

Why health matters for economic performance

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Health is a key component of individual and social wellbeing. Furthermore, the health of a population is a key driver of labour and capital investment and consequent economic growth. Good health can lead to higher gross domestic product (GDP) per capita in the long run due to its impact on population; participation; and productivity. Health outcomes are primarily determined by bio-medical, lifestyle and socio-economic factors, but there is evidence that the level of health care resources also affects health outcomes. The efficiency with which health care resources are used will determine the extent to which health outcomes are enhanced. This article analyses health and its contribution to economic growth and provides a broad framework for the consideration of health care policies.

1 The authors are from the Macroeconomic Policy Division of the Australian Treasury. This article has benefited from comments and suggestions provided by Nathan Deutscher, Robert Montefiore Gardner, Angelia Grant and Tony McDonald. The views in this article are those of the authors and not necessarily those of the Australian Treasury.

Introduction

The ultimate goal of economic policy is to improve the wellbeing of individuals and the community. One element of wellbeing is standard of living or gross domestic product (GDP) per capita. GDP per capita can be increased as a result of the accumulation of physical and human capital, technological improvements, increases in the amount of labour available (either through an increase in the proportion of the population that is of working age or an increase in the number of people participating in the workforce), and improvements in productivity. In the long run, improvements in the standard of living depend almost entirely on a country's ability to increase productivity.

Economists have increasingly recognised that good health across the whole population significantly contributes to labour and human capital to achieve economic growth. Through higher participation and productivity, good health contributes to economic performance and is positive for individual wellbeing (Hsiao and Heller 2007; Bloom and Canning 2000). Good health enables individuals to participate in a range of activities and to engage socially with family and friends and their communities. Good health also allows individuals to be more productive physically and mentally by enabling them to learn more effectively and retain knowledge. Good health also reduces uncertainty, which allows individuals to plan for the whole of life.

The purpose of this paper is to discuss the contribution of health to GDP per capita and to consider how economic policy can affect health and thereby improve living standards. The first section of this paper looks at how health outcomes are measured. The second section considers why health matters for economic performance. The third section briefly compares the health sectors of OECD countries. The fourth section looks at how the delivery of health care services affects health outcomes. The final section concludes.

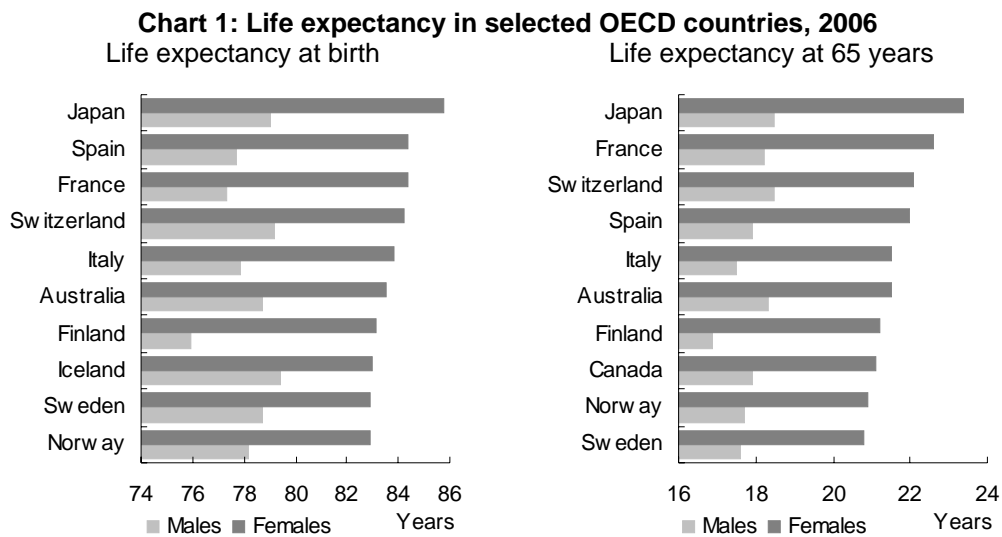
How do we measure population health status?

