

# 7 Health determinants

- Smoking
- Alcohol
- Child immunisation
- Dietary intake
- Physiological and anthropometric measures
- Social and economic environment
- Physical environment

# Smoking

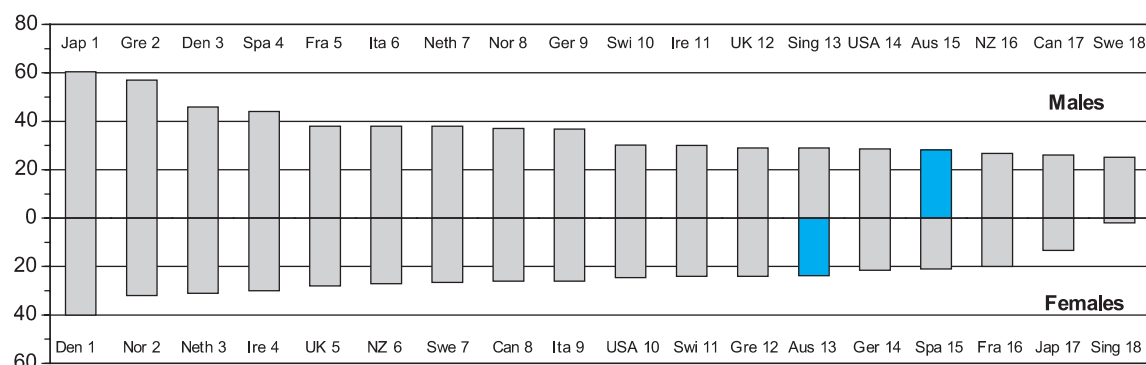


Figure 1: Proportion of population aged 15 years and over who are regular smokers, 1992

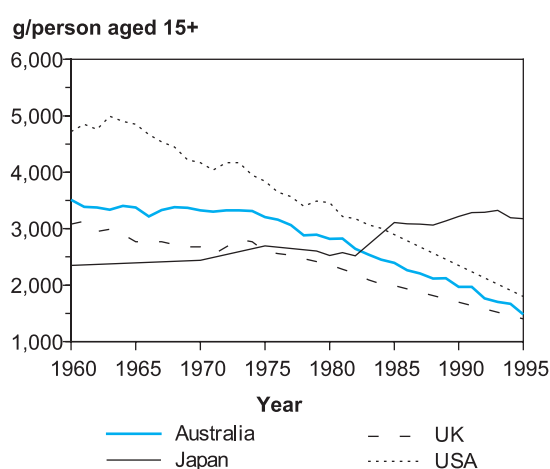


Figure 2: Tobacco consumption, 1960 to 1995

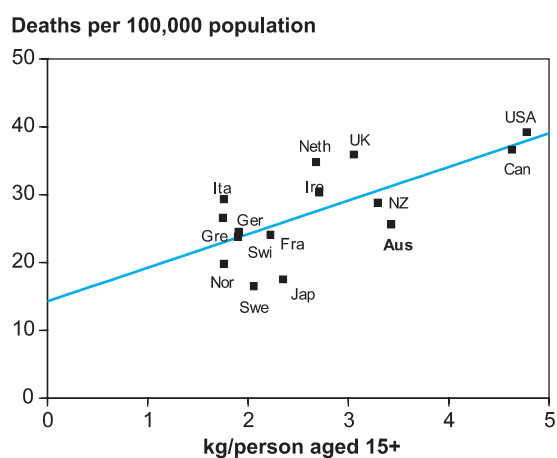


Figure 3: Tobacco consumption, 1960-62 and lung cancer mortality, 1990-92

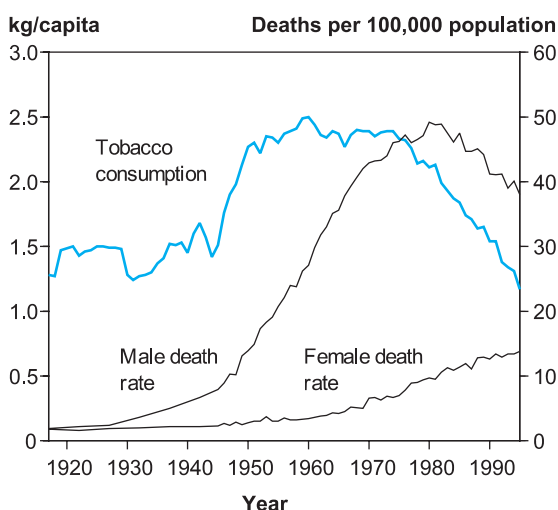


Figure 4: Tobacco consumption and lung cancer mortality, Australia, 1917-1995

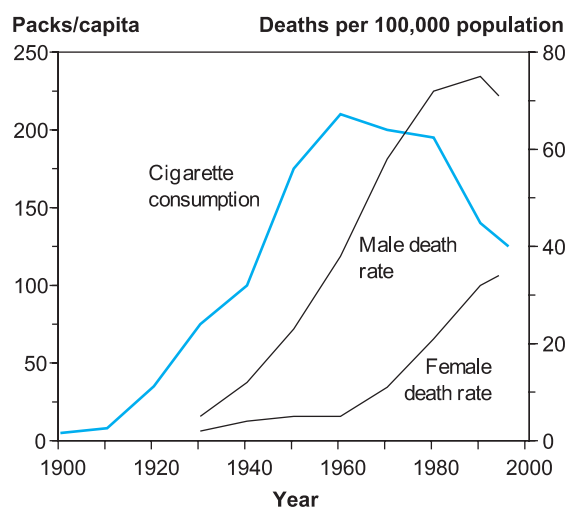


Figure 5: Cigarette consumption and lung cancer mortality, United States, 1900-1994

## Smoking

### Self-reported cigarette smoking and apparent tobacco consumption

Country	Year	Proportion who smoke regularly		Average number of cigarettes per day	Tobacco consumption (g/capita aged 15+)
		% males	% females		
Australia	1995	27.1	23.2	18.9	1995–96 1,480
Canada	1993	30.0	28.0	20.0	1995 1,800
Denmark	1996	36.0	36.0	15.8	1996 2,170
France	1992	38.0	20.0	14.7	1996 2,010
Germany	1995	35.6	21.5	15.6	1995 1,800
Greece	1994	46.0	28.0	—	1995 2,500
Hong Kong	1990	29.0	3.0	—	—
Ireland	1994	29.0	28.0	21.5	1995 1,800
Israel	—	—	—	—	1995 1,600
Italy	1994	38.0	26.0	—	1995 1,600
Japan	1996	57.5	14.2	23.2	1995 3,180
Netherlands	1995	40.9	31.2	—	1995 2,300
New Zealand	1995	27.0	26.0	14.6	1995 1,420
Norway	1996	34.0	33.0	12.8	1997 1,550
Singapore	1992	29.0	2.0	—	1995 2,500
Spain	1995	43.5	24.5	16.8	1995 2,100
Sweden	1994	21.6	23.8	15.3	1996 1,710
Switzerland	1992	30.1	24.1	—	1995 2,000
UK	1994	28.0	26.0	—	1995 1,400
USA	1992	28.6	24.6	—	1995 1,800

Note: Self-reported smoking data are for persons aged 15 years and over, except for Australia, Sweden and the United Kingdom (16+ years), the United States (18+ years) and Japan (20+ years). Definitions and concepts may vary between countries.

