Healthy ageing literature review
2012
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This report was completed by the National Ageing Research Institute (NARI) and Council on the Ageing (COTA) for the Victorian Department of Health.

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1. Background

1.1 Aim and purpose

The aim of this literature review is to provide information to the Victorian Department of Health about the evidence on effective strategies to promote healthy ageing in a range of settings where older people live. This review was undertaken by the National Ageing Research Institute (NARI) and the Council on the Ageing Victoria (COTA).

The review includes an overview of Australian and Victorian health policy and demographic context. It then discusses the evidence for various determinants of healthy ageing including healthy lifestyle factors and age-friendly environments. Finally it examines the strategies that have been used to promote healthy ageing in various settings and presents the current evidence base in relation to the effectiveness of these strategies for promoting health with older people.

As this report is for the Department of Health it has a focus on issues that the Department is able to contribute to addressing. While this report acknowledges and identifies the many broad issues affecting healthy ageing, the strategies reviewed and identified relate to the areas that the Department of Health is most able to influence.

1.2 Definitions

For the purpose of this review, the World Health Organisation (WHO) definitions of health and active ageing have been used.

1.2.1 Health

WHO defines health as ‘a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity’ [1].

1.2.2 Healthy ageing

There are many definitions of healthy ageing, a term which is often used interchangeably with terms such as active ageing [2, 3], successful ageing [4-6], positive ageing [7] and productive ageing [8]. Although there is no universal definition, there is general acceptance that healthy ageing involves more than just physical or functional health.

WHO defines active ageing as ‘the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age’ allowing people to ‘realize their potential for physical, social and mental well-being throughout the life course’[3].

1.3 Australian and Victorian Government health policy

One of the key elements in enabling healthy ageing is the development of strong public policy. Recent Australian Government health policies and initiatives that have an influence on healthy ageing include the Living Longer Living Better aged care reform and the National Partnership Agreement on Preventive Health. In a Victorian context the Victorian Health Priorities Framework, the Public Health and Wellbeing Plan, Improving Care for Older People: a policy for Health Services and the HACC Active Service Model provide agendas for the Victorian heath system. These policies and initiatives are described below.

1.3.1 Living Longer Living Better

In April 2012, the Australian Government released the new aged care reform Living Longer Living Better. The aim of the new aged care reform package is to deliver important benefits to older Australians including: more support and care to remain at home; better access to residential care if needed; increased recognition of carers and those from culturally diverse backgrounds; strengthened aged care workforce; more support for those with dementia; and better access to information [9]. Although these reforms do not directly fund healthy ageing initiatives there is significant funding to assist older people to
remain at home longer, increased care for people with dementia, and additional support for carers, all of which have a positive impact on healthy ageing.

1.3.2 National Partnership Agreement on Preventive Health

The Council of Australian Government (COAG) National Partnership Agreement on Preventive Health (NPAPH) was announced in November 2008. The NPAPH provides significant investment ($872.1 million) for prevention in Australia over six years from 2009–10. One of the most significant initiatives that may provide benefit for older people is Healthy Communities, described in more detail below, as well as the Victorian Prevention Community Model.

Healthy Communities Initiative

From 2009–10 the Australian Government, through the NPAPH, is providing $71.8 million over four years under the Healthy Communities Initiative to support Local Government Areas in delivering effective community-based physical activity and healthy eating programs [10]. Selected local governments have been funded to offer subsidised physical activity/nutrition programs for people not participating in full-time employment (therefore older people may be but were not necessarily included as a target group). The funds are also being used to develop a range of local policies that support healthy lifestyle behaviours.

Victorian Prevention Community Model

As part of Victoria’s implementation of NPAPH, the Department of Health is developing the Victorian Prevention System which includes building the Victorian Prevention Community Model. The Victorian Prevention Community Model will fund 12 local prevention areas consisting of 14 local government authorities and community health agencies with the aim to improve health and reduce health disparities in identified high-needs areas as well as strengthening existing health promotion efforts.

1.3.3 Victorian Health Priorities Framework 2012–2022

The Victorian Health Priorities Framework outlines the Government’s commitment to improving hospital capacity, developing community-based health services, promoting healthy living and providing more extensive and higher quality health care information. The Victorian Health Priorities Framework 2012–2022 is supported by the Metropolitan Health Plan; Rural and Regional Health Plan and Health Capital and Resources Plan.

1.3.4 Victorian Public Health and Wellbeing Plan 2011–2015

The aim of the Victorian Public Health and Wellbeing Plan is to ‘improve the health and wellbeing of all Victorians by engaging communities in prevention, and by strengthening systems for health protection, health promotion and preventive healthcare across all sectors and all levels of government’. The plan was released in September 2011 and provides the basis for building a Victorian prevention system that will be more efficient, sustainable, and coordinated over the longer term.

1.3.5 Improving Care for Older People: a policy for Health Services

The Improving Care for Older People policy was launched in 2003 and has been progressively implemented by successive state governments. It aims to improve and integrate care in health services for older people through:

* adopting a strong person-centred approach
* better understanding the complexity of older people’s health care needs
* improving integration between health services and community care.
1.3.6 Home and Community Care Active Service Model

The Home and Community Care (HACC) Active Service Model is a quality improvement initiative that focuses on restorative care and on promoting capacity building in community care service delivery. The Active Service Model is located in the broad policy context set out in *A Fairer Victoria* (2005) which emphasised early intervention and prevention in all services and for older people, helping them to ‘stay involved in everyday activities to maintain or rebuild their confidence and stay active and healthy’. The goal of the Active Service Model is to assist people in the HACC target group to live in the community as independently and autonomously as possible.

1.4 An ageing population—Australia and the world

The population worldwide is ageing. Due to falling fertility rates, increased life expectancy and falling mortality rates the number and proportion of older people in the population is increasing faster than any other age group [3]. In 1950, the world median aged was 24 and by 2050 it is projected to be 38 years [11]. Concurrently, the world is experiencing rapid urbanisation, with more than half the world’s population now living in cities.

Like most countries, Australia has an ageing population. Older people (those aged 65 years and over) currently make up 13.6 per cent of the population. Compared with 8.3 per cent in 1971, it is estimated that by 2015 older people will comprise 16.4 per cent of the population, increasing to 26 per cent in 2051 and to 27 per cent in 2101 [12-14]. Over the next two decades, Australia’s population is expected to rise by 29 per cent, with the number of people aged 65 and over rising by 90 per cent [11].

Due to their longer life expectancy (males 79.3 years and females 83.9 years), women currently make up a greater proportion of older people in Australia. Nearly two-thirds of Australians aged 80 years and over are female (AIWH 2010).

1.4.1 Victoria

Victoria’s population mimics many of the trends seen in the wider Australian population. As of March 2011, Victoria’s estimated resident population was 5,605,600. This is an increase of almost 10 per cent since June 2005. People aged 55 and above comprise almost a quarter of the population (24.9 per cent) and those aged 65 years and over comprise 13.7 per cent of Victoria’s population [15]. The proportion of the population aged 65 years and over is projected to increase to 16.7 per cent in 2021, 19.5 per cent in 2031, 20.9 per cent in 2041 and 22.1 per cent in 2051 [16]. The greatest proportional change for any age group is projected to be in the oldest age group: the number of Victorians aged 85 years and over is expected to almost quadruple from 106,900 (1.9 per cent of the total population) in 2011 to 402,300 (4.6 per cent of the total population) by 2051 [16].

Table 1 Population of people aged 55 years and over in Victoria [15]

<table>
<thead>
<tr>
<th>Age</th>
<th>Men (per cent of all ages)</th>
<th>Women (per cent of all ages)</th>
<th>Total (per cent of all ages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>55+</td>
<td>647,352 (23.6%)</td>
<td>730,525 (26.2%)</td>
<td>1,377,877 (24.9%)</td>
</tr>
<tr>
<td>65+</td>
<td>343,948 (12.5%)</td>
<td>415,458 (14.9%)</td>
<td>759,406 (13.7%)</td>
</tr>
<tr>
<td>80+</td>
<td>84,026 (3.1%)</td>
<td>132,178 (4.7%)</td>
<td>216,204 (3.9%)</td>
</tr>
<tr>
<td>All ages</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Metropolitan and regional population trends for older Victorians

In Australia, capital cities generally have younger populations than the rest of the country with older people making up 12 per cent of the population in capital cities and 15 per cent outside of the capital cities [11].
In June 2009, 74.7 per cent Victorians lived in major cities, 20.3 per cent lived in inner regional areas, 4.9 per cent in outer regional areas and 0.1 per cent in remote areas [17]. There was a lower proportion of older people living in Melbourne (12.7 per cent of Melbourne’s population) than in regional Victoria (16.4 per cent of regional Victoria’s population). Queenscliff (33.1 per cent) had the highest proportion of its population aged 65 years and over, followed by Hindmarsh (24.4 per cent) and Yarramambiack (24.7 per cent) in the North Wimmera [18].

However, in recent years there have been changes in the migratory patterns for older Australians. Many older Australians are making the move to rural and seaside locations for a number of factors, including the increasing cost of living in major cities and to improve their quality of life. These people are known colloquially as tree-changers or sea-changers [19]. In addition, there is an increasing number of ‘amenity migrants’, older people who move from large metropolitan to regional centres due to the need to access services that are more easily accessible in smaller centres. Data released from the Australian Bureau of Statistics (2005) showed that in 2004 the rate of growth in coastal local government authorities was 60 per cent higher than the national average growth rate for Australia (2 per cent compared with 1.2 per cent respectively) [13].

Cultural diversity in Victoria

One in three Australians aged 65 and over were born outside Australia, compared to one in seven aged less than 25 [11]. In 2006, 35 per cent (953,702 people) of older Australians were born overseas, with 61 per cent of these coming from non-English-speaking countries [20]. In Melbourne, almost half (47 per cent) of people aged 65 and over were born overseas [21]. In June 2009 Indigenous people made up 0.7 per cent of Victoria’s population [17].

Consequently, Victoria is culturally and linguistically diverse. While 93 per cent of the population from culturally and linguistically diverse backgrounds lives in Melbourne, 3 per cent live in Geelong and 3 per cent live in regional areas [22]. Approximately 21 per cent of older people in Victoria speak a language other than English at home, and 43 per cent of this group are not proficient in English [22]. The table below indicates the languages spoken by people aged 65 and over who have a low English proficiency.

<table>
<thead>
<tr>
<th>Cultural group</th>
<th>Victorians aged 65 years and over with low English proficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italian</td>
<td>17,753</td>
</tr>
<tr>
<td>Greek</td>
<td>13,547</td>
</tr>
<tr>
<td>Cantonese</td>
<td>4067</td>
</tr>
<tr>
<td>Mandarin</td>
<td>2545</td>
</tr>
<tr>
<td>Macedonian</td>
<td>2452</td>
</tr>
<tr>
<td>Croatian</td>
<td>2059</td>
</tr>
<tr>
<td>Russian</td>
<td>1919</td>
</tr>
<tr>
<td>Arabic</td>
<td>1444</td>
</tr>
<tr>
<td>Polish</td>
<td>1336</td>
</tr>
<tr>
<td>Spanish</td>
<td>1201</td>
</tr>
</tbody>
</table>
Indigenous and Torres Strait Islander population

Indigenous people are generally less healthy than other Australians, die at much younger ages, and have more disability and a lower quality of life [14]. In 2006, Indigenous Australians aged 65 years and over constituted only 0.5 per cent of all older people, much smaller than their representation among the population generally (2.5 per cent). This is the result of a much lower life expectancy—approximately 17 years lower than for the total population (AIHW, 2007: 4). For this reason, Indigenous people aged 50 and over are considered in the term ‘older Australians’.

GLBTI (gay, lesbian, bisexual, transgender, intersex)

In Australia it has been estimated that between 2–15 per cent of the population are gay or lesbian [24]. There is a commonly held belief in the community that older people are not sexual and therefore not sexually diverse [25].

A small qualitative study exploring GLBTI Victorians’ experiences of aged care services recounted historical experiences of stigma and discrimination and suggested that this led to depression and anxiety [26]. The study also identified that older GLBTI people accessing services often hid their sexual orientation or gender identity from service providers because they feared further discrimination. A follow-up study involving interviews and focus groups with aged care service providers and stakeholders confirmed stigma and discrimination that would perpetuate poor mental health outcomes [27].

1.4.2 Australian population trends

Baby boomers

Significant contributors to Australia’s ageing population trend are the ‘baby boomers’, defined by the ABS as a person born between 1946 and 1964, representing 25 per cent of Australia’s population [28]. In 2011 the oldest members of the baby boomer generation turned 65, nearing retirement age. The impact of this group moving beyond the traditional working age and into retirement in the coming years could be reflected by an overall decrease in the labour force participation rate [28]. However, the number of older workers with jobs in Australia has almost doubled in a decade with 1.93 million workers aged 55 and over employed in 2011 compared to 1.01 million in 2001 [29]. The impact of workforce participation is discussed further below.

Workforce participation

Participation in work, social and community life promotes wellbeing by improving mental and physical health, increasing self-esteem and building a sense of belonging [11, 20, 30]. In Australia in 2010, 62 per cent of males and 44 per cent of females aged 60–64 were in the labour force. For the age group 65–69 this dropped to 32 per cent of men and 18 per cent of women [11]. When considered together, 24 per cent of Australians aged 65–69 were in the workforce, which is the same as the OECD average, but lower than the US (29 per cent), New Zealand (36 per cent), Japan (38 per cent) and Iceland (50 per cent—the statutory retirement age in Iceland is 67) [11].

One in four older Australians contribute to volunteer work, with older people more likely to volunteer for community and welfare organisations (33 per cent) rather than sporting or recreational organisations (13 per cent) [11]. Motivation for older people to volunteer includes a desire to help others (62 per cent) and personal satisfaction (50 per cent) [20].

In 2009, 25 per cent of primary carers were aged 65 years and over. A primary carer is a term used to describe a person who takes most responsibility for providing care for the person requiring support [31]. In total, 19 per cent of older people are carers, with many of them caring for a spouse [11]. In 2005, grandparents provided 60 per cent of informal child care [20]. An informal carer includes any person, such as a family member, friend or neighbour, who is giving regular, ongoing assistance to another person without payment for the care given [20].
Increasing the labour force participation rate of older people is seen as one way to help soften the economic impacts of an ageing population [29]. In March 2012, a review of Australian Government legislation and policies that prevent older people from participating in the workforce or other productive work began in Canberra. The Australian Law Reform Commission undertaking the inquiry aim to ‘review obstacles faced by older persons in actively participating in the workforce, and the desirability of reviewing Commonwealth laws to remove any limitations, according the terms of reference’ [32]. This review may help the Australian government develop policies aimed at lifting the participation among older workers by encouraging them to stay in the workforce longer or re-enter the workforce.

Aged care workforce

Another one of the challenges facing Australia is that while the ageing population increases demand for aged care, the aged care workforce itself is also ageing. According to recent statistics 60 per cent of Australia’s aged care nursing workforce is over 45 years of age, and nearly 30 per cent are aged over the age of 55 [33]. In the September edition of Australian Social Trends it was reported that over the last decade there was substantial ageing of workers in the Residential Care Services industry [33]. Most notably the proportion of workers in this industry aged 55 years and over has more than doubled from 11 per cent in 2000–01 to 27 per cent in 2010–11 [33]. During this same period, there was also a substantial decline in the proportion of workers aged 25–34 years and 35–44 years [33]. Therefore, healthy ageing strategies targeting the aged care workforce will be of great importance in the coming years.

Health and older people

For older Australians, the main causes of death are heart disease, stroke and cancer. Dementia is the main contributor to burden of disease for people over 85 years (the gap between the population’s current health status and the ideal where everyone lives free of disability until the life expectancy age) [14].

Emerging Issues

The number of older people with HIV is growing, which is largely due to the advances in HIV treatments that enable people with HIV to live into old age [34]. An Australian study has found the number of men living with HIV who are aged over 60 has increased by around 12 per cent every year since the mid-1990s [34]. Recent published Australian figures from the University of New England have also revealed that the number of chlamydia cases in people over the age of 50 doubled between 2004 and 2010, and similar trends have also be shown in the incidence of a range of sexually transmissible infections [35]. Ageing drug users and long-term pharmacotherapy clients are also becoming increasing priorities within Australia’s ageing population [36, 37]. There has been limited research into this area but the limited data along with clinical experiences indicate that the range of issues for older drug users/long term pharmacotherapy clients are multifaceted, including health issues related to chronic hepatitis C infection, disease progression and ageing [36].

1.5 Summary

Victoria, like the rest of Australia and the world, has an ageing population. However, the Victorian older population is very diverse, with the largest proportion of people from culturally and linguistically diverse (CALD) backgrounds in Australia. The aged care service system in Victoria is also different to that seen in the rest of Australia with significant state government involvement in provision of residential aged care and Home and Community Care services. This context presents both challenges and opportunities for the government in enabling healthy ageing in Victoria.
2. Enabling Healthy Ageing

Healthy ageing depends on genetic, environmental and behavioural factors, as well as broader environmental and socio-economic determinants. Some of these factors are within the control of the individual, usually referred to as lifestyle factors, and others are outside the individual's control. Social determinants of health, such as income and education, influence the choices that individuals can make and create life circumstances which limit opportunities for healthy lifestyle and create health inequalities. WHO’s Active Ageing Framework provides a useful model for understanding how social, personal and behavioural determinants interact with the physical environment and access to health services to enable or prevent active ageing.

