

Module 4

Prevention

Basic concepts

This section is about the prevention of chronic disease. We describe the assessment and management of the behavioural risk factors for chronic diseases in primary health care.



Learning objectives

By the end of this section you will be able to:

- Describe the risk factors for chronic disease and how they influence the incidence of chronic disease
- Describe primary prevention of chronic disease
- Describe the effectiveness of behavioural risk factor management in primary health care
- Describe the application of the 5As framework to prevention in PHC.

4.1 What is prevention?

The World Health Organization defines prevention as approaches and activities that are aimed at reducing the likelihood that a disease or disorder will affect an individual, ones that interrupt or slow the progress of the disorder or reducing disability [1].

Prevention can be divided into three levels:

- Primary prevention: reduces the risk of developing a disease or disorder
- Secondary prevention: interrupts, prevents or minimises the progress of a disease or disorder at an early stage
- Tertiary prevention: prevents damage and disability due to complication of a disease.

Sometimes in cardiovascular health, secondary prevention is used to refer to the prevention of stroke or heart attack in people who already have cardiac disease. Interventions to prevent chronic disease can occur at a number of levels.

The determinants of chronic disease (Figure 1) can influence our health in either a positive or negative way. Determinants that negatively influence the occurrence of chronic disease are risk factors and those that positively influence it are protective factors.

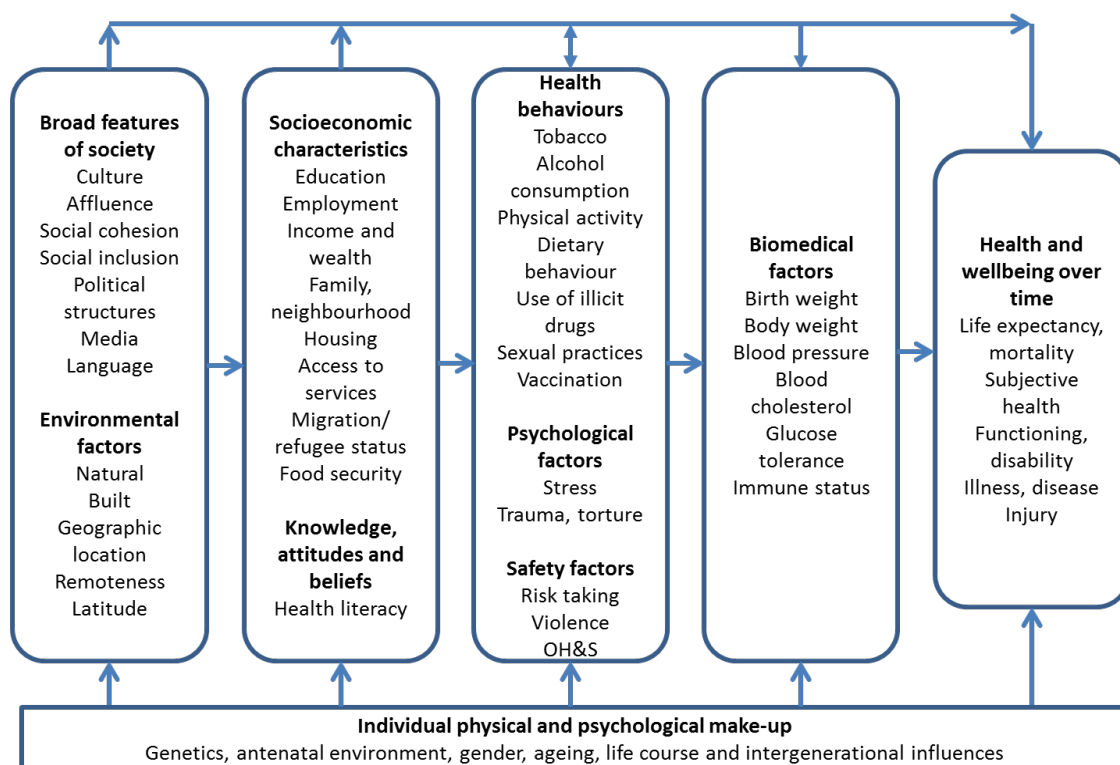


Figure 1: The determinants of chronic disease [2]

4.2 What are the risk factors for chronic conditions and how do they work?

Most chronic diseases share a common set of behavioural risk factors: smoking, nutrition, alcohol and physical inactivity - the SNAP risk factors. Most Australians (just over 90%) fail to consume the recommended amounts of vegetables (5 portions each day) and about 50% do not consume the recommended amounts of fruit (2 portions). Almost 60% of Australians do not undertake sufficient physical activity to incur health benefits (at least 150 minutes in 1 week over at least 5 sessions). More than 80% of Australians spend more than 3 hours each day sitting during their leisure time, regardless of whether they undertake sufficient physical activity [2]. Since 2010, daily smoking has declined in people aged 14 years and over (from 15.1% to 12.85%). In 2011–2012, 62.8% of Australians aged 18 years and over were overweight or obese (35.3% overweight and 27.5% obese).

