.

Edmiston, KD 2002, 'Fostering subnational autonomy and accountability in decentralized developing countries: lessons from the Papua New Guinea experience', *Public Administration & Development*, vol. 22, pp. 221-234.

Edoni, W 1986, 'The confrontation of traditional and Christian norms and values in Papua New Guinea', in *Ethics and development in Papua New Guinea*, ed. G Fugmann, The Melanesian Institute, Goroka, pp. 35-42.

Ehrlich, K & Cash, D 1994, 'Turning information into knowledge: information finding as a collaborative activity', paper presented at the Digital Libraries College Station, Texas, June 1994.

Ein-Dor, P 2006, 'Taxonomies of knowledge', in *Encyclopedia of knowledge management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 848-854.

Eisenberg, EM 1984, 'Ambiguity as strategy in organizational communication', *Communication Monographs,* vol. 51, pp. 227-242.

Eisenberg, EM 1990, 'Jamming: transcendence through organizing', *Communication Research,* vol. 17, pp. 139-164.

Eisenberg, EM 1998, 'Flirting with meaning', *Journal of Language and Social Psychology,* vol. 17, pp. 97-108.

Eisenberg, EM 2001, 'Building a mystery: toward a new theory of communication and identity', *Journal of Communication,* vol. September pp. 534-552.

Eisenberg, EM 2007, 'Introduction', in *Strategic ambiguities: essays on communication, organization, and identity*, ed. EM Eisenberg, SAGE Publications, Thousand Oaks.

Elabor-Idemudia, P 2000, 'The retention of knowledge of folkways as a basis for resistance', in *Indigenous knowledges in global contexts: multiple readings of our world*, eds. GJ Dei, BL Hall & DD Rosenberg, University of Toronto Press, Toronto, pp. 102-118.

Elliot, AJ & Devine, PG 1994, 'On the motivational nature of cognitive dissonance: dissonance as psychological discomfort', *Journal of Personality and Social Psychology*, vol. 67, pp. 382-394.

Emmons, RA 2005, 'Striving for the sacred: personal goals, life meaning, and religion', *Journal of Social Issues,* vol. 61, no. 4, pp. 731-745.

Erdelez, S 2005, 'Information encountering', in *Theories of information behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 179-184.

Erdelez, S 1997, 'Information encountering: a conceptual framework for accidental information discovery', in *Information seeking in context,* eds. P Vakkari, R Savolainen & B Dervin, Taylor Graham, London, pp. 412-421.

Essai, B 1961, *Papua and New Guinea: a contemporary survey*, Oxford University Press, Melbourne.

Estabrooks, CA, Floyd, JA, Scott-Findlay, S, O'Leary, KA & Gushta, M 2003, 'Individual determinants of research utilization: a systematic review', *Journal of Advanced Nursing*, vol. 43, no. 5, pp. 506-520.

Estabrooks, CA, Midodzi, WK & Cummings, GG 2007, 'Predicting research use in nursing organizations: a multilevel analysis', *Nursing Research*, vol. 56, no. 4, pp. S7-S23.

Faules, DF & Alexander, DC 1978, *Communication and social behavior: a symbolic interaction perspective*, Addison-Wesley Publishing Company Inc., Reading.

Festinger, L 1957, *A theory of cognitive dissonance*, Stanford University Press, Stanford, California.

Fine, GA 2001, 'Enacting norms: mushrooming and the culture of expectations and explanations', in *Social norms*, eds. M Hechter & K-D Opp, Russell Sage Foundation, New York, pp. 139-163.

Fine, GA 1979, 'Small groups and culture creation: the idioculture of little league baseball teams', *American Sociological Review*, vol. 44, pp. 733-745.

Fine, GA 1987, *With the boys: little league baseball and preadolescent culture*, The University of Chicago Press, Chicago.

Fine, GA & Kleinman, S 1979, 'Rethinking subculture: an interactionist analysis', *The American Journal of Sociology*, vol. 85, no. 1, pp. 1-20.

Fisher, KE 2005, 'Information grounds', in *Theories of information behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 185-190.

Fisher, KE, Durrance, JC & Hinton, MB 2004, 'Information grounds and the use of need-based services by immigrants in Queens, New York: a context-based, outcome evaluation approach', *Journal of the American Society for Information Science and Technology*, vol. 55, no. 8, pp. 754-766.

Fisher, KE, Erdelez, S & McKechnie, L 2005, 'Preface', in *Theories of information behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc, Medford, New Jersey, pp. xix-xxii.

Fisher, KE, Marcoux, E, Miller, LS, Sanchez, A & Cunningham, ER 2004, 'Information behaviour of migrant Hispanic farm workers and their families in the Pacific northwest', *Information Research*, vol. 10, no. 1, viewed 11th November 2006. Available at: http://InformationR.net/ir/10-1/paper199.html

Fisher, KE & Naumer, CM 2006, 'Information grounds: theoretical basis and empirical findings on information flow in social settings', in *New directions in human information behavior*, eds. A Spink & C Cole, Springer, Dordrecht, pp. 93-111.

Flick, U 2002, *An Introduction to qualitative research*, Second edn, SAGE Publications Ltd, London.

Flick, U, Kardorff, Ev & Steinke, I 2004, 'What is qualitative research? An introduction to the field', in *A Companion to qualitative research*, eds. U Flick, Ev Kardorff & I Steinke, SAGE Publications Ltd, London, pp. 3-11.

Foot, SH 1964, *A start in freedom*, Hodder and Stoughton Ltd, London.

Forgarty, TJ & Dirsmith, MW 2001, 'Organizational socialization as instrument and symbol: an extended institutional theory perspective', *Human Resource Development Quarterly*, vol. 12, no. 3, pp. 247-266.

Foster, A 2004, 'A nonlinear model of information-seeking behavior', *Journal of the American Society for Information Science and Technology*, vol. 55, no. 3, pp. 228-237.

Foster, A 2006, 'A non-linear perspective on information seeking', in *New directions in human information behavior*, eds. A Spink & C Cole, Springer, Dordrecht, pp. 155-170.

Freeman, PA, Thomason, J & Bukenya, GB 1992, 'Factors affecting the use of immunization among urban settlement dwellers in Papua New Guinea', *PNG Medical Journal*, vol. 35, pp. 179-185.

French, B 2006, 'Uncertainty and information need in nursing', *Nursing Education Today*, vol. 26, pp. 245-252.

Fry, J 2006, 'Scholarly research and information practices: a domain analytic approach', *Information Processing and Management*, vol. 42, pp. 299-316.

Fulton, C 2005, 'Chatman's life in the round', in *Theories of information behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 79-82.

Funk, SG 1991, 'Barriers: the barriers to research utilization scale', *Applied Nursing Research*, vol. 4, no. 1, pp. 39-45.

Garner, P, Lai, D & Baea, M 1994, 'Childbirth in rural areas: maternal deaths, village deliveries and obstetric service use', *PNG Medical Journal*, vol. 37, pp. 166-172.

Gergen, KJ 1991, *The saturated self: dilemmas of identity in contemporary life*, Basic Books, New York.

Gergen, KJ 2000, *The saturated self*, Basic Books, New York.

Gerner, B 1991, *Social learning theory*, Third edn, Harper Collins, New York.

Gesch, PF 2007, 'Working out of two mindsets: critical methodology and PNG village traditional ways', *DWU Research Journal*, vol. 7, pp. 17-34.

Giddens, A 1984, *The constitution of society*, Polity Press, Cambridge.

Giddens, A 2001, *Sociology*, Fourth edn, Polity Press, Cambridge.

Gilson, L, Doherty, J, Loewenson, R & Fancis, V 2007, *Challenging inequity through health systems*, World Health Organization, Geneva.

Glaser, BG 1978, *Theoretical sensitivity: advances in the methodology of grounded theory*, The Sociology Press, Mill Valley, California.

Godbold, N 2006, 'Beyond information seeking: towards a general model of information behaviour', *Information Research*, vol. 11, no. 4, viewed 2nd February 2007. Available at: http://InformationR.net/ir/11-4/paper269.html

Godelier, M 1986, *The making of great men: male domination and power among the New Guinea Baruya*, Cambridge University Press, New York.

Godlee, F, Pakenham-Walsh, N, Ncayiyana, D, Cohen, B & Packer, A 2004, 'Can we achieve health information for all by 2015?' *The Lancet*, vol. 364, pp. 295-300.

Goffman, E 1967, *Interaction ritual: essays on face-to-face behavior*, Pantheon, New York.

Goffman, E 1971, *The presentation of self in everyday life*, Pelican Books, London.

Gorman, PN, Lavelle, M, Delcambre, L & Maier, D 2002, 'Following experts at work in their own information spaces: using observational methods to develop tools for the digital library', *Journal of the American Society for Information Science and Technology*, vol. 53, no. 14, pp. 1245-1250.

Griffin, E 2006, *Communication: a first look at communication theory*, Sixth edn, McGraw Hill, Boston.

Grypdonck, MH 2006, 'Qualitative health research in the era of evidence-based practice', *Qualitative Health Research*, vol. 16, no. 10, pp. 1371-1385.

Guilford, JP 1984, 'Varieties of divergent production', *Journal of Creative Behavior*, vol. 18, no. 1, pp. 1-10.

Gusfield, J 2003, 'A Journey with symbolic interaction', *Symbolic Interaction*, vol. 26, no. 1, pp. 119-139.

Habermas, J 2003, *Truth and justification*, Polity Press, Cambridge, viewed 28 June 2008. Available at: http://www.netlibrary.com/Details.aspx

Hadi, A 2003, 'Management of acute respiratory infections by community health volunteers: experience of Bangladesh Rural Advancement Committee (BRAC)', *Bulletin of the World Health Organization*, vol. 31, no. 3, pp. 183-189.

