

# Our hearts and minds — what would it take for Australia to become the healthiest country in the world?

Ian T Ring and John F O'Brien

In a period when the health debate has been dominated by issues such as waiting times for elective surgery and distribution of funding responsibilities between different levels of government, a major achievement has passed without fanfare or significant media attention.

By the beginning of the 21st century, Australia had leapfrogged a group of developed countries — including Sweden, France, Italy, Iceland, Canada and Spain — to rival Switzerland for second ranking behind Japan on all-cause mortality rates (Box 1).<sup>1</sup> Closely related to these are our rankings on total life expectancy and healthy life expectancy at birth,<sup>2</sup> which are also among the best in the world.

Currently, Australia's rate of reduction in death rates parallels Japan's, and the gap in life expectancy between the two nations has also narrowed from a peak in the late 1980s.<sup>1</sup> But our overall position is diminished somewhat by premature deaths from several potentially preventable conditions and by inequalities in their distribution. In contemporary health policy, performance in these respective areas is conceptualised as contributions to "goodness" (absolute measures of our total rates) and "fairness" (the relative distribution of health within populations).<sup>3</sup> The interaction between the two is considerable — disadvantaged Australians die younger, principally from preventable causes. To show the impact of inequalities on our overall position, we have examined the potential gains from reducing those inequalities on the same basis as we have for the major causes of death.

While recognising the range of indicators that can be used to quantify the health and disease burden of populations, we have used mortality rates as a proxy measure because of their annual availability and general comparability across countries. It is our contention that it is now a reasonable aspiration for Australia to have the lowest mortality rate in the world within a decade, though it is unlikely that this will occur through a mere continuation of current trends.

## METHODS

In 1990, Armstrong<sup>4</sup> introduced to broader population health research the notion of

## ABSTRACT

**Objective:** To highlight recent reductions in mortality rates in Australia and identify conditions and population groups with the greatest potential for further reduction in mortality rates.

**Design:** International benchmarking and intranational comparisons of mortality rates were used to identify areas with the greatest potential for improvement.

**Results:** Latest data from Organisation for Economic Cooperation and Development (OECD) countries confirm that, while Japan's death rates remain the lowest in the world, Australia's are decreasing rapidly and we now rival Switzerland for second overall ranking. When the contributions of specific conditions are compared, the areas with the greatest potential for reductions are circulatory diseases (especially ischaemic heart disease); suicide; injury and violence; smoking-related conditions; and cancers amenable to prevention/early detection. Intranational comparisons show considerable scope for reduction in inequalities, especially those between Aboriginal and Torres Strait Islander peoples and other Australians, between males and females, and between low and high socioeconomic groups. These conditions and inequalities are highly interrelated, as differentials in health status are often mediated through broader societal inequalities.

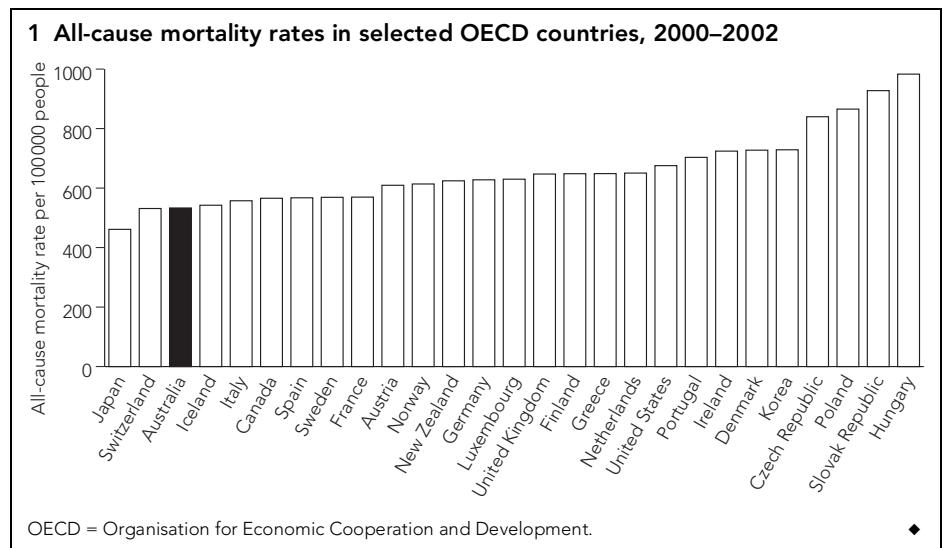
**Conclusions:** Australia should aim to become the country with the lowest mortality rate in the world. This could realistically be achieved by benchmarking performance nationally and internationally, applying current knowledge and available interventions, matching policies with funding, and implementing systemic national programs and activities to promote health and prevent "illth".

