

LIFESTYLE AND EXCESS MORTALITY DURING THE COVID-19 PANDEMIC

REPORT

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Summary

Excess mortality during the COVID-19 pandemic is higher among individuals with an unhealthy lifestyle. Half of the Dutch population is overweight, and within this group between 70 and 98 percent of excess mortality occurs.

During the COVID-19 pandemic more people have died than would be expected based on historical mortality rates. Statistics Netherlands (CBS) estimates that the total excess mortality in 2020 and 2021 amounts to 30 thousand people (CBS and RIVM, 2022). This study focuses on whether excess mortality is higher among people with an unhealthy lifestyle.

Excess mortality is higher among individuals with an unhealthy lifestyle

Table S.1 shows that excess mortality is higher among people with unfavorable lifestyle factors. About half of the Dutch population is overweight, but within this group between 70 and 98 percent of excess mortality occurs. The difference is also significant for people with a history of smoking or a combination of these two lifestyle factors, and for people who are lonely. For people who drink excessively, the difference is not statistically significant.

Table S.1 Between 70 and 98 percent of excess mortality occurs among overweight people

Lifestyle factor	Proportion of people with this lifestyle factor in:			
	Population	Excess mortality Estimation	Lower bound	Upper bound
Overweight	49%	84%	70%	98%
Excessive alcohol consumption	7%	6%	-2%	13%
History of smoking	54%	77%	63%	90%
Loneliness	43%	70%	55%	86%
Overweight and history of smoking	29%	70%	57%	84%

Note: The table shows the estimated percentage of people with certain lifestyle factors in the population and in excess mortality, with lower and upper limits based on a 5% significance level.

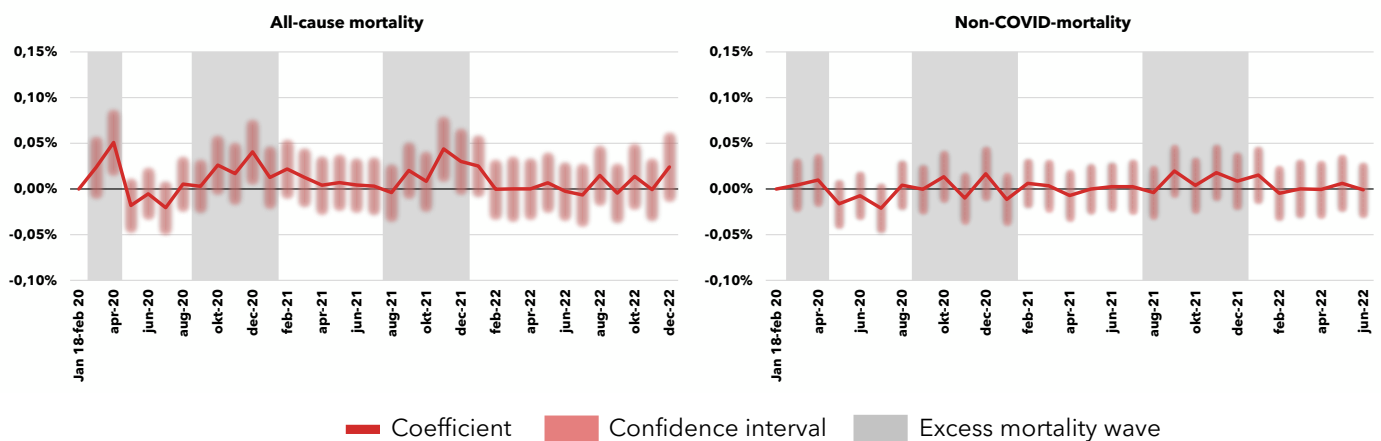
Source: CBS Microdata, processed by SEO Amsterdam Economics.

These figures are based on a comparison of developments in mortality before and during the COVID-19 pandemic between people who meet a certain lifestyle factor and those who do not. In the period from January 2018 to February 2020, mortality for these groups follows a similar trend. However, in the period from March 2020 to December 2022, mortality increases more for people with unhealthy lifestyles than for people with healthy lifestyles. We interpret this additional increase in mortality as excess mortality. For the lifestyle factor exercising, mortality also evolves differently in the period up until March 2020 for people who meet the exercise guidelines of the National Institute for Public Health and the Environment and those who do not. Therefore, Table S.1 does not include figures for this lifestyle factor. However, the study does indicate that excess mortality is higher among people who do not meet the guidelines, especially if they are also overweight or have a history of smoking.

