THE COST OF INACTION ON THE SOCIAL DETERMINANTS OF HEALTH

REPORT NO. 2/2012

STRICTLY EMBARGOED UNTIL 1AM (AEST), JUNE 4, 2012

CHA-NATSEM Second Report on Health Inequalities

PREPARED BY

Laurie Brown, Linc Thurecht and Binod Nepal

PREPARED FOR

Catholic Health Australia

MAY 2012

CATHOLIC HEALTH
Australia

ABOUT NATSEM

The National Centre for Social and Economic Modelling (NATSEM), a research centre at the University of Canberra, is one of Australia's leading economic and social policy research institutes, and is regarded as one of the world's foremost centres of excellence for microsimulation, economic modelling and policy evaluation.

NATSEM undertakes independent and impartial research, and aims to be a key contributor to social and economic policy debate and analysis in Australia and throughout the world through high quality economic modelling, and supplying consultancy services to commercial, government and not-for-profit clients. Our research is founded on rigorous empirical analysis conducted by staff with specialist technical, policy and institutional knowledge.

Research findings are communicated to a wide audience, and receive extensive media and public attention. Most publications are freely available and can be downloaded from the NATSEM website.

Director: Alan Duncan

National Centre for Social and Economic Modelling
University of Canberra ACT 2601 Australia
Building 24, University Drive South, Canberra University, Bruce, ACT 2620

Phone + 61 2 6201 2780
Fax + 61 2 6201 2751
Email natsem@natsem.canberra.edu.au
Website www.natsem.canberra.edu.au

CONTENTS

Boxes, figures and tables

AUTHOR NOTE

Laurie Brown is a Professor and Research Director (Health), Dr Linc Thurecht is a Senior Research Fellow and Dr. Binod Nepal is a Senior Research Fellow at the National Centre for Social and Economic Modelling, University of Canberra.

ACKNOWLEDGEMENTS

The authors would like to acknowledge Martin Laverty, Chief Executive Officer and Liz Callaghan, Director Strategic Policy, of Catholic Health Australia for their support of the project.

This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (MIAESR). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either FaHCSIA or the MIAESR.

GENERAL CAVEAT

NATSEM research findings are generally based on estimated characteristics of the population. Such estimates are usually derived from the application of microsimulation modelling techniques to microdata based on sample surveys.

These estimates may be different from the actual characteristics of the population because of sampling and non-sampling errors in the microdata and because of the assumptions underlying the modelling techniques.

The microdata do not contain any information that enables identification of the individuals or families to which they refer.

ABBREVIATIONS AND ACRONYMS

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ALOS	Average Length of Stay
CSDH	Commission on Social Determinants of Health
Disadv.	Disadvantaged
HILDA	Household Income and Labour Dynamics in Australia survey
IRSD	Index of Relative Socio-economic Disadvantage
LTC	Long-term Health Condition
MBS	Medicare Benefits Schedule
NATSEM	National Centre for Social and Economic Modelling
NHMRC	National Health and Medical Research Council
NILF	Not in Labour Force
PBS	Pharmaceutical Benefits Scheme
SAHS	Self-assessed Health Status
SEIFA	Socio-Economic Indexes for Areas
vs.	versus
WHO	World Health Organisation

FOREWORD

Half a million Australians could be freed from chronic illness, $2.3 billion in annual hospital costs could be saved and the number of Pharmaceutical Benefits Scheme prescriptions could be cut by 5.3 million annually.

These staggering opportunities are what new approaches to health policy could achieve, yet counter-intuitively they do not require radical change to the way in which our health system operates. In fact, the opportunity to reduce chronic illness and save on hospital and pharmaceutical expenditure requires action outside of the formal health system.

Australia suffers the effects of a major differential in the prevalence of long-term health conditions. Those who are most socio-economically disadvantaged are twice as likely to have a long-term health condition than those who are the least disadvantaged. Put another way, the most poor are twice as likely to suffer chronic illness and will die on average three years earlier than the most affluent.

International research points to the importance of factors that determine a person's health. This research, centred on the social determinants of health, culminated in the World Health Organisation making a series of recommendations in its 2008 *Closing the Gap Within a Generation* report. The recommendations of that report are yet to be fully implemented within Australia.

Drug-, alcohol-, tobacco- and crisis-free pregnancies are understood to be fundamental to a child's lifelong development. So, too, is early learning that occurs in a child's first three years of life. School completion, successful transition into work, secure housing and access to resources necessary for effective social interaction are all determinants of a person's lifelong health. These are factors mostly dealt with outside of the health system, yet they are so important to the health of the nation.

Part of Catholic Health Australia's purpose is improving the health of all Australians, with a particular focus on the needs of the poor. It's for this reason NATSEM was commissioned to produce *The Cost of Inaction on the Social Determinants of Health* to consider economic dynamics of ignoring the World Health Organisation's recommendations for Australia on social determinants of health.

The findings of *The Cost of Inaction on the Social Determinants of Health* appear to suggest that if the World Health Organisation's recommendations were adopted within Australia:

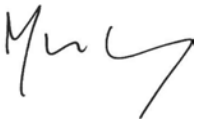
- 500,000 Australians could avoid suffering a chronic illness;
- 170,000 extra Australians could enter the workforce, generating $8 billion in extra earnings;
- Annual savings of $4 billion in welfare support payments could be made;
- 60,000 fewer people would need to be admitted to hospital annually, resulting in savings of $2.3 billion in hospital expenditure;
- 5.5 million fewer Medicare services would be needed each year, resulting in annual savings of $273 million;
- 5.3 million fewer Pharmaceutical Benefit Scheme scripts would be filled each year, resulting in annual savings of $184.5 million each year.

These remarkable economic gains are only part of the equation. The real opportunity for action on social determinants is the improvements that can be made to people's health and well-being.

Australia should seek the human and financial dividends suggested in *The Cost of Inaction on the Social Determinants of Health* by moving to adopt the World Health Organisation's proposals. It can do so by having social inclusion agendas adopt a "health in all policies" approach to require decisions of government to consider long-term health impacts.

This research further strengthens the case Catholic Health Australia has been making through the two reports prepared by NATSEM on the social determinants of health – and the book *Determining the Future: A Fair Go & Health for All* published last year – that a Senate Inquiry is needed to better understand health inequalities in Australia.

No one suggests a "health in all policies" approach is simple, but inaction is clearly unaffordable.



Martin Laverty
Chief Executive Officer, Catholic Health Australia

EXECUTIVE SUMMARY

Key Findings

The findings of the Report confirm that the cost of Government inaction on the social determinants of health leading to health inequalities for the most disadvantaged Australians of working age is substantial. This was measured in terms not only of the number of people affected but also their overall well-being, their ability to participate in the workforce, their earnings from paid work, their reliance on Government income support and their use of health services.

Substantial differences were found in the proportion of disadvantaged individuals satisfied with their lives, employment status, earnings from salary and wages, Government pensions and allowances, and use of health services between those in poor versus good health and those having versus not having a long-term health condition. Improving the health profile of Australians of working age in the most socio-economically disadvantaged groups therefore would lead to major social and economic gains with savings to both the Government and to individuals.

(a) Health inequity

If the health gaps between the most and least disadvantaged groups were closed, i.e. there was no inequity in the proportions in good health or who were free from long-term health conditions, then an estimated 370,000 to 400,000 additional disadvantaged Australians in the 25-64 year age group would see their health as being good and some 405,000 to 500,000 additional individuals would be free from chronic illness depending upon which socio-economic lens (household income, level of education, social connectedness) is used to view disadvantage (Figure 1). Even if Government action focussed only on those living in public housing, then some 140,000 to 157,000 additional Australian adults would have better health.

(b) Satisfaction with life

People's satisfaction with their lives is highly dependent on their health status. On average, nearly 30 per cent more of disadvantaged individuals in good health said they were satisfied with their lives compared with those in poor health (Figure 2). Over eight in every 10 younger males who had poor health and who lived in public rental housing were dissatisfied with their lives. If socio-economic inequalities in health were overcome, then as many as 120,000 additional socio-economically disadvantaged Australians would be satisfied with their lives. For some of the disadvantaged groups studied, achieving health equality would mean that personal well-being would improve for around one person in every 10 in these groups.

Figure 1 Additional numbers of most disadvantaged Australians in good health status (SAHS) or free from long-term health conditions (LTC) from closing the health gap between most and least disadvantaged Australians of working age

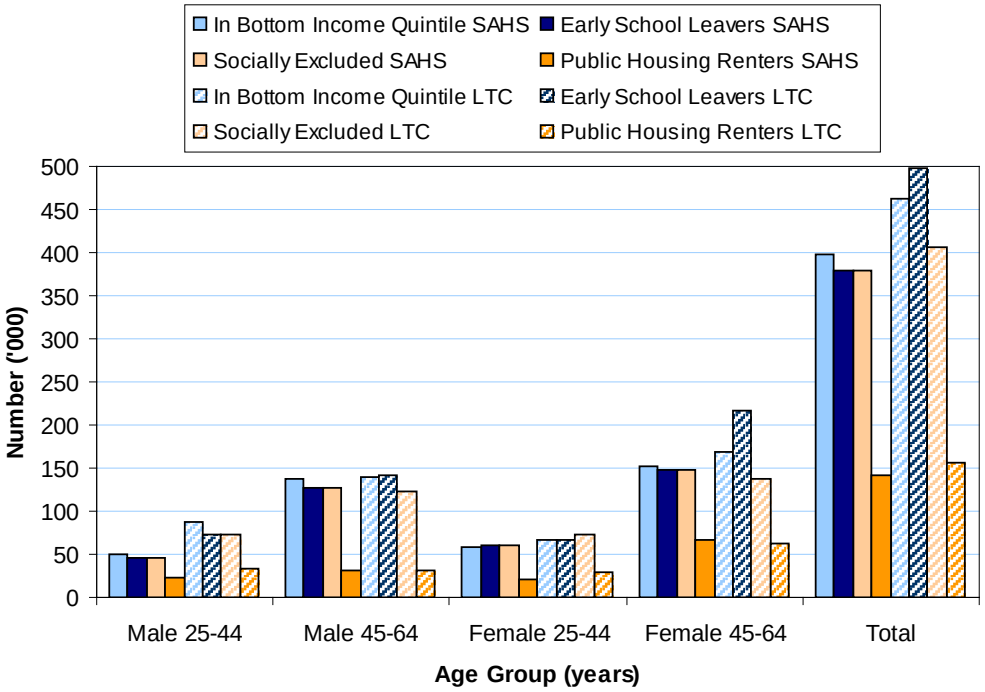
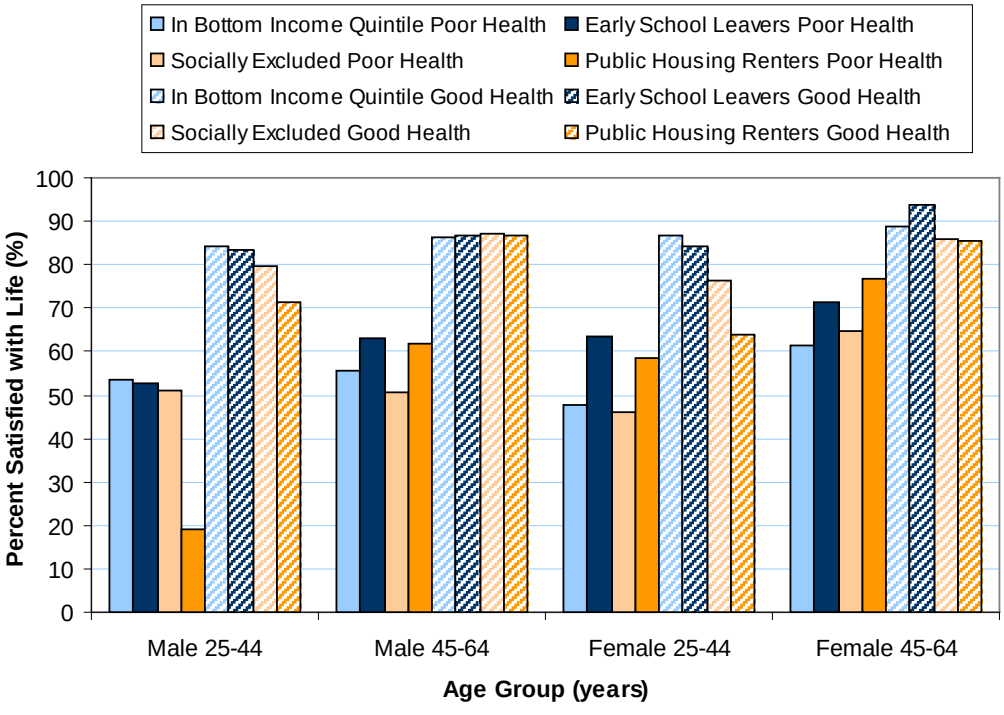


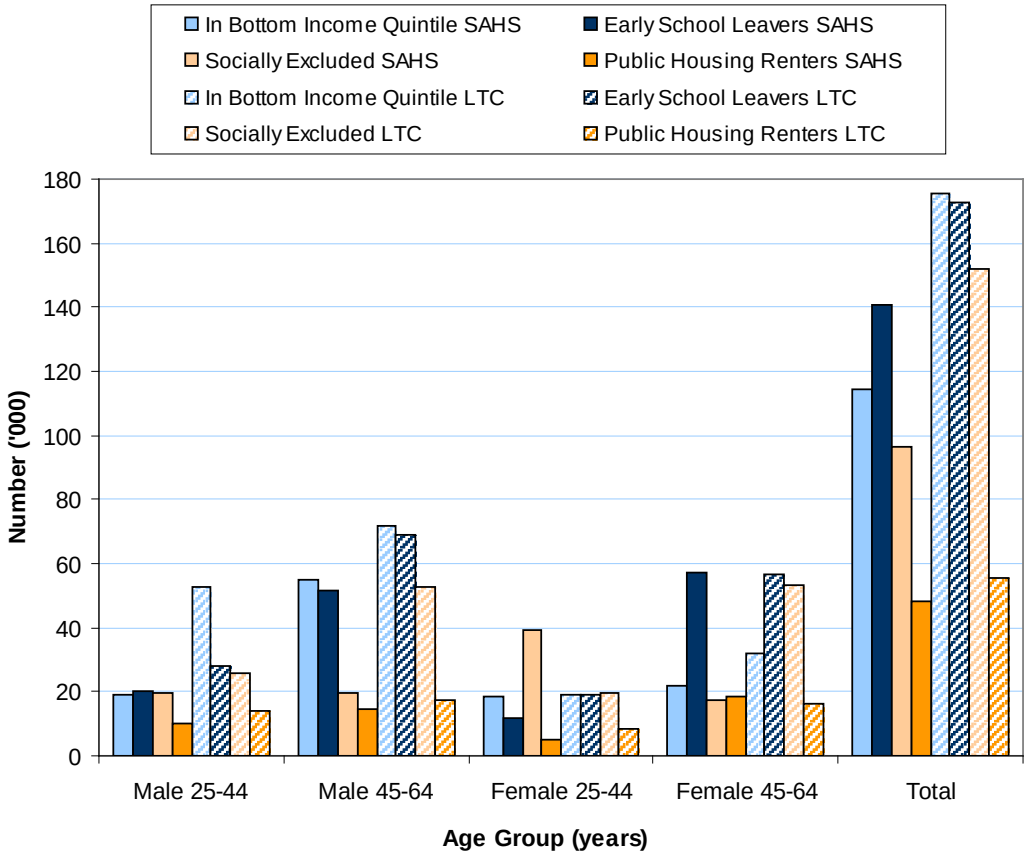
Figure 2 Percentage of disadvantaged persons of working age satisfied with their lives by health status



(c) Gains in employment

Rates of unemployment and not being in the labour force are very high for both males and females in low socio-economic groups and especially when they have problems with their health. For example, in 2008, fewer than one in five persons in the bottom income quintile and who had at least one long-term health condition was in paid work, irrespective of their gender or age. Changes in health reflect in higher employment rates, especially for disadvantaged males aged 45 to 64. Achieving equity in self-assessed health status (SAHS) could lead to over 110,000 new full- or part-time workers when health inequality is viewed through a household income lens, or as many as 140,000 workers if disadvantage from an educational perspective is taken (Figure 3). These figures rise to over 170,000 additional people in employment when the prevalence of long-term health conditions (LTC) is considered.

