

Expert Opinion

What do we know about the risk of dying from COVID-19?

The COVID-19 pandemic and the lockdown imposed in an attempt to halt the spread of the novel Corona Virus (SARS-COV-2) have made life difficult for millions of Indians. There has been nearly 6 lakh cases and more than 27,000 deaths worldwide due to COVID-19 till date.

The spectrum of SARS-CoV-2 infections can vary from asymptomatic or mild infections, to severe pneumonia, leading to respiratory failure, shock and death. The proportion of asymptomatic infections can vary from 20 to 60% of all infections. SARS-CoV-2 causes a highly contagious infection, and even persons with asymptomatic or mild infections can shed large amount of virus in their respiratory secretions very early in the course of illness.

To understand the risk of dying from COVID-19, we have to understand the difference between 'Crude Mortality Rate', 'Case Fatality Rate', (CFR) and 'Infection Fatality Rate', (IFR). The denominator used is different in each of these measures of mortality. The Crude Mortality Rate measures the **probability that any individual in the population will die from the disease** (not just those who are infected, or are confirmed as being infected), while CFR measures the **probability of dying among those confirmed to have the disease**. IFR is the **probability of dying among the total number of infections**, and not just 'confirmed cases', which is very difficult to measure unless you have extensive testing.

The CFR itself can change with time and place. In China, CFR was higher in the early stages of the outbreak (17% for cases from 1 to 10 January, 2020) and reduced to 0.7% for patients with symptom onset after 1 February, 2020. The reported CFR from Italy is much higher, probably due to the higher age of the population and presence of multiple medical conditions in infected individuals. In COVID-19, the risk of dying is related to your age and the presence of comorbidities.

Table. Case-Fatality Rate by Age Group in Italy and China^a

	Italy as of March 17, 2020		China as of February 11, 2020	
	No. of deaths (% of total)	Case-fatality rate, % ^b	No. of deaths (% of total)	Case-fatality rate, % ^b
All	1625 (100)	7.2	1023 (100)	2.3
Age groups, y				
0-9	0	0	0	0
10-19	0	0	1 (0.1)	0.2
20-29	0	0	7 (0.7)	0.2
30-39	4 (0.3)	0.3	18 (1.8)	0.2
40-49	10 (0.6)	0.4	38 (3.7)	0.4
50-59	43 (2.7)	1.0	130 (12.7)	1.3
60-69	139 (8.6)	3.5	309 (30.2)	3.6
70-79	578 (35.6)	12.8	312 (30.5)	8.0
≥80	850 (52.3)	20.2	208 (20.3)	14.8

^a Data from China are from Chinese Center for Disease Control and Prevention. ⁴ Age was not available for 1 patient.
^b Case-fatality rate calculated as number of deaths/number of cases.

(Table from: G Onder. JAMA, 2020)

Comorbid condition	CFR (%)
Cardiovascular disease	10.5
Diabetes mellitus	7.3
Chronic respiratory disease	6.3
Hypertension	6.0
Cancer	5.6
None	0.8

The CFR **DOES NOT** actually reflect the risk of dying from COVID-19. This is because the denominator includes only the confirmed cases – those who got infected, developed symptoms, sought care from a clinic or hospital, got tested, and the test came back positive. So, someone with asymptomatic or mild infection is unlikely to be counted as a “confirmed case”, unless you do extensive testing in the community. This has been happening in countries like South Korea, Germany and Iceland. So, the reported mortality figures (<1%) from these countries are likely to represent the true IFR of COVID-19. Iceland has tested a higher proportion of people than any other country (9,768 individuals), equivalent to 26,762 per million inhabitants. In Italy, testing is restricted to patients coming to

the hospital, and the mortality figures are a reflection of the CFR. You can also ask the question whether an elderly Italian with multiple comorbidities is dying from or with COVID-19. Only time will tell. When you do extensive testing in the community, you are much more likely to diagnose asymptomatic or mild infections. If testing is done only for symptomatic patients coming to a hospital, patients are likely to have more severe disease and higher probability of dying.

The IFR from the current COVID-19 pandemic has been estimated to be 0.29% (95% CI, 0.25% to 0.33%) by researchers from the Center for Evidence-Based Medicine, Oxford. In other words, if you get SARS-CoV-2 infection (very high probability in the middle of a pandemic caused by a highly infectious viral pathogen), your risk of dying from the infection is roughly 3 per 1000. Or 997 of the 1,000 individuals who get a SARS-CoV-2 infection will only have an asymptomatic infection or mild-to-moderate illness.

References:

1. <https://www.cebm.net/covid-19/global-covid-19-case-fatality-rates/> (Accessed on 27/03/2020)
2. <https://jamanetwork.com/journals/jama/fullarticle/2763667> (Accessed on 27/03/202)

Key points

1. We are in the middle of a pandemic caused by a highly infectious virus. So, most (if not all) of us will get the infection.
2. A substantial number will have no or mild symptoms only.
3. Those who die due to severe pneumonia are usually elderly with serious underlying medical conditions.
4. In countries where they are doing extensive testing in the community, the mortality appears lower as mild infections are picked up. In countries where only sick people coming to a hospital are tested, mortality appears higher.
5. The average risk of someone dying from COVID-19 is very low.

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