Broadly, health refers to physical, mental and social wellbeing, not merely to the absence of disease, disability and injury (AIHW 2008). Given the multi-faceted nature of health, measuring the population health status can be difficult.

Data are collected on a large range of factors that comprise overall health. For example, the incidence of disease, disability and injury, mortality rates, and the degree to which people's ability to live a normal life is affected by illness and disability. Comparisons of population health status across countries require summary measures. There are two broad types of summary indicator: raw mortality and longevity indicators; and indicators adjusted for morbidity and disability.

Raw mortality and longevity indicators

The most widely used summary indicator of population health is life expectancy (AIHW 2008). Life expectancy is the average number of additional years a person of a given age and sex might expect to live if the age-specific death rates of a given period were to continue throughout the person's remaining lifetime. The most common measures are life expectancy at birth and 65 years. Australia has one of the highest life expectancies in the OECD, with life expectancy at birth around 84 years for females and 79 years for males, compared to an OECD average of 82 years and 76 years. In Australia, life expectancy at 65 years is around 22 years for females and 18 years for males, compared to an OECD average of 20 years and 17 years (Chart 1).



Note: The chart shows the top ten OECD countries, ranked according to female life expectancy, for each indicator.

Source: OECD health data 2008.

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Other mortality and longevity indicators that are commonly used include premature mortality (the difference between life expectancy and actual years lived) and infant mortality. These indicators, along with life expectancy, are frequently used because they are widely available both across countries and over long periods of time.

Mortality and longevity indicators deliver broadly consistent messages on recent developments and the relative position of OECD countries (Jourmand et al. 2008). Progress in improving health outcomes, whether measured by life expectancy, premature mortality or infant mortality, has been substantial in all OECD countries. For example, life expectancy at birth has increased by almost 11 years on average in OECD countries between 1960 and 2006. The dispersion across countries has also narrowed substantially for most of these indicators. For example, the gap between the

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highest and lowest life expectancy in the OECD was around 25 years in 1960 and only around 11 years in 2006.

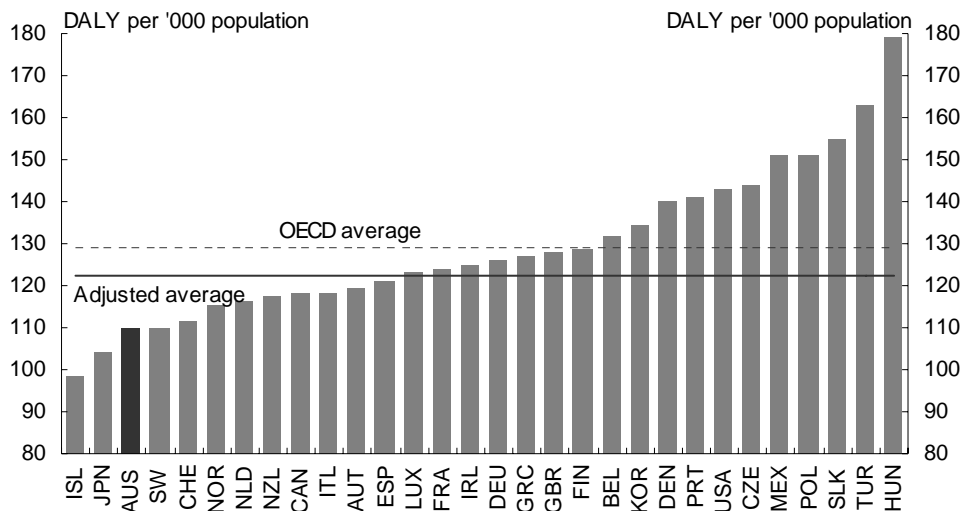
The main drawback of longevity indicators is that they do not measure quality of life, the burden of disease and injury, or disability. Other indicators have been developed that attempt to include morbidity and disability in measures of health status.