A key component of WHO’s active ageing framework is the consideration of how the broad determinants of health affect the process of ageing. Gender and culture are listed as two ‘cross-cutting’ determinants which shape the way we age and influence all the other determinants of active ageing. Other determinants of health identified in this framework include [3]:

- health and social service system determinants (for example, health promotion and disease prevention, curative services, long-term care, mental health services)
- behavioural determinants (for example, tobacco use, physical activity, nutrition, alcohol, oral health, medications)
- physical environment determinants (for example, housing, safety of home environment, clean water/air, safe foods)
- social environment determinants (for example, social support, violence and abuse, education)
- personal determinants (for example, biology, genetics, psychological factors)
- economic determinants (for example, income, social protection, work).

The determinants of active/healthy ageing and their interactions are shown below in figure 1.

![Figure 1 The determinants of active ageing [3]](image)

At all stages of the life course the adoption of healthy lifestyles and actively participating in one’s own care are of great importance. The WHO’s active ageing framework states that ‘engaging in appropriate physical activity, healthy eating, not smoking and using alcohol and medications wisely in old age can prevent disease and functional decline, extend longevity and enhance ones quality of life’. There is evidence to suggest that the determinants of health are good predictors of how well both individuals and populations age.

The following section will summarise the research evidence in relation to what is known about how the lifestyle and social determinants of health affect the process of ageing.
2.1 Management of health

For over a decade, successful ageing was viewed as life in the absence of disease, disability or functional impairment [38]. However, with increasing life expectancy, a decline in physical function becomes more prevalent. Half of people aged 65 years and over have one or more health condition, including cognitive impairment, falls, incontinence, low body mass index, dizziness, vision impairment or hearing impairment [39]. These conditions can have a great impact on health and wellbeing if undetected in the early stages and not treated in a timely manner. Hearing loss is a common example where the condition could be unrecognised by the older person, the carer and their health professionals [40]. Sensory loss may impact on overall health outcomes and predict other health conditions [41].

Early detection of functional impairment is the key to minimise disability, maintain independence at home and prolong survival as age-related conditions are preventable and reversible [42]. A systematic review of screening tests for hearing loss found that it can help identify people at higher risk for hearing loss however the benefits on health outcomes and hearing-related function are yet to be determined [43]. Likewise, evidence on the benefits of vision impairment screening is limited [44]. Screening for other age related conditions such as cognitive impairment is not routinely undertaken as part of care, and basic diagnosis and management are not consistently provided [45].

There is a growing epidemic of chronic diseases such as cardiovascular diseases, type 2 diabetes and chronic respiratory diseases, which contribute towards around 60 per cent of mortality worldwide [46]. In Australia, chronic diseases are of a significant health concern [47], with cardiovascular diseases and type 2 diabetes among the leading causes of the burden of disease and mortality [48]. The top five lifestyle risk factors that account for the total burden of chronic diseases in Australia are tobacco smoking, high blood pressure, being overweight or obese, physical inactivity and poor nutrition [48].

Older people with chronic conditions and their families play a major role in the management of these diseases in their daily lives. This is commonly referred to as self-management, whereby the person with the disease takes a more proactive role in contributing to their health outcomes in partnership with their healthcare providers [49]. Support for self-management has been highlighted as one important feature of the Victorian Department of Health’s Integrated Chronic Disease Management guidelines. The ability to self-manage is dependent on a range of factors, including access to health care, education and socio-economic status. One of the key issues is health literacy, described below.

2.1.1 Health literacy

Health literacy is defined as ‘the knowledge and skills needed to understand and use information relating to health issues such as drugs and alcohol, disease prevention and treatment, safety and accident prevention, first aid, emergencies and staying healthy’ [50]. Health literacy refers to ‘an individual’s capacity to seek, understand and utilise health information to make informed decisions about their own health’ [51].

The concept of health literacy has evolved from simply applying reading, writing and numeracy skills to the health domain to become a multidimensional concept [52]. Researchers state that the five core skills of literacy include not only reading (prose and documents), writing and numeracy but also speaking and listening—the oral exchange [53]. Despite this, a review of commonly used health literacy assessment tools found that the tools primarily focus on reading and writing and quite often fail to cover crucial aspects such as verbal communication, health care system navigation and health-related decision making [54]. Assessment of health literacy in clinical and research settings is affected by a tool’s structure, mode, length of administration and measurement properties; however, indirect self-administered or clinician-administered tools are most suitable in health settings [54]. Despite limitations in psychometric properties across different health literacy assessment tools, a single screening question may be sufficient to ascertain health literacy [55].

Factors related to lower health literacy level include less education, lower income, having ‘blue collar’ jobs, and poorer health status (mental and physical) [56]. Older people are at high risk of low health literacy [56], and approximately 80 per cent of older Australians have reported having poor health
literacy [57]. Similarly, reports from the United States of America (USA) estimates that 70–80 per cent of older people have low health literacy [58] while in the United Kingdom (UK) one in three have problems reading and understanding basic health information [59]. A low level of health literacy can result in poorer health outcomes and poorer use of health care services [60]. Furthermore, recent data shows that older people with low health literacy are 26 per cent more likely to die prematurely as compared to those with high health literacy, taking into account their health, socioeconomic and cognitive status [59]. Given that multiple chronic conditions are common among older people and thus requires them to access health services more frequently, addressing low health literacy is paramount to improve health outcomes [58].

2.1.2 Medication management

The majority of community-dwelling older people take one or more medications daily to manage their multiple chronic conditions [61] or lower health risk factors such as high cholesterol and low Vitamin D. Polypharmacy, referring to a person taking four or more medications, occurs in over 40 per cent of older Australians [61]. A review on medication use in Australia found that on average older Australians take nine medications daily [62]. This review also showed that predictors of multiple medications use include increasing age, female gender, number of diagnoses, recent hospitalisation and depression [62]. Some of the problems associated with medication use encountered by older people are [62]:

• inappropriate prescribing
• polypharmacy and non-adherence
• suboptimal monitoring of drugs
• poor medication management at home (for example,. storing medicines in unsuitable places)
• under-prescribing
• poor communication between health professionals.

Medications include prescribed medications, over the counter drugs and complementary and alternative medicines such as vitamins, herbs and natural medicines [62]. Use of an increased number of medications is often associated with poor adherence, higher incidence of adverse drug reactions, suboptimal prescribing and high health care costs [62]. Despite perception that the number of medications is important, the type and dose of medications have a bigger impact in predicting clinical outcomes [63]. The risks of suboptimal prescribing can be better measured using the drug burden index, which measures the people’s total exposure to certain medications and the effect of a particular type and dose of medication [63]. Recent evidence indicated higher incidence of older people utilising substance abuse programs. Higher demands on the substance abuse treatment place a new unmet need within the emerging ageing drug-using population [64].

2.2 Healthy eating

The nutrition research evidence indicates that adequate and safe supply of food is required throughout different life stages to maintain functional capacity and enable healthy ageing as each life stage affects the next in a cumulative manner [65]. This type of a life course effect can be seen, for example, in relation to intake of vitamin B12, and the ‘bone nutrients’ (calcium, magnesium, potassium, phosphorus and zinc plus vitamins K, C and D) [66]. Foetal stores of vitamin B12 will last for several years after birth, but with insufficient daily intake from the diet, or due to malabsorption, these stores will become depleted [67]. Sufficient intakes of calcium and other bone nutrients during growth are needed to secure optimal bone mass accumulation which, along with sufficient weight-bearing exercise and continued good nutrition, will prevent osteoporosis later in life [68].
Failure to detect early signs of malnutrition at every stage of the life course will jeopardise healthy ageing, while unnecessary supplementation with ‘magic vitamins’ can mask deficiencies of others and lead to irreversible damage [67]. A good example of this is folate supplementation without prior and concomitant monitoring of cobalamin (vitamin B12) status and homocysteine levels in older people [67, 69, 70].

National cross-sectional studies worldwide indicate that significant improvement in dietary patterns and nutritional intake is possible, leading to changes that affect chronic disease in the older adult population [71], a conclusion corroborated by longitudinal studies on dietary habits and cardiovascular disease risk in middle-aged and older populations [72].

Australian nutrition research has shown that the overall dietary quality is better among the older than the younger Australians, based upon the latest available national survey, but there is an association between income and measures of area-level socioeconomic disadvantage, smoking, physical activity and waist-to-hip ratio [73]. An association has also been shown between dietary quality and the indices of socioeconomic status, self-rated health and health service use among mid-aged women in Victoria [74]. Additionally, the 15-year longitudinal study of older Australians [75], and a survey of Western Australian aboriginal people [76] have indicated that health behaviours, including dietary habits, tend to cluster in population subgroups—this predicts more chronic illness in the future ageing generations, especially among disadvantaged groups.

The major nutrition-related threat to healthy ageing in Australia and worldwide is the increasing percentage of the population who are overweight; increased weight is linked with the chronic conditions of cardiovascular disease, metabolic syndrome and cognitive decline [77-82]. Other specific food and nutrition-related threats are related to bone health [66, 68, 83] and cancer [84]. Problems with oral health [85, 86] and anorexia [85, 87] can also affect dietary intake and lead to malnutrition in older people. Older people affected by malnutrition are also more susceptible to foodborne illness [88].

According to the National Health Survey, in 2007–2008, 61.4 per cent of the Australian population (18 years and over) was either overweight or obese; of the 55–64 year old men, 39.9 per cent were classified as overweight; while for women of the same age this was 34.6 per cent. If the current trend continues, 6.9 million Australians are likely to be obese by 2025 [89]. In addition, overweight and obesity account for 54.7 per cent of the disease burden for type 2 diabetes and 19.5 per cent for cardiovascular disease and the health care costs imposed by these would be additional to the costs from obesity-related morbidity alone, which was estimated at $58 billion in 2008 [89]. As the population is rapidly ageing as well as gaining in overweight and obesity, this equates to a greater number of older people with risk of chronic disease, metabolic syndrome, cardiovascular disease and cognitive decline in later life.

However, weight loss among the older population—above 70 years—to a body mass index (BMI) lower than 26–27 may not be advisable based upon findings from the Australian study on BMI and all-cause mortality [90, 91]. For a somewhat younger age group, but still above 65 years, those who are classified as overweight have been shown to have mortality similar to that of those who were classified as normal weight [Jansen & Mark, 2007, cited in 90]. Although a lower body mass index itself was not found to be predictive of low mortality among the older population [90], it is associated with lower risk of chronic disease earlier in life.

While weight loss may be desirable for many middle-aged people, it is not necessarily so for the older population: after the age of 60 years, the weight is disproportionately lost from lean body tissue. Loss of muscle mass can lead to increased falls and risk of protein-energy malnutrition, which in turn is associated with impaired muscle function, decreased bone mass, immune dysfunction, anaemia, reduced cognitive function, poor wound healing, delayed recovery from surgery, and ultimately increased morbidity and mortality [85, 87].

At the food level, the consumption of high-fat foods, foods containing saturated-fat, sugar, salt and alcohol, accompanied by total consumption in excess of energy requirements, are the main health threats in Australia and worldwide. The current Australian food system can, therefore, be considered unsustainable in meeting its population’s nutritional needs, as measured by the current epidemic of
obesity and overweight [92]. The Food and Agriculture Organisation [93] defines food security: ‘Food security exists when all people, at all times, have physical and economic access to enough safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life’. In a recent review on food security and local government action undertaken for the Department of Health of Victoria, the findings offer valuable insight into the ways in which governments and local communities can and have acted, but due to a dearth of research findings into the effectiveness of such strategies, no clear recommendations could be made [94]. Currently, disparity in access exists between rural and urban communities and between socio-economic groupings [73, 75, 76, 95], and more research is needed at the local—Australian—level to find out the best ways to change and alleviate this [94].

In the light of the current review, healthy ageing can be supported through good nutrition, but this requires sound nutrition policy and local action, which supports the availability of, and equal access to, health-promoting foods and evidence-based nutritional advice and services. It also requires the strong participation of health care professionals with training in nutrition.

2.3 Physical activity

Physical activity at all ages can improve health and wellbeing, helping to reduce the likelihood of obesity, and delaying functional decline and the onset of chronic disease. It can also reduce the severity of disability associated with chronic diseases, improve mental health, promote social contacts, prolong independent living and reduce the risk of falls [20]. Balance promotion as part of physical activity is of importance to older people. Maintaining muscle strength and mass in older people helps retain function and independence, weight management, and prevention falls and other injuries [96].

In 2006 the National Physical Activity Recommendations for Older Australians were formulated following a thorough review of the evidence (systematic reviews and randomised controlled trials) and existing guidelines for physical activity. The scope included community and residential care settings. In terms of levels of physical activity, the National Physical Activity Recommendations for Older Australians recommend that [97]:

- Older people should do some form of physical activity, no matter what their age, weight, health problems or abilities.
- Older people should be active every day in as many ways as possible, doing a range of physical activities that incorporate fitness, strength, balance and flexibility.
- Older people should accumulate at least 30 minutes of moderate intensity physical activity on most, preferably all, days.
- Older people who have stopped physical activity, or who are starting a new physical activity, should start at a level that is easily manageable and gradually build up the recommended amount, type and frequency of activity.
- Older people who continue to enjoy a lifetime of vigorous physical activity should carry on doing so in a manner suited to their capability into later life, provided recommended safety procedures and guidelines are adhered to.

While it is known that physical activity is beneficial, over half of Australians aged 65 years and over are not undertaking activity at the level recommended in the National Physical Activity Recommendations for Older Australians. According to the Australian Bureau of Statistics in 2007-2008 the proportion of Australians who did not meet the physical activity guidelines was highest for those aged 75 years and over (76 per cent) and 83 per cent of people aged 75 and over were classified as being sedentary or having low exercise levels [98]. The 2008 Victorian Population Health Survey report shows that 44 per cent of older people (65 years and over) are sedentary with older adults from low socio-economic groups, indigenous older Australians and those from culturally and linguistically diverse communities more likely to have higher incidences of sedentary behaviour or insufficient physical activity to benefit health.
It is particularly important for older people to remain physically active as this can decrease the risk of many age-related conditions. For example, a sedentary lifestyle increases the risk of osteoporosis and diabetes [99], while studies have shown that up to one hour of moderate activity or 30 minutes of vigorous activity daily can cut a person’s risk of cancer [100]. Studies have also found an association between physical inactivity and depression, and that such an association was independent of pre-existing physical or psychological health status [101]. There is also increasing evidence for physical activity in the management of depression among older people [101].

There is a large amount of literature on interventions to promote physical activity in older people and the general conclusion is that many interventions are effective in increasing levels of physical activity among older people [30]. These interventions differ in a number of ways, such as types of physical activity (endurance/fitness activities, strength training activities, and balance/flexibility activities), levels of physical activity (including frequency, intensity and duration), and formats of intervention (such as home-based or group-based activities). Despite beneficial outcomes being shown, reviews of the literature on promoting physical activity in older people have concluded that there is a lack of good quality evaluations of programs and that no single approach in this area stands out as being the most successful [30]. Therefore it has been suggested that the ideal approach to promoting physical activity with older people is to offer a choice of activities that vary by the type of activity, method of delivery, intensity, duration and frequency [30].

### 2.3.1 Falls prevention

Falls in older people often result in serious injury and hospitalisation and are a significant threat to the health, safety and independence of older people. In Australia, 20 per cent of older people who experienced a fall at home required hospitalisation [102]. Besides being more common for females, fall injury rates increase significantly with age. In 2005–06, there were 4.1 fall injury cases per 1,000 persons aged 75 years and over, almost double the rate of 2.4 per 1,000 population for the 65-and-over population [14]. Australian and International studies of community dwelling older people have identified that one in three people aged 65 years and over fall each year, with 10 per cent having multiple falls and over 30 per cent experiencing injuries requiring medical attention [103]. The rates of falls and associated injuries are even higher for older people in hospital settings and residential care [103].

The major modifiable risk factors for falls include impaired balance and mobility, reduced muscle strength, low levels of physical activity, low body mass index, fear of falling, and environmental hazards in the home or in public areas, such as clutter, poor lighting, and uneven flooring[103].

The evidence base in relation to interventions that have been shown to reduce falls in older people in community, hospital and residential care settings is strong [104]. Some interventions shown to be effective in at least one randomised controlled trial include: exercise programs (individualised home-based strength and balance exercises; group-based balance, strength and fitness exercises; tai chi); reduction in psychotropic medications and medication reviews; home hazard assessments and modifications by occupational therapists (with behavioural adaptions for those at high risk); improved post-hospital discharge management; first cataract extraction; falls risk assessment; proactive nursing interventions; and vitamin D supplementation [104, 105]. Multi-factorial intervention programs which combine two or more of the above single interventions have also been found to be most effective [104].

