IHME's latest COVID-19 forecasts indicate that the World Health Organization (WHO) Eastern Mediterranean Regional Office (EMRO) will reach about 182,311 deaths by January 1, 2021. If mask wearing in public increases to 95%, there will be around 99,217 deaths, and about 83,094 lives could be saved.

Current situation

COVID-19 infections and deaths started to increase in the region over the last week while reductions in mobility and mask use remain low. We expect a major surge in daily cases and deaths in November and December, driven by seasonality and decreased vigilance.

- COVID-19 transmission as captured by reported cases has started to increase again (Figure 1). Deaths were declining since early July but are now rising (Figure 2a).
- About 16% of deaths in the region are among those aged 45 or younger (Figure 2b).
- Examination of effective R (the number of new infections caused by each infection) on September 3, based on the combined analysis of data on cases, hospitalizations, and deaths, suggests that transmission is increasing in five countries: Iran, Lebanon, Oman, Libya, and Palestine (Figure 3).
- The percentage of the population infected with COVID-19 is still very low, with the highest rates observed in Bahrain, Iran, Iraq, Oman, Saudi Arabia, and Kuwait (Figure 4).
- The fraction of infections being detected has risen just a little during the epidemic; the fraction of infections detected and reported as confirmed cases is about 7.5%. This rate has not improved in the past month (Figure 5).
- Countries with daily death rates over 1 per million are Bahrain, Lebanon, Palestine, Morocco, Iraq, Iran, Libya, and Oman (Figure 6).

Trends in key drivers of transmission (mobility, mask use, testing, and seasonality)

- Social distancing mandates have stayed relatively constant over the last week. Many countries in the region have started or are about to start the school year with a combined approach of in-person and online instruction (Table 2 and Figure 7).
- Mobility measured by app use on smartphones, including Android and Apple iOS, has increased since early April, with a slight decline around the two major Islamic holidays (Figure 8a). Mobility is now about 12% less than the baseline in January. It remained stable during the past couple of weeks but now shows some signs of slight decline. However, we expect the relaxation of mandates in the region will tend to increase mobility through September. The lowest levels of mobility are currently seen in Saudi Arabia (Figure 8b). A caution about our estimate of mobility is that due to the use of data collected from smart devices, declines in mobility may be overestimated, as smartphone market penetration tends to be higher in wealthier populations, and wealthier people are more likely to reduce their mobility.
- Despite mask mandates in EMRO, mask use has declined to less than 40% (Figure 9a). The highest mask use is observed in the Gulf countries, but it is less than 30% in Afghanistan, Yemen, Palestine, Sudan, Egypt, Libya, and Tunisia (Figure 9b).
- COVID-19 testing rates have increased in the region but are still below 45 per 100,000 (Figure 10a). The highest rates of testing are now in UAE (Figure 10b).

Projections

- Our estimate of cumulative deaths for EMRO has increased from 165,847 deaths by January 1, 2021, from our last week's projections, to 182,311 deaths. As of today, about 56,681 COVID-19 deaths have occurred in the region, and our estimates suggest 125,630 deaths from now until January 1 (Figure 12).
- If a herd immunity strategy is pursued, we estimate 201,761 deaths in the region by January 1 (Figure 12).
- We expect that the daily death rate will start increasing in the coming week and will reach about 2,826 deaths per day by January 1 (Figure 13).
- These forecasts assume that countries will on average re-impose a package of social distancing mandates when the daily death rate reaches 8 per million. Our current projections show that several countries will re-impose mandates by January 1: Libya in October; Oman, Palestine, and Morocco in November; and Bahrain, UAE, Iraq, Iran, and Lebanon in December (Figure 15).
- If mask use were increased to 95%, the level observed in Singapore and several countries in Latin America, the projected number of deaths would be nearly 99,217 deaths, and about 83,094 lives could be saved. This is about a 66% reduction in the number of deaths expected between now and January 1 (Figure 12 and 13).
- By the week of January 1, COVID-19 is expected to the fourth leading cause of death in EMRO (Table 3).

EMRO-specific notes

- A caution for EMRO: since many of the countries have unrest or wars, the chance of under-reporting of cases due to low testing rates and deaths due to poor vital registration is very high. Our current estimates do not include excess mortality.
- Some countries in the region have reported very few deaths, indicating that they have peaked and that their epidemic is declining (e.g., Pakistan, Saudi Arabia, and Egypt). In addition to the under-reporting issue, it is possible that previous coronavirus infections have resulted in some immunity to COVID-19. A few factors in the EMRO Region may have contributed to a reduction in the size of the epidemics in some of its countries. For example, the smaller relative size of contact networks in EMRO countries – compared to the West – may have limited the spread. It is also possible that some super-spreaders have been removed from the infection pool (i.e., the death or immunity of a key "connector" in a community such as a store employee, etc.).

Model updates

1. Change made to assign a mandate date within each draw

   In our projections, we generate a set of 1,000 models to get the estimates and the confidence interval. Each of these 1,000 models differs in terms of resampling past deaths, cases, and hospitalizations, and sampling ranges of key parameters such as the duration of time spent infectious. For each of the 1,000, we sample data and parameters, the regression predicting b(t), and the transmission parameter. Each model will generate different coefficients on key drivers such as mobility, mask use, testing, and pneumonia seasonality. This allows us to have a range for these estimates. In previous versions of the model, we have re-imposed mandates on all 1,000 models on the same day when the mean daily death rate for a location across the 1,000 models reaches 8 deaths per million per day. In this release, we have modified the model by re-imposing mandates for each of the 1,000 model projections on the day in that model with the death rate exceeds 8 per million per day (i.e., the re-imposing is now at each draw and we have 1,000 scenarios/dates for reaching the level). This means that we generate a range of days when the mandates will be re-imposed for each location. We believe this is a more realistic reflection of what might occur in each state. This new approach will result in lower forecasts since more extreme cases with rapidly expanding epidemics in our 1,000 models will re-impose mandates earlier.

2. The impact of increased testing is declining

With each re-estimation of the regression coefficients over the last three months for predicting b(t), the transmission parameter, the coefficient on testing per capita has decreased sharply. In many of the 1,000 models, the coefficient is now 0 and not associated with transmission. This declining role of testing in reducing transmission seen empirically may have several explanations. First, many tests are being conducted but results are not being returned fast enough to impact transmission through contact tracing and isolation. Second, the capacity of the public system to do contact tracing, testing, and isolation is overwhelmed in many locations by the large number of cases, especially during the peak. Third, since most testing is still in symptomatic individuals, testing per capita may be poorly correlated with actual testing of contacts that may have a larger impact on reducing transmission. Fourth, when the epidemic starts to increase, testing of symptomatic individuals increases and vice versa.

3. Herd immunity

Given considerable public discussion of the role of herd immunity in explaining peaks and subsequent declines in the daily death and case rate, we have explored the implied total death rate for each country based on the infection-fatality rate (IFR) and different assumptions about the level of cumulative infection that will be associated with herd immunity. The natural experiment of the Charles de Gaulle aircraft carrier suggests that up to 70% of individuals can get infected in a situation of near-random mixing. But various theories, including the role of super-spreaders, non-random mixing in less dense populations, non-overlapping social networks, and some prior coronavirus immunity, have led to theories that herd immunity may take place at much lower levels of cumulative infection, such as 35% to 65%. Our IFR, based on the analysis of seroprevalence data and herd immunity at 35% cumulative infection, would suggest the region will eventually see 423,249 deaths; with herd immunity at 50% cumulative infection, the figure would be 604,641 deaths, and at 65% it would be 786,033 deaths. Scale-up of a vaccine or improved treatments could substantially reduce these figures. These calculations only serve to suggest that the epidemic in the region is far from complete, and even in the optimistic scenario of herd immunity kicking in at 35% cumulative infection, may be less than 30% of the way through the epidemic. Finally, in many countries where the infected population is high, such as Ecuador, there is evidence against the theory of herd immunity at a low level of infection.

4. Seasonality

Our projections to January 1 take into account the seasonality of COVID-19. The large increase in daily deaths expected in late November and December is driven by continued increases in mobility and declines in mask use, but most importantly by seasonality. We estimate the likely impact of seasonality by examining the trends in the Northern and Southern Hemispheres. For example, Southern Hemisphere countries such as Argentina, Chile, southern Brazil, and South Africa had much larger epidemics than expected on the basis of mobility, testing, and mask use during their winter months. The statistical association between COVID-19 transmission rates and pneumonia seasonality patterns is strong in our data and is the basis for our estimate of the magnitude of the seasonal increase that is expected.

