The Value of Medicines in Australia

Report to Medicines Australia

Centre for Strategic Economic Studies
Victoria University, Melbourne
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1. Introduction

Australians generally enjoy good health, with life expectancy at birth among the top five countries in the world and rising more rapidly in Australia than in comparable countries such as the USA and UK. These good health outcomes have been achieved in spite of high levels of some risk factors, such as obesity and alcohol use.
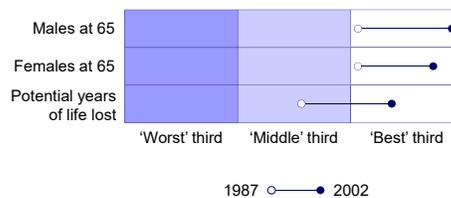
Australia's population is ageing, although not as fast as in some other countries. By 2050 35.7% of the population will be 55 years and over, by comparison with 21.5% in 2005. With this ageing will go an increased incidence of the 'diseases of the elderly' – initially heart disease and cancer, but increasingly arthritis, dementia, sense organ diseases and others.

Ready access to new medicines in Australia has played, and will continue to play, a major part in achieving good health outcomes. Medicines in the development pipeline will help Australians to live longer, with a better quality of life.

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Australian life expectancy is towards the top of all the developed countries, and its ranking has improved markedly since 1987.

Life expectancy at age 65, and potential years of life lost

|	'Worst' third	'Middle' third	'Best' third
Males at 65			
Females at 65			
Potential years of life lost			

1987 ○——● 2002

Note: All 30 developed countries are ranked on each of the indicators provided. The top 10 are the 'Best' third for a particular indicator, next 10 are the 'Middle' third, and the last 10 are the 'Worst' third. Circles show Australia's position for each indicator in 1987 and 2002.
Source: AIHW 2006, based on OECD Health Data 2005.

4

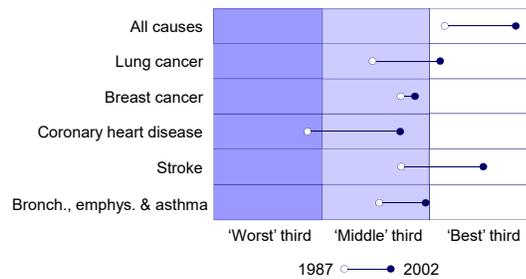**This is in spite of Australia's poor performance on certain key risk factors, such as alcohol use and obesity.**

Key risk factors

Tobacco (a)
Alcohol (b)
Obesity (c)

'Worst' third   'Middle' third   'Best' third

1987 ○———● 2002
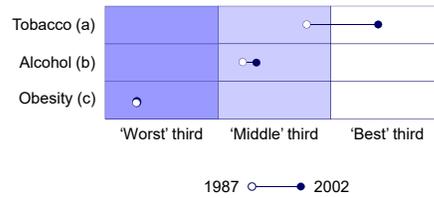
Notes:
(a) Daily smokers as a proportion of the population aged 15 years or over.
(b) Litres of pure alcohol per person aged 15 years or over.
(c) Proportion of the population with a body mass index greater than 30.
All 30 developed countries are ranked on each of the indicators provided. The top 10 are the 'Best' third for a particular indicator, next 10 are the 'Middle' third, and the last 10 are the 'Worst' third.
Circles show Australia's position for each indicator in 1987 and 2002.
Source: AIHW 2006, based on OECD Health Data 2005.

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**Actual and relative health outcomes for most major diseases have improved, but not for all cancers.**

Age-adjusted death rates from various causes

All causes
Lung cancer
Breast cancer
Coronary heart disease
Stroke
Bronch., emphys. & asthma

'Worst' third   'Middle' third   'Best' third

1987 ○———● 2002

Note: All 30 developed countries are ranked on each of the indicators provided. The top 10 are the 'Best' third for a particular indicator, next 10 are the 'Middle' third, and the last 10 are the 'Worst' third. Circles show Australia's position for each indicator in 1987 and 2002.
Source: AIHW 2006, based on OECD Health Data 2005.

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The proportion of Australian's aged 55 years and over will increase steadily to over 35% in 2050.

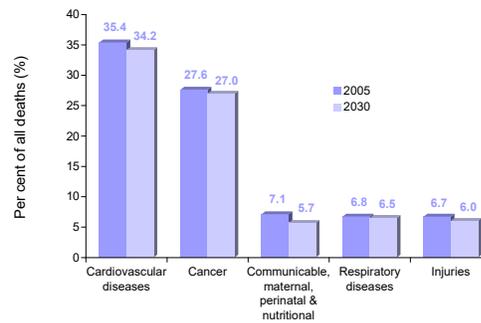*Share of older people (55 years and over) in the population*

Per cent of population (%)

2000: 21.5
2010: 26.0
2020: 30.2
2030: 33.1
2040: 34.5
2050: 35.7
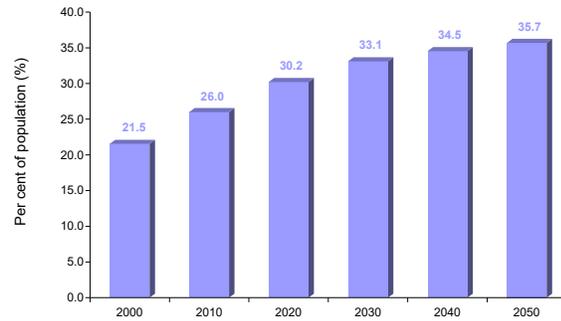
Source: UN 2006.