Coordinated, effective falls prevention strategies are needed in order to combat the emotional, physical, personal and health resource costs associated with the increasing number of falls among older Australians. A key component of this is sustainability of fall prevention programs. In 2011 the ‘Community falls prevention program sustainability guidelines’ were developed following a thorough review of the literature. The aim of the guidelines is to ‘help agencies implement community-based falls prevention programs and achieve long-term program sustainability by addressing sustainability from the outset’ [105]. It is hoped that these guidelines will improve the likelihood of maintaining effective falls prevention programs longer-term which in turn may help reduce rates of falls and injuries in Victoria [104].
2.4 Alcohol and tobacco use

Analysis of the 2007–08 National Health Survey shows that lifestyle behaviours such as tobacco smoking and risky alcohol consumption are among the most prominent risk factors for health in Australia [106]. Although a small amount of alcohol may be considered part of a healthy diet in the Mediterranean region [107], the demarcation of a ‘healthy’ amount elsewhere has been difficult. The 2009 alcohol guidelines in Australia state that light to moderate alcohol consumption (one to two drinks per day) in older adults may lower the risk of several chronic conditions and convey health benefits such as reduced bone loss and risk of cardiovascular conditions such as heart failure, stroke and atherosclerosis [108]. However, it was also noted that for some older people alcohol can increase the risk of falls and injuries as well as some chronic conditions as discussed further below [108]. Therefore, it is recommended that older people consult their health professionals about the most appropriate level of drinking for their health [108]. Having one to two alcohol-free days per week is recommended for older people [109-111]. While all-cause mortality may be higher among abstainers, the risk is highest among those who consume alcohol daily compared to those who enjoy a drink on 3–6 days a week. The Australian standard drink used in the guidelines is defined as containing 10g of alcohol (equivalent to 12.5mL of pure alcohol) [108]. A recent report titled ‘Working with Older Drinkers’ by Alcohol Research UK <http://alcoholresearchuk.org/> showed that older people consume more alcohol in recent years with an estimated 20 per cent of men and 10 per cent of women exceed their drinking limit and this trend is projected to be particularly evident in the baby boomer cohort [112].

According to recent reviews alcohol consumption carries with it more risks to older people, who often are on long-term multiple medication [109, 113]. Risky alcohol consumption is associated with liver disease and acute short term detrimental effects on executive function (for example, the ability to form concepts, organise thoughts and activities, prioritise tasks, and think abstractly) [106]. Alcohol abuse is also associated with the growing prevalence of mental health conditions such as depression and anxiety. Furthermore, alcohol has an impact on the efficacy of antidepressant medications [108]. Every year it is estimated that nearly 600 Australians aged 65–74 die prematurely from injury and disease and another 6500 are hospitalised as a result of high alcohol consumption [108]. Alcohol abuse is strongly associated with higher treatment rates as compared to other substances [64]. Long-term alcohol misuse can often result in alcohol-related brain injury which is common among disadvantaged older people such as those who are homeless and isolated [114]. Whether short or long-term exposure is more detrimental to health is still unclear [109].

A mini-review [109] of the effects of alcohol exposure on cognitive decline and cognitive development also reports the J or inverse-U shaped association between alcohol consumption and dementia risk, stroke, cognitive performance and cognitive decline in later life. This indicates that the association of alcohol consumption and these conditions is not linear whereby the optimal disease outcome is seen among moderate drinkers as opposed to abstainers or heavy drinkers. This review points out the link between alcohol and stroke, and stroke as a risk factor for dementia and cognitive decline. However, the review quite rightly highlights the difficulty in finding causative links from longitudinal studies, as there may be underlying risks of specific disease. In addition, drinking behaviour may be associated with other lifestyle factors that affect cognitive decline, for example moderate alcohol consumption accompanied by a healthy lifestyle such as regular exercise and healthy diet. Difficulty in comparing results between studies arises from the use of different measures of alcohol exposure, either drinks per day or total weekly consumption.

A recent review of studies conducted on substance abuse among adults aged 50 and over found that admission rates involving alcohol misuse have reduced, however, rates related to illicit drug use and prescription drug misuse are rising [61]. Furthermore, older adults appeared to be less likely than younger adults to perceive substance use as problematic or to use treatment services [64]. There is robust evidence from this review showing that an increased number of older adults will need substance abuse care in the coming decades. Increasing demands on the substance abuse treatment system will require expansion of treatment facilities and development of effective service programs to address emerging needs of the ageing drug-using population.
A report from Alcohol Research in UK indicates that complex physical and social factors often mask timely detection of alcohol problems among older people resulting in under reporting and presenting a barrier for older people to seek help. This is further exacerbated by a lack of awareness and understanding among health professionals about complex factors affecting older adults and alcohol misuse. Considering the exposure to alcohol from a life-course perspective, it is suggested that the prevention of exposure requires identification of the individual characteristics and ecological or contextual factors that give rise to the exposure, and identification of strategies for changing exposures by changing the environment or behaviour [109].

Tobacco smoking has consistently been linked with lung disease, cancers, long-term morbidity and premature mortality [106]. Analysis of 2007–08 National Health Survey data by the Australian Bureau of Statistics shows that the prevalence is partly dependent upon the socioeconomic index of the area where people live. People living in the most disadvantaged area are more likely to smoke (30 per cent) as compared to people from the least disadvantaged area (12 per cent). The WHO Framework Convention on Tobacco Control [115] was ratified by the Australian Government in 2004 and led to the development of the National Tobacco Strategy [116], but reports on its effectiveness are still awaited. The Victorian Tobacco Control Strategy 2008–2013 was launched in 2008 and this major initiative aims to reduce tobacco use among adult population by 20 per cent over five years [117]. This tobacco reform was introduced to combat the growing prevalence of cancer and preventable chronic disease.

In combining data from two large scale studies in Australia, McLaughlin et al. (2011) have shown how all-cause and cause-specific mortality hazards associated with smoking were similar for men and women, and that quitting was associated with lowered risk, in a time-dependent manner: the longer the time since quitting, the lower the risk [111]. This message is repeated in international research; however, it is still worth quitting late in life.

2.5 Participation

Older people’s participation in social, economic, cultural, spiritual and civic affairs, not just the ability to be physically active or to participate in the labour force, is essential for their health and wellbeing. Crucially, participation is linked to social connectedness. There is a direct link between social connectedness and mental and physical health outcomes[3]. In a recent meta-analytic review, participants with stronger social relationships had a 50 per cent increased likelihood of survival than those without social ties. This effect is comparable with the well-established risk factors of smoking and alcohol abuse [118]. Research has also shown that poor mental health and sensory impairments are associated with smaller and less satisfying support networks [119]. Also, lower levels of contact with social networks and loneliness increase the risk of cognitive decline and dementia, while frequent emotional support and social activity reduce the risk of cognitive decline [120].

There is also a complex relationship between living alone, loneliness and social isolation. The rates of older couples and lone person households have increased and are projected to rise. In 2006, 44 per cent of people in couples without children were aged 60 years and over. By 2031 this is projected to be 55 per cent while almost two-thirds of the increase in lone person households between 2006 and 2031, is projected to be among people aged 60 years and over. In 2006, the peak age for people living alone was 55–59 years. In 2031, this is projected to shift to 80–84 years. Women are more likely to live alone, with a projected growth rate of 2.8 per cent per year across Australia. It is estimated, there will be 1.1 million older women (aged 60 years and over) living alone in 2031, up from 0.6 million in 2006, and representing over three-fifths of the number of older people living alone [121].

Among older people, living alone was associated with a greater risk of economic hardship. One in five (20 per cent) people aged 65 years and over who were living alone were considered to have low economic resources [122].

In Victoria this impact is the greatest in rural and regional areas [123]. The term ‘amenity migrants’ usually refers to people moving to regions perceived as desirable, usually for non-economic reasons, such as a physical or cultural environment that is seen as more beautiful, tranquil or inspirational than their current, usually urban environment. The migration pattern of older people may reflect a move away
from an increasingly challenging urban environment to a regional centre with more affordable social and health services amenities.

Volunteering, both formal and informal, provides an opportunity to participate in the social and civil life of the community. Formal volunteering refers to unpaid community work conducted through a formal organisation or group, and informal volunteering refers to unpaid help, support and care given to family, friends, and neighbours [124]. Informal volunteering is often done on an individual or family basis rather than through a formal organisation [124].

Volunteering has been shown to have a positive health and wellbeing impact on older people with improvement in functional health indices, self-reported health and life satisfaction and social integration [113, [124]. These benefits are usually explained through the increased social capital associated with volunteering. As Onyx and Warburton [125] commented, ‘it is likely that the presence of high levels of social capital supports and maintains the health of older persons, provides informal support in times of sickness and stress and thus enhances quality of life as well as reducing or delaying the onset of illness and death’.

However, not all volunteering activities are equally beneficial [124, 125]. Firstly, while most studies support the health benefits of formal volunteering, the evidence for informal volunteering is less convincing as there are some contradictory findings regarding the effects of informal volunteering among older people [124]. Secondly, there seems to be a curvilinear relationship between volunteering and health, as several studies found that volunteering too much may be as counter-productive as too little [125]. Thirdly, the benefits of volunteering seem to depend on the characteristics of the volunteer jobs. For example, stressful volunteering, volunteering that lacks social support, or volunteering that focuses on individual gratification may not be beneficial [125]. Consequently, it is argued that volunteering is most likely to be beneficial when it provides [125]:

- the possibility of maintaining physical and cognitive activity
- information and encouragement to maintain or improve good health practices
- strong personal emotional support
- the opportunity to contribute to the well-being of others
- strong links into supportive community networks.

Lifelong learning is also an essential component of healthy ageing and an avenue for participation and connectedness. In the absence of dementia, older people maintain almost all cognitive processes without a decline. Indeed, learning continues throughout the lifespan with vocabulary and cultural knowledge continually increasing [126]. Along with these improvements in learning capability are improvements in motivation and emotional stability, permitting older people to develop or improve interpersonal skills [127]. Lifelong learning also has a positive and lasting impact on cognition, with the capacity to improve brain health and brain function [128]. Active learning is considered an ideal means of cognitive stimulation that can be achieved by simply learning something new and interesting [128]. Such active learning opportunities include being involved in a group discussion on a new topic, attending lifelong learning institutes (such as University of the Third Age), or learning a new language [128, 129]. Lifelong learning opportunities are also important to assist older people to be able to participate in civil activities, volunteering and in the work place as well as encourage intergenerational understanding and support [129]. The social benefits of lifelong learning also help to solidify and enhance the mental health benefits [128, 129].

Workforce participation remains an important component of healthy ageing for many older people. It is estimated that people aged 45 and over will need to provide 85 per cent of workforce growth in the next decade in order to meet the labour demands of employers, so there is a strong imperative to keep older people in the workforce for longer periods. Many older people want to work with estimates of almost one in three people who have retired interested in actively participating in the labour market. The ability to work part time and/or flexible hours is a critical enabler—after good health—for older people to work beyond traditional retirement age.
Age discrimination continues to present a significant barrier to workforce participation along with the lack of flexible working arrangements, compulsory retirement ages and re-qualification requirements [130].

2.6 Ageism

Ageism is the ‘process of stereotyping of and discrimination against people because of their age, just as racism and sexism accomplish this for skin colour and gender’ [131]. Ageism can negatively affect older people’s health in a number of ways. It can limit access to health care, due to beliefs that health problems are just a normal part of ageing; reduce opportunities for participation in the workforce, due to negative beliefs about older workers; and limit access to social activities, for example, sporting activities, due to these activities being designed for and focused on younger people. A review paper by Ory and colleagues (2003) found that ageist stereotypes are pervasive in our society and harmful to older people’s psychological well-being, and physical and cognitive functioning [132].

Ageism can also impact upon older people’s views of themselves. If older people are continually exposed to ageist attitudes and negative depictions of older people, such as are seen in the media, in cartoons and birthday cards, they can internalise these views. In turn this can impact upon their sense of self-worth, identity and wellbeing [133, 134]. Research has demonstrated the self-fulfilling nature that negative ageist stereotypes have on older people [135, 136]. Older people with negative attitudes to ageing have been found to have decreased physical health, including elevated blood pressure, less stability and walking speed, and even decreased lifespan [137].

Ageism has also been linked to elder abuse [138], which is becoming an increasing problem in our ageing society. Elder abuse is defined by WHO [139] as ‘a single or repeated act or lack of appropriate action, occurring within any relationship where there is an expectation of trust which causes harm or distress to an older person’. Although it is often seen as an individual act involving a perpetrator and a victim, older people themselves tend to see it in much broader terms. In a series of peer-led focus groups O’Brien et al. (2011) found that older people identified societal concerns such as the withdrawal of respect and recognition, and the reduction of the roles and opportunities for participation, as constituting elder abuse [140]. These findings were reflected in WHO’s 2002 report ‘Missing Voices: Views of older persons on elder abuse’, which found that older people’s perceptions fall under three main areas: neglect, including isolation, abandonment and social exclusion; violation, of human, legal and medical rights; and deprivation, of choices, decisions, status, finance and respect [141].

Ageist views can come from a lack of knowledge about older people, lack of close interactions with older people, and a ‘fear of being old translating itself into a desire to distance oneself from being old’ [132, 137]. Phillips et al. (2010) identify a key to age prejudice in the process of ‘othering’, which ‘lumps those considered old into a category defined first, as different and, secondly, as inferior. More importantly, it suggests that all older people are alike, hence obscuring differences that exist among and between older persons’ [142]. Research into perceptions of ageing shows that age prejudice is more likely to be expressed towards groups and individuals who are not known to the person. It is more difficult to see all older people as alike and inferior if one is in close day-to-day contact with them. Generally, family and friends are excluded from age-based negative stereotypes [143]. This would suggest that strategies to address ageism might include education that debunks myths associated with ageing, programs that remove barriers to workplace participation for older people, and promotion of intergenerational connection and/or strategies to reduce fear of ageing.

2.7 Environments that improve health

Healthy ageing depends on a variety of influences that surround individuals, families and communities. They include material conditions as well as social, cultural, economic and environmental factors. All of these factors, and the interaction between them, play an important role in determining how well people age. Many aspects of where people live—either in cities, regional or rural towns—and the services available reflect these determinants and are included in the characteristic features of an age-friendly communities.
The WHO defines age-friendly cities as:

‘Encourage[ing] active ageing by optimizing opportunities for health, participation and security in order to enhance quality of life as people age. In practical terms, an age-friendly city adapts its structures and services to be accessible to and inclusive of older people with varying needs and capacities’ [144].

Physical environments affect a person’s ability to maintain their health by providing opportunity for physical activity and social connectedness, and access to health services. For example, people are more likely to be physically active in neighbourhoods that are pedestrian-friendly [14].

While Australia’s population is becoming increasingly urbanised, the proportion of older people living in regional areas is higher than those in the capital cities. People living in rural and remote areas tend to have higher levels of disease risk factors and illness than those in major cities and can have difficulty accessing services and staying connected with others [14].

Older people living in major cities have more difficulty accessing transport than those living in inner regional areas; 77 per cent of older people in major cities can easily get to the places they need to go compared with 86 per cent for those living in inner regional areas [20]. The most common reasons for older people not using public transport are difficulty getting into or out of vehicles (53 per cent), difficulty getting to stops and stations (30 per cent), lack of seating combined with difficulty standing (12 per cent) and pain or discomfort (12 per cent) [20].

Some important aspects of age-friendly cities that encourage healthy ageing are pleasant and clean environments, green spaces, seating areas available for rest, paving and surfaces free of fall hazards, accessibility of shops and transport, security and adequate public toilets [144].

2.8 Summary

Enabling healthy ageing involves a number of factors, best summarised by the WHO Active Ageing Framework as health, participation and security. Health includes lifestyle factors, such as a healthy diet and regular physical activity as well as access to and use of health information and services. Participation involves meaningful participation in work, family and community life and opportunities for lifelong learning. Security includes personal and financial security and maintenance of human rights. All of these factors require environments that support them, including policy and physical environments. The next section will focus on strategies that have been trialled and evaluated in Australia and internationally to enable healthy ageing.
3. Strategies to promote healthy ageing

3.1 Introduction

This section summarises the evidence from evaluations on programs that target each of the individual and social determinants of healthy ageing outlined in Section 2. Programs were only included in this review if they had undergone some form of evaluation. The evidence is drawn from the evaluations, outlined in Table 3 Healthy Ageing Strategies Framework Review and summarised in Table 4 Summary of Evidence—Healthy Ageing Programs. For the purposes of this paper a strategy is defined as ‘a coherent set of program activities designed to achieve a specific goal or objective’ [145].

3.2 Management of health

Given the complexities of age-related conditions, recent studies suggest that a coordinated multidisciplinary effort is required [40, 42]. A novel, community-based comprehensive prevention program for older people in the USA using 10 preventive health goals, education and counselling, showed improvements in adherence to preventive health activities such as vaccination, cancer screening and target goals for cholesterol, blood pressure and blood glucose [146]. Meanwhile, a trial of problem-based geriatric intervention where primary care physicians referred older people for problems with cognition, nutrition, behaviour, mood, or mobility, resulted in improved functional abilities and mental well-being of vulnerable older people in the Dutch EASYcare Study [147]. This Dutch Geriatric Intervention Program was also shown to be cost effective in preventing hospitalisation and admission to residential aged care facilities [148]. Research has also shown that a hospital based comprehensive geriatric assessment, using a multidimensional, interdisciplinary diagnostic process to determine the medical, psychological and functional capabilities of a frail older person, reduces mortality and increases the likelihood that an older person will still be living in their own home at least one year following an emergency hospital visit [149].

In Australia, the Commonwealth provides a Medicare-funded annual 75-years-and-over health assessment (HA) conducted in general practice [150]. People aged 75 and over (or Aboriginal and Torres Strait Islander people who are aged 55 years and over) living in the community or residential aged care are eligible for the 75-years-and-over HA. This HA examines older people’s health status and physical, psychological and social functions, aiming to facilitate health management that will improve older people’s health and quality of life. Evaluation of the HA program among community-dwelling older people showed no significant differences between the intervention and usual care groups at the 12-month follow-up in the number of problems, the number of participants with problems, or mortality [151]. However, there were significant improvements shown in self-rated health, geriatric depression score, and number of falls in participants who received the 75-years-and-over HA [151]. National screening initiatives for people aged between 65 and 75 are currently not available in Australia.