COVID-19 appears to be the determining cause of additional excess mortality

Figure S.1 shows that excess mortality is higher among overweight people. This additional excess mortality occurs during periods of excess mortality, as determined by CBS and RIVM (2022). For causes of death other than COVID-19, there is no statistically significant higher excess mortality among overweight people. The figure shows the difference in the increase in mortality between overweight and normal-weight people compared to the period between January 2018 and February 2020. The left panel shows total mortality and the right panel shows mortality from causes of death other than COVID-19. During the excess mortality periods, all-cause mortality among overweight people increases significantly compared to those without overweight. However, this effect disappears when mortality due to COVID-19 is excluded. Also for other lifestyle factors, excess mortality largely occurs during the excess mortality period. For causes of death other than COVID-19, there is generally no statistically significant increase or decrease in excess mortality.

Figure S.1 COVID-19 caused an additional increase in mortality among overweight people



Note: The figure shows the estimated change in the difference in the probability of death between people who are overweight and those who are not overweight relative to the period of January 2018 to February 2020, with associated 1%-level confidence intervals. The figure on the left includes all causes of death in the analysis. The figure on the right includes only non-COVID deaths. Results run through June 2022, as causes of death from the second half of 2022 were not available at the time of writing.

Source: CBS Microdata, edited by SEO Amsterdam Economics.

Link between overweight and excess mortality is robust within subgroups

For overweight, whether or not combined with a history of smoking or too little exercise, there is also a difference in excess mortality within breakdowns by population groups based on sex, age, origin, education level and perceived health. Within the group of people with poor perceived health, excess mortality among overweight people appears to be particularly high – possibly because of comorbidities. The same is true to a lesser extent for the lower educated and those over the age of 80. These results point to a causal relationship between overweight and excess mortality, although causality cannot be firmly established in this study. For other lifestyle factors, the picture is less robust: within population groups the association with excess mortality disappears. This suggests that the association between these lifestyle factors and excess mortality is partly due to their association with other characteristics that also affect the likelihood of dying from COVID-19. For example, the association between loneliness and excess mortality can probably partly be attributed to the fact that loneliness is higher among the elderly and excess mortality is higher among the elderly.

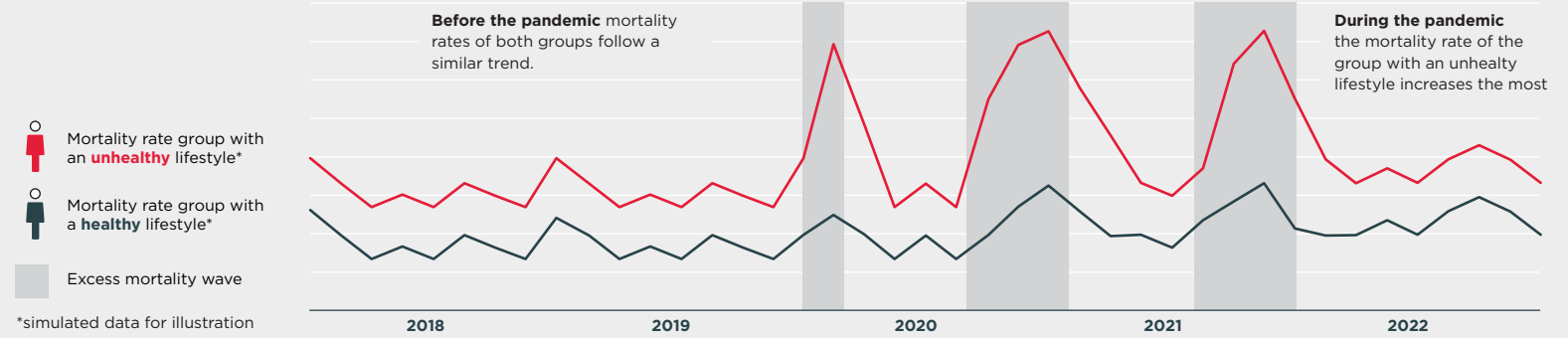
Our results support policies targeting vulnerable groups in future pandemics

This research provides further insight into which groups are vulnerable and supports policies that take this into account. For example, in a future pandemic, lifestyle factors can be taken into account in targeted vaccination campaigns or through the prioritization of effective vaccines in case of scarcity in order to prevent excess mortality. The research also points to the importance of prioritizing people with a combination of unhealthy lifestyle factors - overweight and smoking in particular - to prevent excess mortality. Furthermore, to the extent that the relationship between lifestyle factors and excess mortality is causal, the higher excess mortality among people with unhealthy lifestyles highlights the importance of prevention policies that promote healthier lifestyles. This relationship is most evident for overweight.