7

Over the next 25 years the major causes of death will shift somewhat from cardiovascular disease and cancer.

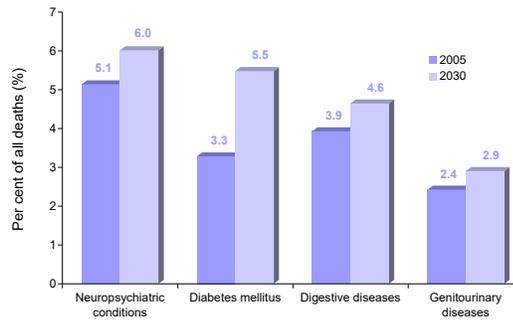*Shares of deaths, by cause, developed countries of APEC, 2005 and 2030*

Per cent of all deaths (%)

■ 2005
□ 2030

Cardiovascular diseases: 35.4 / 34.2
Cancer: 27.6 / 27.0
Communicable, maternal, perinatal & nutritional: 7.1 / 5.7
Respiratory diseases: 6.8 / 6.5
Injuries: 6.7 / 6.0

Source: Unpublished WHO data consistent with Mathers and Loncar 2006.

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4

... to another set of diseases including neuropsychiatric conditions and diabetes.

Shares of deaths, by cause, developed countries of APEC, 2005 and 2030
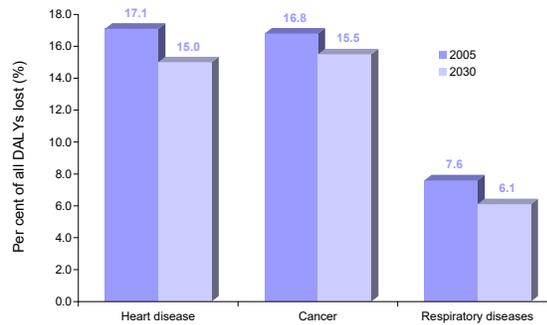
Source: Unpublished WHO data consistent with Mathers and Loncar 2006.

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In terms of the burden of disease the importance of major diseases will decline a little...

Shares in disability-adjusted life years (DALYs) lost, by cause, developed countries of APEC, 2005 and 2030
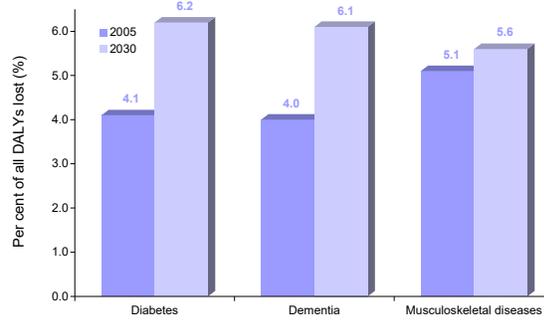
Source: Unpublished WHO data consistent with Mathers and Loncar 2006.

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**...as diseases linked to way of life and ageing –
such as diabetes, dementia and musculoskeletal
diseases – become of greater importance.**

*Shares in disability-adjusted life years (DALYs) lost, by cause, developed
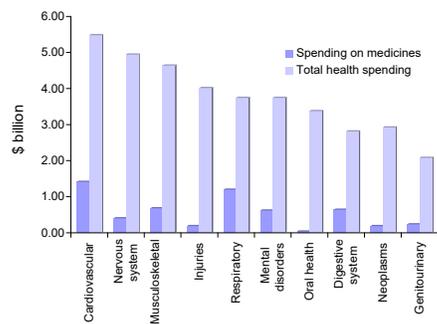countries of APEC, 2005 and 2030*

Source: Unpublished WHO data consistent with Mathers and Loncar 2006.

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**Spending on medicines varies across diseases,
but is in all cases a small part of total treatment
costs.**

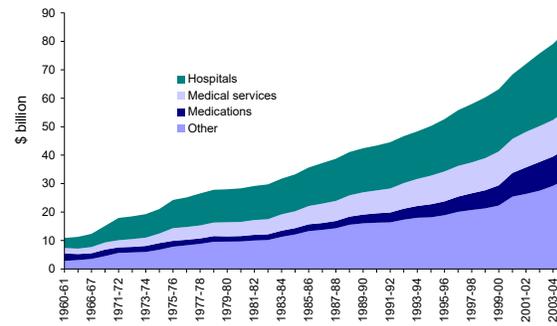*Total health spending and spending on medicines by disease, Australia,
2001*

Source: AIHW 2005.

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Health costs are rising as Australians age and demand the best care, but spending on medicines remains only 12.4% of the total.

Total expenditure on health by type, at constant prices, Australia

Source: AIHW 2007a.

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2. Extending Life

The life expectancy of Australians has been rising rapidly in recent decades, more so than in other comparable countries. Australians born in 2003 can expect to live 80.3 years, nearly five years more than those born in 1983, and higher than in UK (78.5 years) and USA (77.5 years).

Good access to new medicines has played an important part in this increased life expectancy in Australia. By 2005-06 three quarters of all spending in the PBS was on drugs introduced after 1990-91. One study estimates that about 65% of the rise in life expectancy since 1995 has been due to the impact of new medicines.