The health assessment and comprehensive geriatric evaluation provides an opportunity to screen for risk factors for chronic co-morbidities. Chronic conditions are as prevalent as geriatric conditions among older people [152]. Nearly all older people surveyed in Australia reported having two or more chronic conditions [153]. Increasing age and weight gain have contributed to the epidemic of chronic diseases such as diabetes, stroke, and heart disease in Australia [154]. High prevalence of co-morbidities among older people is associated with increased use of health services and access to health practitioners [155].

Most preventive healthcare and early disease screenings are ideally undertaken by general practitioners (GPs) in a primary care setting [156, 157]. The Australian Government introduced the Chronic Disease Management (CDM) Medicare items on the Medicare Benefits Schedule (MBS) [158]. The CDM enables GPs to plan and coordinate care of patients with multiple chronic conditions who require multidisciplinary, team-based care from a GP and at least two other health or care providers. The CDM items are designed to provide structured care for patients. Patients are eligible for Medicare rebates for certain allied health services on referral from their GPs.
Focus groups with health practitioners in Australia found there was a lack of evidence-based guidelines or training for them to manage older people presenting with multiple chronic health problems [155]. Health practitioners reported inconsistency across primary, secondary and tertiary healthcare settings in identifying, assessing, monitoring, reviewing and educating older people [155]. Older people reported having difficulties in identifying and accessing support and community services while older people from CALD backgrounds reported barriers in accessing health services [155]. A survey by the British Heart Foundation in 2010 of more than 4,000 women in the UK aged 50 or older revealed that 9 in 10 women never discussed risk factors for heart disease with their GPs and that many were unaware of the symptoms of a heart attack [159]. These findings highlight significant literacy gaps among older people to navigate the health system and that health care professionals were not sufficiently equipped to deal with age-related conditions.

The common occurrence of both age-related syndromes and chronic diseases among older people suggests the need to integrate health care and management of these conditions. Comprehensive care guidelines and quality indicators offer coordinated management of coexisting chronic diseases and age related syndromes [152]. The Coordinated Veterans’ Care Program aims to improve the wellbeing and quality of care for chronically ill veterans [160]. Care is coordinated in general practice by GPs and practice nurses for people at high risk of hospitalisation. Through improved community based care, the program is intended to improve the health of participants by:

- providing ongoing planned and coordinated care from GPs and practice nurses
- educating and empowering older people to self-manage their conditions
- encouraging the most socially isolated to participate in community activities.

In this review the four health management programs showing some evidence of effectiveness for older adults were the Wellness Guide for Older Carers [161], MOVE! [162], the STAYWELL program [163] and the Healthy Changes Programs [164]. The key strategy used was a multifaceted approach with the programs covering a wide variety of topics including nutrition, exercise, managing stress, accessing services, physician access, and care management. The MOVE! evaluation found that sustained intervention was needed in order for weight loss to occur for older adults [165]. The Healthy Changes program was successfully translated into a community setting and its innovative approach of a peer-leader group format resulted in improvements in health behaviours for older adults with type 2 diabetes. Evaluations of the Living with Memory Loss Program and the Dementia Education and Support Program, which both target people with dementia and their carers, showed some evidence of effectiveness in terms of older adults satisfaction with the programs [166, 167]. Even with the differing approaches of telephone support and counselling versus small-group discussions, carers of people with dementia in both programs reported feeling less burdened. However, it was noted in the evaluation of the Dementia Education and Support Program that carers reported less satisfaction with provision of advice specific to individual situations and knowledge of local services.

Best Care for Older People Everywhere—The toolkit and Project InSights have each had only low level evaluations conducted on them and therefore it is hard to determine their effectiveness [168] [169]. Further evaluation would be warranted on the Best Care for Older People Everywhere - The toolkit as it is already widely implemented in Victorian hospitals and has the key feature of being built from an evidence base through a partnership approach with policy makers, researchers and clinicians.

The Hospital Admission Risk Program (HARP) was introduced by the Victorian Department of Health to prevent avoidable hospital presentations and admissions in response to growing demand on the acute care setting [170]. Evaluation of HARP showed marked reduction in Emergency Department presentations, admissions and hospitalisations. HARP was then expanded to rural areas in 2010 and its evaluation found similar benefits. The program is currently offered in 35 state-wide HARP services among people with chronic diseases and aged/or complex needs level 1 and 2 who benefit from intensive care coordination.
3.2.1 Self-management

Chronic Disease Self-Management (CDSM) programs are developed to introduce and educate participants to the core elements of self-management, such as problem solving, decision making, resource utilisation, forming partnerships with healthcare providers and taking action [49]. CDSM can cover specific health conditions or chronic disease risk prevention in general. There are different ways of delivering effective CDSM programs but research evidence predominantly comes from face-to-face group setting delivery [171]. Despite the majority of CDSM evidence being derived from osteoarthritis, diabetes and hypertension are the two chronic conditions that have shown significant health improvement [171, 172]. Risk factors attributable to diabetes and hypertension are interrelated including poor nutrition, high blood pressure, physical inactivity, tobacco smoking, alcohol abuse, and overweight/obesity.

The key principles behind self-management are that [173]:

- illness management skills are learned and behaviour is self-directed
- motivation and self-confidence (or self-efficacy) in management of illness are important determinants of patients' performance of self-care
- the social environment of the family, workplace, and health care system can support or impede self-care
- monitoring and responding to changes in disease state, symptoms, emotions, and functioning improves adaptation to illness.

Building on these key principles, self-management can be defined as [173]:

- engaging in activities that promote health, build physiologic reserve
- interacting with health care providers and adhering to recommended treatment protocols
- monitoring physical and emotional status and making appropriate management decisions on the basis of the results of self-monitoring
- managing the effects of illness on the patient's ability to function in important roles and on emotions, self-esteem, and relationships with others.

National standards were established in the USA to provide ways to deliver effective education in CDSM [174]. Programs incorporating behavioural and psychosocial strategies demonstrate improved outcomes, as do culturally and age-appropriate programs and group education. The review also stated that ongoing support is critical to sustain progress of participants and that behavioural goal setting was an effective strategy. Another important point raised in this review is that low functional health literacy can negatively impact on self-management and its outcomes [174].

There are different types of self-management programs including lay-led or peer-led, health professionals-led, a combination of peer and health professional-led and self-management support which is provided by health care and community services. There are also different ways to deliver self-management programs including face-to-face, over the telephone and online. The most common self-management programs are delivered in a small group setting, for example, the Stanford self-management program [175]. There are limited programs that specifically target older people. A review article on self-care programs available for older people with long-term conditions showed that the majority of the programs were patient education delivered in a group setting by health professionals [176]. This review found significant improvement in physical and illness functioning and self-efficacy due to participation in these self-care programs. The studies included in this review were largely from people with an average age of 60, hence the results may not be extrapolated directly to a much older population, such as those aged 75 years and over.

A Cochrane Systematic Review on lay-led self-management education programs showed small and short-term improvements in participants' self-efficacy, self-rated health, cognitive symptom management, and frequency of aerobic exercise [177]. The Healthy Changes peer education program reported
significant improvement in diet and physical activity among older people who were either overweight or obese and suffered from multiple chronic conditions [178].

Most self-management programs have a single disease focus due to the different nature and progression of the disease. Overall, the self-management programs produce a small to moderate effect size. Among people with arthritis, self-management programs produce small effects with potential improvement in certain cognitive-behavioural markers and functional gains [179]. Self-management education for people with Chronic Obstructive and Pulmonary Disease (COPD) is associated with reduced hospital admissions [180]. Among people with heart failure, cognitive-behavioural intervention is commonly used to improve people's heart failure self-care [181]. Most studies in this review found significantly higher levels of knowledge pertaining to heart failure and heart failure related self-care [181]. Intensive self-management interventions reduced emergency department visits and hospitalisations while intensive self and disease-management interventions reduced disease severity [182]. Most recently, a three-year follow-up of the Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) study using a single education and self-management structured program for people with newly diagnosed type 2 diabetes in the UK found no significant clinical or lifestyle differences [183]. This is despite the DESMOND program previously being shown to be cost effective and meet the quality criteria for education programs listed by the UK Department of Health and Diabetes UK Patient Working Group and the American Diabetes Association criteria [184].

There is new evidence that peer telephone support may be effective for certain health conditions [185]. An evaluation of a structured telephone support and telemonitoring intervention found that this intervention was effective in reducing the risk of all-cause mortality and chronic heart failure-related hospitalisations [186]. Moreover, this intervention was found to improve quality of life, improve prescribing of evidence-based pharmacotherapies and reduce costs [186]. The Department of Veterans' Affairs (DVA) is trialling the use of in-home telemonitoring at the end of 2012 [187].

A systematic review of nine self-management studies on physical activity, weight loss, nutrition, and diabetes conducted among older people found an average small to moderate effect size [188]. This review showed that positive lifestyle changes were feasible among older people. Furthermore, they found that complex interventions were more effective than single component interventions regardless of the way the interventions were being delivered (tailored vs. generic; online vs. offline). Online self-management interventions are perceived as a cost effective method to deliver lifestyle program in a wider audience [188]. A recent trial of the Stanford online CDSM in South Australia found reduction in symptoms, improvement in health behaviours, self-efficacy, and reduction in health care utilisation at the 12-month follow-up [189].

In the UK, there are several online self-management resource centres for consumers, carers and health professionals. The website <www.selfmanagement.co.uk> contains a National Register of Self-Management, a searchable database of tutors, assessors, trainers and lead trainers who are trained and accredited to deliver the Expert Patient Programme [190]. An evaluation of the Expert Patient Programme showed sufficient evidence of effectiveness with positive results regarding healthcare usage (decrease in GPs and accident and emergency unscheduled visits), reduction in medication usage and improvements in self-efficacy and self-care behaviour in patients with chronic disease. The Health Foundation, a not-for-profit organisation in the UK also established an online resource of self-management support [191]. Apart from the Expert Patient Programme, the DESMOND self-management education program is currently delivered by nearly 750 trained educators from 103 health organisations across the UK, Republic of Ireland, Gibraltar, and Australia [183].

A recent report published by the Health Council of Canada highlights the need to integrate self-management support within the wider Canadian health system using the Expanded Chronic Care Model [192]. Particular emphasis is given towards primary health care where 95 per cent of adults with multiple chronic conditions received their regular care. This report lists CDSM programs and self-management support available in Canada as well as Canadian government health policies and initiatives.

The Victorian Department of Health incorporates the self-management approaches within its model of care across the health service (See Appendices for Kaiser Permanente Pyramid). Older people with
chronic diseases and complex needs (Level 1 and 2) receive self-management through HARP [170]. Meanwhile, older people with chronic diseases that can be managed in the community (Level 3) can access the Early Intervention in Chronic Disease (EiICD) [193] and the Diabetes Self-Management (DSM) initiatives [194]. EiICD and DSM are delivered through Primary Care Partnerships. EiICD is delivered in 36 of 79 Victorian Local Government Agencies (LGAs) while the DSM initiative is available through 32 Community Health Services in 25 rural Victorian LGAs. An evaluation of the EiICD program showed it to be a successful driver of internal change within individual agencies with clients also reporting positive changes in ratings of their own health status.

There are several disease-specific self-management community programs available for older people in Victoria. For example Diabetes Australia offers the Life! Diabetes Prevention Program [195] while Arthritis Victoria runs the Stanford self-management program that covers arthritis and other chronic conditions [196]. In Australia, DVA has implemented a successful national peer education self-management program to its veteran community [197]. None of these three projects have been evaluated and therefore no conclusions about their effectiveness could be drawn out.

### 3.2.2 Medication management

A Cochrane Database meta-analysis could not find any convincing evidence that polypharmacy intervention resulted in significant clinical improvement, however, there were some benefits of certain interventions in reducing inappropriate prescribing and medication-related problems [198]. Another review to reduce inappropriate prescribing in older people found that computerised support system interventions produced significantly improved prescribing and dispensing practices [199]. One of the most effective interventions appeared to be multidisciplinary case conferences involving a geriatrician, which resulted in a number of examples of reduced inappropriate prescribing in both community and hospital settings [199]. Research evidence to improve medication adherence included having reminder packaging [200] or calendar packaging combined with education and reminder strategies [201]. A newly developed web-based tool, Monitor-Rx, can identify older people at high risk of drug-related geriatric syndromes. However, this tool was found to be less superior in identifying inappropriate use of medicines than a well-trained geriatric pharmacist and the professional judgment that comes with that experience [202].

The National Prescribing Service (NPS) provides a telephone support service for consumers called Medicines Line (1300 MEDICINE) [203]. Through this telephone support, older people can access information on:

- how a medicine works
- how to take medicines
- side effects
- interactions with other medicines
- storage of medicines
- how to obtain consumer medicine information leaflets for your prescription medicines
- referrals to reliable services and support organisations, for example, support organisations for people with your health condition
- promotion of quality use of medicines and provision of information that is independent, evidence-based, appropriate and safe
- encouraging responsible use of medicines by increasing public awareness about medicines.

In addition, NPS in collaboration with COTA offers a national Quality Use of Medicine peer education program.
Medications need to be reviewed regularly. The Australian Government introduced Home Medicines Review [204] to be undertaken by a community pharmacist and GPs to assist individuals living at home to:

- achieve safe, effective, and appropriate use of medicines by detecting and addressing medicine-related problems that interfere with desired patient outcomes
- improve the patient's quality of life and health outcomes using a best practice approach, that involves cooperation between the GPs, pharmacist, other relevant health professionals and the patient (and where appropriate, their carer)
- improve the patient's, and health professional's knowledge and understanding about medicines
- facilitate cooperative working relationships between members of the health care team in the interests of patient health and wellbeing.

Medication use among older people is complex. There are many facets to consider including age-related changes and multiple chronic conditions. Medication use should to be tailored to individual needs and requires collaboration from the health care industry, physicians, pharmacists, nurses, care givers and older person, and support from the health care system and regulatory authorities [205].

3.2.3 Health literacy

People with low health literacy levels face barriers in accessing care because the written materials provided to them are produced above the national health literacy level [56]. Schillinger et al. found that people with diabetes with low health literacy who were advised by a physician using an interactive communication strategy were able to manage their diabetic symptoms better [206]. The key elements of this interactive communication strategy were to ask people to restate new information or instructions to ensure these were remembered or to assess peoples’ perceptions about new information that had been delivered to them [206]. A systematic review of 38 interventions addressing low health literacy found evidence around the use of multiple discrete design features that include [182]:

- presenting essential information by itself or first
- presenting information so that the higher number is better
- adding icon arrays to numerical information
- adding video to verbal narratives.

Another important aspect to consider is writing. Writing covers the choice of words, sentence structure and writing style [207]. Some key strategies for good writing are [207-209]:

- using simple words and replacing words with more than three syllables
- using short sentences with less than 15 words
- using active rather than passive voice
- giving definitions for technical terms
- avoiding the use of acronyms
- introducing important information first and repeating it more than once.

Besides presentation, format, and writing of the information, reading is another factor that needs to be taken into account in the development of health education materials. The elements of reading consist of [210]:

- alphabetics—using letters to create words
- fluency—competency to read
- vocabulary—understanding of the meaning of words.
The degree of reading comprehension involving all the above elements can vary [210].

- Beginner level: learning by sounding out words and making connection to meaning.
- Intermediate level: an increased capacity in word recognition and fluency to build knowledge and vocabulary.
- Advanced level: proficiency in all elements of reading that could be applied to a range of daily and scholarly undertakings.

In recent years, and with the introduction of the National Broadband Network, many older people have begun to seek health information online. Evidence around the effectiveness of interventions to improve consumers’ online health literacy (including skills to search, evaluate and use online health information) is still lacking mainly due to small number of studies published to date [211]. A review of seven computer-based interventions showed that screening questions on the assistance required to navigate health information gives a good indication of health literacy [55]. The use of basic screening questions on health and technology literacy allows online health programs to be tailored to meet the consumers’ needs [55].

In Victoria, the Victorian Quality Council formed a working group under the Patient Journey and Communications Steering Group. Its main objective is to support improved health literacy for Victorian consumers by developing resources and providing forum and workshops for consumers [212].

3.2.4 Strategies for management of health programs

From the evaluations of the above programs a number of key strategies for self-management programs for older adults could be drawn. These include:

- using a coordinated multidisciplinary approach
- using sustained interventions
- using cognitive-behavioural approaches to achieve behaviour change
- promoting self-efficacy and positive behaviour change
- tailoring interventions to individual’s needs
- using multi-faceted approaches focusing on various healthy ageing domains
- having an evidence-base to the development of the program
- using peer-led, lay-led and health-professional-led education
- having individual advice from health professionals
- using peer telephone support and online self-management programs
- using interactive communication strategies.

