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Photo: Pierre Amerlynck

contents

Dementia

The flipside of a long life

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For many people dementia is one of the most frightening prospects of growing older. As the chance of dementia increases strongly with age, and as our population is ageing rapidly, more and more people are set to suffer from this disease. A demographic epidemiological study has examined the expected years of life lived with dementia among different groups of people.

Dementia is a disease that generally occurs at old age. And as the average life expectancy is increasing, more and more people will suffer from some kind of dementia at some point in their lives. Little is known about the direct cause of cognitive decline in old age, and medication to combat the decline in cognitive ability still leaves much to be desired. A number of epidemiological studies have, however, studied the effect of risk factors on dementia, but their results vary. The most important risk factors for physical and mental health are smoking, overweight or obesity, and level of education. A measure often used in demography is life expectancy. This article compares different groups of people in terms of the expected years of life lived with, or without, dementia.

The data and risk factors

The Health and Retirement Survey (HRS), an American survey which started in 1992, follows the state of health of a representative group of Americans once every two years. The research on dementia used HRS data about white American men and women aged 55 years and over. The sample included 17,342 people (7,763 men and 9,579 women) who had taken part in the HRS at least twice between 1992 and 2004. The answers given by respondents during their first interview were used to analyse the effect of risk factors. Overweight and obesity were measured using the Body Mass Index (BMI=kg/m^2), which identifies five classes, from low normal weight to severe obesity. With respect to smoking, respondents were categorised as people

Photo: www.neuroprotectivelifestyle.com

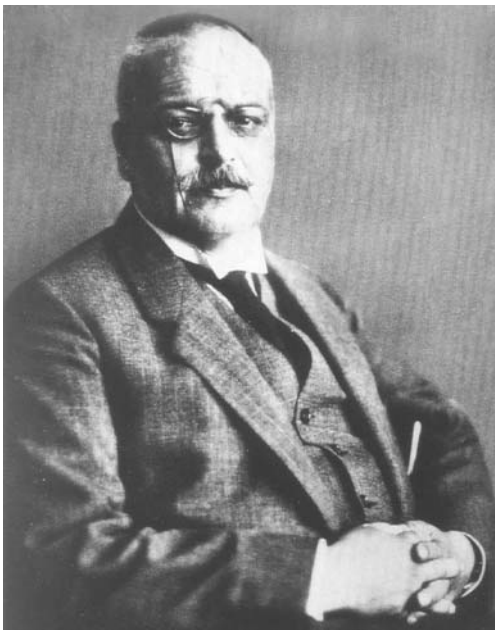


Photo: www.helpdirect.org

TELEPHONE INTERVIEW for COGNITIVE STATUS (TICS)

The Telephone Interview for Cognitive Status (TICS) is commonly used to measure cognitive ability. During the interview, respondents are asked 35 questions to test such things as the ability to remember words, to repeatedly subtract by the number 7, to count backwards from 20 to 0 and to name the day of the week and the date. People who scored at most eight correct answers are considered to be severely cognitively impaired, which we here referred to as dementia.

Some respondents are not willing, or not able to answer the questions themselves. In these cases, a proxy is interviewed. If the proxy respondent says the person in question suffers from memory loss, this person is classified as having dementia.

who had never smoked, those who had stopped smoking and current smokers. Education was divided into three categories: low, medium and high level of education.

Dementia

Dementia is a generic term for conditions with a variety of causes. The term refers to an impairment of cognitive brain functions. All illnesses, traumas, cases of poisoning or nutritional deficiencies that affect the brain can result in dementia. Dementia is often used to refer to senility or senile dementia, the main cause of which is old age, and it is precisely because of the ageing process that senile dementia takes on many forms and has many causes – it is hard to identify a clear, single cause. Genetic and cardiovascular risk factors heighten the risk of premature dementia.

People are diagnosed as suffering from dementia if a loss of cognitive brain function is measured. The measure used here is based on 35 questions asked to test people's memory, known as the Telephone Interview for Cognitive Status, (TICS for short; see Box). This measure is commonly used in the literature on dementia and is based on mini-mental state examination, MMSE. TICS is a sensitive screening test rather than a clinical-diagnostic test. People who gave eight correct answers, or less, were defined as being cognitively impaired, which we will here refer to as having dementia.

