

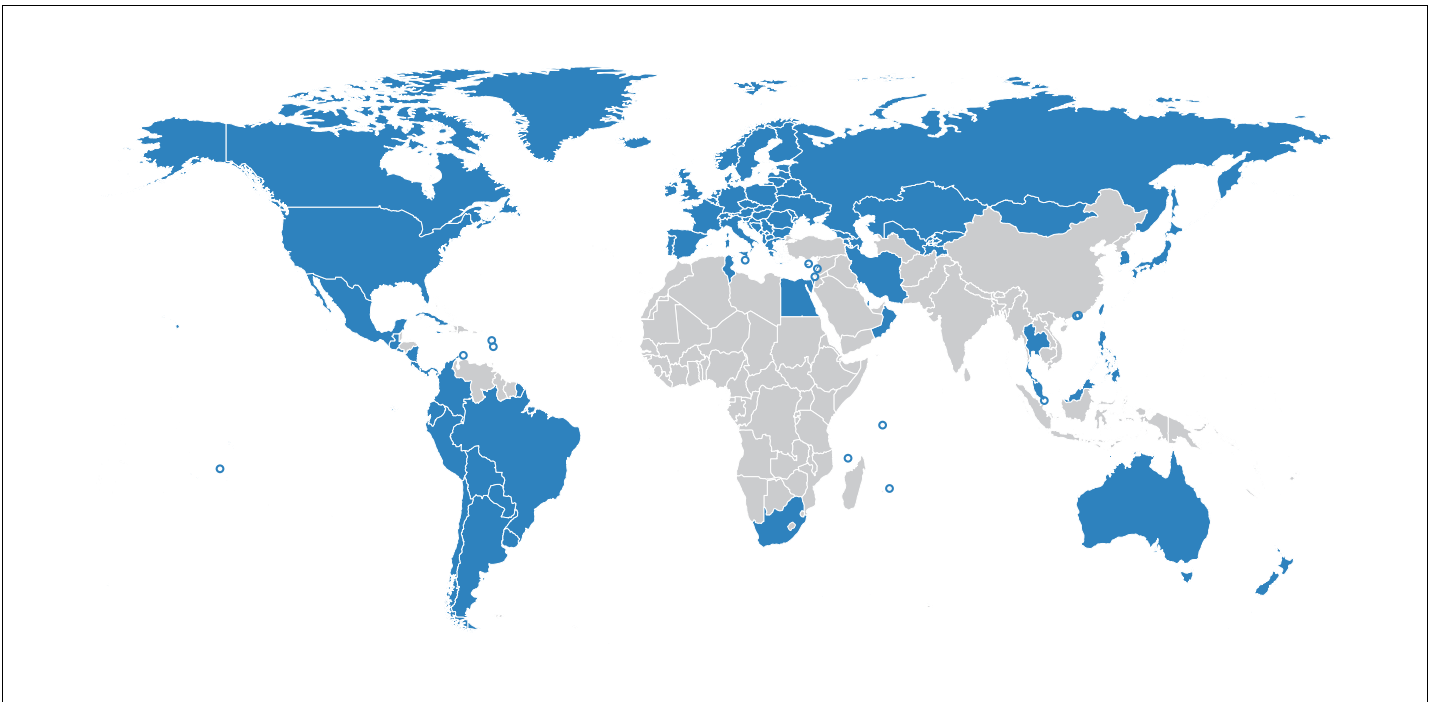


---

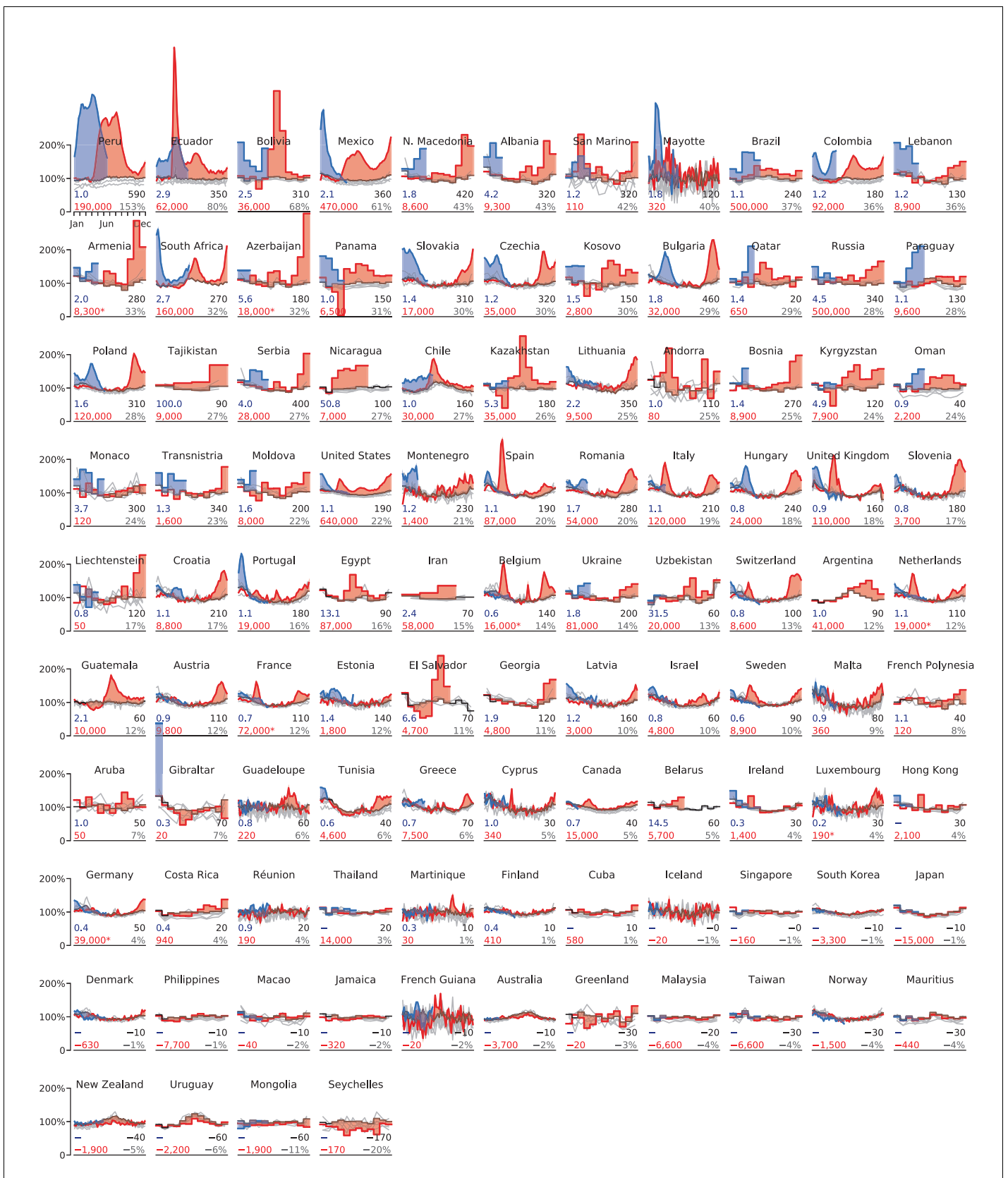
## Figures and figure supplements

Tracking excess mortality across countries during the COVID-19 pandemic with the World Mortality Dataset