3.3 Healthy eating

3.3.1 Overweight, cardiovascular disease, cancer and cognitive decline

Measures recommended for reducing overweight in Australia and worldwide, can also reduce the nutritional risk factors for chronic disease, cancer and cognitive decline. With respect to cognitive decline these include:

- Reducing the intake of saturated and trans-unsaturated (hydrogenated) fats (positively associated with increased risk of age-related cognitive decline and mild cognitive impairment and Alzheimer’s disease).
- Increasing the intake of polyunsaturated (in particular, n-3 PUFA) and monounsaturated fats (protective against cognitive decline in older people in prospective studies).
- Increasing fish consumption (associated with lower risk of Alzheimer’s disease in longitudinal cohort studies).
• Ensuring adequate intake of B-vitamins, especially vitamins B9 (folate) and B12, on cognitive decline and dementia.
• Results on antioxidant nutrients are more mixed, suggesting a need to balance the combination of several antioxidant nutrients to exert a significant effect on the prevention of cognitive decline and dementia to avoid any adverse effects caused by overdosing on some.
• Securing adequate intake of fruit and vegetables as a source of protective antioxidants against cognitive decline, dementia and Alzheimer’s disease.
• Keeping alcohol use to a moderation. Light-to-moderate alcohol use may be associated with a reduced risk of incident dementia and Alzheimer’s disease, while for vascular dementia, cognitive decline and pre-dementia syndromes, the current evidence is only suggestive of a protective effect [77, 78, 82]

The above recommendations are in line with the WHO dietary guidelines [77] for the reduction in overweight and obesity by achieving energy balance and a healthy weight, reduction of chronic illness by limiting energy intake from total fats and saturated fats and eliminating trans-fatty acids from the dietary sources, increasing the consumption of fruits and vegetables, legumes, whole grains and nuts, and limiting the intake of free sugars and salt (sodium). These guidelines refer to all ages, however, as noted in the previous section, some caution should be exercised with adults over the age of 60 and 70 years (depending on the study) [85, 87, 90, 91]. Reducing salt consumption from the current levels of above 18 g per day closer to the recommended level (varying by country from 5 to 8 g per day), will lead to lower blood pressure levels resulting in significant health benefits [213]. Centrally implemented national salt reduction strategies involving all stakeholders and with monitoring and regulatory systems in place are projected to be highly cost-effective in the prevention of chronic diseases [214].

The National Health and Medical Research Councils’ Australian Dietary Guidelines for all Australians are currently being reviewed to ensure that they reflect the latest knowledge on nutrition, diet and health [215]. The revision of the guidelines includes shifting the focus from how much of certain nutrients people should consume (2003 version) to food choice recommendations in the 2010/2012 version [215]. The review is expected to be finalised in the second half of 2012.

3.3.2 Bone health
Bone fractures can be prevented by adequate calcium intake and weight-bearing exercise, plus daily 15 minute exposure to sunlight or supplementing the diet with vitamin D, provided the nutritional intake is otherwise adequate. Although bone health is established early in life, it needs to be upheld throughout the life course, and can be improved and maintained till late in life [68]. Reducing salt (sodium) intake can provide protection against fractures as high intake of salt has been associated with osteoporosis [83].

3.3.3 Anorexia in older people
Due to the normal physiologic effect of healthy ageing or the common medical conditions of this age group, healthy older people are less hungry and become more rapidly satiated after eating a standard meal than younger persons. Frequent, small meals therefore become essential to maintaining adequate nutritional intake [85, 87].

3.3.4 Malnutrition in care settings
Adults aged 65 years and over living in care settings can be at risk of malnutrition which highlights the vulnerability of this group of older people and the need for routine nutrition screening and targeted intervention programs [216]. Multilevel approaches such as the Victorian Well for Life health promotion intervention [217] are promising in successfully addressing the nutrition-related issues faced by the community nursing services providing home nursing care. An evaluation of this program indicated that over two-thirds of the participants had good to very good nutritional intake from a food variety perspective
Some participants in the evaluation reported receiving meals in Planned Activity Groups or through HACC delivered meals. The Well for Life program is discussed further in section 3.9.

3.3.5 Food safety

Although older people generally report safer food handling practices than younger people, they are more susceptible to food-borne illness and the related complications due to age-related weakening of resistance to infection [88, 219]. Food safety may also become a concern with older people due to poor eye-sight, memory or other reduction of sensory capacity. Older people affected by malnutrition are naturally more susceptible to food-borne illness. Good nutritional status helps fight the infection, but prevention is the key [88, 219]. In a review of food-borne illness, Lund & O’Brien (2011) pointed out that ‘diets for vulnerable people in care should exclude higher-risk foods, and vulnerable people in the community should receive clear advice about food safety, in particular avoidance of higher-risk foods and substitution of safer, nutritious foods’. Food safety education delivered to older adults has been shown to change food safety practices, as illustrated in a program conducted at congregate meal sites [220].

In terms of prevention, food safety training is required at all levels in the community, including at-risk groups such as older adults. Food safety information and educational material is now available online, which may give opportunities for intergenerational learning with interactive computer technology [221]. However, the success of a web-based educational intervention among older people was not very encouraging, and the authors recommend printed materials and personal contact [222].

Food safety strategies should also include industry-led approaches to safer and user-friendly packaging with solutions that can provide longer shelf-life and more suitable portion sizes [223].

3.3.6 Fortification and supplementation as a strategy

Vitamin D fortification is needed as a safe and effective food-based strategy to increase vitamin D (concentration of circulating 25 hydroxyvitamin D in blood) across the population and prevent vitamin D deficiency, with a potential benefit for public health [224].

Incorporating plant stanols and sterols (used as a constituent in margarines to lower low-density lipoprotein levels and thus reduce cardiovascular disease risk) into a healthy diet, can be recommended and implemented in older adult populations in order to promote healthy ageing [225]. These compounds may also have other potential beneficial effects including anti-atherogenic, anti-inflammatory, antioxidant and anti-cancer activities [225].

3.3.7 Improving the meals offered

In Western countries an increasing proportion of meals are being eaten outside of the home, in restaurants, schools and from take-away stores [226]. Studies have shown that frequent consumption of unhealthy and unbalanced take away meals is linked with overweight and obesity [226-228]. From a healthy ageing perspective this development raises expectations as to the quality of food served. As older people are in large numbers among those who go ‘out to eat’, the quality of food served should be scrutinised, improved and monitored. The accessibility and availability of balanced meal options is all the more important when choice of restaurants is limited due to personal circumstance.

Multilevel approaches are required to encourage caterers to set new trends and reorient their business to prepare and promote healthier choices; to educate the public via agenda change among educators and the mass media; and to ensure commitment by state and federal governments to offer training and support for the implementation, followed by monitoring of quality and fiscal action when necessary. As the proportion of food consumed outside of the home continues to increase, it is essential that the nutritional quality be improved [226, 228, 229].
3.3.8 Increasing practical skills

Lack of cooking skills may be related to more frequent use of ready-meals, defined as meals requiring few or no extra ingredients and designed to replace the main course of a homemade meal [230]. Ready-meals are typically high in energy, fat, salt and sugar, and have inadequate amounts of vegetables, and have been associated with overweight [230]. More attention should be given to the composition of ready-meals and the ways in which more vegetables could be included with such meals when served at home.

Overall, there is increasing evidence on the negative effects of the transition away from home cooking: an Australian research team [231] has shown how adhering to home cooking can have a positive effect on healthy ageing in a longitudinal study in Taiwan. Tailored cooking skills in intergenerational settings with interactive computer technology may prove useful [232].

3.3.9 Healthy eating programs

There is a strong tendency for health promotion activities relating to nutrition to focus on children—although there are some that do focus on older adults [30]. A recent review found that there is a paucity of evidence-based research on community nutrition interventions for older adults and few of these studies are well-designed or randomised with well-matched intervention and comparison groups [233]. This review identifies innovative government healthy eating initiatives for older adults as well as programs and initiatives that have been implemented and evaluated for older adults in settings where they live. The evaluation methods of these programs tended to be based on self-reported habits and knowledge and not on more robust measures of nutritional outcomes. Using these evaluation methods makes it difficult to draw conclusions about the effectiveness of these programs for older adults, however, key findings and strategies used have been drawn out.

A recent review on nutrition education interventions for older adults found that many interventions tended to report limited success in behaviour change [233]. Despite this finding there were certain features that had positive outcomes including: limiting education messages to one or two; reinforcing and personalising messages; providing hands-on activities, incentives, cues and access to health professionals; and using appropriate theories of behaviour change [233]. However, this review found that currently there is a paucity of intervention programs for older adults targeting nutrition. It was noted by these reviewers that before the question about whether nutrition education has a lasting influence on dietary behaviour, biochemical changes and ultimately health improvement and maintenance in older adults can be answered, we need to learn what constitutes well-constructed intervention programs for older adults and develop and evaluate these programs.

The Eat Well Stay Well project aimed to promote key safety and nutritional messages for older people living at home through education talks given to older adults at various community centre locations [234]. In line with the research literature the evaluation of the program found there to be only a marginal difference in nutritional knowledge at the end of the of the project indicating that the information the older adults had received had made little impact on healthy eating habits [234]. Another education program, the Healthy Eating for Life Program (HELP), specifically addressed nutritional needs of older adults and focused on food for good nutritional help and eating a variety of nutritious foods [235]. A comparison evaluation showed that the HELP program did assist older adults plan for changes and subsequently making changes in their fruit and vegetable eating behaviours through promoting behaviour change and self-efficacy [235]. However, the evaluation did not use random selection, which may have biased the results.

Evidence-based nutrition and exercise education programs that were successfully implemented into a community setting were the Eat Better Move More (EBMM) program in the USA [236] and the Happy Together course in Austria [237]. The EBMM program was tailored to meet the needs of older adults and aimed to promote behaviour change. The evaluation showed the program to improve diets and increase fruit, vegetable and fibre consumption [236]. The evaluation of the Healthy Together course showed health effects in participating migrant women with changed lifestyles and views on nutrition [237]. These nutrition education programs were thought to be enhanced by integrating physical activity, however, as
the evaluations did not involve any comparison groups it is difficult to determine which strategy or approach was most effective.

The Evergreen Action Nutrition program was developed as community-based approach after Canadian researchers identified that little was known about secondary prevention services to help older adults in the community eat better [238, 239]. The program was created by nutritionists and older adults and offers secondary programs such as food demonstrations and workshops at local community centres, as well as nutrition counselling, garden fresh boxes, diabetes support groups and cooking groups. A three-year process evaluation of the program showed that the food demonstrations resulted in the greatest changes in food practices such as cooking methods and/or increased fruit and vegetable intake [239]. Key strategies to the success of the food demonstrations and workshops included: empowerment of behaviour change; an interactive format (including taste testing); social interaction; relevant information, specifically in the form of recipes; consistent, high-quality education; and small group sizes [239]. Another key strategy was involving older adults in planning, implementing and evaluating the program. This is likely to be a successful strategy as it promotes an ownership of the program for older adults, which is more likely to lead to behaviour change.

The largest nutrition assistance program for older adults in the USA and possibly worldwide is the Elderly Nutrition Program (ENP) [240]. This innovative program provides grants to state agencies to support congregate and home delivered meals to people aged 60 and over [240]. The primary aim of the program is to improve the dietary intakes of older adults and offer opportunities to form new friendships and extend social networks [240]. A major national evaluation of the program was completed in 1996 [241]. The evaluation found that ENP provided an average of 1 million meals per day to older Americans, targeting highly vulnerable groups including the very old, people living alone, people below or near the poverty line, minority populations and individuals with significant health conditions [241]. The main nutritional outcomes were that ENP meals supplied well over 33 per cent of the Recommended Dietary Allowances for key nutrients, were nutrient dense, and significantly increased the dietary intakes of ENP participants [241]. Other key outcomes were the reduction in social isolation seen in the evaluation participants, community development, the linking of agencies with the home and community-based long-term care system and the cost effectiveness of the program. The ENP plays a key role in improving nutritional intake of older American’s through providing a range of nutrition services such as nutrition screening, assessment, education and counselling to help older adults meet their health and nutrition needs. A number of ENP’s across the USA have implemented innovative strategies and activities to address the current nutrition challenges.

One of the ENP’s strategies that has been evaluated is the Senior Farmer’s Market Nutrition Program, an innovative program that provides low-income seniors with coupons that can be exchanged for eligible foods at farmer’s markets, roadside stands and community support agricultural programs [242]. The aim is to provide fresh, nutritious, unprepared locally grown fruits and vegetables to low-income seniors while increasing the consumption of agricultural commodities [242]. In 2005 an evaluation of this program was undertaken and the program was found to be cost-effective and successful in targeting older adults [243]. The evaluation participants noted high satisfaction with the program in terms of nutritional benefits and improved finances [243]. The risk assessment showed that older adults who participated in the program significantly improved their chances of receiving proper nutrition [243]. One concern outlined in the evaluation was that although all participants were meant to receive nutrition education materials only 57.6 per cent could recall receiving them [243]. A recommendation was made to improve the nutrition education efforts of the program. Key strategies used in this program included individual empowerment and behaviour change as well as ongoing community development and mobilisation. These factors may have played a role in the programs long-term sustainability.

The Nutrition for One or Two program in Australia aimed to increase nutrition and food preparation skills of frail HACC clients and promote their functional independence through six three-hour workshops run at community centres [244]. Although there was only a low-level impact and process evaluation conducted, the program showed improvements in self-reported knowledge, attitudes and behaviour regarding nutrition, quality of life and improvements in skills to cook for themselves. The promotion of self-efficacy of the participants was a key strategy used in this program [244].
Nutrition programs targeting food insecurity that have been evaluated include the Braystone Fruit and Vegetable Supply Project in Australia [245] and the Food Security Community Partnership Project (FSCPP) in Canada [246]. Both projects help people access healthier foods, particularly fresh fruit and vegetables, through innovative programming and partnerships. Low-level evaluations were conducted and findings indicate that both the frozen food program in the FSCPP program [246] and the weekly mobile market stall in the Braystone project [247] were successful in providing affordable and convenient access to fruit and vegetables. The evaluation also showed the ‘come cook with us’ facilitated cooking sessions in the FSCPP program resulted in increased food preparation skills and increased food safety knowledge [246]. The community development and linking between agencies were key strategies utilised in these programs. The evaluation of the Braystone project also showed that through the commitment and hard work of individuals and the support of a strong network of evolving partnerships the project had clear potential for sustainability [247].

The 2005 national Go for 2&5 campaign was an Australian Government, State and Territory health initiative that aimed to promote good health [248]. An evaluation of the campaign was conducted in 2007, however, as the campaign primary target groups were parents and carers of children and youth and children, the effectiveness of the campaign was only highlighted in relation to these two groups [248].

The UK national 5 A Day program was launched in 2002 to raise awareness of the health benefits of fruit and vegetable consumption and improve access to fruit and vegetables [249]. The evaluation of this program included adults aged 50 and over and found that for all age groups there were greater levels of improvement in awareness and understanding of the issues and implications of eating fruit and vegetables, rather than an increase in overall consumption levels [249]. This finding indicates that changes in knowledge and increased awareness through media campaigns may not lead to sustained nutrition behaviour change.

A number of innovative nutrition programs targeting older adults were found in this review, however, they have not yet been evaluated and therefore the effectiveness of these approaches remain unknown. These programs include public education campaigns, behaviour change nutrition education programs, bus transportation to supermarkets and social eating groups (see Table 3 for more detail). The Victorian Healthy Eating Enterprise is a new initiative developed to support healthy eating in Victoria [250]. The Victorian Government, in partnership with local governments, businesses, health professionals, communities and industry, will be undertaking a range of initiatives with the shared vision of improving the health and wellbeing of all Victorians through healthy eating [250]. Evaluation of the initiatives will be undertaken by the Centre of Excellence in Intervention and Prevention Science at a community and state-wide level. The initiatives are in their early stages and no findings have been released to date.

3.3.10 Strategies for healthy eating programs

From the evaluations of the above programs a number of key strategies for successful nutrition programs for older adults could be drawn. These include:

• using education programs that have the key features of limiting education messages to one or two; reinforcing and personalising messages; providing hands-on activities, incentives, cues and access to health professionals, and using appropriate theories of behaviour change
• involving older adults in planning, implementing and evaluation of the programs
• using interaction approaches such as cooking classes, food demonstrations and workshops that promote empowerment of behaviour change and builds skills of older adults
• using group-based nutrition activities that promote social interaction
• using cognitive-behavioural approaches to achieve behaviour change
• promoting self-efficacy and positive behaviour change
• using multi-faceted approaches focusing on various healthy ageing domains
• promoting community development
• having an evidence-base to the development of the program.
3.4 Physical activity

The National Physical Activity Recommendations for Older Australians suggest that older people should be active every day in as many ways as possible; this includes doing a range of physical activities that incorporate fitness, strength, balance and flexibility. In terms of formats of physical activity, reviews of the literature show that group-based interventions are often preferred by older adults due to their potential to extend social networks [30].

Physical activity interventions specifically designed for older adults from Australia, Canada, USA and UK were analysed in this review. These programs included: Home Support Exercise Program [251]; Functional Fitness for Long Term Care Program [252]; Living Longer Living Stronger (LLLS) [253]; Multicultural Multi-active Seniors (MMS) [254]; Lift for Life [255]; Community Healthy Activities Model Program for Seniors (CHAMPS) [256]; Get Fit for Active Living [257]; Osteofit [258]; and Active Sandwell [259]. The programs were either run in community or residential aged care settings and the formats generally included multi-intervention approaches to increasing physical activity in older adults. These multi-intervention approaches included combining various physical activity approaches (for example, aerobic, strength, balance and flexibility exercises) with education programs to empower individuals and promote individual skill development and behaviour change.

The Home Support Exercise Program and Functional Fitness for Long Term Care Program both target the needs of a more at risk group of older adults living at home or in long term care aiming to improve functional mobility through physical activity programs. The Home Support Exercise Program is an evidence-based program designed for frail older adults and delivered via the existing home care infrastructure in Canada [251]. The Functional Fitness for Long Term Care Program, also from Canada, is tailored to meet the needs of high and low mobility residents in long term care homes [252]. The evidence of these two programs was good (level 3—some evidence of effectiveness) and the evaluations showed both programs to be cost-effective and improve physical function for the participants [251, 252].

The Canadian Centre for Activity and Aging (CCAA) is an organisation that shows effectiveness in translating research-based knowledge through education programs delivered to and through health care organisations. The CCAA runs workshops for staff wanting to implement these two programs. The support from CCAA for these physical activity programs promotes sustainability and increases the reach of the programs to older adults in Canada.

