Whose *place* is it?
Examining the socio-spatial geography of obesity in young adults for an Australian context

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This thesis was written in a climate of rising obesity rates within our population. In recent times, an inundation of media, marketing and health stories have focused on the "increasing waistlines" of both adults and children. The research aligns itself with the "geographies of health" perspective, utilising knowledge from geography, sociology, epidemiology and population health. Extensive literature has shown that those living in the developed world, who are locationally and socially disadvantaged, are more likely to experience the highest prevalence of obesity. This thesis contributes to a broader knowledge base on how socio-spatial factors impose barriers to achieving and maintaining a healthy weight within a young adult cohort (18 to 34 years).

The research design consists of both theory and data triangulation. The theoretical underpinning utilises Giddens' Theory of Structuration exploring the structure and agency debate along with a number of geographical theories on space and place. The overarching socio-spatial conceptual framework for the research captures four main theme areas; the social environment, socio-cultural factors, residential perceptions of local areas, and lay perceptions of weight status and health in the context of place. Data were obtained from a biomedical and socio-demographic cohort study (n=4056), the North West Adelaide Health Study (NWAHS) and longitudinal survey information from the South Australian Health Omnibus Survey (SA HOS) between 1994 and 2004. A follow-up telephone interview to NWAHS participants (n=2996) provides additional unique primary data around social environments, housing, residential migration, lifecourse and perceptions of health. Additionally, semi-structured interviews were undertaken with young women from the NWAHS cohort which addressed socio-demographic, geographical and lifecourse themes. Other secondary social environmental data were utilised on accessibility to services, Australian Bureau of Statistics (ABS) Population and Housing Censuses and property valuations data providing additional insight into the complexities of the macro or global level influences.

The thesis discusses the themes from the socio-spatial framework highlighting the social, cultural, historical and geographical aspects that are important for understanding the current increasing prevalence of obesity within young adults. The findings highlight the importance of space and place when thinking about health. Obesity is a complex and multifaceted issue and there is the need for contemporary research methodologies to guide future policy development and interventions.
DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution to Natasha Jayne Howard 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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Natasha Jayne Howard    Date
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I was fortunate to be able to undertake this work after early beginnings working on the North West Adelaide Health Study (NWAHS). I would like to acknowledge the team behind NWAHS, particularly Janet Grant (Study Coordinator) Sandy Pickering (Clinic Coordinator), Alicia Montgomerie, Clinic Staff and Chief Investigators. I am appreciative of the NWAHS participants and their families for their enduring contribution to the study and making a difference to population health in South Australia. Thank you also to numerous colleagues within the Population Research and Outcome Studies Unit, Department of Health who encouraged me in my research.

In particular I would like to acknowledge my fellow PhD students within the Discipline of Geographical and Environmental Studies (GES), The University of Adelaide. I looked forward to our many discussions about our research and candidature experiences, thanks to Dr Kelly Parker, Dr Julie Franzon, George Tan, Danielle Taylor, Francesca Harris-Spence, Jennifer Buckley, Dr Tony Lockwood and Helen Feist. I would like to acknowledge the staff at The National Centre for the Social Applications of Geographic Information Systems (GISCA) and the Australian Institute of Social Research (AISR), in particular to Maria Fugaro who looked after us all on a daily basis. I have many great memories of the time working with you all. To my new team within the Social Epidemiology and Research Evaluation Group, at the University of South Australia, I look forward to extending many of these issues relating to the socio-spatial context and health over the coming years.

Over time I have learnt from many good friends and colleagues and the journey of the PhD is certainly much more than what is contained within these pages. I am extremely grateful to a number of wonderful friends. In particular, Donna Sundberg and Kate White who have been there from the beginning of the PhD and encouraged me through it all. Katherine Baldock who was a great support to me professionally and personally, and I am glad that we get to work together again in this research area. Dr Julie Franzon who was a great friend to have on the journey and I loved our travels and discussions along the way and Dr Kelly Parker who was an amazing friend to share this experience with and I think over the years we have deliberated every aspect of our work and life. I am glad that this experience has introduced some tremendous people into my life.

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Thank you lastly to my family, Mum, Dad, James and Sara.
For your love and belief in me always.
This research was a component of the overarching Nutrition Obesity Lifestyle and Environment (NOBLE) study, an Australian Research Council (ARC) linkage project (LP0455737), 2005-2009. The South Australian Government Department of Health was the major industry linkage partner and the primary aim of the relationship was to use population research intelligence to inform effective policy and interventions surrounding obesity. Other study collaborators included the Children, Youth and Women's Health Service (CYWHS), Central Northern Adelaide Health Service (CNAHS), Australian Commonwealth Scientific and Research Organisation (CSIRO), The National Centre for Social Applications of Geographic Information Systems (GISCA), The University of Adelaide and the University of South Australia (UniSA).

The CYWHS contributed a population level, measured data set of four-year old children within South Australia. There were also other social and physical environmental data sources made available through research partners, such as, accessibility, transport, education, health services and property capital valuations. A partnership existed to explore the use of the Australian Bureau of Statistics (ABS) Population and Housing Censuses and other social surveys.

