

Is it possible to eradicate the covid-19 or not?

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Dear Editor,

In December 2019, four cases of pneumonia with an unknown cause were reported to the World Health Organization (WHO) in Wuhan, China. Since then, SARS-COV-2 disease has spread rapidly all around the world. Hence, the WHO considered the outbreak a pandemic on March 12, 2020 [1].

Elimination and eradication of human diseases have been the focus of conferences, symposia, workshops, and public health planning meetings for more than a century. Despite all these plans, malaria and yellow fever eradication plans have not been successful in recent years. Successful eradication of these diseases will significantly help to improve the economic, social, biological, and political situation to achieve the greater goal of disease control. Given the biological characteristics of the covid-19 and the widespread mortality of this virus worldwide, can this disease be considered a candidate for eradication?

Different definitions have been proposed for eradication, including:

Definition 1: Elimination of the disease forever [2]. Can COVID-19 be eliminated forever?

Definition 2: Non-occurrence of disease even without using preventive measures [3]. Can we be sure that new cases of COVID-19 will not occur without preventive measures?

Definition 3: Non-transmission of disease to humans in a specific geographical area [4]. Can we eradicate COVID-19 at least in a specific geographical area?

Definition 4: Zero incidence of disease worldwide following the disease control efforts [5]. Can we reduce the incidence of COVID-19 to zero through global control and health measures?

Given the high incidence and morbidity of COVID-19 mentioned in the foreword, one of the most important questions for the future is whether COVID-19 can be eradicated from its new human host or not?

Experience in eradicating other infectious diseases, such as smallpox and polio, has shown that complete eradication of infectious diseases (like COVID-19) can be possible only if the following three conditions are met:

1. There would be an effective intervention to stop the transmission, ideally, a vaccine should be available.
2. There would be simple diagnostic tools with sufficient sensitivity and specificity should be available to diagnose the levels of infection causing the disease transmission.
3. And the last condition, the human infection must be a necessary causal factor for the course of life, and the pathogen cannot survive if the human-to-human transmission chain is broken. The existence of an animal reservoir greatly complicates eradication, not preventing it, unless there would be interventions to break the transmission chain in animal species too.

To globally eradicate COVID-19, control interventions need to be safe, simple, and feasible. The ongoing control measures for COVID-19 disease, including disease detection, isolation, follow-up, contact follow-up, and quarantine of people in contact with the patient for up to 14 full days, are effective but extremely time-consuming, costly, and socially fragile. As a

result, limited countries may continue such control measures over time.

Although the WHO announced in February 2020 that it is not expected to find a vaccine against the acute respiratory syndrome virus (SARS-COV-2)—the virus that causes COVID-19—in less than 18 months, in November 2020, Pfizer and Moderna announced positive results of the effectiveness of their vaccine against COVID-19. Certainly, finding a highly effective vaccine to eradicate a disease is one of the basic conditions, which has been made possible to prevent the development of COVID-19 disease and shows an optimistic outlook for the eradication of COVID-19 disease.

Regarding the third condition necessary for the eradication of COVID-19 disease, it should be mentioned that acute coronavirus acute respiratory syndrome (SARS-COV-2) is the cause of a common disease between humans and animals and it is a newly emerging disease. The disease has human and animal reservoirs. Although the presence of a non-human reservoir somewhat complicates the eradication of the disease, it cannot prevent it.

Finally, considering the three conditions necessary to eradicate a disease like COVID-19 and the potential and facilities available to prevent and control SARS-COV-2, it seems that it will not be impossible to eradicate this disease.

Transparency declaration

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