Maternal and perinatal research conducted in Australia: Generation, synthesis, translation, implementation and impact

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CONTENTS

Abbreviations

ACOG:	American College of Obstetrics and Gynecology
aCSR:	Australian Cochrane systematic review
ACPR:	Australian Cerebral Palsy Register
ACTA:	Australian Clinical Trials Alliance
ADA:	American Diabetes Association
AIHW:	Australian Institute of Health and Welfare
AMICABLE:	The Antenatal Magnesium Individual participant data international Collaboration: Assessing the Benefits for babies using the best Level of Evidence
AMSTAR:	Assessment of the Methodological Quality of Systematic Reviews
ANZCTR:	Australian and New Zealand Clinical Trials Registry
ANZNN:	Australian and New Zealand Neonatal Network
aOR:	adjusted odds ratio
ARC:	Australian Research Council
ARCH:	Australian Research Centre for Health of Women and Babies
ART:	antiretroviral therapy
BCW:	Behaviour Change Wheel
BMI:	body mass index
CDSR:	Cochrane Database of Systematic Reviews
CI:	confidence interval
CINAHL:	Cumulative Index to Nursing and Allied Health Literature
CPG:	clinical practice guideline
CSR:	Cochrane systematic review
CTG:	cardiotocography
DIAMIND:	Diabetes Reminder
ERA:	Excellence in Research for Australia
FENO:	fraction of exhaled nitric oxide
FORM:	Formulating Optimal Recommendations Methodology
g:	gram
GAP:	Guideline Action Pack
GBD:	Global Burden of Disease
GDM:	gestational diabetes mellitus
GRADE:	Grading of Recommendations Assessment, Development and Evaluation
HbA1c:	glycated haemoglobin
HIC:	high income country
HIV:	human immunodeficiency virus
IADPSG:	International Association of the Diabetes and Pregnancy Study Groups
ILCOR:	International Liaison Committee on Resuscitation
IMPACT Network:	Interdisciplinary Maternal Perinatal Australasian Collaborative Trials Network
IPD:	individual participant data
IV:	intravenous
JAMA:	Journal of the American Medical Association
kg:	kilogram
LMIC:	low-middle income country
m:	metre
mmHg:	millimetre mercury
mL:	millilitre
mmol:	millimole
MOOSE:	Meta-analysis of Observational Studies
NEJM:	New England Journal of Medicine
NHMRC:	National Health and Medical Research Council

NICE:	National Institute for Health and Care Excellence
NICS:	National Institute of Clinical Studies
OGTT:	oral glucose tolerance test
OR:	odds ratio
pa:	per annum
PAR:	population attributable risk
Periconc.:	periconceptual
PLoS:	Public Library of Science
PSANZ:	Perinatal Society of Australia and New Zealand
RCOG:	Royal College of Obstetricians and Gynaecologists
RCT:	randomised controlled trial
RevMan:	Review Manager
RR:	risk ratio
RRR:	relative risk ratio
SAMe:	S-adenosylmethionine
SD:	standard deviation
SGA:	small for gestational age
SMS:	short message service
SOGC:	Society of Obstetricians and Gynaecologists of Canada
SOMANZ:	Society of Obstetric Medicine of Australia and New Zealand
SPIRIT:	Standard Protocol Items: Recommendations for Interventional Trials
SR:	systematic review
TDF:	Theoretical Domains Framework
TRIS:	Translational Research Impact Scale
UDCA:	ursodeoxycholic acid
UK:	United Kingdom
USA:	United States of America
Vs.:	versus
WCH:	Women's and Children's Hospital
WISH:	Working to improve survival and health for babies born very preterm
WHO:	World Health Organization
WOMBAT Collaboration:	Women and Babies Health and Wellbeing: Action through Trials Collaboration
YCHD:	Yinchenghao decoction

Abstract

Background: There is an increasing expectation by governments and communities that health research will lead to health and health system improvements, yet developing the necessary science behind translation and implementation of research findings into policy and practice has been neglected and underfunded.

Aims:

- to investigate the contribution made by Australian randomised controlled trials and Cochrane systematic reviews in maternal and perinatal health to improvements in the health and wellbeing of women, babies and their families in Australia and internationally;
- to evaluate different ways of assessing impact and to identify the most effective methods for informing future strategies to improve generation, synthesis, translation and implementation of research into health impact.

Methods: I used mixed methods (bibliometric and social media analyses; survey of triallists (quantitative and qualitative); case studies; systematic reviews of observational studies; systematic reviews of interventions; an overview; cohort studies; a randomised controlled trial; clinical practice guidelines; and implementation studies). I used behaviour change theory to explore uptake and implementation of research and developed a research, translation and impact cycle to chart the flow from knowledge to impact.

For the cohort of Australian maternal and perinatal randomised controlled trials, I compiled a database of all known trials published between 1986 and 2014. For the survey of triallists I developed a questionnaire using the Behaviour Change Wheel to assess perceptions related to capability, opportunity and motivation and the influences of these on uptake and implementation.

Results: In a cohort of over 500 Australian maternal and perinatal randomised trials, multi-centre design, National Health and Medical Research Council or equivalent funding, and larger sample sizes were associated with higher citation rates, increased inclusion in syntheses and policy documents. More recent trials (published from 2011-2014) also showed improvements compared with trials from 1986-2010.

In the survey of triallists, fellow health professionals were thought to be aware of trial findings only 50% of the time, but skill deficits were not major barriers to implementation. When trial results were widely known, confidence in the findings was sometimes low. Trials with null results were difficult to interpret and there was some lack of clarity about who should be responsible for translation and implementation.

Emerging citation and social media systems such as Altmetric could increase visibility of research and change some of the ways that impact is currently measured.

In three case studies addressing different stages of translation, I have demonstrated how integrating a research, translation and impact cycle with behaviour change theory can explain, predict and shape practice and policy change. These case studies were: closing an important research gap (reminder systems for women with previous gestational diabetes); initiatives to highlight the importance of stillbirth and its prevention (including development of a tool to assess the impact of bibliographic citations); and the implementation of antenatal magnesium sulphate for fetal neuroprotection (a project exemplifying rapid and effective implementation).

Conclusions: Maternal and perinatal research in Australia has made a major contribution to better health and health systems. I have shown that this impact could be even greater with improved translation processes such as making research more implementation ready, strengthening networks and using coordinated approaches to accelerate uptake and impact.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or tertiary university and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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Philippa Middleton
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List of key publications authored/co-authored by Philippa Middleton

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