Mortality indicators adjusted for morbidity and disability

The Disability-Adjusted Life Year (DALY) was developed by the World Health Organisation (WHO) to provide a measure of potential life lost due to premature death plus the equivalent years of 'healthy' life lost due to poor health or disability (WHO 2008). One DALY can be thought of as one lost year of healthy life due to premature death, prolonged illness or disability, or a combination. The more DALYs, the greater the burden of disease, whether applied to an individual or a population. For example, the sum of DALYs across the Australian population measures the gap between current health status and an ideal health situation where the entire Australian population lives to an advanced age, free of disease and disability.

DALYs can be compared across countries by calculating the number of DALYs per 1,000 population (Chart 2). In 2002, Australia had one of the lowest DALYs per 1,000 population in the OECD, with 110 DALYs. The OECD average is around 130 DALYs.

Chart 2: Disability-Adjusted Life Year, OECD countries, 2002



Note: The adjusted average is the average of OECD countries excluding the Czech Republic, Mexico, Poland, the Slovak Republic, Turkey and Hungary. The excluded countries are those with 2006 GDP per capita below a purchasing power of US\$23,000.

Source: World Health Organisation, Department of Measurement and Health Information, December 2004.

Another measure that adjusts for the quality of life is Health-adjusted Life Expectancy (HALE), also developed by WHO. HALE aims to summarise the number of years expected to be lived in full health. Australia had a HALE of 73 years in 2004, among the highest in the world (Table 1). Japan had the highest HALE of 75 years.

The DALY and HALE indicators attempt to quantify the quality of life of a population. Unfortunately, they are not widely available as a time-series across countries, which can limit their use in cross-country studies.

Table 1: Comparison of HALE, DALY and life expectancy indicators
Selected OECD countries

	HALE at birth 2004	Rank	DALYs 2002	Rank	LE at birth 2006	Rank	Average rank
Japan	75.0	1	104.3	2	82.4	1	1.3
Iceland	72.8	4	98.6	1	81.2	3	2.7
Switzerland	73.2	3	111.4	5	81.7	2	3.3
Australia	72.6	6	110.2	3	81.1	4	4.3
Sweden	73.3	2	110.2	4	80.8	8	4.7
Italy	72.7	5	118.1	10	80.9	7	7.3
Spain	72.6	7	120.8	12	81.1	5	8.0
Canada	72.0	8	118.1	9	80.4	10	9.0
Norway	72.0	10	115.3	6	79.9	12	9.3
France	72.0	9	123.8	14	80.9	6	9.7
OECD average	70.3	-	189.5	-	78.9	-	

Note: OECD countries have been selected on the basis of the top ten ranked according to the average of rankings for HALE, DALYs and life expectancy. The 'average rank' is shown in the final column.

Source: WHO, *World Health Report*, 2004; WHO, Department of Measurement and Health Information, 2004; OECD health data 2008.

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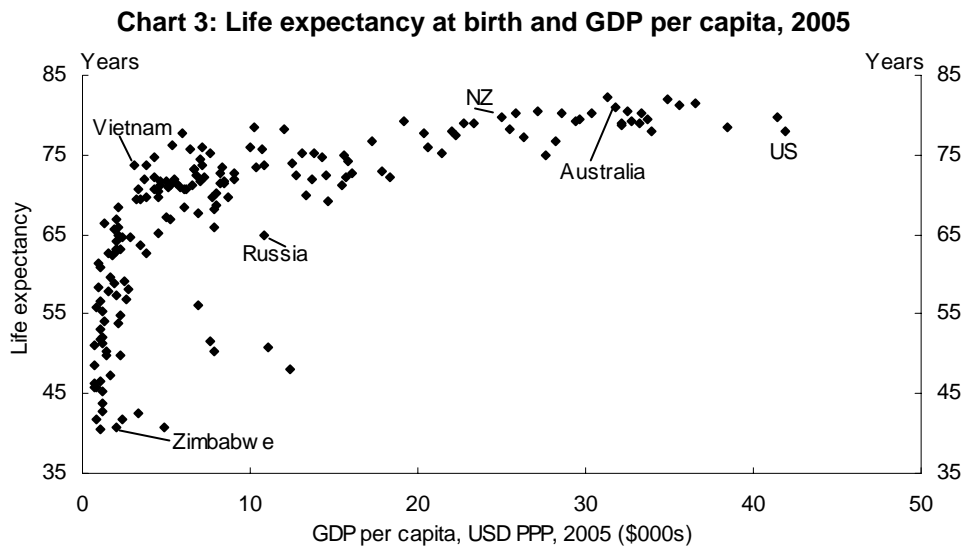
There is a high correlation between GDP per capita and population health status across countries (Chart 3), although the relationship is stronger below \$US10,000. The causal relationship appears to work both ways. Higher GDP per capita can lead to better health outcomes, and better health outcomes can improve GDP per capita. Those countries whose citizens enjoy good health tend to be better educated, have higher incomes and greater wealth (Bloom and Canning 2000). These relationships are remarkably stable across time and are generally observed within all countries.

