

6 Nutrition and health inequalities

The geographic and demographic factors affecting food and nutrition in Australia are described in Chapter 1 and are therefore not treated in detail here. Nevertheless, factors such as employment, income, education, cultural influences and lifestyle, ability to communicate in English, sex and other genetic differences, isolation (geographic, social or cultural), age and disability, the security and standard of accommodation, and the availability of services and facilities all interact with diet, health and nutritional status. Not all health inequalities are inequitable. The term 'inequality' refers to the mathematically unequal distribution of some factor in a given population. The term 'equity' refers to inequalities that may be unnecessary and unavoidable, but that are also considered to be unfair and unjust. Inequities are inequalities judged to be unfair in the context of what applies to the rest of society. This chapter discusses nutrition-related health inequalities according to some of the factors listed above. These can be considered risk factors in themselves, although they are more conventionally referred to as 'social determinants of health'.

Some population subgroups that tend to be more vulnerable to these social determinants of health risk are Aboriginal and Torres Strait Islander people, immigrants (particularly those of non-English-speaking background), people with low incomes and people reliant on social security benefits (including the unemployed), people with limited education, people in blue-collar occupations, elderly people, disabled people, women, homeless people, people with poor housing, people living in remote rural areas, and people otherwise isolated socially or culturally. This is a long list. Many Australians do suffer some disadvantage. Those Australians who simultaneously meet the criterion of disadvantage for several of the social determinants of health constitute the greatly disadvantaged and tend to have the greatest needs.

6.1 Social determinants of nutritional status

Social class and socioeconomic status

The terms 'social class' and 'socioeconomic status' tend to be used interchangeably in Australia, which may be an expression of a cultural tradition different from the British or European models. There are few population data based on social class in Australia. The basis has usually been 'occupational prestige'¹ because in Australia occupation is collected more commonly than other measures of socioeconomic status and perceptions of social class based on this have been found to be acceptably consistent.²

Health-related statistics and studies use a number of different measures of socioeconomic status. Occupational prestige ratings have been used extensively in nutrition-related studies. For example, the 1985 and 1990 Victorian Nutrition Surveys used quintiles of occupational prestige based on the Daniel seven-point occupational prestige score.^{3,4} The Australian Bureau of Statistics classifies occupations according to the Australian Standard Classification of Occupations (ASCO), which uses eight major groups and 51 subgroups.⁵

Occupation, education, unemployment, and income

Table 6.1 gives details of national occupational, educational and unemployment levels, and mean gross income based on ASCO categories.

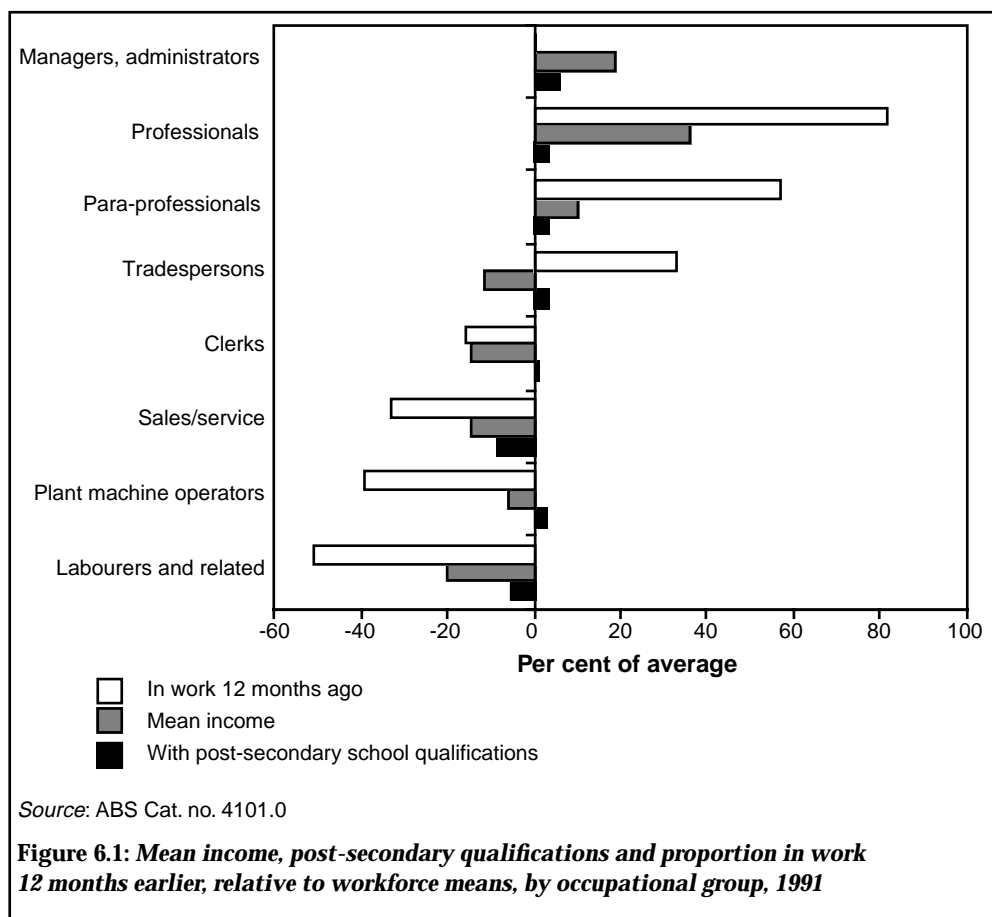
Table 6.1: Occupation, education, unemployment and income, by sex

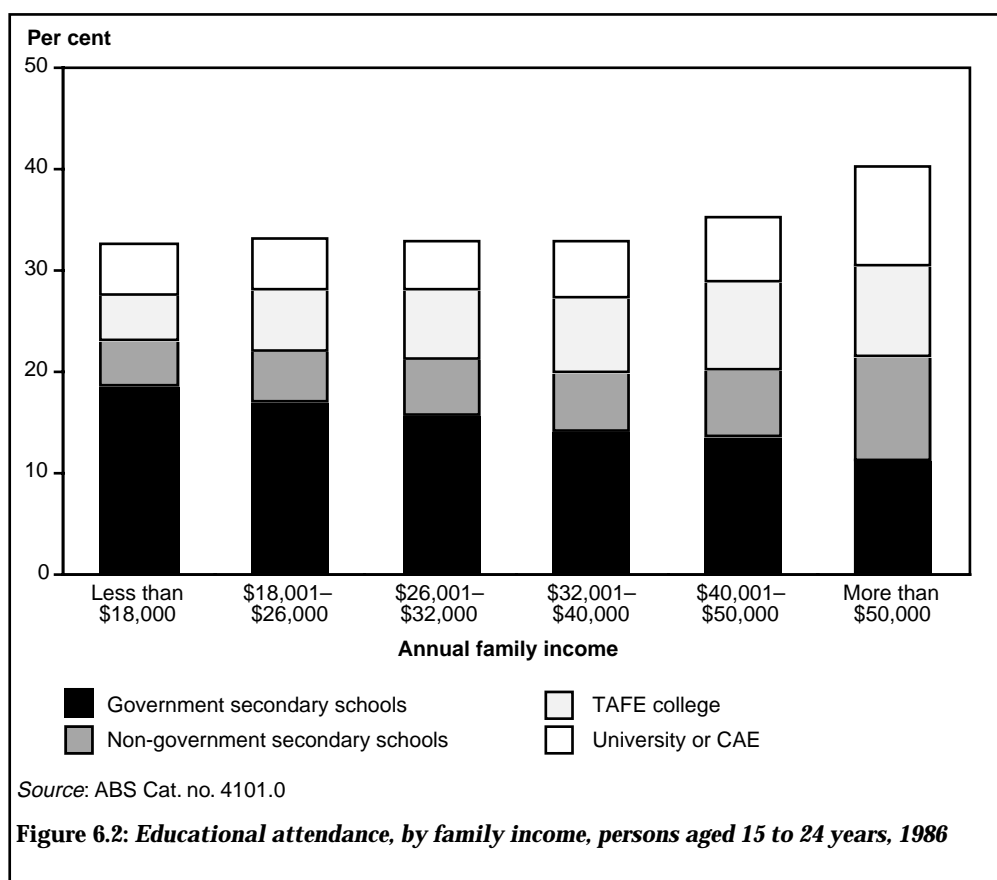
	Males	Females	Persons
Employment, by occupation, 1991–92 (per cent)			
Managers, administrators	8.3	2.9	11.2
Professionals	7.8	5.6	13.4
Para-professionals	3.3	2.7	6.0
Tradespersons	13.5	1.5	15.0
Clerks	3.9	13.1	16.9
Sales/service	5.4	9.8	15.3
Plant/machine operators	6.1	1.1	7.2
Labourers and related	9.7	5.2	14.9
All occupations	58.0	42.0	100.0
Educational attainment, persons aged 15–69, February 1992 (per cent)			
<i>With post-secondary qualifications</i>			
Degree	5.4	4.0	9.4
Trade qualification	11.9	1.4	13.3
Other	6.3	12.8	19.1
<i>Without post-secondary qualifications</i>			
Finished secondary school	7.1	7.0	14.1
Did not finish secondary school	17.1	22.0	39.1
Still at school	2.5	2.4	4.9
All levels of attainment	50.3	49.7	100.0
Unemployment rate, persons aged 15–69, February 1992 (per cent)			
<i>With post-secondary qualifications</i>			
Degree	0.3	0.2	0.5
Trade qualification	0.9	0.1	1.0
Other	0.5	0.9	1.4
<i>Without post-secondary qualifications</i>			
Finished secondary school	0.9	0.7	1.5
Did not finish secondary school	2.1	1.3	3.4
Still at school	0.2	0.2	0.4
All levels of attainment	4.8	3.3	8.1
Full-time labour force, mean gross annual income, 1989–90 (\$)			
<i>With post-secondary qualifications</i>			
Degree	46 290	33 680	42 700
Trade qualification	29 010	19 770	28 640
Other	33 035	23 375	30 215
<i>Without post-secondary qualifications</i>			
	26 630	20 270	24 570
All levels of attainment	31 130	23 700	28 950

