# Preventing dementia: a provocation

How can we do more to prevent dementia, save lives and reduce avoidable costs?

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# Contents

# Executive Summary

When asked about his dementia, the author Terry Pratchett replied: 'I'm slipping away a bit at a time and all I can do is watch it happen.' In the UK today we estimate there are 766,000 people with dementia and that number is set to grow to 1.32 million by 2040[1]. The human cost of dementia for those who have it and those who care for them is immense.

The financial costs of dementia to the state for health and social care are also high. In this report we estimate that the cost to the state is £10.54 billion and that by 2040 the costs will have risen to £18.31 billion[2]. This excludes those people who pay to support themselves. When the costs borne by the state and private individuals are combined, we calculate that the financial burden of dementia over the next 27 years will reach £392 billion.

At present there is no cure for dementia, so this requires us to ask a fundamental question: what more can we do to help prevent people developing dementia? This report aims to stimulate the debate in response to that question and builds on the excellent work of organisations such as the Alzheimer's Society, Alzheimer's Research UK and others in the UK and across the world.

This report suggests that we can have a significant impact on reducing the number of people who will develop dementia. It is widely accepted that increasing numbers of people developing dementia is inevitable in ageing societies across the world, especially amongst the oldest old. However in this report we identify a number of risk factors for dementia that are amenable to intervention - the top three of which are diabetes mellitus, midlife hypertension and depression. If we are able to intervene successfully on these risk factors, we should be able to reduce the number of people who could otherwise go on to develop dementia. These interventions may also delay the onset of dementia for many people with all the associated benefits this brings for individuals and the state, but establishing this will require further research.

There will be costs to the state associated with reducing these risk factors but in nearly all cases we do not anticipate that these will be extensive, compared to the savings that could be generated from reducing the number of people who develop dementia and other direct savings from reducing these risk factors in the population. We have modelled the impact of matching the best-practice interventions on reducing the six main risk factors from global case studies and estimate that over the 27-year period 2013-2040 this could prevent nearly 3 million people developing dementia in the UK. This would reduce the costs to the state in the UK by £42.9 billion between now and 2040 (minus any associated costs of intervention).

This report aims to stimulate debate and discussion about how we can tackle these risk factors at scale. We do see this report as a starting point and a provocation of what could be achieved in this regard, there could also be substantial additional savings to individuals and further savings for the state if we can identify interventions that would have a greater impact on these risk factors. For example, the data on the relatively low impact of existing behavioural change programmes for reducing obesity and increasing physical activity suggests there is considerable room for greater benefits if we can develop more effective interventions or combinations of interventions that reduce these largely behavioural risk factors.

Dementia stands as one of the biggest global health challenges for the next century. In 1950, there were 200 million people aged over 60 in the world. By 2050, the number of older people aged over 60 will have grown to two billion[3]. As a result the number of those at risk of dementia in the UK and beyond will also grow. Governments, policymakers, health professionals and citizens do not yet have a cure for dementia available to them but there is cause for hope if we can better tackle some of the biggest risk factors. If we can act, then we can prevent fewer people as Terry Pratchett said 'slipping away.'

# Introduction

This report is based on data for the United Kingdom but has relevance for all countries, especially those that will experience the demographic pressures from ageing first. We begin with some analysis of the 'anatomy' of dementia in the UK, including the human and financial costs. This helps us to frame what we have described as the 'policy-off' assessment. By 'policy-off' we mean, what would happen if we maintain the current set of policy interventions or, put another way, if we do not do anything new. This gives us a baseline against which we can assess what might be possible.

There are thought to be many risk factors for dementia. The Australian national dementia strategy for example includes hypertension, high cholesterol, stroke, obesity, diet, smoking, diabetes, chronic kidney disease, depression, head injury, alcohol, physical exercise, mental activity and social activity.

In this report we have decided to focus on risk factors for which there is believed to be the strongest evidence as defined by a National Institute of Health analysis from 2010[4], but as evidence develops for other risk factors this should be revisited. The risk factors we look at are:

- Diabetes mellitus
- Midlife Hypertension (untreated)
- Midlife Obesity (BMI>30)
- Depression
- Physical Inactivity
- Smoking

For each risk factor we assess the highest impact interventions aimed at reducing it, drawing on international best practice from published studies[5,6,7,8,9]. We identify the potential to reduce each risk factor if that level of performance was matched. In this sense, the report does not start with a theoretical analysis of what could be achieved but draws on evidence about what has been achieved. The report then goes on to model what would happen if this best practice were to be replicated at the national level, in terms of preventing numbers of people developing dementia and savings to the state.

We conclude with a set of next steps, which focus on the process of how government, policy-makers, health professionals, charities and industry might seek to take these ideas forward, undertake further research and make preventing dementia a greater priority.

# Policy-off projections

Dementia affects around 766,000 people in the UK[10]. There are many different types of dementia. In the UK, Alzheimer's disease and vascular dementia make up 80% of all people with dementia (see table below).

| | Percentage of all people with dementia (rounded figures) | | | Numbers of people with dementia (rounded figures) |
|---|---|---|---|---|
| **Type** | **Female** | **Male** | **Both** | |
| Alzheimer's disease | 66.2% | 54.6% | 62.3% | 475,000 |
| Vascular dementia | 14.8% | 20.5% | 16.7% | 130,000 |
| Mixed (AD & VD) | 10.2% | 10.9% | 10.4% | 77,000 |
| Lewy bodies dementia | 2.7% | 5.6% | 3.8% | 31,000 |
| Fronto-temporal dementia | 1.4% | 2.3% | 1.7% | 15,000 |
| Parkinsons | 1.3% | 2.7% | 1.7% | 15,000 |
| Other | 3.5% | 3.5% | 3.5% | 27,000 |

*Table showing the breakdown of late-onset dementia within the population by type[11]*

There are many risk factors for developing dementia. They vary depending on the type of dementia, but include non-modifiable risk factors such as age, sex, genetic inheritance and modifiable risk factors such as 'lifestyle factors', which include smoking, high blood pressure, high cholesterol, diabetes, excessive alcohol consumption, and lack of physical activity. The risk of developing dementia doubles every five years after 65[12]. As such, the proportion of people with a dementia increases the older the age group (see table below) although the actual number of people with dementia in an age group peaks in the 85-89 year age range.