The level of evidence of the community programs varied ranging from level 2—sufficient evidence of effectiveness (CHAMPS; Osteofit) to level 3—some evidence of effectiveness (LLLS; MMS; Lift for Life) to level 4—weak evidence of effectiveness (Get Fit for Active Living; Active Sandwell). The evaluations showed that the physical activity interventions resulted in improved physical function, improved quality of life, improved mental health, high satisfaction with the program, increased caloric expenditure, high exercise adherence rates, and increased social connections [254, 256, 257, 259-261]. The evaluations of the group-based programs (for example LLLS, MMS) also showed that the social components of these programs were an important reason older people joined and continued to attend the physical activity programs. This finding complements the research evidence in this area. Therefore group-based exercise programs could be used as a strategy to not only increase physical activity and adherence to the program but also increase social connections for older people. Other key features of the programs included the cost effectiveness of the programs, the community development and the coordinated approach between organisations for example, the utilisation and endorsement of existing mainstream community facilities such as community and fitness/leisure centres. These factors may have resulted in the ability of the programs to be continued with sustainability being shown in all programs.

The LLLS program has particular relevance in this context given that it is already widely utilised and accepted by older people in Victoria. The LLLS scheme was built from an evidence base and incorporates multiple strategies (promotion, education, training and capacity building) to bring about industry change in parallel with the facilitation of appropriate programs. This multi-factorial approach coupled with the cost-effectiveness and endorsement of mainstream facilities could be seen as the key strategies relating to the success and sustainability of the program. The Lift for Life program is another example of an evidence-based program that has been successfully implemented in the Australian
community setting. The evaluation of this program noted that considerable time and extensive collaboration is required to establish and foster collaborative links between scientists/researchers and the practitioners who are delivering exercise programs in the community [255]. For example, the Lift for Life program has been under development for approximately seven years. An increased emphasis on the establishment and translation of evidence-based physical activity programs for older adults is warranted, as discussed further below.

3.4.1 Evidence-based physical activity programs for older adults

In recent years evidence-based healthy ageing programs are becoming the preferred model for giving older adults information and support [262, 263]. The benefits of evidence-based programs are that they are adapted from tested models and interventions that have been proven successful in addressing health issues [262, 263]. They are also appealing to health care organisations and funding agencies because they are based on scientific research [262].

The National Council on Aging’s Center for Healthy Aging in the USA does a lot of work in helping community-based organisations develop and implement evidence-based physical activity programs that promote healthy lives for older adults [263]. These programs include: Active Choices [263]; Active Living Every Day [264]; Fit and Strong [265]; Walk with Ease [266]; Healthy Moves for Ageing Well [267] and Strong for Life [268]. All these programs have been successfully translated into a community setting with diverse populations in the USA. The format of the programs vary and include: a group-based facilitated problem-solving method; physical activity program with a trained activity coach; multi-component community programs incorporating flexibility, strength training and walking with health education and motivational strategies; an in-home strengthening physical activity program; and an in-home physical activity intervention for frail high risk sedentary older adults. The strength of evaluation of these programs was high, ranging from level 2—sufficient evidence of effectiveness (Active Choices; Active Living Every Day; Fit and Strong) to level 3—some evidence of effectiveness (Walk with Ease; Healthy Moves for Ageing Well and Strong for Life). Health outcomes for older adults from the evaluations of these programs included: significant increases in physical activity levels, improved physical function, decreases in stress and depressive symptoms, improved physical activity efficacy and physical activity adherence, increased self-confidence and significant declines in number of falls [255, 266-270]. The programs with a high level of evaluation used guidance and education strategies to help participants develop the behavioural skills needed to build moderate physical activity into their daily lives.

3.4.2 Health professional/general practice interventions

Due to the high rates of consultations older people have with health professionals, general practice presents an ideal setting to promote and give advice on physical activity to older people. The Active Script [271] and Heartmoves [272] programs in Australia, the Green Prescription scheme [273] from New Zealand and Prescription for Exercise [274] from the UK are four healthy ageing strategies that use health professional and GPs to deliver physical activity advice to patients.

The evidence is very strong (level 2—sufficient evidence of effectiveness) for the Green Prescription scheme and the Prescription for Exercise program with significant improvements being shown in physical health and adherence to physical activity [274, 275]. The Active Script program and Heartmoves showed level 3—some evidence of effectiveness [271, 272].

The Active Script and Green Prescription programs were shown to be cost-effective strategies in the promotion of physical activity [271, 275]. Both these programs involve GPs delivering affective physical activity advice to their patients and writing them a ‘script’ for exercise. The Green Prescription scheme implements various health promotion actions (reorientating health services, strengthening community actions and development of personal skills) that may contribute to the sufficient evidence of effectiveness being shown for this particular healthy ageing strategy.

Using a slightly different approach, the Prescription for Exercise and Heartmoves models aim to link health professionals (in particular, GPs) and the fitness industry to promote physical activity. The Prescription for Exercise program specifically targets sedentary older adults and uses an individual
education approach to promote skill development and behaviour change. In contrast, the Heartmoves model was designed to provide low to moderate intensity exercise programs to the general population. Although it was not specifically targeted for older adults the evaluation showed that 70 per cent of the Heartmoves participants were aged 60 years and over [272]. The focus on process level indicators in the evaluation of Heartmoves allowed a number of key learnings on effective strategies to be drawn [272]. These key strategies included the utilisation of existing fitness centres, low cost, fitness industry backing, and engagement of fitness leaders and health professionals, which all impacted positively on the ability of the program to be sustained long term. The evaluation also highlighted the difficulty in engaging health professionals, mainly GPs, in the promotion of this program. It was stated that there needs to be further investigation into strategies to engage health professionals in physical activity promotion beyond existing strategies such as educational workshops and script pads [272]. In addition it was noted that there needs to be continued monitoring of programs such as these, with a focus on referral sources and collecting data from people who withdraw, to inform the development of future programs [272].

3.4.3 Awareness-raising campaigns

Australian physical activity awareness raising campaigns to show some level of effectiveness have been the National Heart Foundation campaign [276] and the Seniors Go for your Life campaign [277]. Although the National Heart Foundation campaign was not specifically designed for older people the evaluation of this program showed that the slogan ‘Exercise: make it a part of your day’ was particular successful at increasing walking for exercise or leisure among older age groups [278]. However, the second campaign resulted in no further increase in walking in any age group [278]. The Seniors Go for your Life campaign, which was specifically targeted at older people, also showed beneficial physical outcomes for older Victorians but it was only evaluated mid-way through the campaign period [277].

The strengths and strategies of the Seniors Go for your Life campaign were the grants provided to Primary Care Partnerships and organisations in Victoria to develop, promote and deliver physical activity programs, the promotional activities and sector development. The National Heart foundation campaign purely used a mass-media strategy which was effective in one stage but not another.

The Heart Foundation Heartmoves program described in section 3.4.2 also used a social marketing campaign with friends, family and the media as a key strategy to inform participants about the physical activity program. The evaluation of this program found that social marketing strategies to promote physical activity programs needed to be multi-component (for example, a combination of public launches, demonstrations, presentations, direct promotion to GPs, media, advertising campaigns, etc.) to ensure wide coverage and promotion in the community [272].

The Measure Up campaign was a social marketing activity that was recently run in Australia [279]. The aim of the campaign was to raise awareness of healthy lifestyle choices and promote consistent evidence-based lifestyle messages to all Australians. The primary target group were 25 to 50 year old parents with a secondary audience of people aged 45–65. The evaluation focused on outcomes for the primary target group and therefore no new learnings about the effectiveness of this approach for older people (above 65) could be found [279].

The combination of awareness-raising campaigns (mass-media) with community health development of physical activity programs could be used as an important healthy ageing strategy to change physical activity behaviours in older adults.

3.4.4 Falls prevention

There is very strong evidence for the use of physical activity programs for falls prevention in older adults. The Otago exercise programme has been systematically evaluated and has the strongest level of evidence for effectiveness in this area [280]. This is in terms of its ability to significantly reduce the risk of death and falling in older community-dwelling adults. This individual-based program has been shown to be cost-effective as well as appropriate and effective when delivered from routine healthcare practice [280]. These are all important factors for an effective healthy ageing strategy. Other physical activity interventions for falls prevention with high levels of evidence include Falls Management Exercise (FaMe)
The FaMe program uses exercises based on the Otago program while the Tai Chi program emphasises postural alignment and coordinated movements to prevent falls [281, 282]. The key strategy in the FaMe program is the promotion of long term adherence to exercise. This is achieved through instructors giving older adults exercises to complete at home with the aim to integrate exercise into their daily lives. The Extra Time—Standing Tall strategy was a falls prevention program that used a group-based exercise program to reduce falls risk with the added aim of reducing social isolation. Although it has a low evidence base the program was shown to empower the older people involved allowing them to regain confidence [283]. Empowerment of older people is a key strategy in healthy ageing through allowing individuals to take initiative for their own health and wellbeing. Other physical activity programs that play a role in falls prevention are discussed in section 3.4.

In recent years, peer education has been used in healthy ageing programs for older people in the falls prevention area. Peer education falls prevention programs identified in this review included: No Falls; Positive Action on Falls; and Up and About [284-286]. These programs aimed to increase awareness of falls risk factors through education sessions provided by peer educators to older people. The level of evidence of these programs was low, however, satisfaction with the education sessions and increased knowledge of falls risk factors were reported [286-288]. As peer education is a community-based intervention, the majority of falls prevention programs tend to describe implementation without rigorous evaluation [289]. Reviews on falls prevention interventions in older people found no evidence that peer education when offered alone is effective in preventing falls [290]. Therefore, peer education may only be a useful falls prevention strategy when used in multi-factorial approach.

In Canada an annual, month-long, social marketing campaign called Finding Balance is used to increase awareness among older adults about the importance of leading a healthy, safe lifestyle to prevent falls [291]. This campaign uses four main messages (check your medications, keep active, watch your step and speak up about dizziness) and targets the community and health professionals. Although the evaluation of this program only showed weak evidence of effectiveness, the campaign has raised awareness of falls prevention in Canada for older adults with the greatest recall being the television ads that were run during the month long campaign [291]. In Australia the Stay Active Stay Independent (SASI) program used a social marketing campaign as part of its multi-strategy program to raised awareness of falls prevention and physical activity [292]. Although the evaluation of the program showed evidence of ineffectiveness in improving falls risk factors (as discussed further below) the social marketing campaign was found to have effective reach and impact on raising awareness of older adults on a limited core budget [293]. Over a third of respondents to the evaluation recognised the campaign and attributed this to mainly the television and newspaper advertising [293]. The main strategies used in this campaign included the use of strong formative research to develop the campaign, significant use of corporate, community and media partnerships and a detailed strategic distribution plan.

Given that multiple-risk factors are often involved in falls, a falls prevention program that addresses more than one falls risk factor is more likely to reduce falls rates than single interventions. Multi-factorial falls prevention programs with strong evidence include: Stay on Your Feet; Standing Strong; Steady As You Go (SAYGO); Strategies and Action for Independent Living (SAIL); Matter of Balance; Greater Glasgow and Clyde Community Falls Prevention Program and Stepping On [294-300]. These programs used a combination of: peer education programs, social marketing strategies, training programs for staff, exercise programs (strength and balance), falls risk assessments, falls monitoring systems, education of falls prevention strategies, strategies to reduce fear of falling, community education, awareness raising, policy development and individually targeted interventions, in order to prevent falls. The Stay on Your Feet program has strong evidence of effectiveness and produced lower incidence of self-reported falls and fall-related hospitalisation rates [301]. The program was also very cost-effective and resulted in benefit to cost ratio of 20.6:1.21 [301].

The SAYGO and Stepping On programs also showed strong evidence of effectiveness in reducing falls rates in their respective evaluations [296, 298]. Both programs use a cognitive-behavioural approach and a multi-factorial risk abatement approach focusing on empowering older adults to identify and implement strategies to reduce community falls hazards. The Stepping On program also uses adult learning
principles which aimed to increase knowledge and change attitudes and behaviours. Two other programs also showing some, albeit weaker, levels of effectiveness were the SAIL and the Greater Glasgow and Clyde Community Falls Prevention programs [299, 300]. The SAIL program is an innovative program that has been implemented in Canada and Australia. This program trains community health workers and home care professionals to implement falls prevention strategies with older adults who are in need of ongoing home support. The Canadian evaluation showed this program to be cost-effective and effective in preventing falls [299]. No Australian evaluations of this program could be found in this review. The Greater Glasgow and Clyde Community Falls Prevention Program works in partnership with local authority and voluntary organisations to provide a specialist falls service in the UK. The program provides comprehensive falls screening, health education, exercise, rehabilitation and onward referral. Although the evaluation only showed weak evidence of effectiveness the program currently sees 175 older adults a month (the largest falls service in the UK per capita) and has shown a reduction of falls in the home and residential institutions [300]. The program empowers individuals and promotes community development with key success factors being its single entry point, constant update training, promotion, and its accessibility and easy referral pathway.

One multi-factorial falls prevention program showing evidence of ineffectiveness was the Stay Active Stay Independent (SASI) program [292]. An independent evaluator found that neither the community awareness campaign nor an increased availability of group physical activity opportunities in themselves substantially improved falls risk factors or decreased the rate of falls related injuries [293]. The evaluators attributed this ineffectiveness to a lack of targeted strategies advocating for changes to policies that create known barriers for older adults to sustain participation in unstructured physical activity including fees, transport and poorly lit public places [302]. They also stated that there was little focus in this program on reorienting services to incorporate system enablers such as establishing referral pathways between health professionals and physical activity leaders or incorporation of recommended physical activity measures in standard professional development and training practices [302].

3.4.5 Strategies for physical activity and falls prevention programs

From the evaluations of the above programs a number of key strategies for successful physical activity and falls prevention interventions for older adults could be drawn. These include:

- having an evidence base to the development of physical activity programs
- using multi-factorial approaches for example interventions that incorporate physical activity with educational/motivational programs that allow older adults to develop behavioural skills needed to build physical activity into their daily lives
- empowering and engaging older adults in physical activity behaviour change
- using individual or group-based education to promote skill development
- using group-based classes to promote increased social connection
- using individualised physical activity programs that are designed for each older person’s needs, ability, interests and readiness to begin exercise
- promoting community development (for example, linking the community with fitness organisations)
- ensuring the programs are cost-effective
- training staff to implement physical activity interventions
- using multi-faceted, holistic falls programs that take into account the physical, mental and social health needs of the older person and empower them to implement falls prevention strategies.

The literature has also identified a number of variables that might affect older people’s participation in physical activity, including ageism and ageist stereotypes, and the built environment. A recent review paper found that ageist stereotypes are pervasive in our society and harmful to older people’s psychological well-being, physical and cognitive functioning [132]. Based on previous studies, they provided some strategies regarding promotional messages that will and will not motivate older people to participate in healthy ageing activities, in particular, physical activity programs. They suggested that messages that will motivate older people to be more physically active tend to:
• feature ordinary people doing ordinary things
• provide concrete information
• be specific
• recognise the obstacles that people face and that family is a key motivator.

In contrast, messages that will not motivate older people are those that:

• make exercise look like work
• use the term ‘exercise’ or ‘fitness’
• remind older people of their age
• are confrontational.

These strategies should be taken into consideration when developing physical activity programs targeted towards older people.

3.5 Alcohol and tobacco use

A number of programs providing services to adults who encounter alcohol and drug problems were located in this review and described below. Also listed are the few programs that are specifically designed for older adults. The majority of these programs have not had evaluations conducted on their effectiveness in relation to outcomes for older adults. Where evaluations are available the outcomes of the programs are also listed.

The Presentation and Management of Alcohol Problems In Older Adults program is an evidence-based program which has been successfully implemented in a community setting in the USA [303]. The program components include: alcohol screening, assessments, brief interventions, and a guide to referral for more intensive care. This brief alcohol intervention approach relies on concepts of motivational interviewing to enhance older adults’ commitment to change their behaviour. A randomised controlled trial showed program participants decreased their drinking by 40 per cent compared to 28 per cent in the control group, however, there were no significant overall difference between the groups in terms of change in alcohol consumption over the course of the study [304]. Despite the positive findings a major limitation to this study was the reliance on self-report to determine alcohol consumption. This may have resulted in participants underestimating their alcohol use in an effort to please their physicians.

The Centre for Addiction and Mental Health (CAMH) in Canada provides holistic care for people who have problems with addiction or mental illness, and their families, in conjunction with family practice, home support services, community agencies and other health care providers [305]. Among the available programs, the Geriatric Mental Health Program caters for people aged 60 years and over through inpatient and outpatient treatment services, support and ongoing follow-up. The CAMH has also developed a free online behavioural program that was found most relevant among heavy drinkers living in the community.

There are a range of services available for older people living in the state of Ontario in Canada. ConnexOntario, a health service information organisation funded by the Ontario Government delivers free and confidential drug and alcohol addiction services via the Drug and Alcohol Helpline [306]. The service is provided by a Referral Specialist who is accessible either by phone, email or web chat 24 hours a day. People can access information about community services, seek advice and support and receive basic education. Another service that targets people aged 55 years and over with addictions living in Toronto is the Community Outreach Programs in Addictions (COPA) [307]. COPA is a not-for-profit organisation that provides evidence-based initial assessment, treatment, case management and outreach services to older people living in the community or experiencing homelessness. Lastly, residents of the City of Hamilton aged 55 and over who encounter alcohol, drug, prescribed medications or gambling problems can access the following programs [308]:

• Older Wiser Lifestyles (OWL)—Established by the Ministry of Health and Long Term Care in 1994. The program covers alcohol, drugs or prescribed medications use. An evaluation of this program is currently being undertaken (finishing in 2013) to examine its effectiveness.
• DrinkWise—A brief educational program of one hour assessment, and four one-hour private sessions or five 90-minute group sessions to stop or reduce drinking. This program is not suitable for people who are severely alcohol dependent. No evaluation on this program could be found.