5. Infection fatality rate

Clinical experience suggests that case management of COVID-19 has improved through oxygenation/ventilation methods and use of dexamethasone and remdesivir. This improved management would manifest itself as a reduction in the infection-fatality rate at each age. We have looked for statistical evidence of this shift in two ways. First, we have examined the COVID-19 admission-fatality rate – the number of deaths divided by hospital admissions. To date, the admission-fatality rate has remained constant since April. This could be explained by two possible factors. First, it is possible that there is no change in the infection-fatality rate. Second, it is possible that the infection-fatality rate has declined because hospitals are admitting only more severely ill patients over time, using better triage. However, we have looked at the directly measured infection-fatality rate using seroprevalence studies; to date we have not detected any statistically significant decrease in the infection-fatality rate. We will continue testing on a regular basis for statistical evidence that the infection-fatality rate is declining, but we do not see it on the basis of our seropositivity analyses yet.

IHME wishes to warmly acknowledge the support of these and others who have made our COVID-19 estimation efforts possible. Thank you.

For all COVID-19 resources at IHME, visit http://www.healthdata.org/covid.

Questions? Requests? Feedback? Please contact us at https://www.healthdata.org/covid/contact-us.

COVID-19 Results Briefing: the Eastern Mediterranean Region

Institute for Health Metrics and Evaluation (IHME)

September 17, 2020

This briefing contains summary information on the latest projections from the IHME model on COVID-19 in the Eastern Mediterranean Region. The model was run on September 16, 2020.

Model updates

Updates to the model this week include additional data on deaths, cases, and updates on covariates.

Current situation

Figure 1. Reported daily COVID-19 cases

Table 1. Ranking of COVID-19 among the leading causes of mortality this week, assuming uniform deaths of non-COVID causes throughout the year

Cause name	Weekly deaths	Ranking
Ischemic heart disease	15,912	1
Neonatal disorders	7,028	2
Stroke	6,729	3
Lower respiratory infections	3,385	4
Road injuries	2,935	5
Cirrhosis and other chronic liver diseases	2,806	6
Chronic kidney disease	2,501	7
COVID-19	2,432	8
Diabetes mellitus	2,403	9
Diarrheal diseases	2,386	10

Figure 2a. Reported daily COVID-19 deaths and smoothed trend estimate

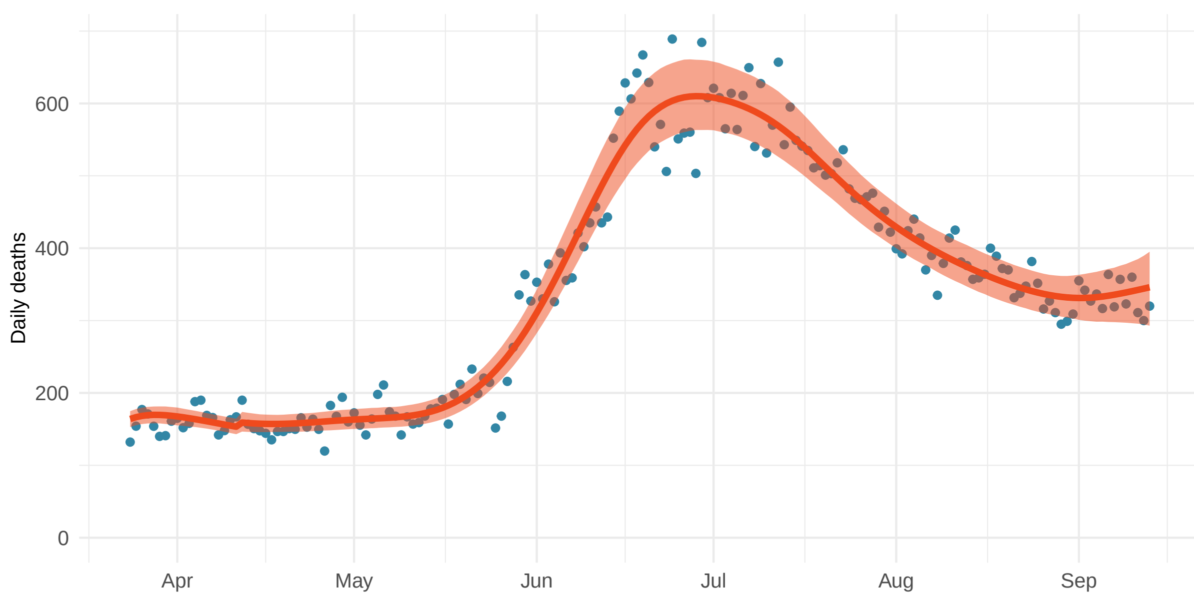


Figure 2b. Estimated cumulative deaths by age group

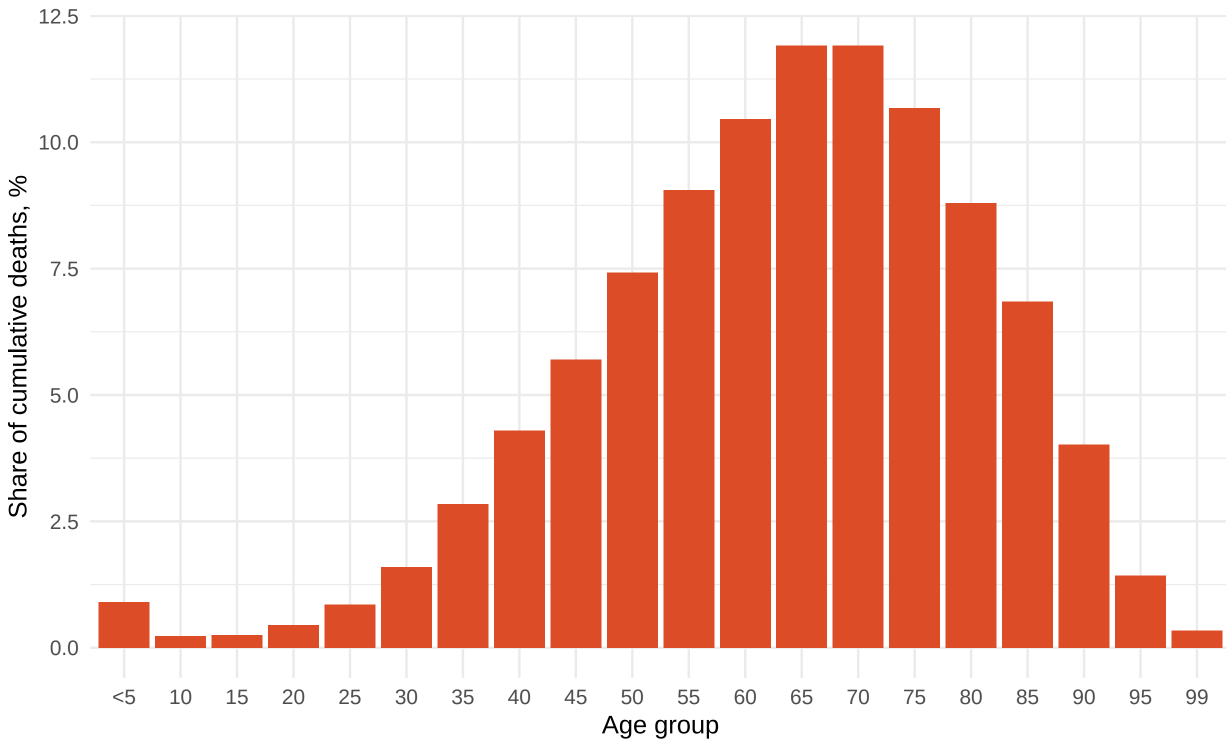


Figure 3. Mean effective R on September 03, 2020. The estimate of effective R is based on the combined analysis of deaths, case reporting and hospitalizations where available. Current reported cases reflect infections 11-13 days prior so estimates of effective R can only be made for the recent past. Effective R less than 1 means that transmission should decline all other things being held the same.