Higher GDP per capita can lead to better health outcomes

GDP per capita has been found to be a major determinant of health status (Jourmand et al. 2008; Afonso; St Aubyn 2006). Higher income can improve life expectancy because it facilitates access to health care, education, food, and housing, all of which contribute to better health outcomes (Jourmand et al. 2008; AIHW 2008).

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Higher incomes can also lead to higher demand for health care services. Wealthier households have greater access to formal healthcare and education and because of this they often have greater knowledge of the services available, how to use them appropriately and are able to afford them. Parents who place a high value on future outcomes tend to invest heavily in their children's health and education, perpetuating a virtuous cycle.



Source: United Nations Development Report 2007-08.

Better health outcomes can improve GDP per capita

While GDP per capita affects health outcomes, it is also well established that health can have a substantial influence on GDP per capita. This impact takes place through population, participation and productivity.

Population

To the extent that improved health outcomes lead to an increase in the proportion of the population that is of working age, they can lead to an increase in GDP per capita. The effect of improved health is dependant upon the development status of a country. For example, low income countries with high infant mortality rates and low life expectancy, will experience population growth as better health reduces the mortality rate and lengthens life. While this will initially increase the proportion of the young and old in the population, it can, over time, lead to an increase in the proportion of the population that is of working age. The increase in the working age population has the capacity to increase income, provided that new workers are absorbed into productive employment (Bloom and Canning 2000).

However, as incomes rise and the mortality rate falls, the fertility rate tends to decline. Of itself, this results in a slowing in population growth. For example, the fertility rate in the 50 least developed countries is currently around 4.63 children per woman of child bearing age, 2.75 for other low income countries and an average of 1.6 for developed OECD countries (United Nations 2007; Sleenbos 2003). Falling fertility rates are associated with opportunities for the mother to work outside the home, further increasing participation (Bloom and Canning 2000; Arora 2001). While rising incomes and a reduction in the fertility rate can lead to an increase in participation, they also combine with a lengthening life expectancy, now well beyond the retirement age, to cause a demographic shift which can lead to an increase in the old age dependency ratio. Without improvements in productivity, this would lead to a decline in GDP per capita over the long term.

Participation

Health affects participation in a number of ways. Healthier people are more likely to participate in the workforce and less likely to be absent from work due to illness, either personally or within families (Bloom and Canning 2000).

In Australia, people with a disability have lower participation and higher unemployment rates than those without (Table 2). Those that report high levels of disability are also more likely to be engaged in part-time work, rather than full-time, than those who report no disability.

The impact of health outcomes on participation is also a result of the strong relationship between these outcomes and education (Becker 2007; Grossman 2004). Increased life expectancy increases the incentive to acquire education since the returns to investment in education increase over a longer working life. Good health also enables individuals to learn and retain knowledge. As a result, the stock of human capital increases. More educated workers are also more likely to participate in the work force. Continued good health also reduces uncertainty and allows for whole of life planning, allowing for the same incentives to apply for saving for a long and increasingly healthy retirement.

The link between health and education also runs both ways. There is also evidence that education affects health. Better-educated people are more likely to use health care services more effectively – they follow medical instructions better and are more likely to use the most up-to-date treatments – and so education leads to better health. Better educated people also tend to adopt healthier lifestyles. For example, in Australia those with post-school qualifications are more likely to have never smoked compared to those without post-school qualifications (AIHW 2008).

