



**An Australian Government Initiative**

# **Towards a Dementia Prevention Policy for Australia: Implications of the Current Evidence**

March 2010

**Dr Maree Farrow**





**Contents**

Acknowledgements and Disclaimers..... ii

Executive Summary ..... iii

1 Introduction ..... 1

2 The dementia epidemic ..... 1

3 Can dementia be prevented? ..... 2

    3.1 Vascular risk factors ..... 2

    3.2 Mental activity ..... 3

    3.3 Physical exercise ..... 3

    3.4 Social activity ..... 4

    3.5 Smoking and alcohol ..... 4

    3.6 Diet ..... 4

    3.7 The impact of age and genetics ..... 5

    3.8 Summary..... 5

4 Community awareness of dementia risk reduction ..... 6

5 Translating the evidence into practice ..... 6

6 Modelling the impacts of dementia risk reduction..... 8

7 The role of health professionals and the healthcare system ..... 9

8 Implications for dementia prevention policy ..... 9

9 Conclusions..... 11

References..... 12

## Acknowledgements and Disclaimers

This paper was prepared by Dr Maree Farrow, Research Fellow, Alzheimer's Australia Vic, as part of Alzheimer's Australia Vic's involvement in the Dementia Collaborative Research Centre: Early Diagnosis and Prevention.

The Dementia Collaborative Research Centres are an Australian Government funded initiative established to advance Australian research into dementia and the translation of research into clinical practice. The three Centres each focus on a different area of dementia research:

- Assessment and better care
- Early diagnosis and prevention
- Carers and consumers

© Alzheimer's Australia 2010

Whilst appreciable care has been taken in the preparation of this information paper, Alzheimer's Australia and its member organisations accept no responsibility for any inaccuracies or information that may be perceived as misleading. The information contained in this paper is not to be taken as the giving of medical advice.

Copyright in the product sample templates, Commonwealth logo, photographs and graphic layouts reproduced from the *Dementia Research Graphic Design Standards Manual* is owned by or licensed to the Commonwealth of Australia and published with the permission of the Commonwealth of Australia on the condition reproduction occurs for non-commercial use and promotes or benefits selected Commonwealth approved dementia initiatives and programs. All commercial and other rights are reserved.

**Important notice: this work may not be a Commonwealth publication or product**

The views expressed in this work are the views of its author(s) and not necessarily those of the Commonwealth of Australia. Despite any permitted use of the *Dementia Research Graphic Design Standards Manual* copyright or licensed material, the reader needs to be aware that the information contained in this work is not necessarily endorsed, and its contents may not have been approved or reviewed, by the Australian Government Department of Health and Ageing.

## Executive Summary

Australia's population is ageing and, as old age is the biggest risk factor for dementia, we face a dementia epidemic in the coming decades. By 2050 it is estimated there will be over 1.13 million Australians living with dementia. This will place increasingly significant burdens on our society, healthcare system and economy.

There is consistent research evidence that certain modifiable lifestyle and medical factors are associated the risk of dementia. Older people with better vascular health, who have been more physically, mentally and socially active, whose diet is lower in saturated fats and higher in vegetable and fruit consumption, who don't smoke and who drink alcohol in moderation are significantly less likely on average to develop dementia.

This evidence suggests it should be possible to reduce the growing incidence of dementia, and provides important information to guide us in planning policies and programs to reduce dementia risk factors and enhance protective factors in the population. Preventative health approaches that facilitate lifelong mental, physical and social activity, healthy eating and lifestyles, and good control of vascular risk factors have the potential to reduce future numbers of people developing dementia.

However, Australians have poor knowledge about this evidence and the potential for reducing their risk of dementia. Survey findings suggest there is some awareness of the links between dementia risk and mental stimulation, physical exercise and healthy eating, which could be built upon. Importantly, there is very little awareness of the association with cardiovascular risk factors, highlighting a pressing need to educate the public that preventing or better managing vascular risk factors can reduce their risk of dementia in addition to heart disease and stroke.

There are calls in the scientific and clinical literature to develop and implement dementia prevention policies based on addressing population risk factors. Alzheimer's organisations in Australia and around the world have established public education campaigns to raise awareness about dementia risk reduction. Raising awareness is only one step toward more people adopting risk reduction behaviours, however.

Computer modelling based on population growth estimates and dementia prevalence data shows that significant impacts can be achieved by modifying the risk factor profile in the Australian population. Interventions that achieved small annual improvements in rates of physical inactivity, smoking, hypertension and other dementia risk factors could prevent some cases of dementia and reduce the expected societal and economic costs of the dementia epidemic.

The primary healthcare system and general practitioners have an important role to play in increasing dementia risk reduction behaviour, as most Australians visit their GP at least annually. Health professional education and resources and incentives that facilitate GPs to undertake preventative health activities will be required to achieve lifestyle changes and improved vascular health in their patients.