| | Percentage of age-sex group with dementia in UK | | | Number of people with dementia in age group in UK (2013) |
|---|---|---|---|---|
| **Age** | **Female** | **Male** | **Both** | |
| 65-69 | 1.0% | 1.5% | 1.3% | 41,224 |
| 70-74 | 2.4% | 3.1% | 2.9% | 71,357 |
| 75-79 | 6.5% | 5.1% | 5.9% | 122,250 |
| 80-84 | 13.3% | 10.2% | 12.2% | 183,428 |
| 85-89 | 22.2% | 16.7% | 20.3% | 190,514 |
| 90-94 | 29.6% | 27.5% | 28.6% | 117,631 |
| 95+ | 34.4% | 30.0% | 32.5% | 39,972 |

*Table showing the age-sex breakdown of dementia cases within the UK[13]*

The symptoms associated with dementia are progressive, that is, they get more severe over time.

| | Of those with a dementia, severity percentage | | |
|---|---|---|---|
| Age | Mild | Moderate | Severe |
| 65-69 | 61.7% | 32.0% | 6.3% |
| 70-74 | 62.5% | 30.4% | 7.1% |
| 75-79 | 57.0% | 31.5% | 11.5% |
| 80-84 | 56.8% | 31.9% | 11.3% |
| 85-89 | 54.3% | 32.6% | 13.1% |
| 90-94 | 48.9% | 33.0% | 18.1% |
| 95+ | 42.3% | 34.4% | 23.3% |

*Table showing the age-band breakdown of dementia cases by severity*[14]

Based on population estimates from World Population Prospects the growing older population will lead to a substantial increase the number of people in the UK with a dementia. The number is set to go from 766,000 today to 1.32 million by 2040[15].

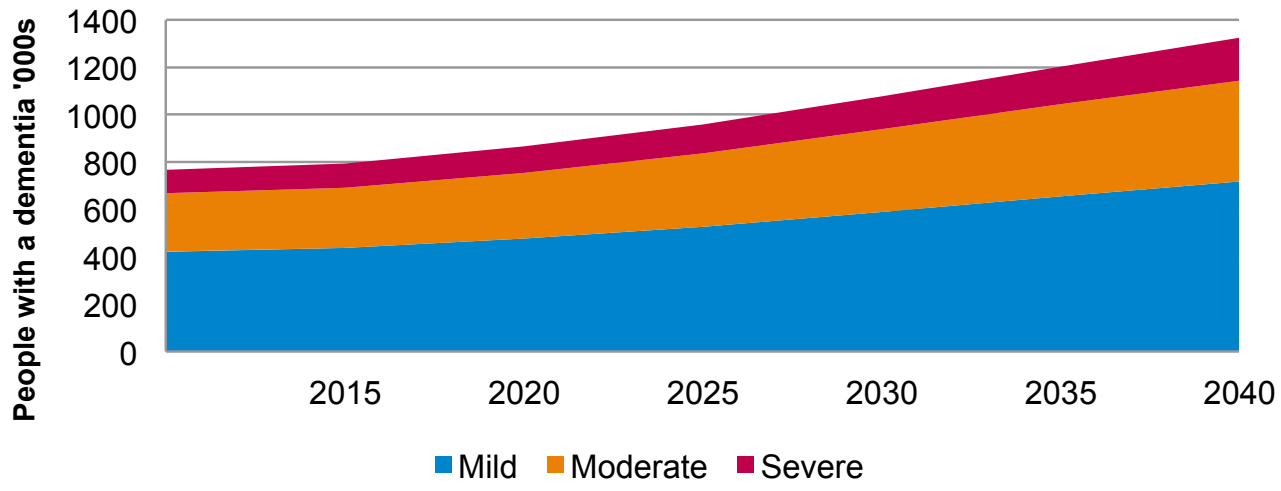



*Chart showing the expected rise in the number of people with a dementia*[16]

The costs of care for people with a dementia have been estimated by the PSSRU at LSE (as shown below) based on the severity of their dementia and the setting of their care.

| | Costs of care, per year (£) | | | |
|---|---|---|---|---|
| | NHS | Social Care | Informal Care | Accommodation |
| Community, Mild | 2508 | 4935 | 9246 | 0 |
| Community, Moderate | 2430 | 6224 | 17223 | 0 |
| Community, Severe | 2639 | 7738 | 27096 | 0 |
| Residential Care | 1334 | 378 | 938 | 28646 |

*Table showing the expected costs for someone with dementia*[17]

Informal care costs or unpaid care costs represent the cost of providing that care, were it to have been provided in the 'formal' way, that is, by professional carers. It was calculated by attaching unit costs to services received by applying: (i) the hourly cost of a home care worker to hours spent performing specific tasks, and by applying (ii) the minimum wage to time spent performing general tasks and supervisory activities.

In the UK, all healthcare (NHS) costs would be paid for by the state, whereas social care is typically means-tested and so the social care costs will be borne by both the private individual and the state. It is estimated that 55.1%[18] of residential care is paid for by the state and 80%[19] of home or community care.

Further costs to the state include benefits paid to an individual with dementia and their carers and lost tax revenue from carers not working. Half of people with dementia in the community have more than 35hrs informal care a week - qualifying them for Carer's Allowance at £59.75 per week.[20] Additionally, Attendance Allowance is paid to anyone over 65 requiring help with personal care because of a physical or mental disability. It is paid at two different rates – £53 and £79.15 – depending on the level of care required. We have assumed for the purposes of our calculation that those with mild and moderate dementia are paid at the £53 rate and those with severe are paid at the £79.15 rate.

A further cost to the state is due to lost tax receipts from carers who have had to give up work in order to provide care; 7% of carers report having given up work in order to care. Taking the average wage in the UK as £26,500[21]; the tax revenue lost for each person who make up the 7% would be £5,662.24.