Haig, P 1993, 'Nursing journals: are nurses using them?' *Nursing Standards*, vol. 8, no. 1, pp. 22-25.

Haines, A, Kuruvilla, S & Borchert, M 2004, 'Bridging the implementation gap between knowledge and action for health', *Bulletin of the World Health Organization*, vol. 82, no. 10, pp. 724-732.

Haines, A & Rogers, S 1998, 'Integrating research evidence into practice', in *Evidence based practice in primary care*, eds. C Silagy & A Haines, BMJ Books, London, pp. 144-160.

Hall, MF 1965, 'Communication within organisations', *Journal of Management Studies*, vol. February, pp. 54-69.

Hall, P 1997, 'Meta-power, social organization, and the shaping of social action', *Symbolic Interaction,* vol. 20, no. 4, pp. 397-418.

Hallet, T & Ventresca, MJ 2006, 'Inhabited institutions: social interactions and organzational forms in Gouldner's *Patterns of Industrial Bureaucracy*', *Theory and Society,* vol. 35, no. 2, pp. 1-24.

Hamnett, MP & Connell, J 1981, 'Diagnosis and cure: the resort to traditional and modern medical practitioners in the North Solomons, Papua New Guinea', *Social Science & Medicine,* vol. 15B, pp. 489-498.

Hara, N & Kling, R 2002, 'Communities of practice with and without information technology', paper presented at the American Society for Information Science and Technology 65th Annual Meeting, Medford, NJ, 18-21 November.

Hargittai, E & Hinnant, A 2006, 'Toward a social framework for information seeking', in *New directions in human information behavior,* eds. A Spink & C Cole, pp. 55-70.

Harrington, B & Fine, GA 2000, 'Opening the "black box": small groups and twenty-first-century sociology', *Social Psychology Quarterly,* vol. 63, no. 4, pp. 312-323.

Hastings, P 1969, *New Guinea, problems & prospects*, Cheshire for the Australian Institute of International Affairs, Melbourne.

Hatch, M 1999, 'Exploring the empty spaces of organizing: how improvisational jzz helps redescribe organizational structure', *Organization Studies,* vol. 20, pp. 75-100.

Hauck, V, Mandie-Filer, A & Bolger, J 2005, *Ringing the church bell: the role of churches in governance and public performance in Papua New Guinea*, The European Centre for Development Policy Management, Maastricht.

Hechter, M 1984, 'When actors comply: monitoring costs and the production of social order', *Acta Sociologica,* vol. 27, no. 3, pp. 161-183.

Hechter, M & Opp, K-D 2001, 'What have we learned about the emergence of social norms?' in *Social norms*, eds. M Hechter & K-D Opp, Russell Sage Foundation, New York, pp. 394-415.

Hermanns, H 2004, 'Interviewing as an activity', in *A companion to qualitative research,* eds. U Flick, Ev Kardorff & I Steinke, SAGE Publications Ltd, London, pp. 209-213.

Hermes, M 1998, 'Research methods as a situated response: towards a first nations' methodology', *Qualitative Studies in Education*, vol. 11, no. 1, pp. 155-168.

Hermkens, A-K 2007, 'The power of Mary in Papua New Guinea', *Anthropology Today*, vol. 23, no. 2, pp. 4-8.

Hersberger, J 2005, 'Chatman's information poverty', in *Theories of information behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 75-78.

Herzlich, C 1973, *Health and illness: a social psychological analysis*, Academic Press, London.

Hesketh, T & Zhu, WX 1997, 'Health in China: traditional Chinese medicine: one country, two systems', *British Medical Journal*, vol. 315, pp. 115-117.

Hewitt, JP 1991, *Self and society: a symbolic interactionist social psychology*, Allyn and Bacon, Boston.

Hill, A, Joyce, MD, Rivers, D & Watson, J 2007, *Key themes in interpersonal communication*, Open University Press, Maidenhead, viewed 12th February 2008. Available at: http://www.unisa.eblib.com.au.ezlibproxy1.unisa.edu.au/EBLWeb/patron/

Hinchliffe, K & Allan, B 1983, 'Public expenditure planning in Papua New Guinea: an evaluation of innovation', *World Development*, vol. 11, no. 11, pp. 957-969.

Holdsworth, D 1975, 'Traditional medicinal plants used in the treatment of malaria and fevers in Papua New Guinea', *PNG Medical Journal*, vol. 18, no. 3, pp. 142-148.

Holmes, K & Crossley, M 2004, 'Whose knowledge, whose values? The contribution of local knowledge to education policy processes: a case study of research development initiatives in the state of Saint Lucia', *Compare*, vol. 34, no. 2, pp. 197-214.

Holsapple, CW & Joshi, KD 2006, 'Knowledge Management Ontology', in *Encyclopedia of Knowledge Management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 397 - 402.

Honor Society of Nursing, STTI 2005, *Evidence based nursing position statement*, Honor Society of Nursing, Indianapolis, viewed 16 May 2008

<http://www.nursingsociety.org/aboutus/PositionPapers/Pages/EBN_positionpaper.aspx>.

Hope, GS & Haberle, SG 2005, 'The history of the human landscapes of New Guinea', in *Papuan pasts: cultural, linguistic and biological histories of Papuan-speaking peoples*, ed. A Pawley, Australian National University, Canberra, pp. 541-554.

Horne, C 2001, 'Sociological perspectives on the emergence of social norms', in *Social Norms*, eds. M Hechter & K-D Opp, Russell Sage Foundation, New York, pp. 3-34.

Horton, R 2000, 'North and south: bridging the information gap', *The Lancet*, vol. 355, pp. 2231-2236.

Horwitz, AV 2008, 'Normality', *Contexts*, vol. 7, no. 1, pp. 70-71.

Huberman, MA & Miles, MB 1994, 'Data management and analysis methods', in *Handbook of qualitative research*, eds. NK Denzin & YS Lincoln, SAGE Publications, London, pp. 428-444.

Hudson, K, Duke, G, Haas, B & Varnell, G 2008, 'Navigating the evidence-based practice maze', *Journal of Nursing Management*, vol. 16, pp. 409-416.

Hughes, H 2002, 'Aid has failed in the Pacific: inquiry into Australia's relationship with Papua New Guinea and other Pacific island countries', viewed 14th March 2004. Available at: http://66.102.1.104/scholar?hl=en&lr=&q=cache:KIRs2CuqHPwJ:202.14.81.34/Senate/committee/fadt_ctte/completed_inquiries/2002-04/png/submissions/sub61.doc+allintitle:+aid+has+failed+the+pacific+author:%22Helen+Hughes%22

Illeris, K 2004, *The three dimensions of learning: contemporary learning theory in the tension field between the cognitive, the emotional and the social.*, Second edn, Niace Publications, Leicester.

Illeris, K 2003, 'Workplace learning and learning theory', *Journal of Workplace Learning*, vol. 15, no. 4, pp. 167-178.

Im, E-O, Page, R, Lin, L-C, Tsai, H-M & Cheng, C-Y 2004, 'Rigor in cross-cultural nursing research', *International Journal of Nursing Studies*, vol. 41, pp. 891-899.

Ingerwersen, P 1996, 'Cognitive perspectives of information retrieval interaction: elements of a cognitive IR theory', *Journal of Documentation*, vol. 52, no. 1, pp. 3-50.

International Conference on Primary Health Care 1978, 'Declaration of Alma-Ata', viewed 17th November 2006. Available at: http://www.euro.who.int/AboutWHO/Policy/20010827_1

Isetta, M 2008, 'Evidence-based practice, healthcare delivery and information management: a contemporary case study', *New Information Perspectives*, vol. 60, no. 6, pp. 619-641.

Iteanu, A 2004, 'Partial discontinuity: the mark of ritual', *Social Analysis*, vol. 48, no. 2, pp. 98-115.

Jacobson, CM 2006, 'Knowledge sharing between individuals', in *Encyclopedia of knowledge management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 507-514.

Jakubik, M 2007, 'Exploring the knowledge landscape: four emerging views of knowledge', *Journal of Knowledge Management*, vol. 11, no. 4, pp. 6-19.

Jashapara, A 2004, *Knowledge management: an integrated approach*, Financial Times Prentice Hall, Harlow.

Jenkins, C 1988, 'Health in the early contact period: a contemporary example from Papua New Guinea', *Social Science & Medicine*, vol. 26, no. 10, pp. 997-1006.

Jenkins, C 1984, 'Indigenous childbrith practices: information gathering with the Machik interview, Part II', *PNG Medical Journal*, vol. 27, no. 2, pp. 61-64.

Jeon, Y-H 2004, 'The application of grounded theory and symbolic interactionism', *Scandinavian Journal of Caring Science*, vol. 18, pp. 249-256.

Johannisson, J & Sundin, O 2007, 'Putting discourse to work: information practices and the professional project of nurses', *Library Quarterly*, vol. 77, no. 2, pp. 199-218.

Johnson, CA 2005, 'Nan Lin's theory of social capital', in *Theories of information behavior*, eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 323-327.

Johnson, DJ 2003, 'On contexts of information seeking', *Information Processing and Management,* vol. 39, pp. 735-760.

Julien, H & Michels, D 2000, 'Source selection among information seekers: ideals and realities', *Canadian Journal of Information and Library Science,* vol. 25, no. 1, pp. 1-17.

Jutting, JP, Drechsler, D, Bartsch, S & Soysa, Id 2006, 'Introduction and overview: informal institutions', paper presented at the Informal Institutions: How Social norms Help or Hinder Development, Paris, 11-12 December.