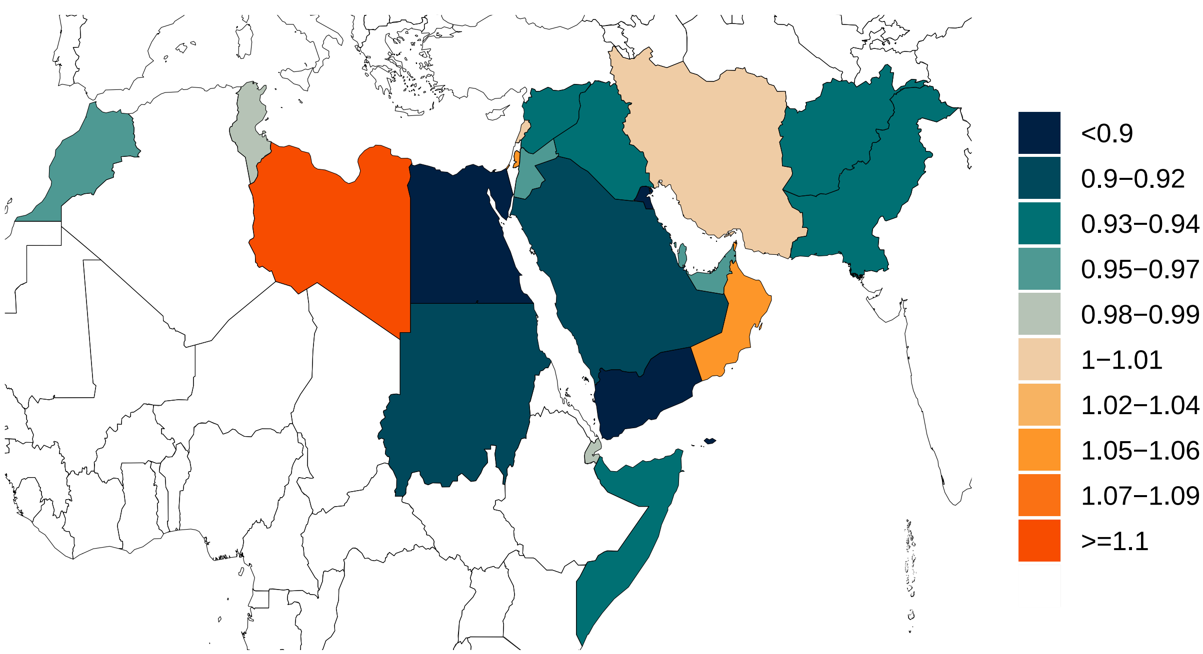


Figure 4. Estimated percent infected with COVID-19 on September 14, 2020

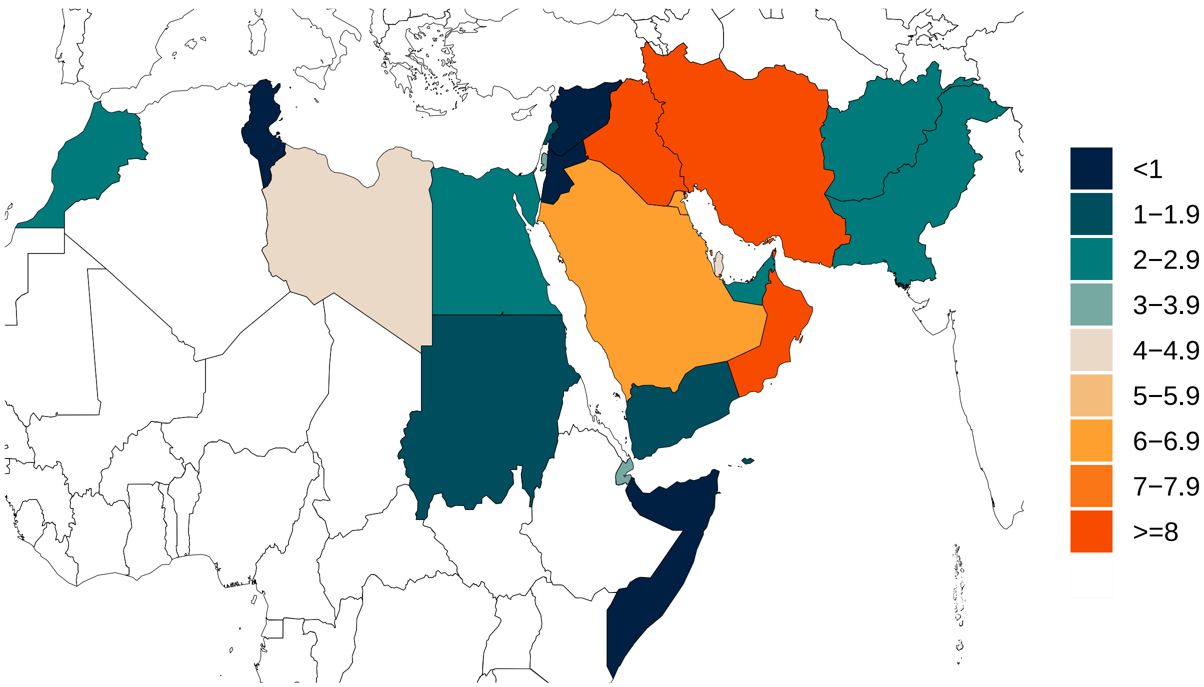


Figure 5. Percent of COVID-19 infections detected. This is estimated as the ratio of reported COVID-19 cases to estimated COVID-19 infections based on the SEIR model.

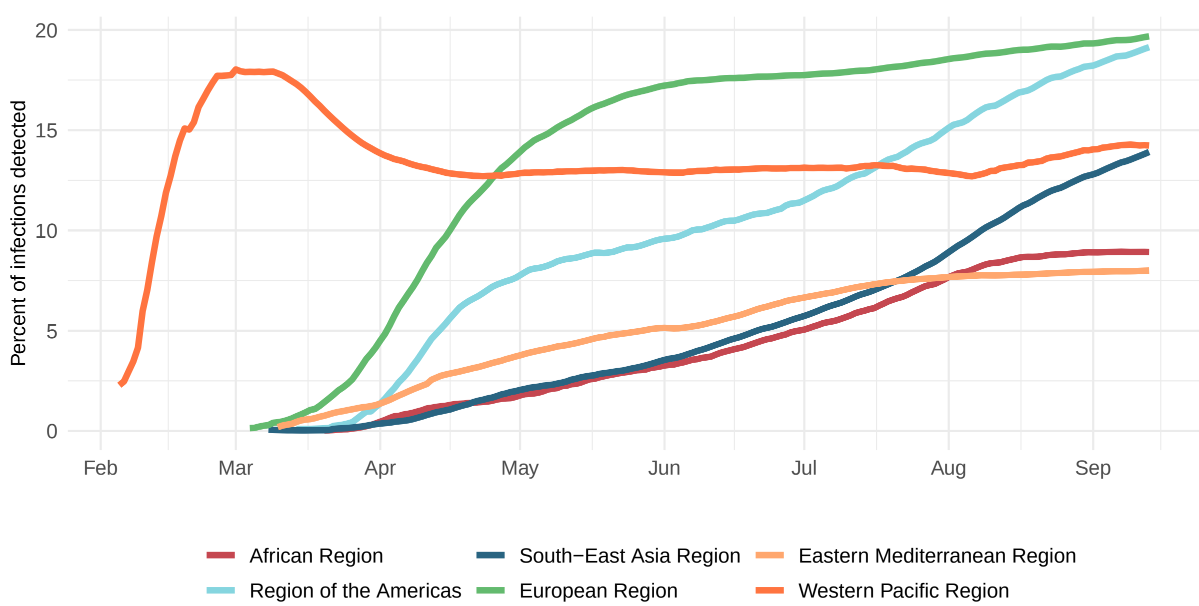
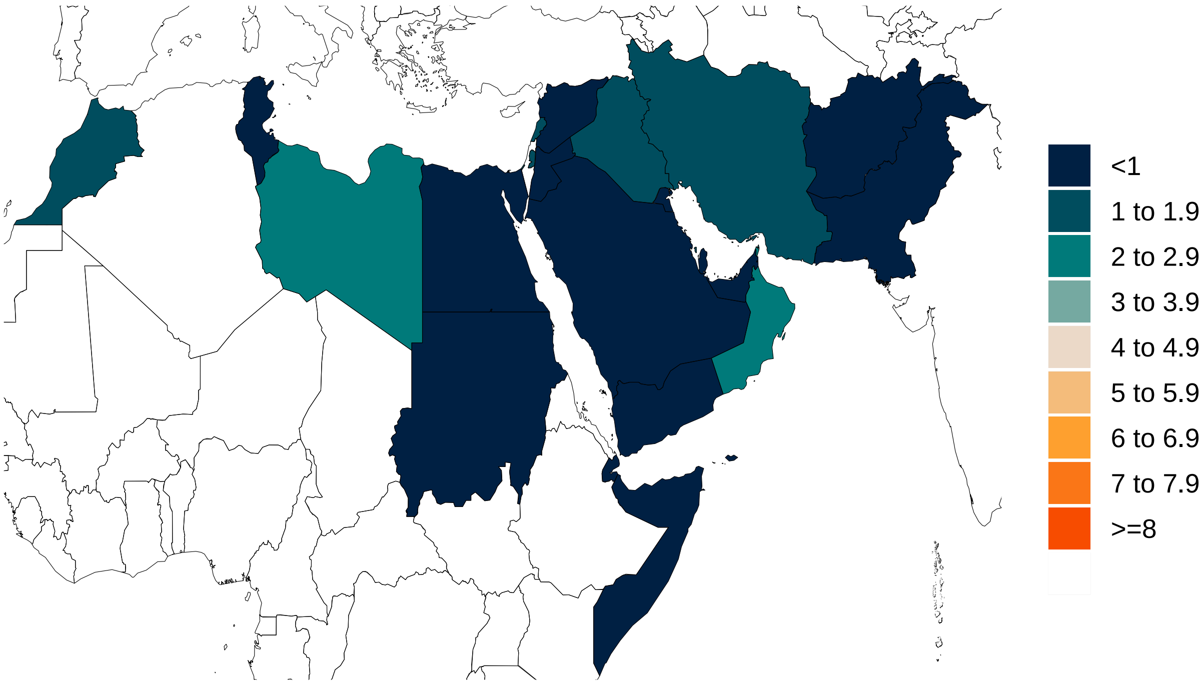