Taken together these 'costs of dementia' add up to £10.54bn to the state per year and £4.03bn for private individuals. Assuming constant costs the increase in the number of people with dementia (shown previously) will mean these costs rise to £18.31bn each year for the state and £7.15bn for private individuals by 2040. Between 2013 and 2040 dementia will have cost the state £392bn.[22]

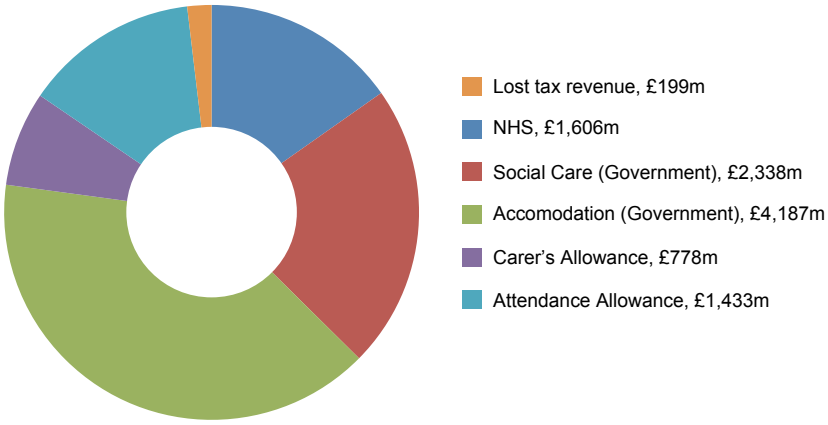
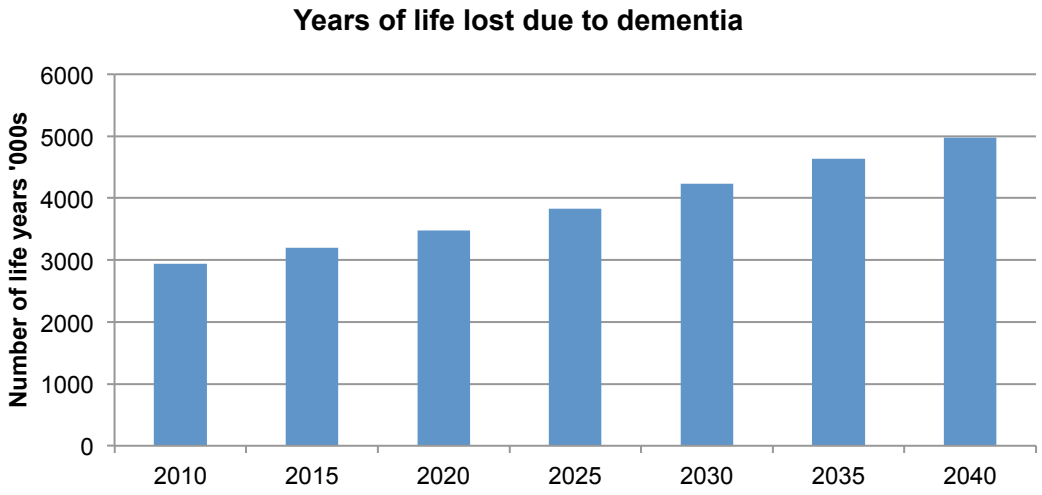



*Chart showing the expected costs borne by the UK the state due to dementia*

Once someone has dementia their remaining life expectancy drops by about half[23] so, for instance, a 75 year-old woman without dementia would expect on average to live another 11.6 years in the UK; however, once diagnosed with dementia this drops to 5.8 years. That is, dementia has led to 5.8 years of life lost (YLL). If this is summed for everyone who develops dementia we calculate that approximately 3 million years of life lost are due to dementia in the UK (in 2013). This is expected to rise to 5 million by 2040.[24] This is illustrated in the graph below.




*Graph showing the expected increase in the number of life years lost to dementia to 5 million in 2040*

# Risk factors

As discussed, there are some key risk factors for dementia that increase the likelihood of a person developing dementia, this may however vary depending on the type of dementia. For the purposes of this report, we have used a study that considers the relative risk factors of developing Alzheimer's disease - the relative risk indicates how much of an increased chance a person would have to develop Alzheimer's disease if they have this risk factor[25]. For instance, the relative risk for those with diabetes is 1.39. That is, the chance of developing Alzheimer's disease is 1.39 times greater for those with diabetes when compared to someone without diabetes, all other things being equal.

We are of course aware that there are limitations to applying the relative risk factor for Alzheimer's disease to other dementias, we did however want to demonstrate what could be theoretically possible with dementia risk reduction at a population level. While we use the generic term of dementia throughout this report, this must be caveated that the relative risk rate is based on that for Alzheimer's disease.

| Risk factor | Relative risk (RR) |
|---|---|
| Diabetes mellitus | 1.39 |
| Midlife Hypertension (untreated) | 1.61 |
| Midlife Obesity (BMI>=30) | 1.60 |
| Depression | 1.90 |
| Physical Inactivity | 1.82 |
| Smoking | 1.59 |
| Cognitive inactivity or low educational attainment | 1.59 |

*Table showing the relative risk of different risk factors for Alzheimer's disease*[26]

The risk factors are defined in more detail in the table below.

| Risk factor | Population definition |
|---|---|
| Diabetes mellitus | People with either Type 1 or Type 2 diabetes |
| Midlife Hypertension (untreated) | People who were diagnosed as hypertensive between the ages of 55 and 64 and who were not treated for it |
| Midlife Obesity (BMI≥30) | People who were identified as obese (had a BMI≥30) when they were between the ages of 55 and 64 |
| Depression | People diagnosed as having depression by the Automated Geriatric Examination for Computer-Assisted Taxonomy (AGECAT) algorithm |
| Physical Inactivity | People who do less than 30 minutes of moderate physical activity per week |
| Smoking | People who class themselves as regular smokers |

*Table of risk factor definitions used for later calculation*

# Reducing risk factors: potential interventions

Reducing the number of people with a given risk factor should lead to a reduction in the number of people developing dementia. Below we evaluate the likely impact of interventions aimed at reducing specific risk factors on the number of people developing dementia.