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Deteriorating health can often lead to early retirement as sufferers become unable to practice their chosen career. Cai and Kalb (2007) find that health has a significant effect on the labour supply of older Australian males. Mental health is also a major determinant of participation of older workers (Mitchell and Anderson 1989).

Table 2: Disability and employment status, 2003
(Persons aged 15-64 years in households)

	Unemployed	Participation	Full-time	Part-time
	rate		employed	
	(per cent)		(as a percentage of total)	
Profound core-activity limitation(a)	*13.9	15.2	50.3	49.2
Severe core-activity limitation(a)	9.5	35.8	51.5	48.5
Moderate core-activity limitation(a)	7.6	47.9	61.2	38.9
Mid core-activity limitation(a)	7.7	50.6	62.3	37.7
Schooling or employment restriction	11.5	44.9	57.6	42.4
No reported disability	5.0	80.6	70.9	29.1
Total	5.4	76.0	70.0	30.0

(a) Core activities comprise communication, mobility and self care.

Note 1: Data are drawn from the 2003 Survey of Disability, Ageing and Carers. Employment status may not match official population estimates as it is based on survey responses from households.

Note 2: The data are not adjusted for age.

* estimate has a relative standard error of 25 to 50 per cent and should be used with caution.

Source: ABS, 2004, *Disability, Ageing and Carers, Australia, 2003*, cat no. 4430.0.

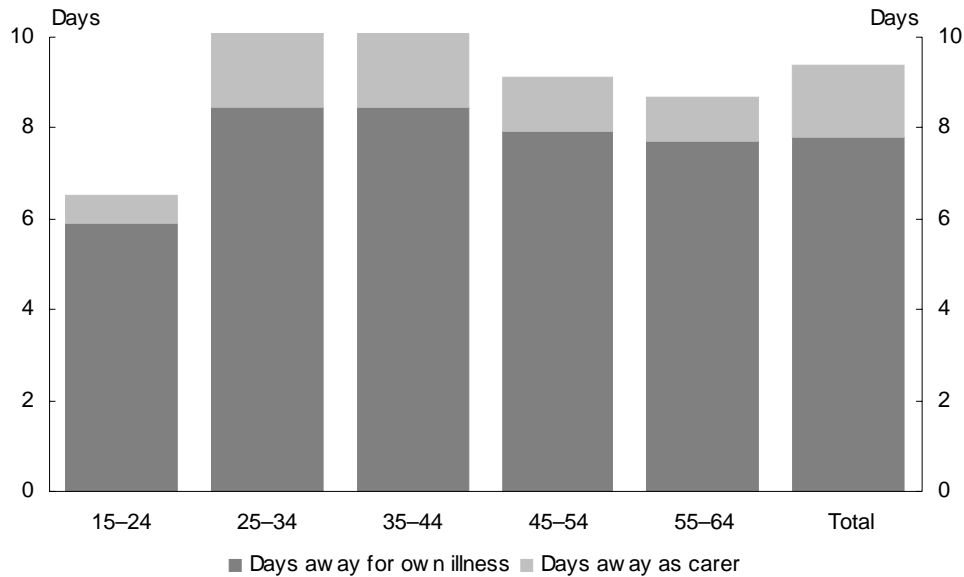
Productivity

Health has both direct and indirect effects on productivity. Good health contributes to productivity directly as healthier workers have more physical and mental energy and report less absenteeism to cope with health issues (Bloom and Canning 2000).

Worker absenteeism due to personal sickness or caring for others is a key reason for productivity loss in the workplace. Productivity losses can also occur through 'presenteeism', which is reduced productivity associated with employees attending work while ill and lacking the motivation or health to be fully productive (Productivity Commission 2006).

In Australia, the average worker takes around nine days leave (sick leave and carer's leave) per year (Chart 4). Those with long-term illnesses and disabilities are more likely to be absent from work due to illness and the length of absence is likely to be longer (Kidd et al. 2000).

