



[2] COVID-19 infection and mortality tracking in the US and around the world

This section analyzes COVID infections and mortality reported to local, federal and intergovernmental agencies, and are heavily influenced by testing rates and differences in government reporting standards and capabilities. As we explain in Section 5, serology tests suggest that the *true* number of COVID infections may be 10x-20x higher than the number of *reported* infections. However, trends in reported infections are still important to monitor, since they influence government policy and the behavior of citizens and companies.

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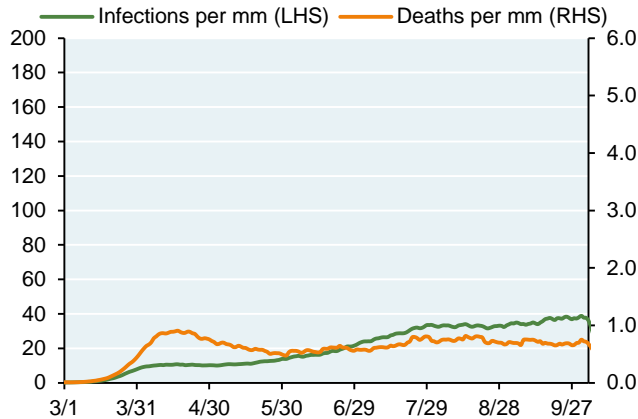
Additional supplementary materials are available upon request: COVID mortality distributions and probabilities by age bracket and US state, COVID mortality per mm vs Case Fatality Rates by country and US state, and COVID infections by age group by US state.

On data sources. We generally use infection and mortality data from Johns Hopkins, with any exceptions noted in chart sources. While JHU data usually match sources such as covidtracking.com and Worldometers, this is not always the case. Any large differences usually work themselves out over time; even so, such differences are a warning against over-extrapolating any short term trends seen in the data. There are also patterns in some countries in which tests and infections drop over the weekend, only to rise the following week. Other anomalies: countries and US states sometimes make large one-time additions or subtractions to infections or deaths data to reflect over- or underestimations made over the course of the entire pandemic. JHU and other data providers do not amortize such adjustments over time and simply reflect them on the day they are made; we do the same.



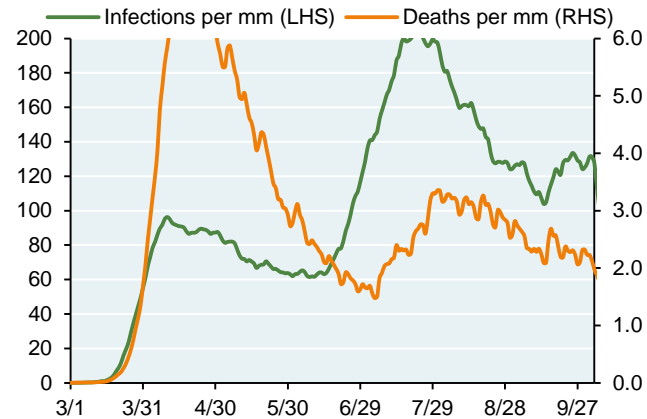
Summary of global and US infection/mortality trends

World daily infections vs mortality



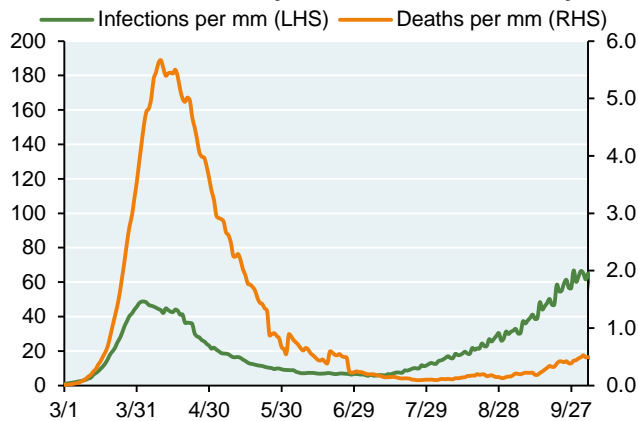
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

US daily infections vs mortality



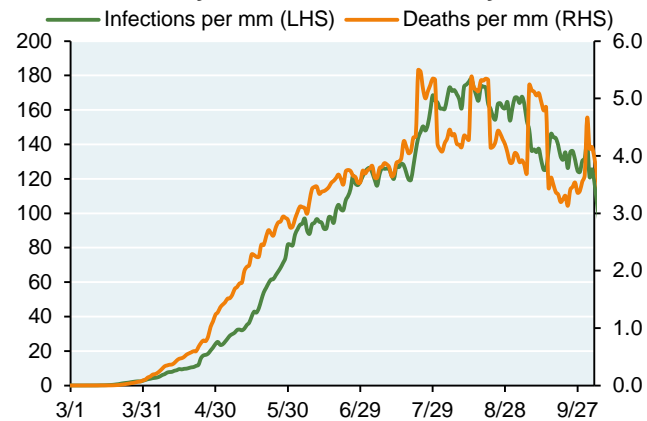
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Dev World ex-US daily infections vs mortality



Source: JHU, JPMAM. 10/04/2020. 7 day averages.

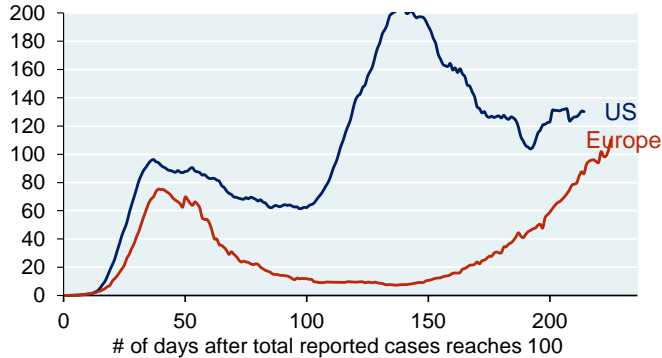
S America daily infections vs mortality



Source: JHU, JPMAM. 10/04/2020. 7 day averages.

US vs Europe infections

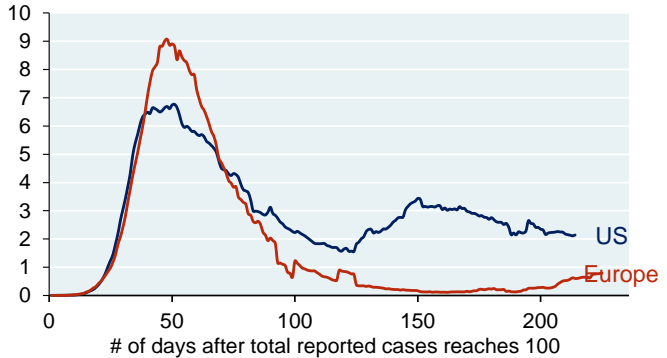
New daily infections per mm people, 7 day avg



Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020

US vs Europe mortality

Daily deaths per mm people, 7 day avg

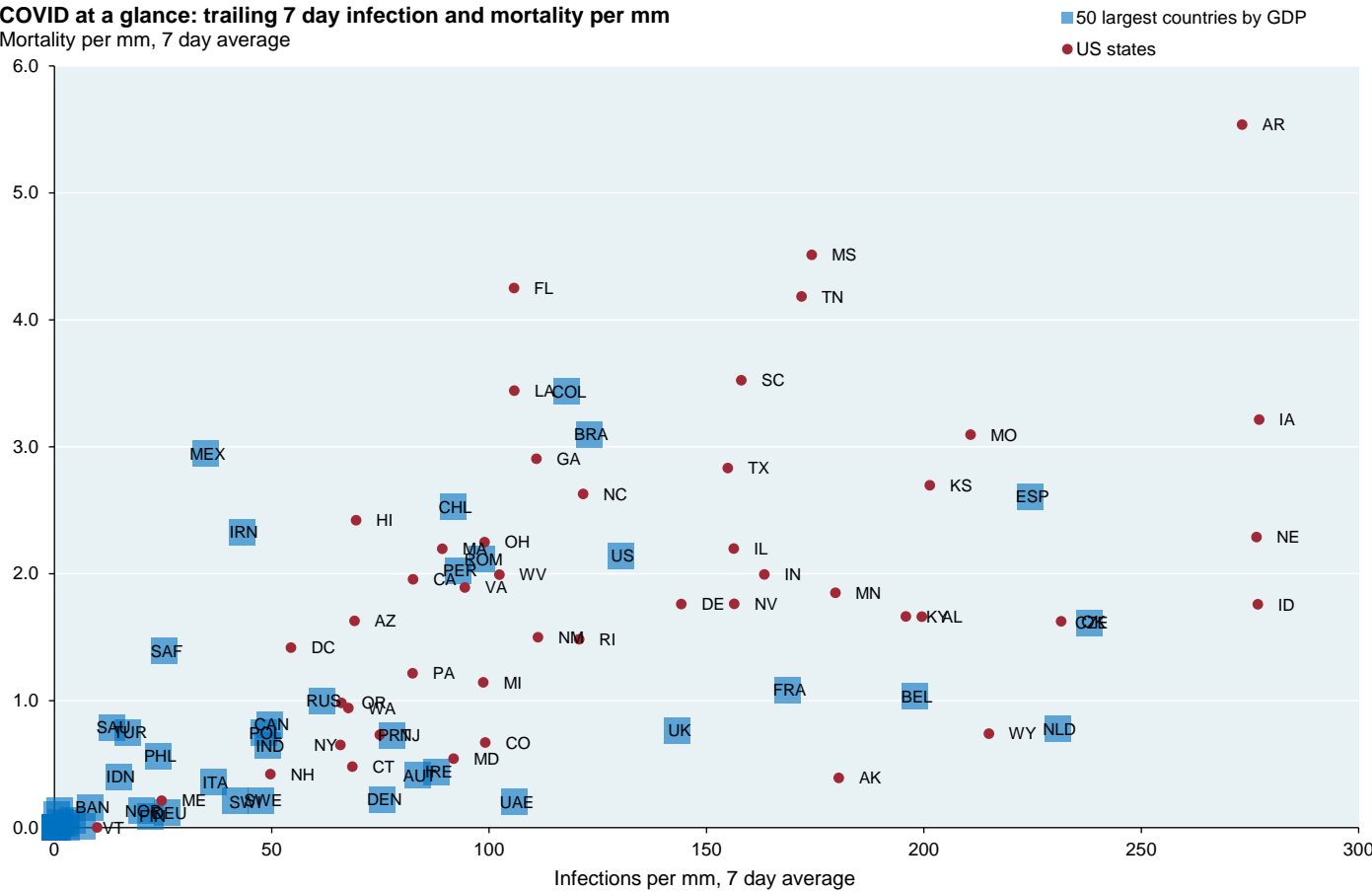


Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020



COVID at a glance: infections and mortality per mm

COVID at a glance: trailing 7 day infection and mortality per mm
Mortality per mm, 7 day average



Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020

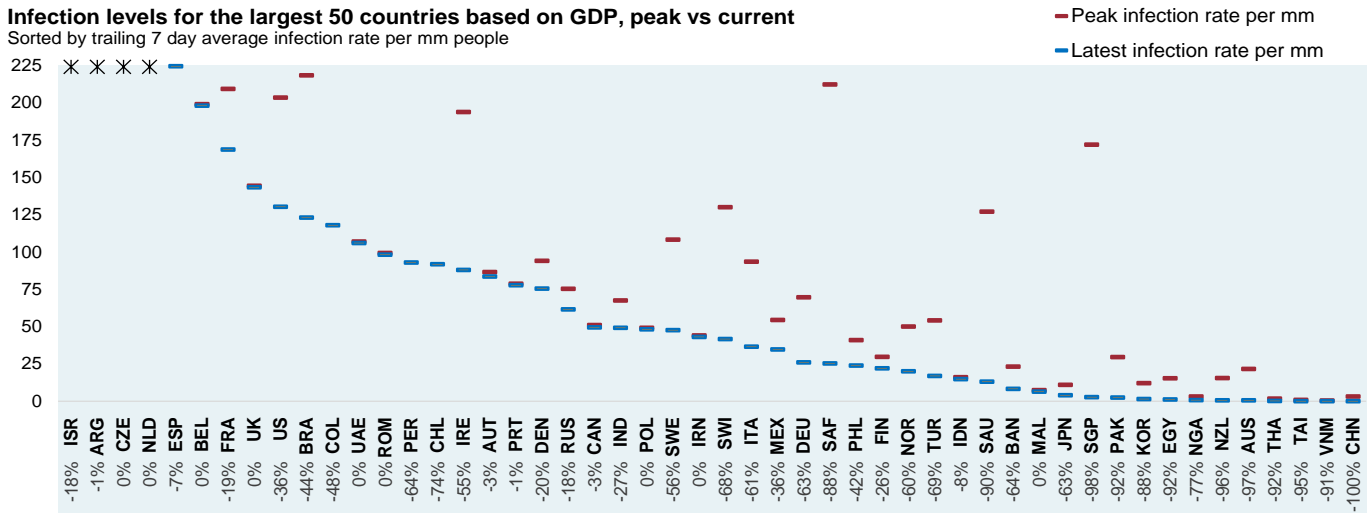


Infections and mortality snapshots: current vs peak levels of infection and mortality

The two charts below show peak and current levels of infection (top chart) and mortality (bottom chart) for the 50 largest countries in the world based on GDP. These countries represent 94% of global GDP.

Infection levels for the largest 50 countries based on GDP, peak vs current

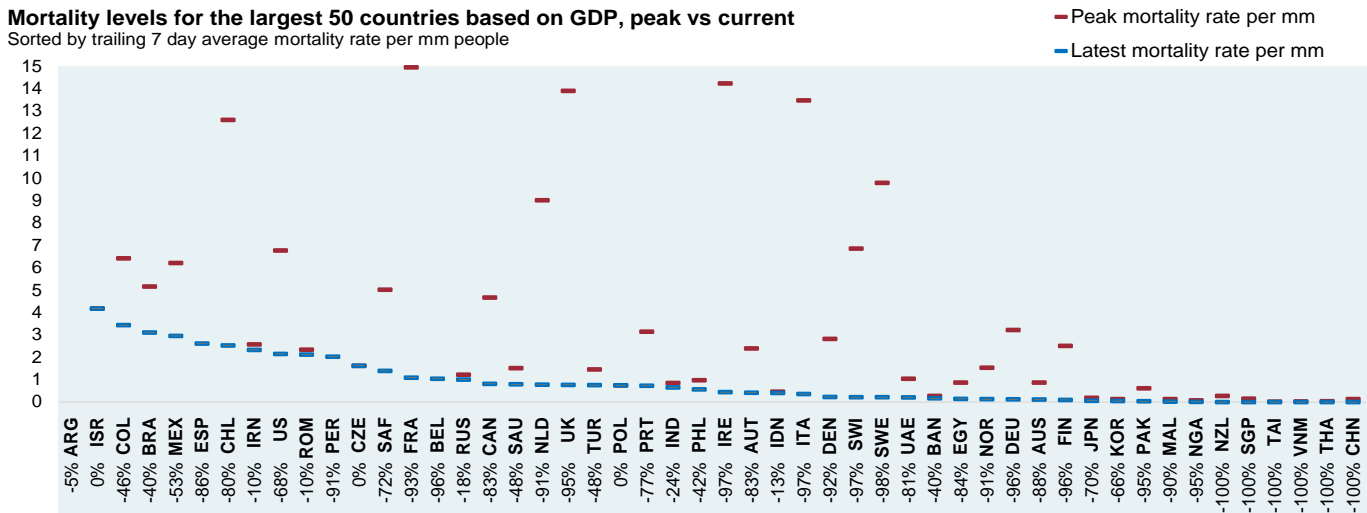
Sorted by trailing 7 day average infection rate per mm people



Source: Johns Hopkins University, IMF, JPMAM. Countries shown represent 94% of World GDP. Asterisk denotes countries with infection levels over 225 per mm people. October 04, 2020.

Mortality levels for the largest 50 countries based on GDP, peak vs current

Sorted by trailing 7 day average mortality rate per mm people



Source: Johns Hopkins University, IMF, JPMAM. Countries shown represent 94% of World GDP. October 04, 2020.

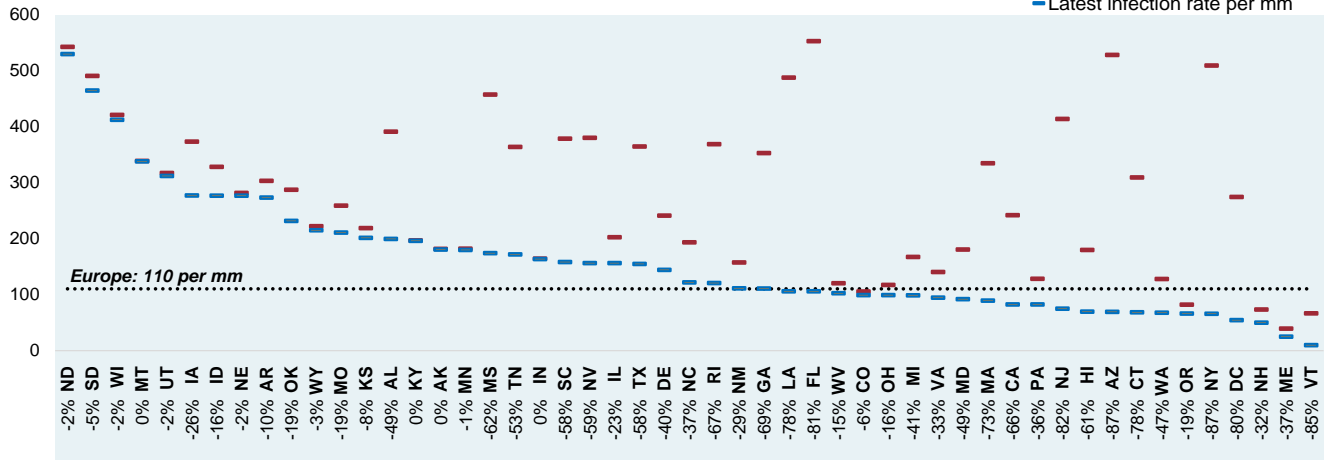


The two charts below show peak and current levels of infection (top chart) and mortality (bottom chart) for the 50 US states and DC.