Antihypertensive drugs and cholesterol lowering agents have become widely used, and have greatly reduced deaths from cardiovascular disease. Cancer drugs such as various forms of chemotherapy have contributed to improved survival rates for many forms of cancer. Since its introduction in 1996, highly active antiretroviral therapy has greatly improved life expectancy for people with HIV and new medicines have helped reduce the suicide rate.

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There has been a strong improvement in life expectancy at birth in Australia, faster than in USA and UK, over the past two decades.
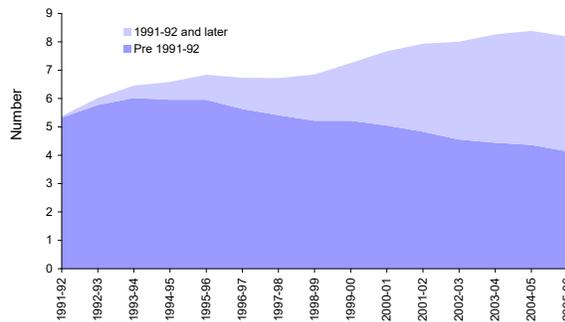
Life expectancy at birth
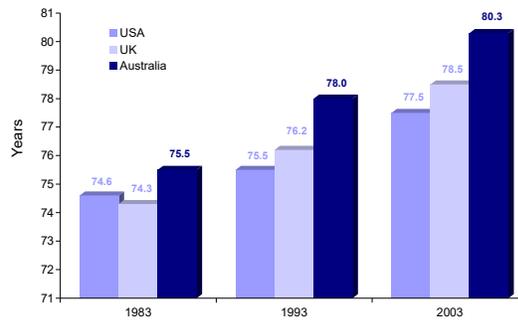
Source: OECD 2006.

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The use of new medicines has increased strongly since the early 1990s, whether measured by the number of PBS scripts per head for medicines introduced from 1991-92…

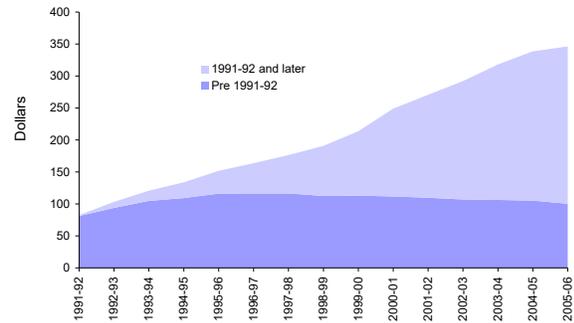*Number of PBS scripts per head of population*

Source: Department of Health and Ageing and Medicare Australia, unpublished data.

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...or by total PBS expenditure on medicines introduced from 1991-92.
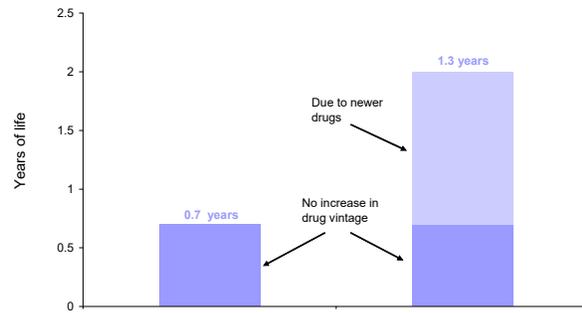
PBS expenditure per head of population

Source: Department of Health and Ageing and Medicare Australia, unpublished data.

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About 65% of the rise in life expectancy in Australia from 1995 to 2004 is due to the use of medicines introduced since 1995.

Drugs introduced since 1995 have led to an increase in life expectancy of 1.3 years, out of total increase of 2.0 years
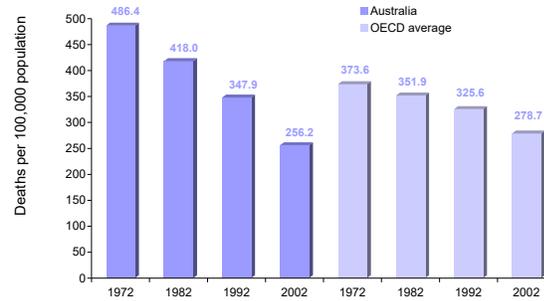

Source: Lichtenberg 2007.

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Death rates from heart disease in Australia used to be well above the OECD average, but are now well below that average.

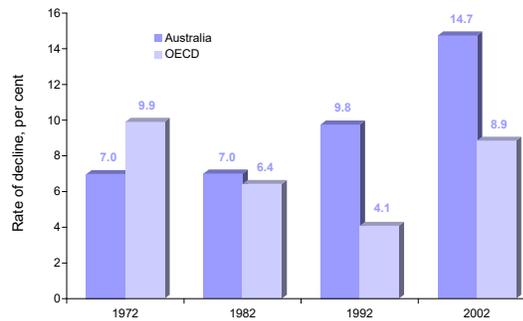*Age standardised death rate from heart disease, Australia and OECD, 1970-2002*

Source: OECD 2006.

19

Greater decline in death rates from heart disease, both absolutely and relative to the OECD, since 1990.