**Ariel Karlinsky and Dmitry Kobak**



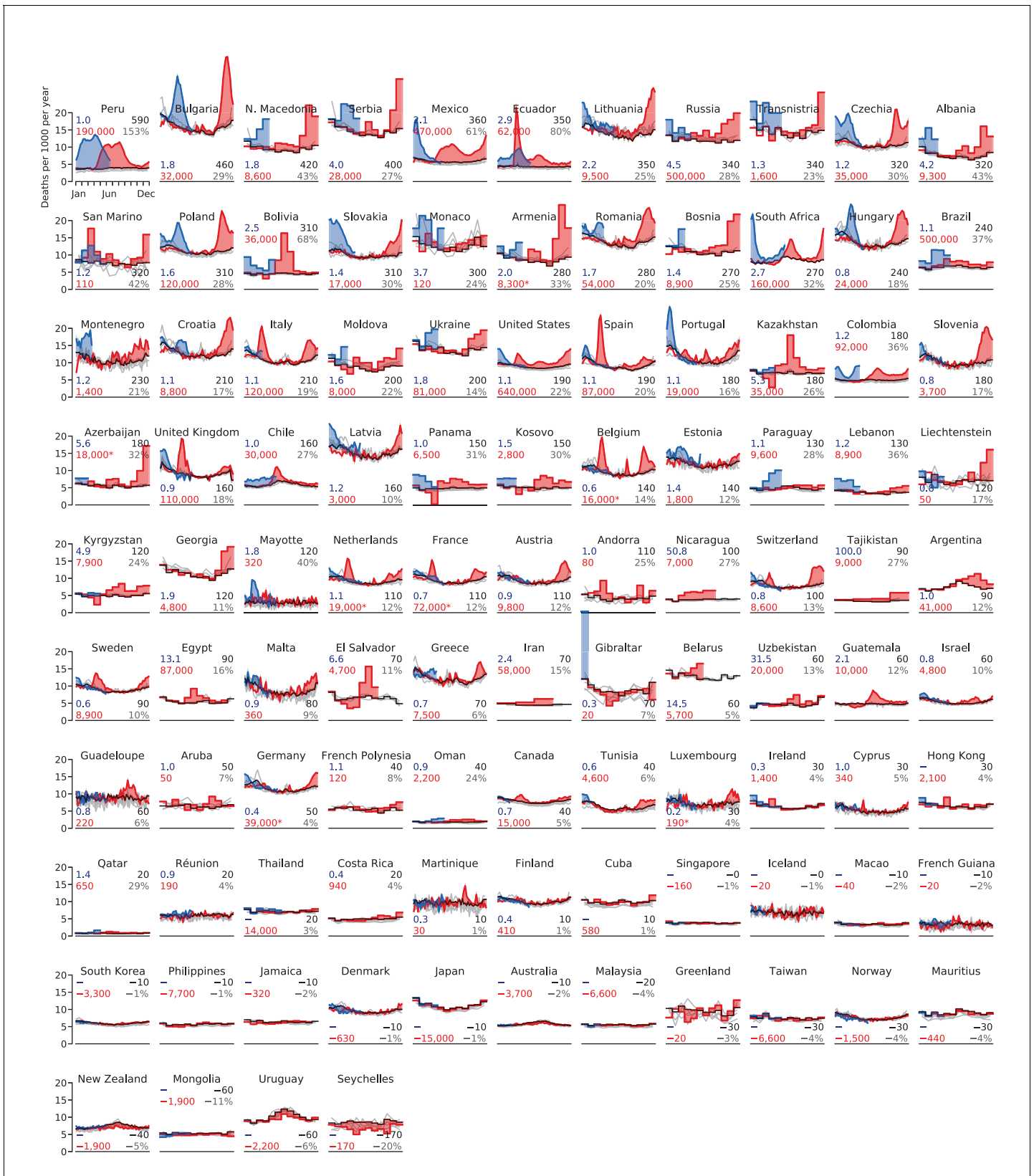
**Figure 1.** Countries in the World Mortality Dataset are shown in blue. Small countries and territories are shown with circles.