Figure 3 Expected increase in numbers employed through a reduction in the prevalence of chronic illness from closing the health gap between most and least disadvantaged Australians of working age



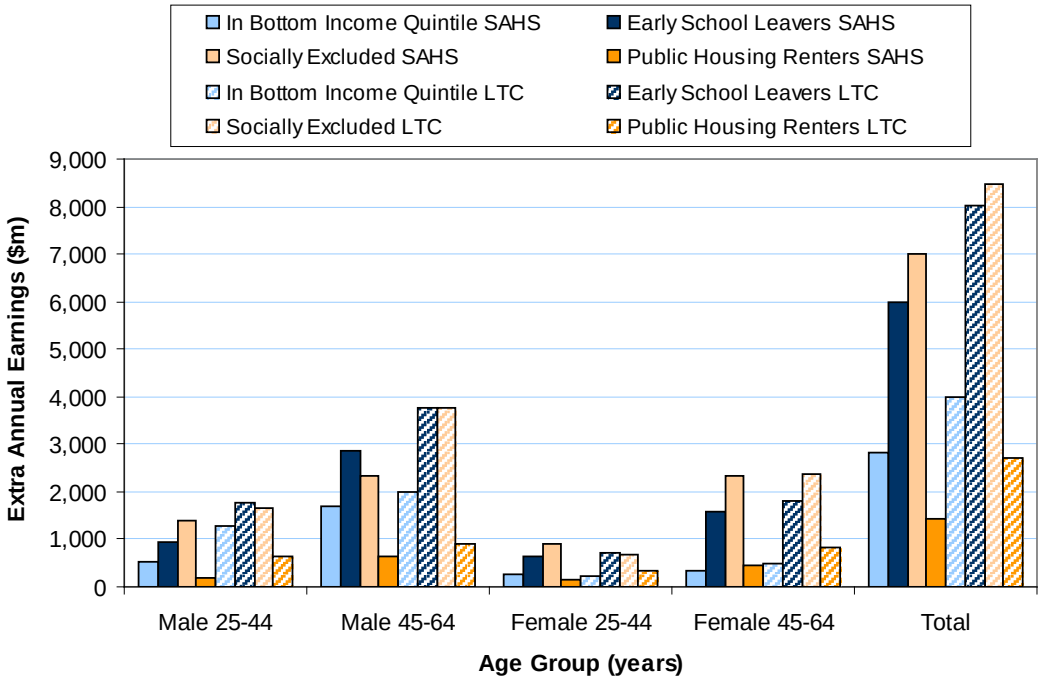
(d) Increase in annual earnings

If there are more individuals in paid work, then it stands to reason that the total earnings from wages and salaries for a particular socio-economic group will increase. The relative gap in weekly gross income from wages and salaries between disadvantaged adult Australians of working age in good versus poor health ranges between a 1.5-fold difference for younger males (aged 25 to 44) who live in public housing or who

experience low levels of social connectedness to over a staggering 6.5-fold difference experienced by males aged 45 to 64 in the bottom income quintile or who are public housing renters.

Closing the gap in self-assessed health status could generate as much as $6-7 billion in extra earnings and, in the prevalence of long-term health conditions, upwards of $8 billion (Figure 4). These findings reflect two key factors – the large number of Australians of working age who currently are educationally disadvantaged having left school before completing year 12 or who are socially isolated and the relatively large wage gap between those in poor and good health in these two groups. In terms of increases in annual income from wages and salaries, the greatest gains from taking action on the social determinants of health can be made for males aged 45 to 64.

Figure 4 Expected increase in annual earnings from wages and salaries through either an improvement in self-assessed health status (SAHS) or a reduction in the prevalence of long-term health conditions (LTC) from closing the health gap between most and least disadvantaged Australians of working age



(e) Reduction in income and welfare support

A flow-on effect from increased employment and earnings and better health is the reduced need for income and welfare support via Government pensions and allowances. Those in poor health or who have a long-term health condition typically received between 1.5 and 2.5 times the level of financial assistance from Government than those in good health or who were free from chronic illness. Irrespective of whether an income, education or social exclusion lens is taken, closing the gap in health status potentially could lead to $2-3 billion in savings per year in Government expenditure, and in the order of $3-4 billion per year if the prevalence of chronic illness in most disadvantaged socio-economic groups could be reduced to the level experienced by the least advantaged groups.

(f) Savings to the health system

Potential savings to the health system through Government taking action on the social determinants of health were difficult to estimate because of the lack of socio-economic coded health services use and cost data. As an example of the possible savings that might accrue, changes in the use and cost of health services – hospitals, doctor and medically related (Medicare) services, and prescribed medicines subsidised through the PBS – from changes in self-assessed health status for individuals in the lowest household income quintile were modelled.

Nearly 400,000 additional disadvantaged individuals would regard their health as good if equity was achieved with individuals in the top income quintile. Such a shift is significant in terms of health services use and costs as there were very large differences in the use of health services by individuals in the bottom income quintile between those in poor versus good health. More than 60,000 individuals need not have been admitted to hospital. More than 500,000 hospital separations may not have occurred and with an average length of stay of around 2.5 days, there would have been some 1.44 million fewer patient days spent in hospital, saving around $2.3 billion in health expenditure.

A two-fold difference in the use of doctor and medical services was found between disadvantaged persons in poor versus good health. Improving the health status of 400,000 individuals of working age in the bottom income quintile would reduce the pressure on Medicare by over 5.5 million services. Such a reduction in MBS service use equates to a savings to Government of around $273 million each year. With respect to the use of prescription medicines, in 2008, disadvantaged individuals in the 45 to 64 age group and who were in poor health and who were concession cardholders used 30 prescriptions on average each. While those aged 25 to 44 averaged 19 scripts, both age groups used twice as many scripts as concessional patients in good health. Over 5.3 million PBS scripts would not have been required by concessional patients if health equity existed. However, a shift to good health through closing socio-economic health gaps would shift around 15,000 persons in low-income households from ‘having’ to ‘not having’ concessional status, resulting in a net increase of 41,500 scripts (a 6 per cent increase) for general patients. Health equity for concessional patients was estimated to yield $184.7 million in savings to Government and a $15.6m reduction in patient contributions. However, there would be an increase in the out-of-pocket cost of medicines to general patients by some $3.1m.

Conclusions

This is the first study of its kind in Australia that has tried to gauge the impact of Government inaction on the social determinants of health and health inequalities. Reducing health inequalities is a matter of social inclusion, fairness and social justice (Marmot et al, 2010). The fact that so many disadvantaged Australians are in poor health or have long-term health conditions relative to individuals in the least socio-economically disadvantaged groups is simply unfair. So are the impacts on people’s satisfaction with their lives, missed employment opportunities, levels of income and need for health services. This study shows that major social and economic benefits are being neglected and savings to Government expenditure and the health system overlooked. The findings of this Report are revealing and are of policy concern especially within the context of Australia’s agenda on social inclusion. However, in this study the health profile of individuals of working age in the most socio-economic disadvantaged groups only was compared with that of individuals in the least disadvantaged groups. The first CHA-NATSEM Report (Brown et al, 2010) on health inequalities showed that socio-economic gradients in health exist in Australia. It is not only the most socio-economically disadvantaged groups that experience health inequalities relative to the most advantaged individuals, but also other low and middle socio-economic

groups. Thus, this Report provides only part of the story of health inequalities in Australians of working age.

Socio-economic inequalities in health persist because the social determinants of health are not being addressed. Government action on the social determinants of health and health inequalities would require a broad investment, a focus on health in all policies and action across the whole of society. In return, significant revenue would be generated through increased employment, reduction in Government pensions and allowances, and savings in Government spending on health services. The WHO Commission on the Social Determinants of Health called for national governments to develop systems for the routine monitoring of health inequities and the social determinants of health, and to develop more effective policies and implement strategies suited to their particular national context to improve health equity (http://www.who.int/social_determinants/en/). This Report continues the work of demonstrating how improving health equity could have a major impact on the health and well-being of Australians, as well as a significant financial impact for the country.

Key words

Socio-economic disadvantage, health inequalities, social determinants of health, Government action

1 INTRODUCTION

There are no regular reports that investigate and monitor trends in Australia in health inequality over time nor whether gaps in health status between 'rich' and 'poor' Australians are closing. In September 2010, Catholic Health Australia (CHA) and the National Centre for Social and Economic Modelling (NATSEM) released the first CHA-NATSEM Report on Health Inequalities "*Health lies in wealth: Health inequalities in Australians of working age*" (Brown and Nepal, 2010). That Report investigated socio-economic inequalities in health outcomes and lifestyle risk factors of Australians of working age, i.e. individuals aged 25 to 64. The Report received widespread media attention. Taking a social determinants of health perspective, the study showed health inequalities exist for Australians of working age; social gradients in health were common, i.e. the lower a person's social and economic position, the worse his or her health is; and that the health gaps between the most disadvantaged and least disadvantaged socio-economic groups were often very large. The Report further showed that household income, a person's level of education, household employment, housing tenure and social connectedness all matter when it comes to health. Socio-economic differences were found in all the health indicators studied – mortality, self-assessed health status, long-term health conditions and health risk factors (such as smoking, physical inactivity, obesity and at-risk alcohol consumption) – and were evident for both men and women and for the two age groups (those aged 25-44 and 45-64) studied.

As Professor Marmot and his review team remark in the *Strategic Review of Health Inequalities in England post-2010*, serious health inequalities that are observed do not arise by chance (Marmot et al, 2010). Social inequalities in health occur because of the inequalities in the conditions of daily life under which we are born, develop as young children, grow into teenage years and adulthood, and live into old age. The material and social circumstances under which we live are in turn shaped by the unequal distribution of money, power and resources at both the local and national levels. We have different access to household goods and services, to health care, schools and higher education, conditions of work and leisure, housing and community resources, and different opportunities to lead flourishing and fulfilling lives. A collection of societal factors will play out over an individual's lifetime and will be expressed through their health and health behaviours. Evidence collected by social determinants of health researchers shows that it is the social determinants of health that are mostly responsible for health inequities – the unfair and avoidable differences in health status seen within countries (http://www.who.int/social_determinants/en/).

Health inequalities persist because inequalities persist across key social and economic domains – early child development and education, employment and working conditions, housing and neighbourhood conditions, standards of living, and, more generally, the freedom to participate equally in the benefits of society (Marmot et al, 2010). The Australian Government's vision of a socially inclusive society is one in which all Australians feel valued and have the opportunity to participate fully in the life of our society. Achieving this vision means that all Australians will have the resources, opportunities and capability to: learn by participating in education and training; work by participating in employment, in voluntary work and in family and caring; engage by connecting with people and using their local community's resources; and have a voice so that they can influence decisions that affect them (www.socialinclusion.gov.au). Australian families and individuals may experience social exclusion if they lack certain resources, opportunities or capabilities so that they are unable to participate in learning, working or engaging activities and are unable to influence the decisions affecting them.

What would it mean for Australians of working age if the gaps in health between the least socio-economically disadvantaged and most socio-economically disadvantaged were closed? How many more individuals would feel

satisfied with their life? How many more would be in full-time work or even employed part-time? How would earnings from paid work increase and the reliance on Government welfare payments reduce? If the most disadvantaged Australians of working age enjoyed the same health profile of the most advantaged, what savings would occur through reduced use of hospitals, doctors, medical services or prescribed medicines for example? These potential social and economic benefits are the costs of Government inaction on the social determinants of health and on socio-economic health inequalities.

1.1 OBJECTIVES OF THIS REPORT

The aim of this research is to provide an indication of the extent of the cost of Government inaction in developing policies and implementing strategies that would reduce socio-economic differences within the Australian population of working age (25-64 years) that give rise to health inequities.

The cost of inaction is measured in terms of the loss of potential social and economic outcomes that might otherwise have accrued to socio-economically disadvantaged individuals if they had had the same health profile of more socio-economically advantaged Australians. For the purposes of this report, the contrast is made between those who are most socio-economically disadvantaged and those who are least disadvantaged defined in terms of household income, level of education, housing tenure and degree of social connectedness.

Four types of key outcomes are considered – the number of disadvantaged Australians of working age experiencing health inequity, satisfaction with life, economic outcomes (including employment, income from paid work, savings to Government expenditure on social security payments and transfers) and savings to the health system.

Thus the Report aims to address five key questions:

- If the most socio-economically disadvantaged Australians of working age had the same self-reported health status profile of the least disadvantaged groups,how many more individuals would be in good health rather than poor health?
- If the most socio-economically disadvantaged Australians of working age had the same prevalence of long-term health conditions as the least disadvantaged groups,how many more individuals would be free from chronic long-term illness?
- If individuals in the most socio-economically disadvantaged groups had the same health profile – in terms of self-assessed health status and long-term health conditions – of the least disadvantaged groups, how many more individuals would be satisfied with their life?
- If individuals in the most socio-economically disadvantaged groups had the same health profile of the least disadvantaged groups, what improvements in employment status, income from paid work and reductions in government pensions, allowances and other public transfers are likely to be gained?
- If individuals in the most socio-economically disadvantaged groups had the same health profile of the least disadvantaged groups, what savings might occur to the health system in terms of reduced number of hospital separations, number of doctor- and medical-related services and prescribed medicines and associated costs to Government?

1.2 Structure of this Report

The following section outlines the key health and socio-economic indicators that have been chosen to explore the cost of inaction in addressing health inequalities. The data sources and variables used are identified and explained. A profile of the study population and a brief overview of the statistical analyses are provided.

How many disadvantaged Australians of working age are experiencing health inequity is explored in Section 3. Potential gains in satisfaction with life are then investigated in Section 4 and economic gains from closing socio-economic health gaps in Section 5. Section 6 addresses possible savings to Australia's health system and some concluding remarks are provided in Section 7.