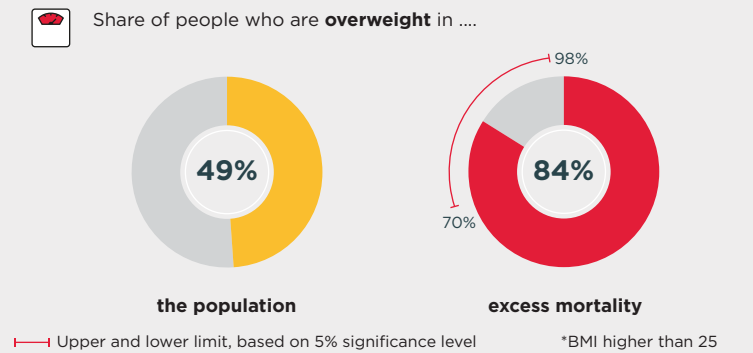
Mortality during the COVID-pandemic: is excess mortality higher among people with an unhealthy lifestyle?

During the COVID-19 pandemic more people have died than expected based on historical mortality rates. The Central Bureau of Statistics estimates that in 2020 and 2021, the total excess mortality amounts to 30 thousand people.

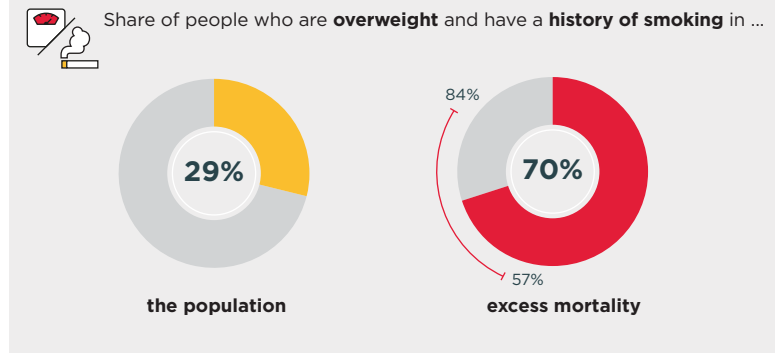
1 EXCESS MORTALITY WAS HIGHER AMONG GROUPS WITH AN UNHEALTHY LIFESTYLE



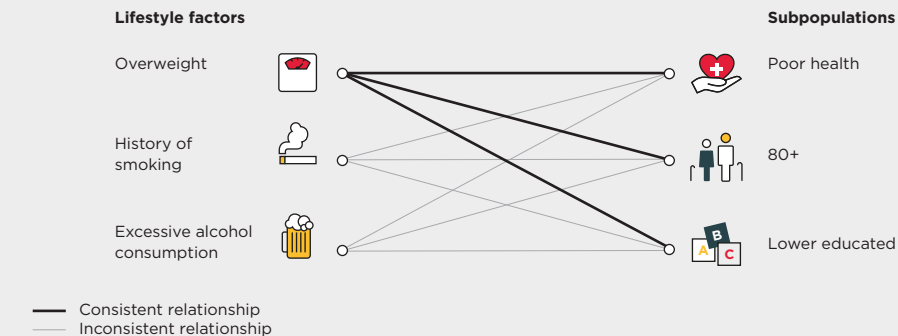
2 EXCESS MORTALITY IS HIGHER AMONG OVERWEIGHT INDIVIDUALS



3 29% OF THE POPULATION IS OVERWEIGHT AND HAS SMOKED, YET WITHIN THIS GROUP 57%-84% OF EXCESS MORTALITY TAKES PLACE



4 RELATIONSHIP BETWEEN EXCESS MORTALITY AND OVERWEIGHT IS CONSISTENT WITHIN DIFFERENT SUBPOPULATIONS



Policy recommendations

The results provide insight into vulnerable groups and support policy measures that take this into account.

- In future pandemics, lifestyle factors can be taken into account in targeted vaccination campaigns, or in the distribution of vaccines. If the policy goal is to reduce excess mortality.
- It is also important to take into account a combination of unhealthy lifestyle factors – particularly obesity and smoking.
- Results also highlight the importance of prevention policies that promote healthier lifestyles.



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