Chart 4: Time off from work, average days per person per year, 2004-05



Source: ABS, 2006, National Health Survey, 2004-05, cat no 4364.0.

The role of the health care system

There are a large number of factors that determine the health outcomes of individuals and populations (AIHW 2008). Broadly these factors are: biomedical, such as blood pressure and cholesterol levels; socio-economic, such as income per capita, education attainment and pollution; and lifestyle, such as physical activity, diet and the consumption of tobacco and alcohol.

Because good health matters for individual wellbeing and economic growth, governments have an interest in improving health outcomes. However, governments are only able to indirectly affect the primary factors determining health outcomes. For example, preventative and public health programs may lead to behavioural change and reduce lifestyle risk factors related to tobacco and alcohol consumption and diet. Similarly, government policy that leads to broad socio-economic improvements, such as higher incomes and education attainment, may lead to better health outcomes.

The health care system itself also can also affect health outcomes (WHO 2000). Governments intervene extensively in the health care sector to finance and provide health services to try to address market failures, deal with information asymmetries, capture positive spillovers in health service provision and promote equity. Governments may be able to directly affect health outcomes by changing the level of

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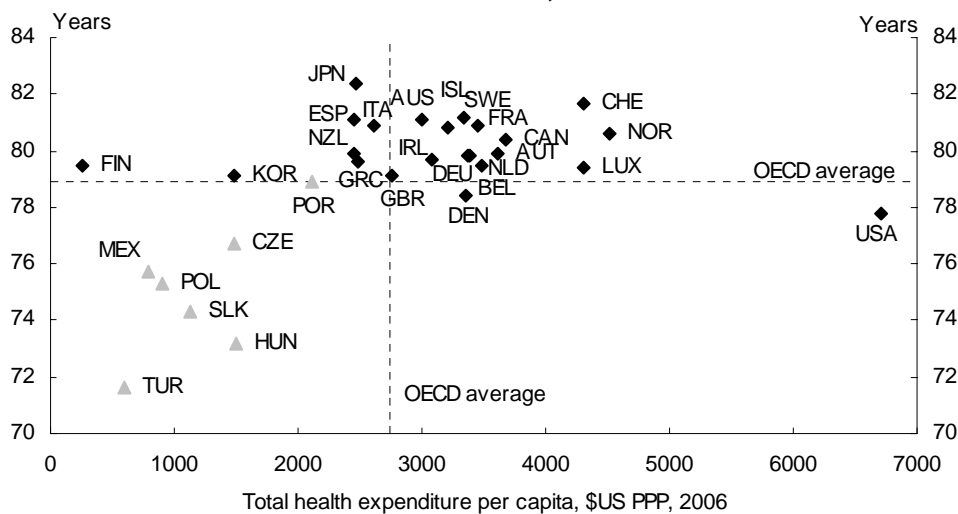
resources in the health care system. However, the extent to which increases in resources lead to improvements in health outcomes is not certain.

Health care resources and health outcomes

OECD countries' governments devote significant resources to health, with public expenditure on health averaging 6 per cent of GDP in 2005. Total expenditure on health care in OECD countries averaged 9 per cent of GDP in 2005. In Australia, total health expenditure ranged between 8 and 9 per cent of GDP over the last decade; around 70 per cent of which was public expenditure (AIHW 2008).

Health care resources and health outcomes in OECD countries vary markedly and countries with higher total health expenditure do not always achieve higher outcomes. Indeed, the lack of relationship between expenditure on health care and health outcomes for high-income countries is striking (Chart 5). The United States, for example, spends twice as much per person on health care as Germany and achieves inferior average health outcomes. Similarly, Australia and Japan achieve excellent average health outcomes, with a life expectancy of 81 to 82 years, but while Australia spends more than the OECD average, Japan spends less.