Infection levels for US states: peak vs current

Sorted by trailing 7 day average infection rate per mm people

— Peak infection rate per mm
— Latest infection rate per mm

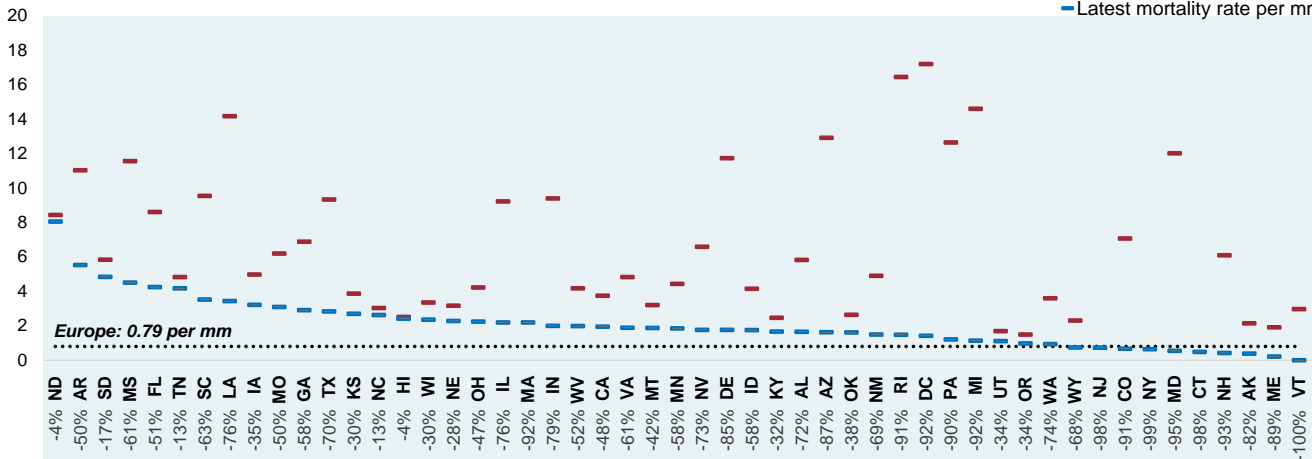


Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020

Mortality levels for US states: peak vs current

Sorted by trailing 7 day average mortality rate per mm people

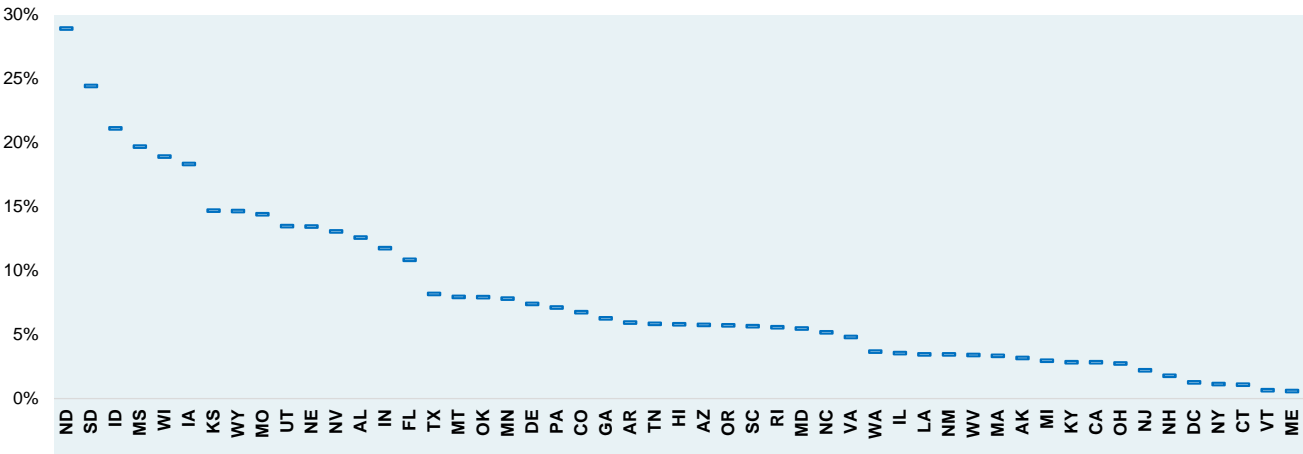
— Peak mortality rate per mm
— Latest mortality rate per mm



Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020

Positive testing rate for US states

Sorted by trailing 14 day average positive testing rate



Source: COVID Tracking Project, JPMAM. October 04, 2020.

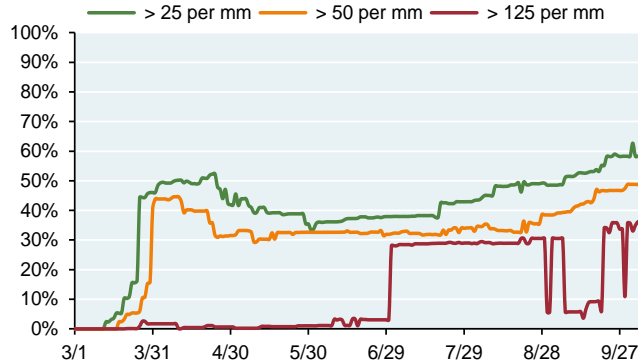


Global and US infection and mortality threshold levels

The charts below track the percentages of the global and US economy with infection and mortality levels that surpass indicated thresholds. The geographical units are countries for the global economy, and states for the US economy.

Global COVID infection thresholds

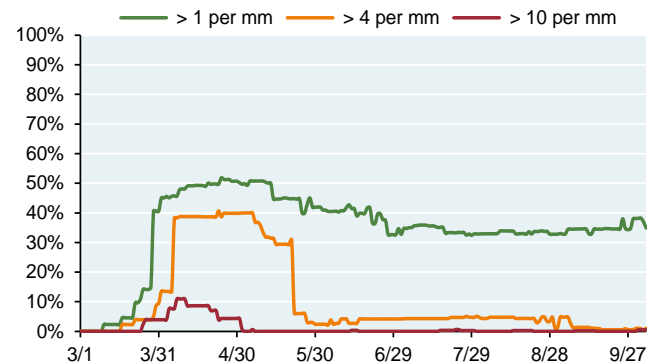
% of global GDP exceeding indicated threshold



Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Global COVID mortality thresholds

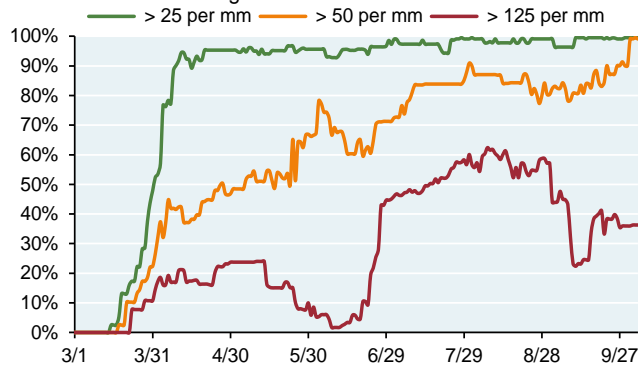
% of global GDP exceeding indicated threshold



Source: JHU, JPMAM. 10/04/2020. 7 day averages.

US COVID infection thresholds

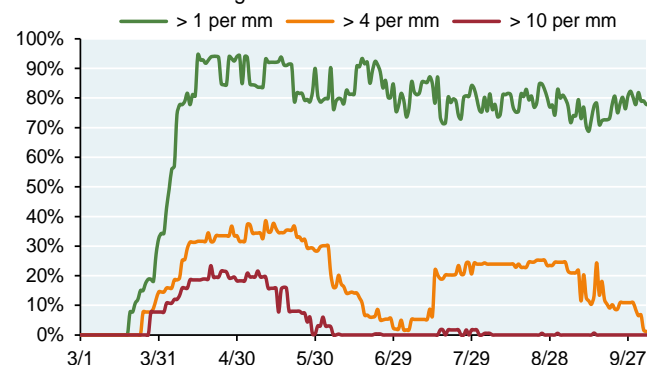
% of US GDP exceeding indicated threshold



Source: Covid Tracking, JPMAM. 10/04/2020. 7 day averages.

US COVID mortality thresholds

% of US GDP exceeding indicated threshold



Source: JHU, JPMAM. 10/04/2020. 7 day averages.

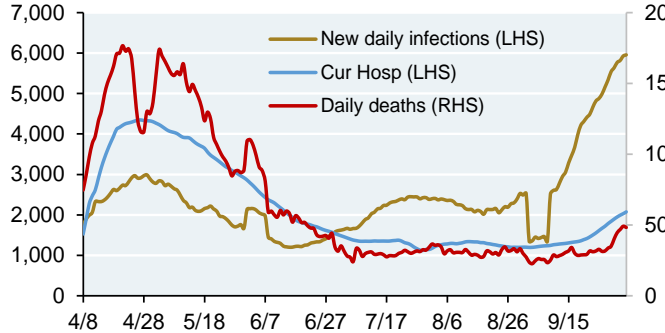


US hotspot infection, hospitalization and mortality tracking¹

The charts below track infection, hospitalization, testing, mortality and doctor visit data for the US in aggregate and for US hotspots. See section 6 for a state-by-state chartpack which covers the full range of infection, mortality, hospitalization, testing and hospital utilization data.

Hotspots: ND SD WI MT NE WY MA UT

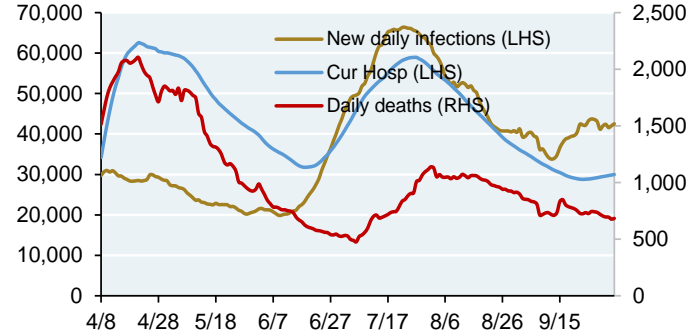
Current hospitalizations and daily infections



Source: COVID Tracking Project, JPMAM. 10/4/2020. 7 day avgs.

United States virus tracking

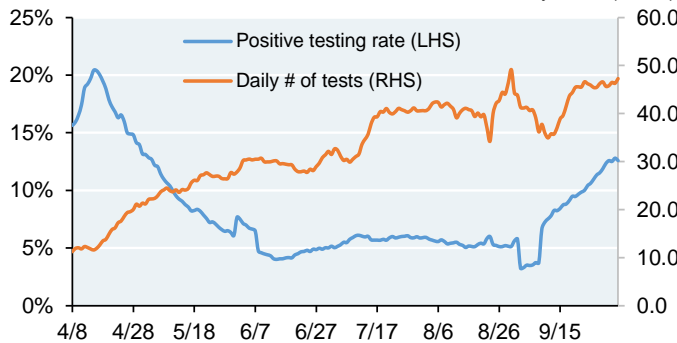
Current hospitalizations and daily infections



Source: COVID Tracking Project, JPMAM. 10/4/2020. 7 day avgs.

Hotspots: ND SD WI MT NE WY MA UT

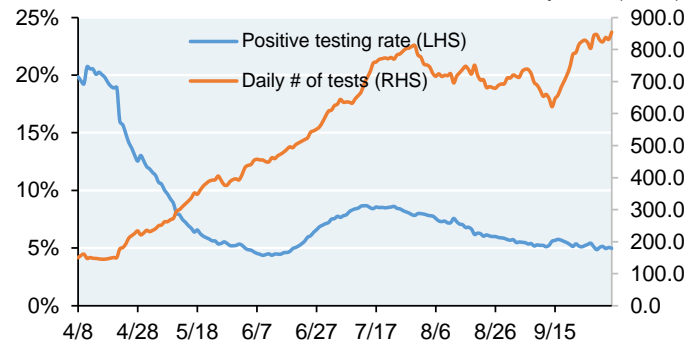
Positive tests/total tests



Source: COVID Tracking Project, JPMAM. 10/4/2020. 7 day avgs.

United States virus tracking

Positive tests/total tests



Source: COVID Tracking Project, JPMAM. 10/4/2020. 7 day avgs.