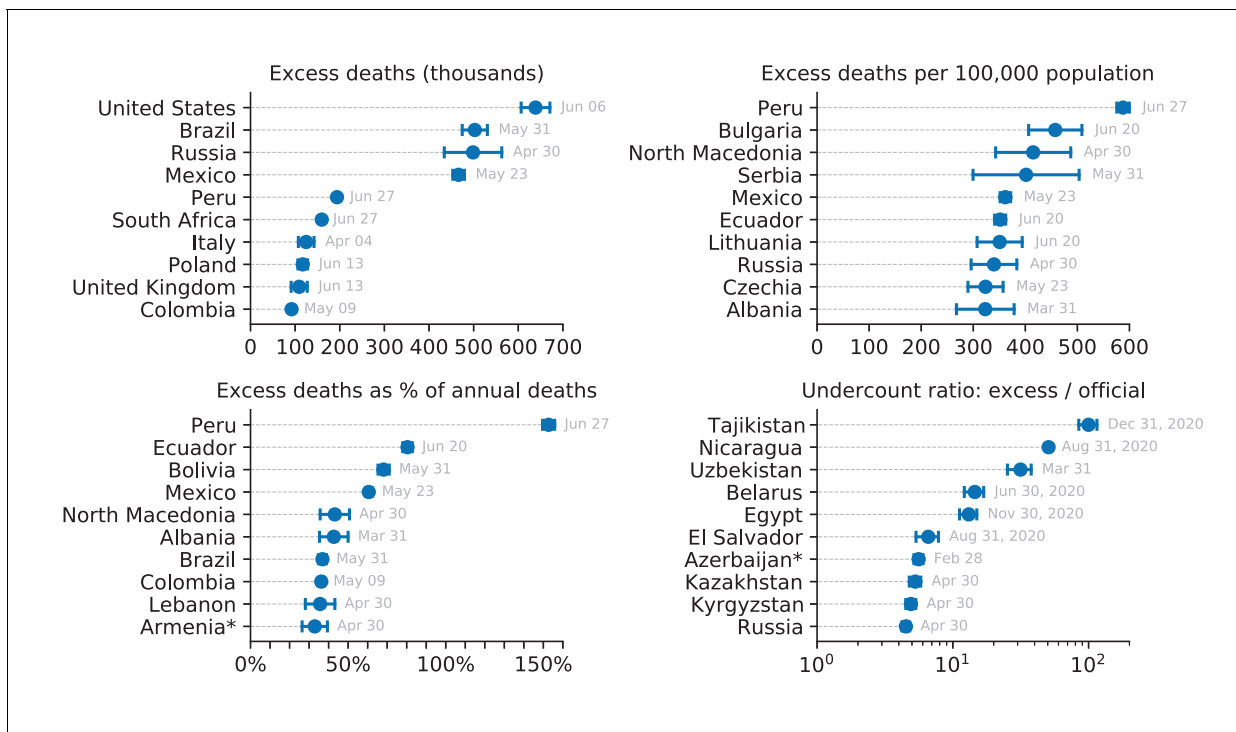
**Figure 2.** Excess mortality time series. Each subplot shows baseline mortality (black), mortality in 2015–2019 (gray), in 2020 (red) and in 2021 (blue). Excess mortality is shown in red/blue shading. The numbers in each subplot are: total excess mortality (red), excess mortality per 100,000 population (blue). *Figure 2 continued on next page*