Sources: Australian Bureau of Statistics, Cat. nos 6203.0, 6235.0, 4101.0.

Extricating the different effects of occupation, education, employment and income is difficult because they are closely associated with each other. Occupational capability and the availability of work bear on income; educational attainment bears on occupation and on employment prospects. Figure 6.1 illustrates the differences between occupational groups by comparing each of three factors for those groups—mean income, proportion with post-secondary qualifications, and the proportion in work 12 months earlier—with the workforce mean for each factor.

Australians with poor education will experience highly constrained occupational options, limited employment prospects, limited access to high income, and a greater likelihood of unemployment and poverty. To complete the circle, income, occupation and education of parents bear on the education of their children (see Figure 6.2).

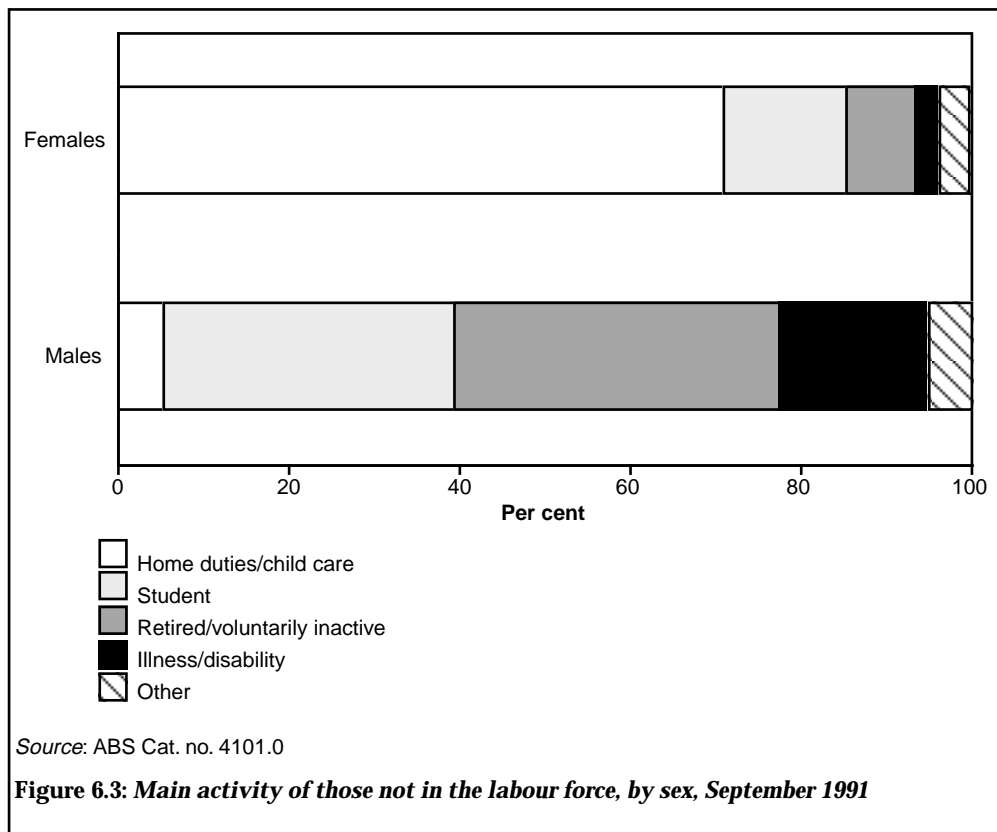




Occupation

In 1991–92 the Australian workforce was made up of 7.7 million people, 58 per cent of whom were male. Employment ratios in 1991–92 were 74.5 per cent for men and 51.9 per cent for women. An increase in the overall employment ratios from 1984 was due primarily to increases in employment for females aged 20–44 years. Migrants, particularly those from the Mediterranean, Middle East and South-east Asia, and Aboriginal and Torres Strait Islander people are more likely than other Australians to be employed in blue-collar occupations, to be poorly educated, and to have low incomes or be unemployed.⁶⁻⁹

There is a very great difference between the sexes in the main activities of those who are not in paid work and not seeking paid employment. Figure 6.3 illustrates this difference for the 1.17 million men and 2.47 million women aged 15–69 years in this category in September 1991.¹⁰



Education

As Table 6.1 shows, the Australian population is highly educated but education levels in some population subgroups are markedly lower than the mean. Educational status varies between migrant groups.⁷ The proportion of women without qualifications was uniformly higher in all migrant groups, as it is in the Australian population as a whole.⁷

The 1991 census data show that the educational status of Aboriginal and Torres Strait Islander people is less than that of the general population: only 20 per cent have educational qualifications (c.f. 39 per cent for the non-indigenous population); and 17 per cent left school at age 17 years or more (c.f. 34 per cent).¹¹ In 1986, there were 436 university graduates.¹² By 1992 this had increased to 721. In 1992, Aboriginal and Torres Strait Islander people in New South Wales and Victoria, who comprise 33 per cent of the total Aboriginal and Torres Strait Islander population, accounted for 74 per cent of Aboriginal and Torres Strait Islander people completing post-secondary education.¹³

Unemployment

Two major differentials for unemployment are sex and education (see Table 6.1). Unemployment among migrant groups differs from the Australian mean and those with the lowest educational attainments have high rates of unemployment.⁷ Migrants arriving since 1989 have higher unemployment rates than earlier migrants.

Unemployment among Aboriginal and Torres Strait Islander peoples is higher than for the general population. In 1991, the unemployment rate for Aboriginal women was lower than the rate for men, but still higher than the rate for non-Aboriginal women and men (for women 28.6 per cent c.f. 12.4 per cent for non-Aboriginal women; for men 32.6 per cent c.f. 10.6 per cent).¹¹

Income

Income disadvantage is closely associated with disadvantages in occupational and educational levels and is, of course, tied to employment status. The incomes of females were consistently lower for every employment group and level of educational attainment; in 1989–90 the mean for females was 18 per cent below the population mean of \$28 950; the mean for males was 8 per cent above the population mean.⁶ Mean incomes of migrant and Aboriginal and Torres Strait Islander families tended to be well below the population means.^{7,11}

Poverty and deprivation

Although it is not within the realm of a food and nutrition policy to deal directly with poverty, it is appropriate for any health-related policy to deal with deprivation. The socioeconomic barrier is the most difficult barrier to better nutrition, and those people with the least disposable income are at the greatest risk of poor nutrition.