Figure 6. Daily COVID-19 death rate per 1 million on September 14, 2020



Critical drivers

Table 2. Current mandate implementation

	All gatherings restricted	All nonessential businesses closed	Any businesses restricted	Mask use	School closure	Stay home order	Travel limits
Afghanistan	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Bahrain	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Djibouti	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Egypt	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Iran (Islamic Republic of)	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Iraq	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Jordan	Mandate in place	No mandate	No mandate	Mandate in place	Mandate in place	No mandate	No mandate
Kuwait	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place
Lebanon	Mandate in place	Mandate in place	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Libya	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Morocco	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Oman	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Pakistan	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Palestine	Mandate in place	No mandate	Mandate in place	No mandate	Mandate in place	No mandate	No mandate
Qatar	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Saudi Arabia	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Somalia	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate	No mandate
Sudan	Mandate in place	No mandate	No mandate	No mandate	Mandate in place	No mandate	Mandate in place
Syrian Arab Republic	Mandate in place	No mandate	Mandate in place	No mandate	Mandate in place	No mandate	No mandate
Tunisia	No mandate	No mandate	No mandate	Mandate in place	Mandate in place	No mandate	No mandate
United Arab Emirates	Mandate in place	No mandate	Mandate in place	Mandate in place	Mandate in place	No mandate	No mandate
Yemen	No mandate	No mandate	No mandate	No mandate	Mandate in place	No mandate	No mandate

Mandate in place | No mandate

Figure 7. Total number of social distancing mandates (not including mask use)

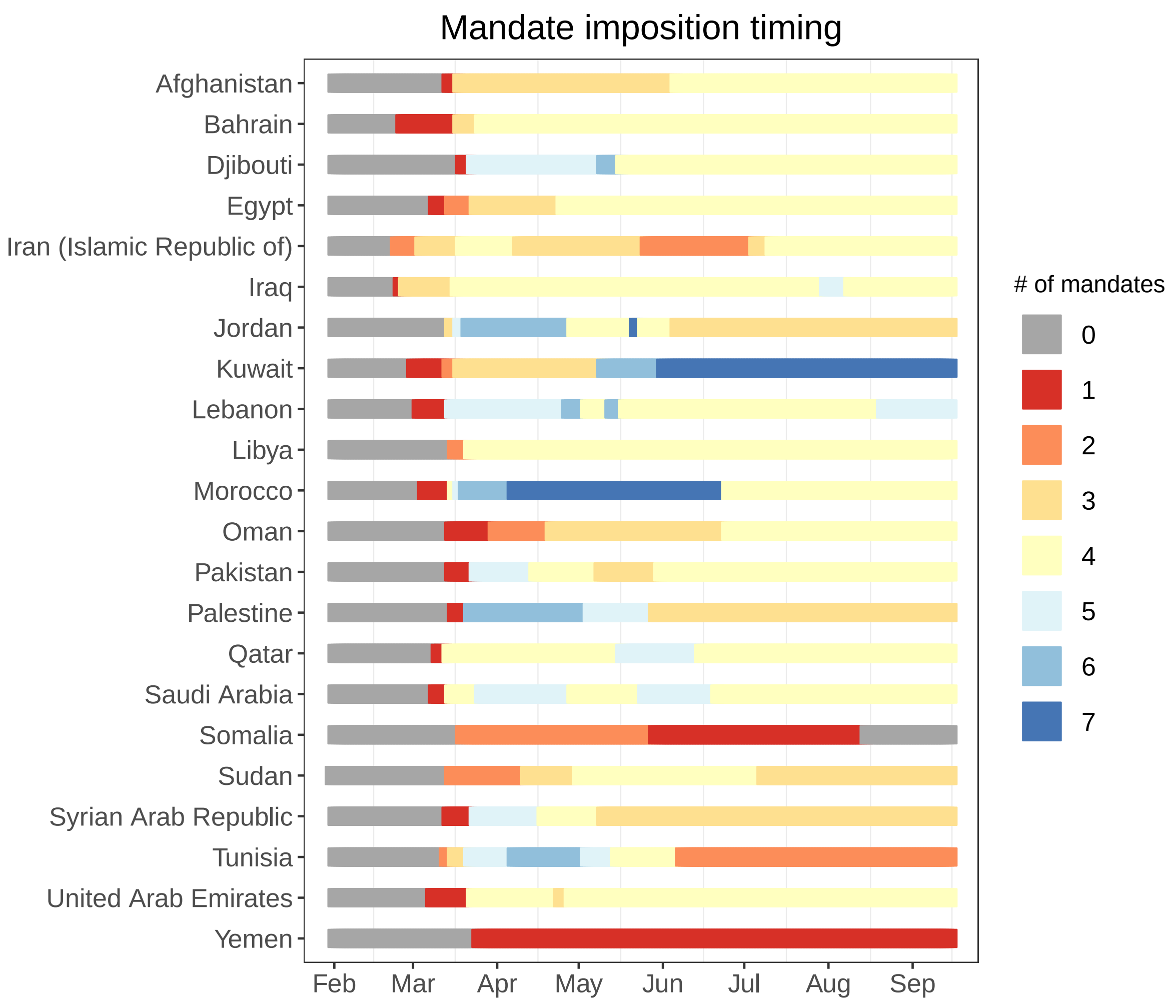


Figure 8a. Trend in mobility as measured through smartphone app use compared to January 2020 baseline

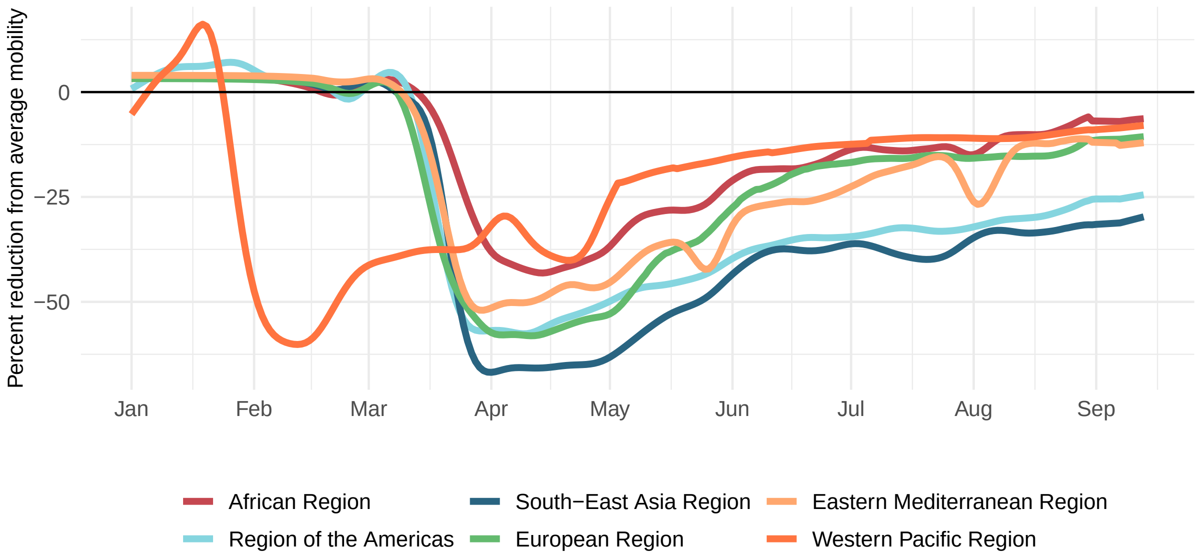


Figure 8b. Mobility level as measured through smartphone app use compared to January 2020 baseline (percent)

