[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 4, serology tests suggest that the true number of COVID infections may be much 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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Comments on infection data. Several countries show up with almost no COVID outbreak reported. In cases like New Zealand, Taiwan, Japan, Vietnam and South Korea, we interpret the lack of a material outbreak as possible based on the quality of data reporting and testing. Other countries which report low incidence of COVID include Nigeria, Kenya, Angola, DR Congo, Tanzania and Mozambique. As per various news reports¹, there’s a shortage of reliable data in many of these countries, and the lack of funds to carry out broad testing. On the other hand, while infections can be obscured, it’s harder to obscure a sharp rise in mortality; even when accounting for some under-reporting of deaths, Africa mortality rates are still much lower than expected. The few antibody surveys conducted in Africa reveal COVID prevalence that is similar to other European countries; in other words, COVID is spreading in Africa as it is elsewhere. The most likely explanation for lower relative mortality is age: Africa’s median age is 18, compared to 35 in North America and 42 in Europe. Since those over age 65 experience 80% of COVID mortality, age distributions are the most likely reason for lower African COVID mortality rates.

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.

What’s new: US hits a plateau, Canada rises to US infection levels

- In the US, infections have reached summer 2020 lows; hospitalizations and mortality should improve as well in the next 4-6 weeks. US COVID hotspots now show flat to declining infections, even in Michigan; hotspot hospitalization data still in neutral close to March levels
- European COVID situation now showing sharp improvement, parallel to US

---

**US**

![Graph](source)

**Current hospitalization levels vs summer 2020 average**

15 largest states

![Bar Chart](source)

**US vs Europe infections**

Daily infections, # per mm, smoothing = 7 days

![Line Chart](source)

**US vs Europe mortality**

Daily deaths, # per mm, smoothing = 7 days

![Line Chart](source)
What’s new: a closer look at Europe

- UK COVID stats close to lowest levels since pandemic began, lockdowns being eased, vaccinations 54%
- Infections and hospitalizations rolling over in Continental Western Europe, particularly France and Italy; lockdowns still in place
- So-called “Swedish model” failing again, particularly when compared to the rest of Scandinavia

**United Kingdom**

Source: JHU, IMF, OWID, JPMAM. May 19, 2021. 7 day smoothing.

**W Europe**

Source: Johns Hopkins University, IMF, JPMAM. May 19, 2021.

**Scandinavia**

Source: Johns Hopkins University, IMF, JPMAM. May 19, 2021.

**W Europe**

Source: various country sources, IMF, JPMAM. May 19, 2021.

**Lockdown stringency index: US, UK and Europe**

Index, 100 = highest level of lockdown strictness

What’s new: Asia, MidEast, Eastern Europe and Russia

- Infections remain low in Developed and EM Asia, although modest outbreaks have occurred in Japan, the Philippines and Malaysia (even in Malaysia, infection levels still much lower than in Europe)
- Israel COVID stats close to lowest levels since pandemic began; vaccination at 63%
- Eastern European infections are rolling over sharply after winter surge
- Russia region infections stable other than in Lithuania and Georgia
What’s new: Latin America and India region

- Brazil is now the epicenter of COVID infection and mortality in the Western Hemisphere; Brazil mortality surge has spread to Uruguay and other countries in the region; LatAm mortality surges past US/Europe
- February reports of high seroprevalence levels in India were wildly inaccurate and another example of useless and premature COVID risk assessments/forecasting
- On a per capita basis, India infections and mortality are still below countries in Europe and Latin America; but vaccinations are low, and there are widespread reports of COVID undercounting

**Regions**
Daily deaths, # per mm, smoothing = 7 days

**Brazil states**
Daily deaths, # per mm, smoothing = 14 days

**Latin America**
Daily deaths, # per mm, smoothing = 14 days

**India states**
Daily infections, # per mm, smoothing = 7 days

**India region**
Daily deaths, # per mm, smoothing = 7 days

**India region**
Daily infections, # per mm, smoothing = 7 days
What’s new: Countries outside the Top 50, Canada counties, Caribbean, South Africa region

**Highest infections outside Top 50**
Daily infections, # per mm, smoothing = 7 days

**Highest mortality outside Top 50**
Daily deaths, # per mm, smoothing = 7 days

**Canadian provinces**
Daily infections, # per mm, smoothing = 7 days

**Caribbean**
Daily infections, # per mm, smoothing = 7 days

**Southern Africa**
Daily infections, # per mm, smoothing = 7 days

Source: Johns Hopkins University, IMF, JPMAM. May 19, 2021.
Summary of global and US infection/mortality trends

**World**

- Daily infections # per mm (LHS)
- Daily deaths # per mm (RHS)

**US**

- Daily infections # per mm (LHS)
- Current hospitalizations # per mm (LHS)
- Daily deaths # per mm (RHS)

**Dev World ex-US**

- Daily infections # per mm (LHS)
- Daily deaths # per mm (RHS)

**S America**

- Daily infections # per mm (LHS)
- Daily deaths # per mm (RHS)