Kafuko, J, Zirabamuzaale, C & Bagenda, D 1996, *Rational use of drugs in rural health units of Uganda: effect of Uganda Essential Drugs Management Programme National Standard Treatment Guidelines on rational drug use,* Uganda Essential Drugs Management Programme, Entebbe, Uganda.

Kardorff, Ev 2004, 'Qualitative evaluation research', in *A companion to qualitative research,* eds. U Flick, Ev Kardorff & I Steinke, Sage Publications, London, pp. 137-142.

Katseli, LT 2006, 'Preface', paper presented at the Informal Institutions: How Social Norms Help or Hinder Development, Paris, 11-12 December.

Keck, V 1991, *Social discord and bodily disorders: healing among the Yupno of Papua New Guinea,* Carolina Academic Press, Durham, North Carolina.

Kehalie, M 1999, 'Health workers and community's perception of barriers hindering the provision of quality health care within the church rural health service in Simbu Province, Papua New Guinea', Masters of Public Health, Masters thesis, Queensland University of Technology.

Kettle, E 1979, *That they might live,* F. P. Leonard, Sydney.

Kimaro, HC & Nhampossa, JL 2005, 'Analyzing the problem of unsustainable health information systems in less developed economies: case studies from Tanzania and Mozambique', *Information Technology for Development,* vol. 11, no. 3, pp. 273-298.

King, WR 2006, 'Knowledge transfer', in *Encyclopedia of knowledge management,* ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 538-543.

Kitson, A, Rycroft-Malone, J, Harvey, G, McCormack, B, Seers, K & Titchen, A 2008, 'Evaluating the successful implementation of evidence into practice using the PARiHS framework: theoretical and practical challenges', *Implementation Science*, vol. 3, no. 1, viewed 28 June 2008. Available at: http://www.implementationscience.com/content/3/1/1

Koczberski, G & Curry, G 1999, '*Sik bilong ples*: an exploration of meanings of illness and well-being amongst the Wosera Abelam of Papua New Guinea', *Australian Geographical Studies*, vol. 37, no. 3, pp. 230-247.

Koczberski, G, Curry, G & Connell, J 2001, 'Full circle or spiralling out of control? State violence and the control of urbanisation in Papua New Guinea', *Urban Studies*, vol. 38, no. 11, pp. 2017-2036.

Koka, BE 2004, 'Traditional medicine in Papua New Guinea: cultural beliefs and practices', paper presented at the Traditional Medicine in Papua New Guinea: Proceedings of the National Workshop on Policy and Practices, Port Moresby.

Kolb, DA 1984, *Experiential learning: experience as the source of learning and development*, PTR Prentice-Hall, Englewood Cliffs, New Jersey.

Kolb, DA 1974, 'On management and the learning process', in *Organizational psychology*, 2nd edn, eds. DA Kolb, IM Rubin & JM McIntyre, Prentice-Hall, Inc, Englewood Cliffs, New Jersey, pp. 27-42.

Kolehmainen-Aitken, RL 1990, 'Aid post and hospital orderlies: a vanishing breed?' *PNG Medical Journal*, vol. 33, pp. 187-193.

Kolehmainen-Aitken, RL 1992, 'The impact of decentralization on health workforce development in Papua New Guinea', *Public Administration & Development*, vol. 12, pp. 175-191.

Kosteniuk, JG, D'Arcy, C & Barbara, S 2006, 'Central and peripheral information source use among rural and remote registered nurses', *Journal of Advanced Nursing*, vol. 55, no. 1, pp. 100-114.

Krikelas, J 1980, 'Searching the library catalogue: a study of users access', *Library Research*, vol. 2, no. 3, pp. 215-230.

Krikelas, J 1983, 'Information-seeking behavior: patterns and concepts', *Drexel Library Quarterly*, vol. 19, no. 2, pp. 4-20.

Krishma, S & Walsham, G 2005, 'Implementing public information systems in developing countries: learning from a success story', *Information Technology for Development*, vol. 11, no. 2, pp. 123-140.

Kuhlthau, CC 1991, 'Inside the search process: information seeking from the user's perspective', *Journal of the American Society for Information Science and Technology*, vol. 42, no. 5, pp. 361-371.

Kuhlthau, CC 1993, *Seeking meaning: a process approach to library and information services*, Ablex Corporation, Norwood, NJ.

Kuhlthau, CC 2004, *Seeking meaning: a process approach to library and information services*, Second edn, Libraries Unlimited, Westport.

Laing, R, Hogerzeil, H & Ross-Degnan, D 2001, 'Ten recommendations to improve use of medicine in developing countries', *Health Policy and Planning*, vol. 16, no. 1, pp. 13-20.

Lal, BB 1995, 'Symbolic interaction theories', *American Behavioral Scientist*, vol. 38, no. 3, pp. 421-441.

Lamond, D, Crow, R, Chase, J & Doggen, K 1996, 'Information sources used in decision making: considerations for simulation development', *International Journal of Nursing Studies*, vol. 33, no. 1, pp. 47-57.

Land, F, Amjad, U & Nolas, S-M 2006, 'Knowledge management processes', in *Encyclopedia of knowledge management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 403-409.

Land, F, Nolas, S-M & Amjad, U 2006, 'Theoretical and practical aspects of knowledge management', in *Encyclopedia of knowledge management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 855-861.

Langer, A, Diaz-Olavarrieta, C, Berdichevsky, K & Villar, J 2004, 'Why is research from developing countries underrepresented in international health literature, and what can be done about it?' *Bulletin of the World Health Organization*, vol. 82, no. 10, pp. 802-804.

Larsson, R, Bentsson, L, Henriksson, K & Sparks, J 1998, 'The inter-organizational learning dilemma: collective knowledge development in strategic alliances', *Organization Science,* vol. 9, no. 3, pp. 285-305.

Lave, J & Wenger, E 1991, *Situated learning: legitimate peripheral participation,* Cambridge University Press, Cambridge.

Lavelli, M & Fogel, A 2005, 'Developmental changes in the relationship between the infant's attention and emotion during early face-to-face communication: the 2-month transition', *Developmental Psychology,* vol. 41, no. 1, pp. 265-280.

Lawrence, P 1971, 'Introduction', in *Politics in New Guinea,* eds. RM Berndt & P Lawrence, University of Western Australia Press, Nedlands, pp. 1-34.

LeCompte, MD & Schensul, JJ 1999, *Designing & conducting ethnographic research,* AltaMira Press, Plymouth.

Ledgerwood, A & Chaiken, S 2007, 'Priming us and them: automatic assimilation and contrast in group attitudes', *Journal of Personality and Social Psychology,* vol. 93, no. 6, pp. 940-956.

Lee, CK, Foo, S & Goh, D 2006, 'On the concept and types of knowledge', *Journal of Information & Knowledge Management,* vol. 5, no. 2, pp. 151-163.

Lepowsky, M 1990, 'Sorcery and penicillin: treating illness on a Papua New Guinea island', *Social Science & Medicine,* vol. 30, no. 10, pp. 1049-1063.

Lewis, DJ 1991, 'A social behaviorist interpretation of the meadian "I"', in *Philosophy, social theory and the thought of George Herbert Mead,* ed. M Aboulafia, State University of New York, Albany, pp. 109-133.

Lin, N 2001, 'Building a network theory of social capital', in *Social capital: theory and research,* eds. N Lin, K Cook & RS Burt, Aldine de Gruyter, New York, pp. 3-29.

Lincoln, YS & Guba, EG 1985, *Naturalistic inquiry,* SAGE Publications, Newbury Park.

Lindesmith, AR, Strauss, AI & Denzin, NK 1975, *Social psychology,* Fourth edn, The Dryden Press, Hinsdale, Illinois.

Lloyd, A 2005, 'Information literacy: different contexts, different concepts, different truths?' *Journal of Librarianship and Information Science,* vol. 37, no. 2, pp. 82-88.

Lloyd, B 2007, 'Knowledge management: what has wisdom got to do with it?' in *Knowledge management: social cultural and theoretical perspectives*, ed. R Rikowski, Chandos, Oxford, pp. 5-13.

Lor, PJ & Britz, JJ 2004, 'Information imperialism: moral problems in information flow from south to north', in *Information ethics in the electronic age: current issues in Africa and the world*, eds. T Mendina & JJ Britz, McFarland & Company Inc Publishers, Jefferson, pp. 15-21.

Losch, ME & Cacioppo, JT 1990, 'Cognitive dissonance may enhance sympathetic tonus, but attitudes are changed to reduce negative affect rather than arousal', *Journal of Experimental Social Psychology*, vol. 26, pp. 289-304.

Lown, B, Bukachi, F & Xavier, R 1998, 'Health information in the developing world', *The Lancet*, vol. 352, pp. 34-38.

Luker, KA & Kenrick, M 1992, 'An exploratory study of the sources of influence on the clinical decisions of community nurses', *Journal of Advanced Nursing*, vol. 17, pp. 457-466.

Macfarlane, J Accepted for Publication in 2009, 'A focused ethnography about treatment-seeking behaviour and traditional medicine in the Nasioi area of Bougainville', *PNG Medical Journal*.

Macfarlane, J 2005, 'The Relationship between cultural beliefs and treatment-seeking behaviour in Papua New Guinea: implications for the incorporation of traditional medicine into the health system', Centre for International Health, PhD thesis, Curtin University of Technology.

Machet, MP 1996, 'Problematic issues in cross-cultural research', *Mousaion*, vol. 14, no. 1, pp. 60-67.