2 Measuring Health and Socio-economic Disadvantage

2.1 Key Health and Socio-Economic Indicators

The analyses in this Report draw on the same data sources and variables used in the first CHA-NATSEM Report *"Health lies in wealth: Health inequalities in Australians of working age"* (Brown and Nepal, 2010). The choice of these was based on the commonality and importance of different social determinants of health reported in the national and international literature and measures that represent key dimensions of health. The health and socio-economic variables chosen for the analyses are described briefly in Table 1 below.

All of the variables in Table 1 are derived from the person-level data contained in Wave 8 of the Household, Income and Labour Dynamics in Australia (HILDA) Survey and all involve self-reported data. The interviews for Wave 8 were conducted between August 2008 and February 2009, with over 90 per cent of the interviews being conducted in September-October 2008 (Watson, 2010). HILDA is a broad household-based social and economic longitudinal survey which started in 2001. As Watson (2010) describes:

> The HILDA Survey began with a large national probability sample of Australian households occupying private dwellings. All members of the households providing at least one interview in Wave 1 form the basis of the panel to be pursued in each subsequent wave. The sample has been gradually extended to include any new household members resulting from changes in the composition of the original households. (Watson, 2010, p2).

More information on the variables can be found in Appendix 1.

The groups compared in this research representing the **most** and **least disadvantaged** Australians of working age for the four socio-economic indicators are given in Table 3.

Table 1 Socio-economic and health domains and variables

Domain	Variable description
Socio-economic status	
Household income	Annual disposable (after-tax) household income including government transfers (government benefits) in the past financial year. Income is equivalised to household size and structure, and is reported by quintile.
Education	Highest educational qualification categorised into three groups: year 11 and below, year 12 or vocational qualification, and tertiary education.
Housing	Tenure type of the household – owner, purchaser, private renter, public renter or rent other/free.
Social connectedness	A summary measure constructed on the basis of rating of three questions on frequency of gathering with friends/relatives, perceived availability of someone to confide in at difficult times, and feeling of loneliness. Classified as low connectedness, moderate connectedness or high connectedness.
Health outcomes	
Self-assessed health status	The five standard levels of self-assessed health status have been collapsed into two: "good health" and "poor health" where "good health" includes excellent, very good and good health; and "poor health" refers to fair and poor health.
Presence of a long-term health condition	Has any long-term health condition, impairment or disability that restricts an individual in their everyday activities, and has lasted or is likely to last for six months or more.

Table 2 Socio-economic classification

	Most Disadvantaged	Least Disadvantaged
Income	bottom quintile	top quintile
Education	≤ year 11 schooling	tertiary qualification
Housing	public renter	homeowner
Social connectedness	low	high

2.2 Measuring Lost Benefits – the Costs of Inaction

As previously stated, the cost of Government inaction on social determinants of health is viewed in terms of the loss of potential social and economic benefits that otherwise would have accrued to individuals in the most disadvantaged socio-economic groups if they had had the same health profile as those who are least disadvantaged. In the first CHA-NATSEM Report it was shown, for example, that only 51 per cent of males aged 45 to 64 who were in the bottom household income quintile reported that they were in good health compared with 87 per cent in the top income quintile. So, what would happen in terms of their overall satisfaction with their life, employment or income or need for government assistance, or their use of health services if an additional 36 per cent of disadvantaged 45- to 64-year-old males enjoyed good health rather than being in poor health?

Table 3 Outcome measures

Domain	Measure	Definition
Health Inequity		
	Inequity in self-assessed health status	Increase in number of most disadvantaged individuals in good health if self-assessed health profile was the same between most and least disadvantaged groups
	Inequity in long-term health conditions	Increase in number of most disadvantaged individuals with no long-term health condition if self-assessed health profile was the same between most and least disadvantaged groups
Satisfaction with Life	Satisfaction with life overall	Classified as 'not satisfied' or 'satisfied' to the question in HILDA 'all things considered, how satisfied are you with your life?'
Economic		
	Employment status	Classified as: employed full time, employed part time, unemployed looking for full-time work, unemployed looking for part-time work, not in the labour force marginally attached, and not in the labour force not marginally attached
	Wages and salaries	Individual weekly gross wages and salary from all jobs as at 2008
	Government pensions & allowances	Total Government pensions & allowances including income support payments and payments to families, all age and other pensions, Newstart and other allowance payments as at 2008
Health System		
	Hospital use	Number of persons hospitalised in public or private hospital, number of separations and number of patient days in 2008.
	Use of doctor- and medical-related service	Number of Medicare Benefits Schedule (MBS) services in 2008
	Government expenditure on doctor- and medical-related service	Benefits paid for MBS services in 2008
	Use of prescribed medicines	Number of prescriptions dispensed through the Pharmaceutical Benefits Scheme (PBS) in 2008
	Government expenditure on prescribed medicines	Benefits paid under the PBS in 2008
	Consumer expenditure on prescribed medicines	Co-payments paid on PBS medicines in 2008

A number of outcome measures were chosen for the analysis. These are described in Table 3. Data used to address the first three domains are from the 2008 HILDA survey. An important category in terms of employment status is 'not in the labour force' (NILF). Individuals who are not participating in the labour force are often described as 'marginally attached' or 'not marginally attached' to the labour market. If a person is marginally attached to the labour force then in many ways they are similar to those who are unemployed. However, while they satisfy some, they do not satisfy all of the criteria necessary to be classified as unemployed. The marginally attached include those who want to work and are actively looking for work, but were not available to start work; or were available to start work but whose main reason for not actively looking for work was that they believed they would not be able to find a job, i.e. discouraged jobseekers. Persons not in the labour force are classified as 'not marginally attached' to the labour force if they do not want to work or want to work at some stage but are not actively looking for work and are not currently available to start work.

The data to assess potential savings to the health system were derived from three of NATSEM's health microsimulation models:

- HospMod – a static microsimulation model of the use and costs of public and private hospitals in Australia (Brown et al, 2011);
- MediSim – a static microsimulation model of the use and costs of the Australian Pharmaceutical Benefits Scheme (Abello and Brown, 2007); and
- the health module in APPSIM – a module within the dynamic microsimulation model APPSIM that simulates lifestyle risk factors, self-assessed health status, health service utilisation and costs in Australia over 50 years (Lymer, 2011).

These data were supplemented by administrative data on the MBS and PBS from Medicare Australia.

The steps taken to estimate potential benefits if the health inequity between the most and least disadvantaged individuals disappeared are described below (and as represented in Figure 1).

1. The proportion of individuals in the most disadvantaged group (for each of the socio-economic characteristics above) who were in good health, or who had a long-term health condition, was compared with the percentage of individuals in the least disadvantaged group.
2. The number of additional individuals in each most disadvantaged group who would be expected to have good health (or be free from chronic illness) if the most disadvantaged group had the same percentage as the least disadvantaged group was calculated.
3. It was then assumed that the number of individuals 'shifting' from poor to good health, or having to not having a long-term health condition, would have the same level of satisfaction with life, employment profile, income, government benefits and payments, and use of health services as those belonging to individuals in the **same most disadvantaged socio-economic group** but who reported in the HILDA survey that they were in **good health**. Thus, it is assumed that any 'improvement' in health does not 'shift' individuals out of their socio-economic group but rather they take on the socio-economic characteristics of those in the group but who were 'healthy'. The difference between the profiles of all individuals having poor health and the mix of some individuals remaining in poor health and some shifting to good health gives a measure of the potential gains that might occur if health equity was achieved between the most and least disadvantaged socio-economic groups in Australia.

The HILDA survey population weights were applied to the person-level records to generate the estimates for the Australian population of working age. As in the first CHA-NATSEM Report, the study population is broken down by gender and into two age groups: those aged 25 to 44 and those aged 45 to 64. Youth under 25 years of age were excluded as many of these individuals could be studying. In the first Report, simple cross-tabulations between the various socio-economic and health indicators were generated and the percentages of the different socio-economic groups having a particular health characteristic calculated (Brown and Nepal, 2010).

2.3 MISSING DATA

The HILDA Wave 8 data had a total of 8,217 unit records for people aged 25to 64. For some variables, however, a slightly fewer number of records were available for analyses owing to non-response. To deal with this, we compared the socio-demographic profiles of people with missing and non-missing responses. Differences were not sufficiently large to bias the results for whom responses were known.

2.4 PROFILE OF THE STUDY POPULATION

The basic socio-economic profile of the Australian population of working age is given in Table 4. In 2008, nearly 14 per cent of persons of working age lived in Australia's poorest 20 per cent of households[1]. One of every four Australians aged between 25 and 64 had left high school before completing year 12, with nearly two of every five females aged 45 to 64 being an early school leaver. Although the majority of individuals were home-owners (either outright owners or purchasers), nearly 500,000 (4%) Australians of working age lived in public rental accommodation. Over one in five individuals of working age experienced a low level of social connectedness – gathering infrequently with friends or relatives, having no one or struggling to find someone to confide in at difficult times, and often felt lonely.

Table 4 Per cent distribution of men and women aged 25-64 years by selected socioeconomic characteristics

	Men[c]		Women[c]	
	25-44	45-64	25-44	45-64
Equivalised disposable HH[a] income quintile[b]				
Bottom	10	15	13	17
Second	20	17	20	18
Third	22	21	22	18
Fourth	23	22	22	22
Top	25	26	22	25
Education				
Year 11 and below	18	25	20	38
Year 12 / vocational	55	52	45	40
Tertiary	27	22	35	22
Housing tenure				
Owner	16	45	17	47
Purchaser	49	37	51	34
Renter private	28	13	26	12
Renter public	4	4	4	6
Rent other/free	3	1	3	1
Social connectedness				
Low connectedness	20	28	19	24
Moderate connectedness	30	33	30	32
High connectedness	30	25	35	30
Population (million)	2.97	2.63	2.99	2.70
Number records in HILDA	2,007	1,879	2,230	2,101

Source: HILDA Wave 8 datafile.
Note: [a]HH = household. [b] Equivalised disposable household income quintile is based on all responding households in the full HILDA sample, and weighted by population weights. [c] Percentage totals may not add to 100 owing to rounding or missing data..

[1] Defined by annual disposable (after-tax) household income including government transfers (government benefits) in the past financial year where income is equivalised to household size and structure, and is reported by quintile.

3 How Many Disadvantaged Australians of Working Age Are Experiencing Health Inequity?

As many as one in nine 25- to 44-year-old Australians and over one in five Australians aged 45 to 64 believe their health to be poor or at best fair. However, the proportion of individuals who report their health as being poor differs greatly by socio-economic status, with inequalities in self-assessed health status being significant for both men and women, and for both the younger and older age group studied. For example, three-quarters of those aged 25 to 44 and half of individuals aged 45 to 64 and who live in poorest income quintile households report poor health compared with 85 to 95 per cent of those living in the top 20 per cent of households. Around 15 per cent of Australians aged 25 to 44 and a third of those aged 45 to 64 have at least one long-term health condition, impairment or disability that restricts them in their everyday activities and that has lasted, or is likely to last, for six months or more. Health conditions included under the term 'long-term health conditions' are very broad, ranging from, for example, a person having hearing problems, loss of sight or visual impairment, long-term effects of a head injury or stroke, chronic or recurring pain, limited use of their arms or legs, a mental health condition, arthritis, asthma, heart disease, dementia and so on. However, the key factor is that whatever health problem or problems an individual has, this impacts on their daily life and is long-lasting. As with self-assessed health status, there is a major socio-economic differential in the prevalence of long-term health conditions – those who are most socio-economically disadvantaged are twice as likely as those who are least disadvantaged to have a long-term health condition, and for disadvantaged younger men up to four to five times as likely (Brown and Nepal 2010).

If the health gaps between the most and least disadvantaged groups were closed, i.e. there were no inequity in the proportions in good health or who were free from long-term health conditions, then how many more most disadvantaged Australians of working age would be in good health or have no chronic health problem?

Tables 5 and 6 show the number and health profile of individuals in the most disadvantaged income, educational, housing and social exclusion groups and compares the proportion in 'good' health or 'does not have a long-term health condition' with individuals in the least disadvantaged groups. The number of individuals who are socio-economically disadvantaged differs substantially between the four indicators. Nonetheless, it is clear that many socio-economically disadvantaged Australians experience poor health including chronic illness, and that the rates of ill-health are significantly higher ($p<0.05$) than those for least disadvantaged individuals. Over 700,000 of the 2.8 million working-aged Australians who left school before completing high school report their health as poor – this is a significant number of Australians. Of the 485,000 living in public rental accommodation, 44 per cent (211,000 people) report their health as poor. And, more individuals report having at least one long-term health condition (Table 6) with typically between 750,000 and 1 million people reporting a chronic health problem.

Combined with these large numbers is the significant difference in the health profile of the most and least disadvantaged groups. While inequity occurs across all four socio-economic measures, the most striking differences are by household income and housing tenure where the percentage point difference for both males and females aged 45 to 64 is between 30 and 40 per cent. The final columns in Tables 5 and 6 give estimates of the number of individuals who would be expected to be in good health or have no long-term illness if the prevalence rates for the least disadvantaged group also applied to most disadvantaged individuals. In other words, these estimates are a measure of the number of individuals experiencing health inequity.

Leaving housing tenure aside, a staggering number of around 370,000 to 400,000 additional disadvantaged Australians would see their health as being good if socio-economic inequalities in health disappeared – this number is equivalent to the entire population of the ACT (Table 5). Government action on the social determinants of health would particularly benefit females in terms of self-assessed health status. With respect to long-term health conditions, an estimated 405,000 to 500,000 additional individuals (approaching the population of Tasmania) would be free from chronic illness if prevalence rates were equalised. Again in numerical terms, the group that would benefit the most are females aged 45 to 64 (Table 6).

Table 5 Inequality in self-assessed health status – potential increase in numbers of most disadvantaged Australians reporting good health through closing the health gap between most and least disadvantaged Australians of working age

	Most Disadvantaged Group				Least Disadv. Group	Difference in % Good Health	Increase in No. of Most Disadv. in Good Health
	Group Pop (No.)	No. In Poor Health	No. In Good Health	% Good Health	% Good Health		
Income Quintile							
Male 25-44	301,333	70,158	231,175	76.7	93.3	16.6	49,864
Male 45-64	384,626	188,624	196,003	51.0	86.5	35.6	136,889
Female 25-44	398,476	88,084	310,392	77.9	92.4	14.5	57,906
Female 45-64	468,563	218,833	249,730	53.3	85.8	32.5	152,327
Total	1,552,998	565,699	987,300	-	-	-	396,986
Educational Attainment							
Male 25-44	541,677	97,419	444,258	82.0	92.5	10.5	44,911
Male 45-64	669,051	229,672	439,379	65.7	85.0	19.3	127,315
Female 25-44	605,230	86,467	518,763	85.7	93.2	7.5	60,548
Female 45-64	1,028,959	284,585	744,374	72.3	88.3	16.0	146,878
Total	2,844,917	698,143	2,146,774	-	-	-	379,652
Housing Tenure							
Male 25-44	104,525	31,634	72,892	69.7	92.4	22.7	23,659
Male 45-64	93,698	51,035	42,663	45.5	78.2	32.7	30,624
Female 25-44	114,649	32,498	82,151	71.7	90.5	18.8	21,549
Female 45-64	172,503	94,699	77,804	45.1	83.4	38.3	66,033
Total	485,376	209,866	275,510	-	-	-	141,865
Social Connectedness							
Male 25-44	604,147	110,338	493,809	81.7	94.0	12.3	74,191
Male 45-64	735,361	213,866	521,495	70.9	81.8	10.9	79,896
Female 25-44	568,955	110,978	457,978	80.5	94.2	13.7	77,913
Female 45-64	645,296	227,592	417,704	64.7	86.1	21.4	137,606
Total	2,553,759	662,774	1,890,986	-	-	-	369,606

Source: HILDA Wave 8 datafile.