**US vs Europe infections**

Infections to date, levels, smoothing = 1 days

**US vs Europe mortality**

Deaths to date, levels, smoothing = 1 days

Source: JHU, IMF, JPMAM. May 19, 2021. 7 day smoothing.
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. May 19, 2021.
Infection, mortality and hospitalization snapshots

The two charts below show the current rates of infection (top chart) and mortality (bottom chart) compared to the rate 21 days ago 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**
Sorted by trailing 7 day average infection rate per mm people

**Mortality levels for the largest 50 countries based on GDP**
Sorted by trailing 7 day average mortality rate per mm people

Source: Johns Hopkins University, IMF, JPMAM. Countries shown represent 94% of World GDP. May 19, 2021.
The charts below show current rates of infection (first chart), mortality (second chart) and hospitalization (third chart) compared to the rate 21 days ago for the 50 US states and DC.

**Infection levels for US states**
Sorted by trailing 7 day average infection rate per mm people

**Mortality levels for US states**
Sorted by trailing 7 day average mortality rate per mm people

**Hospitalization levels for US states**
Sorted by trailing 7 day average current hospitalizations per mm people

Source: Johns Hopkins University, IMF, JPMAM. May 19, 2021.

US at a glance: infection, hospitalization and mortality tracking

The charts below track infection, hospitalization, testing and mortality data for the US in aggregate. See section 3 for a state-by-state chartpack which covers the full range of infection, hospitalizations and mortality.

2 40 states report the total number of “testing encounters” or “testing specimens”; the rest show the number of people tested each day that have never been tested before or include untested probable cases. We only compute testing rates for the 40 states that provide encounter or specimen data.
How lethal is COVID, and for whom?

Let’s first compare it to the flu. A key issue to keep in mind: there’s a difference between case fatality rates (deaths as a % of reported cases) and infection fatality rates (deaths as a % of all infected people, whether symptomatic or not). The latter can only be derived through antibody testing and other sampling methods involving molecular assessments of infection. The IFR of the seasonal flu is reported to be well below 0.1% with other estimates ranging from 0.02% to 0.04%. In contrast, the IFR for COVID has been estimated at 0.23% by Stanford’s Metaresearch Innovation Center, and at 0.7%-0.9% by the CDC. Either way, COVID is significantly more lethal than the seasonal flu. Tracking “excess” abnormal death levels is another way to understand the incremental mortality impact of COVID (see second chart). In addition to higher mortality than the flu, COVID also appears to entail more longer-lasting medical complications (see web portal section 4).

Flu vs COVID-19 infection fatality rates

<table>
<thead>
<tr>
<th>%, estimated infection fatality rate</th>
<th>Seasonal influenza</th>
<th>COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO</td>
<td>0.0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Oxford</td>
<td>0.1%</td>
<td>0.8%</td>
</tr>
<tr>
<td>CDC</td>
<td>0.2%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Imperial College London</td>
<td>0.3%</td>
<td>1.0%</td>
</tr>
<tr>
<td>University of Wollongong (global)</td>
<td>0.4%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Stanford</td>
<td>0.5%</td>
<td>2.0%</td>
</tr>
<tr>
<td>Meta-Research Innovation Center (global)</td>
<td>0.6%</td>
<td>2.5%</td>
</tr>
<tr>
<td>CDC US Seroprevalence Survey</td>
<td>0.7%</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

DISTRIBUTION OF ACTUAL MORTALITY: Mortality to-date by age group, % of total mortality

<table>
<thead>
<tr>
<th>Age Group</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 yr</td>
<td>0.0%</td>
</tr>
<tr>
<td>1-4 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>5-14 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>15-24 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>25-34 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>35-44 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>45-54 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>55-64 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>65-74 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>75-84 yrs</td>
<td>0.0%</td>
</tr>
<tr>
<td>&gt; 85</td>
<td>30.2%</td>
</tr>
</tbody>
</table>

MORTALITY RATES FOR EACH AGE BRACKET: COVID deaths to-date per mm population in each age group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 yr</td>
<td>18</td>
</tr>
<tr>
<td>1-4 yrs</td>
<td>2</td>
</tr>
<tr>
<td>5-14 yrs</td>
<td>2</td>
</tr>
<tr>
<td>15-24 yrs</td>
<td>21</td>
</tr>
<tr>
<td>25-34 yrs</td>
<td>83</td>
</tr>
<tr>
<td>35-44 yrs</td>
<td>241</td>
</tr>
<tr>
<td>45-54 yrs</td>
<td>687</td>
</tr>
<tr>
<td>55-64 yrs</td>
<td>1,665</td>
</tr>
<tr>
<td>65-74 yrs</td>
<td>4,000</td>
</tr>
<tr>
<td>75-84 yrs</td>
<td>9,817</td>
</tr>
<tr>
<td>&gt; 85</td>
<td>25,994</td>
</tr>
</tbody>
</table>

RELATIVE MORTALITY RISK: risk of dying across age brackets

<table>
<thead>
<tr>
<th>Age Group</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative to 85+</td>
<td>0.1%</td>
</tr>
<tr>
<td>Relative to 75+</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Source: CDC, JPMAM. May 8, 2021.
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