





Risk factors

Poor diet and nutrition **%** Physical inactivity **%** Tobacco **%** Alcohol misuse **%** High blood pressure **%** High blood cholesterol **%** Excess weight **%**

Chapter 3



3 Risk factors

This chapter shifts the focus from specific chronic diseases and conditions to risk factors that affect the onset, maintenance and prognosis of a variety of chronic diseases and their complications. The focus is on those risk factors that are avoidable or modifiable and for which there is potential for health gain through early prevention or appropriate management. Stand-alone information is presented on four common behavioural risk factors (tobacco smoking, alcohol misuse, physical inactivity, poor nutrition) and three biomedical risk factors (high blood pressure, high blood cholesterol, excess weight). All of these represent events along the causal pathways leading to the development of various chronic diseases and their complications (Figure 3.0.1).

Figure 3.0.1: Relationships of risk factors and chronic diseases



Surveillance of risk factors is an integral part of chronic disease monitoring. Importantly, surveillance aids in forecasting levels and trends and provides an opportunity for early intervention.

Although this chapter profiles seven risk factors individually, it is important to note that the factors do not act alone or independently. They tend to coexist and to interact in their effects. As an individual factor they are almost always a contributory cause in a disease, not the sole cause. All diseases are to some extent multi-factorial in their causes. It should also be noted that only a small proportion of risk factors associated with chronic diseases or conditions has been consistently found to meet the accepted epidemiological criteria of causation. In addition, the distinction between a disease (or a condition) and a risk factor is difficult to achieve, because several diseases act as risk factors for other diseases and conditions. Table 3.0.1 sets out some of the key linkages noted in this report between the risk factors and diseases covered. A further point to remember is that there are important, broader influences on health and disease, such as many social and economic factors as shown in Figures 1.0.4 and 3.0.1. It is beyond the scope of this report to cover them here even though they make an important contribution to the risk factors discussed and also contribute to health and disease in a range of other ways.

It is difficult to be certain that a particular risk factor has contributed to a disease in any individual case, however good estimates can be made of its contribution to health and disease at a population level. A well-established approach is to calculate what is known as the attributable fraction. This is based on knowing the proportion of people who have the risk factor in question and the extra risk that the factor imposes on the individual who has it. For example, by knowing the percentage of smokers and ex-smokers, and the extra risk of lung cancer they have compared to nonsmokers, it is estimated that over 80% (the attributable fraction) of lung cancer cases can be attributed to cigarette smoking. Some examples of attributable fractions are presented in the following sections.

Since risk factors often interact, it is much more difficult to establish their combined contribution to a particular disease. The individual attributable fractions cannot simply be added.

The following overviews include information on health outcomes associated with each risk factor, prevalence patterns, impacts in terms of associated mortality and use of health services, and potential for reducing the impact of the factor. Information is also presented on certain population groups because they have higher levels of some of the risk factors covered in this report and therefore are at greater risk of certain chronic diseases.

	Risk factor							
	Behavioural			Biomedical			Other	
Chronic disease/condition	Poor diet	Physical inactivity	Tobacco use	Alcohol misuse	Excess weight	High blood pressure	High blood cholesterol	Diabetes
Coronary heart disease	а	a	a	a	a	a	a	a
Stroke	а	a	a	a	a	a	a	a
Lung cancer			a					
Colorectal cancer	а	a			a			
Depression			a	a	a			
Diabetes	а	a			a			
Asthma			a		a			
Chronic obstructive pulmonary disease			a					
Chronic renal diseases	a				a	a		a
Oral diseases	а		a					a
Osteoarthritis		a			a			
Osteoporosis	а	a	a	a				
Excess weight	а	a						
High blood pressure	а	a		a	a			
High blood cholesterol	а	a			a			

Table 3.0.1: Relationships between various chronic diseases, conditions and risk factors

3.1 Poor diet and nutrition

Consensus has developed about the role of diet in the aetiology and prevention of chronic diseases. A poor diet contributes to chronic diseases directly or indirectly through a range of health risk factors. It often results from over-consumption of food in general, or diets high in energy-rich components such as fat. A poor diet may also be low in dietary fibres or complex carbohydrates, and deficient in certain vitamins and minerals. In Westernised societies, the problem is typically one of excess food rather than deficiency.

Poor diet and nutrition is common and contributes substantially to the burden of chronic diseases in Australia.

Description

A key to achieving optimum health, is eating a balanced diet. In order to work efficiently, our bodies require a variety of nutrients on a daily basis and we can derive these from many different sources.

The importance of nutrition in disease prevention and health maintenance has been emphasised by the publication of dietary guidelines by the National Health and Medical Research Council (NHMRC). Three sets of guidelines have been developed—for adults, for children and adolescents, and for older Australians. The guidelines (summarised in Box 3.1.1) emphasise that we require a full set of nutrients—vitamins, minerals, carbohydrates, fibre, protein, and fats—to nourish and energise us.

Health outcomes

Poor diet plays a key role in the development and progression of several chronic diseases such as coronary heart disease, stroke, some forms of cancer, Type 2 diabetes and dental caries. It also contributes to a variety of other health risk factors such as high blood pressure, excess weight, and high blood cholesterol (see Box 3.1.2). Alternatively, a healthy diet plays an important role in protecting against many chronic diseases and their risk factors.

