

**Dental insurance, dental service use  
and health outcomes:  
Effectiveness and cost-effectiveness  
among Australian adults**

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# List of Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory, Australia
AIHW	Australian Institute of Health and Welfare
APRA	Australian Prudential Regulation Authority
ARCPOH	Australian Research Centre for Population Oral Health
BLQ	Baseline Questionnaire
CAL	Clinical Attachment Loss
CDHP	Commonwealth Dental Health Program
CEA	Cost-Effectiveness Analysis
CEAC	Cost Effectiveness Acceptability Curve
CI	Confidence Intervals
CUA	Cost Utility Analysis
DALYS	Disability Adjusted Life years
DMFS	Decayed, Missing and Filled Surfaces
DMFT	Decayed, Missing and Filled Teeth
EuroQoL or EQ-5D	European Quality of Life Scale
GP	General Practitioner
HHI	Household Income
HICAPS	Health Industry Claims and Payments Service
HIE	Health Insurance Experiment
HLL	Healthy Life-years Lost
HRQoL	Health Related Quality of Life
ICER	Incremental Cost-Effectiveness Ratio
LHC	Lifetime Health Cover
LSDPA	Longitudinal Study of Dentists Practice Activity
MEPS	Medical Expenditure Panel Survey
MID	Minimal Important Difference
MLS	Medicare Levy Surcharge
NDTIS	National Dental Telephone Interview Survey
NHHRC	National Health and Hospital Reforms Commission
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
NMB	Net Monetary benefit
NSAOH	National Survey of Adult Oral Health
NSW	New South Wales, Australia
OECD	Organisation for Economic Cooperation and Development
OHIP	Oral Health Impact Profile
OOP	Out of Pocket (Expenditure)

OR	Odds Ratio
PBS	Pharmaceutical Benefits Scheme
PD	Pocket Depth
PHI	Private Health Insurance
PHIAC	Private Health Insurance Administrative Council
PHIO	Private Health Insurance Ombudsman
PICO	Population Intervention Comparator Outcome
PR	Prevalence Ratio
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QALYS	Quality Adjusted Life Years
RAND	Research and Development Corporation
ROP	Relief of Pain
RTS	Returned To Sender
SDS	School Dental Service
SES	Socio-Economic Status
SG	Standard Gamble
SIS	Standard Information Sheets
SRGH	Self-Rated General Health
SROH/SRDH	Self-Rated Oral/Dental Health
TTO	Time Trade Off
VAS	Visual Analogue Scale

# Abstract

## ***Aim***

The aim of this research thesis is to examine the relationship between dental insurance status and dental service use and health outcomes, to ascertain the out of pocket dental expenditure from a consumer perspective and examine the cost-effectiveness of being dentally insured.

## ***Methods***

The thesis presents a summary of existing literature and examined the relationship between dental insurance status and dental service use and oral health outcomes in working age adults in Australia using a two-year prospective cohort study. Out of pocket dental expenditure was calculated for the 2 year cohort and cost-effectiveness was examined. Baseline data was collected in 2009-10 with two follow ups in 2010-11 and 2011-12, through questionnaires, service use log books and receipts. Dental insurance premium costs were imputed from a database of private health insurance funds, plans and policies.

## ***Results***

The literature review showed a positive relationship between dental insurance status and favourable dental visiting pattern (regular dental visiting, visiting for check-up and visiting the same dentist). Mixed evidence on a positive relationship with oral health outcomes was reported.

The cohort study had a 37% response rate and a 40% retention rate (from baseline) by the end of the two years. 67% of the participants were dentally insured, 73% visited a dental professional, 15% and 23% reported negative change in self-rated oral and general health respectively and mean out of pocket expenditure was \$788 during the study period.

Dental visiting among the insured was significantly higher than the uninsured. Among those who visited, there were no significant associations with dental insurance for number of visits, services or services per visit. None of the main areas of services were significantly associated with dental insurance status either. However, the insured received significantly higher rates of diagnostic and preventive services per visit. Dental insurance was positively associated with OHIP severity change and negative change in self-rated oral health but not with general health outcomes. Mean net expenditure was marginally higher among the dentally insured participants but not significantly. Dental insurance was cost effective with 95% certainty if an individual consumer was willing to pay \$4300 over two years to maintain or improve their self-reported oral health.

## ***Conclusion***

The systematic analysis of literature and comprehensive analysis of cohort data found that dental insurance is effective in increasing dental visiting. It is also effective in improving oral health outcomes but not general health outcomes. The out of pocket dental expenditure is large but not substantially larger than other common household expenditures. Being dentally insured is more expensive but also provides better maintenance or improvement of oral health among adults. What these results mean for subgroups based on visiting frequency, type of visiting, longer term outcomes and reduction of future expenditure needs to be further examined in larger and longer duration studies.

# Declaration

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. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968. I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

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Emmanuel Sumithran Gnanamanickam

Date: 10<sup>th</sup> May 2016

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