Hotspots: ND SD WI MT NE WY MA UT

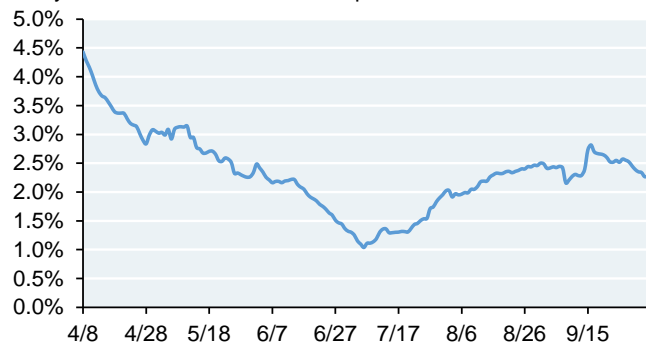
Daily deaths as a % of current hospitalizations



Source: COVID Tracking Project, JPMAM. 10/4/2020. 7 day avgs.

United States virus tracking

Daily deaths as a % of current hospitalizations

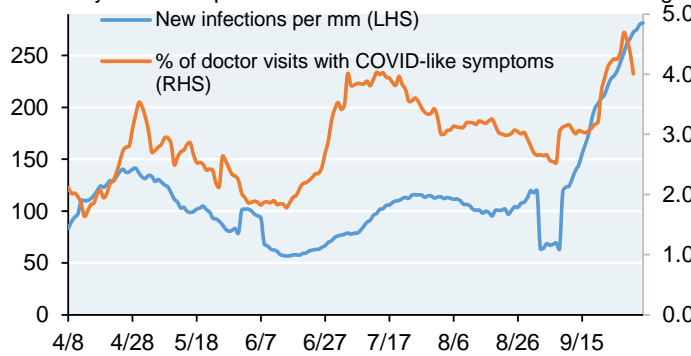


Source: COVID Tracking Project, JPMAM. 10/4/2020. 7 day avgs.

¹ We dynamically define hotspot states in two ways: the largest one-month increase in new daily infections per mm people, and states with the most persistent, rising infection rates per mm people.

**Hotspots: ND SD WI MT NE WY MA UT**

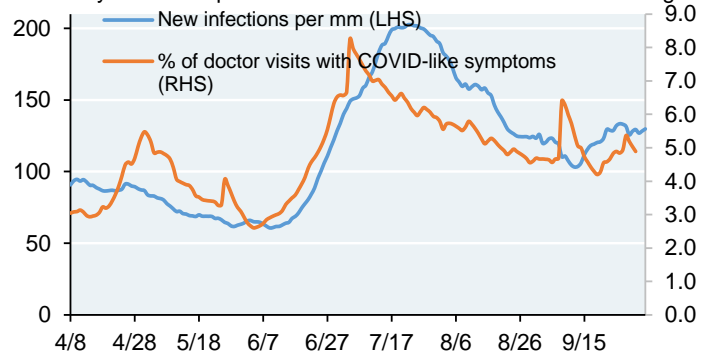
New daily infections per mm



Source: COVID Tracking, CMU, JPMAM. 10/4/2020. 7 day avgs.

United States virus tracking

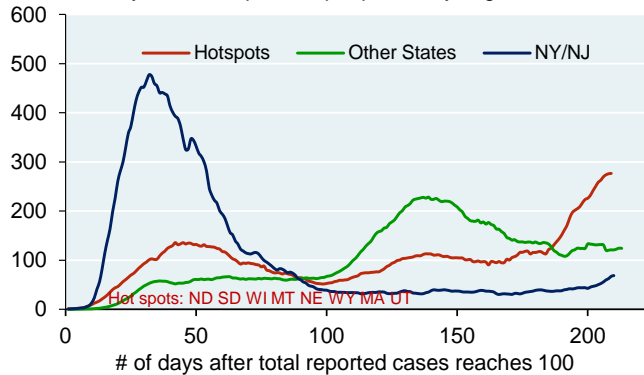
New daily infections per mm



Source: COVID Tracking, CMU, JPMAM. 10/4/2020. 7 day avgs.

Infections by state category

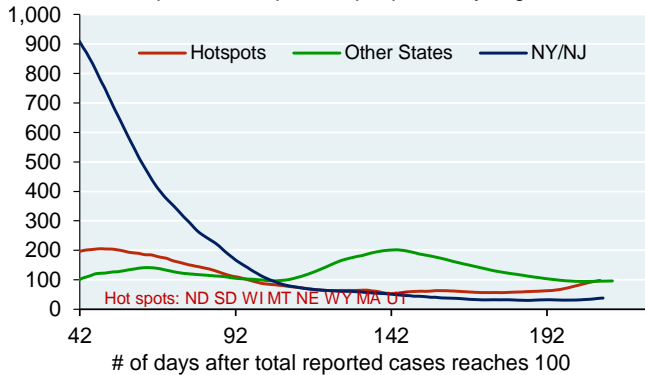
US new daily infections per mm people, 7 day avg



Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020

Hospitalizations by state category

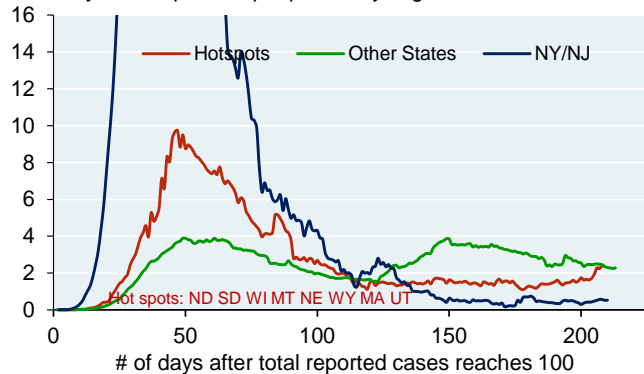
US current hospitalizations per mm people, 7 day avg



Source: COVID Tracking Project, IMF, JPMAM. October 04, 2020

Mortality by state category

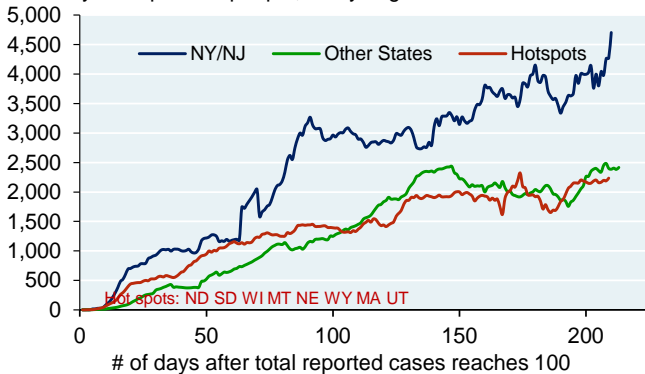
US daily deaths per mm people, 7 day avg



Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020

Testing by state category

US daily tests per mm people, 7 day avg



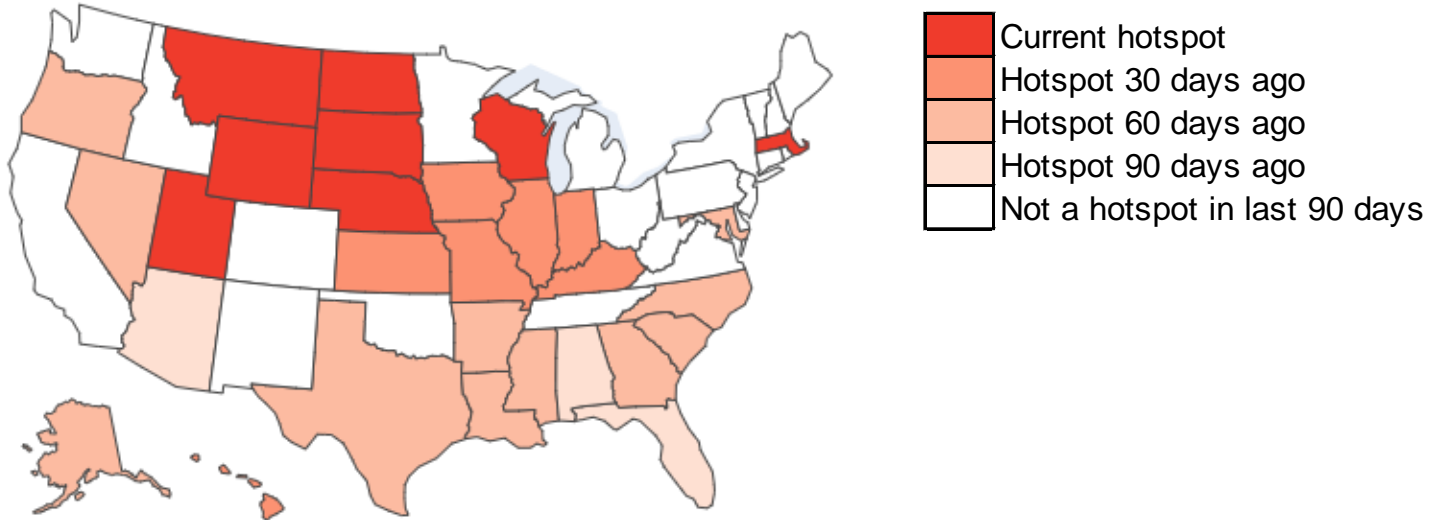
Source: Johns Hopkins University, IMF, JPMAM. October 04, 2020



Why aren't US infections declining more rapidly?

The US does not have internal border controls; as a result, focusing too much on infections at the state level ignores the ease with which US citizens cross state lines. As shown below, former Hotspot states have now transmitted the infection to new Hotspot states.

Without border controls, Hotspots keep shifting



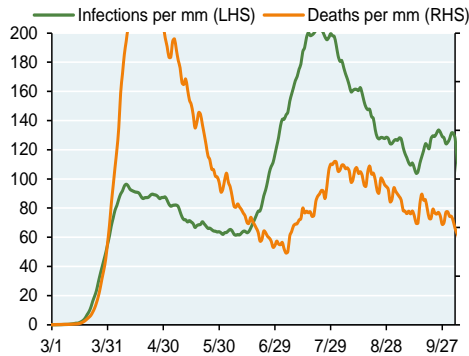
Source: JHU, JPMAM. October 5, 2020.