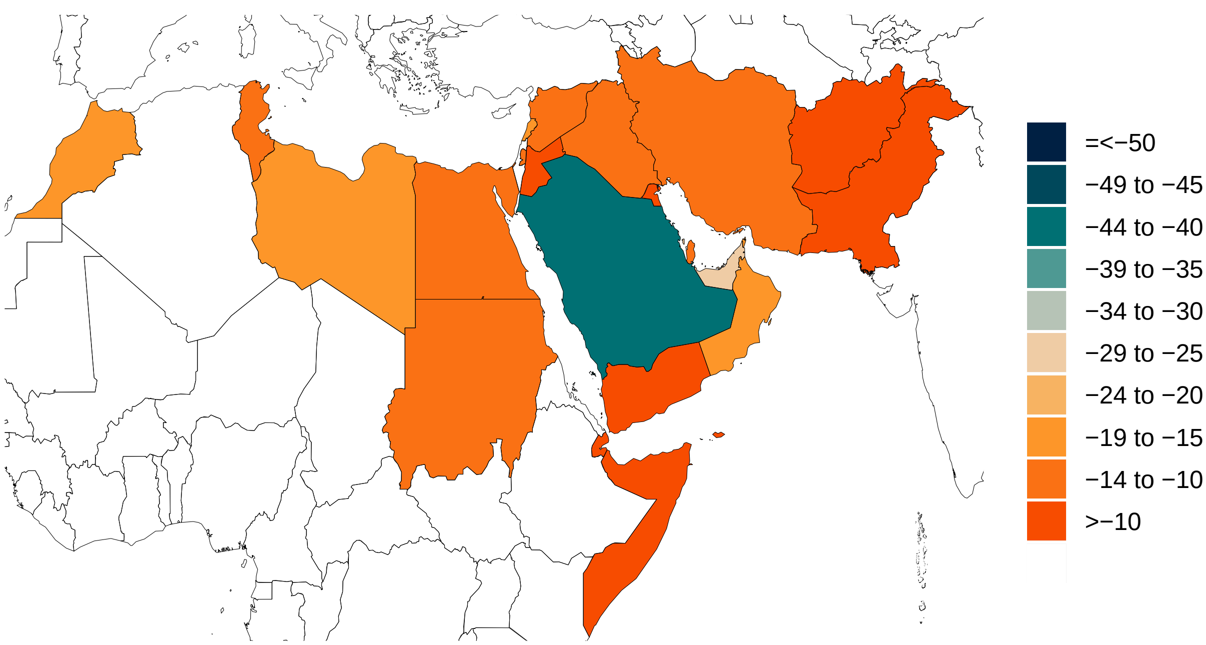


Figure 9a. Trend in the proportion of the population reporting always wearing a mask when leaving home

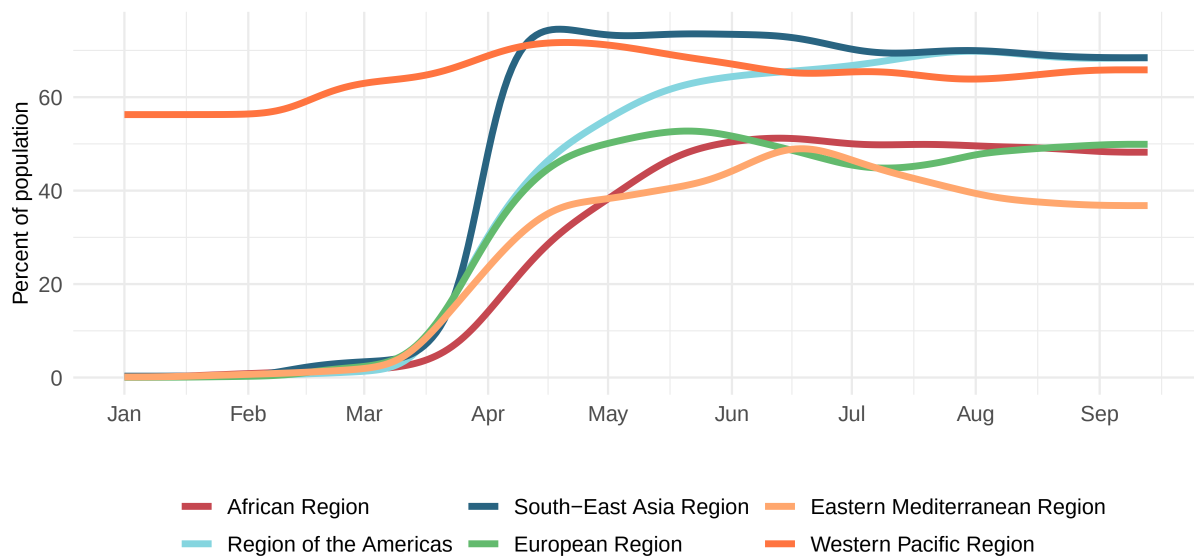


Figure 9b. Proportion of the population reporting always wearing a mask when leaving home on September 14, 2020