• Age Wise—A healthy lifestyle choices program where older people receive an individual assessment and, if appropriate, six educational/support group sessions. There is also an on-going bi-weekly support group. No evaluation on this program could be found.

Meanwhile the state of British Columbia in Canada also offers services for older people aged 55 years and over who experience problems with alcohol and drugs. The Victoria Innovative Seniors Treatment Approach (VISTA) offers outreach program including consultation, educational workshops and group counselling [309].

The Substance Abuse and Mental Health Services Administration (SAMHSA) at the Department of Health and Human Services in the USA establishes national treatment programs for alcohol and drug abuse [310]. The programs are currently delivered in over 11,000 locations, including residential centres, outpatient, and hospital inpatient setting.

Several services are available for treatment of alcohol problems in the UK including: Drinkline, a national telephone helpline for residents of England and Wales [311]; UK National Health Service Choices, which has a database of support and treatment services [312]; rehab-online, a directory of residential rehabilitation services for adult drug and/or alcohol misusers [313]; GPs or local Community Alcohol Team; The London Drug and Alcohol Network (LDAN), an online directory of services across London [314]; and the Wales drug and alcohol helpline. None of these services are tailored for older people.

Alcoholics Anonymous is an international peer-based program that aims to support people to quit drinking alcohol [315]. This program is available in a face-to-face community group setting or online meeting. It operates in numerous locations including USA, UK, Canada and Australia.

In Australia, DVA created the Right Mix program where its members can assess how much they drink and complete a self-paced program by correspondence, and Changing the Mix, to ensure that its members can improve their drinking patterns in a confidential manner [316]. DVA is aware that alcohol abuse may be related to the traumatic events that its members have experienced and also produces the At Ease mental health program and offers counselling for both the veterans and their families to assist them with alcohol problems [317].

The Australian Centre for Addiction Research runs two controlled drinking programs, namely the Controlled Drinking by Correspondence Program and Control Your Drinking Online [318]. Both programs are available free for people who wish to reduce their drinking but not suited for people who have severe dependence on alcohol. Each program covers self-assessment and several treatment modules that can be completed anonymously and at their own pace.

Turning Point Alcohol and Drug Centre has a variety of services for people affected by drugs and alcohol problems across Australia [319]. Some treatments require a referral from GPs however, other services such as the 24 hours online counselling, case management, and self-management group the Victorian Drug and Alcohol Clinical Advisory Service is a specialist telephone consultancy service that is free of charge for health and welfare professionals in Victoria, Tasmania and Northern Territory [320].

In the UK, QUIT is a charitable organisation that leads smoking cessation services including Quitline phone helplines and community programs in eight different languages namely English, Bengali, Urdu, Punjabi, Gujarati, Hindi, Turkish and Kurdish [321]. Quit also produces free information leaflets in five different languages. Quitline service to multicultural Asian communities is supported by the British Heart Foundation as Quit understands that there are cultural issues surrounding smoking. The smoking cessation service is now also available through Skype, Quit Skype counselling. Quit is leading a collaboration with the European Network of Quitlines in providing Quitline services.

The UK Department of Health through NHS network offers the Smokefree program that covers a diverse range of services for people to quit smoking [322]. Their website lists local NHS Stop Smoking Services
in individual or group sessions; Smokefree Together Programmes for support at home by mail, phone, text or email; information about stop smoking medicine; and a Quit Kit, Quit App, and MP3 download.

Health Canada runs the free phone helpline 1-800 Quit Lines [323], which offers free telephone support from trained specialists who can help develop a personal quit plan or provide counselling to family and friends of smokers. They can also answer questions and locate self-help materials and other quit smoking support in the community. Health Canada also has On The Road to Quitting Program, a self-help online program, to increase motivation and self-efficacy to quit smoking. People can learn why they smoke, their level of addiction to nicotine, how to prepare to quit, and receive support through withdrawal, cravings and stress [324]. In addition, the Canadian Cancer Society runs Smokers’ helpline, Online Quit Program, coaching by phone through Quitline, and TXT service for Ontario residents. The services are available in English and French.

The Australian Government Department of Health and Ageing supports several initiatives under the National Tobacco Campaign including Quitline, which offers information and advice over the phone; My QuitBuddy, a personalised interactive app of quit tips, daily motivational messages and quitting reminders that people can download in their iPhone or iPad; Quit Coach, an interactive online smoking cessation program; and the Quit Pack information kit [325].

3.5.1 Strategies for alcohol and drug programs

Further evaluation is required on programs and services that are available to older adults who encounter alcohol and drug problems before effective strategies can be drawn out.

3.6 Participation

There is sound evidence for the health benefits of specific programs supporting older people’s participation in all aspects of community life [326]. However, there is less evidence available on the design and implementation of effective programs.

A recently published evaluation of the Queensland Cross-Government Project to Reduce Social Isolation of Older People generally suggested that there were benefits in using a community development model to help reduce social isolation in later life [326]. No significantly robust findings on the effectiveness of the programs in reducing loneliness and increasing social support for older people in the community were found, however, qualitative data indicated that the projects were successful [326]. However, methodical issues and problems with data collection were highlighted as limitations of the evaluation. A set of Best Practice Guidelines from the overarching evaluation of the Queensland Cross-Government Project to Reduce Social Isolation of Older People were developed [327]. In short, programs should be theory-based, aiming to address the known protective and risk factors; utilise an approach, method and model that addresses local needs and fits with existing resources; target a specific group; have an holistic integration approach, and an awareness of life-course and the important points of transition; and, importantly for funders, be aware of the long time required in community development work to establish partnerships (this was 18 months for the Queensland work).

In the evaluation of Count Us In participation projects undertaken with residents in aged care facilities, a number of key factors were also identified. Greater success was achieved when time was spent engaging and involving residents in the project and activities; funding was used as a resource to initiate change; residential care services had a strong philosophy of social wellbeing and social inclusion and demonstrated an increased capacity to implement the projects; there was the existence of high-level support and leadership through executive and senior management; and there were dedicated project managers [328]. As many of the projects relied heavily on the use of volunteers to assist with community-based activities, successful volunteer recruitment strategies were essential. Overall, it was found that the success of participation strategies was multifactorial and that it was important that the strategies or projects were integrated within broader principles of healthy ageing.

A number of other projects identified are of relevance to Victoria. The Greenvale and Hervey Bay projects for rural and regional communities, and the Santropol Roulant Intergenerational program and
Thinking Village projects across the state offer new approaches to participation, with individual benefits for participants as well as benefits flowing more broadly to intergenerational renewal, social inclusion, and community strengthening [329-331]. In addition, the Community Leadership Program and the Apple Store offer guidance for working with existing providers of services to expand their models to include older people. These innovative programs currently have no evaluation components.

Programs showing some evidence of effectiveness include the Successful Ageing program from the Netherlands, the SCOPe program from Scotland, and the Arts, Health and Seniors Project from Canada [332-335]. Innovative approaches used in these programs included: peer-led education course, a befriending program, and providing vulnerable older adults with community engaged arts programming via weekly workshops with professional artists respectively. Outcomes included increased self confidence in creating connections and increased perception of health, self-esteem and social support. The Arts, Health and Seniors project in Canada has been able to achieve long-term sustainability in a community setting and the program developers are current designing sustainability guidelines to assist other organisations wishing to implement the program [334].

The University of the Third Age and the Brotherhood of St Laurence Community Care Social Isolation initiatives show weaker levels of effectiveness due to low level evaluations being conducted on them [336-339]. The University of the Third Age provides intellectually stimulating activities in a social environment while the Brotherhood of St Laurence program provides encouragement and support for older people experiencing health problems to continue to participate in areas of their life they consider priorities. Both programs are widely implemented in Victoria and further evaluation of the effectiveness of these approaches in engaging older adults is warranted.

There are other participation programs which include older people in significant numbers but have been beyond the scope of this review to access and report on. VicHealth, the National Heart Foundation and the International Diabetes Institute have all funded programs focusing on increasing rates of participation in social activities alongside physical activity programs, many of which have a majority of older people participating. However, the information publicly available regarding the evaluation of these programs is limited, and fails to provide advice on implementation and outcomes.

3.6.1 Strategies for participation programs

From the evaluations of the above programs a number of key strategies for successful participation programs for older adults could be drawn. These include:

- using multi-faceted approaches/integrated strategies that aim to enhance the health and wellbeing of older people and address various healthy ageing domains (for example, nutrition, physical activity, emotional wellbeing and social connection)
- using mixed approaches to reducing social isolation (for example, direct service delivery and developing and consolidating support networks for older adults at risk of social isolation)
- using collaborative partnership approaches
- involving older adults in planning, implementing and evaluation of the programs
- using volunteers to run the programs
- having an evidence-base to the development of the program that aims to address the known protective and risk factors
- using approaches, methods and models that address local needs and fit with existing resources
- using targeted approaches which are holistic, integrated and utilise a life course approach.

3.7 Ageism

There is little evidence for the benefit of education for reducing ageist attitudes amongst health professionals and para-professionals (a worker who is trained to perform certain functions, as in medicine or teaching, but not licensed to practice as a professional) [340]. The three education programs reviewed here showed minimal impact on attitudes [341-343]. However, the Aging Game Workshop, which has been part of the medical education program at the University of Minnesota since 1994, was
valued by medical students. Unfortunately, no evaluation of its impact on attitudes or practice was undertaken [341].

As discussed in section 2.6, ageist views can come from a lack of knowledge of or close interactions with older people. Intergenerational programs, defined as ‘vehicles for the purposeful and ongoing exchange of resources and learning among older and younger generation’[344], attempt to bring different generations together, improving understanding and increasing interaction between them.

Intergenerational projects can take many forms:

- older people assisting younger people (for example, Experience Corp, Timehelp, Intergenerational Mentoring Project, Grandfriends Intergenerational Program, Generations in Action, and Landed Learning School Year Program) [342, 345-349]
- younger people assisting older people to improve their skills (for example, Trans-IT intergenerational computer project, and Students Teach Adults Computer Knowledge) [350, 351]
- older and younger people working together (for example, Thinking Village, Our Generations, Creating Community) [331, 351, 352]
- shared site programs (for example, Playgroup in residential aged care, Naturally Occurring Interaction in a Shared Environment Everyday). [353, 354]

These programs involve different types of activities (academic mentoring, arts activities, computer training, environment improving activities, etc.), and happen in a wide range of settings (schools, community centres, farms, aged care, etc.).

Evaluation of these programs indicates that there are a number of benefits of intergenerational programs, including benefits to older people, younger people and the community. For older people, the opportunity to share their skills, knowledge, and experience with younger generations and to stay connected to their communities had a positive impact on life satisfaction, social engagement, and overall health [342, 350-352, 354-361]. Experience Corps (EC) is an American program that brings older adults into disadvantaged public elementary schools to improve academic achievement of students through one-to-one tutoring, small group academic help, and assisting teachers [345]. External evaluation of the program found that older volunteers showed significant increases in cognitive ability, physical activity, and strength, compared to older people in the control group [361]. Older volunteers of the program also reported social gains, including a significant decrease in time spent watching TV and a significant increase in the number of people they feel they could turn to for help [361]. Creating Community is an American intergenerational program where older people and children/youth spend one year learning together to construct an oral history and then present it to the community [351]. Evaluation of the program found that older people felt invigorated and safer in the neighbourhood [351]. They discovered that they matter to the younger people, and that they have something to give them [351]. These experiences of connection dispel feelings of isolation. Trans-IT intergenerational computer project is a weekly program of one-to-one tuition delivered by young volunteers from local secondary schools to help older people access computers and the internet [350]. It was found that older people in this program gained more independence and confidence through enhanced IT skills and social networks [350]. They also changed their opinion of young people through being involved in the program.

These intergenerational programs also help to reduce ageist attitudes towards older people. The Thinking Village project initiated by the Joseph Rowntree Foundation in the UK involved older and younger people doing activities together, such as museum visits and playing bowls [331]. The qualitative evaluation of the project found that there was some evidence of improved relationships between generations, increased trust and understanding [357]. The Victorian Government’s Count Us In initiative included a playgroup run in a residential care facility. Residents, staff, parents and children all seemed to benefit from this approach and anecdotal evidence suggested improvement in attitudes towards older people amongst the parents [356].

Intergenerational programs can also expand services and stretch scarce resources by utilising volunteers and sharing sites and/or resources. Timehelp is an Australian school-based intergenerational mentoring
program [360]. Evaluation of this program found that the program contributed positively to the schools. The 2009 dollar value (as deemed by schools) of the 90+ Timehelp volunteers in 31 schools was approximately $324,000, resulting in a return of 360 per cent on investment of $90,000 [360]. COTA NSW runs a Grandfriends Intergenerational Program where older volunteers assist in schools with a variety of learning activities [348]. Feedback from children and volunteers suggest that the volunteers were well accepted by the children and that they enjoyed making a contribution to their education [362].

### 3.7.1 Strategies for intergenerational programs

From the evaluations of these programs a number of key factors for a successful intergenerational program could be drawn. These include:

- using collaborative partnership approaches
- using sustained interventions that allow enough time for relationships between participants to be established
- ensuring the programs involve thorough planning
- providing staff, volunteers and participants with appropriate skills and training needed to foster intergenerational relationships between participants (for example, communication skills training)
- using activities shaped by and for the needs of participants
- creating activities that focus on empowering and developing relationships with participants.

### 3.8 Environments that improve health

As discussed in section 2.9 healthy and productive ageing depends on broad social, cultural, work and economic environments in which people live. Social and cultural strategies to promote healthy ageing are discussed in sections 3.6 and 3.7. Consideration of the built environment is also essential to the achievement of healthy ageing as it has a great impact on mobility, independence, quality of life and autonomy of older adults and can facilitate the healthy living at all ages [363].

Many of the programs targeting environments for health for older people have recently been developed under the framework of Age-Friendly Cities or Age-Friendly Communities. These programs vary from small, local projects funded by regional groups to major national programs coordinated by national committees under the direction of federal governments. WHO have established the WHO Global Network of Age-friendly Cities in which cities who join are required to commence a cycle of four stages: planning (year 1–2); implementation (year 3–5); progress evaluation (end of year 5) and continual improvement [144]. Given the early nature of much of this work, and its community development approach, there is little evaluation literature available at this time. However a number of promising projects are listed from the Age-Friendly Cities or Age-Friendly Communities initiatives, including the Age-Friendly Restaurant Guide in Ireland [364], and TAFCity work being undertaken in the European Union [365]. The Age-Friendly Restaurant Guide is aiming to develop a directory of age-friendly restaurants that provide a discount to older people. The strategies involved include: cross sector involvement of business, tourism and older people; business training; checklist of age-friendly features; endorsement program; links with older people through training and support; and promotion and marketing. No evaluation has been conducted on this program to date. The TAFCity initiative involves developing a training program for tourism and service sectors to work with older people on age friendly cities and ensure their support and integration into communities [365]. An evaluation is currently being undertaken on the TAFCity with funding from the Leonardo da Vinci program and no findings have been release to date.

The Active Communities Initiative (ACE) in the USA was developed by the Centers for Disease Control and Prevention to promote policy and environmental interventions that create more accessible places for physical activity [366]. The initiative promotes walking, bike riding and the development of accessible recreation facilities. An evaluation of this program found that land use and transportation planning may play a role in supporting active community environments [367]. Characteristics of communities such as proximity of facilities, street design, density of housing, availability of public transport and pedestrian and bicycle facilities were found to play a significant role in promoting or discouraging physical activity. The
evaluation of this program did not state any specific outcomes for older adults however this approach of using land-use and transportation plans incorporated into public policy could be used to support active community environments in Australia [367]. No further evaluations have been conducted on the impact of the ACE initiative on the community. The Slí na Sláinte/Paths to Health initiative developed by the Irish Health Foundation is another physical environment initiative that aims to encourage people of all ages to walk for leisure and good health [368]. The initiative uses attractive, bright signage at regular intervals on established walking routes to help walkers identify the distance they walk. Walking leader training is available for individuals wishing to set up walking groups in their community or workplace. The initiative has been implemented in over 10 countries however no systematic evaluation of its effectiveness in any age groups has been performed and therefore its effectiveness on increasing activity in older adults is unknown.

In terms of improving physical environments for older people in health services, an audit tool was developed as part of an initiative of the Department of Human Services’ Continuing Care and Clinical Service Development Section to support the implementation of the Improving care for older people: a policy for Health Services 2003 [369]. The audit tool enables Health Services to perform environmental audits and develop action plans for improving the physical environment for older adults accessing services [369]. The audit tool was pilot tested and subsequently modified according to staff feedback. The strategy of empowering staff to identify and make changes is an innovative and sustainable strategy, however, no evaluation has been conducted on the audit tools’ use and outcomes for older adults, therefore, the effectiveness of this approach is unknown at this point.