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"Arcadian normals" — the lowest mortality rates being achieved in European and other developed countries whose people are of predominantly European background (the United States, Canada, Australia and New Zealand). He compared prevailing Australian rates with those in the best-performing

country and deemed the excess to be the "proportion preventable in Australia".

We used Organisation for Economic Cooperation and Development (OECD) health data for 2004–2006 (pertaining to the period 2000–2002) to identify Australia's position relative to other developed coun-



tries for all-cause mortality and selected specific causes. Our analysis included Japan (the country with the world's lowest all-cause mortality rate), Korea (which, despite high rates of death from stroke and modest overall performance, has some of the lowest rates of ischaemic heart disease and several cancers in the developed world) and several other OECD countries for which reliable recent data were available.

We indexed the difference in the age-standardised mortality rates between Australia and Japan to equal 100 points. We then calculated the number of points that could be gained by equalling the best-performing countries on a range of selected conditions. Rates in the "best-performing country" are not meant to imply finite limits. For example, while Australia's death rate from accidental falls is the lowest in the world, current evidence suggests there is substantial scope for improvement,<sup>5</sup> and the same probably applies in the leading country for each of the selected conditions. While these comparisons require appropriate caveats around the consistency of cause-of-death coding across OECD countries and

the effect on subsequent death rates from other causes when fatal events are averted, this approach reveals many opportunities for improvement in Australia.

We also examined several known inequalities within Australia — between Indigenous and non-Indigenous people, males and females, and high and low socioeconomic groups — and expressed these using the same set of points. We ranked geographical areas and grouped them into quintiles (fifths of the population) according to the Australian Bureau of Statistics Index of Relative Socio-economic Disadvantage,<sup>6</sup> and into deciles (tenths) according to all-cause mortality rates.

## RESULTS

### International comparisons

In Armstrong's 1990 study, Switzerland had the lowest all-cause mortality, and the proportion preventable in Australia was calculated at 13.4%. Had Japan been included in the original analysis, a further 12.1% would have been preventable in Switzerland, indicating the margin by which Japan then led the world.

A decade later, Australia had caught up with Switzerland and overtaken all the other original comparison countries on all-cause mortality and had also reduced the gaps on several specific conditions. However, when compared with Japan on the same basis, the proportion preventable in Australia in 2000 was still about 13%.

An update of Armstrong's original comparisons is shown in Box 2, and an inequality dimension is added in Box 3. Both analyses use 100 points to compare the potentials for reducing or eliminating the gap between Australia and Japan. Circulatory conditions, diabetes, selected cancers and suicide provide the greatest potential for reduction in mortality. For most of the conditions selected, at least one other country is achieving a rate better than halfway between Australia and the world's best.

### Differences within Australia

Several aspects of inequality in mortality rates within Australia are shown in Box 3 and Box 4.

The potential for reducing excess death rates among Indigenous Australians is striking.

## 2 If Australia needed to achieve 100 points\* to equal the lowest mortality rates in the world, where could they come from?† (specific causes of mortality, Australia v other OECD countries)

Condition	Australian rate‡	Rate‡ for best-performing OECD country	Points* gained if Australia equalled best	OECD countries already achieving rates better than halfway between Australia and the best performing country
Ischaemic heart disease	102.6	JAP (32.5)	89	KOR, POR
Stroke	45.5	SWI (33.4)	15	FRA, CAN
Colorectal cancer	20.6	GRE (11.9)	11	KOR, FIN, SWI
Lung cancer	32.1	POR (20.9)	14	SWE, FIN
Skin cancer	4.6	KOR/JAP (0.2)	6	POR, SPA, FRA, GER, POL, CAN, UK, FIN, USA, HUN
Breast cancer	21.3	KOR (5.1)	10	JPN
Prostate cancer	27.2	KOR (6.6)	14	JPN
Cervical cancer	2.1	ITA (0.8)	2	GRE
Suicide	11.1	GRE (2.4)	11	None
Land transport accidents	9.7	UK (5.8)	5	SWE, NED, SWI, NOR
Assault	1.5	JAP (0.6)	1	GER, FRA, GRE, UK, OST, ITA, SPA, SWI, NOR, IRE, SWE, DEN
Accidental falls	2.5	AUS (2.5)	0	None
Bronchitis, emphysema, asthma	5.2	GRE (0.6)	6	FIN
Diabetes	13.0	GRE (4.9)	10	JPN, ICE, FIN, UK
Chronic liver disease and cirrhosis	5.0	ICE (1.1)	5	None
Infant mortality§	4.7	ICE/JAP (2.8)	4	SWE, NOR, FIN, SPA, CZE
All-cause mortality	528.3	JAP (449.3)	100	None