Percentage change in age standardised death rates from heart disease, OECD and Australia, 1972-2002 (per cent over ten years)
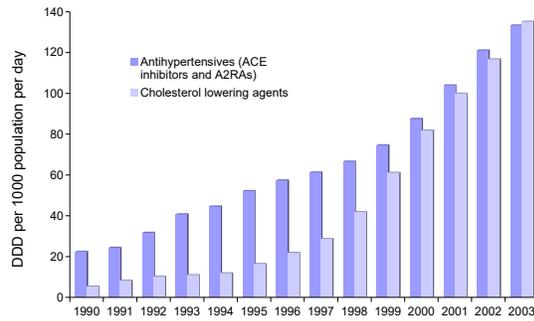

Source: OECD 2006.

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Lying behind these gains has been rapid growth in the use of new drugs for the prevention and treatment of heart disease.

The use of new medicines for preventing cardiovascular disease, Australia, 1990-2003

Source: For 1990-98, Mathur 2002; for 1999-2003, Department of Health and Ageing.

21

Lying behind these gains has been rapid growth in the use of new drugs for the prevention and treatment of heart disease.

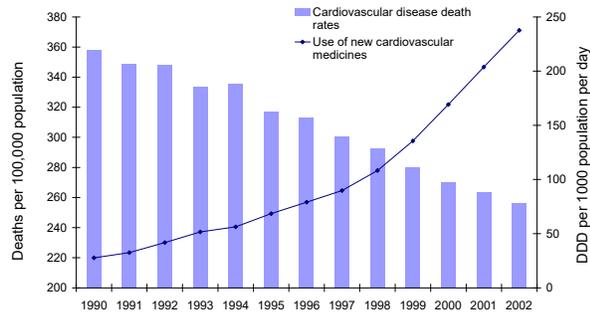Note: New cardiovascular medicines are ACE inhibitors, A2RAs, and cholesterol lowering agents.
Source: For 1990-98, Mathur 2002; for 1999-2003, Department of Health and Ageing.

22

Five year cancer survival rates differ greatly across cancer sites, but have improved significantly for most types of cancer.

Change in five-year female cancer survival rates, Australia, 1982-86 to 1992-97
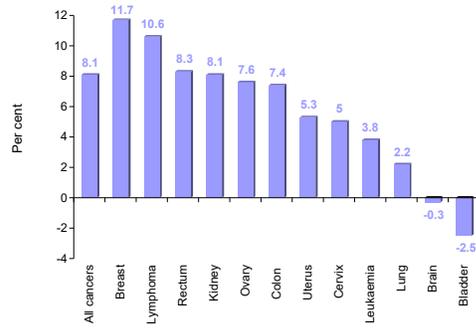
Source: AIHW 2001.

23

Age standardised death rates from cancer have fallen significantly in Australia since the early 1990s, both absolutely and relative to the OECD average.

Source: OECD 2006.

24

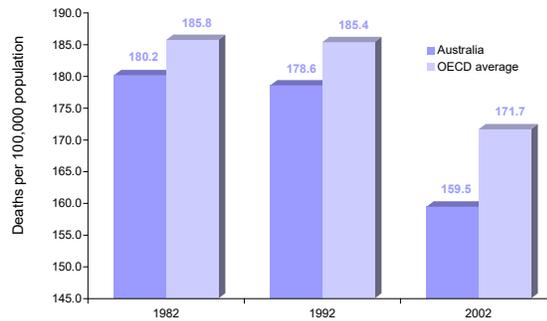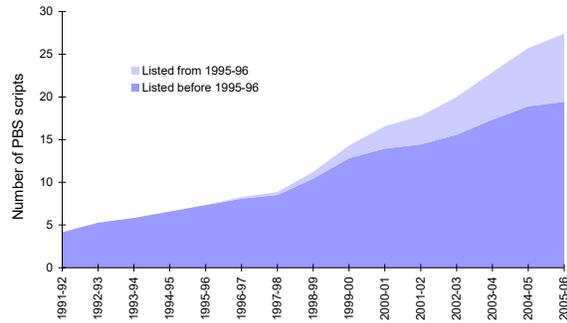**These gains in survival rates can be linked to new cancer medicines, as measured by PBS scripts…**

Total number of PBS scripts issued for cancer medicines, per head of population, 1991-92 to 2005-06

Number of PBS scripts (y-axis, 0 to 30)

Legend:
- Listed from 1995-96
- Listed before 1995-96

X-axis: 1991-92, 1992-93, 1993-94, 1994-95, 1995-96, 1996-97, 1997-98, 1998-99, 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05, 2005-06

Source: Department of Health and Ageing and Medicare Australia, unpublished data.

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…or by PBS spending on cancer medicines listed from 1995-96.

PBS spending on cancer medicines, per head of population, 1991-92 to 2005-06

Dollars (y-axis, 0 to 18)

Legend:
- Listed from 1995-96
- Listed before 1995-96

X-axis: 1991-92, 1992-93, 1993-94, 1994-95, 1995-96, 1996-97, 1997-98, 1998-99, 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05, 2005-06
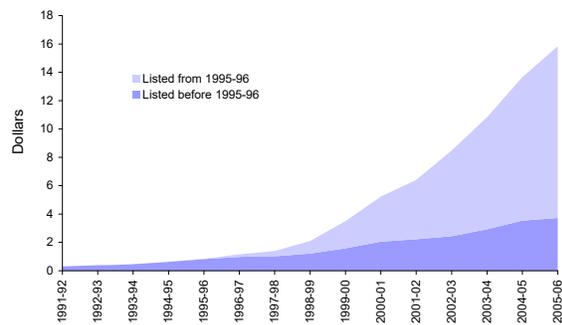
Source: Department of Health and Ageing and Medicare Australia, unpublished data.