Chart 5: Life expectancy and total expenditure on health, OECD countries, 2006

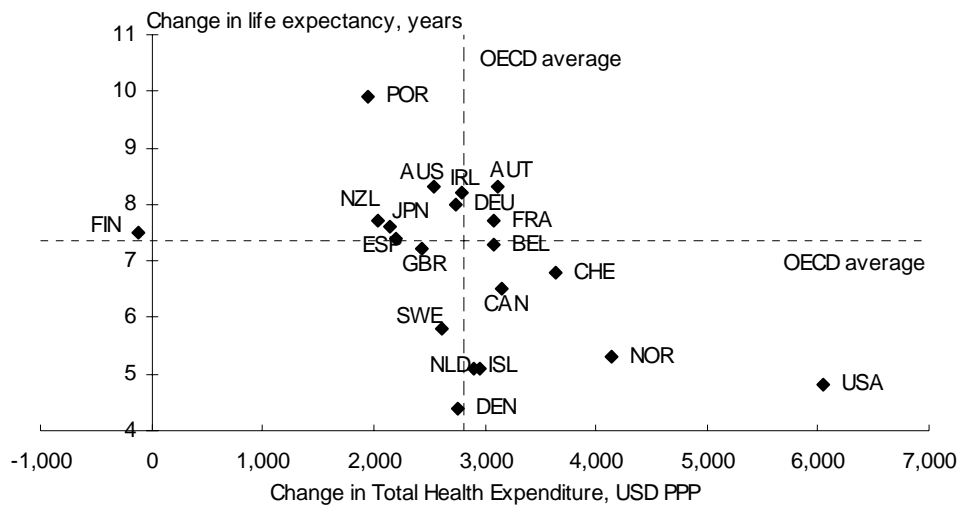


Note: Total health expenditure includes public and private expenditure on health. Triangles indicate countries with 2006 GDP per capita below a purchasing power of US\$23,000.
Source: OECD health data 2008.

There also does not appear to be any significant relationship between changes in health expenditure and health outcomes over time (Chart 6). Some countries have achieved the same improvements in health with a smaller increase in resources devoted to health care. For example, life expectancy in Australia, Japan and France

improved by around eight years over the past 30 years. However, while Australia's total health expenditure per capita increased by around US\$2,500 per person, expenditure in Japan increased by \$US2,100 per person and expenditure in France increased by around US\$3,000 per person. In the United States, where life expectancy increased by only five years, total health expenditure increased by around US\$6,000 per person.

Chart 6: Changes in life expectancy and health expenditure, selected OECD countries, 1976-2006



Note: Data not available for Czech Republic, Greece, Hungary, Korea, Luxembourg, Mexico, Poland, Slovak Republic and Turkey.
Source: OECD health data 2008.

Evidence on the effects of health spending on health outcomes is mixed even when empirical studies attempt to control for lifestyle, socio-economic and bio-medical factors using more sophisticated methods.

Some empirical studies show that health care resources have a significant, large and positive effect on health outcomes in OECD countries (Jourmand et al. 2008, Berger and Messer 2002; Or 2000a and 2000b). Others studies show that an increase in health expenditure has only a small impact on health status (for example, Nixon and Ulmann 2006). Finally, there are studies that find that health expenditure has no significant impact on the population health status (for example, Self and Grabowski 2003).

The lack of consensus in the empirical evidence may be due to measurement problems, diminishing returns and institutional arrangements. Most empirical studies use raw mortality and longevity indicators because morbidity- and disability-adjusted indicators are not available in time series across countries. The use of raw mortality and longevity indicators may underestimate the impact of health care resources on health outcomes. This is particularly so since health spending in developed countries,

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where significant gains in reducing mortality have already been made, is increasingly focusing on improving the quality of life – mitigating pain, developing palliative care units and reducing morbidity (for example hip replacements) (Fogel 2004).

The lack of consensus may also be due to diminishing returns to health expenditure. To the extent that health expenditures are subject to diminishing returns, increases in health expenditure may not lead to improvements in health outcomes. The magnitude of diminishing returns to health expenditure may be dependent on the stage of economic development, with diminishing returns being smaller in developing countries than in developed countries.