In 2012, nine in ten Australian adults had at least one and 64% had at least three risk factors for chronic disease (such as tobacco smoking, low intake of fruit or vegetables, at risk alcohol consumption, physical inactivity, high blood pressure, cholesterol or excess weight) [2]. Tobacco smoking is a risk factor for a range of chronic diseases including a number of cancers, cardiovascular disease, stroke, and chronic obstructive lung disease. Drinking alcohol above the *NHMRC Guidelines* [3] increases the risk of heart disease, liver disease and stroke. Poor nutrition and physical inactivity increase the risk of coronary heart disease, stroke, hypertension, type 2 diabetes, colon cancer and osteoporosis and mental health disorders.

These risk factors can independently cause these conditions or can act via other known physiological risk factors for these conditions including overweight and obesity, high blood pressure, high cholesterol or abnormal glucose metabolism. The pathways by which these factors operate to cause chronic disease to occur across the life cycle can also be influenced by genetic, social or economic factors.

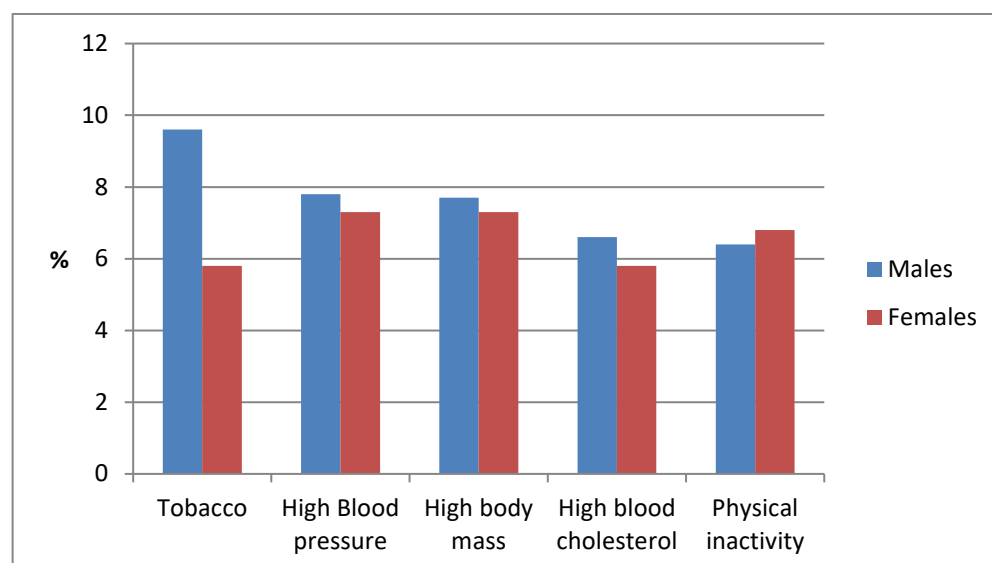


Figure 2: Attributable burden due to risk factors for chronic disease (AIHW 2012) [2]

The risk of cancer associated with these risk factors varies according to the risk factor and the type of cancer. Tobacco use increases the risk of lung cancer by 23 times in males [4]. It also increases the risk of larynx, oesophagus, oral cavity and pharynx, bladder, pancreas, kidney, liver, stomach, bowel, cervix, leukaemia, and ovarian cancers [5]. Every 5 kg/m² of BMI overweight increases the risk of a range of cancers by between 20% and 50% including colon, rectum, liver, gallbladder, pancreas, oesophagus, uterus and thyroid [6].

4.3 Population interventions to prevent chronic disease

There is considerable potential to improve the risk factors and thus prevent disease (Figure 3).

