

Is case fatality rate an appropriate index to represent the status of case-finding process for COVID-19 in different countries?

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Dear Editor

According to the World Health Organization, almost all countries in the world are currently infected with COVID-19. Although studies show that about 85% of people with the disease are asymptomatic or have mild symptoms, and only 15% are in serious conditions (10%, with a case fatality rate of 15%) and critical (5%, with a case fatality rate of 50%), but so far (7 May 2020) more than 3,806,000 people around the world have been confirmed to be identified as infected with the virus, of which more than 263,000 have died [1–4].

One of the most important index in epidemiological studies is the Case Fatality Rate (CFR) of the disease which is the proportion of deaths caused by the disease compared to the total number of cases diagnosed with it for a certain period of time. So, to have a valid calculation, all infected cases must be identified [5].

At the beginning of an epidemic, the calculation of CFR may be affected by a selection bias. As all of the population is not screened and the identified cases are only the one with acute conditions who are more likely to die, it causes overestimation. However, as the time passes, more infected cases are identified which causes the denominator to increase and eventually leads to a more realistic CFR [6,7].

China was the first country infected with the virus, and now it seems that it is one of few that have partially controlled it. The total number of identified cases and definite death cases caused by this disease are 82,883 and 4633. These numbers show that CFR in china is near 5.5% while it is estimated about 6.9% in the world [4].

Can we consider 5.5% as a reference value for case fatality rate to judge about how appropriate the process of case-finding for this disease in different countries is conducted? To be concise, the answer is no.

Accessing all the confirmed cases, as well as deaths due to the COVID-19 reported in the eight countries

with the highest number of cases in the world, results in different CFR values [4]. For example, the USA, has reported the case fatality rate of 5.9% (1,256,039 cases and 74,093 deaths).

Germany is another country which is at the beginning of the epidemic curve, but has a lower CFR rather than the others. The total number of cases identified in this country is 167,817 and the number of deaths due to this disease is 7,225 (the CFR is 4.3%). But the case fatality rate in other countries such as Italy, France, Iran, Spain and the UK have been reported respectively 13.8, 14.8, 6.3, 10 and 14.9.

It seems that the CFR, lonely, cannot be an appropriate index to assess the accuracy of case findings in different countries, because other factors including the population age distribution, genetic characteristics, health facilities and infrastructure, and appropriate interventions such as isolation and social distancing may affect this index [6,8]. Also, of course, the different strategies of the countries in testing and confirming cases with COVID-19 can have a major impact on it.

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