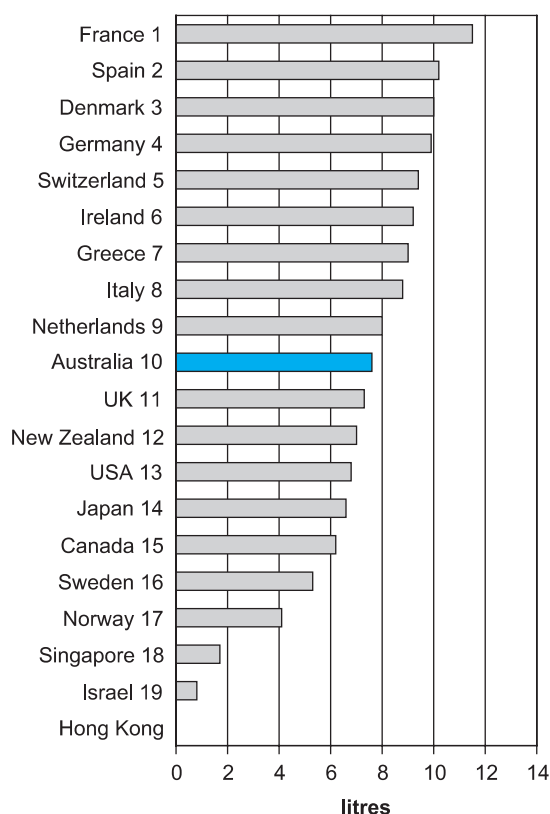
Sources: OECD 1998; Winstanley et al. 1995; Doyle 1997; World Bank 1997; AIHW unpublished.

- Tobacco smoking is a major risk factor for several diseases, including heart disease, stroke, lung cancer and chronic lung disease, and is the largest single preventable cause of premature mortality and illness. Nearly one in five deaths in developed countries are attributed to the effect of cigarette smoking (Peto et al. 1992).
- Self-reported figures indicate that approximately one-quarter of the Australian population were regular smokers in 1995 (27% males, 23% females), smoking an average of 19 cigarettes per day. Tobacco smoking in Australia, especially of manufactured cigarettes, increased markedly following World War II, due to wide availability and low cost (Winstanley et al. 1995). However, apparent consumption has decreased steadily since the 1960s, from an estimated 3,500 g per capita in 1960–61 to 1,500 g in 1995–96.
- In 1992, among 18 developed countries, only New Zealand, Canada and Sweden reported a lower proportion of men smoking regularly than did Australia. For women, Germany, Spain, France, Japan and Singapore reported lower rates. There were large male–female disparities in tobacco smoking for France, Greece, Japan, Spain and Singapore (Figure 1).
- Tobacco consumption is decreasing in most developed countries except, notably, in Japan (Figure 2). Smoking prevalence is increasing in a number of developing regions, especially Asia, as levels of disposable income increase along with economic development.
- Trends in tobacco consumption are closely reflected in lung cancer mortality—a major consequence of cigarette smoking—given a time lag. The two variables are closely correlated, both over time and across international boundaries (Figures 3, 4 and 5).
- The slow decline of cigarette smoking among Australian and United States women in recent decades, in contrast to more rapid declines among men, is also reflected in lung cancer mortality trends. Whereas mortality among men appears to have peaked almost a quarter of a century after the peak of tobacco consumption in 1960, it is still on the rise among women.

#### For more information, see:

Winstanley M, Woodward S, Walker N 1995. Tobacco in Australia: facts and issues. Carlton South: Victorian Smoking and Health Program.

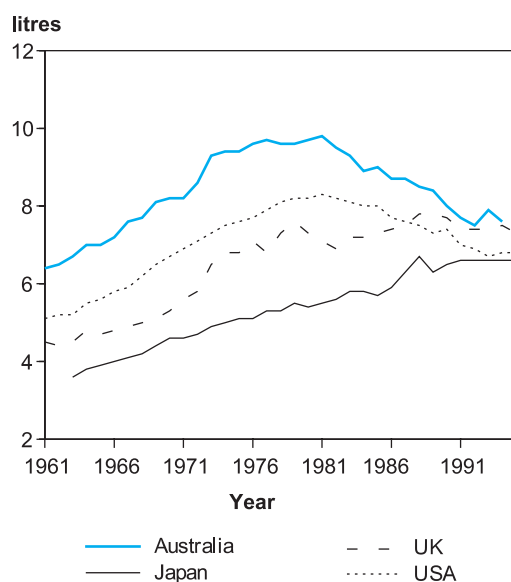
## Alcohol



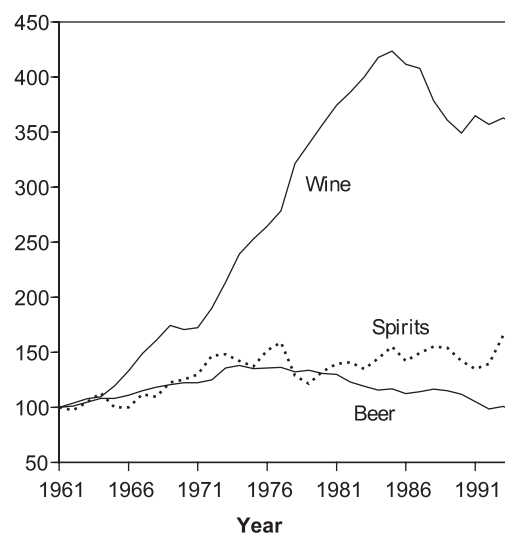
**Figure 1: Apparent alcohol consumption per capita, 1995**



**Figure 2: Changes in apparent alcohol consumption per capita, 1970–1995**



**Figure 3: Trends in apparent alcohol consumption per capita, 1961 to 1995**



**Figure 4: Trends in alcohol consumption in Australia (base year 1961–62 = 100)**

## Alcohol

### Apparent per capita consumption of alcohol (in litres), by beverage type, 1995

Country	Beer	Wine	Spirits (pure alcohol)	Total (pure alcohol)
Australia	95.4	18.2	1.35	7.6
Canada	70.0	8.2	1.75	6.2
Denmark	120.1	27.6	1.07	10.0
France	39.1	63.5	2.52	11.5
Germany	137.7	22.2	2.20	9.9
Greece	42.2	34.5	2.70	9.0
Hong Kong	—	—	—	—
Ireland	141.3	16.1	1.70	9.2
Israel	8.4	3.1	—	0.8
Italy	25.4	60.4	0.90	8.8
Japan	58.0	1.0	2.00	6.6
Netherlands	85.8	16.6	1.74	8.0
New Zealand	98.8	16.8	1.13	7.0
Norway	53.5	7.1	0.81	4.1
Singapore	22.0	0.7	0.50	1.7
Spain	66.6	36.3	2.50	10.2
Sweden	64.5	12.7	1.46	5.3
Switzerland	62.2	43.6	1.49	9.4
UK	102.7	12.8	1.33	7.3
USA	87.9	6.8	1.97	6.8

Note: Calculated by converting the amount of beverage consumed into litres of pure alcohol based on an average alcoholic strength of 5% for beer and 12% for wine unless official strengths were known for the country concerned. Spirits are shown in terms of pure alcohol.