To work out the likely impact we use the relative risk for the given risk factor and the prevalence of the risk factor within the target population. We then use the internationally recognised Levin formula to calculate the expected number of people developing dementia that are due to that risk factor[27]. For instance, for diabetes we have:

Relative risk (RR) of diabetes for dementia is: 1.39

Current prevalence ($P_{RF}$) of diabetes in the UK is – for men 65+: 15-16% and for women 65+:12-13%

We can use these two figures to calculate the number of dementia cases that are due to the risk factor in the UK population. This can be calculated using the Levin formula:

$$PA \quad \frac{P_{RF} \times (RR - 1)}{1 + P_{RF} \times (RR - 1)}$$

Where PAR is the proportion of dementia cases due to the risk factor, $P_{RF}$ is the prevalence of the risk factor in the population and RR is the relative risk.

From this calculation, we can say: Projected proportion of people developing dementia due to diabetes is ~5.3%

Knowing the proportion of people developing dementia that is due to a risk factor allows us to model the impact of reducing that risk factor.

If we consider a scenario where we reduce type 2 Diabetes by 10% we can model how many people developing dementia this would prevent over time, how many life years this would save and how much money this would save in different areas:

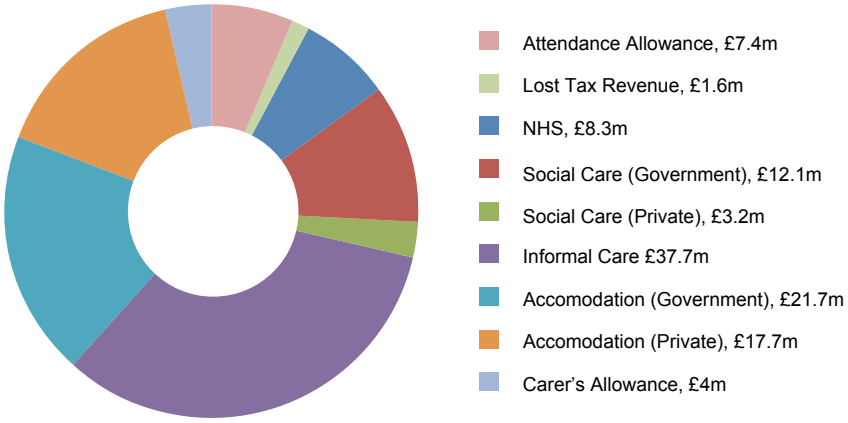
| | 2013 | 2040 |
|---|---|---|
| Dementia cases prevented | 4,000 | 6,900 |
| Live years saved | 16,000 | 25,800 |
| Total savings (for the state) | £55m | £97m |

*Table showing the expected impact of a 10% reduction in diabetes prevalence*

Life years saved is calculated by looking at the difference in life expectancy between people with and without dementia. Total savings for the state are calculated by summing the expected cost of care borne by the state, as described earlier, for those people developing dementia, had they not been prevented.

The pie chart below illustrates the total potential savings resulting from fewer people with dementia for the state, private individuals and carers (providing informal care for people with diabetes) through reducing diabetes in the population by 10%.

Potential Savings (2013) - Total: £114m. Of which government saving are: £55m




For each risk factor we will now consider what appears to be the most effective intervention(s) for reducing its incidence and/or prevalence among a population and what impact this given reduction would have on numbers of people developing dementia (as described in the example of a 10% diabetes reduction above).

# Risk factor 1 – Type 2 diabetes intervention

## Intervention description

A 2003 study[28] found that an intensive lifestyle intervention or taking Metformin (an oral anti-diabetic drug) reduced the incidence of type 2 diabetes within a population with impaired glucose tolerance (IGT).

Those who have type 2 diabetes are around 40% more likely to get dementia. The study found the intensive lifestyle intervention (including an aim of 7% weight reduction and 150 minutes of exercise per week) led to a 58% reduction in diabetes. Those that took Metformin were 31% less likely to have diabetes. Metformin was less effective as recipients got older.

Subjects included in the analysis were overweight (mean BMI 34), middle-aged (mean age 50.6) and had IGT. A blood test is required to diagnose IGT. Most people who develop type 2 diabetes have IGT first.

## Intervention Scenario 1: 58% reduction in type 2 diabetes

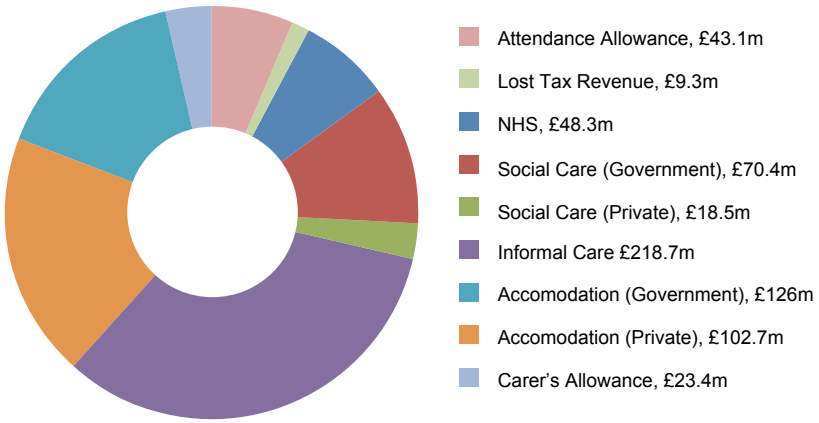
| Diabetes | | |
|---|---|---|
| Relative risk for dementia: | 1.39 | |
| Prevalence among men 65+: | 15-16%[29] | |
| Prevalence among women 65+: | 12-13%[30] | |
| Proportion of people developing dementia due to type 2 diabetes: | ~5.3% | |

## Scenario: 58% reduction in Type 2 diabetes

| | 2013 | 2040 |
|---|---|---|
| Dementia cases prevented: | 23,100 | 40,000 |
| Life years saved: | 92,700 | 149,700 |
| Total savings (for the state): | £321m | £560m |

The pie chart below illustrates the total potential savings for the state, private individuals and carers (providing informal care).

Potential Savings (2013) - Total: £661m. Of which government savings are: £321m



# Risk factor 2 – Hypertension intervention

## Intervention description

A 2006 study[31] found that antihypertensive treatments for people with hypertension reduced their risk of dementia. Those who are hypertensive are around 60% more likely to develop dementia but this risk reduced the longer that the treatments were given:

0-5 years of treatment: 54% more likely

5-12 years of treatment: 12% more likely

12+ years of treatment: 0% more likely (i.e a 100% reduction in hypertension as a risk factor for dementia)

Subjects included in the analysis were midlife hypertensive and dementia-free at the start of treatment. Average age at end of analysis was 76.6 and the subjects were all men.