Country level infection/mortality trends

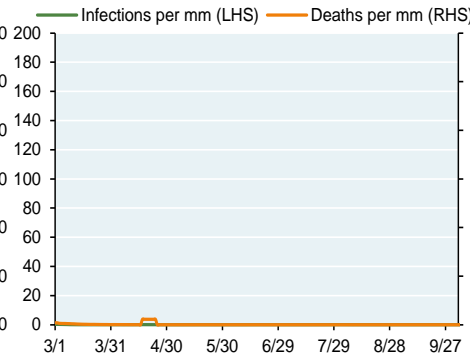
This section contains infection vs mortality charts for the 68 countries that are among the Top 50 Countries by GDP, or among the Top 50 Countries by Population. The country charts appear in descending order of GDP, and are all scaled relative to the US for comparability purposes.

US daily infections vs mortality



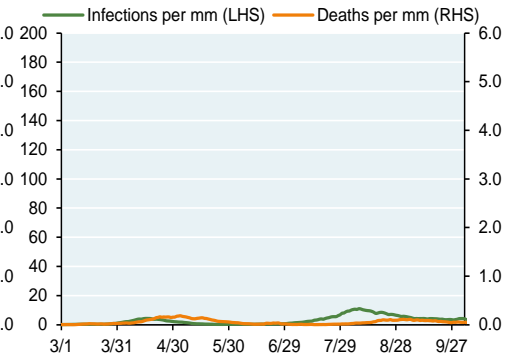
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

China daily infections vs mortality



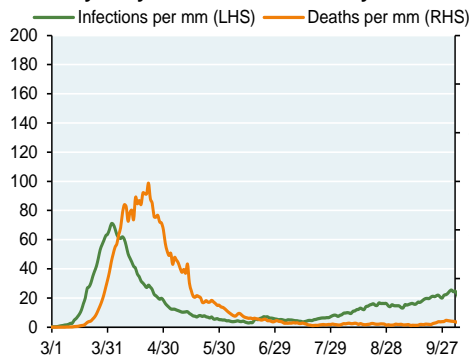
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Japan daily infections vs mortality



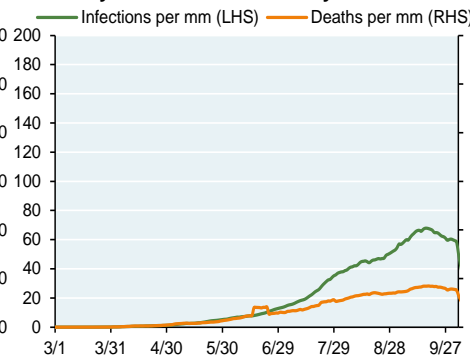
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Germany daily infections vs mortality



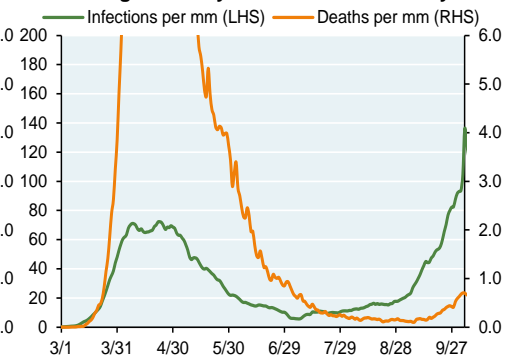
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

India daily infections vs mortality



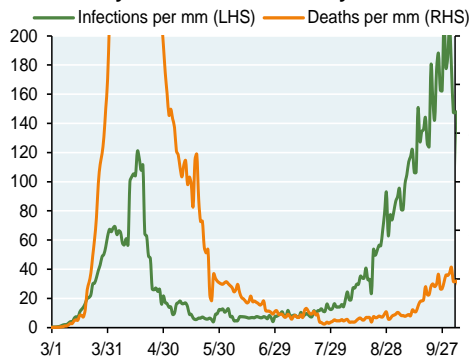
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

United Kingdom daily infections vs mortality



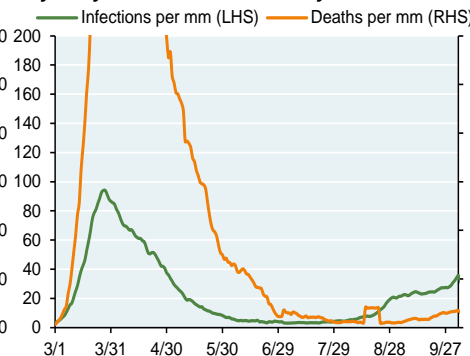
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

France daily infections vs mortality



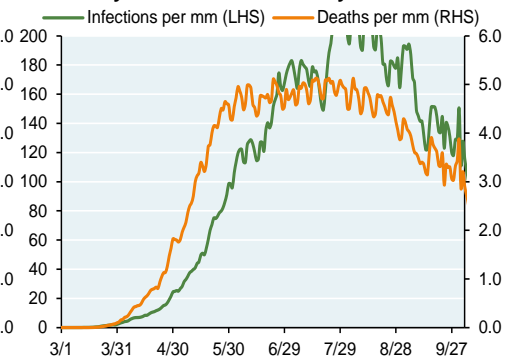
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Italy daily infections vs mortality



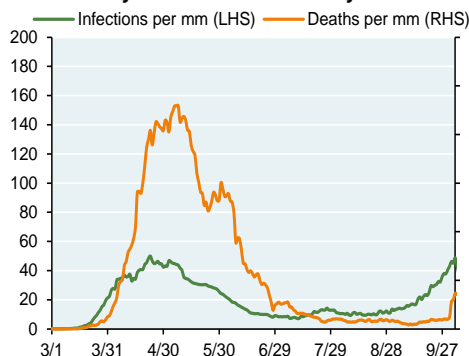
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Brazil daily infections vs mortality



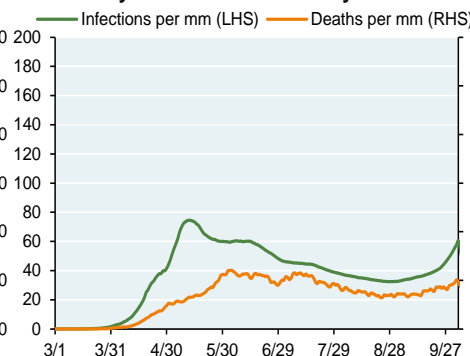
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Canada daily infections vs mortality



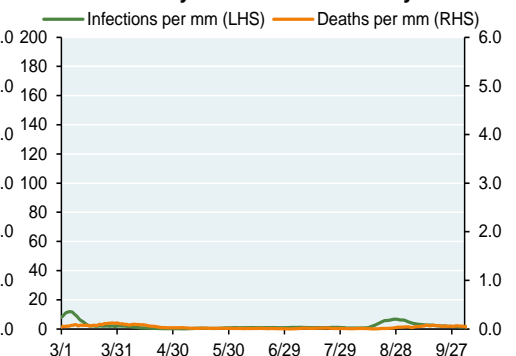
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