Box 3.1.1: Summary of the dietary guidelines for Australians

Promote the consumption of:

- 1 a wide variety of foods including plenty of cereals, vegetables and fruits
- 1 adequate amounts of water and other fluids
- 1 foods high in iron (e.g. lean meats) and calcium (e.g. dairy foods)

Limit intake of:

- 1 added sugars, salt and alcohol (alcohol is not recommended for children)
- fats, particularly saturated fat (low fat diets are not suitable for young children)
 Maintain a healthy body weight
 Care for food and keep it safe to eat
 Encourage and support breastfeeding

Source: NHMRC 1992, 1995, 1999a.

There is strong evidence that poor diet and nutrition mostly leads to the development of chronic diseases through a range of intermediary risk factors. For example, high intake of saturated fat raises blood cholesterol levels, high overall fat intake contributes to overweight and obesity, and high salt use contributes to high blood pressure—all intermediate factors that increase the risk of coronary heart disease (AIHW 2001). There is strong evidence of the role of sugar in the development of dental caries (Stanton 2001).

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Similarly, diets low in fruit and vegetables or high in dietary fat are known to increase the risk of colorectal cancer (NHMRC 1999b).

A high intake of plant foods (such as cereals, fruit, vegetables and legumes) on the other hand is considered to provide protection against coronary heart disease, some cancers and excess weight. There is good evidence that regular consumption of fish, particularly oily fish that are high in omega-3 polyunsaturated fats, reduces the risk of coronary heart disease (NHFA 1999). Similarly, omega-6 polyunsaturated fatty acids (found in large amounts in vegetable oils such as sunflower oil) are considered to protect against heart disease by lowering LDL cholesterol and probably by reducing the risk of an irregular heartbeat (NHMRC draft guidelines).

Breastfeeding, particularly exclusive breastfeeding, is thought to be protective of several chronic diseases later in life. These include Type 2 diabetes, inflammatory bowel disease, allergic diseases, obesity and atherosclerosis.

Box 3.1.2: Health problems associated with poor diet and nutrition

Coronary heart disease Stroke Type 2 diabetes Some cancers Bowel conditions Dental caries High blood pressure High blood cholesterol Excess weight Atherosclerosis Source: WCRF & AICR 1997; Law 1997.

Dietary patterns

Insights into the extent of poor diet and nutrition in the population can be gained by using several different approaches. One method is to compare dietary intake with the recommended levels. Another is to compare nutrient intakes to total energy intake (known as nutrient density), also based on the recommended dietary intakes. A third approach would be to compare trends in the apparent consumption of foodstuffs and nutrients standardised by dietary intake.

Information on dietary intake patterns in Australia as a whole is limited. National data are available mainly from the 1983 ABS Dietary Survey of Australian Adults, the 1985 ABS National Dietary Survey of School Children and the 1995 ABS National Nutrition Survey. Apparent consumption of foodstuffs and nutrients, information compiled by the ABS, can be used to track broad time trends.

Data from the 1995 ABS National Nutrition Survey indicate a 32.5% contribution of fats to energy intake for persons aged 19 and over (maximum recommended level, 30%), of which 12.5% is from saturated fats (maximum recommended level, 10%). Similarly, persons aged 19 and over are reported to consume 144g of fruit (minimum recommended level, 300g) and 259g of vegetables (minimum recommended level, 300g) per day. Put differently, 2 in 3 persons are not consuming the recommended level of vegetables, 4 in 5 are not consuming enough fruit, and 1 in 2 males and 2 in 3 females are not eating recommended levels of cereal foods (Table 3.1.1).

Trends

There have been significant changes in food and nutrient intake in Australia in the last two decades, both among children and adults, as revealed by the nutrition surveys. Intake of energy, dietary fibre, carbohydrate and iron all increased significantly during this period. By contrast, total fat consumption decreased (Table 3.1.2).

Among children, there were no changes in mean intake of dietary staples such as cereals, fruit, vegetables and meats but there were significant

Food group	Amount	Proportion of persons with inadequate intake	Recommended level
Vegetables	Too little	2 in 3	300g per day (minimum)
Fruit	Too little	4 in 5	300g per day (minimum)
Cereal foods	Too little	1 in 2 males 2 in 3 females	210g per day (minimum)
Fat (exceeding level)	Too much	2 in 3 males 1 in 2 females	30% of energy (maximum)
Saturated fat (exceeding level)	Too much	2 in 3	10% of energy (maximum)

Table 3.1.1: Comparison of food intake with recommended levels, 1995

Source: Cancer Council Australia 2001.

increases in the consumption of cereal-based foods (such as cakes, pastries and pizza), nonalcoholic beverages, and confectionary and sugar products (such as honey and jams).

Among adults, foods contributing to the increases (and which were consumed by at least 40% of the sample on the day of the surveys) were cereals (including breads, breakfast cereals, cakes and biscuits etc.) and non-alcoholic beverages.