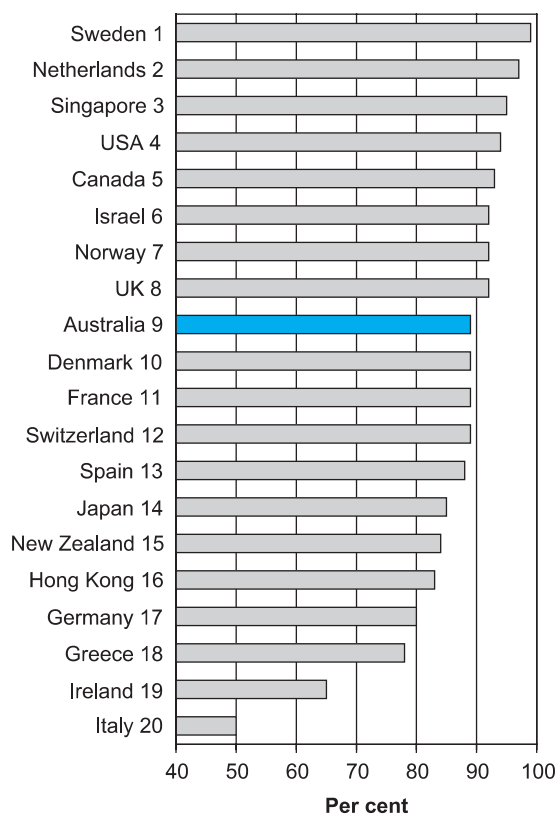
Source: Produktschap voor Gedistilleerde Dranken 1996.

- Alcohol abuse is a dominant drug problem in developed countries. Its excessive use can lead to serious health problems, including liver disease, gastrointestinal cancers and cardiovascular disorders. It plays a major role in deaths and disabilities due to injury, and is a leading cause of road traffic accidents. Fetal exposure to alcohol may also cause mental retardation.
- Data for apparent per capita consumption of pure alcohol indicate that in 1995, Australia ranked tenth amongst 20 developed countries (Figure 1)—it also ranked sixth for beer consumption, eighth for wine consumption and 12th for spirits consumption per capita. Alcohol consumption per capita peaked in Australia and the United States in the early 1980s. However, it continues to rise in many countries, including the United Kingdom and Japan (Figures 2 and 3).
- Ireland, Germany and Denmark had high per capita consumption of beer in 1995. France and Italy had high per capita wine consumption, and Greece, France and Spain high per capita consumption of spirits. It should be noted that the 'French paradox' of low ischaemic heart disease mortality despite a high saturated fat intake has been at least partly attributed to high alcohol consumption and the intake of antioxidant vitamins, both being supplied by wine (Burr 1995).
- Per capita data regarding alcohol consumption give little information as to the number of persons engaging in risk drinking behaviour. Drinking patterns, including binge drinking, frequency of intoxication and amount of consumption, are revealed through population-based surveys, which by and large are not comparable between countries.
- In Australia, the 1995 National Drug Strategy Household Survey revealed that 28% of males and 33% of females aged 14 or more usually consumed alcohol at hazardous or harmful levels. In the two weeks prior to the survey, 8% of male current drinkers and 5% of female current drinkers had consumed alcohol at very harmful levels, i.e. more than 8 standard drinks for females, and more than 12 for males.

#### For more information, see:

Lader M, Edwards G, Drummond DC (eds.) 1992. The nature of alcohol and drug related problems. Society For the Study of Addiction Monograph No. 2. Oxford: Oxford University Press.

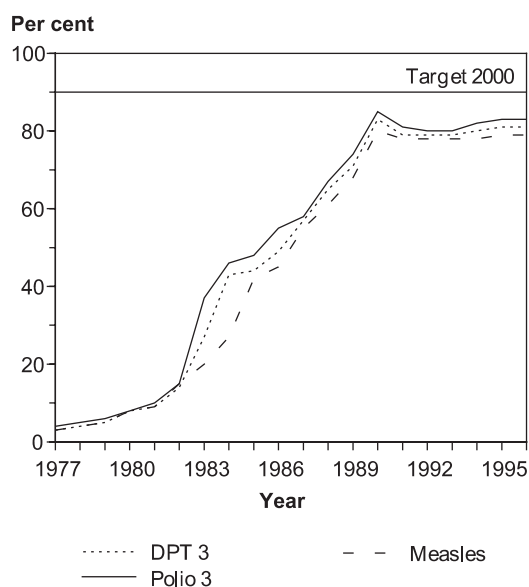
## Child immunisation



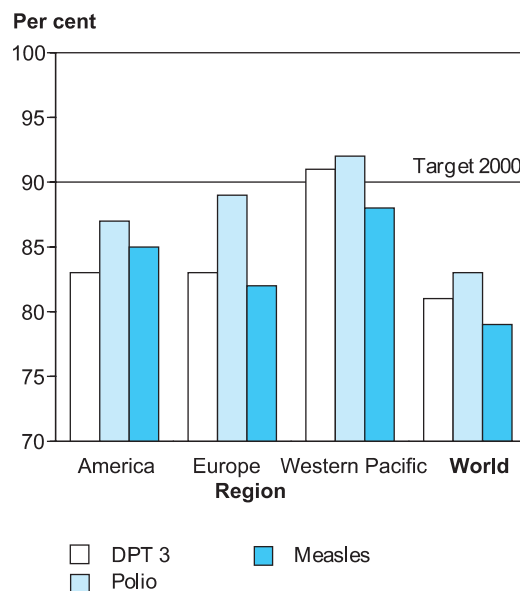
**Figure 1: 1-year-old children fully vaccinated for DPT, 1990-1995**



**Figure 2: 1-year-old children fully vaccinated for polio, 1990-1995**



**Figure 3: Global EPI coverage, 1-year-old children, 1977 to 1996**



**Figure 4: Vaccination coverage of 1-year-old children by selected WHO regions, 1996**

## Child immunisation

### Estimated proportion of 1-year-old children fully vaccinated<sup>(a)</sup>

Country	Year	DPT 3	Polio 3	Measles
Australia	1995	89	86	86
Canada	1994	93	89	98
Denmark	1994	89	100	88
France	1991–92	89	92	76
Germany	1994	80	80	75
Greece	1994	78	95	70
Hong Kong	1994	83	84	77
Ireland	1990–91	65	63	78
Israel	1994	92	93	94
Italy	1995	50	98	50
Japan	1993	85	91	68
Netherlands	1993	97	97	95
New Zealand	1994	84	84	87
Norway	1993	92	92	93
Singapore	1995	95	93	88
Spain	1994	88	88	90
Sweden	1994	99	99	96
Switzerland	1991	89	95	83
UK	1994	92	94	92
USA	1994	94	84	89
Global average	1996	81	83	79

(a) Coverage for children aged up to 2 years are included for countries recommending vaccination at, or later than, 12 months. Three primary doses of polio and DPT vaccine, and one of measles and BCG vaccine (not shown here).

Sources: WHO 1996a; ABS 1996a.