The NOBLE study worked within the areas of psychology, medicine, public health, geography and economics to explore the many aspects of the obesity epidemic. Further research was recognised as a necessity to improve understanding into the social, economic, environmental and biomedical processes related to obesity. This thesis will specifically address NOBLE study aims associated with the socioeconomic factors relating to obesity and the environment (Hugo et al., 2004:68).

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Adjunct Associate Professor Anne Taylor – South Australian Government, Department of Health

**Team Leader**

Professor David Wilson – Discipline of Medicine, The University of Adelaide
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<tr>
<td>ABS NHS</td>
<td>Australian Bureau of Statistics National Health Survey</td>
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<tr>
<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
</tr>
<tr>
<td>ADPT</td>
<td>Australasian Digital Theses Program</td>
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<tr>
<td>ARC</td>
<td>Australian Research Council</td>
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<tr>
<td>ARIA</td>
<td>Accessibility and Remoteness Index of Australia</td>
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<tr>
<td>ANZSCO</td>
<td>Australian and New Zealand Standard Classification of Occupations</td>
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<tr>
<td>ASGC</td>
<td>Australian Standard Geographical Classification</td>
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<tr>
<td>ATSI</td>
<td>Aboriginal and Torres Strait Islander</td>
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<td>BMI</td>
<td>Body Mass Index</td>
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<tr>
<td>BRFSS</td>
<td>Behavioural Risk Factor Surveillance System</td>
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<td>CATI</td>
<td>Computer Assisted Telephone Interview</td>
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<tr>
<td>CBD</td>
<td>Central Business District</td>
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<tr>
<td>CD</td>
<td>Collection District</td>
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<tr>
<td>CDC</td>
<td>Centers for Disease Control</td>
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<td>CNAHS</td>
<td>Central Northern Adelaide Health Service (South Australian Government)</td>
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<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
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<tr>
<td>CSIRO</td>
<td>Australian Commonwealth Scientific and Research Organisation</td>
</tr>
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<td>CYWH</td>
<td>Children, Youth and Women's Health Service (South Australian Government)</td>
</tr>
<tr>
<td>DCDB</td>
<td>Digital Cadastral Database</td>
</tr>
<tr>
<td>DEH</td>
<td>Department of Environment and Heritage</td>
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<tr>
<td>DEXA</td>
<td>Dual Electronic X-Ray Absorption</td>
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<td>DoHA</td>
<td>Department of Health and Ageing (Commonwealth of Australia)</td>
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<tr>
<td>ERP</td>
<td>Estimated Residential Population</td>
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<tr>
<td>EWP</td>
<td>Electronic White Pages</td>
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<tr>
<td>GIS</td>
<td>Geographic Information Systems</td>
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<td>GISCA</td>
<td>The National Centre for Social Applications of Geographic Information Systems</td>
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<tr>
<td>GLM</td>
<td>Generalised Linear Modelling</td>
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<td>GMH</td>
<td>General Motors Holden</td>
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<td>GWR</td>
<td>Geographically Weighted Regression</td>
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<td>HIAP</td>
<td>Health in All Policies</td>
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<tr>
<td>IMVS</td>
<td>Institute of Medical and Veterinary Science</td>
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<td>IRSD</td>
<td>Index of Relative Socioeconomic Disadvantage</td>
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<tr>
<td>KFC</td>
<td>Kentucky Fried Chicken</td>
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<tr>
<td>LGA</td>
<td>Local Government Area</td>
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<td>LMH</td>
<td>Lyell McEwin Hospital</td>
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<tr>
<td>MAUP</td>
<td>Modifiable Area Unit Problem</td>
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<tr>
<td>Metro ARIA</td>
<td>Metropolitan Accessibility and Remoteness Index of Australia</td>
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<tr>
<td>NHANES</td>
<td>National Health And Nutritional Examination Survey (United States)</td>
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<td>NHIS</td>
<td>National Health Institute Survey (United States)</td>
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<td>NOBLE</td>
<td>Nutrition Obesity Lifestyle and Environment Study</td>
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OCSAR Office of Crime Statistics and Research (South Australian Government)
OECD Organisation for Economic Co-operation and Development
OR Odds Ratio
PROS Population Research and Outcome Studies Unit (SA Health)
RAAF Royal Australian Air Force
SA South Australia
SACC Standard Australian Classification of Countries
SA HOS South Australian Health Omnibus Survey
SAHT South Australian Housing Trust
SAMSS South Australian Monitoring and Surveillance System
SASP South Australian Strategic Plan
SaTScan™ Software for the spatial, temporal, and space time statistics
SEIFA IRSD Socio Economic Indexes for Areas, Index of Relative Socioeconomic Disadvantage
SES Socio Economic Status
SF-1 Short Form-1
SLA Statistical Local Area
TAFE Technical and Further Education
TFU Telephone Follow-Up
TATS Torrens Automated Titles System
TQEH The Queen Elizabeth Hospital
UniSA University of South Australia
UK United Kingdom
US United States
WHO World Health Organisation
WHR Waist-to-Hip Ratio
PUBLICATIONS AND PRESENTATIONS

The following peer reviewed publications, conference presentations, posters resulted from work described in this thesis.

PEER-REVIEWED PUBLICATIONS


PRESENTATIONS


Howard, N. and Franzon, J. 2006, *Space, Place and Health: Small area analysis of Obesity*. Space, Place and Health: Geographical Approaches to Public Health Short Course, Flinders University, 7-11 August 2006.