MacIntosh-Murray, A 2001, 'Scanning and vicarious learning from adverse events in health care', *Information Research*, vol. 7, no. 1, viewed 24th November 2008. Available at: http://InformationR.net/ir/7-1/paper113.html

MacLean, TL 2008, 'Framing and organizational misconduct: a symbolic interactionist study', *Journal of Business Ethics*, vol. 78, pp. 3-16.

Madden, AD, Bryson, J & Palimi, J 2006, 'Information behavior in pre-literate societies', in *New directions in human information behavior*, eds. A Spink & C Cole, Springer, Dordrecht, The Netherlands, pp. 33-53.

Maddocks, I 1973, 'Papua New Guinea 1973', *Annals of Internal Medicine*, vol. 6, pp. 968-969.

Maddocks, I 1978, 'Papua New Guinea – Pari village', in *Basic health care in developing countries: an epidemiological perspective*, ed. B Hetzel, Oxford University Press, New York, pp. 11-37.

Maines, DR 1977, 'Social organization and social structure in symbolic interactionist thought', *Annual Review of Sociology*, vol. 3, pp. 235-259.

Manis, J & Meltzer, BN 1978, 'Intellectual antecedents and basic propositions', in *Symbolic interaction: a reader in social psychology*, eds. J Manis & BN Meltzer, Allyn and Bacon, Boston, pp. 1-9.

Map of the Island of New Guinea 2006, Wikimedia Commons.

Marquez, L & Kean, L 2002, *Making supervision supportive and sustainable: new approaches to old problems*, United States Agency for International Development, Washington DC.

Martinez, A, Villarroel, V, Seoane, J & Del Pozo, F 2005, 'Analysis of information and communication needs in rural primary health care in developing countries', *IEEE Transactions on Information Technology in Biomedicine*, vol. 9, no. 1, pp. 66-72.

Martis, R, Ho, JJ & Crowther, CA 2008, 'Survey of knowledge and perception on the access to evidence-based practice and clinical practice change among maternal and infant health practitioners in South East Asia', *BioMed Central Pregnancy and Childbirth*, vol. 8, no. 34, viewed 14th October 2008. Available at: http://www.biomedcentral.com/147-2393/8/34

Maxwell, JA 2005, *Qualitative research design: an interactive approach*, Second edn, Sage Publications, Inc., Thousand Oaks, California.

May, RJ 2006, 'Papua New Guinea: disorderly democracy or dysfunctional state?' in *Australia's arc of instability: the political and cultural dynamics of regional security*,

eds. D Rumley, VL Forbes & CC Griffin, Springer, Dordrecht, The Netherlands, pp. 151-169.

May, RJ 2004, *State and society in Papua New Guinea: the first twenty-five years*, ANU E Press, Canberra.

McAnany, EG 1980, 'The Role of Information in communicating with the rural poor: some reflections', in *Communications in the rural third world: the role of information in development*, ed. EG McAnany, Praeger Publishers, New York, pp. 3-18.

McAuliffe, E & MacLachlan, M 2005, 'Turning the ebbing Tide: knowledge flows and health in low-income countries', *Higher Education Policy*, vol. 18, pp. 231-242.

McCaughan, D, Thompson, C, Cullum, N, Sheldon, T & Raynor, P 2005, 'Nurse practitioner and practice nurses' use of research information in clinical decision making: findings from an exploratory study', *Family Practice*, vol. 22, pp. 490-497.

McDowell, CL, Nagel, A, Williams, SM & Canepa, C 2005, 'Building knowledge from the practice of local communities', *Knowledge Management for Development Journal*, vol. 1, no. 3, pp. 30-40.

McGivney, V 2006, 'Informal learning: the challenge for research', in *Learning outside the academy: international research perspectives on lifelong learning*, eds. R Edwards, J Gallacher & S Whittaker, Routledge, London, pp. 11-23.

McKenzie, PJ 2006, 'Mapping textual mediated information practices in clinical midwifery care', in *New directions in human information behavior*, eds. A Spink & C Cole, Springer, Dordrecht, The Netherlands, pp. 73-92.

McKnight, M 2006, 'The information seeking of on-duty critical care nurses: evidence from participant observation and in-context interviews', *Journal of the Medical Library Association*, vol. 94, no. 2, pp. 145-151.

McMichael, C, Waters, E & Volmink, J 2005, 'Evidence-based public health: what does it offer developing countries', *Journal of Public Health*, vol. 27, no. 2, pp. 215-221.

McPhail, C & Rexroat, C 1979, 'Mead vs. Blumer: the divergent methodological perspectives of social behaviorism and symbolic interactionism', *American Sociological Review*, vol. 44, pp. 449-467.

Mead, GH 1982a, '1927 class lectures in social psychology', in *The individual and the social self: unpublished work of George Herbert Mead*, ed. DL Miller, The University of Chicago Press Limited, Chicago, pp. 106-175.

Mead, GH 1982b, 'Consciousness, mind, the self, and scientific objects', in *The Individual and the social self: unpublished work of George Herbert Mead*, ed. DL Miller, The University of Chicago Press, Chicago, pp. 176-196.

Mead, GH 1964a, 'The mechanism of social consciousness', in *Selected writings George Herbert Mead*, ed. AJ Reck, The Bobbs -Merrill Company, Inc, Indianapolis, pp. 134-141.

Mead, GH 1974, *Mind, self, & society from the standpoint of a social behaviorist*, The University of Chicago Press, Chicago.

Mead, GH 1929, 'The nature of the past', in *Essays in honor of John Dewey*, ed. J Coss, Holt, New York, pp. 235-242.

Mead, GH 1972, *The philosophy of the act*, The University of Chicago Press, Chicago.

Mead, GH 1964b, 'Social consciousness and the consciousness of meaning', in *Selected writings George Herbert Mead*, ed. AJ Reck, The Bobs-Merrill Company Inc, Indianapolis, pp. 123-133.

Mead, GH 1964c, 'The social self', in *Selected writings George Herbert Mead*, ed. AJ Reck, The Bobbs -Merrill Company, Inc, Indianapolis, pp. 142-149.

Mead, GH 1964d, 'Suggestions toward a theory of the philosophical disciplines', in *Selected writings George Herbert Mead*, ed. AJ Reck, The Bobbs -Merrill Company, Inc, Indianapolis, pp. 6-24.

Mel, MA 2001, 'Ples bilong mi: shifting cultures and the learner in relation to cultural identity in Papua New Guinea', paper presented at the National Department of Education seminar 'Promoting National Identity Through Education', Port Moresby, Papua New Guinea, 20-21 November.

Meleis, AI 1996, 'Culturally competent scholarship: substance and rigor', *Advances in Nursing Science*, vol. 19, no. 2, pp. 1-16.

Merkens, H 2004, 'Selection procedures, sampling, case construction', in *A companion to qualitative research*, eds. U Flick, Ev Kardorff & I Steinke, SAGE Publications Ltd, London, pp. 165-171.

Merton, RK 1972, 'Insiders and outsiders: a chapter in the sociology of knowledge', *The American Journal of Sociology*, vol. 78, no. 1, pp. 9-47.

Michie, S, Johnston, M, Abraham, C, Lawton, R, Parker, D & Walker, A 2005, 'Making psychological theory useful for implementing evidence based practice: a consensus appropriate', *Quality and Safety in Health Care*, vol. 14, pp. 26-33.

Miles, MB & Huberman, MA 1994, *Qualitative data analysis: an expanded sourcebook*, Second edn, Sage Publications, Thousand Oaks, California.

Mill, JE & Ogilvie, LD 2002, 'Establishing methodological rigour in international qualitative nursing research: a case study from Ghana', *Journal of Advanced Nursing*, vol. 41, no. 1, pp. 80-87.

Mingers, J 2008, 'Management knowledge and knowledge management: realism and forms of truth', *Knowledge Management Research and Practice*, vol. 6, pp. 62-76.

Ministry of Health 2001a, *National health plan 2001-2010: health vision 2010 program policies and strategies (volume 1)*, Ministry of Health, Papua New Guinea, Port Moresby.

Ministry of Health 2001b, *National health plan 2001-2010: health vision 2010 program policies and strategies (volume 2)*, Ministry of Health, Papua New Guinea, Port Moresby.

Ministry of Health 2001c, *National health plan 2001-2010: health vision 2010 program policies and strategies (volume 4)*, Ministry of Health, Papua New Guinea, Port Moresby.

Mitchell, M, Thomason, J, Donaldson, D & Garner, P 1991, 'The cost of rural health services in Papua New Guinea', *PNG Medical Journal*, vol. 34, pp. 276-284.

Monahan, JL, Murphy, ST & Zajonc, RB 2000, 'Subliminal mere exposure: specific, general, and diffuse effects', *Psychological Science*, vol. 11, no. 6, pp. 462-466.

Monitoring and Research Branch 2007, *Annual health sector review*, National Department of Health, Papua New Guinea, Port Moresby.

Moran, PR 2001, *Teaching culture: perspectives in practice*, Heinle and Heinle, Ontario, Canada.

More, E 1999, 'The role of communication in current debates on knowledge management', *Journal of Communication Management,* vol. 3, no. 4, pp. 353-361.

Morris, CW 1967, 'Introduction', in *Mind, self, & society: from the standpoint of a social behaviorist*, ed. GH Mead, The University of Chicago Press, Chicago, pp. i-xxxviii.

Morris, CW 1938, 'Introduction', in *The philosophy of the act*, ed. GH Mead, University of Chicago Press, Chicago, pp. i-xxxiv.

Morrisson, C & Jutting, JP 2005, 'Women's discrimination in developing countries: a new data set for better policies', *World Development*, vol. 33, no. 7, pp. 1065-1081.

