Obesity, Place and Environment

The spatial distribution and correlates of weight status in South Australian preschool children

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Thesis submitted for the degree of Doctor of Philosophy

Discipline of Geographical and Environmental Studies
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June 2010

Table of Contents

List of Tables

List of Figures

Abstract

The issue of overweight and obesity in childhood has received a great deal of recent attention in both the academic literature and popular media. These discussions have tended to concentrate on individual responses to behavioural and nutritional choices, with limited exploration of how the wider social and economic environment might influence weight outcomes. However there is a growing body of research which has identified area level effects on health outcomes, and this suggests that location should be an important consideration in obesity research.

Currently, very little formal investigation of weight status has been conducted among children of preschool age and location is not routinely considered in obesity research, especially at the small area level and particularly with reference to children. Given that childhood overweight is known to persist into adulthood and that behavioural change may be easier to effect in preschoolers, it is appropriate to focus research attention on this age group.

This study explores an administrative data set containing over 120 000 individual records collected over ten years and supplied by the South Australian Children, Youth and Women‟s Health Service. Geographical Information Systems (GIS) are used to determine the prevalence, distribution and area-level correlates of obesity in South Australian four year old children between 1995 and 2003. It aims to determine if there has been significant variation in the spatial distribution of obesity prevalence between different communities over this time period, and to detect relationships between weight status, socio-economic variables and environmental attributes at a small scale which

may be able to explain some of the discrepancy. These are investigated in conjunction with the data items available for the individual children in this data set.

A univariate analysis approach using cross-tabulation and chi square testing has been used to explore the relationships between the obesity prevalence of the study population and selected socio-demographic and environmental variables at a small area level. The Australian Census of Population and Housing is the primary source of socio-demographic data, but other variables including housing characteristics, proximity to fast food outlets, proximity to recreational areas and the walkability of neighbourhoods have also been examined.

Analysis of this data set reveals an increase in obesity prevalence over time, in line with national and international trends. For individual children, birth weight, ethnicity and breastfeeding history appear to be particularly influential in the development of overweight at four years of age, but there is nevertheless a distinct spatial patterning of obesity prevalence throughout the state, and also within the metropolitan Adelaide area. While there is generally a positive association between socio-economic status and obesity, these relationships are not necessarily straightforward and the area-level physical and social environmental variables actually show a varying relationship with obesity prevalence in different communities.

This study has clearly identified neighbourhood characteristics as an important component in the complex etiology of obesity development in even very young children. It has shown that aspects of environment such as ethnicity and disadvantage should be taken into account when targeting and tailoring public health initiatives to combat the development of obesity in these populations.

The exploration of this unique, administrative data set with reference to location has illustrated the complexity of the relationship between biology and environment in the development of overweight and obesity in young children. This has implications for policy development across many spheres of government.

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 Julie Franzon 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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Julie Franzon

June 3rd 2010

Acknowledgements

A journey like this is never taken alone. To my supervisors – Graeme Hugo, David Wilson and Gary Wittert – I would like to extend my deepest appreciation for their direction, constructive criticism, patience and much needed encouragement throughout all stages of research. Their individual expertise and enthusiasm for my work has been invaluable.

I would like to acknowledge and thank Bob Volkmer and colleagues at the Children, Youth and Women‟s Health Service; who enabled this study by making the primary data set available to me and supporting me while I came to grips with it. My thanks also to the other government departments and organisations who freely supplied supporting data when requested – in particular DEH, Planning SA and DAIS.

A special thank you to my friends and colleagues in the NOBLE Study and at GISCA, AISR and the Department of Geographical and Environmental Studies at the University of Adelaide for sharing this journey with me and lightening the road. In particular I would like to acknowledge Natasha Howard – my travelling companion on journeys both physical and mental during the last four years.

Finally, love and thanks to my family and friends whose interest and encouragement has meant a great deal to me. But especially to Stephen, Megan and Connor who have cheerfully dealt with my occasional withdrawals from domestic life and given me the freedom and support to pursue my goals.

List of Acronyms

ABS	- Australian Bureau of Statistics
ARIA	- Accessibility and Remoteness Index for Australia
ASD	- Adelaide Statistical Division
ASGC	- Australian Standard Geographical Classification
ATSI	- Aboriginal and/or Torres Strait Islander
BMI	- Body Mass Index
CBD	- Central Business District
CD	- Census Collection District
CDC	- Centres for Disease Control and Prevention
CT	- Computed Tomography
CYWHS	- Children, Youth and Women‟s Health Service
DAIS	- Department for Administrative and Information Services
DCDB	- Digital Cadastral DataBase
DEH	- Department of Environment and Heritage
DXA	- Dual X-Ray Absorptiometry
GIS	- Geographic Information Systems
GISCA	- National Centre for Social Applications of Geographic Information Systems
IOTF	- International Obesity Task Force
IRSA	- Index of Relative Socio-Economic Advantage/Disadvantage
IRSD	- Index of Relative Socio-Economic Disadvantage
LSAC	- Longitudinal Study of Australian Children
LSG	- Land Services Group
MARIA	- Metropolitan ARIA
MAUP	- Modifiable Areal Unit Problem

MRI	-	Magnetic Resonance Imaging
NILF	-	Not in the Labour Force
NOBLE	-	Nutrition, Obesity, Lifestyle and Environment Study
OR	-	Odds Ratio
SA	-	South Australia
SAHT	-	South Australian Housing Trust
SD	-	Statistical Division
SEIFA	-	Socio-Economic Indexes for Areas
SES	-	Socio-Economic Status
UK	-	United Kingdom
USA	-	United States of America
WHO	-	World Health Organisation