Australia faces a dementia epidemic that at the moment can only be checked by dementia prevention strategies. A dementia prevention policy is needed so that all Australians see their cognitive health as just as important as their physical health. The evidence suggests this should include increased education for the community and for health professionals, increased preventative health activities in primary healthcare, development of appropriate resources and infrastructure, and an increased focus on the importance of maintaining cognitive health.

## 1 Introduction

Since 2007, the Dementia Collaborative Research Centre: Early Diagnosis and Prevention (DCRC-EDP) and Alzheimer's Australia have been working to establish an evidence base for a preventative health approach to dementia. This work has included:

- Systematic reviews of the literature on the relationship between particular health and lifestyle factors and dementia risk [1,2].
- Reviewing and collating the published literature on dementia risk reduction [3].
- Investigating the general public's knowledge of dementia risk factors and awareness of the potential for dementia risk reduction [4].
- Modelling the impact of modifying risk factor profiles in the population on the expected future rise in dementia prevalence [5].
- Examining existing guidelines, recommendations and programs for dementia risk reduction from around the world.
- Reviews of the literature on barriers and enablers for the take up of dementia risk reduction activities by primary health care practitioners [6,7].

This paper draws together the evidence generated by this work and discusses its implications for establishing a dementia prevention policy for Australia. There is evidence that certain modifiable lifestyle and health factors significantly influence the risk of developing dementia. And there is evidence that preventative health approaches to address these could reduce the future incidence of dementia and its impact on our society. While more research is needed, this paper seeks to outline what the current evidence suggests should be considered for Australia to address the dementia epidemic through preventative health strategies.

## 2 The dementia epidemic

Access Economics was commissioned by Alzheimer's Australia to provide up-to-date estimates and projections of the prevalence of dementia in Australia over the period 2009 to 2050. The prevalence of dementia is projected to increase over four-fold from 257,000 people in 2010 to around 1.13 million people by 2050 [8]. There is also evidence to suggest that there are many more people with some degree of cognitive impairment.

This year, 2010, the first of the baby boomer generation turn 65. By 2020 there will be around 75,000 Australian baby boomers with dementia. This generation is likely to be more demanding about the help they expect from the health care system. With a higher retirement age of 67, it will also be the case that more people will be unable to remain in the workforce due to having dementia, or due to the need to care for someone with dementia, and productivity losses due to dementia will grow [8].

The total cost of dementia care in Australia in 2002 was estimated to be \$6.6 billion and by 2050 dementia costs are expected to exceed 3% of GDP [9]. The baby boomer bulge in Australia's population means that we are at the beginning of an acceleration of dementia prevalence greater than previously seen. This will have huge impacts on our health care system, our economy and our quality of life.

The dementia epidemic surely makes implementation of strategies to encourage dementia prevention a national priority. Policy makers at all levels of public and private governance cannot ignore the huge impacts that dementia will increasingly have on Australian society.

### 3 Can dementia be prevented?

It would be a major benefit to society if we could prevent some cases of dementia by reducing risk factors in the population. But is this possible? We now know quite a lot about the lifestyle and health factors that affect dementia risk. These overlap considerably with risk factors for other chronic illnesses, particularly cardiovascular disease, where there is good evidence that addressing the risk factors reduces the incidence of disease. Preventative health strategies aimed at addressing dementia risk factors have the potential to reduce risk and delay onset of dementia for individuals, and reduce the incidence of dementia in the population.

There is growing consistent evidence from longitudinal studies that certain factors are associated with increased or decreased risk of dementia. For example, people who exercise their brain more with mentally stimulating activity have been demonstrated to be about half as likely to develop dementia, on average, compared to those who have undertaken less mental activity [10]. The research shows a reduced risk for those with higher education levels compared to lower, those with a history of more mentally demanding occupations compared to less demanding, and those participating in more cognitively stimulating leisure activities compared to those participating in fewer such activities.

Conversely, people with a history of untreated hypertension in midlife have been demonstrated to be around twice as likely to develop dementia, on average, compared to those with normal blood pressure and those who have their high blood pressure effectively treated [11,12]. So, if we could get more people engaging in mentally challenging activities, and effectively treat more people with high blood pressure, a common condition in the population, it is very likely that fewer people would develop dementia in the future.

In fact, for hypertension, there is some clinical trial evidence that treatment of older hypertensive adults does result in fewer numbers developing dementia [13]. Not all of the few trials conducted to date have shown an effect, but because it is midlife hypertension that seems to have the strongest influence on late-life dementia risk, short duration clinical trials involving older adults may not provide the full picture.

For many dementia risk factors, such clinical trials may not be practical. For example, we have not conducted studies where the amount of mental activity people do over their lives is deliberately and specifically manipulated, then we follow them up for 30 or 40 years to see who develops dementia. Such studies would be impractical and unethical because participating in stimulating education, work and social activities have vital social benefits beyond their effect on dementia risk.

The evidence we do have from epidemiological studies suggests it should be possible to reduce the growing incidence of dementia, and provides important information to guide us in planning policies and programs to reduce dementia risk factors and enhance protective factors in the population. What we know about these risk and protective factors is briefly summarised below. The evidence is discussed in more detail in Alzheimer's Australia's Paper 13 *Dementia Risk Reduction: The Evidence* [3].