- Lack of immunity is a risk factor for several devastating infectious diseases. Immunisation against preventable diseases such as diphtheria, pertussis (whooping cough), tetanus, measles and poliomyelitis is an effective public health measure. In 1990 alone, immunisation is estimated to have prevented 3.2 million deaths from measles, neonatal tetanus and pertussis, and 445,000 cases of paralysis from poliomyelitis worldwide (WHO 1992a).
- The Expanded Programme on Immunisation (EPI), initiated by the World Health Organization in 1974, aims to achieve global coverage against a number of vaccine-preventable diseases. Most developed countries are on target to achieve the year 2000 WHO goals of 90% immunisation and the global eradication of poliomyelitis (Figures 1 and 2). By 1996, some 83% of the world's infants were estimated to have received all three primary doses of polio vaccine. Global coverage was estimated to be 81% for all three primary doses of DPT (diphtheria-pertussis-tetanus) vaccine and 79% for measles (Figures 3 and 4).
- The endorsement of immunisation targets such as those for the year 2000 aids in spurring the international community to action. To date, success in immunisation has been achieved through the cooperative efforts of national governments and development agencies, WHO, UNICEF and other nongovernment organisations. Investment in immunisation not only saves lives but also reduces the need for costly curative and rehabilitative care.
- Although in 1995 Australian vaccination levels at 12 months of age were considered satisfactory, levels after this age declined substantially. To be fully vaccinated according to the NHMRC schedule, children need to attend a clinic or visit a doctor at least six times, at 2, 4, 6, 12, 18 months of age and prior to school entry. Recent outbreaks of preventable diseases have spurred efforts to address low immunisation levels.

#### For more information, see:

Kim-Farley R 1992. Global immunization. *Ann Rev Public Health* 13: 223–38.

## Dietary intake

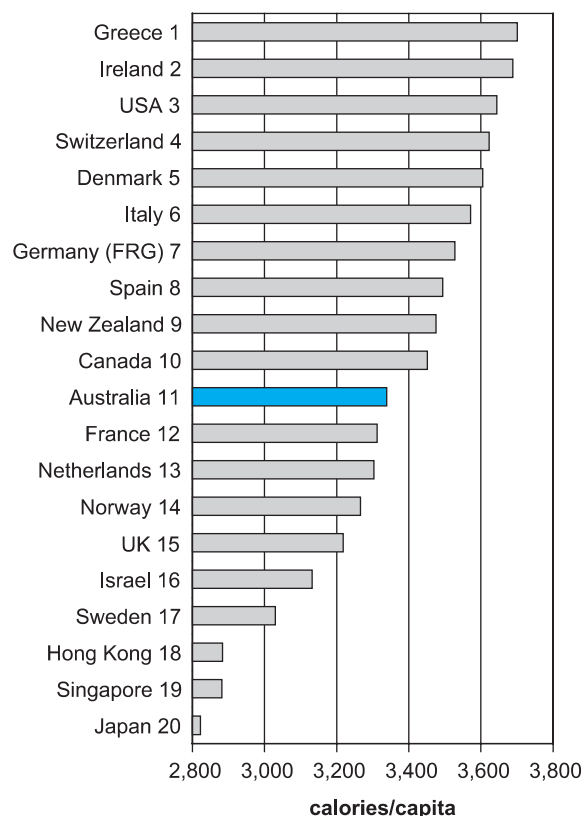


Figure 1: Daily energy intake, 1986-88



Figure 2: Daily fat intake, 1986-88

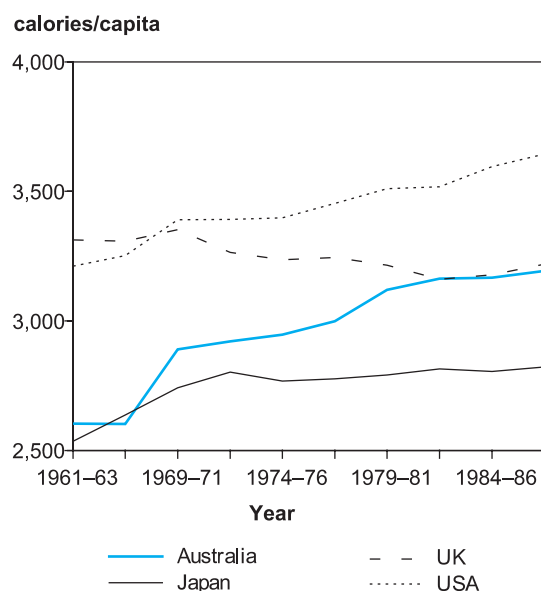


Figure 3: Trends in daily energy intake, 1961-63 to 1986-88

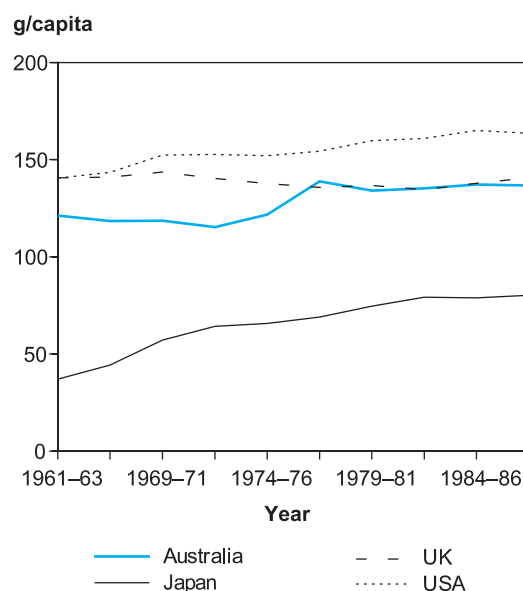


Figure 4: Trends in daily fat intake, 1961-63 to 1986-88



## Dietary intake

### Components of dietary intake

Country	Estimated daily nutrient intake (1986–88)			Apparent annual consumption	
	Energy (calories/capita)	Protein (g/capita)	Fat (g/capita)	Butter (kg/capita)	Sugar (kg/capita)
Australia	3,339	99.4	136.6	1996 2.8	1995 47
Canada	3,451	98.8	152.2	1995 2.7	1992 42
Denmark	3,605	100.5	176.0	1992 6.2	1996 43
France	3,312	112.5	141.8	1992 8.9	— —
Germany	3,528	103.5	152.6	1992 6.8	1992 34
Greece	3,701	113.0	153.9	1991 1.0	— —
Hong Kong	2,883	88.3	113.6	— —	1993 26
Ireland	3,688	108.5	148.1	1991 3.7	1991 35
Israel	3,132	98.3	122.7	1994 0.6	1994 36
Italy	3,571	110.4	144.4	1992 2.3	1992 27
Japan	2,822	89.8	80.2	1995 0.7	1993 22
Netherlands	3,303	97.6	152.3	1994 3.3	1991 40
New Zealand	3,475	109.7	143.8	1996 8.0	1996 44
Norway	3,266	100.5	136.7	1996 2.2	1993 43
Singapore	2,882	81.4	80.9	— —	1993 73
Spain	3,494	100.9	150.7	1991 0.6	1991 27
Sweden	3,030	96.2	131.0	1992 3.8	1993 44
Switzerland	3,623	100.1	169.6	1995 5.5	1993 45
UK	3,218	89.4	140.7	1992 3.1	1992 39
USA	3,644	109.0	163.5	1995 2.2	1993 32

Sources: FAO 1991; OECD 1998; United Nations 1995b; Israel CBS 1996.