Morse, JM 1998, 'Designing funded qualitative research', in *Strategies of qualitative inquiry*, eds. NK Denzin & YS Lincoln, SAGE Publications, Thousand Oaks pp. 56-85.

Mosse, E & Nielsen, P 2004, 'Communication practices as functions, rituals and symbols: challenges for computerization of paper-based information systems', *The Electronic Journal on Information Systems in Developing Countries*, vol. 18, no. 3, viewed 13th August 2005. Available at: http://www.ejisdc.org/ojs2/index.php/ejisdc/article/viewFile/112/112

Mrossko, K-D 1986, 'Missionary advance to the highlands', in *The Lutheran church in Papua New Guinea*, Lutheran Publishing House, Adelaide, pp. 187-222.

Mueller, CM, Mai, PL, Bucher, J, Peters, JA, Loud, JT & Greene, MH 2008, 'Complementary and alternative medicine use among women at increased genetic risk of breast and ovarian cancer', *BMC Complementary and Alternative Medicine*, vol. 8, no. 17, viewed 2nd May 2008. Available at: http://222.biiomedcentral.com/1472-6882/8/17

Murray, SB 2003, 'A spy, a shill, a go between or a sociologist: unveiling the 'observer' in participant observer', *Qualitative Research,* vol. 3, no. 3, pp. 377-395.

Myers, MD & Tan, FB 2002, 'Beyond models of national culture in information systems research', *Journal of Global Information Management,* vol. 10, no. 1, pp. 24-32.

Nachman, SR 1984, 'Lies my informants told me', *Journal of Anthropological Research,* vol. 40, no. 4, pp. 536-555.

National Statistical Office of Papua New Guinea 2004, *2000 National Census*, National Statistical Office of Papua New Guinea, Port Moresby, viewed 1st September 2008, <http://www.nso.gov.pg/2000_Census/census.htm>.

National Statistical Office of Papua New Guinea 2003, *2000 national census: national report*, National Statistical Office, Port Moresby.

Nelson, H 1982, *Taim bilong masta: the Australian involvement with Papua New Guinea*, Australian Broadcasting Commission, Sydney.

Nettleton, S 2006, *The sociology of health and illness*, Second edn, Polity Press, Cambridge.

Newcomb, TM, Turner, RH & Converse, PE 1975, *Social psychology: the study of human interaction*, Routledge & Kegan Paul Ltd, London.

Newsom, D 2007, *Bridging the gaps in global communication*, Blackwell Publishing, Malden, MA.

Nicholson, D 2002, 'The 'information-starved': is there any hope of reaching the 'information super highway'?' *IFLA Journal*, vol. 28, no. 5/6, pp. 259-265.

Nonaka, I 1994, 'A dynamic theory of organizational knowledge creation', *Organization Science*, vol. 5, no. 1, pp. 14-37.

Nonaka, I & Toyama, R 2005, 'The theory of the knowledge-creating firm: subjectivity, objectivity and synthesis', *Industrial and Corporate Change*, vol. 14, no. 3, pp. 419-436.

O'Brien, J 2006, 'From masks to selves', in *The production of reality*, Fourth edn, ed. J O'Brien, Pine Forge Press, Thousand Oaks, pp. 236-248.

O'Brien, J & Kollock, P 1997, *The production of reality: essays and readings on social interaction*, Pine Forge Press, Thousand Oaks, California.

O'Reilly, K 2005, *Ethnographic methods*, Routledge Raylor and Francis Group, London.

O'Sullivan, T, Hartley, J, Saunders, D, Montgomery, M & Fiske, J 1994, *Key concepts in communication and cultural studies*, Second edn, Routledge, London.

Olatunbosun, OA & Edouard, L 1997, 'The teaching of evidence-based reproductive health in developing countries', *International Journal of Gynecology and Obstetrics*, vol. 56, pp. 171-176.

Olsson, M 2005, *Beyond 'needy' individuals: conceptualizing information behavior*, ASIST, Charlotte, NC.

Olsson, M 2005, 'Meaning and authority: the social construction of an 'author' among information behaviour researchers', *Information Research*, vol. 10, no. 2, viewed 20th February 2006. Available at: http://InformationR.net/ir/10-2/paper219.html

Oronje, RN 2006, 'Challenges faced by African organizations in knowledge sharing: the case of the African population and health research centre', *Knowledge Management for Development Journal,* vol. 2, no. 1, pp. 78-87.

Orrange, RM 2003, 'The emerging mutable self: gender dynamics and creative adaptions in defining work, family, and the future', *Social Forces,* vol. 82, no. 1, pp. 1-34.

Ostrom, E 2005, *Understanding institutional diversity*, Princeton University Press, Princeton.

Owen, P 2004, *Plant diversity and health: food and medicinal plant use in transitional coastal communities of Papua New Guinea*, School of Dietetics and Human Nutrition, McGill University, Canada.

Owen, P & Urai, H 2004, 'Ethno-medical practices in Central Province: a comparative analysis between three coastal communities', paper presented at the Traditional Medicine in Papua New Guinea: Proceedings of the National Workshop on Policy and Practices, Port Moresby.

Pakenham-Walsh, N 2000, 'Access to reliable information for healthcare workers in developing countries: an international perspective', *Health Libraries Review,* vol. 17, pp. 37-40.

Pakenham-Walsh, N 1997, 'Meeting the information needs of health workers in developing countries', *British Medical Journal,* vol. 314, no. 7074, pp. 90-92.

Palafox, NA, Buenconsejo-Lum, L, Riklon, S & Waitzfelder, B 2002, 'Improving health outcomes in diverse populations: competency in cross-cultural research with indigenous Pacific Islander populations', *Ethnicity & Health,* vol. 7, no. 4, pp. 279-285.

Palmer, CL & Neumann, LJ 2002, 'The information work of interdisciplinary humanities scholars: exploration and translation', *Library Quarterly*, vol. 72, no. 1, pp. 85-117.

Papua New Guinea Health Services Support Program Pty Ltd 2004, *A situational analysis of health services in Eastern Highlands Province*, Papua New Guinea Health Services Support Program, Goroka.

Pargament, KI 2002, 'Is religion nothing but ...? Explaining religion versus explaining religion away', *Psychological Inquiry*, vol. 13, no. 3, pp. 239-244.

Pargament, KI, Magyar-Russell, GM & Murray-Swank, NA 2005, 'The sacred and the search for significance: religion as a unique process', *Journal of Social Issues*, vol. 61, no. 4, pp. 665-687.

Pataki-Schweizer, PJ 1985, 'Traditional medicine: institutional perceptions and cultural realities', *PNG Medical Journal*, vol. 28, pp. 211-216.

Patriotta, G 2004, 'On studying organizational knowledge', *Knowledge Management Research and Practice*, vol. 2, pp. 3-12.

Pauka, S 2001, 'The use of traditional knowledge in understanding natural phenomena in the Gulf Province of Papua New Guinea', Science and Mathematics Education Centre, PhD thesis, Curtin University of Technology.

Pendleton, VE & Chatman, EA 1998, 'Small world lives: implications for the public library', *Library Trends*, vol. 46, no. 4, pp. 732-752.

Pep, M 2004, *Promoting traditional medicine in the health system*, Department of Health. Papua New Guinea, Port Moresby, pp. 4-5.

Peren, HI 2007, *Revival of Maya medicine and impact for its social and political recognition (in Guatemala)*, The Health Systems Knowledge Network, Geneva.

Pettigrew, KE 2000, 'Lay information provision in community settings: how community health nurses disseminate human services information to the elderly', *Library Quarterly*, vol. 70, no. 1, pp. 47-85.

Pettigrew, KE 1999, 'Waiting for chiropody: contextual results from an ethnographic study of the information behaviour among attendees at community clinics', *Information Processing and Management*, vol. 35, pp. 801-817.

Pettigrew, KE, Fidel, R & Bruce, H 2001, 'Conceptual frameworks in information behavior', in *Annual Review of Information Science and Technology*, vol. 35, ed. ME Williams, Information Today, Medford, New Jersey, pp. 43-28.

Phye, GD 1997, 'Learning and remembering: the basis for personal knowledge construction', in *Handbook of Academic Learning*, ed. GD Phye, Academic Press, San Diego, pp. 47-64.

Piaget, J 1952, *The origins of intelligence in children*, International Universities Press, Inc., New York.

Pincock 2006, 'Papua New Guinea struggles to reverse the health decline', *The Lancet*, vol. 368, pp. 107-108.

Pirolli, P & Card, S 1999, 'Information foraging', *Psychological Review*, vol. 106, no. 4, pp. 643-675.

Polanyi, M 1969a, 'Knowing and being', in *Knowing and Being*, ed. M Grene, Routledge & Kegan Paul, London, pp. 123-137.

Polanyi, M 1969b, 'The logic of tacit inference', in *Knowing and Being*, ed. M Grene, Routledge & Kegan Paul, London, pp. 138-158.

Polanyi, M 1958, *Personal knowledge: towards a post critical philosophy*, University Press Chicago, Chicago.

Polanyi, M 1959, *The study of man*, Routledge & Kegan Paul, London.

Polanyi, M 1966, *The tacit dimension*, Doubleday & Company Inc, New York.

Polanyi, M & Prosch, H 1975, *Meaning*, The University of Chicago Press, Chicago.

Pollis, NP 1968, 'Reference group re-examined', *The British Journal of Sociology*, vol. 19, no. 3, pp. 300-307.

Posey, DA 1988, 'Ethnobiology: implications and applications', paper presented at the First International Congress of Ethnobiology, Belem, Brazil, 19 - 22 July.