Absolute poverty occurs when living standards fall below the minimum level needed for human survival and this is not usually thought to happen in Australia. However, persistent mild to moderate levels of energy under-nutrition have been documented in some Aboriginal children and among homeless youth.¹⁴ In Australia relative poverty is more common than absolute poverty. 'Relative poverty' is defined in terms of a person's capacity to enjoy a living standard comparable with that enjoyed by people in the community who have an average level of material resources. The Henderson inquiry into poverty provided a definition that is used to assess the amount of money a given household structure requires to cover basic living costs and maintain an 'austere' living standard.¹⁴ It should be noted that single parents with three or more children and on social security benefits fell below the Henderson poverty line for the December quarter in 1990.¹⁵

Income units in the lowest quintile in 1990 'were characterised by a high level of dependence on government pensions and benefits, low levels of employment and educational attainment, high proportions of young and aged and one-person income units (mainly women)'.¹⁶ In addition to this, there are people who for periods have no income at all or no home. They rely heavily on welfare agencies for food, through provision of financial assistance, vouchers, food parcels or meals. People who lack money or who lack access to a home in which to store and prepare food are at high risk of inadequate food intake.

There are also those whose income may not be consistently adequate even though they are in the paid workforce,¹⁷ among them single people on low incomes and with high private housing costs and families or couples now on one income when two had previously been available. Notable are couples who enter parenthood with an accompanying loss of or reduction in one income: if they have inadequate income to service loans, disposable income may be least at the time when costs associated with birth are incurred.¹⁸

There appear to be differences in expenditure related to social class, and particularly income level. Selected household types vulnerable to poverty spend less per person, but a greater proportion of their total expenditure, on food.¹⁷ Some households, for example, may need to treat food expenditure as discretionary and economise on food to a substantial extent to balance their budgets. Case studies such as Trethewey's research into low-income families in Victoria¹⁴ and studies from the United Kingdom^{19,20} confirm that food is often the sole discretionary item in the budget of low-income households.

Careful analysis of Australian household food expenditure data, taking household structure into account, suggests that in Australia, as overseas, a substantial proportion of the population (in the order of 10 per cent) is severely restricted in its capacity to make healthy food choices and to achieve a healthy lifestyle. Low-income households can neither gain optimal nutritional status nor match the nutritional status of the 'better off'.¹⁵ The National Food and Nutrition Policy implementation consequently gives priority to the needs of disadvantaged groups in its programs, particularly where income constraints may affect food choices and nutritional status.

Recent information from the Brotherhood of St Laurence's Life Chances Study²¹ confirms the relationship between low income and unequal access to some services. In comparison with middle and higher income mothers, low-income mothers were much less likely to have private means of transport and more likely to have greater difficulty getting to places. They had less security of housing tenure and were more likely to face serious health problems and financial difficulties and have disagreements with their partners. Further, they were less likely to have support from family or friends, they used services less and used a smaller range of services, and they found the services they did use less helpful. They were less likely to be happy and their children were more likely to be ill. It is also of note that the majority of poor adults are women, often with dependent children. The Study identified service access difficulties for a large group within the population.

Housing and living conditions

Housing quality and housing costs have been identified as major problems for several groups of people, for example, people living alone, single parent families, Aboriginal and Torres Strait Islander peoples, and the elderly.^{22,23,24} The cost of housing does not necessarily correlate with the quality of housing. Rental, purchase and maintenance costs depend on a number of factors, for example, land value, construction and maintenance costs in remote areas and difficult sites, availability of maintenance services, and demand for housing. Poor quality housing has been associated with poor health and nutrition, particularly in Aboriginal and Torres Strait Islander communities.^{9,24}

The cost of accommodation can have ramifications for nutritional status. Housing costs can be the cause of financial constraints on food selection. The 1988 Housing Survey found that 15 per cent of families were paying more than half their income for accommodation.²² Coleman and Watson found that there was general concern about accommodation security, with private rental considered the worst option.²⁵ In 1988, 59 per cent of those in private rental spent at least 30 per cent of their income on rent. One-parent families in private rental accommodation spent 35–40 per cent of income in rent, compared with 20 per cent for those in government accommodation.²²

Isolation may contribute to poorer nutrition, particularly in older people. In 1988, 40 per cent of those living alone were aged 65 years or more,²⁶ and living alone has been associated with a poorer, less varied diet.²⁷ A survey of elderly people in Brisbane found that homeless elderly people and pensioners in rental accommodation were 'isolated from the community and materially deprived, and in poor health' while members of senior citizens clubs and elderly members of the Chinese community living in extended families were happy, healthy and socially active.²⁵

Cultural differences

Changes in immigration policy, particularly since 1973, have led to a decrease in the proportions of English-speaking and European migrants and an increase in Asian and Middle Eastern migration. In 1990, 57.5 per cent of Australia's overseas-born population came from non-English-speaking countries.

This change has given Australia a society with great cultural and religious diversity and has been paralleled by a global increase in communication and international trade. The result has been increased exposure of the Australian-born population to different cultures, and particularly cuisines. It has also increased the interest in other cultures and created opportunities for ethnic groups to maintain their cultural heritage. Aboriginal and Torres Strait Islander communities have responded to the increased opportunity to maintain their cultural heritage.⁹

Migrant groups (particularly those of non-English-speaking origin) and Aboriginal and Torres Strait Islander people are under-represented in management, professional and other skilled occupations relative to the population means, and sex inequality is as prevalent for these groups as it is for the population as a whole.⁶⁻⁹ Lack of proficiency in English appears to be the principal factor that predisposes people of ethnic origin to disadvantage. Mortality differentials among immigrants have been analysed by Mathers²⁸ and by Young.²⁹

Some Aboriginal and Torres Strait Islander people may also be disadvantaged by lack of proficiency in English. The 1991 census found that 20 per cent of those aged five years and over spoke an indigenous language at home, and of these, about one-third spoke English 'poorly' or 'not at all'.¹¹

Death from stomach cancer is more likely among immigrants. Men from the United Kingdom and Ireland, men and women from other European countries, and women from Asia are each approximately 80 per cent more likely to die from stomach cancer than their Australian-born counterparts. Women born in Asia are 31 per cent less likely to die from breast cancer than women born in Australia. The risk of death from diabetes mellitus is significantly lower among men and women from the United Kingdom and Ireland, but 82 per cent higher among men from Asia. Immigrants are at decreased risk of dying from coronary heart disease and stroke.

Religion

Australia is considered to be a secular society although there are active adherents of many religions. Religious observance is sometimes associated with specific dietary behaviours. At the time of first European settlement Christianity became the dominant religious persuasion, particularly Anglicanism and Roman Catholicism. Then, as now, Europeans paid little heed to Aboriginal religious beliefs. Missionary contact was generally associated with the disruption of the indigenous culture.³⁰

Since the 1950s Orthodox Christian denominations have gained substantial representation in Australia. The influx of migrants from the Middle East and western Asia has increased the Muslim presence to 1 per cent of the population. This group is younger and more urbanised than the Australian average, and it is generally committed to maintaining its religious heritage.³¹ Jewish immigration began with the first European settlement and there have since been waves of immigration in response to anti-Semitism and war, particularly after World War II. Nevertheless, the Jewish community remains small in number (less than 1 per cent of the population); it is highly urbanised, with the overwhelming majority in Melbourne and Sydney.

Even in the established Australian-born, nominally Christian population, there appear to be differences in lifestyle associated with religious affinity, which are in turn associated with differences in health status.³¹

Location of residence

Rural location gives rise to disadvantage in terms of services and facilities, including services for maximising health status.³² Traditionally, rural communities have accepted these deficiencies, but the consequences have been a lack of exposure to and awareness of preventive health services and some deficits in health status relative to urban communities.^{6,33-35} The 1989-90 National Health Survey data differentiate only between metropolitan and non-metropolitan populations, and so can provide little guidance on the status of rural residents per se. For those aged 25-64 years, men living in metropolitan areas had lesser levels of handicap, disability and reduced activity, while for women there were no significant geographical differences.³⁶

Differences may also arise in urban areas. In particular, the rapid spread of metropolitan areas has led to isolated outer suburban areas with limited access to public transport, health services and shopping facilities.