Top four

Table 6 Inequality in long-term health conditions – potential increase in numbers of most disadvantaged Australians reporting no long-term health conditions through closing the health gap between most and least disadvantaged Australians of working age

	Most Disadvantaged Group				Least Disadv. Group	Difference in % Does not have a LTC	Increase in No. of Most Disadv. who do not have a LTC
	Group Pop (No.)	Has a LTC	Does not have a LTC	% Does not have a LTC	% Does not have a LTC		
Income Quintile							
Male 25-44	301,333	114,859	186,474	61.9	90.9	29.0	87,464
Male 45-64	384,626	239,988	144,638	37.6	73.8	36.2	139,107
Female 25-44	398,476	118,288	280,188	70.3	87.2	16.9	67,387
Female 45-64	468,563	277,850	190,713	40.7	76.6	35.9	168,008
Total	1,552,998	750,985	802,013	-	-	-	461,966
Educational Attainment							
Male 25-44	541,677	123,533	418,144	77.2	90.6	13.4	72,353
Male 45-64	669,051	308,982	360,069	53.8	75.1	21.3	142,402
Female 25-44	605,230	131,533	473,697	78.3	89.2	10.9	66,012
Female 45-64	1,028,959	420,330	608,629	59.1	80.2	21.1	216,934
Total	2,844,917	984,378	1,860,539	-	-	-	497,701
Housing Tenure							
Male 25-44	104,525	50,919	53,606	51.3	83.3	32.0	33,479
Male 45-64	93,698	62,933	30,765	32.8	66.4	33.6	31,406
Female 25-44	114,649	51,931	62,718	54.7	80.1	25.4	29,129
Female 45-64	172,503	114,308	58,195	33.7	70.2	36.5	62,871
Total	485,375	280,091	205,284	-	-	-	156,885
Social Connectedness							
Male 25-44	604,147	144,800	459,347	76.0	88.0	12.0	72,599
Male 45-64	735,361	317,018	418,343	56.9	73.7	16.8	123,615
Female 25-44	568,955	138,865	430,090	75.6	88.3	12.7	72,219
Female 45-64	645,296	304,702	340,594	52.8	74.1	21.3	137,769
Total	2,553,759	905,385	1,648,374	-	-	-	406,202

Source Data: HILDA Wave 8 datafile.

Top four

If the health gap between the most and least disadvantaged groups were closed,how many more socio-economically disadvantaged Australians of working age would be satisfied with their lives, how would employment status change, what gains might be made in earnings from paid work and reductions in government welfare payments, and what savings might accrue to the health system? These potential benefits are investigated in the following sections.

4 COSTS TO WELL-BEING - POTENTIAL GAINS IN SATISFACTION WITH LIFE

In the HILDA survey, respondents were asked about how satisfied or dissatisfied they are with some of the things happening in their lives. This includes a wide range of experiences – the home in which they live, their employment opportunities, their financial situation, how safe they feel, feeling part of their local community, their health, the neighbourhood in which they live and the amount of free time they have. After considering these aspects of their lives, they are asked 'all things considered, how satisfied are you with your life?' Tables 7 and 8 present differences in the proportion of those in the most disadvantaged groups who are satisfied with their lives according to their health status and presence or absence of long-term illness. The last columns in Tables 7 and 8 give the expected increase in number of disadvantaged individuals satisfied with their lives, based on the estimated increase in numbers of individuals expected to be in good health or free from chronic illness from closing the health gap between most and least disadvantaged Australians of working age (last columns in Tables 5 and 6) and the differences in proportion of disadvantaged persons satisfied with life by level of health (Tables 7 and 8).

Table 7 Percentage disadvantaged persons satisfied with life by health status and increase in those satisfied through closing the health gap between most and least disadvantaged Australians of working age

	Poor Health (%)	Good Health (%)	Difference (%)	Increase in Number Satisfied
Lowest Income Quintile				
Male 25-44	53.4	84.1	30.7	15,308
Male 45-64	55.7	86.5	30.8	42,162
Female 25-44	47.9	86.7	38.8	22,468
Female 45-64	61.3	88.9	27.6	42,042
Total				121,980
Year 11 or below				
Male 25-44	52.7	83.6	30.9	13,877
Male 45-64	62.9	86.9	24.0	30,556
Female 25-44	63.4	84.3	20.9	12,655
Female 45-64	71.4	93.6	22.2	32,607
Total				89,695
Public Renters				
Male 25-44	18.9	71.3	52.4	12,397
Male 45-64	61.9	86.8	24.9	7,625
Female 25-44	58.6	63.8	5.2	1,121
Female 45-64	76.7	85.3	8.6	5,679
Total				26,822
Low Social Connectedness				
Male 25-44	51.1	79.6	28.5	21,144
Male 45-64	50.8	87.1	36.3	29,002
Female 25-44	46.0	76.3	30.3	23,608
Female 45-64	64.9	86.0	21.1	29,035
Total				102,789

Source Data: HILDA Wave 8 datafile.

Top four

Table 8 Percentage persons satisfied with life by presence of a long-term health condition and increase in those satisfied through closing the health gap between most and least disadvantaged Australians of working age

	Has LTC (%)	Does not have a LTC (%)	Difference (%)	Increase in Number Satisfied
Lowest Income Quintile				
Male 25-44	68.7	81.7	13.0	11,370
Male 45-64	62.9	82.8	19.9	27,682
Female 25-44	60.8	81.1	20.3	13,680
Female 45-64	63.3	93.0	29.7	49,898
Total				102,631
Year 11 or below				
Male 25-44	72.3	81.0	8.7	6,295
Male 45-64	70.2	84.8	14.6	20,791
Female 25-44	69.3	82.1	12.8	8,450
Female 45-64	73.3	91.2	17.9	38,831
Total				74,366
Public Renters				
Male 25-44	45.9	73.0	27.1	9,073
Male 45-64	62.7	84.4	21.7	6,815
Female 25-44	53.9	67.5	13.6	3,962
Female 45-64	69.8	85.1	15.3	9,619
Total				29,469
Low Social Connectedness				
Male 25-44	61.0	78.7	17.7	12,850
Male 45-64	68.0	83.4	15.4	19,037
Female 25-44	56.1	75.5	19.4	14,010
Female 45-64	73.9	82.8	8.9	12,261
Total				58,159

Source Data: HILDA Wave 8 datafile.

Top four

With respect to self-assessed health status, there are substantial differences in the proportion of disadvantaged individuals satisfied with their lives between those in poor versus good health – with the exception of female public housing renters. Typically only between 45 and 65 per cent of individuals in poor health are satisfied with their life whereas, for those in good health, the proportion increases to around 80 to 90 per cent. On average, nearly 30 per cent more of disadvantaged individuals in good health said they were satisfied with their lives compared with those in poor health. More than eight in every 10 younger males who had poor health and who lived in public rental housing were dissatisfied with their lives.

If the health status of those in the most socio-economically disadvantaged groups could be improved to be on par with the least disadvantaged groups, then as many as 120,000 individuals could shift from being dissatisfied to satisfied with their lives. For some groups, the gain in numbers equates to around 10 per cent of the group's total populations, in particular, men and women aged 45 to 64 living in the poorest 20 per cent of households and male public housing renters. Thus these numbers are not inconsequential.

The patterns for long-term health conditions (Table 8) reflect those in Table 7 for self-assessed health status, with slightly fewer individuals in each group shifting to greater satisfaction with their life. Gains occur for all four socio-economic indicators, but targeting health inequities by household income quintile would lead to the greatest number of disadvantaged individuals benefitting from Government action.

5 Lost Economic Benefits – Potential Economic Gains From Closing Health Gaps

5.1 Potential Gains in Employment

It is well known that health influences the participation of individuals in the labour force. Tables 9 and 10 show the distribution of employment status of the four study groups broken down by self-assessed health status and the presence of long-term health conditions. A key point to note is that while these groups are of working age, they are also socio-economically disadvantaged, which is reflected in relatively high rates of unemployment or not being in the labour force. Both distributions adhere to general patterns of employment in that it is the younger males who have the highest rates of full-time employment, females the highest rates of part-time employment and the older females the highest rates of having no attachment to the labour force. These broad patterns are consistent across health status and long-term illness and the four socio-economic groupings.

The differences in employment between those in good and poor health and those not having or having a long-term health problem are given in Tables 11 and 12. These tables also show what might happen to employment if the health inequities between the most and least disadvantaged groups of individuals are overcome. The figures show 'shifts' in employment states where increases in the number of individuals employed are matched by numbers moving out of unemployment or into the labour force from not being in the labour force.

In terms of full-time employment, it is the older males, i.e. those aged 45 to 64, followed by younger males, who experience the greatest health differentials, while in terms of part-time employment it is females in both age groups who are most disadvantaged through health. The potential gains in the number of individuals in paid work if the health gaps between the most and least disadvantaged groups could be closed are substantial. Targeting inequality in health status would, for example, suggest an additional 141,000 early school leavers would be employed full time or part time (Table 11). Even more individuals would be in the paid workforce if the prevalence of long-term health conditions was reduced – the findings indicate that targeting long-term health issues in either those living in the lowest income households or those who did not complete high school would see more than 172,000 additional persons participating in paid work.

What do the numbers in the final column of Tables 11 and 12 represent? Improvement in the health status of males aged 45 to 64 who either live in the poorest 20 per cent of households or who live in private rental accommodation would lead to an additional 55,000 or 14,000 men respectively being in full- or part-time employment. These figures equate to an additional one man in every seven males aged 45 to 64 in the bottom income quintile or public renter disadvantaged groups being in paid work. With the exception of public renters, the figures for younger males and for females represent about one additional person in 20 of the group population being employed. For those in public rental accommodation this rises to about one in 10 individuals, which is socially important given that those living in public rental accommodation are most often those individuals who are suffering multiple and cumulative disadvantage.

When improvements in long-term health conditions are considered, then the magnitude of the impact rises, and it is not only the older males who seem to benefit the most, but also the younger males. The figures in Table 12 suggest an additional one man in every five males aged 45 to 64 in the bottom income quintile or public renter disadvantaged groups would be employed (either full or part time) and for the younger males in these two groups an additional one male in every six and eight respectively. For the older females, the figures start to approach an additional one female in 10 being employed.

Table 9 Distribution of employment status among most disadvantaged groups by health status

Employment Status	Poor Health[a]				Good Health[a]			
	M25-44 (%)	M45-64 (%)	F25-44 (%)	F45-64 (%)	M25-44 (%)	M45-64 (%)	F25-44 (%)	F45-64 (%)
Lowest Income Quintile								
Employed FT	21.6	10.3	2.6	2.2	49.1	38.5	11.3	9.2
Employed PT	5.8	3.9	8.1	13.4	16.9	15.7	30.8	20.7
UnEmpl looking FT work	12.1	8.1	0.0	0.6	9.6	4.6	8.7	2.5
UnEmpl looking PT work	0.0	0.0	4.0	3.1	0.5	0.4	2.5	2.3
NILF marginally attached	14.1	18.2	28.4	10.8	17.3	8.7	14.2	7.6
NILF not marginally attached	46.4	59.6	57.0	69.9	6.7	32.0	32.5	57.7
Total population (n)	70,158	188,624	88,084	218,833	231,175	196,003	310,392	249,730
Year 11 or Below								
Employed FT	42.8	32.8	17.2	8.4	73.4	67.2	31.2	28.3
Employed PT	6.1	4.7	19.6	18.5	10.8	10.2	31.8	33.7
UnEmpl looking FT work	8.2	2.8	2.2	0.7	2.4	2.0	2.9	0.5
UnEmpl looking PT work	0.0	0.0	2.5	0.9	0.9	0.2	3.0	0.8
NILF marginally attached	27.0	9.8	20.9	6.3	10.2	1.4	7.8	4.0
NILF not marginally attached	15.8	49.9	37.6	65.3	2.3	19.0	23.1	32.8
Total population (n)	97,419	229,672	86,467	284,585	444,258	439,379	518,763	744,374
Public Renters								
Employed FT	25.9	9.6	19.6	13.2	45.6	47.5	21.5	25.6
Employed PT	0.0	2.4	0.0	4.9	23.6	11.3	21.1	20.5
UnEmpl looking FT work	4.8	0.0	0.0	0.7	0.8	0.0	9.6	3.9
UnEmpl looking PT work	0.0	0.0	3.9	1.1	0.0	0.0	0.0	4.4
NILF marginally attached	57.7	39.6	29.5	35.6	22.9	1.3	20.3	8.6
NILF not marginally attached	11.6	48.3	47.1	44.5	7.1	39.8	27.5	36.9
Total population (n)	31,634	51,035	32,498	94,699	72,892	42,663	82,151	77,804
Low Social Connectedness								
Employed FT	56.0	26.6	23.3	14.9	83.5	71.6	41.8	36.5
Employed PT	6.3	5.9	22.5	18.8	5.5	10.4	26.5	31.1
UnEmpl looking FT work	6.7	7.1	1.5	0.5	5.1	2.0	5.0	1.5
UnEmpl looking PT work	0.0	0.5	2.3	3.5	0.2	0.3	3.5	1.8
NILF marginally attached	16.8	8.5	19.8	14.6	3.0	3.0	7.1	4.1
NILF not marginally attached	14.2	51.3	30.6	47.7	2.7	12.7	16.0	25.0
Total population (n)	110,338	213,866	110,978	227,592	493,809	521,495	457,978	417,704

Source Data: HILDA Wave 8 datafile.

Note [a] Percentage totals may not add to 100 owing to rounding or missing data.