Pruitt, DG & Carnevale, PJ 1993, *Negotiation in social conflict*, Open University Press, Buckingham.

Putnam, LL & Stohl, C 1996, 'Bona fide groups: an alternative perspective for communication and small group decision making', in *Communication and Group decision Making*, ed. MS Poole, SAGE Publications, Thousand Oaks, California, pp. 147-178.

Radford, AJ & Speer, A 1986, 'Medical tultuls and aid post orderlies: Some historical notes on the use of village health workers in Papua New Guinea up to independence.' *PNG Medical Journal*, vol. 29, no. 2, pp. 165-182.

Rai, PP 1989, 'Development and standardization of herbal medicine', paper presented at the Proceedings of International workshop on Strategies and Priorities in Indigenous Pharmaceutical Research and Development, Lagos.

Rambo, KF 1990, 'Jesus came here too: the making of a culture hero and control over history in Simbu, Papua New Guinea', *Ethnology*, vol. 29, no. 2, pp. 177-189.

Rankin, JA, Grefsheim, SF & Canto, CC 2008, 'The emerging informationist speciality: a systematic review of the literature', *Journal of the Medical Library Association*, vol. 96, no. 3, pp. 194-206.

Rapley, TJ 2001, 'The art(fulness) of open-ended interviewing: some considerations on analysing interviews', *Qualitative Research*, vol. 1, no. 3, pp. 303-323.

Reade-Fong, E & Gorman, GE 2005, 'NGOs, ICTs and information dissemination in Asia and Oceania', *IFLA Journal*, vol. 31, no. 1, pp. 45-51.

Reilly, B 2006, 'Diversity, democracy and development in the Asia-Pacific', in *Democracy and diversity: political engineering in the Asia-Pacific*, ed. B Reilly, Oxford University Press, Oxford, pp. 47-71.

Renzl, B, Matzler, K & Hinterhuber, H 2006, 'Introduction', in *The future of knowledge management*, eds. B Renzl, K Matzler & H Hinterhuber, Palgrave MacMillan, New York, pp. 1-4.

Rhodes, P 1985, *An outline of history of medicine*, Butterworth, London.

Ribiere, VM 2006, 'Knowledge flow', in *Encyclopedia of knowledge management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 336-343.

Richards, L 2005, *Handling qualitative data: a practical guide*, SAGE Publications, London.

Richards, P 1980, 'Community environmental knowledge in African rural development', in *Indigenous knowledge systems and development*, eds. D Brokensha, DM Warren & O Werner, University of Press of America, Lanham, pp. 181-194.

Richardson, L 1994, 'Writing: a method of inquiry', in *Handbook of Qualitative Research*, eds. NK Denzin & YS Lincoln, SAGE Publications, London, pp. 516-529.

Rimé, B, Schiaratura, L, Hupet, M & Ghysselinckx, A 1984, 'Effects of relative immobilization on the speaker's nonverbal behavior and on the dialogue imagery level', *Motivation and Emotion*, vol. 8, no. 4, pp. 311-325.

Rivers, J 1999, 'Formulating basic policy for community relations programs', *Discussion Paper*, viewed 16 November 2007. Available at: http://rspas.anu.edu.au/papers/melanesia/discussion_papers/rivers99-1.pdf

Roberts, H 1998, 'Indigenous knowledges and western science: perspectives from the Pacific', paper presented at the Science and Technology Education and Ethnicity: An Aotearoa/New Zealand Perspective - Proceedings from the Royal Society of New Zealand, Thorndon, Wellington, 7-8 May.

Rosenthal, TL & Zimmerman, BJ 1978, *Social learning and cognition*, Academic Press, New York.

Rowe, AK, de Savigny, D, Lanata, CF & Victoria, CG 2005, 'How can we achieve and maintain high-quality performance of health workers in low-resource settings?' *Lancet*, vol. 366, pp. 1026-1035.

Rowe, SY, Kelly, JM, Olewe, MA, Kleinbaum, DG, McGowan Jr, JE, McFarland, DA, Rochat, R & Deming, MS 2007, 'Effect of multiple interventions on community health workers' adherence to clinical guidelines in Siaya district, Kenya', *Transactions of the Royal Society of Tropical Medicine and Hygiene*, vol. 101, pp. 188-202.

Roxana, N 2000, 'Toward an embodied pedagogy: exploring health and the body through Chinese medicine', in *Indigenous knowledges in global contexts: multiple readings of our world*, eds. GJ Sefa Dei & BL Hall, University of Toronto Press, Toronto, pp. 179-183.

Rubin, HJ & Rubin, IS 2005, *Qualitative interviewing: the art of hearing data*, Second edn, SAGE Publications, Thousand Oaks.

Rueda, R & Moll, LC 1994, 'A sociocultural perspective on motivation', in *Motivation: theory and research*, eds. HF O'Neil & M Drillings, Erlbaum Associates, Hillsdale, NJ, pp. 117-137.

Ryan, RM, Rigby, S & King, K 1993, 'Two types of religious internalization and their relations to religious orientations and mental health', *Journal of Personality and Social Psychology*, vol. 65, pp. 586-596.

Rychetnick, L, Hawe, P, Waters, E, Barratt, A & Frommer, M 2004, 'A glossary for evidence based public health', *Journal of Epidemiology and Community Health*, vol. 58, pp. 538-545.

Rycroft-Malone, J 2002, 'Clinical guidelines', in *Clinical decision making and judgement in nursing*, eds. C Thompson & D Dowding, Harcourt Publishers Limited, Edinburgh, pp. 147-164.

Rycroft-Malone, J, Seer, K, Titchen, A, Harvey, G, Kitson, A & McCormack, B 2004, 'What counts as evidence in evidence-based practice?' *Journal of Advanced Nursing*, vol. 47, no. 1, pp. 81-90.

Salamone, FA 1969, 'The methodological significance of the lying informant', *Anthropological Quarterly*, vol. 42, no. 3, pp. 117-124.

Sanchez, R 2006, 'Knowledge management and organizational learning: fundamental concepts for theory and practice', in *The future of knowledge management*, eds. B Renzl, K Matzler & H Hinterhuber, Palgrave MacMillan, New York, pp. 29-61.

Sande, GN, Goethals, GR & Radloff, CE 1988, 'Perceiving one's own traits and others': the multifaceted self', *Journal of Personality and Social Psychology*, vol. 54, no. 1, pp. 13-20.

Sandelowski, M 1995, 'Qualitative analysis: what it is and how to begin.' *Research in Nursing and Health*, vol. 18, pp. 371-375.

Sandiford, P 2004, 'Improving workforce performance', paper presented at the High Level Forum on the Health Millennium Development Goals, Geneva, Switzerland, 8 January.

Sandstrom, KL, Martin, DD & Fine, GA 2006, *Symbols, selves, and social reality: a symbolic interactionist approach to social psychology and sociology*, Second edn, Roxbury Publishing Company, Los Angeles.

Sapir, E 1970, 'Language', in *Culture, language and personality*, ed. DG Mandelbaum, University of California Press, Berkeley, pp. 1-44.

Sarantakos, S 1998, *Social research*, MacMillan Education Australia Pty Ltd, South Yara.

Savolainen, R 1995, 'Everyday life information seeking: approaching information seeking in the context of "way of life"', *Library & Information Science Research,* vol. 17, pp. 259-294.

Savolainen, R 2006, 'Time as a context of information seeking', *Library & Information Science Research,* vol. 28, pp. 110-127.

Savolainen, R 2007, 'Information behavior and information practice: reviewing the "umbrella concepts" of information-seeking studies', *Library Quarterly*, vol. 77, no. 2, pp. 109-132.

Savolainen, R 2009, 'Information use and information processing: comparisons of conceptualizations', *Journal of Documentation*, vol. 65, no. 2, pp. 187-207.

Schatzman, L & Strauss, AI 1973, *Field research: strategies for a natural sociology*, Prentice-Hall Inc., New Jersey.

Schech, S & Haggis, J 2000, *Culture and development: a critical introduction*, Blackwell Publishers, Oxford.

Schneider, A 2006, 'How quality improvement in health care can help to achieve the Millennium Development Goals', *Bulletin of the World Health Organization*, vol. 84, no. 4, pp. 259-260.

Sciadas, G 2005, 'Infostates across countries and over time: conceptualization, modelling, and measurements of the digital divide', *Information Technology for Development*, vol. 11, no. 3, pp. 299-304.

Shariq, SZ & Vendelo, MT 2006, 'Tacit knowledge sharing', in *Encyclopedia of knowledge management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 833-839.

Shibutani, T 1955, 'Reference groups as perspectives', *The American Journal of Sociology*, vol. 60, no. 6, pp. 562-569.

Shibutani, T 1961, *Society and personality: an interactionist approach to social psychology*, Prentice-Hall, Inc., Englewood Cliffs NJ.

Shils, E 1957, 'Primordial, personal, sacred and civil ties: some particular observations on the relationships of sociological research and theory', *British Journal of Sociology*, vol. 8, no. 2, pp. 130-145.

Shiva, V 2000, 'Cultural diversity and the politics of knowledge', in *Indigenous knowledges in global contexts: multiple readings of our world*, eds. GJ Sefa Dei & BL Hall, University of Toronto Press Incorporated, Toronto, p. 282.

Shroff, FM 2000, 'Ayurveda: mother of indigenous health knowledge', in *Indigenous knowledges in global contexts: multiple readings of our world*, eds. GJ Dei, BL Hall & DD Rosenberg, University of Toronto Press, Toronto, pp. 215-233.