Russia daily infections vs mortality

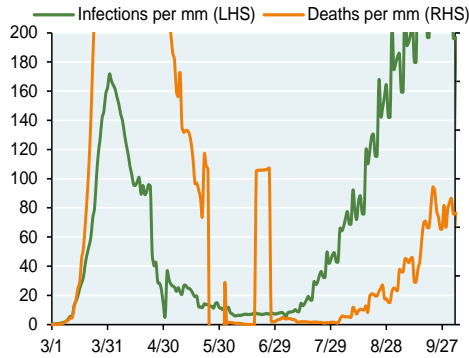
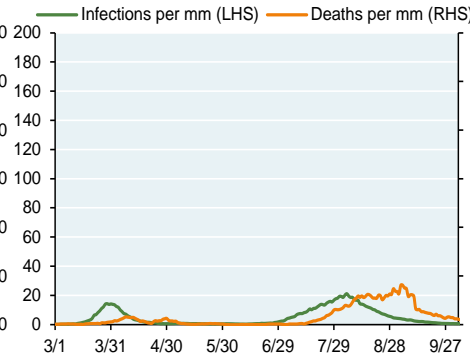
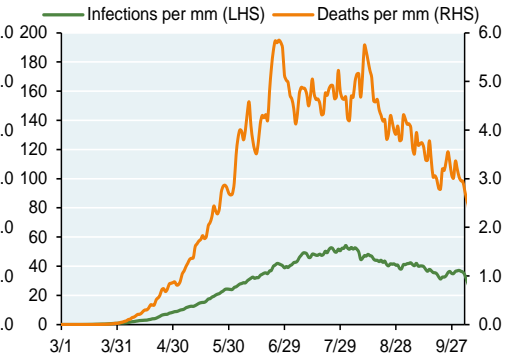
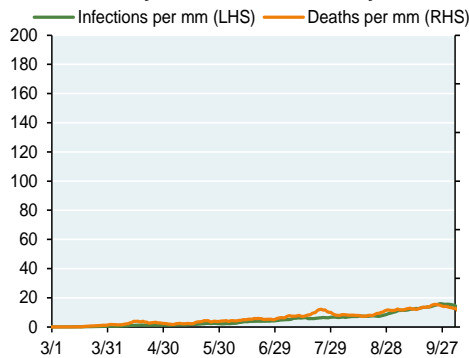
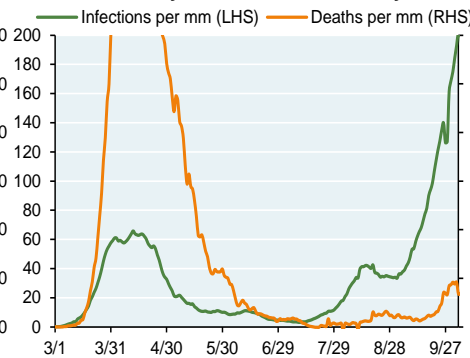
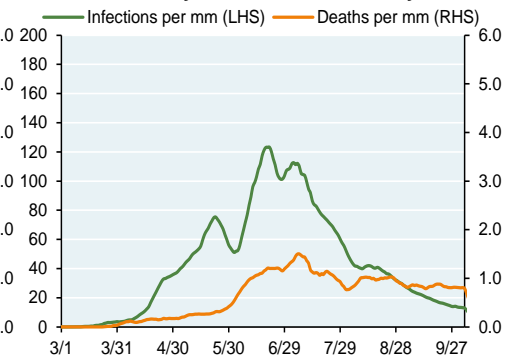
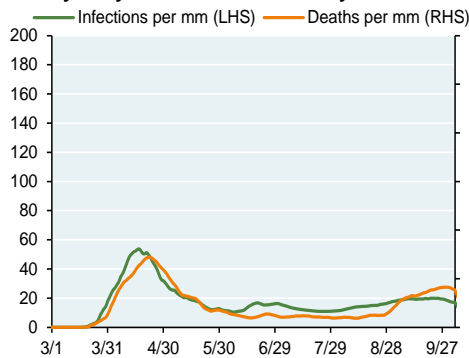
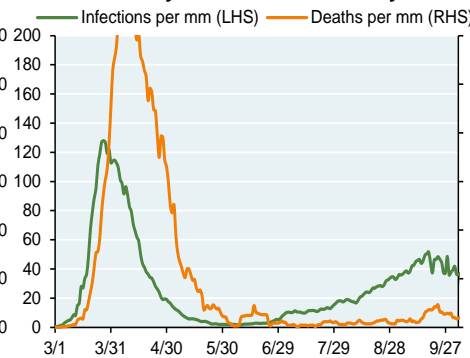
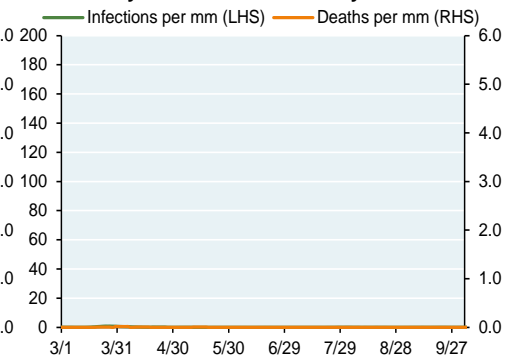
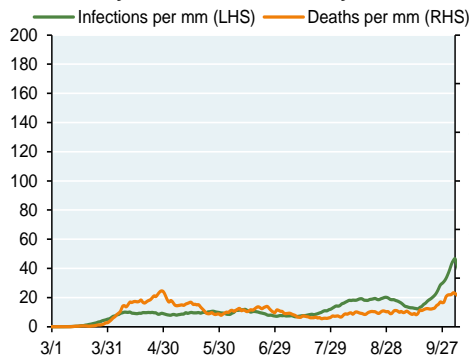
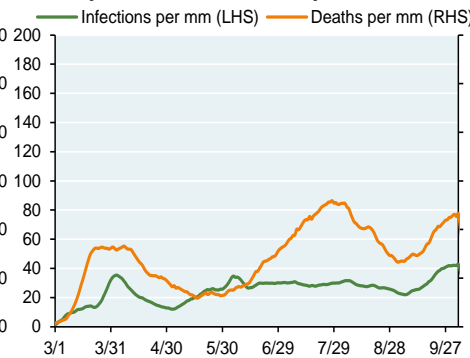
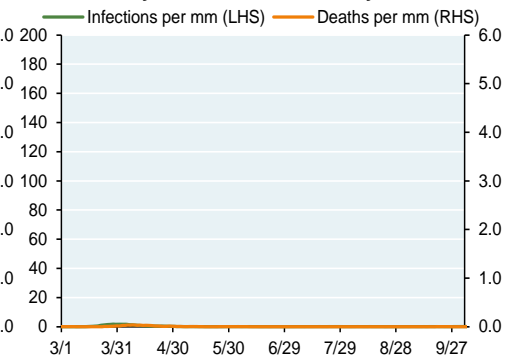


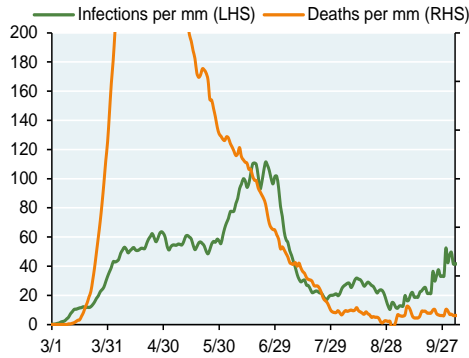
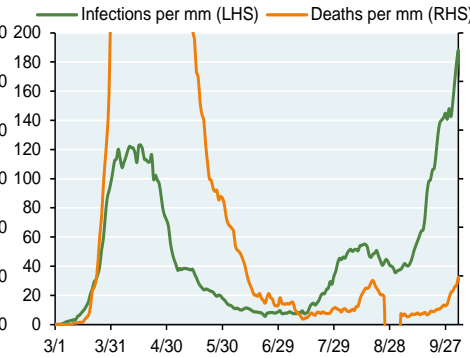
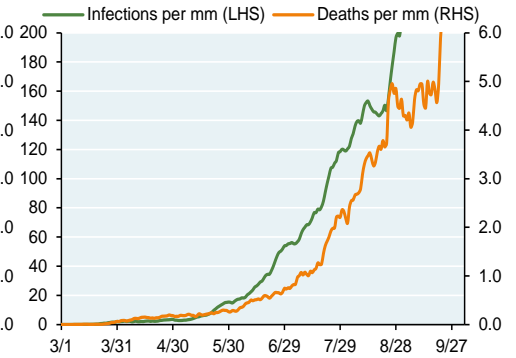
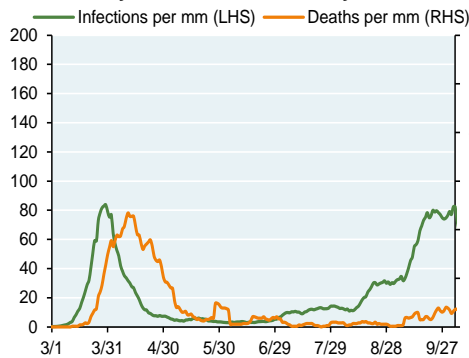
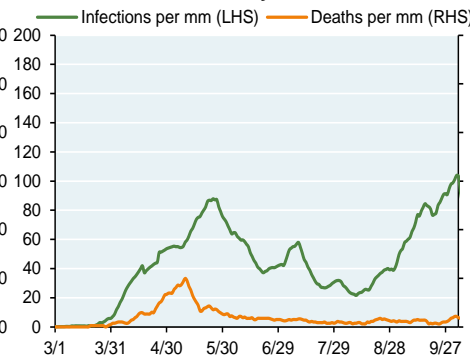
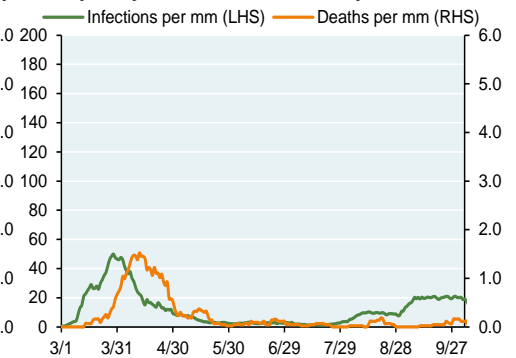
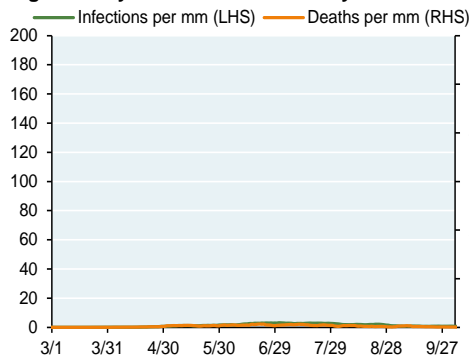
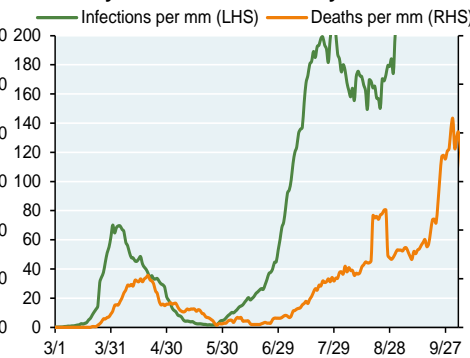
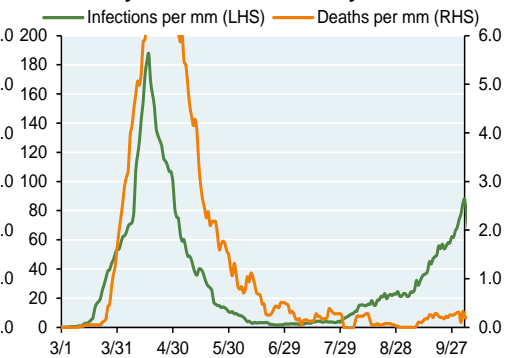
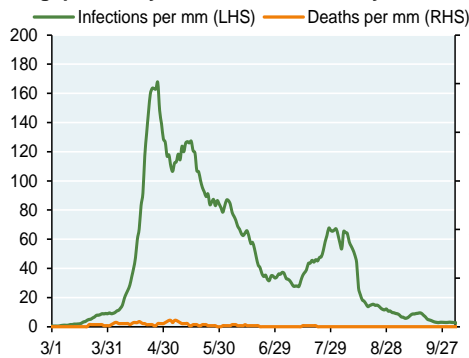
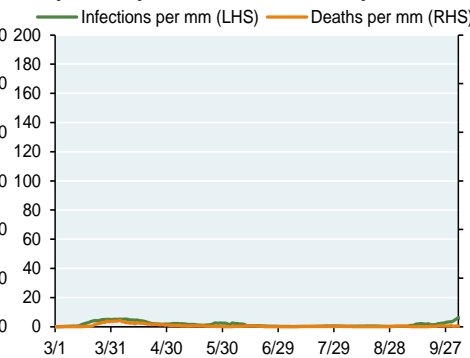
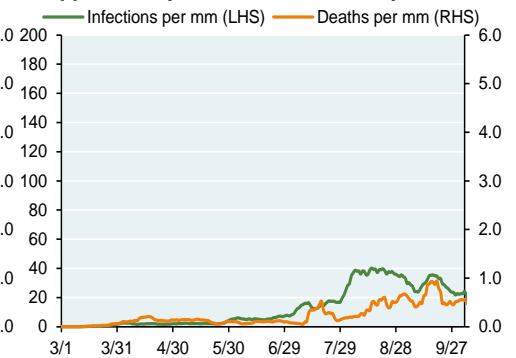
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