Table 10 Distribution of employment status among most disadvantaged groups by prevalence of long-term health conditions

Employment Status	Has a LTC[a]				Does not have a LTC[a]			
	M25-44 (%)	M45-64 (%)	F25-44 (%)	F45-64 (%)	M25-44 (%)	M45-64 (%)	F25-44 (%)	F45-64 (%)
Lowest Income Quintile								
Employed FT	10.2	7.6	8.1	2.2	64.5	49.2	12.3	12.1
Employed PT	9.6	6.2	8.1	12.6	15.5	16.0	32.1	21.8
UnEmpl looking FT work	11.3	5.1	6.8	2.1	8.6	6.7	7.5	0.3
UnEmpl looking PT work	5.7	0.0	5.1	3.0	0.0	0.5	1.4	1.1
NILF marginally attached	22.1	15.8	23.0	8.5	8.7	8.7	13.7	10.2
NILF not marginally attached	41.1	65.4	48.8	71.5	2.7	18.8	33.0	54.5
Total population (n)	114,859	239,988	118,288	277,850	186,474	144,638	280,188	190,713
Year 11 or Below								
Employed FT	30.7	29.0	15.0	15.6	81.3	74.6	32.9	29.6
Employed PT	19.1	7.5	20.9	20.4	7.1	10.1	31.9	32.4
UnEmpl looking FT work	4.4	0.8	5.1	1.1	2.8	3.2	2.8	0.1
UnEmpl looking PT work	5.7	0.0	5.3	1.1	0.5	0.2	1.9	0.7
NILF marginally attached	22.2	7.3	13.6	4.9	7.4	1.1	8.5	4.3
NILF not marginally attached	17.8	55.4	40.1	57.0	0.9	10.7	22.1	32.8
Total population (n)	123,533	308,982	131,533	420,330	418,144	360,069	473,697	608,629
Public Renters								
Employed FT	25.3	6.2	8.7	11.4	56.2	58.3	26.6	27.4
Employed PT	5.7	6.9	11.4	9.1	20.9	10.1	21.4	18.8
UnEmpl looking FT work	3.2	0.0	7.5	0.5	5.3	0.0	8.9	4.2
UnEmpl looking PT work	2.4	0.0	1.8	3.1	0.0	0.0	2.4	0.0
NILF marginally attached	39.0	29.9	29.9	32.3	16.9	1.4	10.8	15.5
NILF not marginally attached	24.4	57.0	40.7	43.5	0.6	30.2	29.8	34.1
Total population (n)	50,919	62,933	51,931	114,308	53,606	30,765	62,718	58,195
Low Social Connectedness								
Employed FT	49.7	34.8	25.6	13.4	87.6	76.5	42.2	42.4
Employed PT	7.5	8.5	17.6	21.9	5.0	9.4	28.5	31.7
UnEmpl looking FT work	11.6	4.3	2.4	1.6	3.4	3.2	4.9	0.8
UnEmpl looking PT work	1.0	0.4	4.2	3.5	0.0	0.4	2.9	1.3
NILF marginally attached	17.8	7.5	22.3	11.8	1.6	2.3	5.8	4.1
NILF not marginally attached	12.4	44.6	27.9	47.8	2.3	8.2	15.7	19.8
Total population (n)	144,800	317,018	138,865	304,702	459,347	418,343	430,090	340,594

Source Data: HILDA Wave 8 datafile.

Note [a] Percentage totals may not add to 100 owing to rounding or missing data.

Table 11 Difference in employment between those with good and poor health status and change in employment status from closing the health gap between most and least disadvantaged Australians of working age

	Difference in Employment (%)				Change in Number of People				
	M25-44	M45-64	F25-44	F45-64	M25-44	M45-64	F25-44	F45-64	Total
Lowest Income Quintile									
Employed FT	27.5	28.2	8.7	7.0	13,663	38,876	5,096	10,663	68,298
Employed PT	11.1	11.8	22.7	7.3	5,535	16,153	13,145	11,120	45,953
UnEmpl looking FT work	-2.5	-3.5	8.7	1.9	-1,247	-4,791	5,038	2,894	1,894
UnEmpl looking PT work	0.5	0.4	-1.5	-0.8	249	548	-869	-1,219	-1,291
NILF marginally attached	3.2	-9.5	-14.2	-3.2	1,596	-13,004	-8,223	-4,874	-24,505
NILF not marginally attached	-39.7	-27.6	-24.5	-12.2	-19,796	-37,781	-14,187	-18,584	-90,348
Year 11 or Below									
Employed FT	30.6	34.4	14.0	19.9	17,349	44,479	6,397	32,579	100,804
Employed PT	4.7	5.5	12.2	15.2	2,673	7,111	5,496	24,884	40,164
UnEmpl looking FT work	-5.8	-0.8	0.7	-0.2	-3,299	-1,034	315	-327	-4,345
UnEmpl looking PT work	0.9	0.2	0.5	-0.1	512	259	225	-164	832
NILF marginally attached	-16.8	-8.4	-13.1	-2.3	-9,556	-10,861	-5,901	-3,765	-30,083
NILF not marginally attached	-13.5	-30.9	-14.5	-32.5	-7,679	-39,953	-6,532	-53,206	-107,370
Public Renters									
Employed FT	19.7	37.9	1.9	12.4	4,661	11,606	409	8,254	24,930
Employed PT	23.6	8.9	21.1	15.6	5,584	2,726	4,547	10,301	23,158
UnEmpl looking FT work	-4.0	0.0	9.60	3.2	-946	0	2,069	2,113	3,236
UnEmpl looking PT work	0.0	0.0	-3.90	3.3	0	0	-840	2,179	1,339
NILF marginally attached	-34.8	-38.3	-9.2	-27.0	-8,233	-11,729	-1,982	-17,829	-39,773
NILF not marginally attached	-4.5	-8.5	-19.6	-7.6	-1,065	-2,603	-4,224	-5,019	-12,911
Low Social Connectedness									
Employed FT	27.5	45.0	18.5	21.6	20,319	20,403	35,873	14,492	91,087
Employed PT	-0.8	4.5	4.0	12.3	-591	-594	3,595	3,117	5,527
UnEmpl looking FT work	-1.6	-5.1	3.5	1.0	-1,182	-1,187	-4,075	2,727	-3,717
UnEmpl looking PT work	-	-0.2	1.2	-1.7	148	148	-160	935	1,071
NILF marginally attached	-13.8	-5.5	-12.7	-10.5	-10,197	-10,238	-4,394	-9,895	-34,724
NILF not marginally attached	-11.5	-38.6	-14.6	-22.7	-8,497	-8,532	-30,840	-11,375	-59,244

Source Data: HILDA Wave 8 datafile.

Top four

TABLE 12 Difference in employment between those without and with a long-term health condition and change in employment status with reduction in prevalence of chronic illness from closing the health gap between most and least disadvantaged Australians of working age

	Difference in Employment (%)				Change in Number of People				
	M25-44	M45-64	F25-44	F45-64	M25-44	M45-64	F25-44	F45-64	Total
Lowest Income Quintile									
Employed FT	54.3	41.6	4.2	9.9	47,493	58,147	2,763	16,465	124,868
Employed PT	5.9	9.8	24.0	9.2	5,160	13,632	16,173	15,457	50,422
UnEmpl looking FT work	-2.7	1.6	0.7	-1.8	-2,362	2,226	472	-3,024	-2,688
UnEmpl looking PT work	-5.7	0.5	-3.7	-1.9	-4,985	696	-2,493	-3,192	-9,974
NILF marginally attached	-13.4	-7.1	-9.3	1.7	-11,720	-9,877	-6,267	2,856	-25,008
NILF not marginally attached	-38.4	-46.6	-15.8	-17.0	-33,586	-64,824	-10,647	-28,561	-137,618
Year 11 or Below									
Employed FT	50.6	45.6	17.9	14.0	36,538	65,078	11,750	30,805	144,171
Employed PT	-12.0	2.6	11.0	12.0	-8,682	3,702	7,261	26,032	28,313
UnEmpl looking FT work	-1.6	2.4	-2.3	-1.0	-1,158	3,418	-1,518	-2,169	-1,427
UnEmpl looking PT work	-5.2	0.2	-3.4	-0.4	-3,762	285	-2,244	-868	-6,589
NILF marginally attached	-14.8	-6.2	-5.1	-0.6	-10,708	-8,829	-3,367	-1,302	-24,206
NILF not marginally attached	-16.9	-44.7	-18.0	-24.2	-12,228	-63,654	-11,882	-52,498	-140,262
Public Renters									
Employed FT	30.9	52.1	17.9	16.0	8,772	16,363	5,243	9,997	40,375
Employed PT	15.2	3.2	10.0	9.7	5,089	1,005	2,913	6,098	15,105
UnEmpl looking FT work	2.1	0.0	1.4	3.7	703	0	408	2,326	3,437
UnEmpl looking PT work	2.4	0.0	0.6	-3.10	804	0	175	-1,949	-970
NILF marginally attached	-22.1	-28.5	-19.1	-16.8	-7,399	-8,951	-5,564	-10,562	-32,476
NILF not marginally attached	-23.8	-26.8	-10.9	-9.4	-7,968	-8,417	-3,175	-5,910	-25,470
Low Social Connectedness									
Employed FT	37.9	41.7	16.6	29.0	27,588	51,671	11,988	39,815	131,062
Employed PT	-2.5	0.9	10.9	9.8	-1,815	1,113	7,872	13,501	20,671
UnEmpl looking FT work	-8.2	-1.1	2.5	-0.8	-5,953	-1,360	1,805	-1,102	-6,610
UnEmpl looking PT work	-1.0	0.0	-1.3	-2.2	-726	0	-939	-3,031	-4,696
NILF marginally attached	-16.2	-5.2	-16.5	-7.7	-11,761	-6,428	-11,916	-10,608	-40,713
NILF not marginally attached	-10.1	-36.4	-12.2	-28.0	-7,332	-44,996	-8,811	-38,575	-99,714

Source Data: HILDA Wave 8 datafile.

Top four

5.2 INCOME AND GAINS IN ANNUAL EARNINGS

If there are more individuals in paid work then it stands to reason that total earnings from wages and salaries by individuals within a particular socio-economic group will increase. Potential gains in annual earnings from wages and salaries were estimated based on the difference in average weekly personal income between those in poor versus good health. A conservative approach to measuring income was taken in that weekly gross (i.e. before tax or anything else is taken out) income from wages and salaries was averaged across **almost all** individuals in a

group. Only those records in HILDA where data on income were missing or where income was stated as being negative[2] were excluded. Records for individuals stating they had zero earnings were included in the analysis. This allows for different employment patterns and change in employment status across a full year. For example, in the HILDA survey, employment status is based primarily on whether or not an individual undertook any paid work at all during the last seven days prior to the survey. Individuals may have been in and out of the workforce over the course of the year with their weekly earnings reflecting this fluctuating attachment to the labour market. Hence, the average weekly incomes given in Table 13 are lower than if only either those in paid work at the time of the survey or those in full- or part-time employment for all of the past year were considered.

Conceptually the annual gains in earnings given in the last columns of Tables 13 and 14 represent the extra earnings from those additional workers joining the workforce through improved health plus any increase in weekly wages and salaries from those already in the workforce but whose health shifts from poor to good (or from having to not having a long-term health condition).

The greatest absolute differentials in average weekly wages and salaries between those in good versus poor health occur for males 45 to 64 years of age who are either socially isolated or early school leavers or live in public housing, followed by younger males of working age who left school before completing year 12. The relative gap in weekly gross income from wages and salaries ranges between a 1.5-fold difference for younger males (aged 25 to 44) who live in public housing or who experience low levels of social connectedness to over a staggering 6.5-fold difference experienced by males aged 45 to 64 in the bottom income quintile or who are public housing renters.

Depending upon which socio-economic lens is used, closing the gap in self-assessed health status could lead to anywhere between $1.4 billion and $7 billion in extra earnings. The largest benefits accrue for those who are most educationally disadvantaged or who are socially excluded – this occurs for both men and women and for younger and older individuals. These findings reflect two key features – the large number of Australians of working age in these two disadvantaged socio-economic groups who would enjoy better health if socio-economic inequalities in health did not exist and the relatively large wage gap between those in poor and good health. Increase in earnings is most significant for males aged 45 to 64.

Potential benefits from closing the health gap in the prevalence of long-term health conditions replicate those for self-assessed health status, although the health differential in wages and salaries are larger as well as the resulting gains in annual earnings exceeding those from closing the socio-economic gap in health status.

[2] Income may be negative when a loss accrues to a person as an owner or partner in unincorporated businesses or rental properties. Losses occur when operating expenses and depreciation are greater than total receipts.

Table 13 Weekly gross income from wages and salaries (2008) and increase in annual earnings from improved health status from closing the health gap between most and least disadvantaged Australians of working age

	Poor Health ($)	Good Health ($)	Difference ($)	Ratio Good to Poor Health	Gain in earnings ($Millions pa)
Lowest Income Quintile					
Male 25-44	174	372	198	2.1	513
Male 45-64	41	279	238	6.8	1,694
Female 25-44	42	130	88	3.1	265
Female 45-64	41	84	43	2.0	341
Total	-	-	-		2,813
Year 11 or Below					
Male 25-44	331	733	402	2.2	939
Male 45-64	222	652	430	2.9	2,847
Female 25-44	161	359	198	2.2	623
Female 45-64	144	351	207	2.4	1,581
Total	-	-	-		5,990
Public Renters					
Male 25-44	320	477	157	1.5	193
Male 45-64	71	470	399	6.6	635
Female 25-44	114	247	133	2.2	149
Female 45-64	199	333	134	1.7	460
Total	-	-	-		1,438
Low Social Connectedness					
Male 25-44	668	1,034	366	1.5	1,412
Male 45-64	313	873	560	2.8	2,327
Female 25-44	250	477	227	1.9	920
Female 45-64	171	499	328	2.9	2,347
Total	-	-	-		7,005

Source Data: HILDA Wave 8 datafile.

Top four

Table 14 Weekly gross incomes from wages and salaries (2008) and increase in annual earnings from reduction in prevalence of long-term health conditions from closing the health gap between most and least disadvantaged Australians of working age

	Has a LTC ($)	Does not have a LTC ($)	Difference ($)	Ratio Good to Poor Health	Income Gain ($ Millions pa)
Lowest Income Quintile					
Male 25-44	150	429	279	2.9	1,269
Male 45-64	36	312	276	8.7	1,996
Female 25-44	82	147	65	1.8	228
Female 45-64	39	95	56	2.4	489
Total	-	-	-		3,982
Year 11 or Below					
Male 25-44	334	800	466	2.4	1,753
Male 45-64	208	715	507	3.4	3,754
Female 25-44	165	377	212	2.3	728
Female 45-64	193	352	159	1.8	1,794
Total	-	-	-		8,029
Public Renters					
Male 25-44	262	627	365	2.4	635
Male 45-64	46	598	552	13.0	902
Female 25-44	68	287	219	4.2	332
Female 45-64	142	395	253	2.8	827
Total	-	-	-		2,696
Low Social Connectedness					
Male 25-44	633	1,074	441	1.7	1,665
Male 45-64	373	961	588	2.6	3,780
Female 25-44	303	480	177	1.6	665
Female 45-64	207	537	330	2.6	2,364
Total	-	-	-		8,473

Source Data: HILDA Wave 8 datafile.

Top four

5.3 Government Pensions and Allowances and Savings in Government Expenditure

Many individuals of working age in disadvantaged socio-economic groups receive welfare support through the Australian Government benefit and transfer system. This includes a variety of payments including, for example, Newstart Allowance, Austudy Payment, the Disability Support Pension, Sickness Allowance, Widow Allowance, Partner Allowance or the Parenting or Carers Payments. Family tax benefits have also been included in the analysis. Eligibility for these pensions and allowances typically depends on individuals and families meeting specified income and assets tests. With increased employment and earnings, an increased number of individuals would no longer qualify for these payments, hence, there is potential for significant savings in Government expenditure on welfare support with health equity. The results of this aspect of the modelling are provided in Tables 15 and 16.

