Covid-19: Interpretation of Morbidity and Mortality Data

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SARS-CoV-2, an emerging humanized virus, has spread in an immunologically naïve population by triggering the Covid-19 pandemic. Such a respiratory tropism virus can theoretically infect up to 60% of the population before its circulation is slowed by collective immunity. The containment measures implemented from March 17 to May 11, 2020, combined with barrier measures (wearing a mask, physical distancing, hand washing, etc.) have significantly slowed the spread of the virus in metropolitan France. This trend is evidenced by the evolution of the reproduction rate of the viral infection R0, which reached a maximum value of 2.8 on March 15, before dropping to 0.8 on May 11 and then to 0.7 on May 31.

In France, as in many other countries, it is difficult to estimate the real attack rate of Covid-19 because a very large number of patients have not been tested and cases suspected by the syndromic approach were not reported. The same applies to the case-fatality rate (number of deaths in relation to the number of infected persons), estimated between 0.3 and 0.6% for the whole population, which is much lower than that of Spanish influenza (2 to 4%), but higher than that of seasonal influenza (0.1%).

The mortality rate is the number of deaths relative to the total population. Bearing in mind that the people most at risk of dying from Covid-19 are over 65 years of age (about 2/3 of deaths) and have co-morbidities, this rate should be stratified by age groups. Currently, only deaths occurring in cases confirmed by RT-PCR are reported, exhaustively at hospital, but much less in EPHADs (Sheltered home for elderly dependent persons). Deaths occurring at home are subsequently estimated by the excess mortality (comparison of mortality observed during the epidemic with mortality during the same months in previous years) based on Civil status data collected by INSEE.

The methods for estimating morbidity and mortality by Covid-19 differ greatly from one country to another, as this particularly demonstrative example illustrates:

- in France (67 million inhabitants), the cumulative number of deaths at the beginning of June was 28,940 for 151,325 cases confirmed by RT-PCR, i.e. an apparent lethality rate of 19% for a mortality rate of 432 per million inhabitants;

- in Belgium (11.4 million inhabitants), where all cases (confirmed and suspected) are reported and all deaths (at home, in hospital or in EHPAD, with or without RT-PCR confirmation) are recorded in real time, the cumulative number of deaths was estimated at 9,505 for a total of 58,615 reported cases, i.e. an apparent case-fatality rate of 16% for a mortality rate of 833 deaths per million inhabitants, the highest in Europe.

Therefore, comparisons of mortality and case-fatality rates between different countries should be made with caution. In European (except Belgium) and North American countries, Australia, New Zealand, etc., the death count is relatively reliable but not exhaustive. In African countries, South America and China, the death toll is often underestimated due to unsystematic or delayed reporting, lack of testing and high mortality from other infectious diseases.

In view of these findings, the National Academy of Medicine recommends:

- the utmost caution in international comparisons of mortality due to Covid-19, taking into account the methods used for case detection and data collection, the demographic structure of populations and the epidemiological context;
- the generalization of electronic certification of the medical causes of death, in order to monitor in real time the indicators of mortality according to its causes;
- the inclusion in the Covid-19 report of indicators of collateral morbidity and mortality (non-Covid-19) as a consequence of the delay or lack of management of medical and surgical emergencies.