

Fat chance!

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A closer look at the effect of overweight on mortality

The number of people with overweight or obesity is increasing the world over. The Netherlands is no exception: In the past 20 years the percentage of obese people has practically doubled to about 12 percent. Our present-day food-orientated consumer society with an abundance of calorie-rich food and a structural lack of physical exercise is often given the blame. Obesity raises health risks, and until the 1990s overweight and obesity were thought to be related to an increased mortality risk. Studies at the time indicated that adiposity was very damaging for one's health and that it claimed as many years of life as smoking. More recent research results from the late 1990s show, however, that overweight at an advanced age does not increase the risk of mortality. In fact, men older than 55 who are overweight live 1.5 years longer than normal-weight men.

In 2005 about half the Dutch population between 18 and 70 years were overweight and expectations are that this percentage will increase strongly in the future. The Body Mass Index (BMI) is widely used to indicate whether or not people are overweight (see Box). According to this categorisation a BMI of between 18.5 and 25 would be the best and healthiest weight, and is referred to as 'normal weight'.

Overweight and mortality

In order to determine the effect of overweight on mortality we used the findings of a large-scale longitudinal survey conducted in the United States since 1992. This *Health and Retirement Survey* is held among middle- and old-aged Americans once every two years. The results presented below refer exclusively to the white population aged 55 and over.

The table shows the relative mortality risks broken down by BMI, with a BMI of between 23 and 25 serving as the reference category. The results show that within the normal-weight group, lighter people (BMI 18.5-22.9) differed from the rest (BMI 23-25), that overweight does not increase mortality, that even mild obesity does not shorten our lives and that the risk of mortality among both men and women is only significantly raised in the event of severe obesity. The figures also show that among men a low 'normal weight' is not good for their health. A low 'normal weight' results in a higher mortality rate than overweight does.

These mortality rates can be expressed in terms

Relative risks of total mortality by BMI among men and women, adjusted for age, smoking habits and level of education. The reference category is normal weight, BMI 23-25.

	BMI	Men		Women	
		55-80	80+	55-80	80+
Low normal weight	18.5-22.9	1.42*	1.10	1.01	1.01
Normal weight	23-24.9	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
Overweight	25-29.9	0.96	0.86	1.03	0.80*
Mild obesity	30-34.9	1.08	0.85	1.07	0.95
Severe obesity	35+	1.47*	1.31	1.95*	1.80

* Significant at p<0.05

The Body Mass Index (BMI) divides body weight in kilos by the height in metres squared (kg/m²). The World Health Organisation (WHO) distinguishes five categories:

	Body Mass Index (kg/m ²)
Underweight	<18,5
Normal weight	18,5 – 24,9
Overweight	25 – 29,9
Mild obesity	30 – 34,9
Severe obesity	35 +

BMI is not an ideal measure of obesity for the following two reasons:

- BMI measures total body weight including bones and muscle mass, whereas only a high fat percentage is damaging to health. For example, heavily built Dutchmen with a given BMI tend to have less fat around the waist than small-built Asians with the same BMI. Skin-fold measurements and waist circumference are better measures of adiposity but are used less in practice.
- This study used self-reported weight. It is a known fact that fat people, in particular women, are inclined to report a lower weight than their actual weight.

of life expectancy, a measure often used by demographers. The figure shows the expected remaining years of life from age 55, broken down by the most common risk factors: BMI, smoking and level of education.

The results show that overweight and mild obesity do not, or only barely affect life expectancy. Severe obesity shortens life by about three years among men and five years among women. Overweight men live an average of 1.5 years longer than normal-weight men, and men who smoke live an average of 9.5 years shorter than men who have never smoked. This difference is eight years for women. The difference between highly educated and lower educated men and women is 6.3 years and 5.4 years respectively. The influence of smoking and a low level of education on life expectancy is therefore much greater than the influence of overweight or obesity.

How does overweight protect against mortality?

Health is a complex system and the relationship between overweight and mortality is not easy to identify. The existing literature shows, among other things, that in the past excess mortality resulting from overweight was clearly related to cardiovascular diseases. Obesity is known to significantly increase the risk of cardiovascular diseases, but mortality from these diseases has halved in the Netherlands since 1972. This may be explained by improved diets, less smoking, better treatment of formerly fatal heart attacks and the improved treatment of risk factors with blood pressure and cholesterol medications. Now that death from cardiovascular diseases has been substantially reduced, overweight has even been found to protect against mortality. Studies have shown that in the event of illness overweight patients have a better chance of survival than those with normal weight or underweight. For cardiovascular diseases, mortality was found to be lower in cases of overweight and moderate obesity. Overweight also protects against hip fractures, which is plausible for the simple reason that fat serves as padding in the event of a fall. It is difficult to identify cause and effect in the relationship between overweight and mortality. The causality may be reversed: People are fatter because they are healthier. In any case, there is proof that overweight, expressed as a BMI of between 25 and 29.9, is associated with reduced mortality.

Quality of life

This does not mean however that overweight is healthier. What we have found is that overweight reduces the risk of mortality and that fatter people are better protected in the event of illness. And there's the crux: Overweight and obesity still increase the risk of cardiovascular diseases and diabetes and these diseases make many older people dependent on care. Recent research in the United States has shown that obesity among the 60-plus is strongly related to disabilities and impairments. In other words, people with overweight or

obesity do not die earlier, but they live longer in poor health. Quality of life and the measurement of years lived in good health have gained in importance in recent years. Not only do most people want to live longer, but they have an even stronger desire to live an independent, healthy life. It is important –in particular for the healthcare sector and for health insurers– to be able to estimate how many years on average people will be in need of care. Ongoing research at NIDI studies the effect of BMI on unhealthy years of life.

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Life expectancy at age 55 for males and females, separated by risk factors BMI, smoking and education. The error bars depict 95 percent confidence intervals

