



Over the course of the COVID-19 pandemic, we have focused separately on incidence and mortality, whether in terms of total or per capita values. Today, we will take a closer look at the relationship between these two metrics by discussing the case fatality ratio (CFR). CFR helps us understand how severe a disease is by determining what percentage of patients ultimately die. The CFR for the vast majority of countries remains below 3%. In fact, 86% of countries (163 of 190) and territories tracked by [Our World in Data](#) are reporting CFR of 3% or less, 63% (120) are reporting a CFR 2% or less, and 31% (59) are reporting a CFR of 1% or less. Globally, the cumulative CFR is currently 2.3%.

High CFR can be driven by a number of factors. As we observed early in the pandemic, CFR was elevated initially in countries that were severely affected, due in part to a lack of understanding of how to treat COVID-19, an absence of therapeutics against the novel disease, and overwhelmed health systems, which did not allow patients to receive the same level of attention and care they would under normal circumstances. But one of the principal drivers of CFR is testing volume, which factors directly into how CFR is calculated. Early in the pandemic, limited testing capacity meant that only the most severe patients were tested and detected, which meant a higher percentage of identified patients went on to die. As testing volume increased, more mild and moderate cases, as well as asymptomatic infections, were identified, which [shifted the CFR down](#) due to detecting more infections relative to deaths. Additionally, improvements in our understanding of how to treat COVID-19 patients, increased availability of effective therapeutic drugs, and waning community transmission that reduced the burden on health systems also reduced COVID-19 mortality.

While most countries are reporting moderate or low CFR, [several countries stand out as concerning](#). Most notably, Yemen is currently reporting a CFR of 28%, meaning more than 1 out of every 4 identified cases ultimately dies. Yemen's health system has been devastated by years of civil war, including [numerous attacks on hospitals and healthcare workers](#). Without a fully functioning healthcare and public health infrastructure, Yemen's COVID-19 patients cannot receive the clinical care they need. [Yemen does not report testing data](#), but considering the condition of the public health and healthcare sectors, it is likely that testing volume is extremely low, which would dramatically increase the calculated CFR. Mexico is reporting the

second highest CFR globally (9.5%), and 9 other countries are reporting 5% or higher, including several in Africa, South and Central America, and the Eastern Mediterranean region as well as China. Fortunately, 8 of these 11 countries are reporting decreasing trends in CFR. Among this group, only Bolivia, Egypt, and Syria are reporting increasing trends.

Of this group of countries, only Bolivia, Iran, and Mexico have [test positivity data available in the Our World in Data database](#). Bolivia is currently reporting test positivity of 9.2%. This is nearly double the [5% benchmark recommended by the WHO](#), but it is a significant improvement over its peak of 63.6% in mid-July. Iran's test positivity has increased steadily since early September, now up to 32.1%. Mexico's most recent test positivity data is from November 12, when it reported 48.2%. Elevated test positivity indicates that testing volume is not sufficient to capture the full scope of transmission in these countries, which could also potentially account for some portion of the elevated CFR in these countries.

NOTES:

1. We are only discussing case fatality ratio (CFR), as opposed to distinguishing it from infection fatality ratio (IFR). IFR traditionally includes individuals who are determined to be infected but do not exhibit symptoms of the disease as well as symptomatic cases, but the data we have available do not distinguish between cases and infections. The "cases" reported by countries typically include both the individuals with positive tests and those with clinical diagnoses, without differentiating between symptomatic cases and asymptomatic infections. Additionally, many asymptomatic infections are never detected, or even tested, so we cannot include those individuals in this analysis. Considering the expected proportion of infections that are asymptomatic or mildly symptomatic, we expect that the IFR for COVID-19 is considerably lower than both the true CFR and the figures discussed above. Many research efforts are ongoing to better characterize the total number of infections, including those never formally identified, in order to better approximate IFR.

2. You may be more familiar with the terms "case/infection fatality rate" (also commonly referred to by the acronym CFR/IFR); however, "rate" implies a temporal nature to the data (ie, cases/death over a specified period of time). We are evaluating the total data from the beginning of the pandemic so we will refer to it as "case fatality ratio."