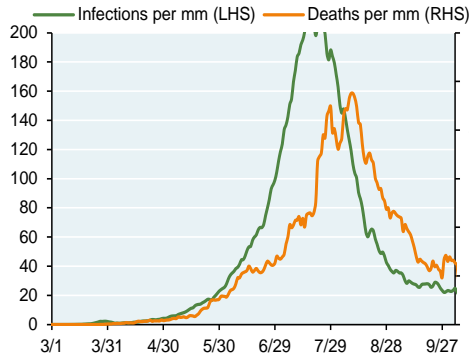
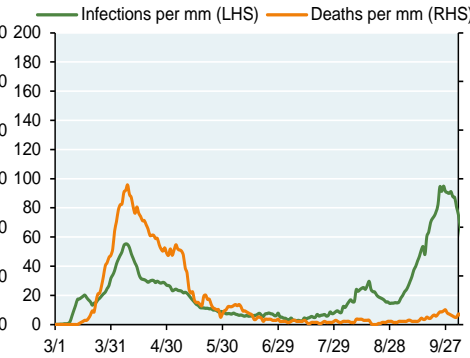
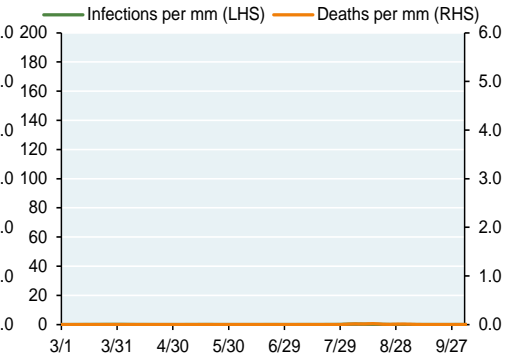
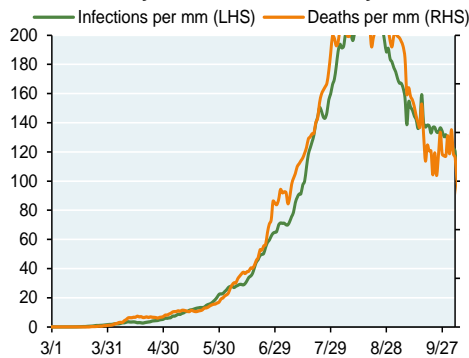
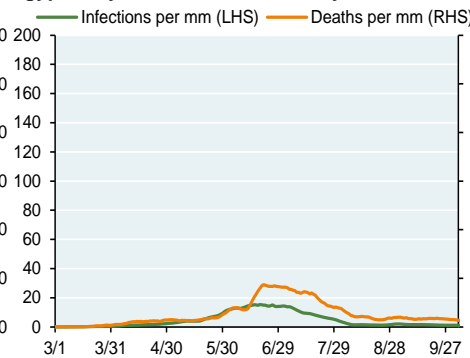
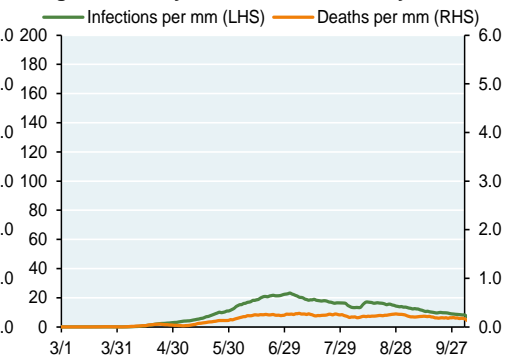
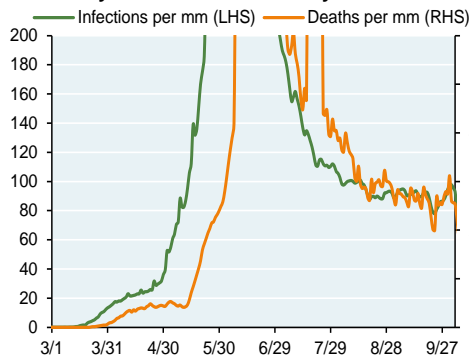
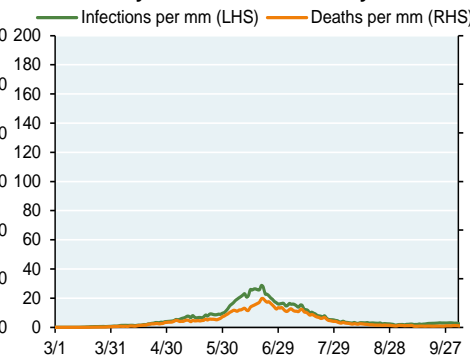
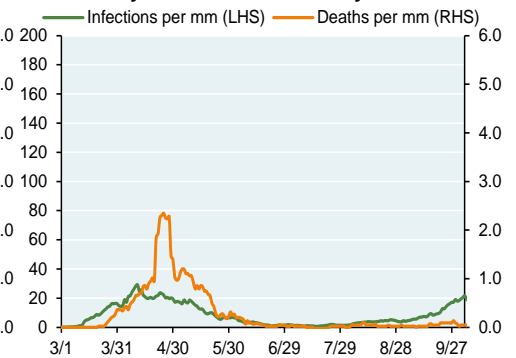
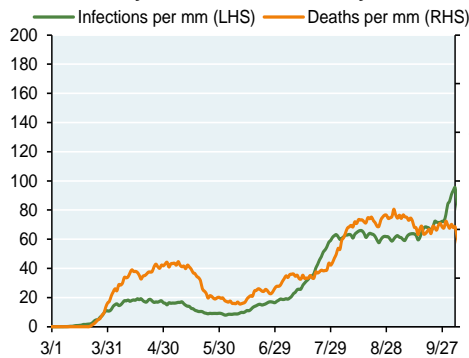
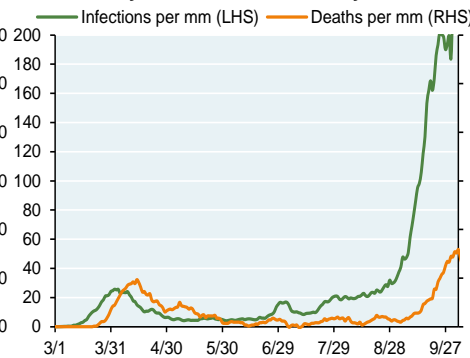
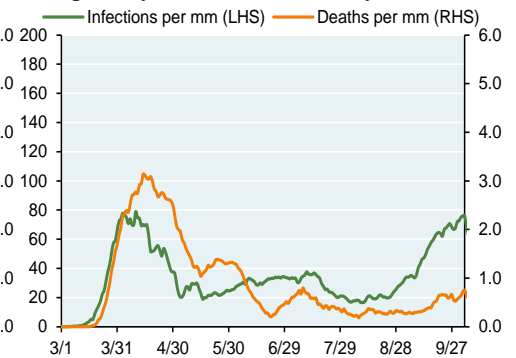
South Korea daily infections vs mortality