## Intervention Scenario 2: 100% reduction in midlife hypertension as a risk factor

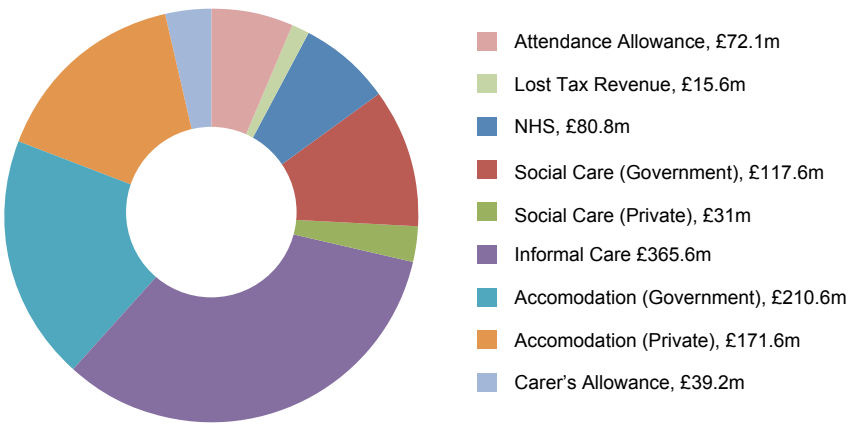
| Midlife hypertension | |
|---|---|
| Relative risk for dementia: | 1.61 |
| Prevalence among men 65+: | 10%[32] |
| Prevalence among women 65+: | 8%[33] |
| Proportion of people developing dementia due to midlife hypertension: | ~5.2% |

## Scenario: 100% reduction in midlife hypertension

| | 2013 | 2040 |
|---|---|---|
| Dementia cases prevented: | 38,600 | 67,000 |
| Life years saved: | 156,200 | 252,000 |
| Total savings (for the state): | £536m | £937m |

The pie chart below illustrates the total potential savings for the state, private individuals and carers (providing informal care).

Potential Savings (2013) - Total: £1104m. Of which government saving are: £536m



# Risk factor 3 – Midlife obesity intervention

## Intervention description

Research for this report did not find significant evidence that obesity prevention programmes have been successful, especially those that included weight management as a specific goal (rather than improving health generally)[34]. One study of workplace interventions including a range of health promotion and risk reduction programs demonstrated a 1% reduction in obesity rates after two years[35].

A key challenge is maintaining behaviour changes over time and it has been suggested that interventions need to last longer than five years to be sustainable. This may be especially true for older target groups who may have more fixed habits. This represents a significant policy challenge because it suggests that interventions that seek to achieve behaviour change may need to be developed further or new interventions developed and perhaps used in combination with other interventions such as medical and drug interventions.

## Intervention Scenario 3: 1% Reduction in midlife obesity (BMI≥30)

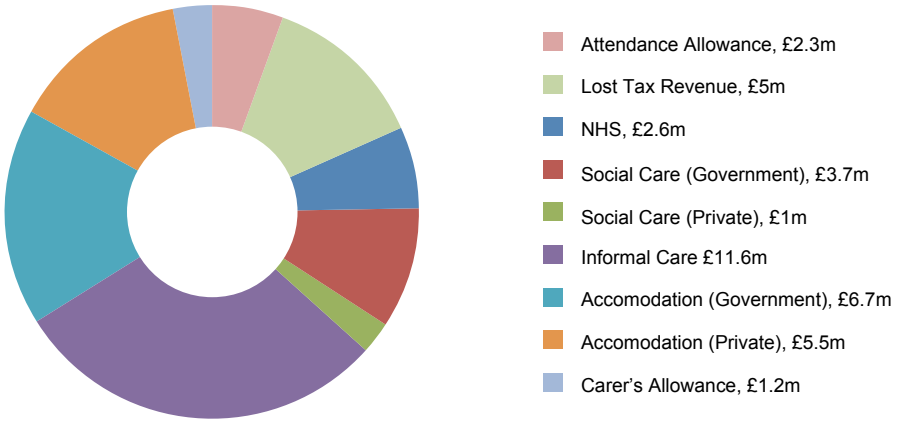
| Midlife obesity | |
|---|---|
| Relative risk for dementia: | 1.6 |
| Prevalence among men 65+: | 32%[36] |
| Prevalence among women 65+: | 32%[37] |
| Proportion of people developing dementia due to midlife obesity: | ~16% |

## Scenario: 1% reduction in midlife obesity

| | 2013 | 2040 |
|---|---|---|
| Dementia cases prevented: | 1,200 | 2,100 |
| Life years saved: | 4,900 | 8,000 |
| Total savings (for the state): | £17m | £30m |

The pie chart below illustrates the total potential savings for the state, private individuals and carers (providing informal care).

Potential Savings (2013) - Total: £35m. Of which government saving are: £17m



# Risk factor 4 – Depression intervention

## Intervention description

Depression can be treated, with recovery rates of around 50%, although relapse is common[38]. Interventions include medication, various psychological interventions, group physical activity and guided self-help. The most effective intervention for moderate or severe depression is thought to be a combination of psychological therapy (for example, Cognitive Behavioural Therapy) and medication[39], although studies suggest that the type of treatment offered is less important than getting depressed patients involved in an active therapeutic program.

Depression can also be prevented, with one study finding that incidence was reduced by 20-25% over 1-2 years through the use of psychoeducational and psychological interventions with mixed-age and older adults in High Income Countries[40].