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Deaths from HIV/AIDS have fallen sharply since the introduction in 1996 of highly active antiretroviral therapy (HAART), using combinations of different medicines to treat HIV.

HAART introduced in 1996

765

103

Deaths

1994   2005
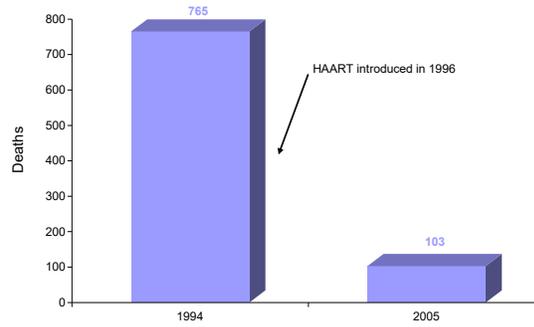
Source: ABS various years.
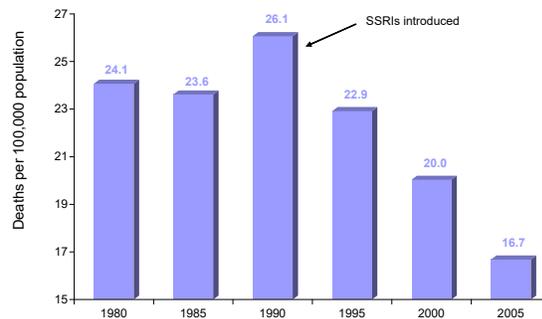
27

The use of selective serotonin reuptake inhibitors (SRRIs) has led to a significant reduction in the rate of suicide from 1979 to 2005, particularly for older people.

Suicide rate males 50 and over, Australia

SSRIs introduced

26.1

24.1   23.6   22.9   20.0   16.7

Deaths per 100,000 population

1980   1985   1990   1995   2000   2005

Source: ABS 2000, 2007.

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3. Preventing the Need for Care: Hospital, Emergency and Long-term Care

New vaccines allow many people to avoid previously common diseases, and new medicines prevent the onset of, or slow the progress of, many illnesses. Both reduce the need for costly hospital care and invasive surgery.

- The number of days spent in hospital by asthma patients has nearly halved between 1994-95 and 2004-05.
- Immunisation programs have sharply reduced the incidence of many diseases.

29

Medicines currently avert some of the disease burden from asthma, but much more could be averted if optimal treatment was used.

The incidence of asthma is high in Australia, but available medicines can do much to alleviate the disease. A recent study estimated that the untreated burden of disease for adults with asthma in Australia in 2000-01 was 129,268 DALYs, of which 32,270 (25%) was averted through the use of asthma medications available at the time. If doctors implemented guidelines for optimal treatment and these were adhered to by patients, 69% of the disease burden could be averted.

Part of the benefit derived from adherence to optimal treatment comes from avoiding hospital admissions a trend that has been evident for some time. The number of patient days in hospitals in Australia for asthma for patients under 50 with no complications has more than halved over the past ten years, from 132,592 in 1994-95 to 74,715 in 2004-05.

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The number of days spent in hospital by asthma patients has nearly halved over ten years.
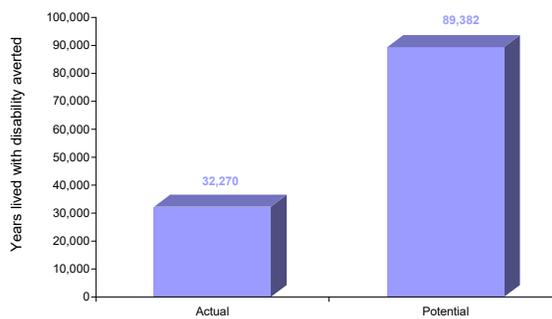
Patient hospital days

- 132,592 (1994-95)
- 74,715 (2004-05)
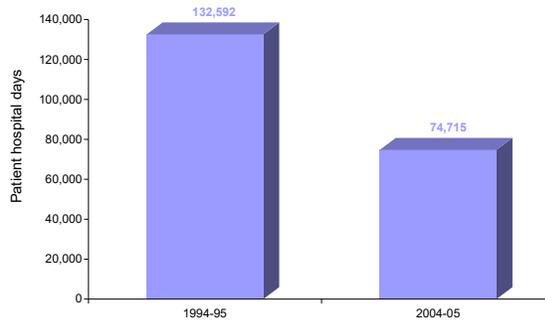
Source: AIHW 2007b.

31

But moving to optimal treatment would yield much greater health benefits.

Disease burden from asthma averted by use of medicines

Years lived with disability averted

- Actual: 32,270
- Potential: 89,382

Note: Actual – reduction in burden of disease achieved with current treatment.
Potential – reduction in burden of disease if best practice treatment guidelines followed.
Source: Simonella et al. 2006.

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Vaccines

Over the past 20 years or so new and better vaccines have been introduced for a range of communicable diseases including:

- a combined measles-mumps-rubella vaccine for children in 1989 and a second-dose in 1992
- a vaccine for haemophilus influenzae type B (Hib) in 1993
- a hepatitis B vaccine for adolescents in 1997 and for infants in 2000
- a meningococcal C vaccine in 2003
- a pneumococcal vaccine in 2004

The following charts show the decline in the occurrence of these diseases using data on notifications of communicable diseases to the National Notifiable Diseases Surveillance System maintained by Communicable Diseases Australia within the Department of Health and Ageing from 1991 to 2006.