SIL International 2005, *Ethnologue: languages of the world* fifteenth edn, SIL International, Dallas, viewed 9th June 2005, <http://www.ethnologue.com/>.

Silberman, I 2005, 'Religion as a meaning system: implications for the new millennium', *Journal of Social Issues*, vol. 61, no. 4, pp. 641-663.

Silverman, D 1993, *Interpreting qualitative data: methods for analysing talk, text and interaction*, SAGE Publications, London.

Smart, N 1996, *The religious experience*, Fifth edn, Prentice Hall, Upper Saddle River, N.J.

Smart, P 2004, 'Two-way traffic: information exchange between the developing and developed world', *Serials*, vol. 17, no. 2, pp. 183-187.

Smith, GP 1995, 'Language choice in an acutely multilingual society: communication and development in Papua New Guinea', paper presented at the International Conference on Language in Development: The Stakeholders' Perspectives, Bali, 10-12 April.

Snow, DA 2001, 'Extending and broadening Blumer's conceptualization of symbolic interactionism', *Symbolic Interaction*, vol. 24, no. 3, pp. 367-377.

Snyder, M & Campbell, BH 1982, 'Self-monitoring: the self in action', in *Psychological perspectives on the self*, ed. J Suls, Lawrence Erlbaum Associates, Hillsdale, NJ, pp. 185-207.

Solomon, P 1997a, 'Discovering information behavior in sense making: I. time and timing', *Journal of the American Society for Information Science,* vol. 48, no. 12, pp. 1097-1108.

Solomon, P 1997b, 'Discovering information behavior in sense making: II. the social', *Journal of the American Society for Information Science,* vol. 48, no. 2, pp. 1109-1126.

Solomon, P 1997c, 'Discovering information behavior in sense making: III. the person', *Journal of the American Society for Information Science,* vol. 48, no. 12, pp. 1127-1138.

Solomon, P 2002, 'Discovering information in context', in *Annual Review of Information Science and Technology*, ed. B Cronin, Information Today, Inc., Medford, New Jersey, pp. 229-264.

Sonnenwald, DH 1995, 'Contested collaboration: a descriptive model of intergroup communication in information system design', *Information Processing and Management,* vol. 31, no. 6, pp. 859-877.

Sonnenwald, DH 1999, 'Evolving perspectives of human information behavior: contexts, situations, social networks and information horizons', in *Exploring the contexts of information behavior*, eds. TD Wilson & D Allen, Taylor Graham, London, pp. 176-190.

Soysa, Id & Jutting, JP 2006, 'Informal institutions and development: how they matter and what makes them change', paper presented at the Informal Institutions. How Social Norms Help or Hinder Development, Paris, 11-12 December.

Spark, C 2005, 'Learning from the locals: Gajdusek, kuru, and cross-cultural interaction in Papua New Guinea', *Health and History,* vol. 7, no. 2, pp. 80-101.

Spector, R 2004, *Cultural diversity in health and illness*, Sixth Edition edn, Pearson Prentice Hall, Upper Saddle River.

Spiegler, I 2000, 'Knowledge management: a new idea or a recycled concept?' *Communications of the Association for Information Systems*, vol. 3, no. 14, pp. 1-24.

Spink, A & Cole, C 2004, 'Human information behavior: integrating diverse approaches and information use', *Journal of the American Society for Information Science and Technology,* vol. 57, no. 1, pp. 25-35.

Spink, A & Cole, C 2006, 'Introduction: New Directions in Human Information Behavior', in *New direction in human information behavior*, eds. A Spink & C Cole, Springer, Dordrecht, pp. 1 - 10.

Spink, A & Cole, C 2006, 'Human information behavior: integrating diverse approaches and information use', *Journal of the American Society for Information Science and Technology*, vol. 57, no. 1, pp. 25-35.

Stainton-Rogers, W 1991, *Explaining health and illness: an exploration of diversity*, Harvester Wheatsheaf, Hertfordshire.

Stajikovic, AD & Luthans, F 1998, 'Self-efficacy and work-related performance: a meta-analysis', *Psychological Bulletin*, vol. 124, no. 2, pp. 240-261.

Strasser, R 2003, 'Rural health around the world: challenges and solutions', *Family Practice*, vol. 20, pp. 457-463.

Strathern, A 1984, *A line of power*, Tavistock, London.

Strathern, A 1971, *The rope of moka: big-men and ceremonial exchange in Mount Hagen New Guinea*, Cambridge University Press, London.

Strauss, AI & Corbin, J 1998, *Basics of qualitative research: techniques and procedures for developing grounded theory*, Second edn, SAGE Publications, Thousand Oaks.

Sun, PY & Scott, JL 2005, 'An investigation of barriers to knowledge transfer', *Journal of Knowledge Management*, vol. 9, no. 2, pp. 75-90.

Sundin, O 2002, 'Nurses' information seeking and use as participant in occupational communities', *The New Review of Studies of information seeking in context*, vol. 3, pp. 187-202.

Sundin, O 2003, 'Towards an understanding of symbolic aspects of professional information: an analysis of the nursing knowledge domain', *Knowledge Organization*, vol. 30, no. 3-4, pp. 170-181.

Swinkels, A, Albarran, JW, Means, RI, Mitchell, T & Stewart, MC 2002, 'Evidence-based practice in health and social care: where are we now?' *Journal of Interprofessional Care*, vol. 16, no. 4, pp. 335-347.

Tajfel, H & Turner, J 1986, 'An integrative theory of social conflict', in *Psychology of Intergroup Relations*, eds. S Worchel & W Austin, IL: Nelson Hall, Chicago, pp. 101-114.

Tarakeshwar, N, Stanton, J & Pargament, KI 2003, 'Religion: an overlooked dimension in cross-cultural psychology', *Journal of Cross-Cultural Psychology,* vol. 34, pp. 377-394.

Temple, B, Edwards, R & Alexander, C 2006, 'Grasping at context: cross language qualitative research as secondary qualitative data analysis', *Forum: Qualitative Social Research*, vol. 7, no. 4, viewed 4 September 2006. Available at: http://www.qualitative-research.net/fqs-texte/4-06/06-4-10-e.htm

The Global Forum for Health Research 2008, *The 10/90 Gap Now*, Geneva, viewed 21st May 2008, <http://www.globalforumhealth.org/Site/003__The%2010%2090%20gap/001__Now.php>.

The World Bank 2007, *Strategic directions for human development in Papua New Guinea,* The World Bank, Washington, viewed 13th January 2008. Available at: http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&theSitePK=523679&entityID=000310607_20070921131918&searchMenuPK=64187283&theSitePK=523679

The World Bank 1999, *World development report: knowledge for development*, Oxford University Press, New York.

Therborn, G 2002, 'Back to norms! on the scope and dynamics of norms and normative action', *Current Sociology,* vol. 50, pp. 863-880.

Thomas, KJ, Nicholl, JP & Fall, M 2001, 'Access to complementary medicine via general practice', *British Journal of General Practice*, vol. 51, pp. 25-30.

Thomas, WI 1928, *The child in America: behavior problems and programs*, Alfred A. Knopf, New York.

Thomason, J 1988, 'Disbursement, decentralization and development: lessons from the first rural health services project in Papua New Guinea', *Public Administration & Development,* vol. 8, pp. 391-399.

Thomason, J & Kolehmainen-Aitken, RL 1991, 'Distribution and performance of rural health workers in Papua New Guinea', *Social Science & Medicine*, vol. 32, no. 2, pp. 159-165.

Thomason, J & Newbrander, WC 1991, 'A survey of Papua New Guinea's health sector financing and expenditure', *PNG Medical Journal*, vol. 34, pp. 129-143.

Thompson, L & Fine, GA 1999, 'Socially shared cognition, affect, and behavior: a review and integration', *Personality and Social Psychology Review*, vol. 3, no. 4, pp. 278-302.

Thomson, JJ 1897, 'Cathode rays', *Philosophical Magazine*, vol. 44, no. 293.

Todd, RJ 1999, 'Utilization of heroin information by adolescent girls in Australia: a cognitive analysis', *Journal of the American Society for Information Science*, vol. 50, no. 1, pp. 10-23.

Tsoukas, H & Efi, V 2001, 'What is organizational knowledge?' *Journal of Management Studies*, vol. 38, no. 7, pp. 973-993.

Tuomi, I 1999, 'Data is more than knowledge: implications of the reversed knowledge hierarchy for knowledge management and knowledge memory', *Journal of Management Information Systems*, vol. 16, no. 3, pp. 103-117.

Tuominen, K & Savolainen, R 1997, 'A social constructionist approach to the study of information use as discursive action', paper presented at the Information Seeking in Context, Tampere, Finland, 14 - 16 August.

Turner, J 2000, *On the origins of human emotions: a sociological inquiry into the evolution of human affect*, Stanford University Press, Stanford, California.

Turner, J 2006, 'Social control and emotions', *Symbolic Interaction*, vol. 28, no. 4, pp. 475-485.

Twinn, S 1997, 'An exploratory study examining the influence of translation on the validity and reliability of qualitative data in nursing research', *Journal of Advanced Nursing*, vol. 26, pp. 418-423.

United Nations 2006, *Overcoming economic vulnerability and creating employment: report of the committee for development policy on the eighth session*, United Nations, Department of Economic and Social Affairs, New York, viewed 4th June 2007. Available at: http://www.un.org/esa/policy/devplan/cdppublications/2006cdpreport.pdf

United Nations Information Technology Service n.d., *Resources for Cultural Projects Involving Technology*, United Nations, Bonn, viewed 19th September 2007, <http://www.unites.org/html/resource/knowledge/06culture.htm>.