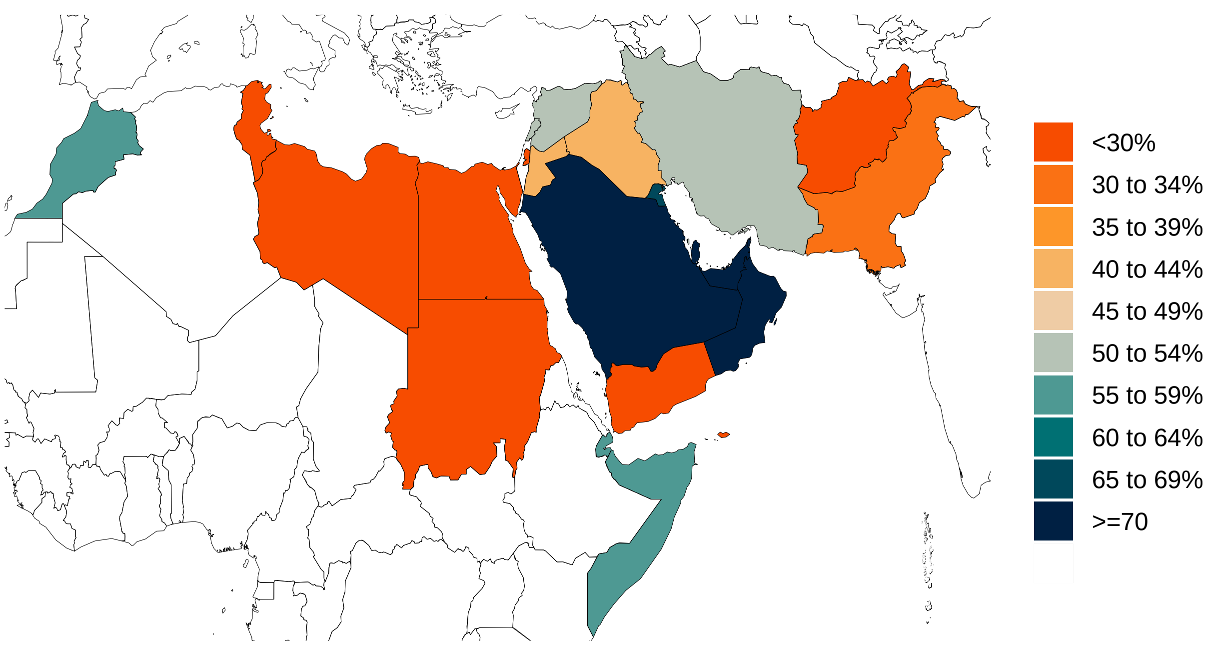


Figure 10a. Trend in COVID-19 diagnostic tests per 100,000 people

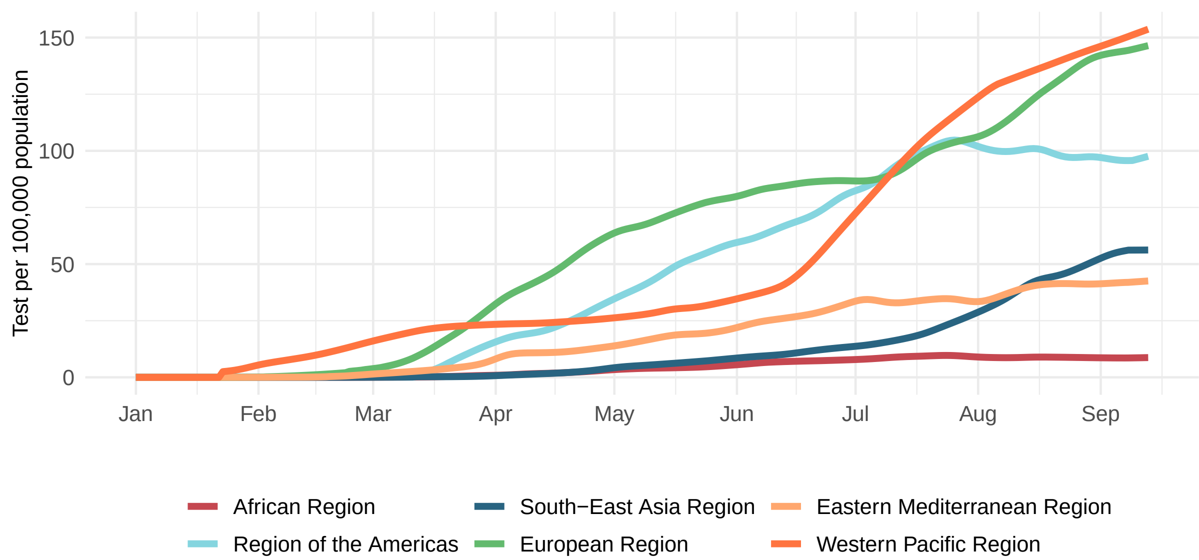


Figure 10b. COVID-19 diagnostic tests per 100,000 people on September 09, 2020

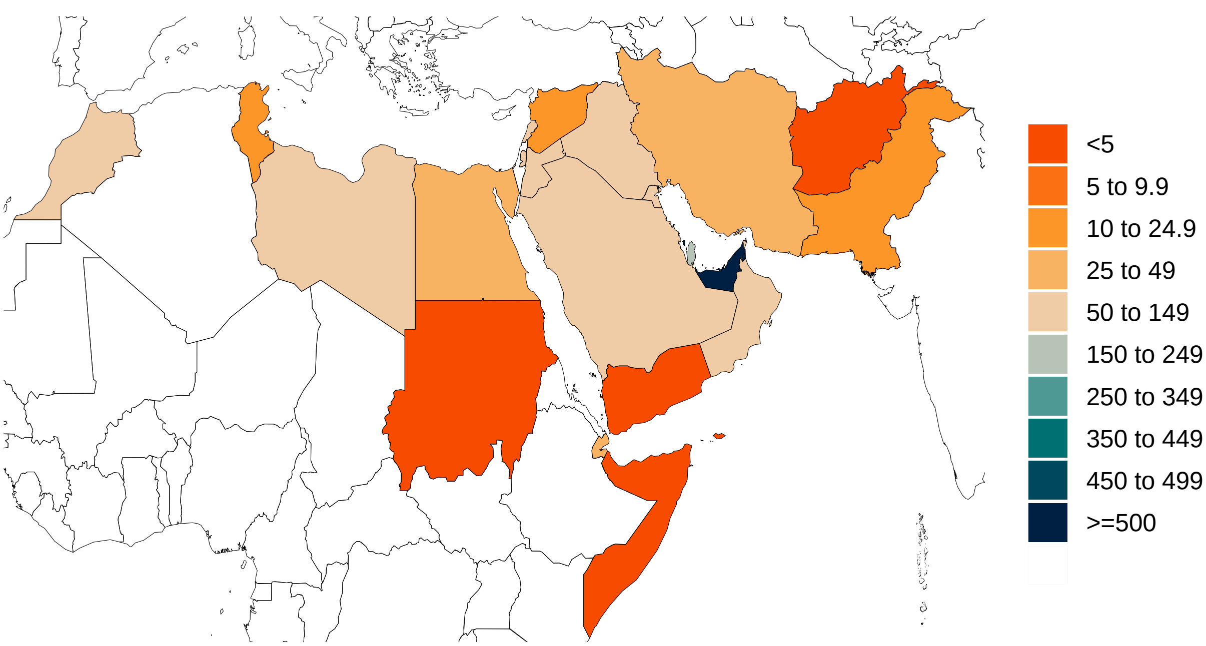
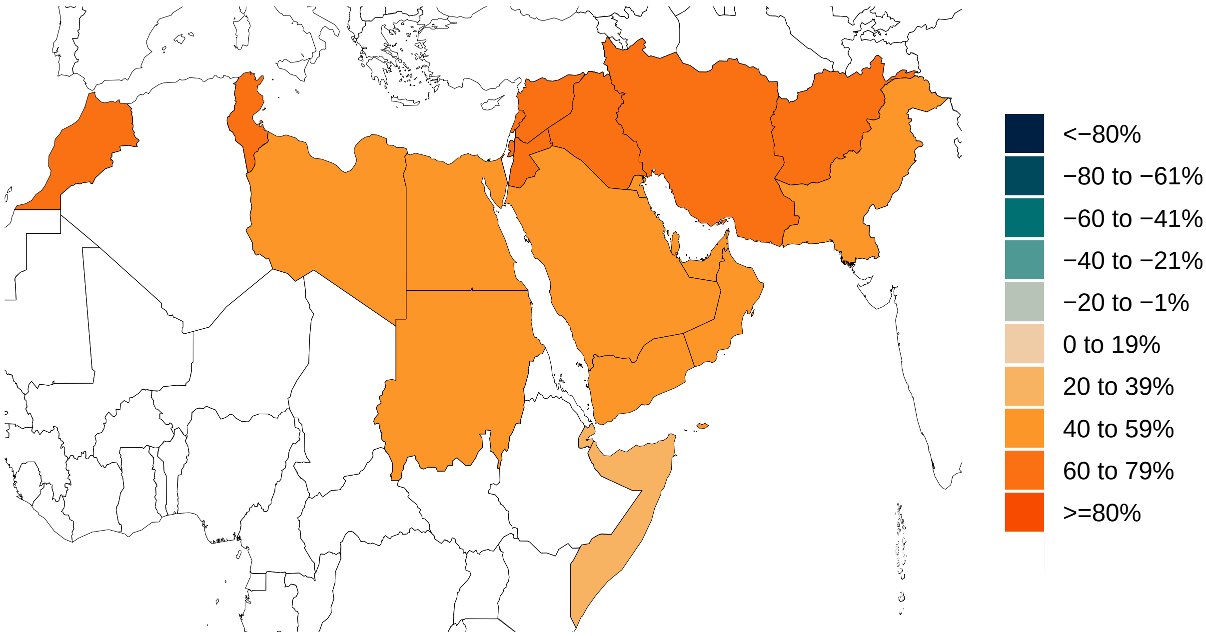


Figure 11. Increase in the risk of death due to pneumonia on February 1 compared to August 1



Projections and scenarios

We produce three scenarios when projecting COVID-19. The reference scenario is our forecast of what we think is most likely to happen. We assume that if the daily mortality rate from COVID-19 reaches 8 per million, social distancing (SD) mandates will be re-imposed. The mandate easing scenario is what would happen if governments continue to ease social distancing mandates with no re-imposition. The universal mask mandate scenario is what would happen if mask use increased immediately to 95% and social distancing mandates were re-imposed at 8 deaths per million.

Figure 12. Cumulative COVID-19 deaths until January 01, 2021 for three scenarios.