33

The percentage of children receiving standard immunisations has increased steadily over the past 10 years.
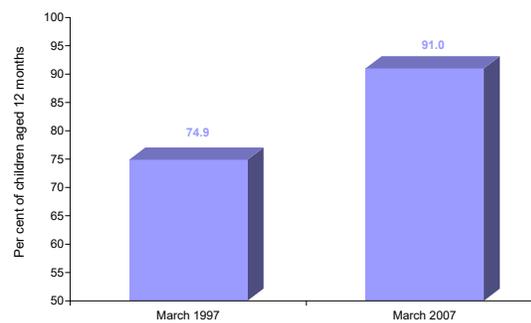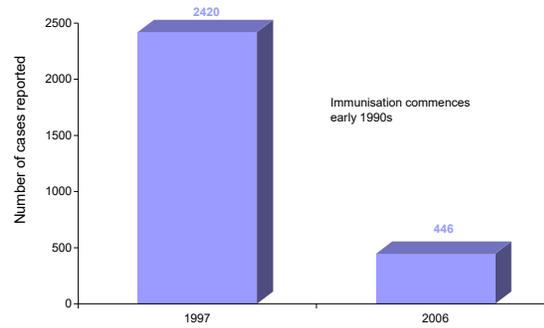

Source: AIHW 2004, and Medicare Australia website.

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Reported cases of measles, mumps and rubella have dropped sharply since introduction of combined immunisation in the 1990s...

Number of reported cases of measles, mumps and rubella

Number of cases reported

2500

2000

1500

1000

500

0

2420

446

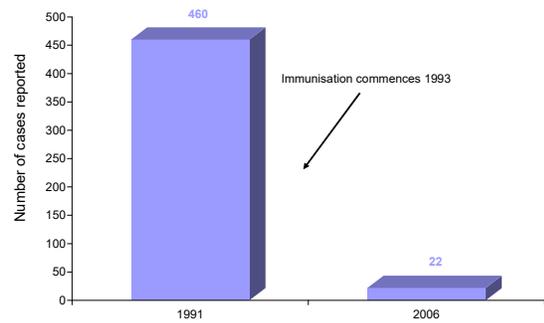Immunisation commences
early 1990s

1997

2006

Source: Communicable Diseases Australia 2007.

35

...as have reported cases of haemophilus influenzae type B.

Number of reported cases of haemophilus influenzae type B

Number of cases reported

500
450
400
350
300
250
200
150
100
50
0

460
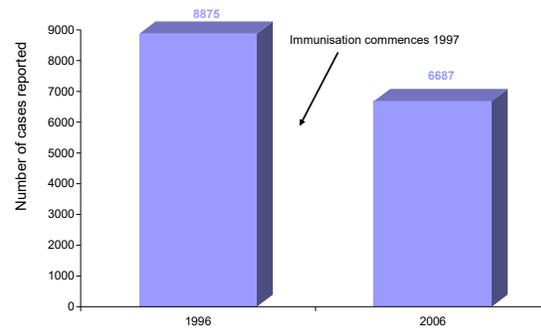
22

Immunisation commences 1993

1991

2006

Source: Communicable Diseases Australia 2007.

36

Reported cases of hepatitis B have fallen by a quarter since immunisation began in 1997.

Number of reported cases of hepatitis B

Number of cases reported

- 8875 (1996)
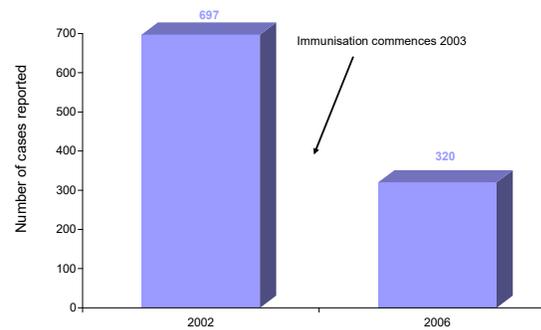- 6687 (2006)

Immunisation commences 1997

Source: Communicable Diseases Australia 2007.

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Since immunisation began in 2003, the number of cases of meningococcal infection have fallen by half...
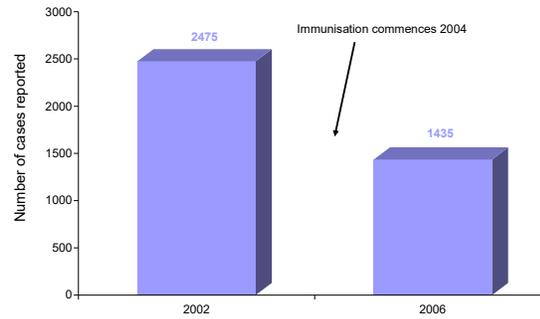
Number of reported cases of meningococcal infection

Number of cases reported

- 697 (2002)
- 320 (2006)

Immunisation commences 2003

Source: Communicable Diseases Australia 2007.

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...as have the number of reported cases of pneumococcal disease.

Number of reported cases of pneumococcal disease

Source: Communicable Diseases Australia 2007.