Leaving tenants of public housing aside for the moment, the difference in Government assistance in 2008 between those in poor versus good health was numerically greatest for those aged 45 to 64, typically ranging between approximately $6,000 and $9,500 each year, with older males receiving slightly more financial assistance than older females. The difference in Government benefits and allowances by health status varied considerably by the socio-economic indicator used for those aged 25 to 44. For those living in the lowest income quintile households, those in poor health received only around $1,000 more than those in good health. In contrast, if younger working age adults are socially isolated and in poor health, then they received upwards of $7,500 more in Government assistance than those in better health. Those in poor health typically received between 1.5 and 2 times the level of financial assistance than those in good health. Irrespective of which of the three socio-economic lenses is taken, closing the gap in health status could potentially lead to $2-3 billion in savings per year in Government expenditure.

Similar patterns are shown in Table 16 when long-term health conditions are investigated. However, reducing the prevalence of chronic illness to levels on par with those in the most socio-economically advantaged groups could produce savings in Government spending in the order of $3-4 billion per year.

The findings for renters of public housing draw attention to some issues different to those found for the other three socio-economic indicators. Individuals living in public housing are most often single persons living alone or a single adult living with one or more children. They frequently will be unemployed or not looking for work because of disability or ill health or through parenting or caring responsibilities (AIHW, 2011). Males aged 45 to 64 who were in good health or free from chronic illness but who through a range of social and economic circumstances needed public housing for their accommodation received 80 per cent more in income from Government benefits and allowances in 2008 than those in poorer health. The net result of this finding is that closing the gaps in health inequity would increase public expenditure by around $450-475 million each year.

When considering self-assessed health status, both males and females aged 25 to 44 living in public housing who were in poor health received considerably more Government assistance than those in good health when compared with the differences in Government expenditure for these two groups by household income, level of education or social connectedness. In contrast, the difference in welfare support by either health status or long-term health conditions for women aged 45 to 64 living in public housing is considerably lower than those found for the other three socio-economic lenses, primarily due to relatively higher payments to women in good health. These findings for public renters reflect the complexity of the needs of those in public housing and the Australian public benefits and transfer system in supporting those with disability and health needs and carers, support for the long-term unemployed, and support for Australian families, especially in helping with the cost of raising children.

Table 15 Government pensions and allowances per annum (2008) for those in poor and good health and savings in government welfare expenditure from improved health from closing the health gap between most and least disadvantaged Australians of working age

	Poor Health ($)	Good Health ($)	Difference ($)	Ratio Poor to Good Health	Govt Spending ($Millions pa)
Lowest Income Quintile					
Male 25-44	19,559	18,623	-936	1.1	-47
Male 45-64	19,092	12,713	-6,379	1.5	-873
Female 25-44	23,038	21,989	-1,049	1.0	-61
Female 45-64	19,114	12,857	-6,257	1.5	-953
Total					-1,934
Year 11 or below					
Male 25-44	16,794	10,221	-6,573	1.6	-295
Male 45-64	17,195	7,587	-9,608	2.3	-1,223
Female 25-44	20,654	13,742	-6,912	1.5	-419
Female 45-64	14,120	7,615	-6,505	1.9	-955
Total					-2,892
Public Renters					
Male 25-44	27,038	18,187	-8,851	1.5	-209
Male 45-64	18,326	32,959	14,633	0.6	448
Female 25-44	33,076	22,433	-10,643	1.5	-229
Female 45-64	17,698	14,833	-2,865	1.2	-189
Total					-180
Low Social Connectedness					
Male 25-44	13,427	6,249	-7,178	2.1	-533
Male 45-64	15,543	6,150	-9,393	2.5	-750
Female 25-44	13,189	10,676	-2,513	1.2	-196
Female 45-64	14,958	7,278	-7,680	2.1	-1,057
Total					-2,536

Source: Source Data: HILDA Wave 8 datafile.

Top four

Table 16 Government benefits and transfers per annum (2008) for those with and without a long-term health condition and savings in government welfare expenditure from reduction in prevalence of long-term health conditions from closing the health gap between most and least disadvantaged Australians of working age

	Has a LTC ($)	Does not have a LTC ($)	Difference ($)	Ratio Poor to Good Health	Govt Spending ($Millions pa)
Lowest Income Quintile					
Male 25-44	22,605	14,990	-7,615	1.5	-666.0
Male 45-64	18,592	10,300	-8,292	1.8	-1,153.5
Female 25-44	24,182	21,008	-3,174	1.2	-213.9
Female 45-64	19,045	12,116	-6,929	1.6	-1,164.1
Total					-3197.5
Year 11 or below					
Male 25-44	16,174	9,282	-6,892	1.7	-498.7
Male 45-64	15,907	6,628	-9,279	2.4	-1,321.4
Female 25-44	18,770	14,035	-4,735	1.3	-312.6
Female 45-64	14,986	6,807	-8,179	2.2	-1,774.3
Total					-3907
Public Renters					
Male 25-44	24,188	17,522	-6,666	1.4	-223.2
Male 45-64	17,624	32,774	15,150	0.5	475.8
Female 25-44	23,575	26,143	2,568	0.9	74.8
Female 45-64	18,989	15,967	-3,022	1.2	-190.0
Total					
Low Social Connectedness					
Male 25-44	13,509	5,686	-7,823	2.4	-567.9
Male 45-64	12,820	5,971	-6,849	2.1	-846.6
Female 25-44	13,485	10,353	-3,132	1.3	-226.2
Female 45-64	14,052	6,317	-7,735	2.2	-1,065.6
Total					-2706.3

Source Data: HILDA Wave 8 datafile.

Top four

6 SAVINGS TO THE HEALTH SYSTEM FROM CLOSING HEALTH GAPS

Differences in the use of health services and potential savings to the health system are investigated in this section of the Report. A key problem, however, in trying to estimate the impact of social determinants of health and socio-economic inequalities in health is the lack of suitable socio-economic coded health data. Socio-economic differentials in health services use and costs are typically limited in Australia to reporting by composite socio-economic area-based measures such as the Index of Relative Socio-economic Disadvantage (IRSD) – an index that reflects the aggregate socioeconomic status of individuals and families living in a geographic unit (ABS, 2008). Measures of socio-economic status, such as income, at the person or household (family) level that are linked to a person's health status and use of health services are not generally available.

For this reason, the analysis below takes changes in **self-assessed health status for individuals living in households in the lowest income quintile** as an example to illustrate the possible savings that might accrue to Australia's health system from improvements in the health profiles of socio-economically disadvantaged individuals of working age. Based on the findings in earlier sections of the Report, looking at potential reductions in health services use and costs through a 'household income lens' will provide a reasonable view as to likely benefits from conquering health inequalities. As shown in Section 3, an additional 400,000 Australians of working age would assess their health as 'good' if health equity was achieved between individuals living in the lowest versus the highest income quintile households. How might this change in health status impact on the use and cost of Australia's health system?

The necessary data for the analyses presented below were accessed from the 2008-09 output of three of NATSEM's health microsimulation models: HospMod, MediSim and the health module in APPSIM.

6.1 REDUCED USE OF AUSTRALIAN HOSPITALS

In 2008-09, there were a total of 8.148 million hospital separations from public and private hospitals in Australia, 4.891m (60%) occurring in public hospitals. One-fifth of these were by Australians aged 25 to 44 (males 0.584m or 7.2% separations; females 1.108m or 13.6% separations) and nearly 30 per cent by individuals aged 45 to 64 (males 1.186m or 14.6% separations; females 1.159m or 14.2% separations) (AIHW, 2010). An estimated $41.8 billion was spent on Australia's hospitals in 2008–09 (AIHW, 2011).

As would be expected, there is a significant difference in the likelihood that a person living in the bottom income quintile households would be hospitalised by their health status (Table 17). In 2008, over one in three disadvantaged persons in poor health needed a hospital either as a day-only patient or for at least one overnight stay. Although this rate is considerably higher than for those in good health, still between one and two in every 10 significantly socio-economically disadvantaged persons who thought their health to be good was hospitalised. Using the findings in Table 5 on the potential increase in numbers of those living in the bottom income quintile households likely to regard their health as good through closing the health gap between the most and least disadvantaged income quintiles and the health status differences in rates of hospitalisation for those in the bottom quintile, the potential reduction in the number of disadvantaged persons hospitalised can be estimated. The results are shown in Table 17.These data suggest that over 60,000 fewer people would use Australian hospitals each year if health equity could be achieved.

Table 17 Hospitalisation in 2008 for Australians of working age in the bottom income quintile and reductions in persons hospitalised through closing the health gap between most and least disadvantaged Australians of working age

	No of Disadv. Persons			% Disadv. Persons Hospitalised		No Disadv. Persons Hospitalised			Reduction in No of Disadv. Persons Hospitalised
	In Poor Health	Remain in poor health	Shift to good health	Poor Health	Good Health	In Poor Health	Remain in poor health	Shift to Good Health	
Male 25-44	70,158	20,294	49,864	30.4	12.8	21,328	6,169	6,383	8,776
Male 45-64	188,624	51,735	136,889	34.1	15.8	64,321	17,642	21,628	25,051
Female 25-44	88,084	30,178	57,906	37.9	22.9	33,384	11,437	13,260	8,687
Female 45-64	218,833	66,506	152,327	32.4	20.1	70,902	21,548	30,618	18,736
All persons	**565,699**	**168,713**	**396,986**	**-**	**-**	**189,935**	**56,796**	**71,889**	**61,250**

Source Data: NATSEM's Microsimulation model 'HospMod'

The average number of separations per year experienced by persons who were hospitalised also varies by health status with those in poor health having a much higher rate of re-admission – especially males aged 45 to 64 (Table 18). The modelling from HospMod suggests that in 2008, individuals aged 25 to 64 who were in the bottom income quintile households and who were in poor health contributed to nearly 1 million hospital separations, i.e. nearly 12 per cent of all hospital separations in Australia. However, over 500,000 hospital episodes could be prevented if the health gap between these individuals and those living in the top income quintile households could be closed (Table 18).

Table 18 Estimated number of hospital separations in 2008 for Australians of working age in the bottom income quintile and reductions in persons hospitalised through closing the health gap between most and least disadvantaged Australians of working age

	Ave No Separations per disadv. person hospitalised		No. of Separations			Reduction in No of Separations
	In Poor Health	In Good Health	Disadv Persons in Poor Health	Disadv Persons Remain in Poor hHealth	Disadv Persons Shift to Good Health	
Male 25-44	4.4	3.3	93,843	27,145	21,063	45,635
Male 45-64	6.6	2.2	424,517	116,435	47,583	260,499
Female 25-44	3.0	1.7	100,152	34,312	22,543	43,296
Female 45-64	4.8	2.4	340,329	103,430	73,483	163,417
All persons	**-**	**-**	**958,841**	**281,323**	**164,671**	**512,847**

Source Data: NATSEM's Microsimulation model 'HospMod'

Average length of stay (ALOS) in hospital varies between two and four days depending on age, gender and health status (Table 19). With reductions in the number of persons hospitalised and number of separations, and difference in ALOS, removing health inequality could ultimately result in 1.44 million fewer patient days spent in hospital by socio-economically disadvantaged persons of working age.

Table 19 Average length of hospital stay in 2008 for Australians of working age in the bottom income quintile and reductions in patient days stay through closing the health gap between most and least disadvantaged Australians of working age

	ALOS (Days)		No. of Patient Days			Reduction in No of Patient Days
	Disadv Persons In Poor Health	Disadv Persons In Good Health	Disadv Persons in Poor Health	Disadv Persons Remain in Poor Health	Disadv Persons Shift to Good Health	
Male 25-44	3.7	1.8	347,220	100,437	37,913	208,870
Male 45-64	2.7	2.4	1,146,196	314,374	114,198	717,624
Female 25-44	2.2	2.5	220,333	75,487	56,357	88,489
Female 45-64	2.4	1.9	816,790	248,232	139,617	428,941
All persons	**-**	**-**	**2,530,540**	**738,531**	**348,085**	**1,443,924**

Source Data: NATSEM's Microsimulation model 'HospMod'

Estimating potential savings in dollar terms is problematic because of the variation in the causes of admission (i.e. the casemix) to hospital, whether public or private hospitals were used and the variation in costs by size and type of hospital. However, in 2008-09, the average cost per separation adjusted for differences in casemix (and excluding depreciation) for a range of selected public hospitals was $4,471. Given the focus is on socio-economically disadvantaged individuals and those living in the poorest households, it is highly likely that the majority of hospital visits would have occurred in public hospitals. Thus, a reduction of nearly 513,000 separations at an average cost of $4,471 would give a total savings of nearly $2.3 billion each year. This is equivalent to 5 per cent of Australia's total expenditure on hospitals.

6.2 Reduced Use of Doctor and Medical Related Services

In 2008-09, there were over 294 million doctor- and medical-related services subsidised through Australia's Medicare Benefits Schedule (MBS) at a cost to Government of $14.3 billion. Nearly 25 per cent of these were by Australians aged 25 to 44 (males 21.8m or 7.4% MBS services; females 45.3m or 15.4% services) and over 30 per cent by individuals aged 45 to 64 (males 38.7m or 13.2% services; females 50.4m or 17.1% services). Visits to GPs are a major component of this service use. For both younger and older females (of working age), visits to GPs account for around 30 per cent of all MBS doctor and medical related services. For males aged 25 to 44, GP attendances contribute to 38 per cent of all MBS services and for the older males 29 per cent.

Results from NATSEM's health module in the APPSIM dynamic microsimulation model show there is a two-fold difference in the number of MBS services used on average in 2008 between disadvantaged persons in poor versus good health (Table 20). Use by females outstrips males especially for younger women in child-bearing age (25-44). If 396,986 individuals in the bottom income quintile households changed their health status from poor to good then the number of MBS services used in 2008 would have been reduced by over 5.5 million services. The reduction in service use is most noticeable for both males and females aged 45 to 64 and with almost 1 million services potentially not needed for females aged 25 to 44.

Focussing on Government expenditure on the benefits paid from the public purse for doctor and medically related services (for which cost data are available by age and gender although not by health or socio-economic status), then this reduction in MBS service use would equate to a savings to Government of around $273 million annually (Table 21).