Urquhart, C 1998, 'Personal knowledge: a clinical perspective from the Value and Evince Projects in health library and information services', *Journal of Documentation*, vol. 54, no. 4, pp. 420-442.

Vail, J 2002, 'Antenatal uilization, family planning and fertility preferences in Tari', *PNG Medical Journal*, vol. 45, no. 1-2, pp. 134-141.

Vakkari, P 1997, 'Information seeking in context a challenging metatheory', in *Information seeking in context*, eds. P Vakkari, R Savolainen & B Dervin, Taylor Graham, London, pp. 451-464.

Vakkari, P 1999, 'Task complexity, problem structure and information actions: integrating studies on information seeking retrieval', *Information Processing and Management*, vol. 35, no. 6, pp. 819-837.

Van Haselen, RA, Reiber, U, Nickel, I, Jakob, A & Fisher, PA 2004, 'Providing complementary and alternative medicine in primary care: the primary care workers' perspective', *Complementary Therapies in Medicine* vol. 12, pp. 6-16.

Varela, F, Thompson, E & Rosch, E 1991, *The embodied mind*, MIT Press, Cambridge.

Waite, CK 2002, 'The role of the self in the social world', *Symbolic Interaction*, vol. 25, pp. 215-231.

Wakeham, M 1992, 'The information seeking behaviour of nurses in the UK', *Information Services & Use*, vol. 12, pp. 131-140.

Wall, S 2008, 'A Critique of evidence-based practice in nursing: challenging the assumptions', *Social Theory & Health*, vol. 6, pp. 37-53.

Walls, A 1984, 'Christianity', in *Handbook of living religions*, ed. J Hinnells, Penguin Books, Harmondsworth, pp. 56-121.

Walsham, G & Sahay, S 2005, 'Research on information systems in developing countries: current landscape and future prospects', *Information Technology for Development*, vol. 12, no. 1, pp. 7-24.

Walshe, K & Ham, C 1997, 'Who's acting on evidence?' *Health Services Journal*, vol. 17, pp. 22-25.

Wang, Y, Dogan, E & Lin, X 2006, 'The effect of multiple-perspective thinking on problem solving', paper presented at the International Conference on Learning Sciences, Bloomington, Indiana, 27 June-1 July.

Welsch, RL 1985, 'The Distribution of therapeutic knowledge in Ningerum: implications for primary health care and use of aid posts', *PNG Medical Journal*, vol. 28, pp. 205-210.

Welsch, RL 1986, 'Primary health care and local self determination: policy implications from rural Papua New Guinea', *Human Organization*, vol. 45, no. 2, pp. 103-112.

Wenger, E 1998, *Communities of practice: learning, meaning, and identity*, Cambridge University Press, Cambridge.

Wengraf, T 2001, *Qualitative research interviewing*, SAGE Publications Ltd, London.

White, O 1972, *Parliament of a thousand tribes: Papua New Guinea the story of an emerging nation*, Wren Publishing Limited, Melbourne.

Whiteley, A 2006, 'Rules as received practice: historical perspective and implications for managers', *Journal of Management History*, vol. 12, no. 1, pp. 53-70.

Whorf, BL 1956, 'Science and linguistics', in *Language, thought and reality*, ed. JB Carroll, MIT Press, Cambridge MA, pp. 207-219.

Wicklund, RA 1999, 'Multiple perspectives in person perception and theorizing', *Theory & Psychology*, vol. 9, no. 5, pp. 667-678.

Wicklund, RA 1997, 'The theory of psychological reactance: a reliably revolutionary perspective', *Contemporary Psychology*, vol. 42, no. 8, pp. 679-681.

Wicklund, RA & Brehm, JW 2004, 'Internalization of multiple perspectives or dissonance reduction?' *Theory & Psychology*, vol. 14, no. 3, pp. 355-371.

Wickramasinghe, N 2006, 'Knowledge creation', in *Encyclopedia of knowledge management*, ed. DG Schwartz, Idea Group Reference, Hershey, Pennsylvania, pp. 326-335.

Widen-Wulff, G, Ek, S, Ginman, M, Perttila, R, Sodergard, P & Totterman, A-K 2008, 'Information behaviour meets social capital: a conceptual model', *Journal of Information Science*, vol. Onlinefirst, pp. 1-10.

Wiig, KM 1993, *Knowledge management foundations – thinking about thinking – how people and organizations create, represent, and use knowledge*, Schema Press, Arlington, Texas.

Wilde, C 2007, "Turning sex into a game': Gogodala men's response to the AIDS epidemic and condom promotion in rural Papua New Guinea', *Oceania*, vol. 77, pp. 58-70.

Wiley, N 2003, 'Self as a self fulfilling prophecy', *Symbolic Interaction*, vol. 26, no. 4, pp. 501-513.

Williamson, K 1998, 'Discovered by chance: the role of incidental information acquisition in an ecological model of information use', *Library & Information Science Research*, vol. 20, no. 1, pp. 23-40.

Wilson, P 1983, *Second-hand knowledge: an inquiry into cognitive authority*, Greenwood Press, Westport, Connecticut.

Wilson, TD 1981, 'On user studies and information needs', *Journal of Librarianship* vol. 37, no. 1, pp. 3-15.

Wilson, TD 1997, 'Information behaviour: an interdisciplinary perspective', *Information Processing and Management*, vol. 33, no. 4, pp. 551-572.

Wilson, TD 1999, 'Models in information behaviour research', *Journal of Documentation*, vol. 55, no. 3, pp. 249-270.

Wilson, TD 2000, 'Human information behavior', *Informing Science*, vol. 3, no. 2, pp. 49 - 55.

Wilson, TD 2001, 'Information Overload: implications for healthcare services', *Health Informatics Journal*, vol. 7, pp. 112 - 117.

Wilson, TD 2002, 'The nonsense of 'knowledge management'', *Information Research*, vol. 8, no. 1, viewed 1st August 2003. Available at: http://InformationR.net/ir/8-1/paper144.html

Wilson, TD 2006, 'On user studies and information needs', *Journal of Documentation,* vol. 62, no. 6, pp. 658-670.

Wilson, TD 2005, 'Evolution in information behavior modelling: Wilson's model', in *Theories of information behavior,* eds. KE Fisher, S Erdelez & L McKechnie, Information Today, Inc., Medford, New Jersey, pp. 31-36.

Wilson, TD & Walsh, C 1996, *Information behaviour: an interdisciplinary perspective,* University of Sheffield Department of Information Studies, Sheffield.

Wilson, TD, Ford, N, Ellis, D, Foster, A & Spink, A 2002, 'Information seeking and mediated searching. part 2. uncertainty and its correlates', *Journal of the American Society for Information Science and Technology,* vol. 53, no. 9, pp. 704 - 715.

Wolf, B 1987, 'Lying informants: a fieldwork experience from Ghana', *Population and Development Review,* vol. 13, no. 2, pp. 314-322.

Wolff, S 2004, 'Ways into the field and their variants', in *A companion to qualitative research,* eds. U Flick, Ev Kardorff & I Steinke, SAGE Publications Ltd, London, pp. 195-202.

World Health Organization 2005a, *Health and the millennium development goals,* World Health Organization, Geneva, Switzerland, viewed 7th October 2006. Available at: http://whqlibdoc.who.int/publications/2005/9241562986.pdf

World Health Organization 2005b, *National policy on traditional medicine and regulation of herbal medicines,* World Health Organization, Geneva, Switzerland, viewed 14th February 2008. Available at: http://whqlibdoc.who.int/publications/2005/9241593237.pdf

World Health Organization 2006, *Papua New Guinea: country health information profiles,* updated 2006, WHO, Geneva, Switzerland, viewed 1st July 2007, <http://www.wpro.who.int/countries/png/>.

World Health Organization n.d., *Primary Health Care,* World Health Organization, Geneva, viewed 3rd July 2007, <http://www.wpro.who.int/health_topics/primary_health_care/>.

World Health Organization 2008, *Primary health care: now more than ever,* World Health Organization, Geneva, Switzerland, viewed 19th October 2008. Available at: http://www.who.int/whr/2008/whr08_en.pdf

World Health Organization 2004, *The World Health Report 2004,* World Health Organization, Geneva, viewed 19th March 2005. Available at: http://whqlibdoc.who.int/hq/2004/a85554.pdf

World Health Organization Papua New Guinea & Department of Health Papua New Guinea 2005, *Demographics, gender and poverty,* World Health Organization, Waigani, viewed 13 November 2007, <http://www.wpro.who.int/countries/png/>.

World Organization of Family Doctors 2004, *Rural: WONCA Working Party on Rural Practice*, updated September 2004, viewed 8th July 2007, <http://www.globalfamilydoctor.com/aboutwonca/working_groups/rural_training/wonca_ruralprac.htm>.

Wright, J & Walley, J 1998, 'Assessing health needs in developing countries', *British Medical Journal,* vol. 316, no. 7147, pp. 1819-1823.

Young, J 2005, 'Research, policy and practice: why developing countries are different', *Journal of International Development,* vol. 17, pp. 727-734.

Young, MW 1981, 'Children's illness and adult's ideology: patterns of health care on Goodenough Island, Milne Bay Province', *PNG Medical Journal,* vol. 24, no. 3, pp. 179-187.

Zanna, MP & Cooper, J 1974, 'Dissonance and the pill: an attribution approach to studying the arousal properties of dissonance', *Journal of Personality and Social Psychology,* vol. 29, pp. 703-309.

Znaniecki, F 1939, 'Social groups as products of participating individuals', *The American Journal of Sociology,* vol. XLIV, no. 6, pp. 799-811.