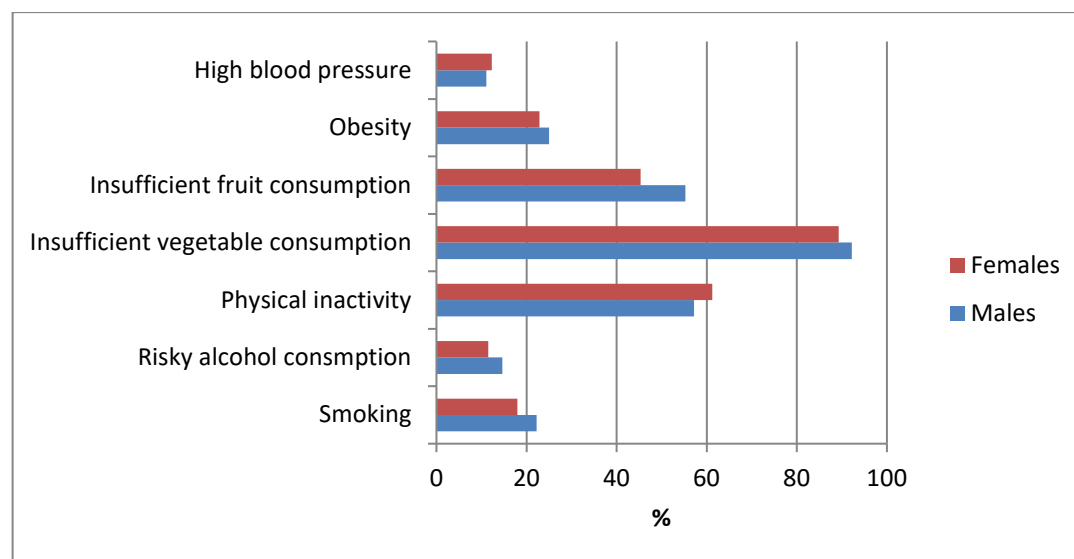


Figure 3: Potential improvements in health by risk factor reduction, 2007–08 [2]

Prevention of chronic disease can involve strategies at both the population and individual levels. Population-based strategies seek to influence the choices or decisions made by the population through market or legislative mechanisms. These can include influencing the availability or market price of tobacco, alcohol or food stuffs; controlling their advertising or promotion to promote change in behaviours; restricting their use in certain situations (e.g. smoking in workplaces or restaurants) and so forth.

Based on evidence, the World Health Organization has suggested a number of 'best buy' policy interventions as well as individual interventions that may assist in the prevention of chronic disease [7]. These include:

- protecting people from tobacco smoke and banning smoking in public places
- warning about the dangers of tobacco use
- restricting or enforcing bans on tobacco and alcohol advertising, promotion and sponsorship

- excise tax increases on tobacco and alcohol
- restricting access to retailed alcohol
- reducing salt intake and salt content of food
- replacing trans-fats in food with unsaturated fats
- promoting public awareness about diet and physical activity, including through mass media.

Effective tobacco control measures include increasing price (through taxes), reducing outlets, banning advertising and sponsorships, putting warnings on packets, banning smoking in buildings and so on. Figure 4 shows how the share of world populations who have been exposed to selected tobacco policies has increased between 2007 and 2018.

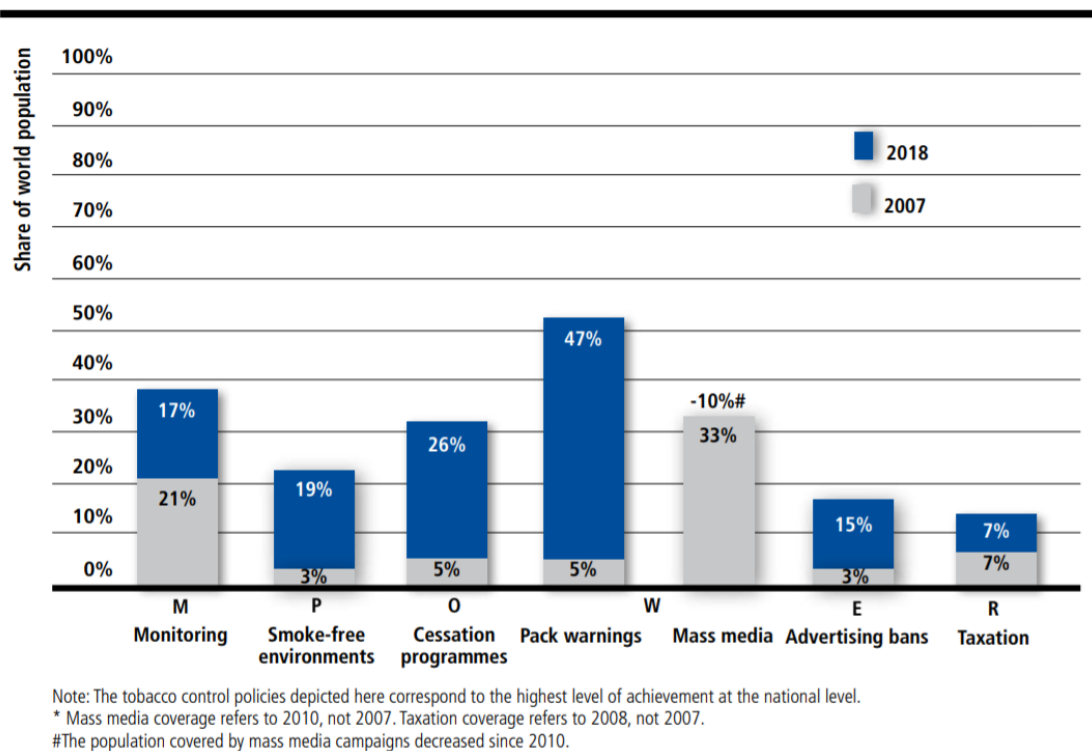


Figure 4: Increase in the share of the world population covered by selected tobacco control policies, 2007* to 2018 [8]