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4. Improving Health and Quality of Life

New medicines not only save lives and reduce the incidence of disease, but they also improve the health and quality of life of those suffering from illness.

For example, many forms of mental illness, from depression and general anxiety disorder to schizophrenia, are widespread in the community. Medicines already available are reducing the burden of these disease for patients, and much more could be done with existing medicines. Extensive R&D is also being undertaken to produce new treatments for mental illness.

The quality of life of patients with other chronic diseases, such as rheumatoid arthritis and osteoarthritis, is already being improved by medications, and much more can be done.

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General anxiety disorder is the largest of the anxiety disorders, but more of the burden of this disease could be averted with optimal treatment.

Generalised anxiety disorder disease burden
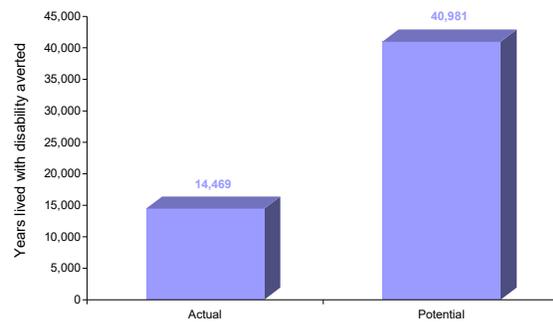
Note: Actual – reduction in burden of disease achieved with current treatment.
Potential – reduction in burden of disease if best practice treatment guidelines followed.
Source: Andrews et al. 2004.

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Schizophrenia remains a difficult and costly disease to treat, but optimal treatment would reduce the burden of disease significantly and the cost almost by half.
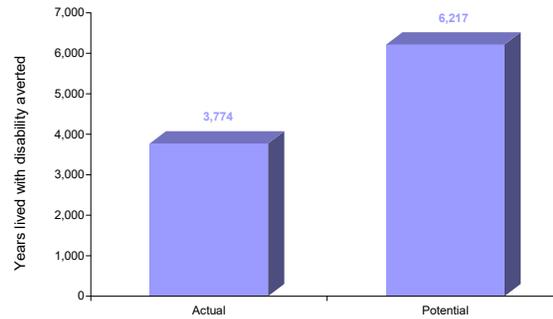
Schizophrenia disease burden

Note: Actual – reduction in burden of disease achieved with current treatment.
Potential – reduction in burden of disease if best practice treatment guidelines followed.
Source: Andrews et al. 2004.

42

Depression is the most common mental illness. Current therapy can avert much of the disease burden and more could be achieved with optimal therapy.
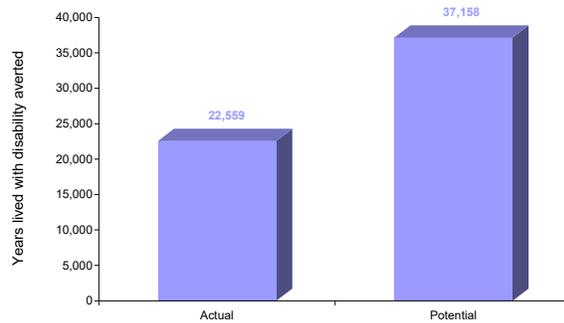
Depression disease burden

Note: Actual – reduction in burden of disease achieved with current treatment.
Potential – reduction in burden of disease if best practice treatment guidelines followed.
Source: Andrews et al. 2004.

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Current treatments for arthritis are reducing the burden of the disease significantly, and optimal treatments could reduce it further. This is true both for rheumatoid arthritis...

Rheumatoid arthritis disease burden

Note: Actual – reduction in burden of disease achieved with current treatment.
Potential – reduction in burden of disease if best practice treatment guidelines followed.
Source: Andrews et al. 2006.

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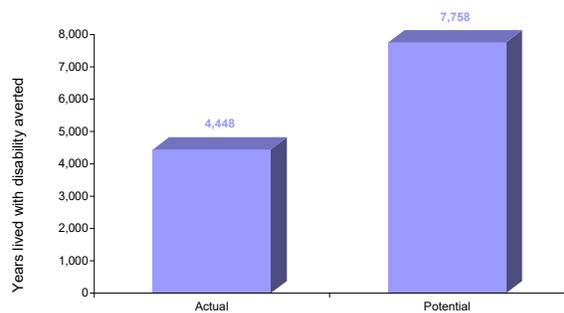**...and for osteoarthritis.**
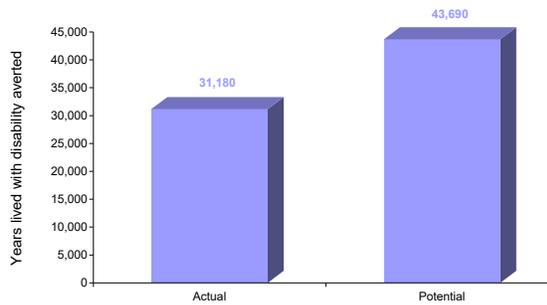
Osteoarthritis disease burden

Note: Actual – reduction in burden of disease achieved with current treatment.
Potential – reduction in burden of disease if best practice treatment guidelines followed.
Source: Andrews et al. 2006.

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5. Controlling Health Costs

In many cases, spending on new medicines reduces health costs elsewhere in the system, either by keeping people healthy or by reducing the extent of hospitalisation or other expensive treatments.