AUS = Australia. CAN = Canada. CZE = Czech Republic. DEN = Denmark. FIN = Finland. FRA = France. GER = Germany. GRE = Greece. HUN = Hungary. ICE = Iceland. IRE = Ireland. ITA = Italy. JAP = Japan. KOR = Korea. NED = Netherlands. NOR = Norway. OECD = Organisation for Economic Cooperation and Development. OST = Austria. POL = Poland. POR = Portugal. SPA = Spain. SWE = Sweden. SWI = Switzerland. UK = United Kingdom. USA = United States of America.

\* Total points derived by converting gap in all-cause mortality between Australia and best-performing country (Japan) to an index of 100. † Source: OECD health data 2004, 2005 and 2006 (data for 2000–2002).<sup>1</sup> All rates were age-standardised to the 1980 OECD standard population. ‡ Age-standardised rate per 100 000 population.

§ To enable comparability with other causes of death, rates of infant death per 1000 live births were converted to direct rates per 100 000 people to calculate points.

ing: studies using socioeconomic indexes demonstrate significant mortality gradients between our least and most disadvantaged areas (Box 3).

When the various geographical areas of Australia — in this case, aggregations of Statistical Local Areas into HealthWIZ Areas<sup>7</sup> — are ranked by all-cause mortality rates, there is a twofold difference between the top and bottom deciles (Box 3, Box 4).

Reducing the male:female mortality ratio to Iceland's level would reduce the overall gap with Japan by almost 40%. There appears to be more potential to reduce female than male mortality (Box 3).

Age-specific comparisons with Japan (Box 5) show higher mortality rates for Australians at virtually every age, with the exception of men in their middle years.

## DISCUSSION

Overall, Australia is already one of the healthiest countries in the world. If each

Australian all-cause mortality decile was a hypothetical sovereign nation of about two million people, the first three "nations" would already be healthier than Japan (Box 4). Our first decile would be far and away the healthiest country in the world, while our tenth would fare a little worse than the United Kingdom and the United States, but better than the countries of eastern Europe (Box 4). Collapsing our top five and bottom five deciles into two halves, the top half would still be the healthiest country in the world (Box 3), while the bottom half would be better than two-thirds of the countries in the OECD. While aggregation into deciles masks vast differences in the experiences of individuals and groups within them, these groupings serve to illustrate how well Australia performs overall and the sound base on which we can build.

Nevertheless, there is considerable room for improvement if we want to match the world's best. Mortality is 100% higher in male blue-collar workers in Australia, and

40% higher in female blue-collar workers, than in their white-collar counterparts,<sup>8</sup> though manual/non-manual comparisons show a lesser degree of inequality.<sup>9</sup> The gap of 5.2 years between males and females in life expectancy recorded in 2000–2002 has narrowed even further in recent years, and Australia ranks around the middle of developed countries on this indicator. Within the sexes, a persistent 4-year gap in life expectancy between males in the least and most disadvantaged areas and a corresponding 2-year gap in females can be demonstrated.<sup>10</sup>

Age-specific comparisons with Japan show higher mortality rates for Australians at virtually every age, with the exception of men in their middle years. This is largely a legacy of very high smoking rates among Japanese males, although other lifestyle factors, including a healthier diet and low levels of overweight, appear to confer health benefits in Japan. In contrast, very low smoking rates among Japanese women, at least in the older cohorts, have been a major