Unexpected changes included increases in the consumption of plain drinking water among both adults and children and a decrease in vitamin C consumption, the latter largely attributable to a fall in fruit consumption among adults and fruit juices among children (Cook et al. 2001).

Disparities

Individual variation in dietary patterns is well recognised. Within any large population there also exist subgroups or pockets of population that are at a high risk of poor diet and nutrition. These people may be nutritionally vulnerable for several reasons—health status (chronically ill or handicapping conditions), socioeconomic disadvantage, education levels, Indigenous status and lack of easy access to a range of appropriate foods.

Socioeconomic disadvantage

According to the 1995 ABS National Nutrition Survey, adults in the socioeconomically most advantaged group have the highest average intake of energy. However, this group was also found to have the highest dietary fibre intake and the lowest cholesterol intake (ABS 1997). In comparison, people in the disadvantaged socioeconomic categories reported high levels of fat consumption. Interestingly, those in the most disadvantaged group reported a slightly higher intake of vegetables than all other socioeconomic groups (ABS & DHAC 1998).

Urban, rural and remote groups

Regional analysis of the 1995 ABS National Nutrition Survey indicated that people living in rural centres have the lowest median intakes for the majority of vitamins and minerals. Cholesterol intake is higher among males living in rural and remote areas but differences are less marked among females. Adults in rural and remote areas have reported eating half a serve more of vegetables daily than their metropolitan counterparts, although they still do not achieve the recommended minimum of five serves per day (ABS & DHAC 1998).

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	Adults (aged	l 25–64 years)	Adolescents (aged 10-15 years)		
Nutrient/indicator	Direction ^(a)	Extent of change	Direction ^(a)	Extent of change	
Energy	Increased	Males—3% Females—4%	Increased	Boys—15% Girls—11%	
Protein	Unchanged		Increased	Boys—14% Girls—13%	
Carbohydrate	Increased	Males—17% Females—16%	Increased	Boys—22% Girls—18%	
Fat	Decreased	Males—6% Females—4%	Unchanged		
Cholesterol	Decreased	Males—14% Females—22%	Unchanged		
Fibre	Increased	Males—13% Females—10%	Increased	Boys—13% Girls—8%	
Calcium	Increased	Males—18% Females—14%	Unchanged		
Iron	Increased	Males—11% Females—15%	Increased	Boys—16% Girls—11%	
Vitamin C	Decreased	Males—8% Females—7%	Decreased	Boys—not significant Girls—10%	

Table 3.1.2: Comparison of nutrient intake in Australia, 1980s and 1995

(a) Where there is a trend in mean intake it is significant at 1% level.

Source: Cook et al. 2001. Based on analysis of comparable samples from the 1983 National Dietary Survey of Adults, the 1985 National Dietary Survey of School Children and the 1995 National Nutrition Survey.

Indigenous and non-Indigenous groups

National data on the diet and nutrition of Indigenous peoples are limited (AIHW 2000). The Indigenous sample in the 1995 ABS National Nutrition Survey was too small to allow reliable analysis. The transition from a traditional hunter-gatherer lifestyle of varied, nutrient-rich diets to energy-rich diets high in fat and refined sugars has created changes in dietary patterns that do not appear to be conducive to good health.

Impacts

In Australia, as in other developed countries, mortality from poor diet and nutrition is almost always associated with diet-related diseases rather than from severe malnutrition or starvation. Two Australian studies have assessed the link between poor diet and mortality.

Gattorna et al. (1997) have attributed 16% of male and 20% of female deaths in Western Australia in 1994 to poor diet. The proportions declined slightly since 1983–85 when the corresponding estimates were 18% and 22% (Gattorna et al. 1997). More specific estimates of the role of inadequate fruit and vegetable consumption in increasing the risk for mortality through a variety of chronic diseases were generated by the Australian Burden of Disease and Injury Study (AIHW: Mathers et al. 1999). According to this study, an estimated 2,541 (3.7%) male deaths and 1,516 female deaths (2.2%) in Australia in 1996 were attributable to inadequate fruit and vegetable consumption.

Prevention

Good nutrition, including childhood and prenatal nutrition, can play an integral part in the prevention of chronic diseases. Population initiatives to encourage nutritious diets can include education and training, mass media campaigns, government initiatives, economic incentives and regulatory measures.

Australia has used a variety of social marketing strategies to promote increased consumption of

fruit and vegetables, e.g. 'Fruit 'n' Veg with Every Meal' (Western Australia 1989–93 and South Australia 1990–91); 'Two Fruit and Five Vegetables Every Day' (Western Australia 1989–93 and Victoria 1992–95) and 'Eat Well' (Tasmania 1997). In 1999, a national education campaign, comprising a partnership between Coles and the Dietitians' Association of Australia, was aimed at increasing fruit and vegetable consumption in the Australian population.

Recent government initiatives aimed at improving the health of Australians through better food and nutrition include the National Nutrition Strategy 2000–2010 (also known as 'Eat Well Australia'), the complementary Indigenous Nutrition Strategy, the National Breastfeeding Strategy, the National Action Plan on Vegetables and Fruit, and the National Cancer Strategy.

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