*Figure 2 continued*

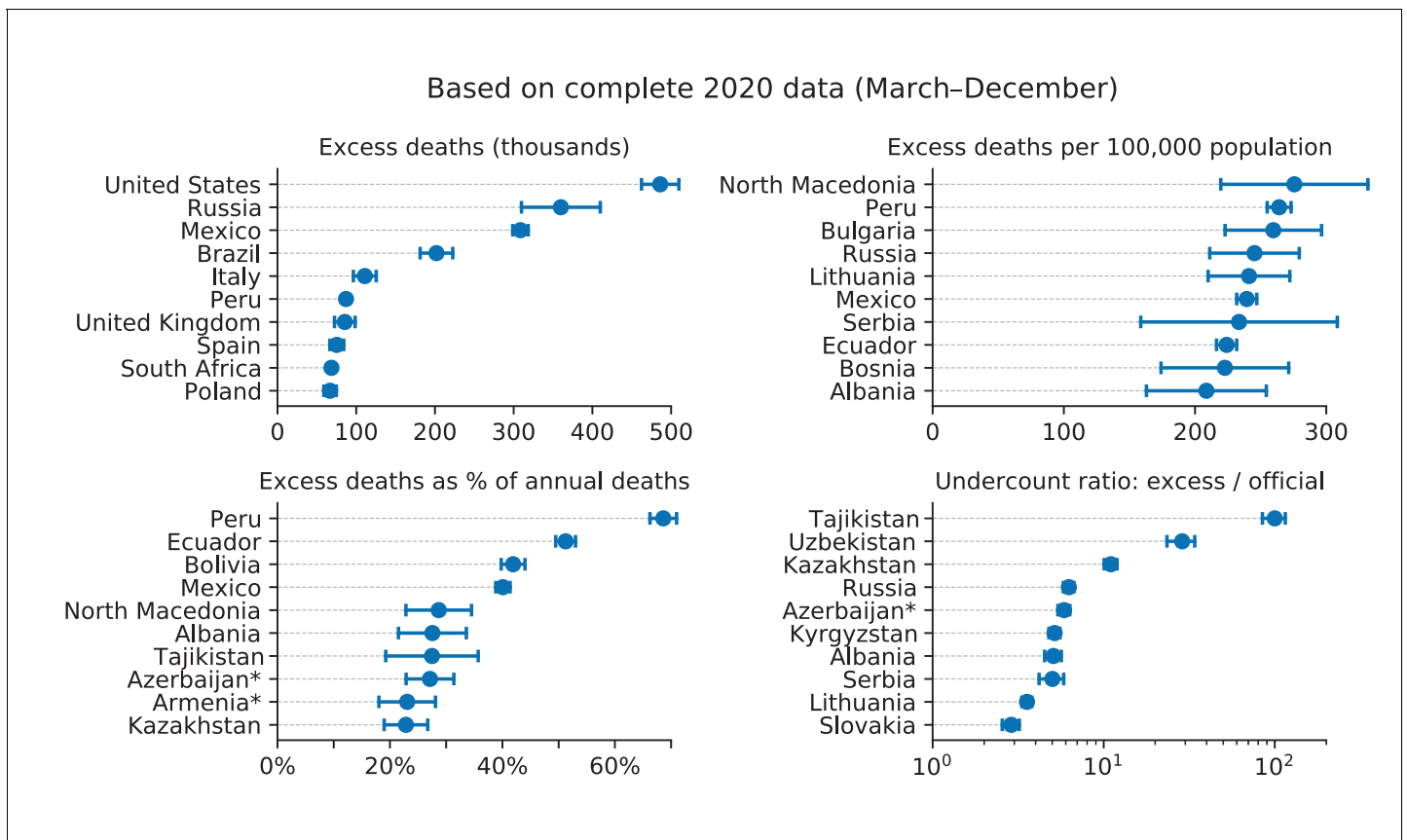
(black), excess mortality as a percentage of annual baseline mortality (gray), and undercount ratio of COVID-19 deaths (blue). See text for the exact definitions. All numbers were rounded to two significant digits; numbers below 100 to one significant digit. The y-axis in each subplot starts at 0 and goes until 200% where 100% corresponds to the average baseline mortality. The x-axis covers the entire year. Asterisks mark excess mortality estimates that were downwards corrected (see Materials and methods). Countries are sorted by the excess mortality as a percentage of annual baseline mortality (gray number). Undercount estimates are not shown for countries with negative total excess deaths and for selected countries where excess deaths were likely not related to the COVID-19 pandemic (Hong Kong, Thailand, Cuba); see Materials and methods.