Likelihood of dementia

The chance of becoming demented in middle age is very small. An average man aged 55, for example, will have an annual 0.2 percent chance of becoming demented at that age. This probability does, however, increase exponentially every year. An 80-year-old man will therefore have a 1.5 percent probability, and a 95-year-old man a 4.4 percent probability of becoming demented. The annual probability of becoming demented is more or less the same for men and women, yet more women suffer from dementia than men as they live longer, on average. For 55-year-old women, the odds of ever becoming demented is 36 percent, compared to 23 percent for men aged 55.

Risk factors

The table demonstrates how the probability of becoming demented for men and women differ by risk factors. The results show that overweight and obesity do not affect the chance of dementia. Smoking slightly raises the probability of becoming demented, but the effect is not significant among men. Level of education has a very strong influence. Highly educated men have a 65 percent smaller chance of becoming demented than men with a low level of education; women have a 48 percent smaller chance. Another interesting result are the differences in mortality among people with dementia. Highly educated people with dementia are more likely to die than demented people with a low level of education.

Expected years of life lived with dementia

In order to calculate the expected years of life with dementia, we need information about the chances of dementia as well as mortality figures for both healthy and demented people. All these transitions are summarised in a so-called multistate model, which is used to calculate duration of life in healthy condition and in a

Relative risks of becoming demented and of dying by risk factor, compared with the reference category (Ref.)

	Relative risk of dementia		Relative risk of dying having dementia	
	Men	Women	Men	Women
Low normal weight	1.17	1.05	1.08	0.93
Normal weight (Ref)	1.00	1.00	1.00	1.00
Overweight	0.84	0.91	0.84	0.84
Mildly obese	0.98	0.98	0.94	1.16
Severely obese	0.84	1.03	0.99	1.07
Never smoked (Ref)	1.00	1.00	1.00	1.00
Stopped smoking	0.97	0.99	1.32	**1.31**
Currently smoking	1.26	**1.28**	1.39	1.39
Low education (Ref)	1.00	1.00	1.00	1.00
Medium education	**0.50**	**0.70**	1.12	**1.26**
High education	**0.35**	**0.52**	1.35	1.24

Values **in bold** are significant at p<0.05

demented state. According to the multistate model, 55-year-old men live an average of 1.7 years with dementia and women an average of 2.7 years. Figure 1 presents the expected number of years lived with dementia for men and women per risk factor. The figures clearly show the opposite effects of smoking and education. Smokers and ex-smokers live somewhat shorter with dementia than non-smokers (0.7 years for men; 0.9 years for women), simply because their total life expectancy is considerably shorter. The opposite was found for level of education: among both men and women a high level of education shortens the number of years of life lived with dementia while at the same time lengthening their total life expectancy by 1.9 years.

Figure 1. Expected years of life with and without dementia for men aged 55, by risk factor