#### 3.1 Vascular risk factors

Vascular risk factors measured in middle age are consistently shown to be associated with an increased risk of later developing dementia. High blood pressure, high cholesterol, diabetes and obesity in midlife are all associated with increased dementia risk. These factors affect the risk for Alzheimer's disease as well as vascular dementia. These are all treatable and/or modifiable and addressing the prevalence of these

conditions in the community is increasingly seen as important in fighting dementia as well as heart disease.

High blood pressure in mid to late life is associated with an increased risk of developing dementia. Studies have demonstrated that long-term treatment with anti-hypertensive drugs reduces this risk [11,12].

High cholesterol during midlife is a risk factor for dementia, especially Alzheimer's disease [1]. Several studies have found that treatment with statins (drugs that lower cholesterol) is associated with reduced dementia risk, but this evidence is not yet conclusive [13].

Diabetes is a risk factor for dementia, particularly type 2 diabetes, and other insulin disorders have also been associated with increased risk [14]. Treatment with anti-diabetic medications and insulin has been shown to reduce the risk of cognitive impairment in some studies [14]. There is no evidence yet that treating diabetes reduces dementia risk, but it seems likely that good control will have benefits.

Obesity in midlife is also associated with increased risk of dementia [15]. There is no evidence yet that modifying body weight can reduce dementia risk, but it seems likely that treating obesity will have benefits.

High blood pressure, high cholesterol, diabetes and obesity are already the focus of preventative health recommendations and initiatives. Reducing the risk of dementia provides additional motivation for individuals and the health care system to effectively address vascular risk factors.

### **3.2 Mental activity**

Many studies have investigated the link between how much people challenge their brain and their risk of developing dementia. These studies consistently find that a lower risk of developing dementia is associated with higher levels of education, more mentally demanding occupations and participating in more intellectually stimulating leisure activities [10].

Regular complex mental activity is believed to result in greater "brain reserve", which may have both physical and behavioural components. Mental activity stimulates the growth of neurons and connections between them. So people who are more mentally active have increased brain volume (more cells) and increased synapses (connections between brain cells). This gives the brain greater physical capacity to overcome injury, as there are more neurons and networks available to take over the role of damaged ones. Complex mental activity also provides a behavioural or cognitive reserve. A brain that is used to being challenged will have greater capacity to use flexible cognitive strategies to overcome difficulties that arise due to brain damage [10,16].

Encouraging young people to remain in education and older people to remain mentally active should become important preventative health strategies.

### **3.3 Physical exercise**

Research consistently finds that regular physical exercise in mid and late life is associated with lower risk of cognitive decline and dementia. Physical activity increases blood flow and oxygen supply to the brain, promotes brain cell growth and survival and contributes to brain reserve [17].

It is not yet known which type of activity, frequency of activity or amount of activity is required for dementia risk reduction, but the available evidence suggests that even

moderate activity like walking is beneficial. Some evidence indicates that aerobic activity of at least 30 minutes duration may be the most beneficial for good brain function, but further research is needed [17].

Promotion of the benefits of regular physical exercise should incorporate dementia risk reduction along with physical, heart and mental health.

### 3.4 Social activity

Several measures of social engagement have been shown to be associated with a lower risk of dementia, including participating in more social activities, having larger social networks and not feeling lonely [3]. Social interaction, through being mentally stimulating, is thought to contribute to brain reserve.

Research suggests that being involved in leisure activities that combine mental, physical and social aspects provides even greater benefits than being involved in activities that cover only one aspect [18].

Social engagement has been shown to have benefits for mental health and reducing risk of heart disease in addition to reducing risk of dementia, and should be addressed in preventative health programs.

### 3.5 Smoking and alcohol

Two recent literature reviews found that current smokers have a higher risk of developing dementia than former smokers or those who have never smoked [19,20]. Smoking is being addressed by the National Preventative Health Taskforce, and dementia risk reduction can provide additional motivation for individuals to quit and for the expansion of quit smoking programs.

Moderate alcohol intake is associated with a reduced risk of dementia compared to those who do not drink alcohol [2,21]. However, heavy alcohol intake is associated with an increased risk of dementia. The National Health and Medical Research Council's *Australian Guidelines to Reduce Health Risks from Drinking Alcohol* [22] recommend that healthy men and women drink no more than two standard drinks on any day to reduce the lifetime risk of harm. The dementia risk reduction evidence and message is consistent with this.

### 3.6 Diet

The effect of diet on brain health and cognitive function is not yet fully understood but is the subject of much research. Particular nutrients may influence cognition by acting on molecular or cellular systems important for maintaining cognitive function. This raises the possibility that dietary manipulations might be used to enhance cognitive abilities and protect the brain from damage or promote repair [23].