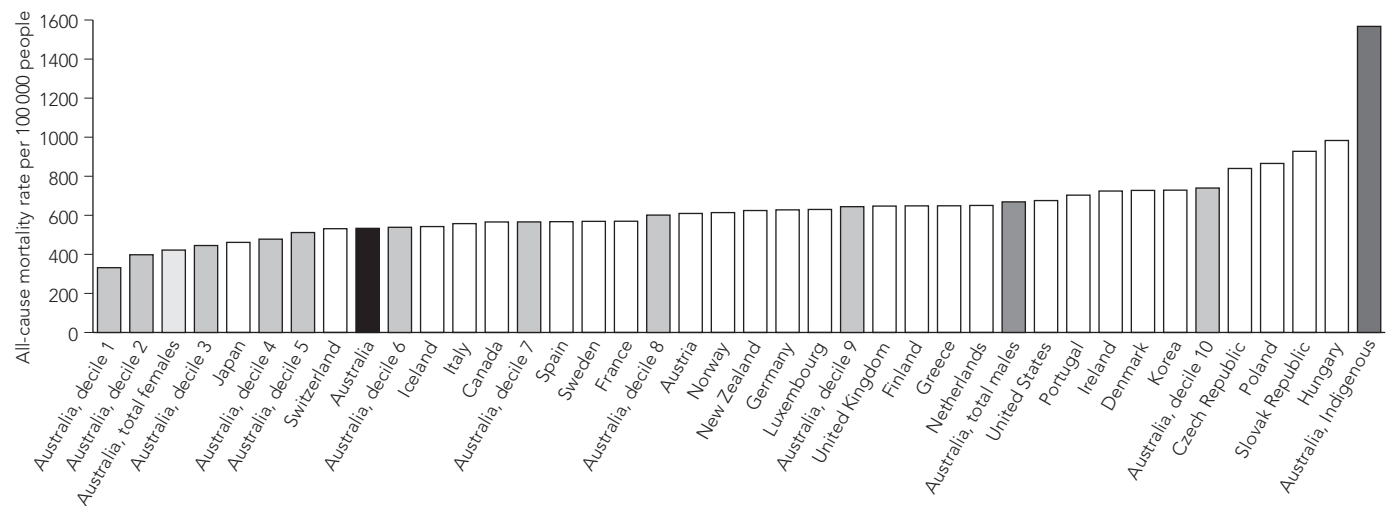
### 3 If Australia needed to achieve 100 points\* to equal the lowest death rates in the world, where could they come from? (inequalities within Australia and compared with other OECD countries)<sup>†</sup>

Inequalities	Australian rate	Rate for best-performing country, population group or area	Points* gained if Australia equalled best	OECD countries, population groups or areas already achieving rates better than halfway between Australia and the best-performing country, group or area
Indigenous (AUS) c/w Indigenous (USA, CAN, NZ) <sup>‡</sup>	1567.3	Indigenous (USA) (652.2)	29	NZ, CAN (the only other countries compared)
Indigenous (AUS) c/w non-Indigenous (AUS) <sup>§</sup>	1567.3	Non-Indigenous (AUS) (501.7)	34	NZ, CAN (the only other countries compared)
Male:female ratio (AUS) c/w M:F ratio (other OECD countries) <sup>¶</sup>	668.8	ICE (610.1)	39	Deciles 1, 2 and 3, but no OECD country
Males (AUS) c/w females (AUS)**	668.8	Females (AUS) (421.9)	164	Decile 1, but no OECD country
Males (AUS) c/w males (world's best)	668.8	Males (JAP) (640.0)	15	Deciles 1, 2, 3 and 4; ICE
Females (AUS) c/w females (world's best)	421.9	Females (JAP) (329.1)	85	Deciles 1, 2, 3, but no OECD country
Overall socioeconomic level (AUS) c/w quintile 1 (AUS) <sup>††</sup>	528.3	Quintile 1 (AUS) (471.8)	72	JAP
Total area-based mortality rate (AUS) c/w decile 1 mortality rate (AUS) <sup>‡‡</sup>	528.3	Decile 1 (AUS) (331.8)	249	Decile 2, but no OECD country
Top 50% area-based mortality rate (AUS) c/w bottom 50% area-based mortality rate <sup>§§</sup>	611.4	Top 50% (AUS) (445.2)	105	Deciles 1 and 2, JAP, Deciles 4 and 5
All-cause mortality	528.3	JAP (449.3)	100	Decile 4 (Deciles 1, 2 and 3 already exceed Japan)

AUS = Australia. CAN = Canada. c/w = compared with. ICE = Iceland. JAP = Japan. M:F = male:female. NZ = New Zealand. OECD = Organisation for Economic Cooperation and Development. USA = United States of America.