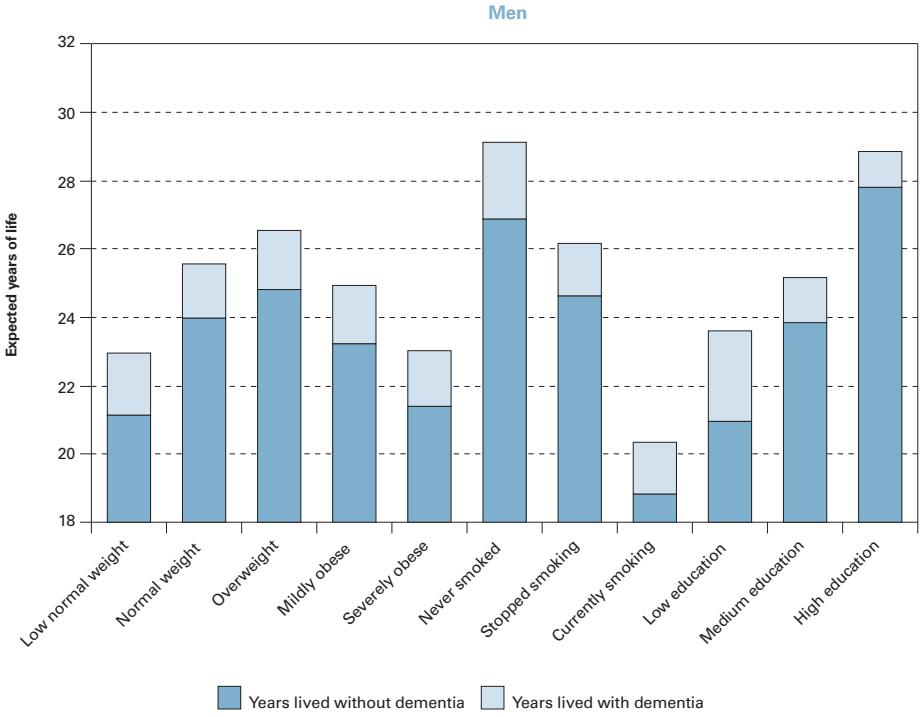
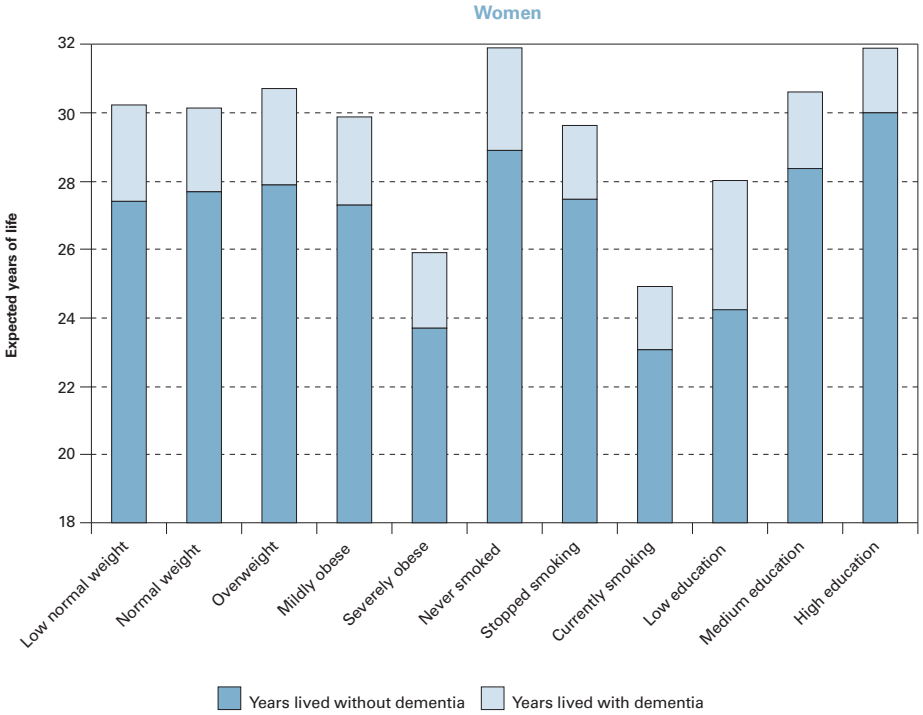


Figure 2. Expected years of life with and without dementia for women aged 55, by risk factor



Cognitive reserve

The results presented here show that a higher level of education shortens both the absolute and the relative life expectancy with dementia. This outcome confirms the cognitive reserve theory, which states that the better educated become demented at a more advanced age, but that they die sooner once demented. The idea behind the theory is that more highly educated people have more cognitive reserves and are therefore better able to delay apparent cognitive impairment and memory loss. As soon as dementia is detected for these people, the stage of cognitive impairment is more advanced and they are likely to die earlier.

To conclude

As dementia is generally a disease of old age and as the average life expectancy is increasing, more and more people will suffer from dementia at some point in their lives. The prevalence of dementia in the Netherlands is expected to increase by 45 percent in the coming 20 years, primarily as a result of population ageing. To this day, the causes of a loss of memory when people grow older are little understood and the development of medication to prevent or fight dementia is still in its infancy. The relationship between a healthy lifestyle and dementia can be paradoxical as factors that extend life can at the same time raise the chance of ever becoming demented. The odds that women will suffer from dementia at some point in their lives are considerably higher than for men simply because women live longer. Conversely, on average smokers live fewer years of life with dementia because they die of smoking at a younger age. Most interesting is the effect of education. The results presented here confirm the cognitive reserve theory, which states that the better educated become demented at a more advanced age, but that once they have dementia, they die earlier. They therefore live fewer years of life with dementia. In a rapidly ageing society in which dementia is becoming more and more prevalent, the fact that the average level of education is rising could offer some solace.

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