In the case of physical activity strategies can involve changes to urban planning transportation and recreation facilities. These create opportunities for people to walk as part of their journeys to and from school and work. They may be coupled with strategies to help motivate people to engage in more physical activity and less sedentary behaviours.

Reduction of dietary salt and fat can be one of the most cost-effective strategies for the prevention of chronic disease [9]. Despite measures to control dietary salt, average levels have increased over the past two decades in many countries including Australia [10]. Most diet salt is added in manufacture or in cooking and so it requires changes to these practices. Reducing saturated fats in the diet is possible but there is a risk that this will be accompanied by increases in the content of sugars. Another population strategy would be to reduce consumption of sugary drinks as a strategy to reduce overweight and obesity rates. Population measures to reduce

alcohol consumption can include restrictions on advertising especially at sporting events and licensing restrictions including hours of sale.

4.4 Individual interventions to prevent chronic disease

Individual based strategies seek to change behaviour through education and counselling usually conducted through health services or programs. While many of the determinants of chronic disease burden lie outside the health care system, there is evidence that a significant proportion of illness and mortality is amenable to health interventions focusing on behaviour change [11]. There is now considerable evidence for the effectiveness of health interventions to prevent cardiovascular disease at both the population and individual levels [12]. Large, population-based studies in China, Finland and USA have also demonstrated the feasibility of preventing, or delaying, the onset of diabetes in high risk patients [13-15]. Effective interventions may include both lifestyle and medications. Behavioural interventions alone can, over three years, reduce the incidence of type 2 diabetes in high-risk patients by 58%, hypertension by 19% and weight by 3-5kg [15, 16].

Despite this evidence there are implementation gaps. For example, in Australia, while 34.4% of general practice encounters were with overweight patients and additional 25.9% were with obese patients and 15.1% with daily smokers [17, 18], less than a fifth of smokers were advised about their smoking, and only about a third of overweight patients were advised about their physical activity or diet [18]. Further, there is evidence that wider evidence-practice gaps relative to need exist for women [19], people from low socioeconomic locations [20] and from Aboriginal and Torres Strait Islander backgrounds [21]. The reasons for this are complex and related to patient, practitioner and practice barriers [22], including lack of capacity to provide brief interventions or refer for more intensive education and support [23]. Typical goals for lifestyle interventions in primary health care are listed in Table 1.

Table 1: Goals for lifestyle interventions in primary health care

Goals	
Exercise	Moderate exercise for at least 30 minutes / day including: walking, jogging, swimming, aerobic, ball games, or skiing with circuit-type resistance training, twice a week. The amount of time sitting continuously should be minimized. For weight loss around 150–300 minutes of moderate-intensity activity or 75–150 minutes of vigorous activity (or a combination of moderate-intensity and vigorous activity), each week.
Diet	Diet low in saturated fats, sucrose and salt with increased portions of vegetables and fruit per day (up to 7 portions) in order to achieve a diet with the percentage of energy from carbohydrate = 50%, saturated fat <10% and total fat < 30%, protein 1g/kg ideal body weight per day, fiber 15g/1000 kcal.
Weight reduction	(if overweight) by ≥ 5 kg or 5% of body weight
Smoking cessation	if smoker
Limit alcohol intake	(if drinking) ≤ 2 drinks / day, including 1-2 alcohol free days / week



Learning Activity 1

Read the WHO report “Preventing chronic diseases designing and implementing effective policy” at http://www.who.int/chp/advocacy/policy.brief_EN_web.pdf

How does this recommend a step-wise approach to the implementation of policy in the following areas?

- a. School-based programs?
- b. Workplaces?

4.5 What is the role of primary health care in prevention?

Primary health care is well suited to offering preventive interventions because of its high reach of the population. For example in Australia more than 86% of the population see a general practitioner at least once a year [24]. Patients are likely to be receptive to advice offered by trusted health care providers. Those that already have one or more risk factors for disease are more likely to perceive the potential health risk that may increase the chance of their participation in lifestyle change activities [25].

High-risk preventative care is well suited to primary health care and selective interventions can bring about behaviour change in patients [26, 27]. The potential role of general practice includes the identification of risk factors and provision of brief interventions to prevent chronic disease and also the referral to other services and programs [28].