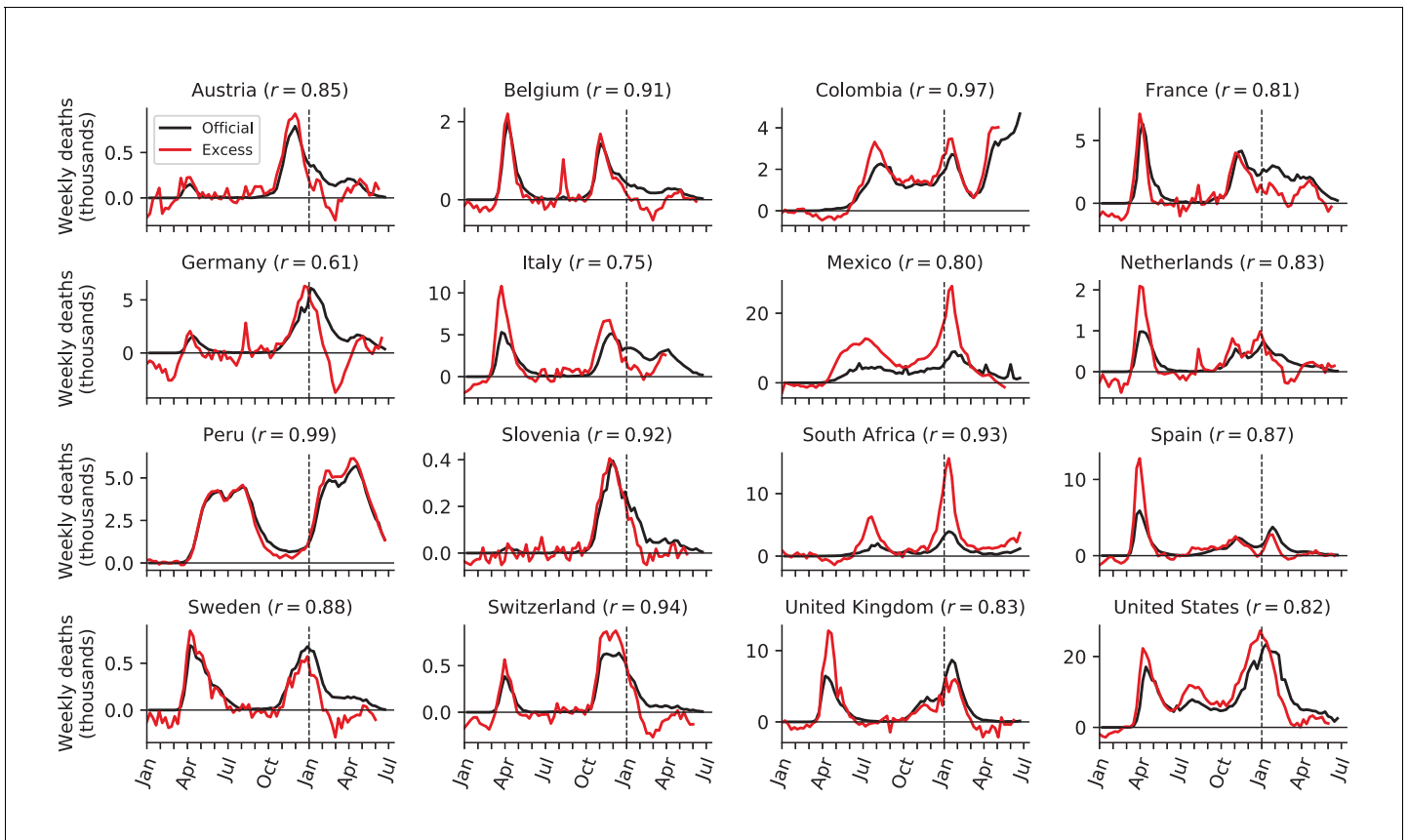
**Figure 2—figure supplement 1.** Excess mortality time series, normalized per population size. The figure is fully analogous to **Figure 2**, but countries are sorted by the excess mortality per 100,000 population, and all shown curves are normalized to yield mortality per 1000 people per year (each data point shows what mortality per 1000 people per year would be if the death rate stayed at the same level throughout the year).



**Figure 3.** Top 10 countries in the World Mortality Dataset by various excess mortality measures. Each subplot shows the top 10 countries for each of our four excess mortality measures: total number of excess deaths; excess deaths per 100,000 population; excess deaths as a percentage of baseline annual mortality; undercount ratio (ratio of excess deaths to reported COVID-19 deaths by the same date). Error bars denote 95% confidence intervals corresponding to the uncertainty of the excess deaths estimate. Countries with population below 500,000 are not shown. Different countries have different reporting lags, so the estimates shown here correspond to different time points, as indicated. Excess mortality estimates in Armenia and Azerbaijan were downwards corrected by 4000 to account for the war casualties (see Materials and methods).



**Figure 3—figure supplement 1.** Top 10 countries in the World Mortality Dataset by various excess mortality measures by the end of 2020. Each subplot shows the top 10 countries for each of our four excess mortality measures: total number of excess deaths; excess deaths per 100,000 population; excess deaths as a percentage of baseline annual mortality; undercount ratio (ratio of excess deaths to reported COVID-19 deaths by the same date). Error bars denote 95% confidence intervals corresponding to the uncertainty of the excess deaths estimate. Countries with population below 500,000 are not shown. Excess mortality estimates in Armenia and Azerbaijan were downwards corrected by 4000 to account for the war casualties (see Materials and methods).



**Figure 4.** Relation between weekly excess deaths and weekly reported COVID-19 deaths. Sixteen selected countries are shown together with the Pearson correlation coefficient ( $r$ ) between the two time series, starting from week 10 of 2020. Note the peak in excess mortality (but not in the reported COVID-19 deaths) associated with the August 2020 heat wave in Belgium, France, Germany, and Netherlands.