\* Total points derived by converting gap in all-cause mortality between Australia and best-performing country (Japan) to an index of 100. † Sources: OECD health data 2004, 2005 and 2006 (data for 2000–2002);<sup>1</sup> international Indigenous rate ratios from Ring, Firman and Elston (unpublished data); socioeconomic rate ratios from the Australian Bureau of Statistics Socio-Economic Indexes for Areas (Index of Relative Socioeconomic Disadvantage);<sup>6</sup> area-based rate ratios for mortality deciles from HealthWIZ data for Australia, 1997–1999.<sup>7</sup> All rates were age-standardised to the 1980 OECD standard population. ‡ Index based on weighted effect of Indigenous mortality disadvantage in USA, NZ, Canada and Australia. Best Indigenous: total population rate ratio (USA) is applied to rate for whole of Australia. § Index is based on the weighted effect of Indigenous mortality, but comparison shows effect if (hypothetically) difference between Indigenous and total Australian population were eliminated completely. ¶ Rate for Australian males is compared with rate that would apply if lowest M:F rate ratio (Iceland) were applied to rate for Australian females. Points are weighted for proportion of total deaths. \*\* Rates for Australian males are compared directly with rates for Australian females. Potential for gain is weighted for proportion of total deaths. †† Total Australian rate is compared with lowest Australian Index of Relative Socioeconomic Disadvantage quintile. Potential for gain is based on all Australia equalling lowest quintile. ‡‡ Total Australian rate compared with lowest mortality decile in Australia. Potential for gain is based on all Australia equalling lowest mortality decile. §§ Potential gain if lower-performing half of Australia achieved same rates as upper-performing half. ◆

#### 4 All-cause mortality rates in Australia (total population, males and females, Indigenous people, and mortality deciles) and selected OECD countries, 2000–2002



contributor to high life expectancy of Japanese women — almost 2 years higher than that in any other country. This advantage may decrease in the next decade as the leading edge of the smoking epidemic among younger Japanese women begins to have an impact. When these comparisons are converted to person-years of life lost, the impact of higher infant mortality and premature deaths (particularly in young Australian males) becomes apparent. In 2000, Australians lost 909 618 years of life due to death before 75 years of age. On Japan's death rates, we could have saved 117 607 of these years of life.

What is overwhelmingly clear is that the greatest potential for improvement lies in preventing ischaemic heart disease and reducing inequalities within Australia — Indigenous/non-Indigenous, male/female, and probably socioeconomic inequalities as well. These inequalities are, to a considerable extent, expressed through potentially preventable conditions, such as heart disease, smoking-related diseases, suicide and certain types of cancer.

Although our rates of heart disease have halved in a decade, we could almost become the country with the lowest mortality rate in the world just by matching Japan or Korea on this condition alone. The Australian Government's announcements in the 2006–07 and 2007–08 budgets in relation to improved chronic disease prevention and management are therefore particularly welcome. Although we have made steady gains in reducing cancer and now perform relatively well on injury, our suicide rates

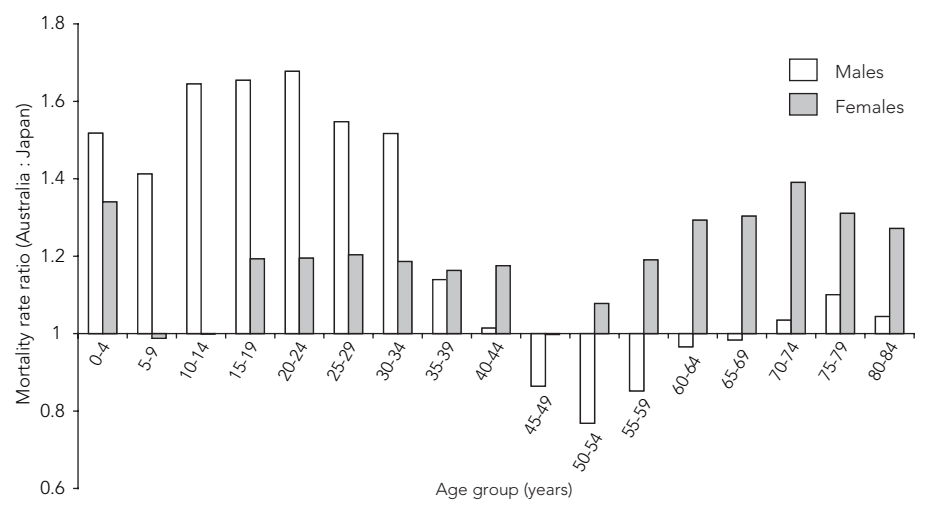
remain high and there is considerable potential for gain in the area of mental health. Unlike many previous policies, those on chronic disease and mental health have been given funding support.