## Intervention Scenario 4: 22.5% Reduction in depression

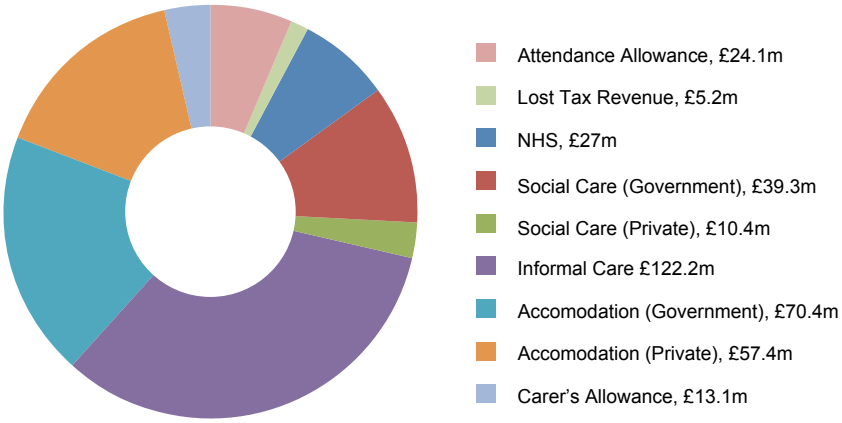
| Depression | |
|---|---|
| Relative risk for dementia: | 1.9 |
| Prevalence among men 65+: | 6.5%[41] |
| Prevalence among women 65+: | 10.4%[42] |
| Proportion of people developing dementia due to depression: | ~7% |

## Scenario: 22.5% reduction in depression

| | 2013 | 2040 |
|---|---|---|
| Dementia cases prevented: | 12,900 | 22,000 |
| Life years saved: | 51,900 | 83,100 |
| Total savings (for the state): | £179m | £308m |

The pie chart below illustrates the total potential savings for the state, private individuals and carers (providing informal care).

Potential Savings (2013) - Total: £369m. Of which government saving are: £179m



# Risk factor 5 – Low levels of physical activity intervention

## Intervention description

Interventions to increase physical activity among younger adults (for example, advice delivered by GPs, exercise referral schemes, use of pedometers) have been found to be effective by NICE[43]. Complex leisure activities with physical, mental, and social components are thought to have the most potential to reduce the risk of dementia[44]. Interventions restricted to adults aged 50+ years were effective in producing short-term changes in physical activity, but there was limited evidence that they could produce mid- to long-term changes.

A meta-analysis of exercise referral schemes found that participants were 16% more likely to meet internationally recommended levels of physical activity after 6 and 12 months compared with usual care, but the authors describe this evidence as weak[45]. Given the lack of evidence of efficacy of interventions to increase physical activity (especially in those over 50), we have used the same percentage improvement estimate that was used for obesity as a comparison and to ensure that our estimates are cautious for this risk factor.

## Intervention Scenario 5: 1% Reduction in physical inactivity

(Note: Intervention has not been identified – 1% estimate given for comparison)

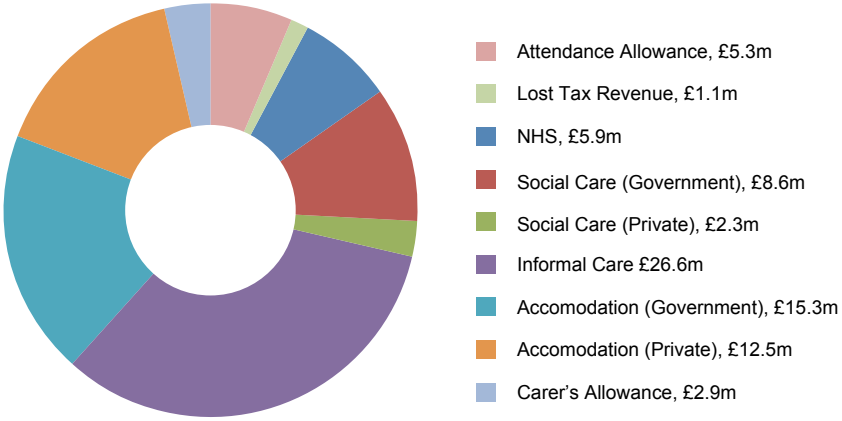
| Physical inactivity | |
|---|---|
| Relative risk for dementia: | 1.82 |
| Prevalence among men 65+: | 47-68%[46] |
| Prevalence among women 65+: | 53-78%[47] |
| Proportion of people developing dementia due to physical inactivity: | ~35% |

## Scenario: 1% reduction in physical inactivity

| | 2013 | 2040 |
|---|---|---|
| Dementia cases prevented: | 2,800 | 4,900 |
| Life years saved: | 11,000 | 17,800 |
| Total savings (for the state): | £39m | £68m |

The pie chart below illustrates the total potential savings for the state, private individuals and carers (providing informal care).

Potential Savings (2013) - Total: £80m. Of which government saving are: £39m



# Risk factor 6 – Smoking intervention

## Intervention description

NICE have conducted a cost benefit analysis of smoking cessation interventions carried out by primary care. They found that smokers who were given an intervention were more likely to give up[48]. Subjects were smokers who visited their GP (for an unrelated matter) and offered five minutes of advice on stopping smoking:

- Brief opportunistic advice + Nicotine Replacement Therapy: 2.1% more likely to quit (for at least 12 months).
- Brief opportunistic advice + telephone helpline: 2.7-3.7% more likely to quit (for at least 12 months).

For the purposes of this intervention scenario, we take 3.2% reduction as the midway point in the more successful of these two types of intervention.

## Intervention Scenario 6: 3.2% Reduction in smoking

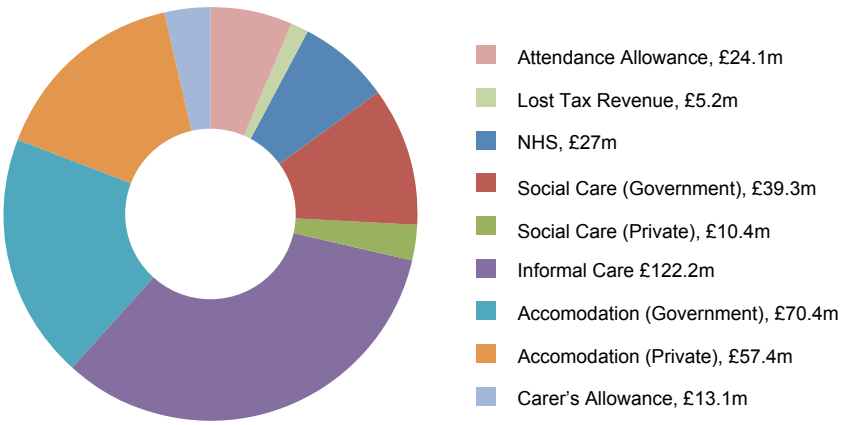
| Smoking | |
|---|---|
| Relative risk for dementia: | 1.59 |
| Prevalence among men 65+: | 13%[49] |
| Prevalence among women 65+: | 13%[50] |
| Proportion of people with dementia cases due to smoking | ~7.1% |

## Scenario: 3.2% reduction in smoking

| | 2013 | 2040 |
|---|---|---|
| Dementia cases prevented: | 1,700 | 3,000 |
| Life years saved: | 7,100 | 11,400 |
| Total savings (for the state): | £24m | £42m |

The pie chart below illustrates the total potential savings for the state, private individuals and carers (providing informal care).

