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Social gradient in child oral health: individual, school and area variation.

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Submitted for the Degree of Doctor of Philosophy November 2015

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LIST OF ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACARA	Australian Curriculum, Assessment and Reporting Authority
ACORN	Acorn is a Geo-demographic Index used in the UK
AIHW	Australian Institute Health and Welfare
AHS	Area Health Service
AIC	Akaike Information Criterion
ARCPOH	Australian Research Centre for Population Oral Health
CDBS	Child Dental Benefits Schedule
CDHS	Child Dental Benefits Schedule
CI	Confidence Interval
COHS	Centre for Oral Health Strategy
DAG	Diagrammatic Acyclical Graph
DMFS	Decayed Missing Filled Surfaces
DMFT	Decayed Missing Filled Teeth
NSW	New South Wales
ICC	Intra-Class Correlation
ICSEA	Index of Community Socio-Educational Advantage
IRSAD	Index of Relative Socio-economic Advantage and Disadvantage
LHD	Local Health District
LIFESTYLE	LIFESTYLE is a demographic Index used in Canada
NT	Northern Territory
OHE	Oral Health Education
OMR	Optical Mark Reader
OR	Odds Ratio
PAF	Population Attributable Fraction
PAS	Priority Action Schools
PR	Prevalence ratio
PSP	Priority Schools Program
QLD	Queensland
RR	Rate Ratio
SA	South Australia
SAP	School Assessment Program
SCUDS	Study into the Child Use of Dental Services

SEIFA	Socio-economic Indexes for Areas
SES	Socio-economic Status
SiC	Significant Caries Index
SOKS	Save Our Kids Smiles
TAS	Tasmania
VIC	Victoria
VIF	Variance Inflation Factor
WA	Western Australia
WHO	World Health Organisation

ABSTRACT

This thesis describes the oral health of New South Wales (NSW) children aged 5-12 years by socioeconomic (SES) characteristics utilising the individual-, school- and area-level socioeconomic indicators. It also quantifies the usefulness of SES indicators for targeting of dental services.

Methods

A cross-sectional study of NSW 5–12 year-olds was conducted in 2007 using a multi-stage, stratified, cluster sample approach. Explanatory SES variables were explored at three levels: individual, school and area. Caries prevalence, caries severity and significant caries were calculated. Bivariate analysis was undertaken. Prevalence ratios (PR) of caries prevalence and SiC_{10} were modelled by Poisson regression (PROC LOGLINK, SUDAAN 10.0). Rate ratios (RR) of caries severity were modelled using Poisson regression (PROC GENMOD, SAS 9.2). Multi-level analysis (SAS PROC GLIMMIX) was undertaken accounting for the nested structure. Use of SES variables to target dental services was examined using number of cases, relative risk and population attributable fraction (PAF%).

Results

Just under 40% of NSW children had a prevalence of deciduous caries with mean dmfs of 3.18 surfaces and just over 22% had experienced permanent caries with mean DMFS of 0.61 surfaces.

Variation in oral health by SES indicators

There was significant variation in caries prevalence, caries severity and SiC_{10} by socioeconomic characteristics; children from the lowest SES category had significantly higher caries prevalence and severity compared to the highest SES category for all SES indicators in both the deciduous and permanent dentition. Membership of the SiC_{10} group showed lower SES groups had a higher proportion of children who formed part of the SiC_{10} group.

Associations across individual, school and area-level SES indicators

In the final models, income was significant for all three caries measures for both dentitions. The children from the lowest income category had significantly higher odds of caries, more severe caries and membership of the SiC_{10} group. School type as an explanatory factor was not significant for caries prevalence and SiC_{10} in the multi-level model, although the

children attending a disadvantaged public school had significantly higher odds of permanent caries severity.

Effectiveness of targeting by SES indicators

In both the deciduous and permanent dentition there were fewer cases of caries and SiC_{10} cases in the designated SES target group, the lowest SES group, than outside the designated target group. SES demonstrated a low population attributable fraction for deciduous and permanent caries prevalence, caries severity and significant caries.

Conclusions

The study demonstrated that caries was higher among lower SES groups whether measured by individual, school or area characteristics. In many instances there were three and five-fold differences among those in the lowest SES categories providing a consistent association with poor oral health. Income was independently associated with variation in child oral health when adjusting for the nested structure. Low SES categories did not identify the majority of those with caries or the highest levels of caries and would therefore be limited as a basis for a targeted oral health strategy and a population health focus that uses a social determinants approach would be more appropriate.

SIGNED STATEMENT

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution 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. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Signed:

Jennifer Miller

Date: 4-11-2015

ACKNOWLEDGEMENTS

There are many who have contributed in making this thesis possible. I wish to express my gratitude to the following individuals and organisations. It is a pleasure to thank the many people who made this thesis possible.

Emeritus Professor A John Spencer for his guidance, encouragement and continued support in pursuing this area of research. His inspiration, mentorship and intellectual advice helped me to develop an understanding of the subject.

Professor Kaye Roberts-Thomson for her guidance and mentorship, friendship and great efforts to explain things clearly and simply. Throughout my thesis development and writing, she provided encouragement and sound advice.

Professor Anthony Blinkhorn and Associate Professor Loc Do for their support, guidance and different perspectives that added to the overall project.

I would like to thank the participating organisations and study participants without which this study would not have been possible.

Ms Dana Teusner for her assistance in data management and analysis and for providing a stimulating and fun environment in which to learn.

Ms Anne Ellershaw for development of the sample framework, weighting of the data, and guidance with data syntax.

I am grateful to my student colleagues for helping me get through the difficult times, and for all the emotional support, camaraderie, and caring they provided.

The colleagues at ARCPOH for valuable support.

The Australian Dental Research Foundation Inc and The University of Adelaide (School of Dentistry) for their kind financial support for this study.

I offer my regards to all of those who supported me in any respect during the completion of the research.

Above all, I thank my family who supported me and encouraged me constantly, my thanks to my children, Tegan and Matt for giving me love and understanding, for my parents, Neidra and Warren for their continuous support and interest in what I do.

THESIS FORMAT

This thesis presents an introductory chapter that provides background information on child oral health in Australia, literature on social gradients in oral health and the various indicators of SES and the association of socioeconomic factors with oral health. It highlights the provision of dental services for children and the variation across Australian states and territories. It also introduces the rationale and conceptual framework, aims, study objectives, hypotheses and rationale. The second chapter describes the study design, sampling procedures and requirements, data collection methods, including details of mail questionnaire SES indicators and oral epidemiological examinations. Data management incorporates data linkage, data weighting, analysis plan and the conceptual model. The third chapter includes responses from the schools in the sampling frame, including the examination and questionnaire phase. The results are described using three caries measures in relation to individual-, school- and area-level characteristics. The fourth chapter discusses the major findings of the study on the associations of SES indicators at an individual-, school- and area-level with caries measures and compares those findings with the available literature. It also includes limitations of the data and further research. The final chapter concludes with the major themes, implications of the findings and principal conclusions.

Tables and figures are presented together with their corresponding text where possible. References to published work are in the text with the author name(s) and the year of publication in parenthesis. Where there were three or more authors, the first author is listed, followed by et. al., in the text. The complete list of authors is listed in the reference list at the end. Where there were multiple references for an author, references are listed in the bibliography in alphabetical order of authors and then by year of publication. The appendices include: consent form; primary approach letter to study participants with the enclosed questionnaire; reminder card and follow-up letters; oral epidemiological examination form; letters for ethical approval of the study; Diagrammatic Acyclical Graphs; and, model selection tables (Appendices 1-8).