Sex

Most women with little or no income in their own right are supported financially by their parents, spouse or adult offspring... However, the traditional role of women as financially dependent mothers and homemakers is changing. Increasingly, women, either through personal choice or economic necessity, are entering, and remaining, in the workforce. Women's earning capacity is becoming important in terms of providing for their own and their family's economic wellbeing. Consequently, sex equality in the labour market has become a major social issue.¹⁶

The social and health problems of women differ in profile from those of men, the most obvious problems being those caused by physiological differences, particularly those related to child-bearing. Pregnancy and lactation have an associated nutrition risk in that nutrient requirements are increased and maternal nutritional status will be a major determinant of foetal and infant nutritional status. Women are particularly subject to

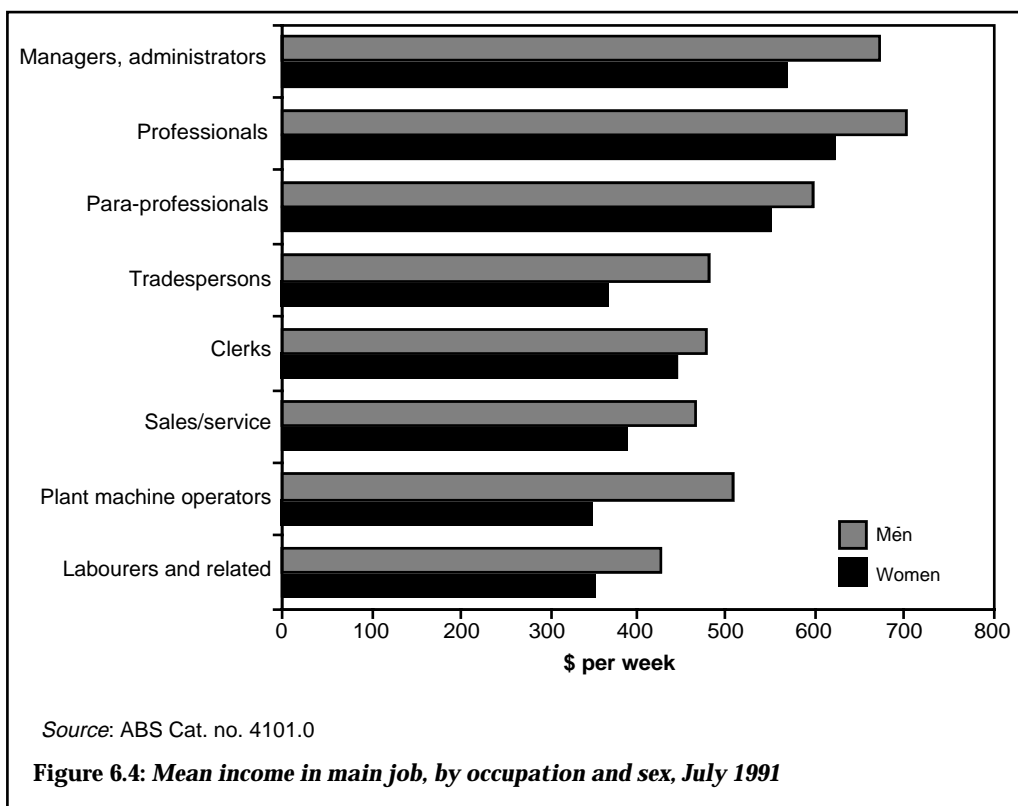
anaemias resulting from folate or iron deficiency between puberty and menopause, to osteoporosis after menopause, and to breast cancer. In other respects, women are genetically better equipped in health terms and generally live longer and have lower age-standardised morbidity and mortality than men.³⁷ It is very likely that, for example, raised total blood cholesterol levels may be a much lesser cardiovascular disease risk factor for women than for men.³⁸ The 1989–90 National Health Survey found that women were more likely than men to have taken a health-related action, to be underweight and to be taking vitamin and mineral supplements, and that more women than men reported making healthier changes to their diets.³⁹

Women are also at risk of death or morbidity associated with pregnancy and childbirth, sex-role stereotyping and spouse violence.⁴⁰ In Australia at present, child-bearing and child-rearing still represent a disadvantage in terms of employment, income and career prospects; and at the same time, increase nutrient needs and food expenditure. Employment status and levels of unemployment demonstrate that women are disadvantaged. Figure 6.4 illustrates the disparities in income between men and women within occupational categories.¹⁰ Even among pensioners and other government beneficiaries, the benefit level for men is 28 per cent higher than it is for women.¹⁶

Women in poverty are documented as being at nutritional risk, partly because they have high nutritional needs during their reproductive years and partly because there is a cultural predisposition for women to feed men and children before themselves. Women in most cultures are regarded as central to the provision of food and, despite changes in the social environment, they are still the most likely to be the buyers and preparers of food in Australia.⁴¹ They are therefore the target for the often conflicting messages from nutrition educators and food advertisers. The orientation and focus of food advertising reflect the perceived role of women as the 'gatekeepers' of household food consumption. The gatekeeper role is constrained by partners' preferences and 'what the children will eat',⁴² and this may cause feelings of guilt and inadequacy when there are unmet desires.⁴³

Marital status

At any age, married men and women are in general at less risk of dying from any particular disease than men and women who have never married or who are widowed or divorced. For diabetes mellitus, coronary heart disease and stroke the risk is approximately double that for married people. Mortality from breast cancer is 30 per cent higher among women who have never married.²⁸



Ageing and disability

Ageing (or being elderly) has as its definitive feature a greater degree and greater dimensions of disability than are found in younger people; the number of elderly people with disabilities greatly exceeds the number of younger disabled people and will continue to do so.⁴⁴ The 1993 Survey of Disability, Ageing and Carers found that 18.0 per cent of Australians had a disability: 14.2 per cent had a handicap (that is, limitation on ability to perform tasks associated with daily living, such as self-care, mobility, verbal communication, schooling or employment), and 3.8 per cent had less serious disabilities. Of 3 176 700 Australians with disabilities, 5.0 per cent live in institutions, 17.7 per cent live alone, and the rest in households with other people. Disability and handicap are strongly associated with age: 7.2 per cent of those aged under 25 years had a disability, compared with 24.5 per cent of those aged 25 years and over; of those aged 60 years or more, 50.9 per cent had a disability (43.1 per cent had a handicap).⁴⁵ Many disabled people rely on invalid pensions, experience difficulty with transport and have communication difficulties; they invariably suffer from chronic medical conditions, which usually involve pain.¹ It was found that 169 700 people required assistance with meal preparation, but of these, 12.5 per cent received no assistance. Most (78.4 per cent) received informal assistance from relatives or friends, with 6 per cent served by Meals on Wheels and the remaining 3.1 per cent receiving formal assistance from other organisations.⁴⁵

The ageing population

The median age of the Australian population has increased from 27.5 years in 1971 to 32.5 years in 1991, and the proportion of people aged over 65 years has risen from 8.3 per cent to 11.4 per cent in the same period.⁶ The demographic trend is towards an older population: the Australian Bureau of Statistics has estimated that the proportion of people aged over 65 years by 2031 may be as high as 22 per cent, or double the proportion in 1991.⁴⁶

As the population continues to age, the demand for residential, respite and day-care services for the elderly will accelerate. The present level of demand has already caused a trend towards caring for people in their own homes and an increased burden on community services such as Meals on Wheels. This means that more older persons are relying on food services for a large proportion of their nutrient intake.⁴⁴ For those living in institutions or looked after by carers in their home, inability to influence those who make food choices may create a barrier to achieving a healthy diet.

Socioeconomic correlates

Many aged and/or disabled people are socioeconomically disadvantaged. The difficulties they experience in shopping for and preparing food may be exacerbated by low income. Access to services may be limited by physical, mental or financial difficulties as much as by limited service delivery, yet there is a high level of reliance on community support or services (for example, domiciliary care and Meals on Wheels) to maintain at least partial independence. These community services were developed for the elderly but could be extended to younger disabled people if resources became available.

6.2 Population subgroups with excess risk of poor nutrition

There are identifiable groups within the population whose nutritional status or diet-related health characteristics are cause for concern. Many of the associations with poor nutrition are social or socioeconomic in origin—as discussed in Section 6.1. Adequate nutrition is discussed at length in this report and elsewhere: it depends on the availability and affordability of a high-quality food supply and on the individual having sufficient skills and knowledge to make discerning choices from the food available.

Mortality differences

Mortality and social determinants of health

The various aspects of socioeconomic disadvantage form a cluster, and most available information is about the composite disadvantage. Almost invariably, the disadvantage experienced by identified 'disadvantaged population sub-groups' is a consequence of a higher than average level of low socioeconomic status within that group.