Early life

There is growing evidence that dietary composition, physical activity and electronic media use amongst infants and young children are associated with obesity later in life [29]. These findings suggest that early childhood, particularly the first 5 years of life, represents a critical window in which to establish family practices and individual behaviours to prevent weight gain and promote health across the life-course. Early intervention among low-SES families is particularly important given that children from lower socioeconomic backgrounds have higher rates of obesity [30]. Interventions in community settings such as childcare and school have been shown to be effective [31]. There is evidence to support family-based, lifestyle interventions aimed at changing diet and physical activity behaviours [32].

5As framework

The theory and effectiveness of the 5As model has been introduced in Module 2 and is presented in Figure 2. At the clinical level, lifestyle interventions involve comprehensive and structured assessment and interventions to change SNAPW

behaviours (smoking, nutrition, alcohol, physical activity and weight). With each “A” of the 5As (ask/assess, advise, agree, assist & arrange) [33, 34] the likelihood to patients changing their lifestyle risk factors increases by 10-30%.

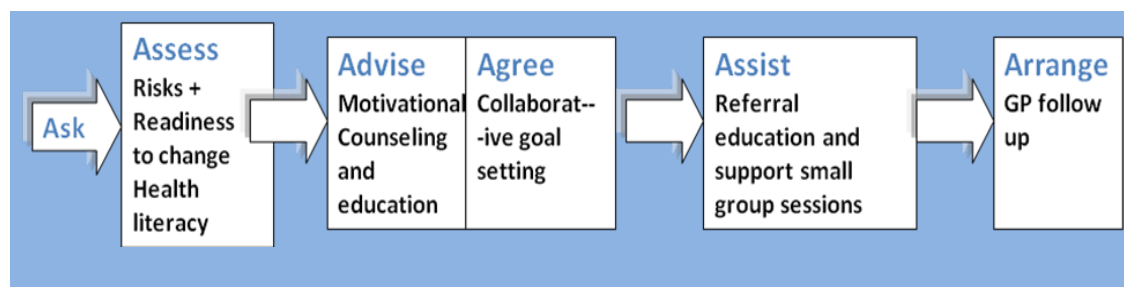


Figure 5: The 5As

Assessment may include assessment of single risk factors or a comprehensive risk assessment. The RACGP guidelines recommend that [35]:

- Absolute Cardiovascular Risk assessment should be performed for all adults aged 45–74 years who are not known to have cardiovascular disease or to be at high risk of cardiovascular disease. This should be reassessed every two years at a minimum (more frequently with those at risk).
- Patients should be screened for diabetes every three years from 40 years of age using the Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK).

Motivational interviewing

Motivational interviewing is often used to involve patients in making decisions about their goals and to develop sustainable behaviour change [36, 37]. In patients who are unsure and have not committed to action, motivational interviewing works on facilitating and engaging intrinsic motivation within the client in order to change behaviour. Motivational interviewing can be used to foster the patient’s own interest and willingness to change and to resolve ambivalence if they are unsure. For patients who are uncertain, a discussion of the benefits and risks of current behaviours or change is appropriate. This can involve the following steps:

1. Helping the patient to examine the good and bad things about improving their lifestyle
2. Asking the patient to compare this with the good and bad things about staying as they are
3. Exploring how the patient feels about this and asking them to balance the pros and cons.



For patients who are not confident about their ability to succeed, information and reassurance about their likelihood of success and the support available may be given. For those who are ready to make a change, time can be spent planning how they can make a change. Patients who have already made a change may need to be followed up to monitor progress and deal with any relapses or difficulties [38].

There has been some concern expressed about the validity and reliability of readiness to change as a predictor of behaviour change [39-41]. However, tailoring of interventions to assessed readiness to change is still a component of many programs [42, 43] and it is recommended in many of the guidelines for the assessment and management of lifestyle behaviours in Australian general practice [35, 44].

4.6 The effectiveness of behavioural interventions to prevent chronic disease in primary health care

Behavioural interventions in primary health care can change the behaviour of general practice patients especially in patients at high risk [26, 45]. Brief interventions can be effective [46].

Smoking cessation

Brief counselling interventions and pharmaco-therapies delivered in primary care are effective in increasing smoking cessation [47]. At an individual patient level, primary care providers can influence smoking rates by systematically providing opportunistic advice and offering support to all attending patients who smoke. The average number of patients who need to be treated to prevent one additional negative outcome is known as the number needed to treat (NNT). The NNT to prevent one excess death from smoking is 67 (for minimal brief advice) and 22 (for optimal treatment).