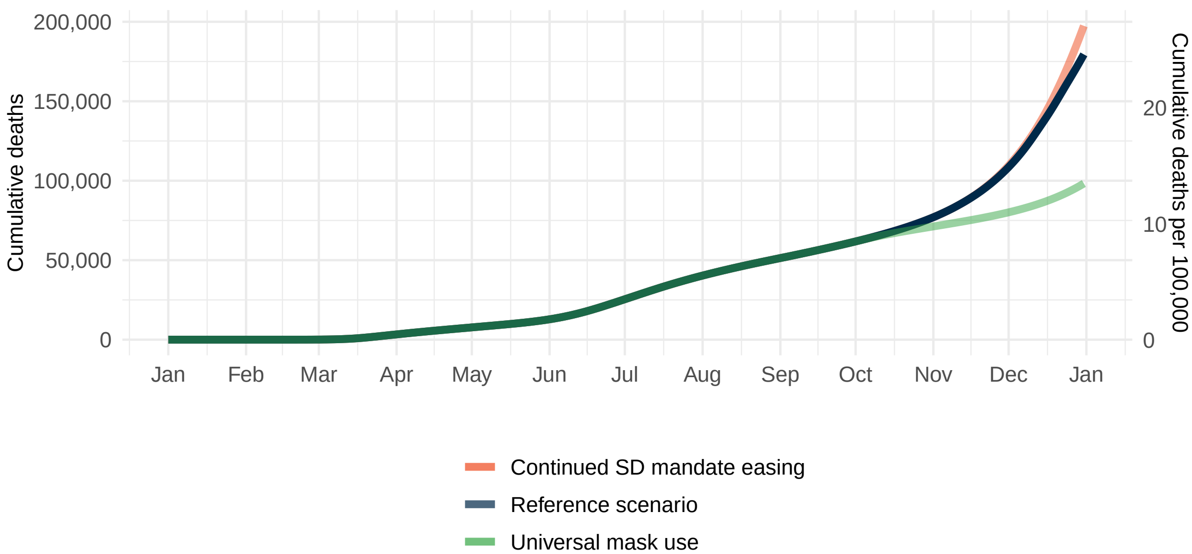


Fig 13. Daily COVID-19 deaths until January 01, 2021 for three scenarios.

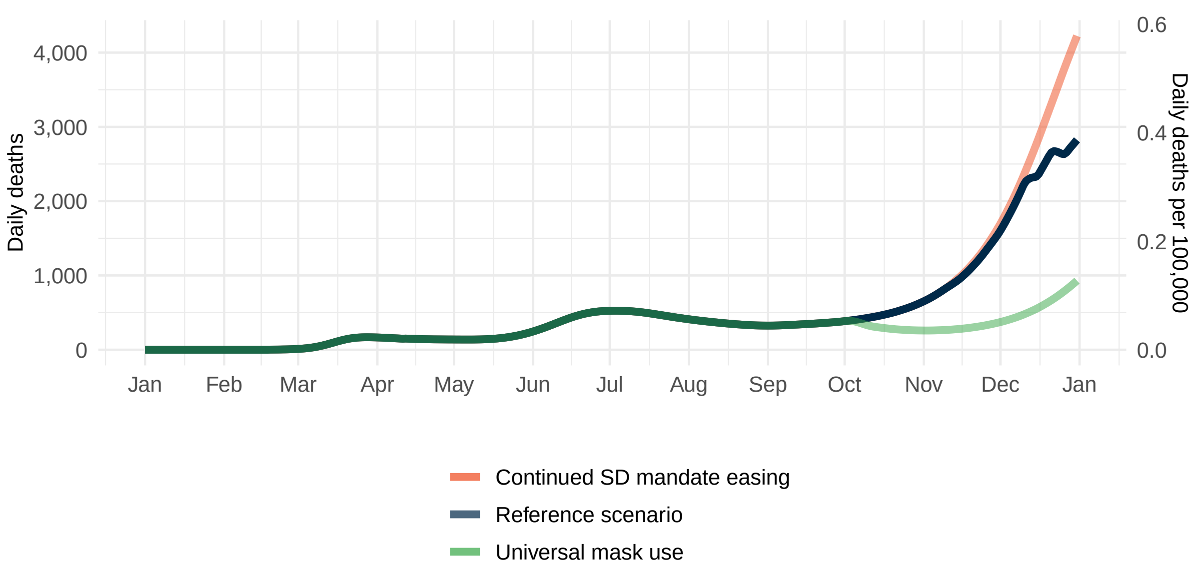


Fig 14. Daily COVID-19 infections until January 01, 2021 for three scenarios.

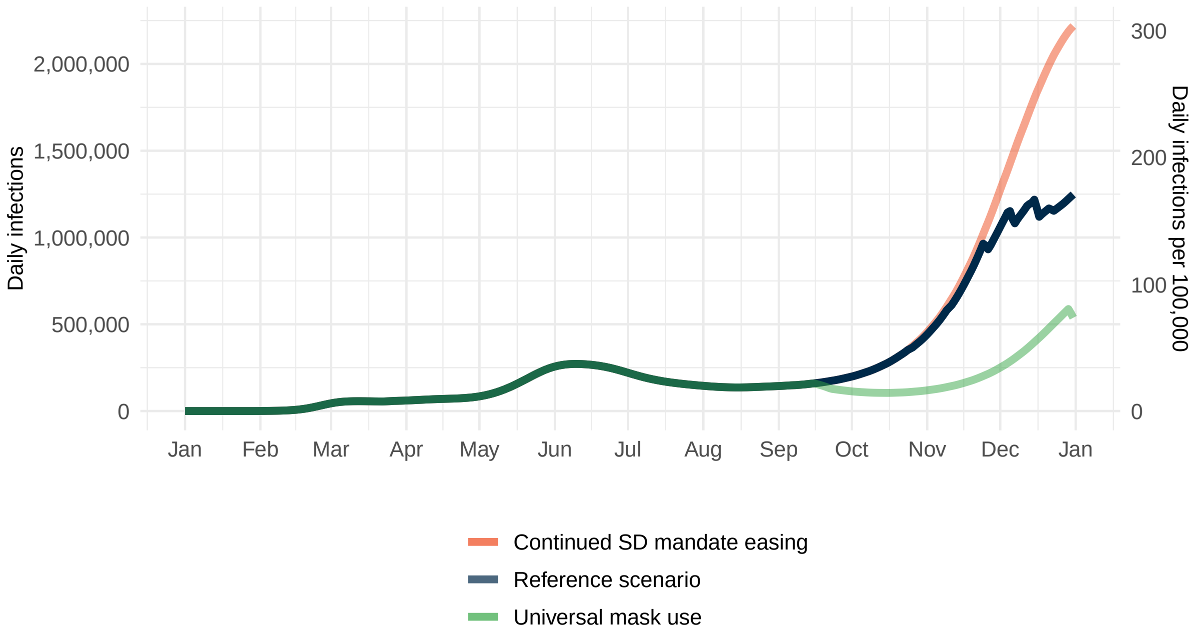


Fig 15. Month of assumed mandate re-implementation. (Month when daily death rate passes 8 per million, when reference scenario model assumes mandates will be re-imposed.)