- Health and diet are closely related. In developed countries, undernutrition is rare – diet-related diseases are largely associated with inactivity and the over-consumption of food. Coronary heart disease, stroke, hypertension, certain cancers, Type 2 diabetes and tooth decay can all be prevented or alleviated by a balanced diet.
- Several indicators are currently used for comparing the nutritional status of various populations. Prominent among these are daily energy, protein and fat consumption per capita. The Food and Agriculture Organisation of the United Nations (FAO) publishes three-year average food balance sheets for specified countries. Derived from food supply data, they act as surrogate indicators of food consumption in the population, hence they are termed ‘apparent consumption’.
- The latest FAO publication, covering 1986–88, ranks Australia 11th out of 20 developed countries for energy intake, and 15th for fat intake (Figures 1 and 2). Greece, the United States, Switzerland and Denmark have high intakes of both energy and fats. Hong Kong, Singapore and Japan have comparatively lower intakes of both energy and fats. Australians have comparatively higher sugar consumption and moderate butter consumption.
- Australian per capita calorie intake has increased since the early 1960s (Figure 3), but energy derived from fats and oils has remained relatively constant (Figure 4). The relative contribution of saturated and unsaturated fats in Australia is not known. Per capita energy intake from Australian and United Kingdom diets are similar, and are higher than for Japan, but not as high as for the United States.
- Australia’s food supply characteristics are similar to those of Northern Europe and the United States, but different from Italy, Greece and Asian countries. Energy derived from fats and oils continues to be much higher in European countries and the United States.
- The 1995 National Nutrition Survey provides information which will serve as a baseline for future analyses of Australian dietary intake. Similar surveys are also currently being undertaken or planned in other developed countries.

#### For more information, see:

Food and Agriculture Organisation of the United Nations 1991. FAO food balance sheets, 1984–1986 average. Rome: FAO.  
Lester IH 1994. Australia’s food and nutrition. Canberra: AGPS.

Physiological and anthropometric measures

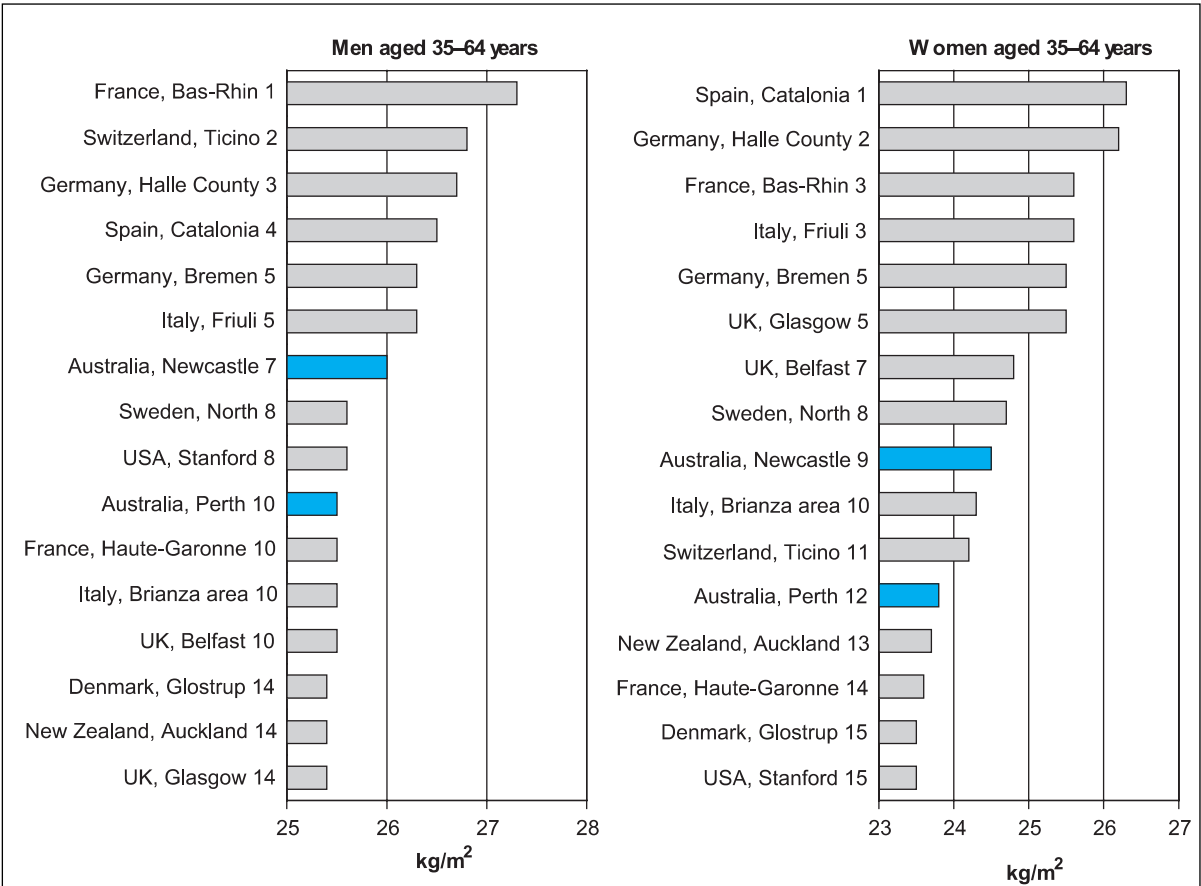


Figure 1: Mean body mass index, WHO MONICA project, 1982–1987

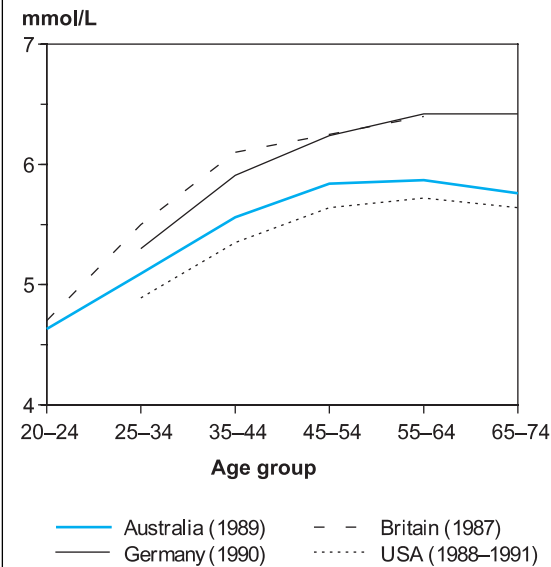


Figure 2: Mean total plasma cholesterol levels for men, by age group

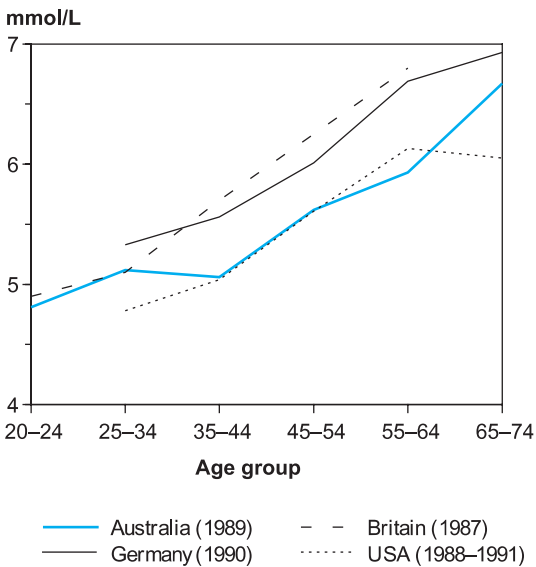


Figure 3: Mean total plasma cholesterol levels for women, by age group

## Physiological and anthropometric measures

### Total cholesterol levels, systolic blood pressure and body mass index, by sex, selected studies and WHO MONICA project