Potential Savings (2013) - Total: £50m. Of which government saving are: £24m



# The cumulative benefit of reducing risk factors: Policy-on projections

Below we provide a table summarising the relative impact of each risk factor on the annual number of people developing a dementia and the potential impact of the interventions listed.

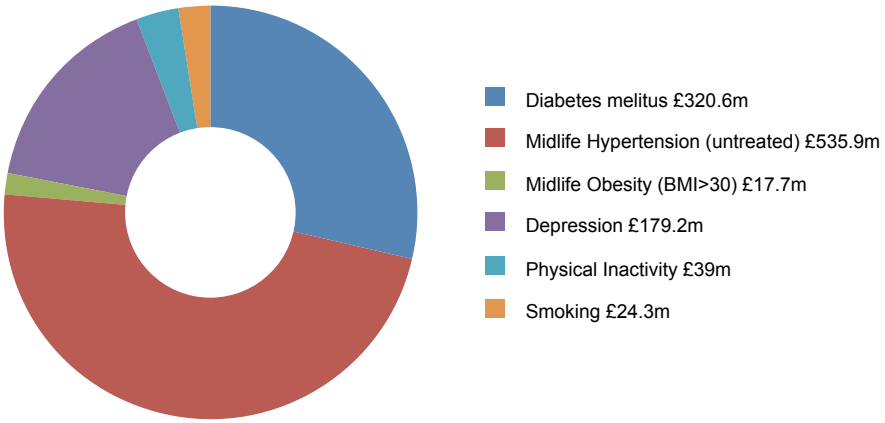
| | | | People developing Dementia caused by RF | | Intervention | | |
|---|---|---|---|---|---|---|---|
| Risk Factor (RF) | Relative Risk (RR) | Prevalence of Risk Factor | % | Number | RF Reduction | People prevented from developing dementia 2013 | People prevented from developing dementia 2013-2040 |
| Diabetes mellitus | 1.39 | 12-16% | 5.3 | 39,772 | 58% | 23,068 | 859,253 |
| Midlife Hypertension (untreated) | 1.61 | 8-10% | 5.2 | 38,555 | 100% | 38,555 | 1,437,797 |
| Midlife Obesity (BMI>=30) | 1.60 | 32% | 16 | 122,442 | 1% | 1,224 | 45,442 |
| Depression | 1.90 | 6.5%-10.4% | 7 | 57,297 | 22.50% | 12,892 | 474,347 |
| Physical Inactivity | 1.82 | 47%-78% | 35 | 280,821 | 1% | 2,808 | 104,249 |
| Smoking | 1.59 | 13% | 7.1 | 54,594 | 3.20% | 1,747 | 64,799 |
| Total | | | | | | 80,294 | 2,985,887 |

*Summary table*

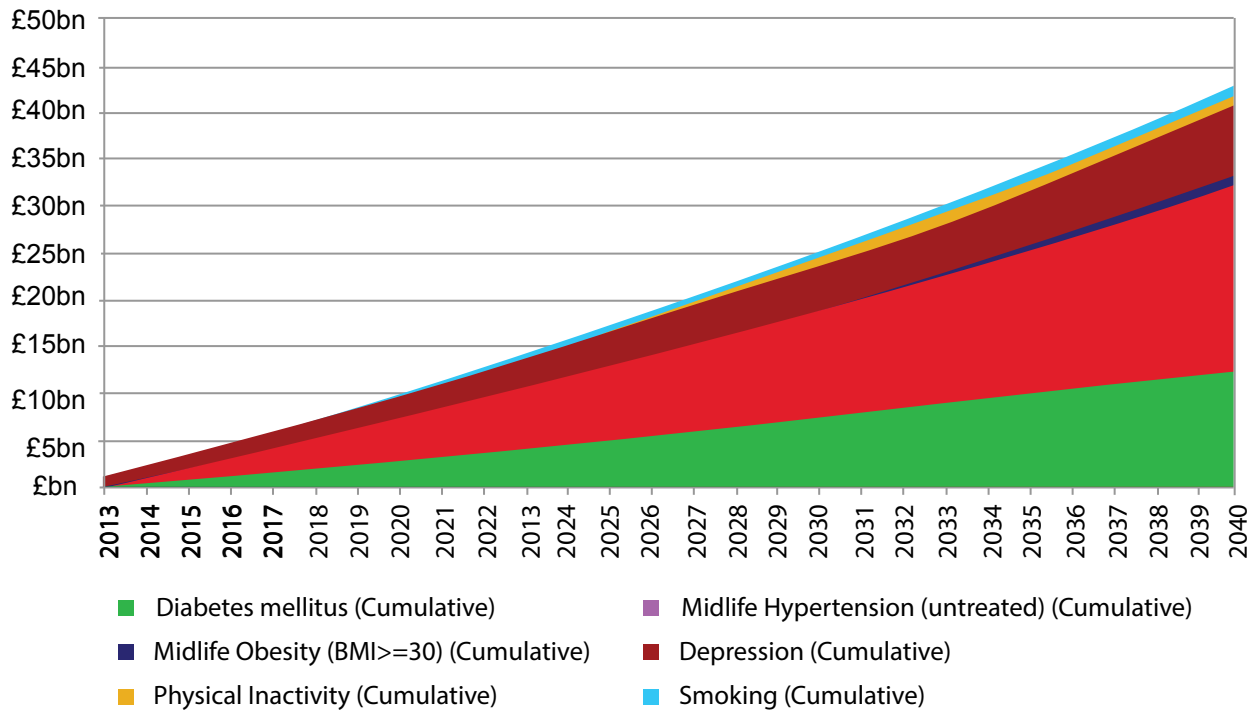
# Savings to the state

If each risk factor were reduced by an amount equivalent to the best practice intervention the state would save £1.12bn a year in 2013, increasing to £1.95bn by 2040[51].

