What is a COVID-19 death?

"Covid19 Mortality: Myiths Vs. Facts *- India has a robust system of recording Covid-19 deaths."*

- Ministry of Health and Family Welfare, Government of India, July 22, 2021[1]

Dear Editor,

Goyal *et al.* make a mortality analysis of COVID-19 cases during the (Indian) second wave and (attempt) its comparison with the (Indian) first wave by conducting a hospital-based study. Thereafter, they get their study results published in the October 2022 issue of the Journal, and the investigators deserve to get accolade for their efforts.[2] When the investigators go through mortality records of the deceased patients, sort out their medical certificates of cause of death, and then compare such data between various waves, we learn a few lessons and become wiser by the visual impressions made by pie charts of the article. The easy-to-understand depictions construct a bird's eye view, and in a single figure, we make sense of a huge set of data. We need more such data sorting studies making secondary analysis of stored pieces of information which may cast a new impression and help us to generate novel insights when the train ran full steam during different waves of the pandemic.

Nevertheless, when we went through the study, there are discrepancies towards which we want to draw the authors' attention. Under a heading of 'Methods', the investigators state in the second paragraph that they adopted an operational definition of the cases in three groups, mild, moderate, and severe ones, and when defining them, they begin by having a prefix of lab-confirmed cases. What we infer then is that only lab-confirmed cases were categorised in three groups and the rest were not.

But that definition is against available evidence. A false negative test result is a known entity in diagnosis of the medical condition, and its value depends upon several factors, which *inter alia* include pre-test probability of having the infection and threshold we set for having a diagnosis.[3] During the epidemic, we observed many cases who were RT-PCR-negative but had extensive lesions on Chest CT scan and are known to be associated with SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). Hence, if lab-confirmed cases in this study made up only microbiology-confirmed cases, we propose to add CT scan reports as well in this category to provide additional data. Radiological lesions constitute a significant component of diagnostics when test availability was limited, especially in the initial stages (first wave) of the pandemic or when a patient presented late in his disease course.

Union Health Ministry, Government of India, and Indian Council of Medical Research issued guidelines for 'official document' for COVID deaths.[4] A directive entitled 'Guidance for appropriate recording of COVID-19 related deaths in India' states in 5 points how a death should be recorded while submitting the relevant papers to higher authorities.[5] There, at point number 2.3, it emphasises ICD-10 codes for COVID-19 provided by World Health Organization. Its point number U07.1 highlights virus identified and U07.2 virus *not* identified. Hence, it is evident that the UN body realised then that a few patients died due to the viral infection, but its causative agent could not be identified. What inference we need to draw is that identification of the virus by microbiological test is not a *sine qua non* prerequisite for diagnosis. Therefore, we want to know how many cases in this study died during (then) two waves of the pandemic, who had no virological confirmation. This missing part of the puzzle may guide us to connect the dots.

Under the first paragraph of 'Results' of the study, the authors underscore 22.8% mortality rate of the infection among patients who were brought to their tertiary care centre. When cases suddenly surged in an area, we call it wave, and during the rising phase of the pandemic, when on ascending limb, we observed collapse of the civilisation as know it in several parts of the world.[6] Patients died not only in hospital corridors and galleries but later on even in ambulances waiting for a vacant hospital bed and then at homes.[7] Therefore, if diagnosis of a patient could not be confirmed when he reached a health care facility during one of the waves, it is something understandable and may be due to exigencies.[8]

But it will be an egregious outreach of our collective investigation if we calculate the mortality rate of a wave of pandemic on the basis of limited information we have had when a wave recently passed by. If we try to do so, we think that a disclaimer of the way we collected the data, with possible sources of errors, should also be indicated along with publishing such results. In lieu of that, a novice reader may draw incorrect conclusions by going through the abstract, reading it long after the pandemic faded. We make usual rules for usual circumstances. COVID-19 pandemic and its waves are not a usual phenomenon by any yardstick.

Therefore, the tools we use to measure various epidemiological events need calibration if we want to utilise them for this purpose. We will draw correct lessons from different waves of the catastrophe when we use the correct methodology. If we deploy previously used formulae to estimate mortality rate during a wave of the pandemic, the answer we get may be questionable.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Received: 28-11-2022 **Revised:** 30-08-2023
Accepted: 01-09-2023 **Published:** 21-11-2023

Access this article online

Quick Response Code:

Website: http://journals.lww.com/JFMPC

DOI: 10.4103/jfmpc.jfmpc_2329_22

How to cite this article: Gupta H, Kumar S. What is a COVID-19 death? J Family Med Prim Care 2023;12:2994-5.