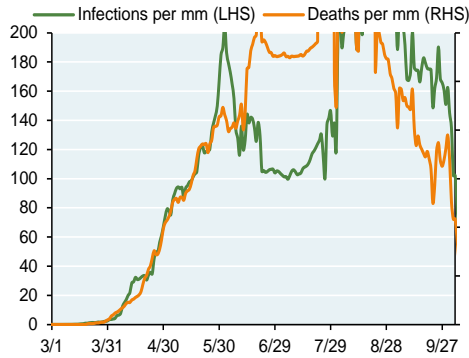
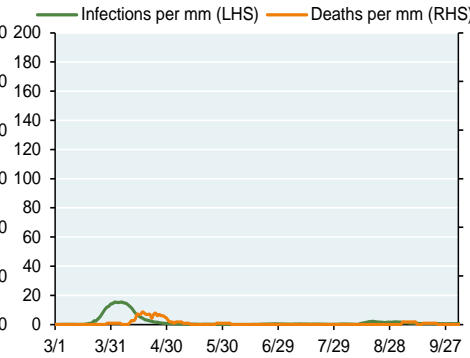
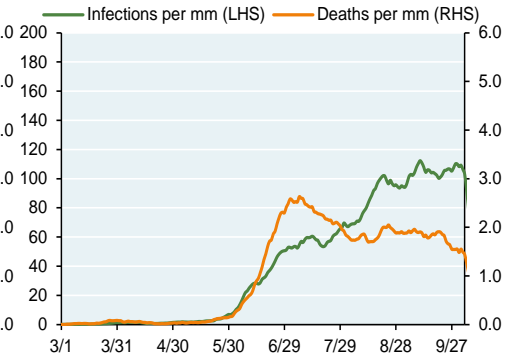
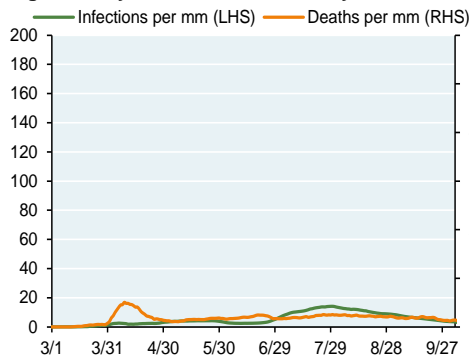
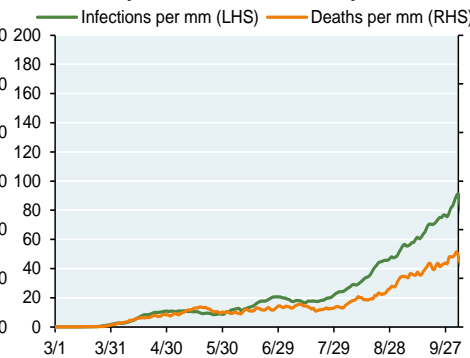
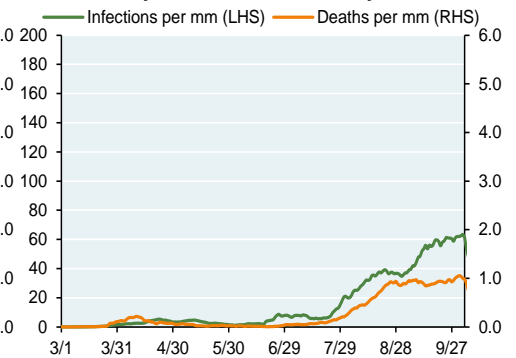
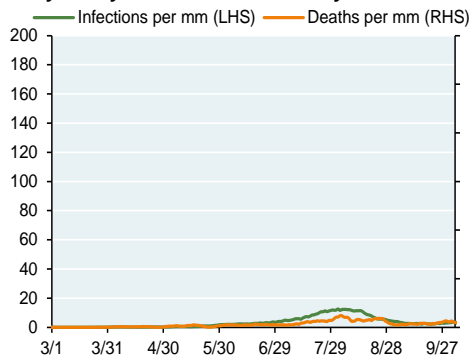
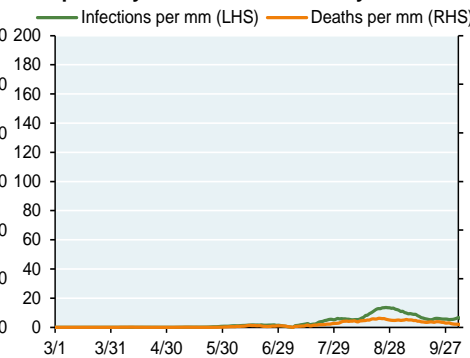
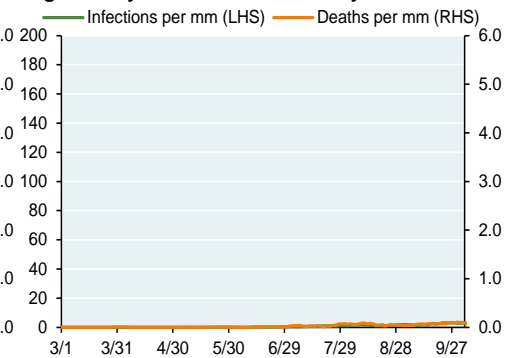
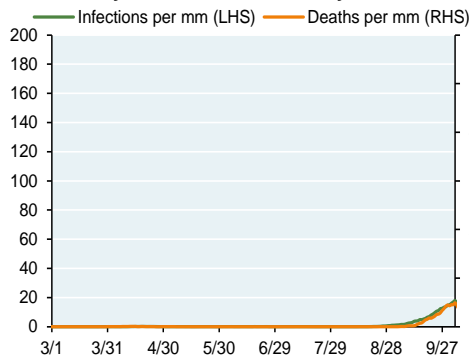
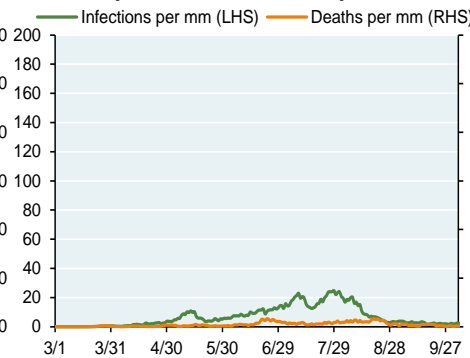
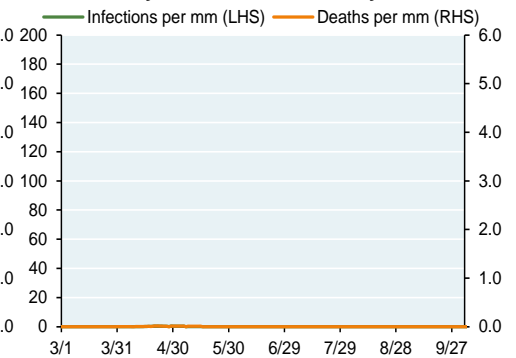


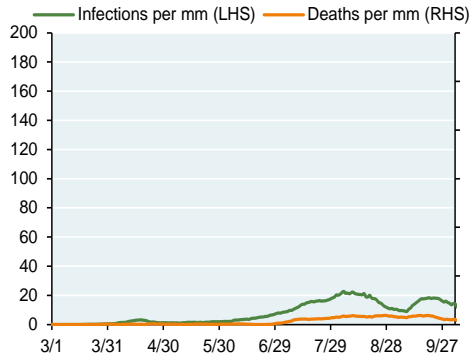
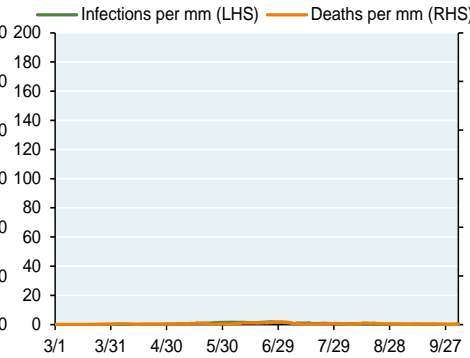
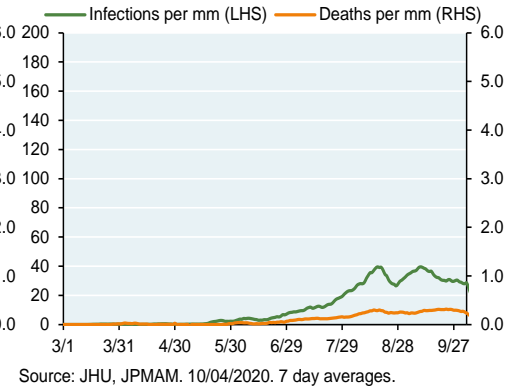
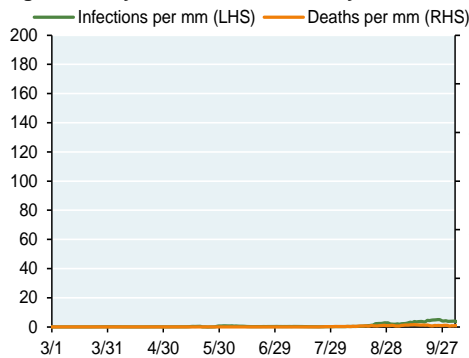
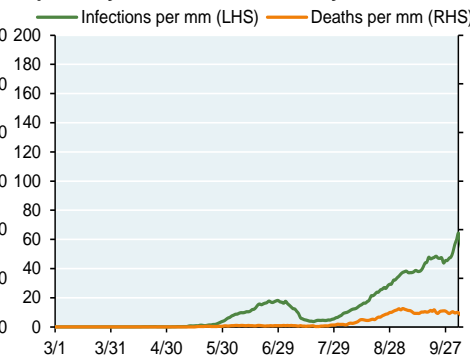
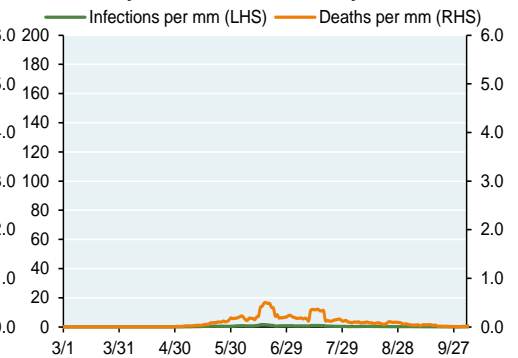
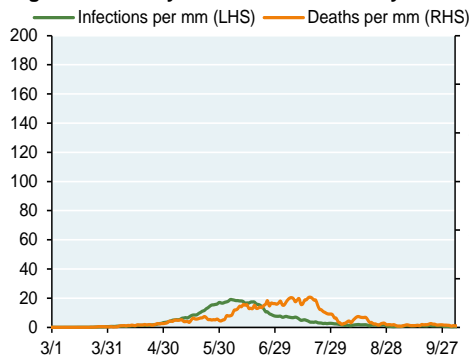
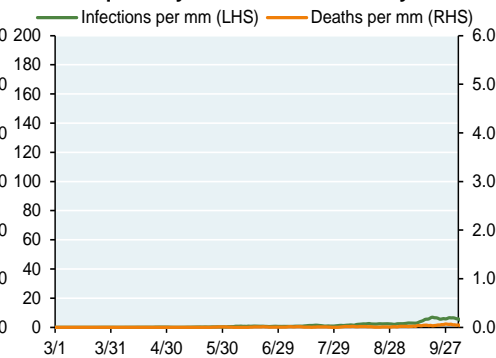
Source: JHU, JPMAM. 10/04/2020. 7 day averages.

**Spain daily infections vs mortality****Australia daily infections vs mortality****Mexico daily infections vs mortality****Indonesia daily infections vs mortality****Netherlands daily infections vs mortality****Saudi Arabia daily infections vs mortality****Turkey daily infections vs mortality****Switzerland daily infections vs mortality****Taiwan daily infections vs mortality****Poland daily infections vs mortality****Iran daily infections vs mortality****Thailand daily infections vs mortality**

**Sweden daily infections vs mortality****Belgium daily infections vs mortality****Argentina daily infections vs mortality****Austria daily infections vs mortality****United Arab Emirates daily infections vs mortality****Norway daily infections vs mortality****Nigeria daily infections vs mortality****Israel daily infections vs mortality****Ireland daily infections vs mortality****Singapore daily infections vs mortality****Malaysia daily infections vs mortality****Philippines daily infections vs mortality**

**South Africa daily infections vs mortality****Denmark daily infections vs mortality****Vietnam daily infections vs mortality****Colombia daily infections vs mortality****Egypt daily infections vs mortality****Bangladesh daily infections vs mortality****Chile daily infections vs mortality****Pakistan daily infections vs mortality****Finland daily infections vs mortality****Romania daily infections vs mortality****Czechia daily infections vs mortality****Portugal daily infections vs mortality**

**Peru daily infections vs mortality****New Zealand daily infections vs mortality****Iraq daily infections vs mortality****Algeria daily infections vs mortality****Ukraine daily infections vs mortality****Morocco daily infections vs mortality****Kenya daily infections vs mortality****Ethiopia daily infections vs mortality****Angola daily infections vs mortality****Burma daily infections vs mortality****Ghana daily infections vs mortality****Tanzania daily infections vs mortality**

**Uzbekistan daily infections vs mortality****Congo (Kinshasa) daily infections vs mortality****Venezuela daily infections vs mortality****Uganda daily infections vs mortality****Nepal daily infections vs mortality****Yemen daily infections vs mortality****Afghanistan daily infections vs mortality****Mozambique daily infections vs mortality**

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