## Potential Savings for the state in 2013 of risk factor reduction scenarios




If the reduction were maintained the state would save **£42.9bn** between now and 2040.




*Note: graph assumes that programmes are implemented uniformly during the period shown*

# Savings in private payments and informal care

## Private care savings

Individuals funding their own care pay for around 45% of residential care and 20% of home care[52,53]. This can place a substantial cost burden on families. However reducing these risk factors would save families just over £4bn that would otherwise be spent on dementia care in 2013. This saving will rise to £7.1bn by 2040 due to the otherwise increasing amount of care required. This amounts to **£16.4bn** between 2013 and 2040 - a potential financial incentive for private individuals and their families to engage with risk factor interventions.

## Informal care savings

Provision of informal care to friends and relatives also directly affects employers as more of their staff carry out informal/unpaid care because of increased staff turnover, potential recruitment issues and having to take time off work for caring. This is a cost burden for employers. However if the care being provided by informal carers had to be covered by paid workers reducing these risk factors would save the equivalent of £7.3bn in 2013, rising to £12.4bn by 2040.

The cumulative value of informal or unpaid care between 2013 and 2040 is **£28.95bn.** This monetised value of the social return of informal care to employers and the state creates a potential incentive for promoting take up of these risk factor interventions.

# Next steps

In the introduction to this report, we said that the ideas here are intended to stimulate further discussion and debate about tackling the risk factors which drive up the number of people developing dementia. As such, we suggest the following next steps:

Firstly, create a process for continuing the debate on the analysis contained in this report:

- Depending upon the response to this report we recommend that key stakeholders develop a high profile communications strategy to raise awareness among health professionals and the public about the risk factors associated with dementia, the actions that can be taken to reduce them, and the health and financial value this would bring.

Second, we suggest undertaking more detailed work on the analytical approach that has been adopted in this report:

- Identifying further evidence of best-practice interventions for each of the risk factors and others not included in this report. We are particularly interested in any case studies relating to preventing and tackling obesity, as well as interventions which have raised levels of physical activity, especially for the over 50s. There is a strong emphasis in public policy at present on behavioural change but this research has not found extensive evidence of effective practice, especially over a sustained period.
- Seeking evidence of risk factors that do not appear in our list of examples. For example, high cholesterol, social and mental activity and chronic kidney disease are also known risk factors. We will then draw together further input from our roundtable and other contributions, including any additional evidence, to develop a more comprehensive analysis of the potential number of life years that could be saved through preventing people developing dementia and the savings to the state and private individuals, through better prevention.

Third, we suggest that a dementia prevention strategy (as distinct from action to help people diagnose and live well with dementia) should be given higher priority in government and policymakers' thinking. For example:

- Preventing dementia should feature more clearly within the current national dementia research strategy.
- The Government should consider the creation of a separate dementia prevention strategy if the further research and analysis confirms the potential value this approach would bring to individuals and the state.

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# Appendix 1, Summary of feedback from dementia and prevention roundtable

- The discussion highlighted that there are gaps relating to nutritional status and depression.
- It was suggested that early diagnosis of dementia opens up the opportunity to address other conditions.
- One of the participants asked if there is scope to understand more about homocysteine as an early indicator of dementia. Some studies suggest that vitamin B could be an effective intervention[1]. Mild cognitive impairment can be screened which is important because 50% of people who have MCI go on to develop dementia, but if it is caught early enough studies suggest it can be effectively treated with high doses of Vitamin B.
- However, it was stated that even where mild cognitive impairment is not detected but high levels of homocysteine are, that can also be treated using Vitamin B.
- One participant suggested that evidence from the period 1991 – 2011 showed a reduction in the prevalence of dementia because of reduced smoking and better lifestyles. This confirms that prevention should cut rates[2].
- There may be a link between nutrient levels in people with dementia. Can we use risk stratification to identify high risk groups to intervene early with vitamin and other nutritional interventions. Is there scope to understand these links more clearly and any associated interventions?
- It was also asked if industry could invest in some promising key lines of enquiry?
- There was discussion on what scope there is to look at 'structural' interventions to tackle some of the risk factors, e.g. salt reduction in Finland; tax on saturated fats in Denmark; banning trans fats or other interventions relating to tax and other forms of regulation[3]. We need to understand more about these interventions and the impact they are having.
- Further discussions highlighted and questioned what the differences in prevalence patterns are between countries and what different policies or contextual factors appear to make a difference? For example the Mediterranean diet appears to be protective but more analysis would be required[4].
- It was also highlighted that recent NICE policy on sustained weight loss interventions funded by the NHS could be important because of the weakness of the international evidence on sustaining physical activity[5].
- A limitation of the report, it was suggested, was that the report does not cost the interventions to reduce risk factors and more work should be done in this area. However, the positive externalities on wider health costs need to be factored in e.g. interventions to reduce hypertension will reduce costs beyond dementia.
- The importance of the political climate was also mentioned, in terms of how we can use the period in the run up to the 2015 General Election to secure support from all parties to make dementia prevention a priority?

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- Further questions included: What do we know about inequalities and closing the gap in relation to dementia? How can we better influence international organisations including the UN and WHO to adopt dementia prevention as a priority for research funding? Are there ways that we can better link to the European Dementia Prevention Initiative with this work and future studies? What more can be done on longer-term interventions including genetic and drug interventions? What other best-practice case studies are out there that our work has not identified? Can we think about prevention linked to different age cohorts e.g. 40s, 50s. 60s etc? Is there more that can be done post-diagnosis to 'prevent' or slow deterioration?
- It was also queried what would be the impact of modelling a reduction in obesity and sustained physical activity (which our research showed were the hardest to move) of say 10%, 20%, 30%?
- A key point of discussion was the current low levels of awareness of dementia particularly with regards to dementia and the implications and methods one may employ to raise awareness levels.

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