Many studies have investigated the link between aspects of diet and the risk of developing dementia. Research to date suggests that higher intakes of saturated fats and trans fats are associated with increased risk of dementia, while higher intakes of monounsaturated and polyunsaturated fats are associated with lower risk of dementia [24].

One of the factors thought to contribute to damaging or killing brain cells in dementia is oxidative stress, and antioxidants may combat this. Some studies have shown associations between higher intakes of some antioxidants and reduced dementia risk. More research is needed to clarify the protective effects of antioxidants against cognitive decline and dementia [13].

Deficiencies of folate (folic acid, vitamin B9) or vitamin B12 can result in cognitive impairment, and some studies have suggested a link between low intakes of these vitamins and increased dementia risk, but other studies have failed to replicate this. Deficiencies of folate, vitamin B6 or vitamin B12 can result in elevated homocysteine (an amino acid), which is also associated with an increased risk of dementia [3,13].

Studies of the Mediterranean diet, which includes plenty of fruits, vegetables and legumes and low levels of saturated fat, have found that higher adherence to this diet is associated with reduced risk of dementia [25]. Diet as a whole may be more important than any one nutrient or food [13,24].

The Australian Dietary Guidelines [26] recommend limiting saturated fat intake and eating plenty of vegetables and fruit. This is consistent with a diet that is likely to be beneficial for dementia risk reduction.

### **3.7 The impact of age and genetics**

The biggest risk factor for developing dementia is old age. The risk of dementia rises exponentially with age. Dementia affects around 1.5% of people aged 65-69, and around 23% of people aged 85-89 [8].

Age is a risk factor that cannot be modified and has been referred to as “the elephant in the room” [27]. Because the modifiable risk factors for dementia overlap with those of heart disease and other chronic illnesses, perhaps the assumed prevention of dementia through addressing lifestyle risk factors would be attenuated by increased survival of the population to older ages [27]. However, if addressing modifiable risk factors reduced the number of people developing dementia at all ages, there would be less people living with the illness even though they lived longer.

The genetics of dementia is not fully understood, but genes are another non-modifiable risk factor. Only a small proportion of dementia cases are thought to be directly inherited and caused by identified gene mutations. The majority of dementia cases are likely to result from a combination of genetic and environmental influences. Clearly, more research is needed to clarify the interactions between age, genes and other risk factors for dementia.

### **3.8 Summary**

Despite the important impact of age on the risk of developing dementia, research clearly indicates there are factors that protect older people from developing the illness. Older people with better vascular health, who have been more physically, mentally and socially active, whose diet is lower in saturated fats and higher in vegetable and fruit consumption, who don't smoke and who drink alcohol in moderation are significantly less likely on average to develop dementia.

The modifiable lifestyle and medical risk factors for dementia are often conceptualised as delaying factors that postpone the onset of dementia [28]. A brain healthy lifestyle can build brain reserve, so that cognitive function remains intact for longer in the face of Alzheimer's disease or other causes of dementia. Most of us wish to live as healthily as possible for as long as possible, and delaying the onset of dementia would help people to do so.

Dementia cannot be definitely prevented, but there is very good evidence that the risk can be reduced or the onset delayed. There is therefore an opportunity to develop and implement strategies to reduce dementia risk among Australians and reduce the number of older people affected by the condition.

## 4 Community awareness of dementia risk reduction

There is general consensus in the literature that public health interventions to modify risk factors have the potential to reduce dementia incidence by reducing risk or delaying onset. To design and implement effective interventions, an understanding of the public's awareness of and attitudes to dementia risk reduction is required. Alzheimer's Australia and the DCRC-EDP reviewed surveys of the general public that included questions related to dementia risk reduction to assess the public's knowledge of the current evidence.

On average, 51% of Australians believed risk reduction is possible, while 20% believed nothing can be done to reduce dementia risk and 28% were unsure [4]. When asked how risk could be reduced, or when presented with factors and asked which would reduce risk, mental activity was nominated by more people than any other strategy, followed by a healthy diet and physical exercise. Most people agreed that social activity and low alcohol consumption could reduce risk when prompted, but very few mentioned these unprompted. On average, the majority of people did not agree that reducing vascular risk factors (smoking, high blood pressure and high cholesterol) could reduce dementia risk [4].

Consistent with Australian findings, almost 1 in 5 North Americans said that nothing can be done to reduce risk and only around 1 in 3 people surveyed in the UK agreed that lifestyle affects dementia risk [4].

Survey findings also revealed that few people are currently taking steps to reduce their dementia risk and many lack motivation to do so [4].

These findings suggest there is poor general knowledge of the current evidence for dementia risk reduction. There is some awareness of the links with mental stimulation and physical health, which could be built upon. Importantly, there is very little awareness of the association with cardiovascular risk factors, highlighting a pressing need to educate the public that preventing or better managing vascular risk factors can also reduce their risk of dementia.

The Australian community is becoming more aware of the importance of preventative health strategies for maintaining physical wellbeing. There is a need to make people aware of the importance of also maintaining their cognitive health into old age. Raising awareness about dementia risk factors and the means by which people can reduce their risk should be part of Australia's preventative health strategy.

