Statistical Ambiguities in Epidemics of Coronavirus Disease 2019 (COVID-19)

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Coronaviruses are a large group of viruses ranging from the common cold virus to severe acute respiratory syndrome (SARS). Every day, the number of countries affected by the coronavirus has increased, and as the virus progresses, it will likely become an epidemic. Given the increasing infected cases and deaths, it arises to be a challenging problem worldwide (1,2). The epidemic of COVID-19 started from Wuhan, China, in late 2019 and spread to other countries, and at least 1 million people in about 200 countries have been infected, and 165174 have died of 2414617Coronavirus cases at the time of writing (20 April 2020) (3). World statistics of COVID-19 show that the outbreak and mortality rate of this disease is much higher than Influenza A and SARS-CoV virus (4).

Except for China, three countries; Italy, Iran and South Korea were with the highest number of confirmed cases and deaths of coronavirus with many variations from the other countries (especially in Italy and Iran, up to March 15) and also had the highest number of days of involvement with the virus compared to most countries. The differences in the number of deaths could be due to the large number of confirmations that could be considered an indirect indicator of the heavier health-care burden on these countries (5-7).

In the following, we aimed to discuss some issues about the absence of statistics science in this serious public health threat.

Are coronavirus deaths considered less than the actual amount?

Recently, an article predicted the expected number of death in thirty days period for three countries: Korea, Iran, and Italy. In this chart, the forecast numbers were shown in orange color, and the statistics officially reported by the three countries are put in blue together. It seems that the biggest difference between the official and estimated numbers belongs to Iran (Figure 1).

I believe that the officials of the Health Ministry honestly report all the positive cases leading to death, but it's better to report other death statistics that have not been tested for corona for any reason or have been diagnosed only based on CT scans.

Another reason for the less number of cases was the lack of accurate registration of statistics, especially in the early epidemic of this disease. Hence, the instructions for returning cases from medical records and re-registration of accurate statistics can solve this problem.

This epidemic is the deepest crisis that Iranian society has faced in recent decades.

On the one hand, the internal structural gap has severely disrupted management, and its financial resources are severely limited, and on the other hand, its foreign relations are in serious trouble. Other incidents, especially in recent months, have led to growing public distrust of this public administration.

However, one important point is that the Health Ministry and the authorities, contrary to their initial behavior, must take the issue more seriously and cultivate the image of a super-crisis from Corona in their minds so that they can fight it.

What does the result look like when a doctor believes that hospitalized patients have corona, based on his or her experience, but higher authorities only refer to the cases that have been tested? So, it results leads to that a province turns from a white state into a red one very quickly.

Maybe, the reason for the high mortality rate for patients in Iran is that the number of patients is not accurate. We should have two statistics. One is official statistics, and the other is estimates statistics. Estimated statistics are important for people. While, the official statistics could be zero, as it was before the first death of Corona.

Now, physicians' perceptions of patients, as well as statistical estimates of the number of patients, must be trusted, and all statistics and atlases of the Iranian corona must be prepared and distributed according to statistical estimates. It is necessary to trust the physicians' diagnosis of the number of patients as well as statistical estimates. The efforts of the Health Ministry should be to bring official statistics closer to analytical and estimates. Ignoring the estimated statistics, we get no other result than to deceive ourselves.

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In fact, the role of statistical science is to express many facts through estimation.
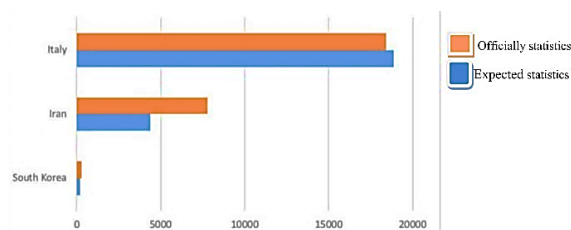

Figure 1. Numbers of official statistics reported by the three countries and the expected number of deaths in thirty days period in 3 countries

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