Alcohol

Brief advice to patients with excessive levels of drinking in general practice has been demonstrated to reduce alcohol consumption by about six standard drinks per week [48]. The number needed to treat (return on effort) using brief interventions is one in eight.

Physical activity, diet and obesity

Brief interventions to promote physical activity or healthy eating in low risk patients in primary care have not been demonstrated to be universally effective [26, 27, 49]. Such interventions include those which aim to achieve at least 30 minutes of moderate physical activity each day, less than 10% of diet energy intake to come from saturated fat and less than 30% as total fat, increased fruit and vegetable intake and reduced calories and a 5% reduction in body weight if overweight or obese. The more effective programs enlist family involvement, use group counselling and provide tailored advice and follow-up [50].

A number of randomised controlled trials have been conducted among high-risk or obese general practice patients providing standard exercise and nutrition information in general practice followed by individual or group education and counselling sessions [26, 43, 51]. These have demonstrated positive effects on diet, physical activity, weight, blood pressure, cholesterol and quality of life. Interventions by practice nurses, allied health (dietitians, exercise physiologists), medical assistants and psychologists have all demonstrated effectiveness in weight control programs [45, 52-55]. Such interventions can be delivered by phone or online and still achieve and maintain weight loss [56].

A review of behavioural interventions for obesity in primary care found that interventions in routine clinical practice were not effective compared to referral to more structured programs that were delivered in person or remotely [57].

A recent technological development has been wearable devices (for example Fitbits), which are often in the form of wristbands that provide feedback to the wearer regarding their own physical activity, usually via monitoring sensors such as accelerometers and gyroscopes which are linked to a smart phone. While modest improvements in physical activity have been observed, the long-term effectiveness of these in promoting weight loss is uncertain [58]. Indeed, a trial in young adults suggested a small negative effect [59].

Multiple risk factors

While there is no evidence that periodic general health checks reduce morbidity and mortality in adults, interventions that target a small number of risk factors have been demonstrated to improve both behavioural and physiological risk factors for cardiovascular disease and diabetes, in high risk groups [48]. However, there is less evidence of their impact on cardiovascular events [60].

4.7 Implementation of chronic disease prevention in primary health care

There are significant gaps in the implementation of prevention of chronic disease in Australia. In 20012–13, 34.9% of general practice encounters were with overweight patients (27.8 % being obese), 23.0% with those who drank alcohol at risky levels and 13.5% with daily smokers [61]. However, less than 1 in 5 patients are routinely asked about their drinking [62], two-thirds are asked about their smoking, up to a third are asked about exercise and physical activity, and about 15-30% of patients get some form of dietary advice from a GP. In 2011, while most participants over the age of 45 years in a large population cohort in NSW reported having had their blood pressure, cholesterol and glucose levels checked in the previous 12 months, fewer than one in five reported having been given advice to increase the number of portions of fruit and vegetables, decrease fat intake or increase physical activity (Figure 6) [63].

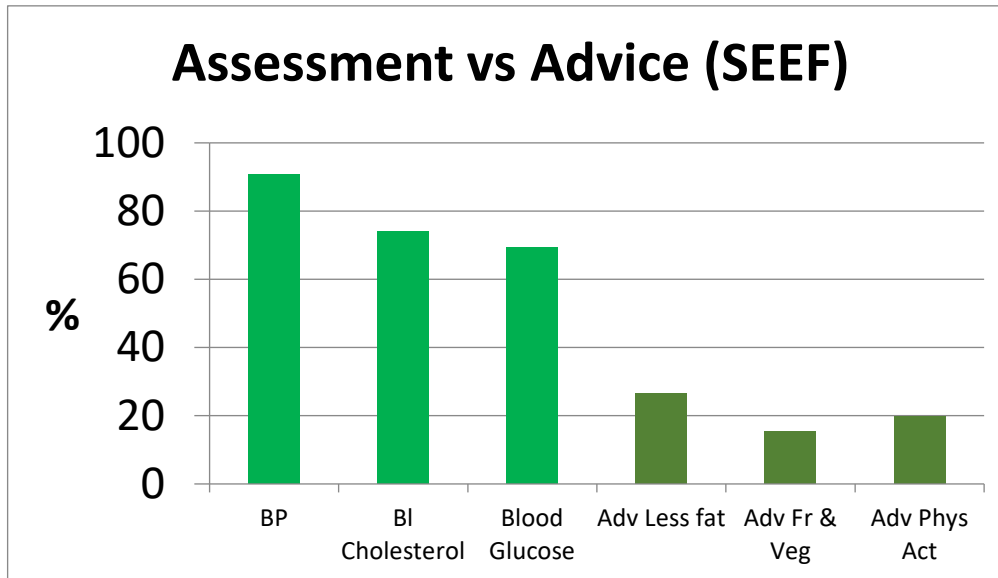


Figure 6: Proportion of people aged 45 years or older reporting assessment or advice from their GP [63]

Reasons cited for failing to offer preventive interventions include: lack of knowledge, skill and confidence on the part of practitioners, competing pressures on general practitioners and patients time, a lack of supportive organisational infrastructure, limited referral options and specific funding to support assessment, training and counselling [23], and an unsystematic approach to assessment and management of risk factors [64]. A major barrier to implementation is the limited time and the amount of work that needs to be done. It is estimated that 7.4 hours per day would be needed by the typical GP to implement known best practice in prevention [65].