## 5 Translating the evidence into practice

Many experts have reviewed the literature that provides evidence for dementia risk reduction and concluded that preventative health interventions can indeed reduce the incidence of dementia and recommend that health promotion strategies for reducing risk should be implemented now [3,24,29,30,31].

Reviewers have recommended that health professionals educate their patients about modifiable risk factors and preventative strategies [24]. Others have emphasised the need to address the current and projected impact of dementia by investing in dementia research and prevention, and raising awareness of dementia risk reduction strategies [8]. Many have also stressed that the potential contributions to quality of life and savings in the costs of health care and other services would be considerable [32,33].

Public education about potentially modifiable risk factors is seen as important [29,30,34]. Consumer organisations around the world are promoting risk reduction strategies based on the evidence of associations between modifiable lifestyle factors and risk of dementia.

In Australia, Alzheimer's Australia's *Mind your Mind* program aims to educate the general community that mental, physical and social activity, healthy diet and habits, regular health checks and control of vascular risk factors, and avoiding head injury may help to reduce the risk of developing dementia. (See [www.mindyourmind.org.au](http://www.mindyourmind.org.au) )

Alzheimer Scotland's dementia risk reduction education program, *Good for You, Good for Your Brain*, concentrates on the benefits of healthy eating, physical activity, mental activity and social activity. It also recommends having regular health checks for vascular risks, maintaining a healthy weight, not smoking and drinking alcohol moderately. (See [www.goodforyourbrain.org](http://www.goodforyourbrain.org) )

The Alzheimer's Society of the UK's dementia risk reduction education program is called *Be Head Strong*. Their program concentrates on the same four factors as Alzheimer Scotland's, i.e. healthy eating, physical activity, mental activity and social activity. It also recommends not smoking, drinking in moderation and regularly checking blood pressure and cholesterol. (See [www.alzheimers.org.uk](http://www.alzheimers.org.uk) )

The Canadian Alzheimer Society provides information on brain health and reducing the risk of dementia. The messages include challenging the brain, being socially active, eating healthily, being physically active, reducing stress, avoiding smoking and excessive alcohol, managing vascular risk factors and protecting against head injury. (See [www.alzheimer.ca](http://www.alzheimer.ca) )

The US Alzheimer's Association's dementia risk reduction education program is called *Maintain your Brain* and recommends that people stay mentally, socially and physically active, adopt a brain healthy diet, and be heart smart to reduce their risk of dementia. (See [www.alz.org](http://www.alz.org) )

In 2005, the US Congress established a partnership between the Centers for Disease Control and Prevention (CDC) and the Alzheimer's Association to educate the public about cognitive health. In 2007, the initiative released a National Public Health Road Map to Maintaining Cognitive Health [32]. The Road Map "represents both a call to action and a guide for implementing an effective coordinated approach to moving cognitive health into public health practice" [32, p.2]. The authors call for continuing and expanding research, educating people about the evidence for risk and protective factors for cognitive health, developing resources and plans of action, establishing systems to evaluate progress, and initiating policy change at federal, state and local levels.

The US Alzheimer's Association and CDC are also conducting a 5-year community intervention designed to affect knowledge and attitudes among African American baby boomers related to physical activity and vascular risk factors, and other general health behaviors such as diet, social activity and mental activity. The project involves assessing needs and obstacles for the target population, eliciting community input and participation, and developing a comprehensive community intervention with evaluation.

The evidence that dementia risk can be reduced by addressing modifiable risk factors is starting to be translated into practice around the world. A preventative health approach to dementia is an important aspect of strategies to stem the dementia epidemic, which will affect communities worldwide. Australia would benefit significantly from developing a national approach to dementia prevention that fits within our healthcare system and includes education, resource development and targeted interventions.

## 6 Modelling the impacts of dementia risk reduction

In 2004, Access Economics modelled the impact of delaying onset of Alzheimer's disease on the number of cases predicted for the coming decades and the economic cost of dementia care [35]. They found that if new cases of AD each year could be reduced by 50% from 2005, equivalent to delaying the onset of AD by around 5 years, there would be 48.7% fewer cases of AD in 2050. Even delaying the onset by 10 months would result in 9.5% fewer cases in 2050.

If the incidence of AD was reduced by 50% from 2005, then Australia would save an estimated \$105 billion by 2050 [35]. Over half of these savings (an estimated 57%) would be in the health and residential care sector.

Access Economics also concluded that these estimates may be conservative, given limitations of the data used, and that savings from early delays could potentially be up to 50% higher [35].

Reducing the incidence of AD by 50% sounds like a lot, but in fact many of the protective factors such as mental activity and treating hypertension are associated with risk ratios of around 0.5. So addressing several risk factors could indeed have a cumulative effect and reduce dementia incidence by a significant proportion over time.