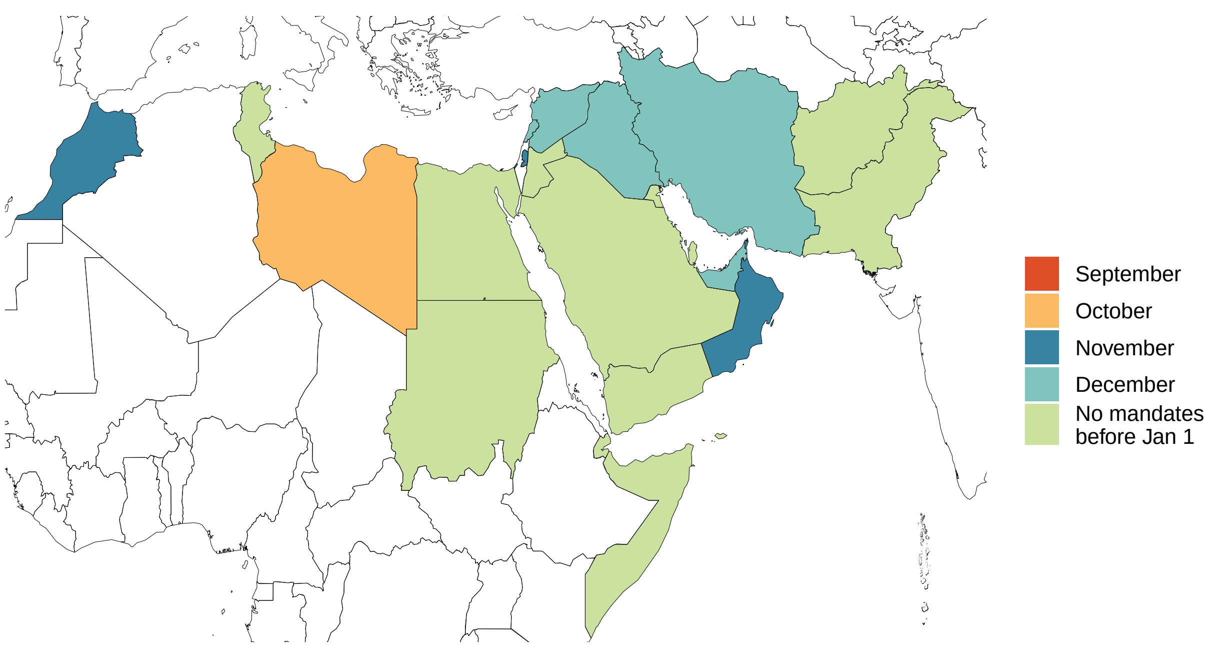


Figure 16. Forecasted percent infected with COVID-19 on January 01, 2021

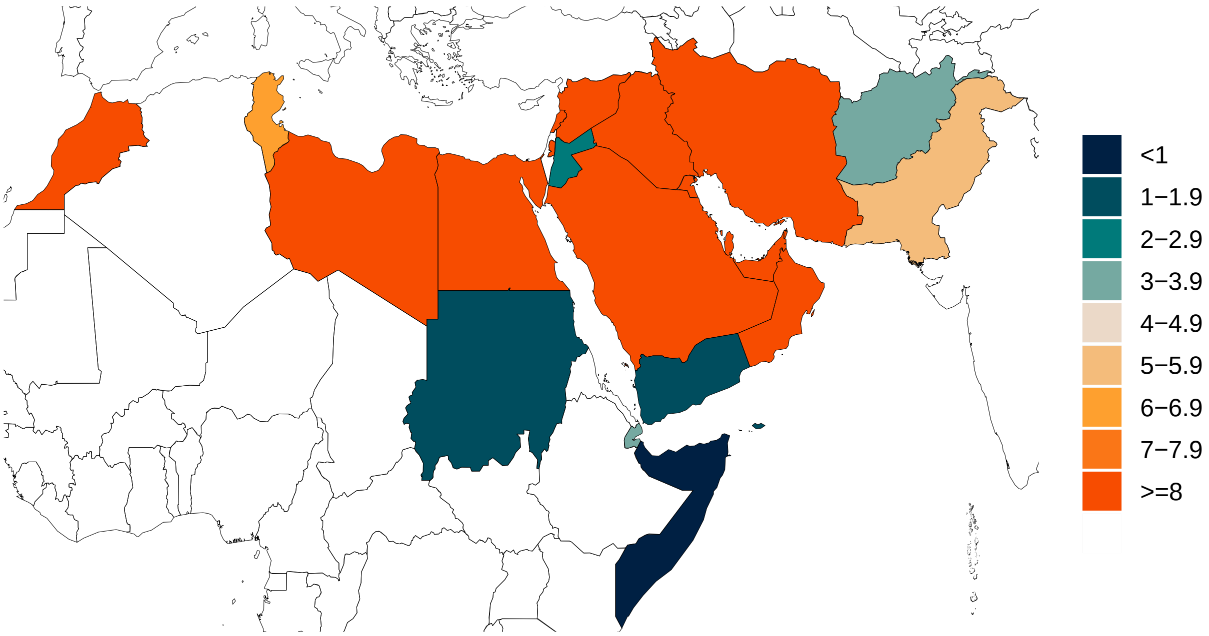


Figure 17. Daily COVID-19 deaths per million forecasted on January 01, 2021 in the reference scenario

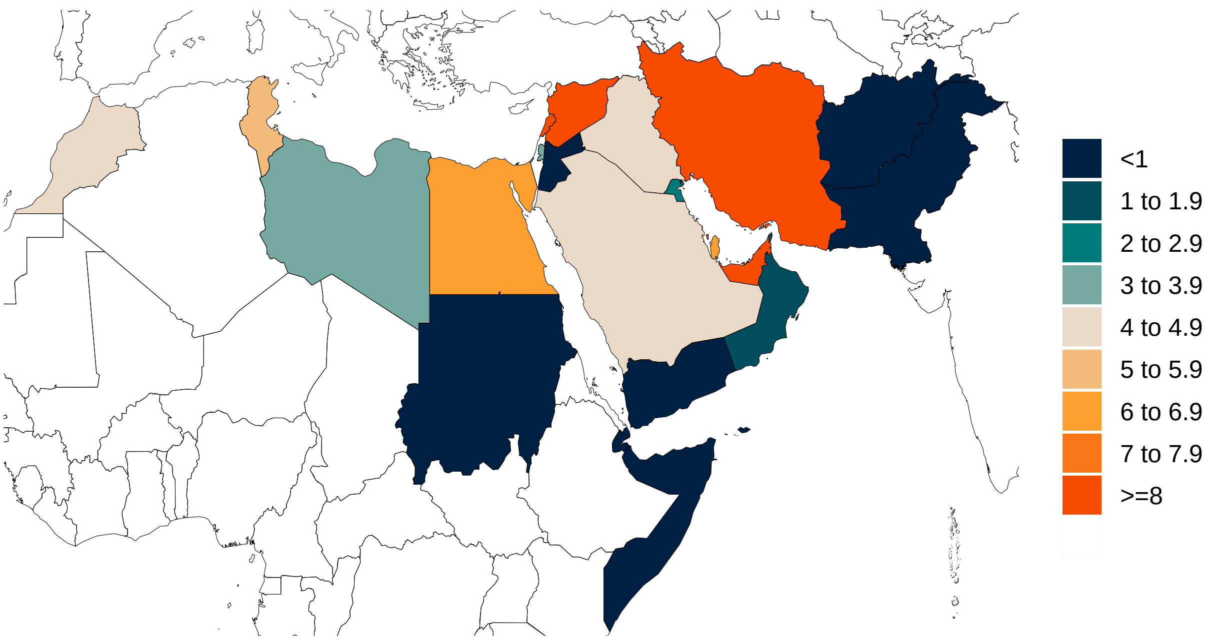


Table 3. Ranking of COVID-19 among the leading causes of mortality in the full year 2020. Deaths from COVID-19 are projections of cumulative deaths on Jan 1, 2021 from the reference scenario. Deaths from other causes are from the Global Burden of Disease study 2019 (rounded to the nearest 100).

Cause name	Annual deaths	Ranking
Ischemic heart disease	827,400	1
Neonatal disorders	365,500	2
Stroke	349,900	3
COVID-19	182,311	4
Lower respiratory infections	176,000	5
Road injuries	152,600	6
Cirrhosis and other chronic liver diseases	145,900	7
Chronic kidney disease	130,100	8
Diabetes mellitus	125,000	9
Diarrheal diseases	124,000	10

Mask data source: Premise; Facebook Global symptom survey (This research is based on survey results from University of Maryland Social Data Science Center); Kaiser Family Foundation; YouGov COVID-19 Behaviour Tracker survey

A note of thanks:

We would like to extend a special thanks to the Pan American Health Organization (PAHO) for key data sources; our partners and collaborators in Argentina, Brazil, Bolivia, Chile, Colombia, Cuba, the Dominican Republic, Ecuador, Egypt, Honduras, Israel, Japan, Malaysia, Mexico, Moldova, Panama, Peru, the Philippines, Russia, Serbia, South Korea, Turkey, and Ukraine for their support and expert advice; and to the tireless data collection and collation efforts of individuals and institutions throughout the world.

In addition, we wish to express our gratitude for efforts to collect social distancing policy information in Latin America to University of Miami Institute for Advanced Study of the Americas (Felicia Knaul, Michael Touchton), with data published here: http://observcovid.miami.edu/; Fundación Mexicana para la Salud (Héctor Arreola-Ornelas) with support from the GDS Services International: Tómatelo a Pecho A.C.; and Centro de Investigaciones en Ciencias de la Salud, Universidad Anáhuac (Héctor Arreola-Ornelas); Lab on Research, Ethics, Aging and Community-Health at Tufts University (REACH Lab) and the University of Miami Institute for Advanced Study of the Americas (Thalia Porteny).

Further, IHME is grateful to the Microsoft AI for Health program for their support in hosting our COVID-19 data visualizations on the Azure Cloud. We would like to also extend a warm thank you to the many others who have made our COVID-19 estimation efforts possible.