The need for primary prevention was recognised by the Council of Australian Governments (COAG) [66]. This identified the importance of promoting healthy lifestyles, which includes addressing issues across alcohol use, nutrition, smoking and physical activity. A health check delivered in general practice for people aged 45-49 years was introduced for patients with one or more chronic disease risk factors in 2006. As part of this GPs are required to identify and support lifestyle and risk modification through brief intervention and referral to services that assist people wanting to make changes to their lifestyle. Referral is an important component of the 5As strategy offering higher risk patients the opportunity for more intensive interventions. However, the evaluation of the *45-49 Year Old Health Check* showed that GPs referred patients infrequently, particularly when compared to the frequency of advice provided by GPs to manage risk factors [18]. Many GPs expressed doubts about the effectiveness of referral options, preferring to manage the risk factors themselves.

The low rate of referral by GPs has been found in other studies in Australian general practice [23, 67]. At-risk patients who do not yet have chronic disease are not well-served by the referral pathways. There are also practical difficulties in communication between general practice and the other services, waiting lists for public allied health services, delays in entry into group programs, the availability at suitable times and some reluctance on the part of patients to be referred especially to group programs. A qualitative study in four districts in NSW examined the referral practices of GPs for patients with BMI >35. As illustrated in Figure 7, their beliefs and attitudes about effectiveness, patient factors and system factors were barriers [68].

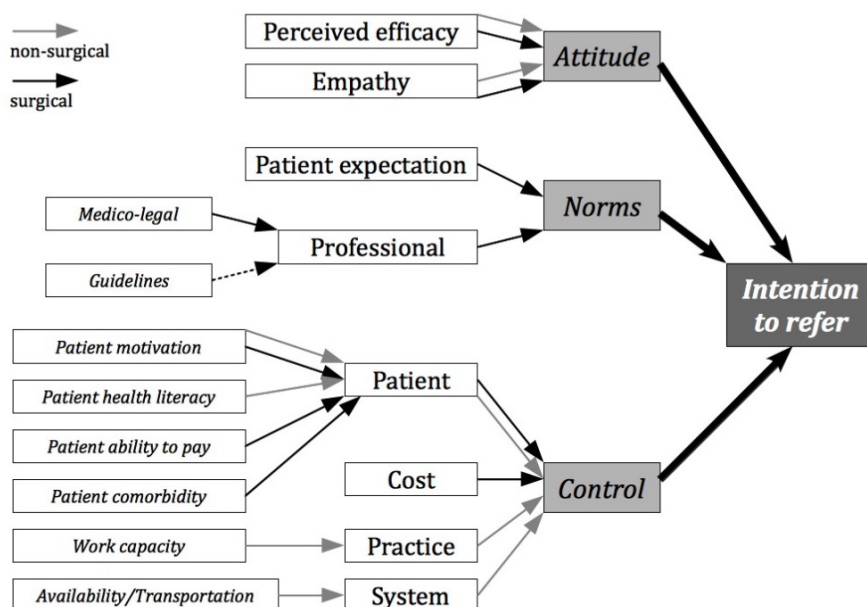


Figure 7: Factors Influencing GP referral of obese patients for surgical and non-surgical interventions [68]



Learning Activity 2

Read the second edition RACGP SNAP guide at <http://www.racgp.org.au/your-practice/guidelines/snap/>

What strategies does this recommend for implementation in practice?

4.8 Integration between public health and clinical activities

To be effective, clinically based interventions need to be linked to community-based programs and resources accessible to disadvantaged communities. The clustering of risk factors suggests a different approach from current approaches to single lifestyle behaviours is required [69]. This needs to be facilitated at the local level, using a socio-ecological approach [70] to identify appropriate partners at individual, organisational, community and state levels that provide more tailored interventions for particular populations [71]. It is widely recognised that addressing health inequality in Australia requires action to address social determinants of health at all levels of the health sector in collaboration with government, business, civil society groups and the community [72].