More recently, Access Economics modelled the impact of changing the prevalence of specific risk factors on future numbers of people with dementia [8]. Physical inactivity is unfortunately on the rise in the Australian population. If, however, physical inactivity rates could be reduced from 70% to 50% from 2009 to 2050 there would be an estimated 5.7% fewer cases of dementia. Treatment of hypertension is thankfully increasing. But if the current improvements in hypertension could not be maintained, there would be an estimated increase in the prevalence of dementia of 5.6% in 2050.

These projections were made on the basis of changing one risk factor individually. Access Economics concluded that "it is expected that a much larger cumulative reduction would take place if more than one risk factor were reduced at the same time" [8, p.iii].

Nepal and colleagues also recently modelled the impact on future dementia prevalence of modifying specific risk factors [5]. They found that a reduction in the proportion of smokers by 5% every 5 years would lower the number of people with dementia by 2% in 2051. If the rate of obesity was reduced by 5% every 5 years, dementia prevalence would be lower by 6% in 2051. A decline in the physical inactivity rate by 5% every 5 years would reduce dementia prevalence by 11% in 2051. Persistence of the growing trends in obesity and physical inactivity would conversely result in a larger than expected dementia epidemic [5].

The recent modelling by Nepal et al and Access Economics highlights the significant impact that can be made by interventions to reduce individual risk factors by even modest amounts. Nepal et al concluded that improving risk behaviours has the potential to produce a substantial reduction in the number of people with dementia [5].

## **7 The role of health professionals and the healthcare system**

There is considerable potential for preventing or delaying the onset of dementia by identifying and addressing risk factors. Around 85% of Australians visit their general practitioner (GP) at least annually, making GPs ideally placed to play an important role in preventative health approaches to reducing dementia risk.

Travers and colleagues reviewed the literature on barriers and enablers to GPs integrating dementia risk reduction strategies into everyday practice [6,7]. They concluded that there is evidence that brief interventions by GPs, including medication prescription, advice, education and counselling, are effective in changing patients' behaviour. They identified several barriers to GPs changing established behaviour, including knowledge of and attitudes to evidence based guidelines, inadequate remuneration for complex activities, and time constraints. Enablers to GPs changing their practices include provision of education, feedback and reminders, easily accessible information, and financial incentives.

Education of health professionals about dementia risk reduction strategies must accompany education of the general public. People are most likely to go to their GP for advice and assistance in identifying and modifying their own risk factors. GPs therefore need appropriate education and resources to enable them to respond to this and meet the needs of their patients.

Travers et al recommend that dementia risk reduction strategies should be incorporated into existing primary care practices and initiatives [6,7]. With common risk factors, dementia sits well with preventative health approaches to cardiovascular and other chronic diseases. They also recommend that resources should be readily available and widely disseminated, adequate remuneration should be given, practice nurses could be involved, and involvement of the Australian General Practice Network is important.

There are various issues to address to increase the take up by GPs of preventative health activities. Australia has commenced work in this area through the National Preventative Health Taskforce, and dementia prevention needs to be included as this work progresses. The cost savings to the healthcare system of increasing preventative health activities would be substantial, in addition to the benefits to society of reducing the incidence of dementia and other chronic diseases.

## **8 Implications for dementia prevention policy**

Australia faces a rapid increase in the number of people with dementia and in the social and economic costs of caring for those people. While there is hope for a medical breakthrough and ultimately a cure for dementia, can we afford to wait for this? Without a cure, identifying and addressing risk factors in the population remains the most viable strategy for preventing cases of dementia and reducing the associated costs to the economy and to society.

The evidence for strong associations between dementia risk and several modifiable medical and lifestyle factors is well established. Absolute proof that modifying these can prevent dementia does not yet exist, but once again, can Australia afford to wait for this before acting? More research is most certainly needed, but many experts suggest we can do much to reduce dementia incidence by implementing preventative health strategies now based on current evidence. Community dementia organisations are running dementia risk reduction education programs and the US Alzheimer's Association has commenced a community intervention program.

Modelling studies provide information about the savings that could be made by a preventative approach to dementia. They show that even modest changes in risk factor profiles could substantially reduce the future numbers of people with dementia as well as the associated economic costs.

Preventative health is becoming a major focus of health policy makers. Similar evidence as presented here for dementia exists for the savings, in terms of numbers of people affected and dollars, that are achievable by preventative approaches to other chronic diseases. Maintaining cognitive health to date has received little attention with the focus very much on physical health. But people are concerned about losing cognitive function as they age, and surveys suggest that more than one in three people fear developing dementia more than cancer or heart disease [36,37].

The *National Preventative Health Strategy* recommends a range of interventions aimed at reducing the chronic disease burden associated with three lifestyle risk factors – obesity, tobacco and alcohol [38]. As the risk factors for dementia overlap significantly with those of other chronic diseases, a national preventative health focus targeting physical activity, healthy eating, smoking cessation and limiting alcohol abuse is very welcomed by Alzheimer's Australia. Dementia needs to be included as one of the chronic diseases that this approach can address. The potential for maintaining cognitive as well as physical health can provide additional motivation for people to heed preventative health messages.

