
How deadly is COVID-19?

EDITORIAL

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The author has completed the ICMJE form and declares no conflicts of interest.

The mortality rate from COVID-19 is not constant. It will vary over time and is affected by several external factors.

We are now experiencing the second wave of COVID-19 [\(1\)](#). There are strong indications that it will be different from the first wave, differing in intensity, duration and mortality.

Norway coped well with the challenging spring months of 2020. Compared with other countries, we have had a low infection pressure with few confirmed cases and few deaths. In this edition of the Journal of the Norwegian Medical Association, Gulseth et al. present an overview of deaths in Norway associated with confirmed COVID-19 [\(2\)](#). The authors have used health registry data, and provide an account of the number of deaths and mortality rate due to the pandemic in Norway up to the end of May. Most of the deaths, in terms of numbers and percentages, were in the group aged 80 or over. Approximately half of those who died had been hospitalised during the course of their illness.

The dangers posed by COVID-19 are well documented. The disease is characterised by approximately three times higher mortality than normal seasonal influenza [\(3\)](#). With an almost complete absence of immunity in the population and a virus that is very infectious, the number of deaths can rise swiftly, as we have seen in parts of Europe and the United States this autumn.

Despite the above estimate, it is still disputed how deadly the virus actually is. How COVID-19 deaths are defined, how mortality is defined, what population group is infected, and how many people are tested all influence the calculations. If there is a significant increase in the number of deaths in a pandemic year compared with the same period in the previous year, it can be assumed that the

pandemic has led to excess mortality. This method corrects for any reduction in the number of deaths due to other causes, which may be affected, directly or indirectly, by a pandemic. In Italy, in the Lombardy region in particular, we have seen increased total mortality compared with the previous year (4), but fortunately this has not been the case in Norway. On the contrary, here we have seen a fall in the number of reported deaths due to cardiovascular and pulmonary diseases during the first phase of the pandemic (5). The reason for this change is uncertain but it is possible that changed behaviour due to the pandemic and the ensuing decline in infectious diseases have played a role (6).

Daily newspapers sometimes confuse the terms *mortality rate* and *case fatality rate*. The mortality rate refers to the percentage of the population that die of a disease over a defined period of time, normally expressed as number of deaths per 10 000 or 100 000 inhabitants. The case fatality rate tells us how many people with a confirmed diagnosis actually die. The mortality rate is influenced by the incidence of the disease in the population, while the case fatality rate depends on the number of people with a confirmed diagnosis. The number with a confirmed diagnosis depends in turn on the testing strategy used and how many are tested. So far in the course of the pandemic we have seen a number of changes in both testing strategy and testing capacity. Today we are testing far more people than was possible in the first phase of the pandemic. This means that more cases have been confirmed (giving a higher denominator in the fraction), with a corresponding decline in the case fatality rate.

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Gulseth et al. report a case fatality rate of 2.9 % in Norway in the first phase of the pandemic. This result must be viewed in light of the number of individuals infected with COVID-19 and the number of tests carried out in the period. In all probability, the actual death rate in Norway from COVID-19 is far lower than 2.9 %. Some countries have conducted serological studies in order to calculate the total number in the population who have been infected with COVID-19 (7). When case fatality rates are calculated on the basis of *the total number infected* rather than *confirmed diagnoses*, the rate falls to just below 0.8 %, also in countries that have been hard hit by the pandemic (8).

Mortality is also influenced by the population affected. In line with studies from other countries, that of Gulseth et al shows that the case fatality rate for COVID-19 is age-dependent, with few reported deaths in the age group 60 years and below. In the first phase of the outbreak, it was mostly older adults and the elderly that were infected. Children, adolescents and young adults were underrepresented among those with confirmed infection. Initially, therefore, it was suggested that the virus was less infectious among the young, but this has subsequently been disproved. During the summer months and early autumn we have again seen a rising infection trend in the population, but this time young people have been overrepresented (1). This has led to fewer seriously ill people among cases of confirmed infection, and therefore fewer hospitalisations and a lower mortality rate.

COVID-19 should still be regarded as a dangerous disease with high mortality, particularly among older adults and those who develop a more serious course of illness necessitating hospitalisation. The most important thing we can do as individuals and as a society is to keep the level of infection down.

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Publisert: 14 December 2020. *Tidsskr Nor Legeforen*. DOI: 10.4045/tidsskr.20.0906
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