One workplace-based study (using postcodes to assign social class) found the age-standardised mortality rate in the lowest class to be 1.73 times that of the highest class in an urban sample.⁴⁷ McMichael reported mortality rates for respiratory and digestive disease to be four times higher for the lowest class than for the highest class

from an earlier study of males based on occupational prestige;⁴⁸ the relative risk for colon cancer was inversely related to social class. Infant mortality rates were found to be inversely correlated with social class based on occupational prestige.⁴⁹

Compared with their high socioeconomic counterparts, women from low socioeconomic areas are 211 per cent more likely to die from diabetes mellitus and 124 per cent more likely to die from coronary heart disease; for men the figures are 74 and 54 per cent respectively. People from low socioeconomic areas are also more likely to die from stroke—men are 102 per cent and women 69 per cent more likely. Conversely, women from low socioeconomic areas are 11 per cent less likely to die from breast cancer.²⁸

Death registration data

The death registration system collects demographic information, including usual place of residence of the deceased, occupation (traditionally for males but recently introduced for females), country of birth (and years of residence in Australia if born overseas) and marital status, but there is no routine analysis of mortality using these data.

Although there is provision for recording Aboriginality in the state death registers, the available data are incomplete. Consequently, the death registration system is not able to provide adequate differentiation, and so identification of mortality differentials between Aboriginal and Torres Strait Islander people and other Australians depends on specific research.

Diet and socioeconomic disadvantage

The first health and nutrition differential is money. Those with incomes below the population mean may be restricted in their choice of food purchases. As discussed in Section 6.1, income, educational level, occupation status and the likelihood of being in work are closely associated and difficult to unravel, and the aggregation is summarised as 'socioeconomic factors'. These factors can, however, be examined separately. Smith and Baghurst analysed the results of a survey of 874 urban residents; they found statistically significant differences in macronutrient and micronutrient patterns when examined separately by occupational prestige, education level, income and occupational category.^{3,50} The results were adjusted for age and sex.

Social status was positively associated with nutrient densities for iron, zinc, magnesium and potassium and with intake of natural sugars. It was inversely associated with energy from fat, whichever measure was used.^{3,50} In an earlier survey of 291 South Australians aged 18 years and over, there was no correlation between occupational status (based on quintiles by head-of-household status) and measured zinc and magnesium status, although there were significant numbers of respondents whose dietary intakes were below the Recommended Dietary Intakes (RDIs) for these nutrients.⁵¹

In the larger survey, occupational prestige and education, but not income, were directly associated with nutrient densities for β -carotene, vitamin C, thiamin, folate and niacin (weak) and with fibre intake; energy from mono-unsaturated fatty acids and saturated fatty acids was inversely associated with occupational prestige (strongly for mono-unsaturates) and education (weakly). Retinol density and total energy intake (weak) were inversely associated with occupational prestige; alcohol intake was

strongly associated with income and weakly with occupational prestige; starch intake was inversely associated with income. There were also significant, but non-linear, differences for occupation category for several nutrients and for energy, alcohol and fibre.^{3,50}

The 1983 National Dietary Survey data showed positive correlations with socioeconomic status (based on postcode) for fibre, thiamin, niacin, vitamin C, calcium, magnesium, iron and zinc in men, and for alcohol, fibre, thiamin, vitamin C and magnesium in women.⁵²

Baghurst et al. found in a 1985 Victorian sample that dietary behaviour corresponding to the Dietary Guidelines was associated directly with socioeconomic status, although differences were small relative to the generally low 'compliance' of the sample as a whole. Smoking and inappropriate dietary intakes tended to be associated and it was noted that 'if one socio-demographic group were to be chosen for special attention, it would have to be younger men of lower occupational status'.⁵³ In addition, this study found no correlation between Body Mass Index (BMI) and socioeconomic status. Age-standardised data from the 1980 and 1983 National Heart Foundation Risk Factor Prevalence Surveys indicated an inverse relationship between BMI and education: this held for all women aged 25–64 in both surveys, but for men aged 25–54 years only, and only in 1983.⁵⁴ It was found also that BMI tended to be lower in men and women in sedentary occupations, but this apparently paradoxical finding is probably attributable to the interactions between many factors associated with differences in BMI.

Gliksman et al. found a correlation between several diet-related risk factors and socioeconomic status in a 1985 sample of schoolchildren, but when dietary factors were included in a multiple regression model the association with BMI disappeared, although a positive association with serum triglyceride levels and a negative association with HDL-cholesterol levels remained.^{55,56}

Rutishauser et al. have taken weighed-food 12-day records of 225 people aged 18–60 years from areas of low and high socioeconomic status in Geelong, Victoria.⁵⁷ The main influences on higher reported levels of intake were BMI and socioeconomic area for men and weight and education level for women. Table 6.2 shows macronutrient and energy intakes, by sex and socioeconomic status of area of residence for the Geelong study.

Table 6.2: Twelve-day average macronutrient and energy intakes, by sex and socioeconomic status (SES) of area of residence, Geelong, 1989–1991

	Males		Females	
	High SES	Low SES	High SES	Low SES
Contribution to energy (per cent)				
Protein	15.5	15.9	16.3	16.9
Fat	35.0	36.9	35.4	38.4
Carbohydrates	42.5	39.5	43.2	39.9
Alcohol	5.0	4.0	3.4	1.8
Intake (g)				
Polyunsaturated fatty acids	16.7	15.1	11.4	10.7
Mono-unsaturated fatty acids	35.6	36.4	24.2	25.2
Saturated fatty acids	38.4	39.8	26.2	27.5
Fibre	26.5	20.0	18.5	13.8
Energy (MJ)	10.5	10.0	7.1	6.7

Note: 'SES' denotes 'socioeconomic status'

Source: Rutishauser et al.⁵⁷

Selected population subgroups

Sole parents and their dependents

Single parents are an economically and socially disadvantaged group, and five out of six single parents are women.²⁶ For many, the only option is a social security benefit:¹⁴ in 1989–90, 35 per cent of all female income recipients derived their income from government pensions and benefits; the equivalent figure for men was 17 per cent.¹⁶

Crotty et al.⁴² studied 29 sole-parent families with low incomes in Geelong, Victoria, in 1989–90. It was found that the study group spent about the same amount (about \$28) on cereals, dairy products, fruit and vegetables as the average for all households in the 1988–89 Household Expenditure Survey, but that this was 48 per cent of their food expenditure compared with the average of 30 per cent. Less was spent on meat and non-alcoholic beverages (\$11 compared with \$27, or 18 per cent compared with 28 per cent).

This study also drew attention to a 'marked difference in expenditure on food in the first and second weeks of a social security payment fortnight', which, apart from a lower median vitamin C intake in the second week of the payment fortnight, was not reflected in the energy and nutrient intakes for the two weeks.⁴² This study is important because it examined the social and economic context of food acquisition in a disadvantaged group, enabling connections to be made between food and nutrient intakes, food decision making, and the way in which food fitted into budget strategies. It is also noteworthy that the study sample exhibited a high level of nutrition awareness, practical knowledge and concern for health (as reflected in purchase strategies and menu selections) a finding at odds with the common perception of lack of interest in these areas.

People living in rural areas

The structural disadvantages of living away from major urban centres have been discussed: less access to and a lesser range of services and facilities, higher costs,

higher unemployment, a lesser range of employment opportunities and greater economic uncertainty. There are differences in the prevalence of diet-related diseases between urban and rural dwellers that may be related to the environmental differences. Not all such differences favour urban dwellers.

Compared with their rural counterparts, women living in metropolitan areas are 16 per cent more likely to die of coronary heart disease and 25 per cent more likely to die of stroke. Urban men are 10 per cent more likely to die of coronary heart disease and 25 per cent more likely to die of stroke. Metropolitan women are also 47 per cent more likely to die from diabetes mellitus.²⁸

The 1985 National Dietary Survey of Schoolchildren obtained both rural and urban samples. A significantly higher proportion of rural children at most ages reported consumption of meat and meat products (particularly lamb and sausages), potatoes, peas, beans and pumpkins, oats and porridge, sugar, jam, honey, and whole milk. More urban than rural children reported consuming leafy greens, rice, snack foods, and reduced-fat milks.⁵⁸ Generally, rural boys had higher nutrient intakes than urban boys. A smaller proportion of rural girls reported vitamin A consumption below 70 per cent of the RDI (25–29 per cent compared with 35–38 per cent for urban girls).