A dementia prevention policy need not sit alone and can be integrated in policies and strategies for general preventative health. This policy needs to engage all sections of the community to achieve the desired outcomes – governments and health policy makers at national, state and local levels; not-for-profit and commercial health providers; health insurers; health professionals; workplaces and individuals.

A dementia prevention policy is needed for Australia. Current evidence and recommendations suggest that it should include:

- **Education for the general community**, as we know that current awareness of the risk factors and the potential for dementia risk reduction are low. Alzheimer's Australia is working to educate the Australian community through its Mind your Mind program, but this needs to be substantially expanded to achieve national community awareness.
- Education that vascular risk factors contribute to the development of dementia and the importance of treating them effectively to promote heart and brain health.
- **Education for primary health care providers**, as they are best placed to treat medical risk factors and help patients address lifestyle risk factors. Alzheimer's Australia has developed a practical dementia risk reduction guide for GPs, online information for health professionals and a dementia risk reduction module for online education of GPs and practice nurses.
- **Integration of preventative health practice** into existing primary health care systems and processes, and addressing enablers to assist practitioners to increase their preventative health activities.
- **An increased research effort** to clarify the best activities, behaviours, foods, treatments, etc to protect against dementia.
- **Public health programs that provide the resources required** for people to change their behaviour and to evaluate the outcomes.
- **Assessment and implementation of the infrastructure required** to support dementia prevention programs.

- **Public health programs that reach at risk people** in the community, including Indigenous Australians, those socioeconomically disadvantaged and those from CALD backgrounds.
- **Flexibility** to incorporate new evidence as it becomes available.
- **Consistency and cooperation with preventative health approaches to other chronic diseases**, particularly cardiovascular disease, as there are many overlapping risk factors.
- **A focus on cognitive health** and the importance of lifelong mental and social activity as a contributor to dementia risk reduction, along with the risk factors that are also related to physical health.

## 9 Conclusions

Preventative approaches to heart disease and stroke have proved to reduce the incidence of disease [38]. There is mounting evidence that the same is possible with dementia. Modifiable lifestyle and medical risk factors for dementia have been identified and many of these are also risk factors for other chronic conditions. By adopting healthy lifestyles, remaining active and managing vascular risk factors, Australians can reduce their risk of chronic disease including heart disease, stroke, cancer, diabetes and dementia.

A dementia prevention policy is needed so that all Australians see their cognitive health as just as important as their physical health. As the number and proportion of elderly Australians is rapidly increasing, we face a dementia epidemic that at the moment can only be checked by dementia prevention strategies. Australia cannot afford, in terms of both social and economic impacts, to do nothing to address the dementia epidemic. Increased investment in prevention and also in care services will be needed.

The baby boomers and coming generations of Australians will expect a healthcare system that helps them live through old age healthy in both mind and body. The first of the baby boomers turn 65 in 2010. Australia is already making inroads into preventative health. There is a priority need to include cognitive health and dementia prevention in current and future initiatives, including the National Preventative Health Strategy. The evidence presented in this paper indicates potential approaches and considerations in developing a dementia prevention policy for Australia.

## References

1. Anstey KJ, et al (2008) Cholesterol as a risk factor for dementia and cognitive decline: a systematic review of prospective studies with meta-analysis. *Am J Geriatr Psychiatry*, 16: 343–354.
2. Anstey KJ, et al (2009) Alcohol consumption as a risk factor for dementia and cognitive decline: meta-analysis of prospective studies. *Am J Geriatr Psychiatry*, 17: 542-555.
3. Woodward M, et al (2007) *Dementia Risk Reduction: The Evidence*. Alzheimer's Australia; Canberra.
4. Farrow M (2008) *Dementia Risk Reduction: What do Australians Know?* Alzheimer's Australia; Canberra.
5. Nepal B, Brown L, Ranmuthugala G (2009) Modelling the impact of modifying lifestyle risk factors on dementia prevalence in the Australian population aged 45 years and over, 2006-2051. Manuscript submitted for publication.
6. Travers CM, Martin-Khan MG, Lie DC (2009) Dementia risk reduction in primary care: what Australian initiatives can teach us. *Aust Health Rev*, 33(3): 461-466.
7. Travers C, Martin-Khan M, Lie D (2009) Barriers and enablers of health promotion, prevention and early intervention in primary care: evidence to inform the Australian national dementia strategy. *Australas J Ageing*, 28(2): 51-57.
8. Access Economics (2009) *Keeping dementia front of mind: incidence and prevalence 2009-2050*. Alzheimer's Australia; Canberra.
9. Access Economics (2003) *The Dementia Epidemic: Economic Impact & Positive Solutions for Australia*. Australia; Canberra.
10. Valenzuela MJ & Sachdev P (2006) Brain reserve and dementia: a systematic review. *Psychological Medicine*, 36: 441-454.
11. Haag MD, et al (2009) Duration of antihypertensive drug use and risk of dementia. A prospective cohort study. *Neurology*, 72: 1727-1734.
12. Piela R, et al (2006) Reducing the risk of dementia: efficacy of long-term treatment of hypertension. *Stroke*, 37: 1165-1170.
13. Hughes TF, Ganguli M (2009) Modifiable midlife risk factors for late-life cognitive impairment and dementia. *Curr Psychiatry Rev*, 5(2): 73-92.
14. Lu F-P, et al (2009) Diabetes and the risk of multi-system aging phenotypes: a systematic review and meta-analysis. *PLoS ONE*, 4(1): e4144. doi: 10.1371/journal.pone.0004144.
15. Luchsinger JA & Gustafson DR (2009) Adiposity and Alzheimer's disease. *Current Opinion in Clinical Nutrition and Metabolic Care*, 12: 15-21.
16. Welsh-Bohmer KA & White CL (2009) Alzheimer disease: What changes in the brain cause dementia? *Neurology*, 72: e21-e23.
17. Jedrzewski MK, et al (2007) Physical activity and cognitive health. *Alzheimers Dement*, 3: 98-108.
18. Karp A, et al (2006) Mental, physical and social components in leisure activities equally contribute to decrease dementia risk. *Dement Geriatr Cogn Disord*, 21: 65-73.
19. Anstey KJ, et al (2007) Smoking as a risk factor for dementia and cognitive decline: a meta-analysis of prospective studies. *American Journal of Epidemiology*, 166: 367-378.
20. Peters R, et al (2008) Smoking, dementia and cognitive decline in the elderly, a systematic review. *BMC Geriatrics*, 8: 36 doi: 10.1186/1471-2318-8-36.