Region or country	Men			Women		
	Total cholesterol	Systolic blood pressure	Body mass index	Total cholesterol	Systolic blood pressure	Body mass index
Selected studies <sup>(a)</sup>	mmol/L	mmHg	% BMI > 30	mmol/L	mmHg	% BMI > 30
Australia (1989)	5.6	126	9	5.1	116	8
Britain (1987)	6.1	126	11	5.7	118	10
Canada (1986–1990)	5.4	123	16	4.9	114	15
Germany (1990)	5.9	129	14	5.6	119	9
New Zealand (1989)	6.2	—	13	5.8	—	13
Sweden (1988–89)	—	—	6	—	—	6
USA (1988–1991)	5.4	126	12	5.0	119	16
WHO MONICA project <sup>(b)</sup>	mmol/L	mmHg	kg/m <sup>2</sup>	mmol/L	mmHg	kg/m <sup>2</sup>
Australia, Newcastle	5.7	129	26.0	5.6	125	24.5
Australia, Perth	5.8	131	25.5	5.7	122	23.8
Denmark, Glostrup	6.2	125	25.4	6.1	121	23.5
France, Bas-Rhin	5.5	143	27.3	5.4	133	25.6
France, Haute-Garonne	5.9	130	25.5	5.7	125	23.6
Germany, Bremen	6.0	139	26.3	6.0	135	25.5
Germany, Halle County	—	137	26.7	—	138	26.2
Italy, Brianza area	5.6	136	25.5	5.5	131	24.3
Italy, Friuli	—	140	26.3	—	136	25.6
New Zealand, Auckland	5.7	131	25.4	5.7	123	23.7
Spain, Catalonia	—	121	26.5	—	118	26.3
Sweden, North	6.1	131	25.6	6.0	126	24.7
Switzerland, Ticino	5.5	131	26.8	5.2	126	24.2
UK, Belfast	5.9	132	25.5	6.0	129	24.8
UK, Glasgow	6.2	134	25.4	6.4	131	25.5
USA, Stanford	5.3	127	25.6	5.2	120	23.5

(a) Mean values for men and women aged 35 to 44 years, except Britain and New Zealand (35 to 49 years) and Germany (30 to 39 years).

(b) Age-standardised 50th percentiles for men and women aged 35 to 64 years, early to mid-1980s.

Sources: Waters & Bennett 1995a; WHO MONICA Project 1989.

- High cholesterol levels, blood pressure and obesity may predispose persons to severe health problems such as cardiovascular disease, perhaps the greatest health problem in the developed world. The World Health Organization's MONICA study provides internationally comparable data for these and other health determinants (WHO MONICA project 1989).
- Mean values of total plasma cholesterol, as measured through national sample surveys, vary in range from 5.4–6.2 mmol/L among men and from 4.9–5.8 mmol/L among women. In comparison, mean values are somewhat higher among women sampled in the MONICA study. Mean levels in Australia are at the lower end of the distribution, and persist throughout life (Figures 2 and 3). Yet the 1989 Risk Factor Prevalence Survey found that 16.0% of men and 14.2% of women aged 20–69 years in Australia were at high risk of developing coronary heart disease, with cholesterol levels above 6.5 mmol/L (Waters & Bennett 1995a).
- Variation in mean systolic blood pressure was found to be much smaller in the national sample surveys than that obtained in the MONICA study. Australian values fall in the middle of the range noted in the MONICA study. The 1989 Risk Factor Prevalence Survey found 18.3% of men and 14.3% of women in Australia to be hypertensive, with systolic blood pressures  $\geq 160$  mmHg.
- Both men and women in Australia in the mid-1980s rank mid-way internationally with respect to body mass index (BMI); however, the BMI values varied between Newcastle and Perth women included in the study (Figure 1). In terms of obesity, 9% of Australian men and 8% of Australian women have a BMI  $\geq 30$ .

#### For more information, see:

Waters A-M, Bennett S 1995. Risk factors for cardiovascular disease: a summary of Australian data. Cardiovascular Disease Series No. 1. Canberra: AIHW.