Workforce capacity and development are important aspects of promoting healthy ageing. A search conducted for aged care and workforce development initiatives and education did not reveal any evidence of programs that have helped aged care workers perform better and thus result in better outcomes for older adults. A recent review also highlighted that the literature of education and training in residential aged care/care homes is sparse, fragmented and made up of small-scale studies with qualitative methodology [370]. The paucity of work is this area highlights the need and potential for future work to be developed. One organisation doing some developmental working in this area is My Home Life from the UK [371]. My Home Life is a collaborative partnership aiming at improving the quality of life for those involved in care homes for older adults. My Home Life uses an innovative community development approach working directly with local authority and care home managers to identify areas they would like to improve. This relationship-centred approach is achieved through leadership programs run over a 12-month period, which brings people together to address shared challenges and work together to achieve change [371]. This approach has the potential to build staff skills and knowledge, empowering them to make changes and also achieve long-term sustainable changes. No evaluation has been conducted on this program to date and therefore the real-life effectiveness is currently unknown.

3.8.1 Strategies for environments that improve health

Further evaluation is required on the programs listed above before effective strategies can be drawn out.

3.9 Programs that target multiple areas

The current review identified a number of programs that target more than one determinant of healthy ageing. The COTA peer-led programs target various areas, such as depression and medication management [362]. Peer education can be an effective health promotion strategy as peer educators are often seen as more credible than experts. These programs also offer the opportunity for older people to become peer educators and therefore learn new skills, develop confidence and contribute to society. However, little formal evaluation of these programs has been conducted.

A number of programs target both physical activity and nutrition. This included the Victorian Well for Life Program, an action research program that enables aged care providers in residential and community care to identify areas that they would like to promote with their client group and provides tip sheets and education programs to assist in improving nutrition, physical activity and, most recently, emotional
wellbeing. An evaluation of an earlier roll-out of this program found it to be effective in developing workforce capacity and partnerships, but did not evaluate outcomes for older people [217]. A further evaluation, including the emotional wellbeing component, included outcomes for clients but was not able to detect significant change in emotional wellbeing outcomes, due to issues of timing and data collection [218]. However, clients of the programs generally scored high on the emotional wellbeing surveys, suggesting a high level of emotional wellbeing among clients of these programs. There was also a high level (90 per cent) of clients who expressed being very satisfied about being treated with respect by staff and workers. The physical activity measures indicated maintenance or minor improvements for clients post their involvement in the program and approximately two thirds of clients had good nutritional intake according to the food variety checklist both before and after Well for Life program [218].

The Encouraging Best Practice in Residential Aged Care Program involved 13 Commonwealth-funded projects each of which targeted a specific area in residential aged care. Of interest to this review were projects focusing on falls prevention and nutrition and hydration. While these projects have not been extensively rolled out, they gave a useful indication of what can be achieved in residential aged care, using the current evidence base and additional resources [372]. They identified nine principles for practice change, which can be summarised as engagement and involvement of staff, the importance of leadership, and the need for resources to free up staff time to support change. One-on-one and small-group education and having strong advocates for change, who might be drawn from any level within the organisation, were also identified as important. There was limited evidence of changes in health outcomes for residents as these were difficult to measure in the time frame. As these projects were conducted in 2007–2010, the sustainability of any changes made is not yet known.

The HACC Active Service Model (ASM), an approach to community care that aims to maximise the client’s independence, has been implemented across Victoria and an evaluation of eight pilot programs has shown increased client satisfaction, improved client health and wellbeing and cost effectiveness, suggesting that this is an effective healthy ageing strategy [373]. Specific strategies that have been implemented through HACC ASM include an occupational therapy assessment and intervention at the Moreland City Council Independent Living Program; designing and building low maintenance gardens for HACC clients in the Shire of Baw Baw, and a Well for Life implementation in Murrindindi Shire that involved education about nutrition and physical activity in a time-limited weekly program [373]. Another Australian example is the Waist Disposal Challenge conducted in Rotary Clubs in Western Australia [374]. This program combines education, a BMI competition and telephone coaching, focusing on physical activity and nutrition. A pre-post evaluation found significant decreases in BMI and weight loss and other life style changes for those participating in the telephone coaching component. This competitive element of this community-based strategy was particularly appealing to men [375].

The Health Action Theatre by Seniors (HATS) is an innovative, community-based health promotion program in Canada [376]. The program is based on the Action Theatre model and has been used to address issues including problem gambling, substance abuse, home and street safety, abuse and neglect of older persons, nutrition, heart health, and caregiving issues [376]. The HATS process starts with a small group of volunteer actors acting out a short scene (in mime format) to illustrate an issue. For example, in the play called Grandmother's Life, the volunteers perform a play that highlights the isolation and neglect of older persons. After the performance, a narrator encourages discussion and the audience is invited to change the outcome of the scene by either replacing the actors or suggesting ways for the actors to act or react to the other players. Together the role-playing and the discussion form a dynamic and powerful learning experience for both actors and audience. One important feature of the program is its use of mime theatre, which reduces language and literacy barriers and thus enables participants, regardless of their culture, language and literacy level, to benefit from the program. Although the program is not formally evaluated, feedback from audience indicated that the program increased older people’s awareness of complex health and social issues associated with ageing and empowered them to act and deal with those challenges [376]. The element of fun and the informality of participatory theatre enable older people to discuss issues that are otherwise too serious, too private or too shameful to share with others. Another important outcome of this project has been its empowering effect on the senior actors who may have lost their status in society when they immigrated. Through this experience they have
found a new role and importance in their lives, in their community and in society as public educators. This program suggests that the Action Theatre model might be a useful tool in health promotion to reach older people from CALD backgrounds.

The HealthEASE is a health promotion program for older people in America [377]. There are multiple components in this program, including comprehensive health screening, health education, and physical activity program. Some important features of the program were coordination with local health services, the use of volunteers in health promotion activities and the use of peer education in delivering health education. Evaluation of the program indicated that older people benefited from participating in these activities [377]. For example, more than half of surveyed participants said their overall health improved after completing the exercise program and planned to continue with the exercise [377].

The Vital Ageing program is a psychosocial course for promoting optimal ageing [378]. This course covers a range of health areas such as physical exercise, cognition and memory training, stress management, and social skills. One important feature of this program is that it can be delivered in three different formats as a traditional course, a video course, and an E-learning course. An evaluation of the video format of the program indicated that the program produces desired behavioural changes in older people and these changes occur both in the group living in the community and in those living in public residences [378].

3.9.1 Strategies for programs that target multiple areas

The main strategy in the above programs was using multi-faceted approaches that aimed to enhance the health and wellbeing of older people through targeting more than one determinant of healthy ageing. Other key strategies drawn from the evaluations of the programs included:

- developing workforce capacity and partnerships through engaging and empowering staff to identify and make changes in their workplace
- having an evidence-base to the development of the programs
- using collaborative partnership approaches
- using interactive communication strategies which aim to reduce language and literacy barriers
- utilising multiple delivery formats which target individuals needs and abilities
- using volunteers and peer educators to run the programs
- empowering and engaging older adults in behaviour change.
4. Gaps and issues

This review has identified programs and strategies that target healthy ageing across a range of domains and in a range of settings. Many of the programs identified in this review were conducted in a community setting. There appear to be fewer healthy ageing programs designed for people who are already frail or in residential care.

Although the level of evidence for factors that influence healthy ageing is high (refer section 2), this review has highlighted a lack of strong evidence for strategies to enable or enhance healthy ageing (refer table 4). Of the over 100 programs identified and evaluated in this review, only seventeen were classified as having strong or sufficient evidence of effectiveness. Of these seventeen programs, fourteen were physical activity or falls prevention programs, two were self-management programs and one was an intergenerational program. The majority of programs identified in this review were classified as having some, weak or inconclusive evidence of effectiveness often with poorly designed methodology and no randomisation or well-matched intervention and comparison groups. Another issue was that many of the healthy ageing interventions were pilot projects or programs that were not of a sufficient duration for their effectiveness to be shown. This was mostly related to funding only being available for a short period of time. Previous reviews of the literature also noted a lack of good quality, comprehensive evaluations of healthy ageing and health promotion projects developed specifically for older people. This review highlights the need for high quality evaluations of healthy ageing strategies and programs that focus on outcomes for older people. Such evaluations would enable better understanding of the strategies and actions needed to support the diversity of older people’s needs for healthy ageing interventions and the factors that support or prevent healthy ageing.

Similarly, although there are some developmental and innovative healthy ageing programs, there is currently little evidence of their effectiveness. As mentioned in section 3 various health organisations in Australia have funded programs focusing on promoting healthy ageing. However, the information made publicly available regarding the evaluation of these programs is limited, and fails to provide advice on implementation and outcomes. There is an opportunity for Government and health organisations to work together in Australia to share and disseminate knowledge so that the current evidence base for healthy ageing can be expanded and shared. There is also an opportunity for evaluation to occur on existing programs that are currently running in settings where older people live. This review identified various programs targeting older adults that are currently being implemented but appear to have had no formal evaluation (refer table 3).

This review also highlighted that many effective healthy ageing initiatives occur in community settings. Such programs require extensive community development, mobilisation, involvement and collaboration for sustainability to be achieved. There has been little documentation of the translation of research programs into the wider community. The Lift for Life program identified in this review is an example of research translation to the Australian community setting. The evaluation of this process emphasised the need for extensive collaboration between the scientists who developed the program and the practitioners who have experience in delivering community-based programs. The Lift for Life program has been under development for seven years, which again underlines the considerable time needed to establish and foster the collaborative links and partnerships for successful translation of programs into community settings. In the USA the National Council on Aging’s Center for Healthy Aging provides various resources to help service providers and community-based organisations develop and implement evidence-based programs that promote healthy lives for older adults. Briefly, their components of evidence-based health promotion include: identifying important health issues and the population at risk; identifying effective interventions; establishing broad-based partnerships; selecting an intervention; translating the intervention into a program; evaluating the program; and sustaining the program. By following this process the Center for Healthy Ageing has helped community organisations successfully implement various evidence-based chronic disease, falls prevention, physical activity and behavioural health programs with diverse populations in the USA. This model has potential for adoption in Australia.

The next section provides a summary of the common features of strategies used to enable healthy ageing which have been drawn out from this review.
5. Summary and key points

This review provides an overview of the research evidence for various determinants of healthy ageing. It highlights various approaches, programs and strategies that target healthy ageing across a range of domains and settings. This review does not claim to be a comprehensive review but rather aims to provide an overview of the existing evidence base.

As stated previously the majority of the programs identified in this review were classified as having some, weak or inconclusive evidence of effectiveness. Without high-quality evaluations of the implementation of programs and the subsequent outcomes for older people, it is difficult to make clear recommendations about or for optimal strategies and programs to promote healthy ageing. However, common features of strategies used to enable healthy ageing can be drawn out from programs identified in this review.

As WHO’s Active Ageing Framework states the determinants of healthy ageing are inter-related and do not always act as discrete domains. A holistic approach to healthy ageing and the need to recognise and address multi-dimensional notions of health and wellbeing were strategies that were identified following a review of the programs. The review showed that healthy ageing programs that targeted multiple domains (for example, social participation, physical activity, healthy eating and making a contribution) were effective in enabling healthy ageing. Examples of this included: the Victorian Well for Life program; COTA’s peer-education programs; HACC Active Service Model; Encouraging Best Practice in Residential Aged Care program; Best Care for Older People Everywhere—The toolkit; Wellness Guide for Older Carers Successful Ageing; MOVE!; and the Waist Disposal Challenge.

Empowerment of individuals and communities was another healthy ageing strategy shown to have some effectiveness in this review. Empowering individuals or communities is an important healthy ageing strategy as it allows the older person/community to realise their needs, present their concerns, devise strategies for involvement in decision-making and take action to meet those needs [379]. Examples of programs that involved empowerment included: the Encouraging Best Practice in Residential Aged Care program; peer education programs; Health Action Theatre by Seniors; Healthy Moves for Ageing Well; falls prevention programs (for example, the Extra Time—Standing Tall strategy, Steady as You Go, A Matter of Balance); Seniors Farmers Market Nutrition Program; Evergreen Action Nutrition; CDSM programs; Active Communities Initiative; Improving the Environment for Older People in Health Services: Audit Tool and the intergenerational programs.

Following on from empowerment the promotion of self-efficacy and behaviour modification were also key strategies found in this review. Various cognitive-behavioural, behavioural and theoretical methods (for example, goal setting, motivational counselling, education, stages of change model) were shown to increase older-adults self-efficacy and skills and knowledge needed to make behavioural changes. Programs identified in this review that utilised this approach included: Active Choices; Active Living Every Day; Fit and Strong; CHAMPS; Healthy Moves for Ageing Well; Get Fit for Active Living; Steady as You Go; Stay on Your Feet; Nutrition for One or Two; Eat Better Move More; Evergreen Action Nutrition; and the self-management and management of health programs.

Multi-factorial and multi-disciplinary programs that used a combination of strategies to target healthy ageing were more effective than singular approaches (for example, using awareness-raising campaigns or education programs as stand-alone interventions). Examples of this were the falls prevention and physical activity programs that combined various strategies (awareness-raising, community education, policy development, engaging health professionals, and interventions directly targeting individuals) and the self-management and management of health programs which utilised a multi-disciplinary approach to achieve healthy ageing outcomes. In addition this review showed that group-based programs often had the added benefit of promoting social engagement even when this was not the primary aim of the program.

This review also highlighted the need for programs to have a theoretical base that aims to address the known protective and risk factors in healthy ageing. It is suggested that an evidence-based approach should be used to underpin the aims, objectives and goals of any healthy ageing program and to guide its development and implementation. Programs identified in this review which have utilised this approach
included the: Encouraging Best Practice in Residential Aged Care program; Living Longer Living Stronger; Active Choices; Active Living Every Day; Fit and Strong; Home Support Exercise Program; Osteofit; Greater Glasgow and Clyde Community Falls Prevention Programme Otago exercise program; SAIL; Eat Better Move More; Healthy Changes program; HARP; Improving the Environment for Older People in Health Services: Audit Tool and the Successful Ageing project.

Other important factors in healthy ageing strategies and programs are cost and accessibility. Both these factors also play a role in the sustainability of the programs. Sustainability of healthy ageing projects is important so that benefits for communities and populations can be maintained beyond the initial stages of program implementation. It is vital that healthy ageing programs build capacity during their implementation in terms of finance, participation and human resources, so that activities can continue beyond the lifetime of the project [379]. Cost-effective programs identified in this review include the: HACC Active Service Model programs; Green Prescription scheme; Home Support Exercise Program; Active Script program; falls prevention programs, for example, Otago exercise programme, SAIL and Stay on Your Feet; LLLS; Elderly Nutrition Project; Senior’s Farmers Market Nutrition Program; Eat Better Move More; Project InSights and the STAYWELL program. Due to the lack of quality evaluations the long-term sustainability of many of these projects remains unknown.

Seventeen programs identified in this review were classified as having sufficient evidence of effectiveness. The promotion of self-efficacy; social engagement; multi-disciplinary approaches including extensive collaboration with education, research and community services; tailoring to individuals needs and abilities; cognitive-behavioural approaches; empowerment of individuals; multi-faceted approaches; and evidence-based development were all common features found in these programs which may have contributed to their success.

The factors identified above are in line with the Victorian Government’s recommendations of using principles of integrated health promotion, which is defined as ‘agencies working in a collaborative manner using a mix of health promotion interventions and capacity building strategies to address priority health and wellbeing issues’ [380]. The core principles of this approach include:

- addressing the broader determinants of health
- basing activities on the best available data and evidence
- acting to reduce social inequities and injustice
- emphasising active consumer and community participation
- empowering individuals and communities
- explicitly considering differences in gender and culture
- working in collaboration.

These principles could be used to guide the planning and delivery of effective, integrated healthy ageing programs and strategies.

In working with older people, there are a number of areas that could be considered or further developed by the Victorian government. These include:

- Working on the gaps/issues identified in section 4 which include: a lack of strong evidence for strategies to enable or enhance healthy ageing; the need for high quality evaluations of healthy ageing strategies and programs that focus on outcomes for older people; evidence/documentation on developmental and innovative healthy ageing programs; and evidence on the translation of research programs into the wider community.
- Monitoring of programs after evaluations have been undertaken (for example, collecting data from older adults who have withdrawn from healthy ageing programs). The findings of such research could be used to inform and develop future programs.
- Further research into what constitutes well-constructed healthy ageing programs to promote further development and evaluation opportunities.
• Implementation of physical activity recommendations; falls prevention and nutrition guidelines for older people in all Victorian Government aged care and health services. For nutrition, this would require additional training for residential and home care workers in the dietary requirements of older people, especially to support good health.
• Promoting healthy ageing strategies with the aged care workforce.
• Food and produce discounts through Seniors Card.
• Considering emerging issues such as sexually transmitted infections in older populations.
• Enhancing behavioural strategies, individual empowerment and social marketing strategies for older people.
• Continuing to implement multi-strategy healthy ageing programs.
• Trialling and evaluating innovative programs identified in this review such as the Aging Game Workshop for people planning to or already working in aged care.
• Investigating further development of intergenerational programs, such as play groups in residential care and older people being involved in kitchen gardens in schools.
• Adoption of other intergenerational strategies in Victoria such as volunteer programs in schools and programs such as the Thinking Village in public housing estates.
• Consolidating health promotion activities and coordinating a more comprehensive assessment of age related conditions.
• Investigating the use of peer education methods or online health promotion.
• Ongoing funding to maintain the quality and ensuring reach of the healthy ageing programs.
• Use of technology to widen the reach and coverage of healthy ageing programs.
• Investigating self-management programs that cover issues specific to older people and use holistic approaches to healthy ageing.
• Investigating health promotion programs on appropriate medications use and misuse, regular medication review and improvement on health literacy regarding medications.
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