There were also some urban–rural differences for particular ages. With the exception of rural girls, bread consumption at 10 years was similar. The pattern was quite different at 15 years: boys' bread consumption increased markedly but girls' bread consumption changed very little. The pattern for breakfast cereals was different again: boys consumed more than girls at 10 years; at 15 years boys' consumption had increased slightly; and at 15 years girls' consumption was slightly less than at 10 years (see Table 6.3).

Table 6.3: Trends in bread and breakfast cereal consumption, by age, sex and area of residence, 1985 (g/day)

Food	Boys				Girls			
	Urban		Rural		Urban		Rural	
	Age 10	Age 15	Age 10	Age 15	Age 10	Age 15	Age 10	Age 15
Bread	82	131	78	115	79	81	64	74
Breakfast cereal	44	59	58	77	36	34	37	29

Source: Australian Institute of Health and Welfare⁵⁸

By comparison, for Victorian adults surveyed in the same year, men in rural areas ate more porridge than men in Melbourne or in rural towns but women showed no difference. More muesli and high-fibre cereals were consumed in urban areas and more wheat cereal in rural areas.⁵⁸ Whole-milk consumption was higher in rural areas and consumption of fat-modified milks higher in the Melbourne metropolitan area. Mean cheese consumption showed no regional variation, but more cottage cheese and yoghurt were consumed in the metropolitan area and more ice-cream and butter in rural areas.⁵⁸

Rural children ate more potato than urban children, and rural children ate more potato as boiled and mashed potato. Potato consumed as chips was similar for all children. Urban boys aged 13 years consumed nearly twice as many potato crisps than their

rural counterparts, and a larger proportion of urban girls ate potato crisps compared with rural girls.⁵⁸ Urban children aged 10 years consumed significantly more cheese than rural 10-year-olds.

Ethnic communities

Dietary differences between ethnic groups (using language spoken at home as the indicator) were found in the 1983 and 1985 National Dietary Surveys. Nutrient intake differences by region of birth for the 1983 National Dietary Survey are given in detail in the published report. In many cases, however, results are based on very small numbers.⁵⁹

For schoolchildren, there were higher proportions reporting calcium intakes below 70 per cent of the RDI in homes where languages other than English were spoken: 56 per cent of girls (compared with 45 per cent where only English was spoken) and 47 per cent of boys (compared with 33 per cent). Similarly, girls from migrant homes reported a greater prevalence of iron intakes below 70 per cent of the RDI (32–42 per cent compared with 27 per cent). Vitamin A intakes for girls and zinc intakes for boys were higher where English was spoken at home. Meat consumption by girls from non-English-speaking backgrounds declined 20 per cent between ages 10 and 15 years: this was very different from the 45 per cent increase for girls from English-speaking backgrounds. Gliksman et al. found that while children from Mediterranean and Middle Eastern backgrounds had a greater-than-average BMI, they also had the lowest average total energy intake and lower-than-average fitness. Children of Asian background or of United Kingdom origin had the lowest BMIs. These differences could not be accounted for exclusively by differences in diet.⁵⁶ Children of Mediterranean and Middle Eastern background also had significantly higher diastolic blood pressures.⁵⁵

Bennett has identified differences in risk factors for cardiovascular disease in immigrants to Australia from the Risk Factor Prevalence Surveys of 1980, 1983 and 1989. As with the 1985 National Dietary Survey of Schoolchildren, adult immigrants from Asia and the United Kingdom had lower BMIs; women and men from Middle Eastern and Mediterranean regions had higher-than-average BMIs. Leisure-time physical activity was 'relatively unpopular' among South-east Asian immigrants and the Australian-born compared with those of European and Middle Eastern origin.⁶¹

Baghurst et al. surveyed 200 women of Vietnamese origin living in Adelaide in 1989;⁶⁰ the dietary pattern differed from that of the 1988 Australian Health and Nutrition Survey,⁶² which used the same basic food frequency method to obtain data. The details shown in Table 6.4 demonstrate a clear difference between the two.

Table 6.4: Mean daily nutrient intakes, Vietnamese women living in Australia, 1989, and Australian women, 1988

	Vietnamese women, 1989	Australian women, 1988
Nutrient (per cent)		
Protein	20.3	16.9
Fat	27.0	38.1
Carbohydrates	52.9	41.6
Other	–	3.4
Energy (MJ)	7.53	7.39
Fibre (g)	15.5	19.3
Micronutrient		
Calcium (mg)	520.0	712.0
Iron (mg)	10.2	11.2
Zinc (mg)	10.8	10.2
Retinol equivalents (µg)	179.0	1362.0
Thiamin (mg)	1.25	1.04
Riboflavin (mg)	1.18	1.76
Niacin equivalent (mg)	17.0	28.6
Vitamin C (mg)	101.0	102.0

– Zero

Note: Totals may not add to 100 per cent due to rounding

Sources: Baghurst et al.,⁶⁰ CSIRO (unpublished data)

Children and adolescents

Dietary surveys of children have typically investigated schoolchildren from about 10 years of age. Baghurst⁶³ reviewed 12 studies undertaken between 1976 and 1991 and found that differences in survey methods and sampling frames limit the usefulness of comparisons. There was, however, a trend to lower saturated fatty acid and sodium intakes, which is consistent with findings in Australian adults.

Only the 1985 Survey of Schoolchildren^{64,65} investigated a national sample of schoolchildren and it is relied on heavily in decision making about nutrition action for children. Young boys from single-parent homes had lower intakes of nutrients than young boys from two-parent homes. A higher proportion of girls from single-parent families consumed less than 70 per cent of the RDI for iron (35–38 per cent) than did girls of the same age from two-parent families (26–29 per cent).

The 1985 Dietary Survey of Schoolchildren was conducted in conjunction with the Australian Council for Health, Physical Education and Recreation's Health and Fitness Survey,⁶⁶ which provided behavioural information. It was found that 11–14 per cent of boys and 11–27 per cent of girls usually did not eat something before school, the proportion increasing with age. Other, smaller scale local surveys of the eating habits of primary school children suggest similar proportions not eating breakfast. Of those respondents aged 16 years from the 1992 Australian Longitudinal Youth Survey, 7 per cent reported having had no breakfast in the preceding seven days and a further

11 per cent had had breakfast on one or two occasions in that time; 12 per cent of 17–18-year-olds had not had breakfast in the seven days and a further 11 per cent had eaten breakfast once or twice in that time.⁶⁷ In contrast, only 2 per cent of 16-, 17- and 18-year-olds reported not eating lunch in the previous seven days, and nine respondents out of the 3540 surveyed had not had an evening meal.⁶⁷

There is some indication from the 1985 survey that, compared with those who did not eat breakfast, a lower proportion of children who ate breakfast had nutrient intakes less than the RDIs. The consumption of breakfast was associated with higher intakes of dairy products and hence calcium. For monitoring purposes, eating breakfast may be a useful indicator of nutrient intakes.

People of Aboriginal and Torres Strait Islander origin

The disadvantageous health and nutritional status of Aboriginal and Torres Strait Islander people has long been recognised and frequently reviewed. Detailed information can be found in several Australian Bureau of Statistics publications and in the sources listed in Table 6.5.

In summary, the proportion of Aboriginal and Torres Strait Islander people living in rural areas is twice the Australian population mean (33.5 per cent compared with 14.6 per cent). They are younger than the general population, leave school earlier and fewer achieve post-secondary qualifications. Unemployment is higher and the distribution of employment is skewed towards lower paid occupational categories. On the whole, Aboriginal and Islander people have relatively high birth and infant mortality rates and very much higher than average age-specific mortality rates for people aged 30–44 years.^{9,86} They have more circulatory disease at a lower age than the general population^{9,86} and a higher proportion are predisposed to non-insulin-dependent diabetes mellitus than is the case with people of European origin.

Among Aboriginal and Torres Strait Islander people the prevalence of diabetes mellitus peaks at about 40 years—about 30 years earlier than for all Australians. In the 20–50 year age group, the prevalence is over 10 times higher for Aboriginal and Islander people than for others. It is also known that death rates from cardiovascular disease are 10–20 times higher for young and middle-aged Aboriginal and Islander adults.⁹

This 1.5 per cent of the Australian population is disadvantaged. Nevertheless, it is essential to keep in mind that Aboriginal and Torres Strait Islander people do not constitute a homogeneous group and within this population lie subgroups with different profiles and different lifestyles. The range takes in traditional hunter–gatherer communities in remote rural areas, inner suburban communities such as those of Redfern in Sydney, and rural town communities as in Roebourne (north-west Western Australia) and Wilcannia (western New South Wales). Collection of data on the nutritional and health status of this group must take this heterogeneity into account.