## Social and economic environment

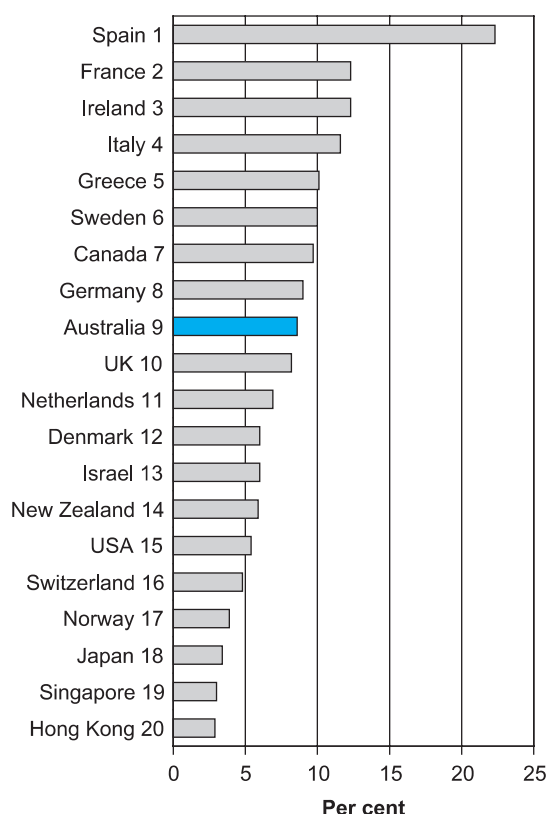


Figure 1: Proportion of labour force unemployed, 1996

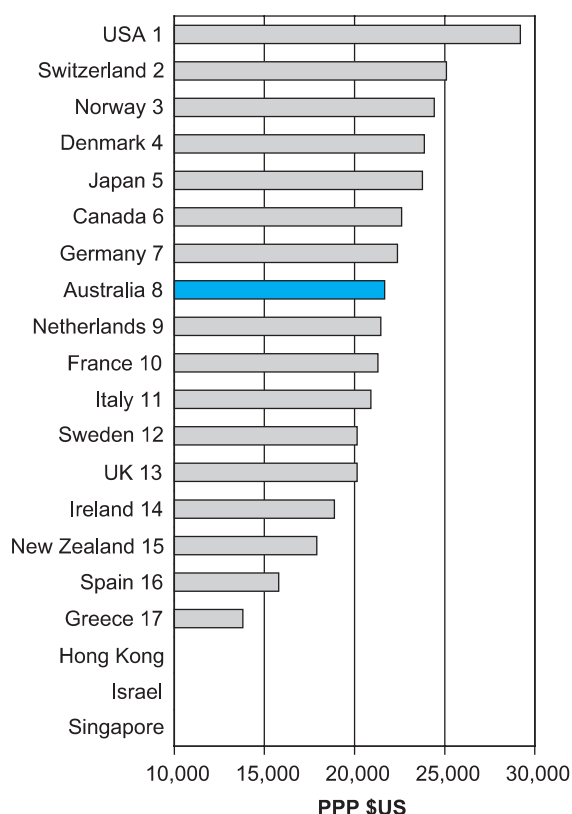


Figure 2: GDP per capita, 1997

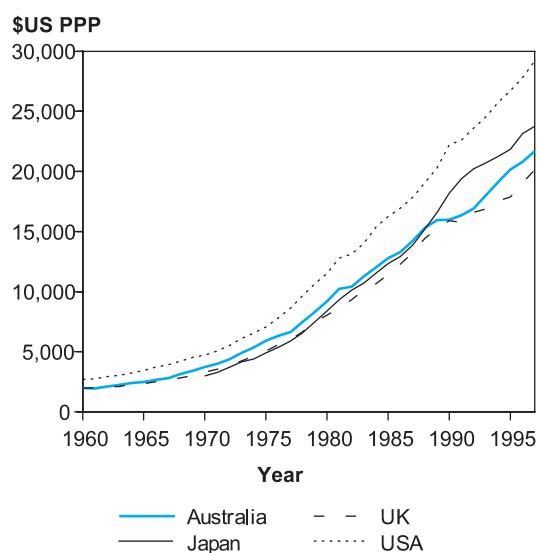


Figure 3: Trends in GDP per capita, 1960 to 1997

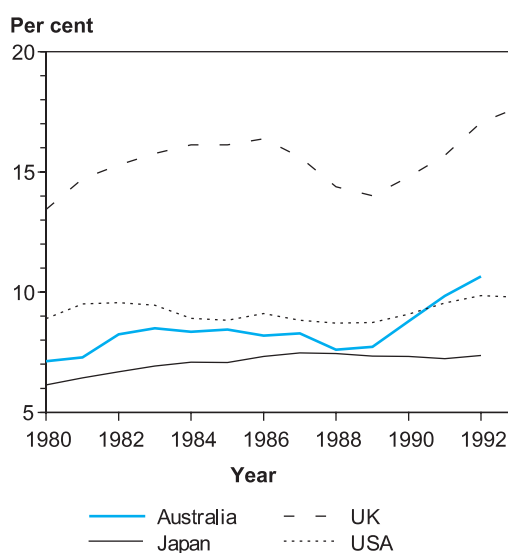


Figure 4: Trends in social expenditure as a proportion of GDP, 1980 to 1993

## Social and economic environment

### Unemployment, inflation, GDP per capita and social expenditure as a proportion of GDP

Country	Unemployed labour force, 1996 (per cent)	Inflation rate (per cent) <sup>(a)</sup>	GDP per capita, 1997 (US\$ PPP) <sup>(b)</sup>	Social expenditure, 1993 (per cent GDP) <sup>(c)</sup>
Australia	8.6	1994–95 2.5	21,671	10.7
Canada	9.7	1994–95 1.7	22,606	12.6
Denmark	6.0	1994–95 1.8	23,874	25.4
France	12.3	1993–94 1.4	21,290	21.5
Germany	9.0	1994–95 2.2	22,385	21.8
Greece	10.1	1993–94 11.0	13,805	13.7
Hong Kong	2.9	—	—	—
Ireland	12.3	1993–94 1.2	18,875	14.9
Israel	6.0	—	—	—
Italy	11.6	1993–94 3.6	20,914	18.7
Japan	3.4	1992–93 0.6	23,765	7.4
Netherlands	6.9	1993–94 2.3	21,450	23.4
New Zealand	5.9	1993–94 1.8	17,903	16.7
Norway	3.9	1993–94 0.3	24,423	22.5
Singapore	3.0	—	—	—
Spain	22.3	1994–95 4.8	15,800	16.8
Sweden	10.0	1993–94 3.0	20,150	31.8
Switzerland	4.8	1994–95 1.5	25,088	14.9
UK	8.2	1993–94 2.2	20,139	17.7
USA	5.4	1993–94 2.0	29,195	9.8

(a) Measured as the change in GDP deflators.

(b) Purchasing power parities (PPP) show the rate at which a given amount of one currency can be converted into the other in order to purchase the same quantity of a particular item in both countries (OECD 1998).

(c) Includes cash benefits and services for the elderly, the disabled and families, as well as occupational injury and disease, sickness benefits, survivors (e.g. widows), labour market programmes, unemployment, housing benefits and other. Does not include public expenditure on health.

Sources: United Nations 1995b; OECD 1996b, 1996c, 1998.

- There is increasing evidence that social and economic factors such as poverty, unemployment, illiteracy, poor housing and social isolation impact upon health status. These determinants are characteristic features of certain segments of the population in developed countries.
- Unemployed persons are more likely to report poor health, use medical services, have a greater prevalence of disability and handicap, and have higher rates of ill-health and mortality (Mathers 1994; Dooley et al. 1996). Poverty is also known to impact upon life expectancy although the effect is more marked at very low levels of income (World Bank 1993).
- A relatively large proportion of the Australian labour force is unemployed (8.6% in 1996) compared to other OECD countries (Figure 1). Long-term effects of unemployment on health status or specific health conditions have not been fully established, but it is now generally accepted that unemployment is causally related to ill-health (Mathers 1994).
- Increased income allows people to buy more food, better housing and health care, although by international standards variation in income levels is generally low among OECD countries. In 1997, Australia was ranked eighth among 17 OECD countries for gross domestic product (GDP) per capita (Figure 2). The United States, Switzerland, Norway and Denmark have comparatively high GDP per capita. Since the mid-1970s, Japan's GDP per capita has increased rapidly (Figure 3).
- Australia spends only a moderate proportion of its GDP on social expenditure compared to other developed countries. The proportion has increased since the late 1980s (Figure 4), but is still low among OECD countries. Welfare spending in Scandinavian countries is especially high.
- Like many other countries, Australia's stable and low rate of inflation affords the opportunity to improve the health status of those who are currently disadvantaged. However, unless addressed, long-term unemployment in conjunction with other social and economic factors may produce harmful health effects in the coming decades.

#### For more information, see:

Dooley D, Fielding J, Levi L 1996. Health and unemployment. *Annu Rev Public Health* 17: 449–66.

Australian Institute of Health and Welfare 1997. *Australia's welfare 1997: services and assistance*. Canberra: AIHW.