Table 20 Estimated number of doctor and medically related services used in 2008 by Australians of working age in the bottom income quintile and reductions in MBS services through closing the health gap between most and least disadvantaged Australians of working age

	Number of Disadv. Persons			Ave No MBS Services per Disadv. Person		No. MBS Services ('000)			Reduction in MBS Services ('000)
	In Poor Health	Remain in poor health	Shift to good health	Poor Health	Good Health	Disadv Persons in Poor Health	Disadv Persons Remain in poor health	Disadv Persons Shift to Good Health	
Male 25-44	70,158	20,294	49,864	16.5	6.1	1,157.6	334.9	304.2	518.5
Male 45-64	188,624	51,735	136,889	27.4	12.3	5,168.3	1,417.5	1,683.7	2,067.1
Female 25-44	88,084	30,178	57,906	30.4	13.7	2,677.8	917.4	793.3	967.1
Female 45-64	218,833	66,506	152,327	30.2	17.1	6,608.8	2,008.5	2,604.8	1,995.5
Total	**565,699**	**168,713**	**396,986**	**-**	**-**	**15,612.5**	**4,678.3**	**5,386.0**	**5,548.2**

Source Data: NATSEM's Microsimulation model 'APPSIM'

Table 21 Estimated MBS benefits in 2008 for Australians of working age in the bottom income quintile and savings in MBS benefits through closing the health gap between most and least disadvantaged Australians of working age

	Ave Benefit per MBS service ($)	MBS Benefits ($m)			Savings in MBS Benefits ($m)
		Disadv Persons In Poor Health	Disadv Persons Remain in Poor Health	Disadv Persons Shift to Good Health	
Male 25-44	46.32	53.6	15.5	14.1	24.0
Male 45-64	48.61	251.2	68.9	81.8	100.5
Female 25-44	52.65	141.0	48.3	41.8	50.9
Female 45-64	49.08	324.4	98.6	127.8	98.0
Total	**-**	**770.2**	**231.3**	**265.5**	**273.4**

Source Data: http://www.medicareaustralia.gov.au/provider/medicare/mbs.jsp

6.3 Reduced Use of Prescribed Medicines

In 2008-09, more than 181 million prescriptions were subsidised under the Pharmaceuticals Benefits Scheme (PBS) at a total cost to Government of over $6.6 billion. Government expenditure accounted for 83.4 per cent of the total cost of PBS prescriptions, the remaining cost being met by consumer out-of-pocket co-payments. Around 10 per cent of PBS medicines are used by individuals aged 25 to 44 and 30 per cent by those aged 45 to 64. Persons on low income as measured by having an Australian Government Pensioner Concession Card, Commonwealth Seniors Health Card, DVA White, Gold or Orange Card, or Health Care Card are eligible for receiving PBS medicines at a concessional rate. Out-of-pocket co-payments are reduced and the safety net threshold is lower, beyond which Government meets the full cost of the medicines. Data from NATSEM's MediSim microsimulation model shows that over 85 per cent of individuals aged 25 to 64 and who are in the bottom income quintile access PBS medicines at concessional rates, irrespective of whether they are in good or poor health (Table 22). Concessional and

general patients have very different patterns of prescription medicine use and costs, and therefore it was important to split the number of individuals modelled into these two patient groups.

Males and females aged 45 to 64 who were in poor health and were concessional patients had an average of 30 and 33 prescriptions filled respectively in 2008. In contrast, males and females of the same age but who were in good health and were general patients (e.g. among the 'working poor' but not meeting income and asset tests to be eligible for concessional rates) used only 12 and 11 scripts on average. General patients aged 25 to 44 with good health filled as few as four or seven scripts depending on whether they were female or male (Table 22). A shift to good health through closing socio-economic health gaps will shift some persons in low-income households from 'having' to 'not having' concessional status (e.g. through changes in their employment status and household earnings). More than 4,300 additional males aged 25 to 44 and some 11,500 males aged 45 to 64 would lose their concessional status and become general patients. In contrast, females aged 25 to 44 who are in good health are fractionally more likely to be concessional patients than those in poor health, hence with improvements in health status more younger adult females (around 2,400 individuals) become PBS concession cardholders. These changes in concessional status impact on potential reductions in script volumes and costs.

For example, over 5.3 million scripts would not have been dispensed for concessional patients if health equity had been achieved, but there would have been a net increase of 41,500 scripts for general patients (Table 22). This reflects a 2.6-fold increase in scripts for males aged 25 to 44 and 1.6-fold increase for males aged 45 to 64 in the general patient group (higher proportions of males in good health are general patients than females).

If these changes in script volume were achieved,what changes might occur in Government and consumer out-of-pocket expenditure on the PBS? The findings are given in Tables 24 and 25. The results are based on cost estimates from MediSim. As an indicator of the reliability of the MediSim data, the MediSim costs were aggregated by age, gender and health status to provide overall costs for concessional and general patients and compared with available administrative PBS data compiled by Medicare Australia (DoHA, 2010). As shown in Table 23, there is a good concordance between the two data sources noting that the administrative data is for the total population (age-sex specific data was not available) and MediSim output is for the 25- to 64-year-old age group.

There is little difference in the average Government benefit paid per script to concessional patients by age, gender or health status (Table 24). The cost of a PBS script on average to Government is slightly higher for both males and females aged 25 to 44 who are in good health overall compared with those in poor health. The opposite occurs for those aged 45 to 64 with the average cost of a script to Government being higher for those in poor health. Improvement in health status for concessional patients would yield substantial savings to Government – an estimated $184.7 million.

Table 22 Estimated number of PBS scripts used in 2008 by Australians of working age in the bottom income quintile and reductions in PBS script volume through closing the health gap between most and least disadvantaged Australians of working age

	% Concessional or General Patient		Number of Disadv. Persons			Average No of PBS Scripts per Disadv. person		No. PBS Scripts ('000)			Reduction in PBS Scripts ('000)
	In Poor Health	In Good Health	In Poor Health	Remain in poor health	Shift to good health	In Poor Health	In Good Health	Disadv. Persons In Poor Health	Disadv. Persons Remain in Poor Health	Disadv. Persons Shift to Good Health	
Concessional											
Male 25-44	96.8	88.1	67913	19645	43930	19	7	1,290.3	373.2	307.5	609.6
Male 45-64	93.9	85.5	177118	48579	117040	30	12	5,313.5	1,457.4	1,404.5	2,451.6
Female 25-44	87.7	91.8	77250	26466	53158	19	8	1,467.7	502.9	425.3	539.5
Female 45-64	88.2	88.2	193011	58658	134352	33	20	6,369.4	1,935.7	2,687.0	1,746.7
Total			515292	153348	348480			14440.9	4269.2	4824.3	5347.4
General											
Male 25-44	3.2	11.9	2245	649	5934	8	7	18.0	5.2	41.5	-28.7
Male 45-64	6.1	14.5	11506	3156	19849	16	12	184.1	50.5	238.2	-104.6
Female 25-44	12.3	8.2	10834	3712	4748	8	4	86.7	29.7	19.0	38.0
Female 45-64	11.8	11.8	25822	7848	17975	14	11	361.5	109.9	197.7	53.9
Total			50407	15365	48506			650.3	195.3	496.4	-41.4
All persons			**565,699**	**168,713**	**396,986**			**15,091.2**	**4,464.5**	**5,320.7**	**5,306.0**

Source Data: NATSEM's microsimulation model MediSim

Table 23 Comparison of MediSim and Medicare Australia average costs of PBS scripts

	Government Cost ($)	Patient Copayment ($)	Total Cost ($)
Concessional			
PBS MA Data*	33.04	3.98	37.02
MediSim+	32.93	3.92	36.85
General			
PBS MA Data	54.61	26.26	80.87
MediSim	57.44	24.38	81.82

* for the total population

+ for the population aged 25-64 years

For general patients, the picture is more complicated. There are very different average Government script costs combined with increasing numbers of male general patients, but a reduced number of younger female general patients. The net effect is that for three of the four age-sex general patient groups, total Government expenditure would likely rise. These increases in Government costs are offset in the modelling by savings from female general patients aged 25 to 44. However, this could be artificially inflated as female general patients aged 25 to 44 who are in poor health appear to receive a very high average benefit per script (Table 24). Nevertheless, any rise in Government expenditure on general patients would not outweigh the savings from reduced script use by concessional patients.

Likely changes in out-of-pocket payments by consumers are shown in Table 25. At January 1, 2009, PBS co-payments were set at $5.30 per script for concessional patients and $32.90 for general patients. The average co-payments in Table 25 are lower because they take into account scripts dispensed 'above' the safety net thresholds. Concessional patients reaching the safety net have any additional scripts, i.e. above the safety net, dispensed at no out-of-pocket cost and for general patients the co-payment reduces to the concessional rate (i.e. $5.30). If health equity was achieved for concessional patients then there would be a $15.6 million reduction in out-of-pocket costs. However, there would be an increase in the cost to general patients by some $3.1m.

Table 24 Estimated Government expenditure on PBS medicines in 2008 for Australians of working age in the bottom income quintile and savings in benefits through closing the health gap between most and least disadvantaged Australians of working age

	Ave Benefit per PBS script ($)		PBS Benefit ($m)			Savings in PBS Benefits ($m)
	Disadv Persons In Poor Health	Disadv Persons In Good Health	Disadv Persons In Poor Health	Disadv Persons Remain in Poor Health	Disadv Persons Shift to Good Health	
Concessional						
Male 25-44	31.82	34.74	41.1	11.9	10.7	18.5
Male 45-64	35.00	30.57	186.0	51.0	42.9	92.1
Female 25-44	29.28	32.95	43.0	14.7	14.0	14.3
Female 45-64	33.03	32.28	210.4	63.9	86.7	59.8
Total	33.35	32.34	480.5	141.5	154.3	184.7
General						
Male 25-44	24.49	28.05	0.4	0.1	1.2	-0.9
Male 45-64	54.20	58.79	10.0	2.7	14.0	-6.7
Female 25-44	191.52	26.80	16.6	5.7	0.5	10.4
Female 45-64	43.19	63.77	15.6	4.7	12.6	-1.7
Total	63.39	53.31	42.6	13.3	28.3	1.1
All persons			**523.1**	**154.7**	**182.6**	**185.8**

Source Data: NATSEM's microsimulation model MediSim

Table 25 Estimated patient co-payments to PBS medicines in 2008 by Australians of working age in the bottom income quintile and savings in PBS patient costs through closing the health gap between most and least disadvantaged Australians of working age

	Ave copayment per PBS script ($)		Copayment ($m)			Savings in PBS Co-payments ($m)
	Disadv Persons In Poor Health	Disadv Persons In Good Health	Disadv Persons In Poor Health	Disadv Persons Remain in Poor health	Disadv Persons Shift to Good Health	
Concessional						
Male 25-44	4.06	4.66	5.2	1.5	1.4	2.3
Male 45-64	3.47	4.37	18.4	5.1	6.1	7.2
Female 25-44	4.16	4.61	6.1	2.1	2.0	2.0
Female 45-64	3.50	4.26	22.3	6.8	11.4	4.1
Total	3.60	4.38	52.0	15.4	21.0	15.6
General						
Male 25-44	29.45	27.67	0.5	0.2	1.1	-0.8
Male 45-64	24.36	24.36	4.5	1.2	5.8	-2.5
Female 25-44	25.42	26.75	2.2	0.8	0.5	0.9
Female 45-64	18.71	27.17	6.8	2.1	5.4	-0.7
Total	21.57	26.33	14.0	4.3	12.8	-3.1
All persons			**66.0**	**19.7**	**33.8**	**12.5**

Source Data: NATSEM's microsimulation model MediSim

7 SUMMARY AND CONCLUSIONS

Social gradients in health are common in Australia – the lower a person's social and economic position, the worse his or her health – and the health gaps between the most disadvantaged and least disadvantaged groups are typically very large. This Report confirms that the cost of Government inaction on the social determinants of health leading to health inequalities for the most disadvantaged Australians of working age is substantial. This was measured in terms not only of the number of people affected but also their overall well-being, their ability to participate in the workforce, their earnings from paid work, their reliance on Government income support and their use of health services.

Health inequality was viewed through a number of different socio-economic lenses – household income, education, housing tenure and social connectedness – with attention being focussed on the health gaps between the most and least disadvantaged groups. The cost of Government inaction was measured in terms of the loss of potential social and economic gains that might otherwise have accrued to socio-economically disadvantaged individuals if they had had the same health profile of more socio-economically advantaged Australians. The modelling 'shifted' disadvantaged individuals from poor to good health, or having to not having a long-term health condition, to replicate the health profile of the least disadvantaged group. It was assumed that any 'improvement' in health did not move individuals out of their socio-economic group but rather that they took on the socio-economic characteristics of those in the group who were 'healthy'.

If the health gaps between the most and least disadvantaged groups were closed, i.e. there was no inequity in the proportions in good health or who were free from long-term health conditions, then an estimated 370,000 to 400,000 additional disadvantaged Australians in the 25-64 year age group would see their health as being good and some 405,000 to 500,000 additional individuals would be free from chronic illness, depending upon which socio-economic lens (household income, level of education, social connectedness) is used to view disadvantage. Even if Government action focussed only on those living in public housing, then some 140,000 to 157,000 additional Australian adults would have better health.

Substantial differences were found in the proportion of disadvantaged individuals satisfied with their lives, employment status, earnings from salary and wages, Government pensions and allowances, and use of health services between those in poor versus good health and those having versus not having a long-term health condition. As shown in the Report findings, improving the health profile of Australians of working age in the most socio-economically disadvantaged groups therefore leads to major social and economic gains with savings to both the Government and to individuals.

For example, as many as 120,000 additional socio-economically disadvantaged Australians would be satisfied with their lives. For some of the disadvantaged groups studied, achieving health equality would mean that personal well-being would improve for around one person in every 10 in these groups. Rates of unemployment and not being in the labour force are very high for both males and females in low socio-economic groups and especially when they have problems with their health. For example, in 2008, fewer than one in five persons in the bottom income quintile and who had at least one long-term health condition was in paid work, irrespective of their gender or age. Changes in health reflect in higher employment rates, especially for disadvantaged males aged 45 to 64. Achieving equity in self-assessed health status could lead to more than 110,000 new full- or part-time workers when health inequality is viewed through a household income lens, or as many as 140,000 workers if disadvantage from an

educational perspective is taken. These figures rise to more than 170,000 additional people in employment when the prevalence of long-term health conditions is considered.

If there are more individuals in paid work then it stands to reason that the total earnings from wages and salaries for a particular socio-economic group will increase. The relative gap in weekly gross income from wages and salaries between disadvantaged adult Australians of working age in good versus poor health ranges between a 1.5-fold difference for younger males (aged 25-44) who live in public housing or who experience low levels of social connectedness to over a staggering 6.5-fold difference experienced by males aged 45 to 64 in the bottom income quintile or who are public housing renters.

Closing the gap in self-assessed health status could generate as much as $6-7 billion in extra earnings, and in the prevalence of long-term health conditions upwards of $8 billion. These findings reflect two key factors – the large number of Australians of working age who currently are educationally disadvantaged having left school before completing year 12 or who are socially isolated and the relatively large wage gap between those in poor and good health in these two groups. In terms of increases in annual income from wages and salaries, the greatest gains from taking action on the social determinants of health can be made from males aged 45 to 64.

A flow-on effect from increased employment and earnings and better health is the reduced need for income and welfare support via Government pensions and allowances. Those in poor health or who have a long-term health condition typically received between 1.5 and 2.5 times the level of financial assistance from Government than those in good health or who were free from chronic illness. Irrespective of whether an income, education or social exclusion lens is taken, closing the gap in health status potentially could lead to $2-3 billion in savings per year in Government expenditure, and in the order of $3-4 billion per year if the prevalence of chronic illness in most disadvantaged socio-economic groups could be reduced to the level experienced by the least disadvantaged groups.