Table 6.5: Sources of information on the health and nutritional status of Aboriginal and Torres Strait Islander people

Author/publication type	Year	Title	Ref.
Books			
Hunter	1993	<i>Aboriginal health and history. Power and prejudice in remote Australia</i>	68
Saggers & Gray	1991	<i>Aboriginal health and society: the traditional and contemporary Aboriginal struggle for better health</i>	69
McGrath et al.	1991	<i>Life-style disorders in Australian Aborigines: diabetes and cardiovascular disease—a review</i>	70
Reid and Trompf eds.	1991	<i>The health of Aboriginal Australians</i>	71
Australian Bureau of Statistics	1991	<i>Census of population and housing, 30 June 1986 Census 86—Australia's Aboriginal and Torres Strait Islander people</i>	72
National Aboriginal Health Strategy Working Party	1989	<i>A National Aboriginal Health Strategy</i>	9
Thomson & Merrifield	1988	<i>Aboriginal health: an annotated bibliography</i>	73
Moodie & Pederson	1971	<i>The health of Australian Aborigines: an annotated bibliography</i>	74
Serials and series			
<i>Aboriginal and Islander Health Worker Journal</i>			
<i>Aboriginal Health Information Bulletin</i>			
<i>Aboriginal and Torres Strait Islander Health Series</i>			
Selected reviews and articles			
Hodgson & Wahlqvist	1993	<i>Nutrition and health of Victorian Aborigines (Kooris)</i>	75
O'Dea et al.	1993	<i>Obesity, diabetes and hyperlipidaemia in a central Australian Aboriginal community with a long history of acculturation</i>	76
Hunter et al.	1992	<i>Patterns of alcohol consumption in the Kimberley Aboriginal population</i>	77
Gracey et al.	1992	<i>Maternal and environmental factors associated with infections and undernutrition in young Australian Aboriginal children</i>	78
Gracey	1992	<i>Diarrhoea in Australian Aborigines</i>	79
Gracey	1991	<i>Nutrition and infections in Australian Aboriginal children</i>	80
O'Dea	1991	<i>Traditional diet and food preferences of Australian Aboriginal hunter-gatherers</i>	81
Gracey & Sullivan	1989	<i>Growth of remote Australian Aborigines from birth to two years</i>	82
Gracey & Sullivan	1988	<i>Growth of Aboriginal infants in the first year of life in remote communities in north-west Australia</i>	83
Sullivan et al.	1987	<i>Food costs and nutrition of Aborigines in remote areas of northern Australia</i>	84
Patterson	1987	<i>Problems in the assessment and the overcoming of nutritional deficiencies in Australian Aborigines</i>	85

References

1. Calvert D, Condon-Paoloni D, Ewan C et al. Diet, nutrition and equity in Australia. Review paper for the National Food and Nutrition Policy development commissioned by the Department of Health, Housing and Community Services. Canberra: Department of Health, Housing and Community Services, 1991.
2. Quine S, Lancaster PA. Indicators of social class—relationship between prestige of occupation and suburb of residence. *Comm Health Stud* 1989;13:510–518.
3. Smith AM, Baghurst KI. Dietary vitamin and mineral intake and social status. *J Epidemiol Community Health* (in press).
4. Daniel A. Power, privilege and prestige: occupations in Australia. Melbourne: Longman Cheshire, 1983.
5. Australian Bureau of Statistics. ASCO — Australian Standard Classification of Occupations. Canberra: ABS (cat. no. 1221.0), 1990.
6. Australian Bureau of Statistics. Demography. In: Year book Australia 1992. Canberra: ABS (Cat. no. 1301.0), 1992;75th ed, 147–181.
7. Jones FL. Ancestry groups in Australia: a descriptive overview. Working paper on multicultural studies no. 3. Wollongong: University of Wollongong Centre for Multicultural Studies, 1991.
8. Ball RE. The economic situation of Aborigines in Newcastle 1982. *Australian Aboriginal Studies* 1985;1:2–21.
9. National Aboriginal Health Strategy Working Party. A national Aboriginal health strategy. Canberra: Department of Aboriginal Affairs, 1989.
10. Australian Bureau of Statistics. Working life. In: Social indicators number 5. Canberra: ABS (Cat. no. 4101.0), 1992;158–234.
11. Australian Bureau of Statistics. Australia's Aboriginal and Torres Strait Islander population. 1991 census of population and housing 6 August 1991. Canberra: ABS, (Cat. no. 2740.0). 1993;1–19
12. Australian Bureau of Statistics. Education. In: Social indicators number 5. Canberra: ABS (Cat. no. 4101.0), 1992;111–156.
13. Australian Institute of Health and Welfare. Derived from 1991 Census data and other unpublished data.
14. Trethewey J. Aussie battlers: families and children in poverty. Melbourne: Collins Dove in association with the Brotherhood of St Laurence, 1989.
15. University of Melbourne Institute of Applied Economic and Social Research. Poverty lines: Australia (quarterly series). 1993.
16. Australian Bureau of Statistics. Income and expenditure. In: Social indicators number 5. Canberra: ABS (Cat. no. 4101.0), 1992;235–306.
17. Crowley S, Way M. Economic aspects of good nutrition. Review paper for the National Food and Nutrition Policy development commissioned by the Department of Health, Housing and Community Services. Canberra: Department of Health, Housing and Community Services, 1991.

18. Cox E. Nutrition policy and the social context. Review paper for the National Food and Nutrition Policy development commissioned by the Department of Health, Housing and Community Services. Canberra: Department of Health, Housing and Community Services, 1991.
19. Malseed J. Bread without dough: understanding food poverty. Bradford, West Yorkshire, 1990.
20. Whitehead M. The health divide: inequalities in health in the 1980s. London: Health Education Council, 1987.
21. Information from Life Chances Study provided by the Brotherhood of St Laurence. 1993.
22. Australian Bureau of Statistics. Housing. In: Social indicators number 5. Canberra: ABS (Cat. no. 4101.0), 1992;307-345.
23. McCallum J. Health: the quality of survival in older age. In: Australian Institute of Health. ed. Australia's health 1990: the second biennial report of the Australian Institute of Health. Canberra: AGPS, 1990;195-240.
24. Ngamampa Health Council Inc., South Australian Health Commission, Aboriginal Health Organisation of SA. Report of the Uwankara Palyanka Kanyintjaku. An environmental and public health review within the Ananga Pitjantjatjara lands. Adelaide: SAHC, 1987.
25. Coleman L, Watson S. Older women: housing issues and perspectives. Aust J Ageing 1985;4:13-18.
26. Australian Bureau of Statistics. Families and households. In: Social indicators number 5. Canberra: ABS (Cat. no. 4101.0), 1992;37-60.
27. Neiwand AC, Kronld M, Lau D. Relative impact of selected factors on food choices of elderly individuals. Can J Aging 1988;7:32-47.
28. Mathers C. Health differentials among working age Australians aged 25-64 years. Canberra: AIHW, 1994.
29. Young C. Selection and survival. Immigrant mortality in Australia. Canberra: Department of Immigration and Ethnic Affairs, AGPS, 1986.
30. Clark M. A short history of Australia. Sydney: Tudor Distributors, 1969.
31. Najman JS, Williams GM, Keeping JD, Morrison J, Andersen MJ. Religious values, practices and pregnancy outcomes: a comparison of the impact of sect and mainstream Christian affiliation. Soc Sci Med 1988;26:401-407.
32. Department of Health, Housing and Community Services. Annual report 1990-91. Canberra: AGPS, 1991.
33. Humphreys JS, Weinand HS. Health status and health care in rural Australia: a case study. Comm Health Stud 1989;13:258-275.
34. Humphreys JS, Weinand HS. Health care preferences in a country town. Med J Aust 1991;154:733-777.
35. McCredie M, Coates M, Ford JM. Epidemiology of alimentary cancers in New South Wales, 1973-82. ANZ J Surg 1990;60:93-98.
36. Australian Institute of Health and Welfare. Unpublished analyses of the 1989-90 National Health Survey.
37. Bennett S, Stevenson C, Melville G, de Looper M, Wright P. Mortality surveillance, Australia 1979-1990. Canberra: AGPS, 1992;130-165.