Physical environment

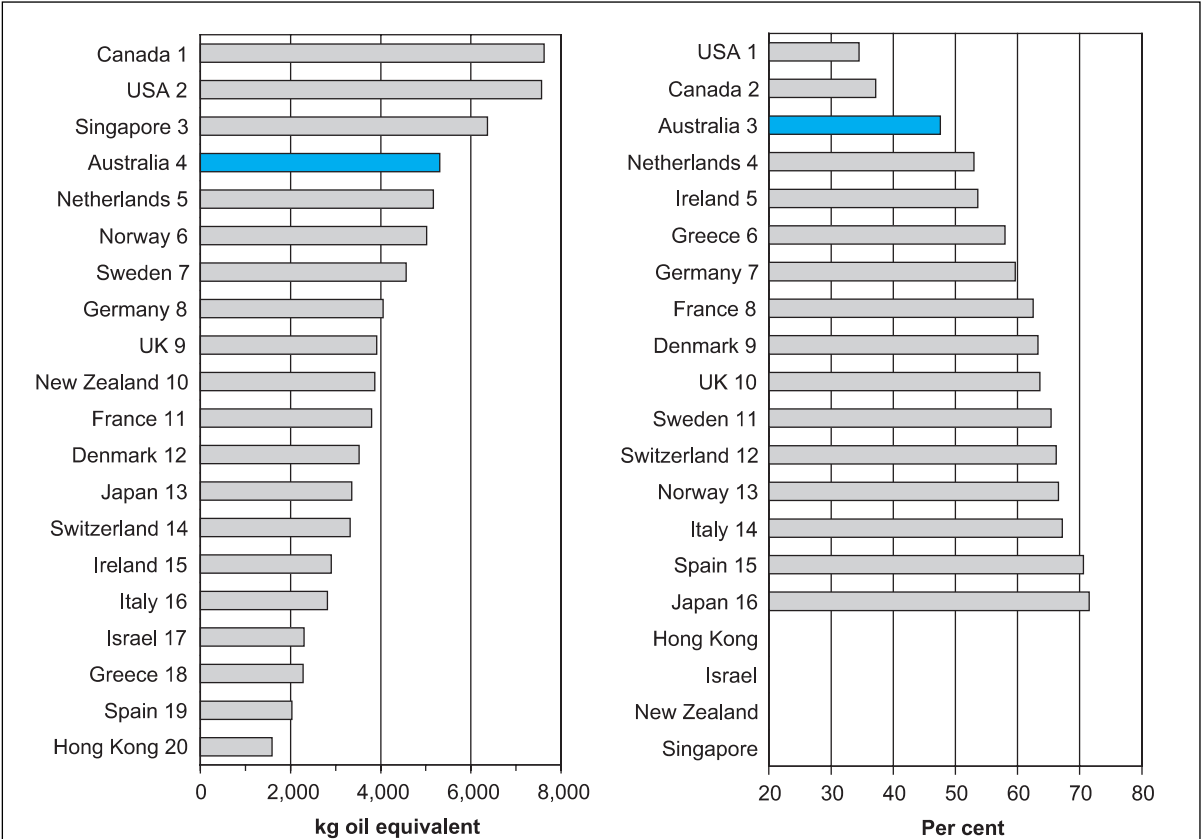


Figure 1: Energy consumption per capita, 1993

Figure 2: A 'green' ranking, 1993

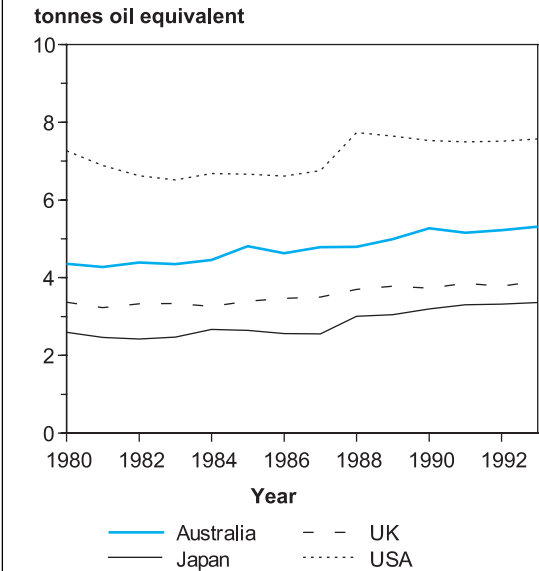


Figure 3: Trends in energy consumption per capita, 1980 to 1993

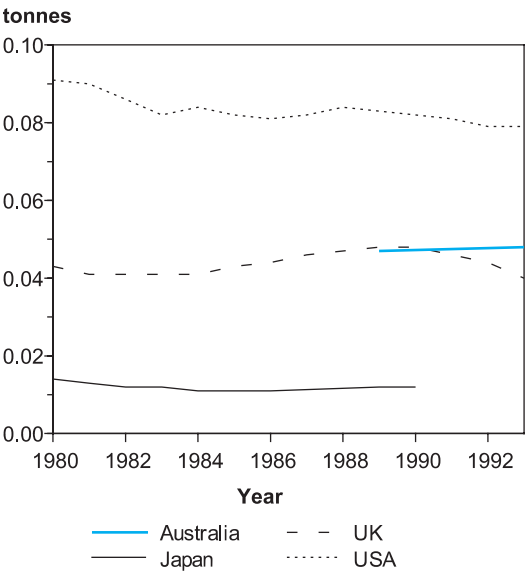


Figure 4: Trends in emissions of nitrogen oxides per capita, 1980 to 1993

## Physical environment

**Per capita emission of 'greenhouse gases', energy consumption and municipal waste, 1993<sup>(a)</sup>**

Country	SO <sub>x</sub> emissions (kg)	NO <sub>x</sub> emissions (kg)	CO <sub>2</sub> emissions (tonnes)	Energy consumption (kg oil equivalent)	Municipal waste (kg)
Australia	90	48	16	5,310	776 (1989)
Canada	107	68	15	7,624	660
Denmark	30	51	11	3,522	460
France	21	26	6	3,800	470
Germany	48	36	11	4,054	360
Greece	51	34	7	2,276	310
Hong Kong	—	—	—	1,588	—
Ireland	53	37	9	2,904	—
Israel	53	35	2	2,297	—
Italy	30	36	7	2,820	350
Japan	7	12	9	3,357	410
Netherlands	11	36	11	5,167	500
New Zealand	—	43	8	3,871	—
Norway	8	53	7	5,020	510
Singapore	—	—	—	6,371	—
Spain	57	32	6	2,031	360
Sweden	12	46	6	4,561	370
Switzerland	8	22	6	3,321	400
UK	55	40	10	3,910	350
USA	76	82	20	7,570	730

(a) Or latest available year, including provisional figures and OECD estimates. Varying definitions can limit comparability across countries.

Sources: OECD 1996c; New Economics Foundation 1993; United Nations 1995c

- The links between the environment and health are receiving increasing prominence. At a broad level, direct causality is difficult to determine although it is generally recognised that depletion of the environment can lead to adverse health consequences, and that improvements in health are gained through limiting harmful environmental impacts. In some cases, such as the relationship between solar radiation and melanoma, causality is better understood via epidemiological studies.
- Air quality, as determined on the basis of per capita emission of oxides of sulphur, nitrogen and carbon, shows large variation across OECD countries. Australia ranks high in terms of these gas emissions (see table above). This high ranking is accompanied by per capita energy consumption statistics which continue to show an increasing trend (Figures 1 & 3).
- Australia ranks low in a 'green league' of nations. A 1993 report (New Economics Foundation 1993), based on 11 key environmental indicators, judges Australia to be a poor performer among OECD countries (Figure 2). In addition to high greenhouse gas emissions and low energy efficiency, Australia generates large amounts of waste per capita. It should be noted that among the three worst performers, Australia performed notably better than the United States or Canada. Each of these countries are geographically vast in comparison to other OECD countries, and although highly urbanised, the dispersion of their populations across large areas contributes significantly to their rankings.
- Japan was judged to be one of the better OECD performers because of the efficiency of its economy and low pollutant emissions. The United States was the worst performer, cited as having excessive energy consumption, output of noxious gases, waste generation, car use and water consumption.
- It is not possible to provide a comprehensive assessment of Australia's air quality due to issues such as a lack of consistent standards, inadequate or non-existent monitoring, fragmented data and the lack of a clear relationship between air quality and health. Australian data are based on the best available estimates (State of the Environment Advisory Council 1996).

### For more information, see:

State of the Environment Advisory Council 1996. Australia: state of the environment 1996. Collingwood: CSIRO Publishing.  
McMichael AJ 1993. Global environmental change and human population health. *Int J Epidemiol* 22: 1–8.