In the United States, the Centers for Disease Control and Prevention program *WISEWOMAN* successfully developed partnerships between clinical services and non-government organisations (such as the heart and stroke foundations), local government and local community organisations including church groups in the

delivery of preventive programs [73]. This allowed much greater reach for programs and helped to ensure their sustainability beyond the initial funding period. It also allowed greater use of technology-supported coaching and counselling interventions for diet, physical activity and weight control [74]. These programs had to be registered and licensed to ensure quality and fidelity with the aims of the program.

Here in Australia, Primary Health Networks aim to improve the prevention and management of disease in general practice and primary health care. They have approached this in a variety of ways, working with practices and through partnerships with State health services, non-government organisations and local community organisations.

4.9 International efforts at prevention

In response to growing prevalence and impact on chronic disease in less economically developed countries, in 2013 WHO developed an international strategy to prevent the rise in chronic conditions: The Global Action Plan for the Prevention and Control of Noncommunicable diseases 2013–2020 [75]. This called for commitment to high-impact affordable interventions to prevent chronic disease and reduce overall mortality from these conditions by 25%. The strategy aims to achieve this by reducing tobacco, alcohol and salt intake, increasing physical activity and reducing blood pressure and halting the rise in blood pressure and obesity (Figure 8). This requires collaboration across sectors outside of health, especially to restrict tobacco, alcohol and salt and trans-fats in the diet, and an investment in equitable access to primary health care to prevent and manage blood pressure, obesity and diabetes.

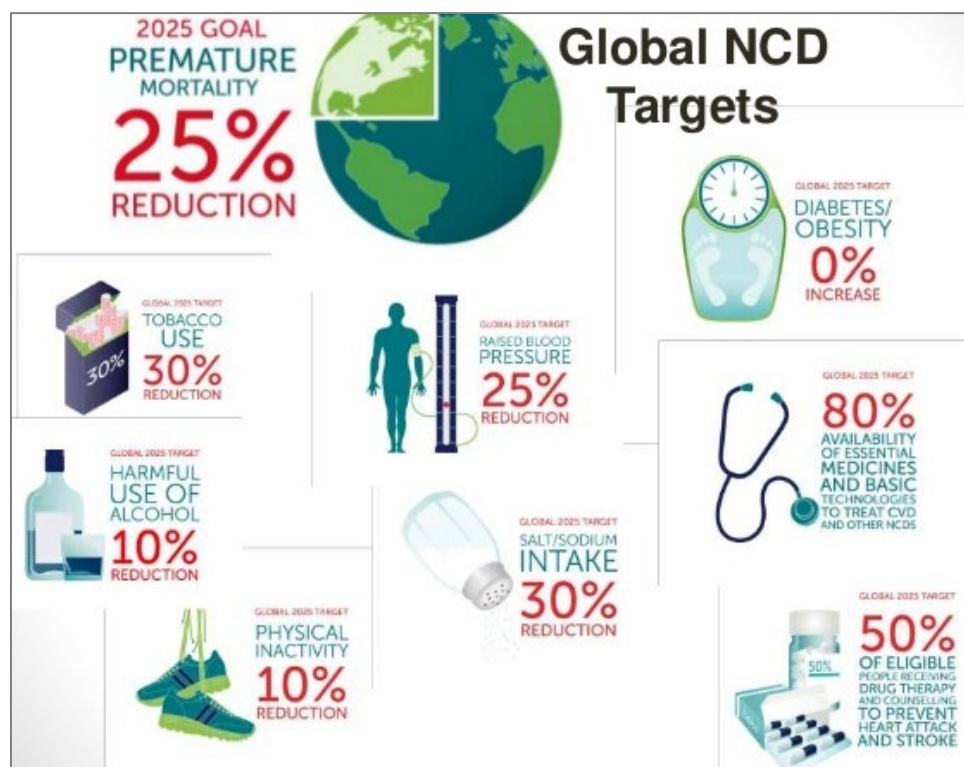


Figure 8: WHO targets for NCD prevention

Suggested further reading



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Australian Institute of Health and Welfare. Risk factors contributing to chronic disease. 2012. <https://www.aihw.gov.au/reports/chronic-disease/risk-factors-contributing-to-chronic-disease/contents/table-of-contents>

RACGP. Guidelines for Preventive Care in General Practice. 9th edition, updated 2018. <http://www.racgp.org.au/guidelines/redbook>

RACGP SNAP Guide 2nd Edition. <http://www.racgp.org.au/your-practice/guidelines/snap>

US Agency for Health Care Research and Quality Prevention Resources. <http://www.ahrq.gov/clinic/ppipix.htm>

US Centres for Disease Control. WISEWOMAN program. <http://www.cdc.gov/wisewoman/>

WHO. Global Action Plan for the Prevention and Control of Noncommunicable diseases 2013–2020. 2013. <http://www.who.int/nmh/publications/ncd-action-plan/en/>

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