Health care outcomes and health sector institutions

Potentially the most important reason for the lack of consensus in the empirical studies is the variation in health sector institutions across countries. Institutional differences can lead to differences in the efficiency with which countries deploy health care resources. To the extent that health care resources are used inefficiently there may be little impact on health outcomes. However, institutions are seldom included as inputs to health status in empirical studies because institutions are difficult to measure, there is no consensus on the features that matter most and interaction effects matter almost as much as individual features (Jourmand et al. 2008).

Health sector institutions, and the impact these have on efficiency, are likely to have a significant impact on health outcomes. The extensive intervention of governments in health care systems means that they are able to influence institutional arrangements. This provides governments with another way to affect health outcomes.

Delivery of health care services and health outcomes

Broadly, health care systems provide and finance preventative, curative and palliative interventions directed at both individuals and populations (WHO 2000). The structure of the health care system is likely to be as important in determining health outcomes as the level of health care resources.

Efficiency and effectiveness

In particular, the efficiency and effectiveness of health spending is likely to be as important as the quantity in affecting health outcomes. Jourmand et al. (2008) show that some OECD countries could make significant gains in life expectancy by improving efficiency without increasing total health expenditure. While this research ranks Australia among the most efficient OECD countries, it is crucial that Australia continues to improve the efficiency and effectiveness of public spending on health.

In Australia, health care is financed and provided both by the private and public sectors and in the public sector there are different levels of government involved. As a result, ensuring that health expenditures are efficient and effective can be complicated. Measuring the performance of health services is particularly important in determining and monitoring cost-effectiveness. Rewarding health service providers for improvements in the quality of and access to health services will provide incentives to innovate and adopt effective practices.

Equity

Policymakers may also need to consider the impact on equity of increases in health expenditure. Most empirical studies test the impact of health spending on the average population health status, and are unable to indicate whether the gains in health outcomes will be spread evenly across the population or concentrated in smaller pockets of the population. In pursuing equity objectives, governments may want to ensure that it is the health outcomes of specific population groups that are improved. This may require a more targeted approach than a general increase in expenditure.

Sustainability

Policymakers must also consider the sustainability of health expenditures in the long term. Non-demographic factors, such as greater use of diagnostic techniques and the development of new medical treatments, have been (and are likely to continue to be) the key driver of health spending. Over the past two decades non-demographic factors contributed around three-quarters of the increase in Australian Government health spending (Australian Government 2007). Australian Government projections of the increase in health spending over the next four decades assume this trend will continue.

Community demand is also an ongoing driver of the growth in health expenditure. Demand for health services has expanded in response to increasing information about new medical technologies and expectations about medicine's ability to treat health conditions. As incomes increase, people are more willing to reduce their share of consumption devoted to goods and services to fund health care that increases their healthy life expectancy.

On the other hand, consumers may demand that governments subsidise access to expensive new medical technologies that offer only small incremental improvements over existing, cheaper treatments. Governments will need to keep a close watch on cost-effectiveness of treatments and services if they are to provide the best possible health outcomes on a sustainable basis.

Conclusion

Health is a key component of an individual's wellbeing as well as contributing significantly to the formation of human capital and labour market participation. As such, it contributes to economic growth and improves the standard of living. Health affects productivity and participation, particularly at the individual level.

Key non-medical determinants of health are income, education, pollution, consumption of tobacco and alcohol, and diet. Governments have little direct control over these factors. However, preventative and public health programs and policies that lead to improvements in income and education will improve health outcomes.

There is also evidence that increases in health care resources, which governments do have direct control over, can lead to improvements in the population health status. However, the evidence is mixed due to data and measurement issues. In addition, it does not necessarily follow that more should be spent on health – the efficiency, effectiveness, equity and sustainability of current health expenditure levels should be taken into account.

While improvements in the average population health status are welcome, there is no guarantee that any such improvement would be spread evenly over the population or accrue to smaller population groups. Where there are large disparities in life expectancies across population groups there is no guarantee that a general increase in health spending would increase the life expectancy of disadvantaged groups.

Efficiency improvements in the health sector could lead to an improvement in population health outcomes without an increase in health care spending. While it appears that Australia's health system is one of the more efficient in the OECD, improving the efficiency and effectiveness of public spending should be an ongoing endeavour.

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