38. Mackerras D. High cholesterol—how important is it for women? Proceedings of the Kellogg Nutrition Symposium on Women's Health—Dietary Effects, Wednesday 2 May 1990, Sydney 1992;1–13.
39. Australian Bureau of Statistics. Unpublished data from the 1988–89 National Health Survey.
40. Department of Community Services and Health. Annual report 1988–89. Canberra: AGPS, 1989.
41. Hicks N, Robbins J, Edwards J, Zweck W. Governments, the food industry and good nutrition. An Australian review. Review paper for the National Food and Nutrition Policy development commissioned by the Department of Health, Housing and Community Services. Canberra: Department of Health, Housing and Community Services, 1991;1–55.
42. Crotty PA, Rutishauser IHE, Cahill M. Food in low income families. *Am J Public Health* 1992;16:168–174.
43. National Health and Medical Research Council. Implementing the Dietary Guidelines for Australians. Report of the Subcommittee on Nutrition Education. Canberra: AGPS, 1989; 1–138.
44. Australian Institute of Health. Australia's Health 1990 : the second biennial report of the Australian Institute of Health. Canberra: AGPS, 1990.
45. Australian Bureau of Statistics. Disability, ageing and carers Australia, 1993. Summary of findings. Canberra: ABS (cat. no. 4430.0), 1993:1–15.
46. Australian Bureau of Statistics. Population. In: Social indicators number 5. Canberra: ABS (Cat. no. 4101.0), 1992;1–36.
47. Gordon I, Christie D, Robinson K. Social class as indicated by area of residence: a mortality study within an Australian industrial population. *Comm Health Stud* 1989;13:170–176.
48. McMichael AJ. Social class (as estimated by occupational prestige) and mortality in Australian males in the 1970s. *Comm Health Stud* 1985;9:220–230.
49. Quine S. Social class as a risk factor for infant mortality in an Australian population. *J Biosoc Sci* 1991;23:65–72.
50. Smith AM, Baghurst KI. Public health implications of dietary differences between social status and occupational category groups. *J Epidemiol Community Health* 1992;46:409–416.
51. Baghurst KI, Dreosti IE, Syrette JA, Record SJ, Baghurst PA, Buckley RA. Zinc and magnesium status of Australian adults. *Nutr Res* 1991;11:23–32.
52. Australian Institute of Health and Welfare. Unpublished data from the 1983 National Dietary Survey of Adults.
53. Baghurst KI, Record SJ, Baghurst PA, Syrette JA, Crawford DA, Worsley A. Sociodemographic determinants in Australia of the intake of food and nutrients implicated in cancer aetiology. *Med J Aust* 1990;153:444–452.
54. English R, Bennett S. Socioeconomic and demographic factors, overweight and obesity in Australian adults. *Zywnienie Czlowieka I Metabolizm [Polish J Human Nutrition & Metabolism]* 1989;16:198–204. (Paper presented at the IUNS Workshop on Nutrition and Obesity, Varna, Bulgaria, 10–12 May 1988).
55. Gliksman MD, Dwyer T, Wlodarczyk J. Differences in modifiable cardiovascular disease risk factors in Australian schoolchildren: the results of a nationwide survey. *Preventive Medicine* 1990;19:291–304.

56. Gliksmann MD, Lazarus R, Wilson A. Differences in serum lipids in Australian children: is diet responsible? *Int J Epidemiol* 1993;22:247-254.
57. Rutishauser IHE, Wheeler CE, Conn JA, O'Dea K. Food and nutrient intake in a randomly selected sample of adults. *Aust J Nutr Diet* 1994 (in press).
58. Australian Institute of Health and Welfare. Unpublished data from the 1985 National Dietary Survey of Schoolchildren (aged 12-15 years).
59. Department of Community Services and Health. National Dietary Survey of Adults: 1983. No. 2. Nutrient intakes. Canberra: AGPS, 1987;1-115.
60. Baghurst KI, Syrette JA, Tran MM. Dietary profile of Vietnamese migrant women in South Australia. *Nutr Res* 1991;11:715-725.
61. Bennett SA. Inequalities in risk factors and cardiovascular mortality among Australia's immigrants. *Am J Public Health* 1993;17:251-261.
62. CSIRO. Unpublished data from the 1988 Australian Health and Nutrition Survey.
63. Baghurst K. Current nutritional status of Australian schoolchildren. Paper presented at ILSI, 1993.
64. Department of Community Services and Health. National Dietary Survey of Schoolchildren (aged 10-15 years): 1985. no. 2. Nutrient intakes. Canberra: AGPS, 1989;1-117.
65. Department of Community Services and Health. National Dietary Survey of Schoolchildren (aged 10-15 years): 1985. no. 1. Foods consumed. Canberra: AGPS, 1988;1-105.
66. Australian Council for Health, Physical Education and Recreation. Australian Health and Fitness Survey 1985. Adelaide: ACHPER, 1985;1-201.
67. Australian Institute of Health and Welfare. Unpublished data from the Department of Education, Employment and Training 1992 Australian Longitudinal Youth Survey.
68. Hunter E. Aboriginal health and history. Power and prejudice in remote Australia. Melbourne: Cambridge University Press, 1993;1-336.
69. Siggers S, Gray D. Aboriginal health and society: the traditional and contemporary Aboriginal struggle for better health. North Sydney: Allen & Unwin, 1991.
70. McGrath M, Collins V, Zimmet P, Dowse G. Lifestyle disorders in Australian Aborigines: diabetes and cardiovascular disease—a review. Canberra: International Diabetes Institute, Brolga Press, 1991.
71. Reid J, Trompf P eds. The health of Aboriginal Australia. Sydney: Harcourt Brace Jovanovich, Publishers, 1991;1-455.
72. Australian Bureau of Statistics. Census of population and housing, 30 June 1986. Census 86—Australia's Aboriginal and Torres Strait Islander people. Canberra: ABS, 1991.
73. Thomson N, Merrifield P. Aboriginal health, an annotated bibliography. Canberra: Australian Institute of Aboriginal Studies, 1988;1-289.
74. Moodie PM, Pederson EB. The health of Australian Aborigines: an annotated bibliography. Canberra: AGPS (School of Public Health and Tropical Medicine, University of Sydney service publ. no. 8), 1971;1-248.
75. Hodgson JM, Wahlqvist ML. Nutrition and health of Victorian Aborigines (Kooris). *Asia Pacific J Clin Nutr* 1993 (in press).

76. O'Dea K, Patel M, Kubisch D, Hopper J, Traianedes K. Obesity, diabetes and hyperlipidaemia in a central Australian Aboriginal community with a long history of acculturation. *Diabetes Care* 1993;16:1004–1010.
77. Hunter EM, Hall WD, Spargo RM. Patterns of alcohol consumption in the Kimberley Aboriginal population. *Med J Aust* 1992;156:764–768.
78. Gracey M, Sullivan H, Burke V, Gracey D. Maternal and environmental factors associated with infections and undernutrition in young Australian Aboriginal children. *Ann Trop Paediatr* 1992;12:111–119.
79. Gracey M. Diarrhoea in Australian Aborigines. *Aust J Public Health* 1992;16:216–225.
80. Gracey M. Nutrition and infections in Australian Aboriginal children. *Aust NZ J Med* 1991;21:921–927.
81. O'Dea K. Traditional diet and food preferences of Australian Aboriginal hunter-gatherers. *Phil Trans Roy Soc Lond* 1991;334:233–241.
82. Gracey M, Sullivan H. Growth of remote Australian Aborigines from birth to two years. *Ann Human Biol* 1989;16:421–428.
83. Gracey M, Sullivan H. Growth of Aboriginal infants in the first year of life in remote communities in north-west Australia. *Ann Human Biol* 1988;15:375–382.
84. Sullivan H, Gracey M, Hevron V. Food costs and nutrition of Aborigines in remote areas of northern Australia. *Med J Aust* 1987;147:334–337.
85. Patterson C. Problems in the assessment and the overcoming of nutritional deficiencies in Australian Aborigines. *Med J Aust* 1987;147:319–337.
86. Lee SH, Smith L, d'Espaignet E, Thomson N. Health differentials for working age Australians. Canberra: AIH, 1987.