21. Peters R, et al (2008) Alcohol, dementia and cognitive decline in the elderly: a systematic review. *Age and Ageing*, 37:505-512.
22. National Health and Medical Research Council (2009) *Australian guidelines to reduce health risks from drinking alcohol*. Commonwealth of Australia; Canberra.
23. Gomez-Pinilla F (2008) Brain foods: the effects of nutrients on brain function. *Nat Rev Neurosci*, 9(7):568-578.
24. Scalco MZ, van Reekum R (2006) Prevention of Alzheimer's disease. Encouraging evidence. *Can Fam Physician*, 52:200-207.
25. Scarmeas N, et al (2006) Mediterranean diet and risk for Alzheimer's disease. *Ann Neurol*, 59(6):912-921.
26. National Health and Medical Research Council (2003) *Dietary guidelines for Australian adults*. Commonwealth of Australia; Canberra.
27. Brayne C (2007) The elephant in the room – healthy brains in later life, epidemiology and public health. *Nat Rev Neurosci*, 8:233-239.
28. Gatz M, et al (2006) Lifestyle risk and delaying factors. *Alzheimer Dis Assoc Disord*, 20(Suppl 2):S84-S88.
29. Burke D, et al (2007) Possibilities for the prevention and treatment of cognitive impairment and dementia. *Br J Psychiatry*, 190:371-372.
30. Lautenschlager NT, et al (2003) Preventing dementia: why we should focus on health promotion now. *Int Psychogeriatr*, 15:111-119.
31. Rabins PV (2007) Do we know enough to begin prevention interventions for dementia? *Alzheimer's & Dementia*, 3:S86-S88.
32. Centers for Disease Control and Prevention and the Alzheimer's Association (2007) *The Healthy Brain Initiative: A National Public Health Road Map to Maintaining Cognitive Health*. Alzheimer's Association; Chicago, IL.
33. The Lewin Group and Alzheimer's Association (2003) *Saving lives, saving money: dividends for Americans investing in Alzheimer's research*. Alzheimer's Association; Washington (DC).
34. Hendrie HC, et al (2007) The NIH cognitive and emotional health project. Report of the critical evaluation study committee. *Alzheimer's & Dementia*, 2:12-32.
35. Access Economics (2004) *Delaying the Onset of Alzheimer's Disease: Projections and Issues*. Alzheimer's Australia; Canberra.
36. Alzheimer's Association: Survey of Americans' knowledge and opinions about Alzheimer's disease. *Press release*. Chicago; 2004.
37. Alzheimer's Society: Dementia – the nation's biggest fear. *Press release*. London; 2007.
38. National Preventative Health Taskforce (2009) *Australia: the healthiest country by 2020. National Preventative Health Strategy – the roadmap for action*. Commonwealth of Australia; Canberra.





**An Australian Government Initiative**

Visit the Mind your Mind website at  
[www.mindyourmind.org.au](http://www.mindyourmind.org.au)  
for further information about dementia risk reduction

Visit the Alzheimer's Australia website at  
[www.alzheimers.org.au](http://www.alzheimers.org.au)  
for comprehensive information about

- dementia and care
- information, education and training
- other services offered by member organisations

Or for information and advice contact the  
**National Dementia Helpline on 1800 100 500**

Visit the Dementia Collaborative Research Centres website at  
[www.dementia.unsw.edu.au](http://www.dementia.unsw.edu.au)  
for further information about the people involved and the research activities