For example, Applied Economics (2003) has evaluated the immunisation program for measles in Australia over the period 1970 to 2003. They found that the number of notifications for measles dropped from around 100,000 per year to under 2,000 per year over this period. The net present value of this program is estimated at $9.2 billion, with most of the value being in savings in public health costs, versus a net present cost of about $52 million for the immunisation program – a substantial net benefit.

CSES has estimated that the reduction in hospital admissions for asthma has reduced hospital costs by $40 million per year .

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At the aggregate level, using US data, it has been shown that using newer medicines results in net savings of $111 per treated condition, after excluding the costs of new medicines.
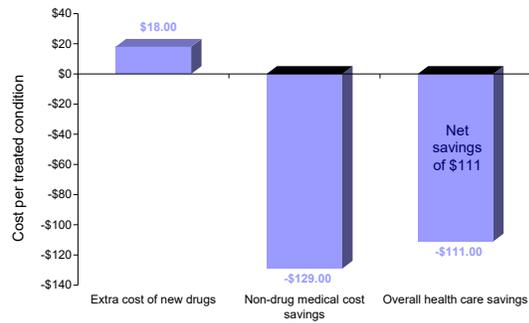
Source: Lichtenberg 2002.

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6. Strengthening the economy

A healthy population is the foundation of a successful economy, and hence through their impact on health outcomes new medicines strengthen the economy in many ways.

In an ageing society, one critical effect relates to the health and vitality of people approaching the end of their working lives. If they remain healthy, able to work and able to participate actively in society, there are many economic and social benefits, as well as lower health costs.

One outcome of improved longevity and better quality of life among older Australians has been much increased workforce participation on the part of persons aged 55 years and over, as shown on the accompanying charts.

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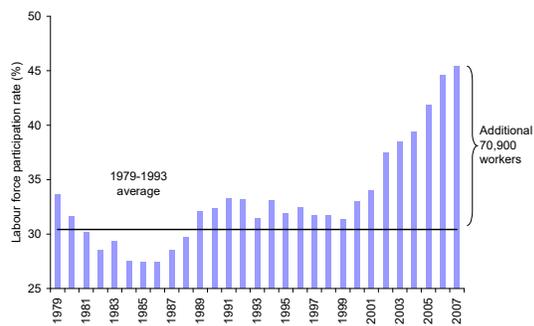**Better health has allowed Australians aged 55-59 to become more involved in the labour force as opportunities have arisen.**

Labour force participation rate (%)
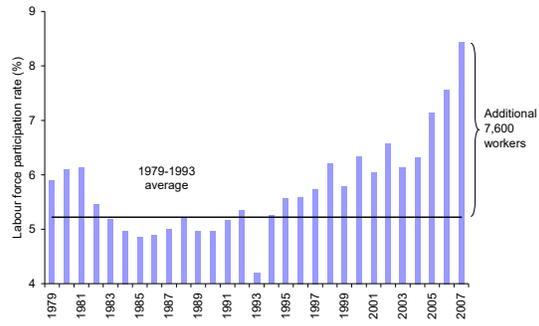
1979-1993 average

Additional 117,400 workers
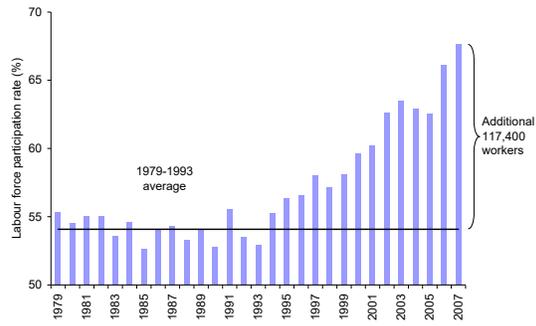
Source: ABS 2007.

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This is true also of Australians aged 60-64 years.

Labour force participation rate (%)

1979-1993 average

Additional 70,900 workers

Source: ABS 2007.

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And also of Australian 65 years and over.

Source: ABS 2007.

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List of Acronyms

ABS   Australian Bureau of Statistics
ACE   Angiotensin-converting enzyme
A2RA   Angiotensin II receptor antagonist
AIDS   Acquired immunodeficiency syndrome
AIHW   Australian Institute of Health and Welfare
APEC   Asia-Pacific Economic Cooperation
CSES   Centre for Strategic Economic Studies
DALY   Disability adjusted life year
DDD   Defined daily dose
HAART Highly active antiretroviral therapy
HIV   Human immunodeficiency virus
OECD   Organisation for Economic Cooperation and Development
PBS   Pharmaceutical Benefits Scheme
SSRI   Selective serotonin reuptake inhibitor
WHO   World Health Organisation
UN   United Nations

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Five year cancer survival rates differ greatly across cancer sites, but have improved significantly for most types of cancer.

Change in five-year cancer survival rates, Victoria, 1990 to 2004
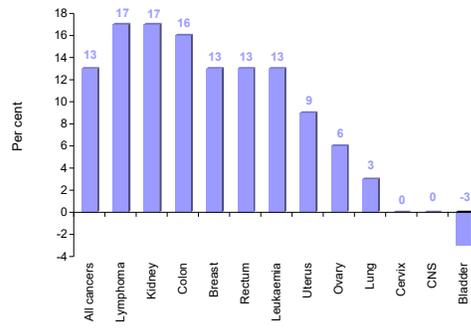
Source: Cancer Council Victoria Epidemiology Centre 2007.

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