Despite the progress made in Australia with reducing smoking, our analysis indicates there is further potential for reduction of smoking-related conditions. Moreover, smoking is a significant component of the three main inequalities within the Australian population. If we were to weight the analysis according to age, suicide and infant mortality would also be areas in which there would be considerable opportunity for reducing mortality rates.

There is evidence of recent modest gains in some aspects of Indigenous health,<sup>11,12</sup>

but there has been relatively little progress in reducing the overall gap between Indigenous and non-Indigenous populations in Australia.<sup>13</sup> Although Indigenous Australians account for only about 2.5% of the population, they account for about a third of the total mortality gap between Australia and Japan. Elimination of the 17–18-year difference in life expectancy between Indigenous Australians and their non-Indigenous counterparts would add about 5 months to the total life expectancy of Australians. Massive inequalities persist — around birth, in childhood, in youth and young adulthood — culminating in a fivefold differential by middle age. Both absolute and relative disparities in life expectancy between Indigenous and non-Indigenous populations are larger in Aus-

#### 5 Age- and sex-specific mortality rate ratios, Australia : Japan, 2001 (Japan = 1)



tralia than in New Zealand, Canada or the USA.<sup>14</sup>

Socioeconomic differences in mortality in Australia, particularly among men, are sizeable and have not received sufficient attention. Being male is now the single largest demographic risk factor for early mortality in developed countries,<sup>15</sup> and it is clear that much of the widening differential between males and females in the 20th century and the recent narrowing of the sex differential is attributable to cigarette smoking.<sup>16</sup> Inequalities between and within the sexes indicate a need for both broadly-based and sex-specific strategies.

Socioeconomic differentials in mortality between manual and non-manual workers in Australia are relatively low compared with other countries. In Australian men aged 20–59 years, the ratio of mortality in manual workers to mortality in non-manual workers was 1.34 in 1991–1995,<sup>9</sup> whereas the lowest ratio reported in a European study of men aged 30–59 years in 1991–1995 was 1.46 in Denmark.<sup>17</sup> The comparisons are not exact, but unlike most other measures listed in Box 3, we have not found other countries that have smaller socioeconomic differentials in mortality on this measure. Nonetheless, health inequalities in Australia are sizeable, increasing and invariably greatest for preventable conditions and in younger age groups,<sup>8</sup> and the non-fatal consequences of these can reduce health trajectories throughout the life course.

The need now is to routinely identify the potential for gain in health in Australia through international and intranational benchmarking, and systematically assess the effectiveness and cost of interventions targeting the conditions and inequalities with the greatest potential for gain for consideration by the Council of Australian Governments. There is also a need to monitor implementation of these initiatives to ensure that the nature and scale of the interventions is optimal. In short, becoming the best requires redirection of policies and requires Australia to lift its game on measurement and the management use of national health information and to leave behind the era of resource-free policies!

These gains in health could be achieved through the application of current knowledge and systemic national effort to improve the societal factors that improve health and prevent “illth”. These measures would not only improve health — they

could help contain or defer increasing health costs and enhance the sustainability of the Australian health system. It is interesting to note that Japan, the healthiest country in the world, is estimated to spend less per capita on health than Australia and has a lower annual growth rate in health expenditure, a larger proportion of health expenditure provided from public sources, a lower heart disease death rate, a much lower infant mortality rate, a lower consumption of alcohol and a lower level of obesity.<sup>1</sup>

It is reasonable for Australia to aspire to become the world's healthiest country within a decade. But we would need to put our minds, resources and energies to the task of identifying and addressing the areas of potential gain. And above all, we would have to do much better with our hearts!

### Limitations

Our analysis shows broad directions only and the relative importance of different topics in terms of mortality. We did not attempt to look at other measures, such as years of life lost, nor to assess morbidity or burden of disease, as valid international comparisons for the inequality measures we have examined are not readily available for morbidity-related items. International comparisons are fraught with difficulty and we do not wish to infer a degree of precision in the comparisons that the data and our methods would not support. However, in our view, the broad thrust of the mortality data is clear.

### COMPETING INTERESTS

None identified.

### AUTHOR DETAILS

Ian T Ring, MBBS, MSc(Stats/Epid), FAFPHM, Professorial Fellow<sup>1</sup>

John F O'Brien, MHSc, Director<sup>2</sup>

<sup>1</sup> Centre for Health Service Development, University of Wollongong, Wollongong, NSW.

<sup>2</sup> Epidemiology Services Unit, Health Information Centre, Queensland Health, Brisbane, QLD.

Correspondence: iring@uow.edu.au

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