Potential savings to the health system through Government taking action on the social determinants of health were difficult to estimate because of the lack of socio-economic coded health services use and cost data. As an example of the possible savings that might accrue, changes in the use and cost of health services – hospitals, doctor and medically related (Medicare) services, and prescribed medicines subsidised through the PBS – from changes in self-assessed health status for individuals in the lowest household income quintile were modelled.

Nearly 400,000 additional disadvantaged individuals would regard their health as good if equity was achieved with individuals in the top income quintile. Such a shift was shown to be significant in terms of health services use and costs as there were very large differences in the use of health services by individuals in the bottom income quintile between those in poor versus good health. More than 60,000 individuals need not have been admitted to hospital. More than 500,000 hospital separations may not have occurred and, with an average length of stay of around 2.5 days, there would have been some 1.44 million fewer patient days spent in hospital, saving around $2.3 billion in health expenditure.

A two-fold difference in the use of doctor and medical services was found between disadvantaged persons in poor versus good health. Improving the health status of 400,000 individuals of working age in the bottom income quintile would reduce the pressure on Medicare by over 5.5 million services. Such a reduction in MBS service use equates to a savings to Government of around $273 million annually. With respect to the use of prescription medicines, in 2008, disadvantaged individuals in the 45- to 64-year-old age group and who were in poor health and who were concession cardholders used 30 prescriptions on average each. While those aged 25 to 44 averaged 19 scripts, both age groups used twice as many scripts

as concessional patients in good health. Over 5.3 million PBS scripts would not have been required by concessional patients if health equity existed. However, a shift to good health through closing socio-economic health gaps would shift around 15,000 persons in low-income households from 'having' to 'not having' concessional status, resulting in a net increase of 41,500 scripts (a 6 per cent increase) for general patients. Health equity for concessional patients was estimated to yield $184.7 million in savings to Government and a $15.6m reduction in patient contributions. However, there would be an increase in the out-of-pocket cost of medicines to general patients by some $3.1m.

This is the first study of its kind in Australia that has tried to gauge the impact of Government inaction on the social determinants of health and health inequalities. Reducing health inequalities is a matter of social inclusion, fairness and social justice (Marmot et al, 2010). The fact that so many disadvantaged Australians are in poor health or have long-term health conditions relative to individuals in the least socio-economically disadvantaged groups is simply unfair. So are the impacts on people's satisfaction with their lives, missed employment opportunities, levels of income and need for health services. This study shows that major social and economic benefits are being neglected and savings to Government expenditure and the health system overlooked. The findings of this Report are revealing and are of policy concern especially within the context of Australia's agenda on social inclusion. However, in this study the health profile of individuals of working age in the most socio-economic disadvantaged groups only was compared with that of individuals in the least disadvantaged groups. The first CHA-NATSEM Report (Brown et al, 2010) on health inequalities showed that socio-economic gradients in health exist in Australia. It is not only the most socio-economically disadvantaged groups that experience health inequalities relative to the most advantaged individuals, but also other low and middle socio-economic groups. Thus, this Report provides only part of the story of health inequalities in Australians of working age.

Socio-economic inequalities in health persist because the social determinants of health are not being addressed. Government action on the social determinants of health and health inequalities would require a broad investment, a focus on health in all policies and action across the whole of society. In return, significant revenue would be generated through increased employment, reduction in Government pensions and allowances, and savings in Government spending on health services. The WHO Commission on the Social Determinants of Health called for national governments to develop systems for the routine monitoring of health inequities and the social determinants of health, and develop more effective policies and implement strategies suited to their particular national context to improve health equity (http://www.who.int/social_determinants/en/). This Report continues the work of demonstrating how improving health equity could have a major impact on the health and well-being of Australians, as well as a significant financial impact for the country.

References

Abello, A., and Brown, L. (2007). *Model 18: MediSim (Static Microsimulation Model of the Australian Pharmaceutical Benefits Scheme)* In Modelling our Future: Population Ageing, Health and Aged Care, Gupta, A. and Harding, A. (Eds), Elsevier, Amsterdam, International Symposia in Economic Theory and Econometrics, Volume 16, pp. 533-542.

Australian Bureau of Statistics (2010) *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples, 2010,* cat. no. 4704.0, ABS, Canberra.

Australian Bureau of Statistics (2009) *Experimental life tables for Aboriginal and Torres Strait Islander Australians, 2005-2007,* cat. no. 3302.0.55.003, ABS, Canberra.

Australian Bureau of Statistics (2008) *An Introduction to Socio-Economic Indexes for Areas* (SEIFA) 2006. Information Paper, cat. no. 2039.0, ABS, Canberra.

Australian Bureau of Statistics (2007) *2007 Year Book Australia,* cat. no. 1301.0, ABS Canberra.

Australian Institute of Health and Welfare (2011) *Australia's hospitals 2009–10: at a glance*. Health services series no.39. Cat. no. HSE 106. Canberra: AIHW.

Australian Institute of Health and Welfare (2011). National Social Housing Survey: a summary of national results. AIHW bulletin no. 92. Cat. no. AUS 141. Canberra: AIHW. Viewed 24 April 2012 <http://www.aihw.gov.au/publication-detail/?id=10737420122>.

Australian Institute of Health and Welfare (2010a) *Australia's health 2010,* Australia's health series no. 12, cat. no. AUS 122, AIHW, Canberra.

Australian Institute of Health and Welfare (2010b) *Australia's health 2010 in brief,* AIHW, Canberra.

Australian Institute of Health and Welfare (2010). *Australian hospital statistics 2008–09*. Health services series no. 17. Cat. no. HSE 84. Canberra: AIHW.

Baum, F. (2008). *The New Public Health*, Oxford University Press, 3rd edition, Melbourne

Begg S., Vos T., Barker B., Stevenson C., Stanley L. and Lopez A.D. (2007) The burden of disease and injury in Australia 2003, cat. No. PHE 82, AIHW, Canberra.

Brown, L.J., Abello, A., Thurecht, L. (2011) *Length of Hospital Stay by Older Australians: Bed-blocking or Not?* NATSEM Working Paper WP8, NATSEM, University of Canberra.

Cai, L. (2009) Be wealthy to stay healthy: An analysis of older Australians using the HILDA survey, *Journal of Sociology*, vol.45, no. 1, pp. 55-70.

Cai, L. and Kalb, G. (2006) Health status and labour force participation: evidence from Australia, *Health Economics*, vol.15, no. 3, pp. 241-261.

Commission on Social Determinants of Health (2008) *Closing the gap in a generation: health equity through action on the social determinants of health,* Final Report of the Commission on Social Determinants of Health, World Health Organization, Geneva.

Department of Health and Ageing (2010). *Expenditure and prescriptions twelve months to 30 June 2009* Data and Modelling Section, Pharmaceutical Policy and Analysis Branch, DoHA, Canberra.

Department of Health and Ageing (1999) National Physical Activity Guidelines for Australians, Australian Government, Canberra.

Hayes, A., Gray, M. and Edwards, B. (2008), *Social Inclusion: Origins, Concepts and Key Themes*, Social Inclusion Unit, Department of the Prime Minister and Cabinet, Canberra.

Gaston , N. and Rajaguru , G. (2009) The long run determinants of Australian income inequality. *Economic Record*, vol. 85, no. 3, pp. 260-275, September 2009.

Last, J.M. (1988) *A Dictionary of Epidemiology.* 2nd Ed. Oxford University Press, New York.

Laverty, M. (2009) *The central place of Health in Australia's Social Inclusion Agenda: Addressing the social determinants of health to achieve social inclusion*, Policy Paper, Catholic Health, Canberra.

Lymer, S. (2011) *More Than Just Population Ageing: An Evaluation Using Dynamic Microsimulation Of The Escalation Of Australian Government Expenditure On Health Over The Next 40 Years*. PhD Thesis, NATSEM, University of Canberra, Canberra.

Marmot, M. and Wilkinson, R. (eds) (2003) *Social Determinants of Health: The Solid Facts*, World Health Organisation, Geneva.

Marmot, M., Allen, J., Goldblatt, P., Boyce, T., McNeish, D., Grady, M. and Geddes. I. (2010) *Fair Society, Healthy Lives – the Marmot Review*, Strategic Review of Health Inequalities in England post-2010, London.

Meagher, G. and Wilson, S. (2008) Richer, but More Unequal: Perceptions of Inequality in Australia 1987-2005, *Journal of Australian Political Economy*, vol. 61, pp. 220-243.

Miranti, R., McNamara, J., Tanton, R. and Harding, A. (2010) Poverty at the Local Level: National and Small Area Poverty Estimates by Family Type for Australia in 2006, *Applied Spatial Analysis*, published online March 2010.

National Health and Medical Research Council (2009) *Australian Guidelines to Reduce Health Related Risk from Drinking Alcohol*, Commonwealth of Australia, Canberra.

National Public Health Partnership (2001) *Preventing Chronic Disease: A Strategic Framework*, Melbourne.

Nepal, B., Payne, A., and Brown, L. (2009) Healthy, wealthy and wise? The relationship between health, employment and earnings in Australia, *AMP.NATSEM Income and Wealth Report,* no. 23, July, AMP, Sydney.

Raphael, D. (2004). *Social Determinants of Health: Canadian Perspectives*, Canadian Scholar's Press, Toronto, Canada.

Saunders, P., Hill, T. and Bradbury, B. (2008) *Poverty in Australia: Sensitivity Analysis and Recent Trends,* Social Policy Research Centre Report, no. 4.

Tanton, R., McNamara, J., Harding, A. and Morrison, T. (2009) Rich suburbs, Poor suburbs? Small area poverty estimates for Australia's Eastern Seaboard in 2006, in A. Zaidi, A. Harding, & P. Williamson (eds), *New Frontiers in Microsimulation Modelling,* Ashgate, London

Tanton, R., Nepal, B. and Harding, A. (2008) *Wherever I lay my debt, that's my home. Trends in housing affordability and housing stress 1995-96 to 2005-06, AMP.NATSEM Income and Wealth Report*, no. 19, March, Sydney, AMP.

Turrell G., Oldenburg B., McGuffog I. and Dent R. (1999) *Socioeconomic determinants of health: towards a national research program and a policy and intervention agenda*. Queensland University of Technology, School of Public Health, Ausinfo, Canberra.

Victoria Department of Health (2010) Life expectancy at birth: Victoria 2003 - 2007, http://www.health.vic.gov.au/healthstatus/le-03-07.htm, Accessed 1 July 2010.

Vinson, T. (2007). *Dropping off the edge: The distribution of disadvantage in Australia*. Richmond, Victoria: Jesuit Social Services and Catholic Social Services Australia.

Vos, T., Begg, S., Chen, Y. and Magnus, A. (2001). Socioeconomic differentials in life expectancy and years of life lost in Victoria,1992-1996, *New South Wales Public Health Bulletin,* 12(5), 126 – 130.

Vu, Q.N., Harding, A., Tanton, R., Nepal, B. and Vidyattama, Y. (2008) Advance Australia Fair? Trends in small area economic inequality 2001 to 2006. *APM.NATSEM Income and Wealth Report, no.* 20, July 2008, AMP, Sydney.

Watson, N. (ed) (2010) *HILDA User Manual – Release 8*, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

APPENDIX 1 - TECHNICAL NOTES

(a) Self-assessed health status

Self-assessed health is a key health variable analysed in this study. This variable represents the standard self-assessed health status collected through the self-completed questionnaire. The question asked was: "In general, would you say that your health is: excellent, very good, good, fair or poor?" Respondents reported their health to be in any of the five levels. For the ease of analysis and interpretation, we have grouped these five levels into two: "good health" and "poor health". "Good health" includes excellent, very good and good health; and "poor health" refers to fair and poor health. Non-response cases were excluded from the analysis.

Use of self-assessed health status has some merits and some demerits that need to be taken into account while interpreting the results presented in this report. This is an easily available indicator of health status from socioeconomic surveys and this provides an opportunity to relate this indictor to various socio-economic measures. The self-assessed health indicator has been widely used in the empirical research of health status because it has been found to reflect the true health status of individuals reasonably well. A number of previous Australian studies of relationships between health and socio-economic issues have satisfactorily used this indicator (Cai and Kalb, 2006; Cai, 2009; Nepal, 2009). Yet the data for this indicator come from individual's perception rather than clinical assessment of their health. Therefore this measure cannot be expected to be identical to an objective measure of health status.

(b) Long-term health condition

In the HILDA survey, data on long-term health conditions was collected through individual interview. The question was: Looking at SHOWCARD K1, do you have any long-term health condition, impairment or disability (such as these) that restricts you in your everyday activities, and has lasted, or is likely to last, for six months or more?

(c) Income quintile

The income quintile used is the equivalised disposable household income quintile. HILDA data files provided disposable income in the previous financial year that was calculated by applying a tax module to the reported incomes:

> In order to produce the disposable income variable, an income tax model is applied to each sample member that calculates the financial-year tax typically payable for a permanent resident taxpayer in the circumstances akin to those of the respondent. The information collected in the HILDA Survey does not permit accounting for every individual variation in tax available under the Australian taxation system, but most major sources of variation are accounted for. When aggregated, income tax estimates from HILDA compare favourably with national aggregates produced by the Australian Taxation Office (ATO). (Watson, 2010, p46).

Before calculating the equivalised disposable household income quintiles, negative income was set to zero. Using the full sample of responding households, equivalent scale was calculated as 1 + (number of remaining adults $\times$ 50%) + (number of children under 15 years $\times$ 30%). Total disposable household income was divided by the equivalence scale to derive equivalised household income. Income is equivalised to take account of the fact that two-person households do not need twice the amount of resources of a single-person household, for example.

(d) Social connectedness

The indicator called social connectedness reflects the degree to which an individual is connected to the family, friends and society. The indicator was derived on the basis of responses to the following three questions or statements posed in a self-completed questionnaire:

i) How often get together socially with friends/relatives not living with you
ii) I don't have anyone that I can confide in
iii) I often feel very lonely

Responses were sought in an ordinal scale of 1 to 7 (better to worse). The first three scales were considered as reflecting a high score and the remaining a low score for the purpose of this study. Having a high score in all these three dimensions was classified as high connectedness, a high score in any two dimensions as moderate connectedness and just one or no high score as reflecting low connectedness.

(e) Public Housing

Public housing encompasses publicly owned or leased dwellings administered by State and Territory Governments. It includes all rental housing owned and managed by Government. Public housing provides affordable and accessible housing for largely low-income households who are in housing need. Public housing and community housing are collectively referred to as 'social housing' (AIHW, 2011).

Table A.1 Sample size and population by analysis variables, persons aged 25-64 years

Variables	N	Population (thousands)
Self-assessed health status	7,178	9,520
Long-term health condition	8,217	11,293
Housing	7,086	9,844
Connectedness	7,164	9,496
Other SES	8,217	11,293

Source: HILDA Wave 8 datefile