United States Covid-19 Death Statistics, to Jan 30 2021

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Covid-19 death rates by year of age

Infection rates for Covid-19 and (even more) death rates have been enormously greater among those in older age groups than among the young. Figure 1 plots reported deaths per 1000 from Covid-19 (and, for comparison, deaths), over the 13 months prior to Jan 30 2021. See `https://data.cdc.gov/resource/3apk-4u4f/` for details.
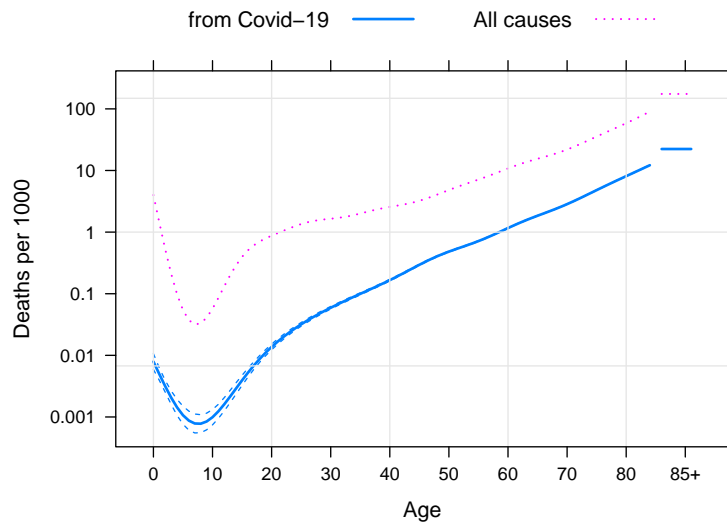
Figure 1: United States reported deaths per 1000 from Covid-19 (and, for comparison, deaths per 1000), for the time period from Jan 01 2020 to Jan 30 2021. For Covid-19 deaths, 2 SE bounds are added to the smooth. The total number of Covid-19 deaths reported was 421254.

Among aged 65 or older, deaths associated with Covid-19 accounted for 13.1% of all deaths. 81.2% of all deaths from Covid-19. occurred in the 65 or older age group.

Deaths from Covid-19, pneumonia alone, & influenza (all), by age category
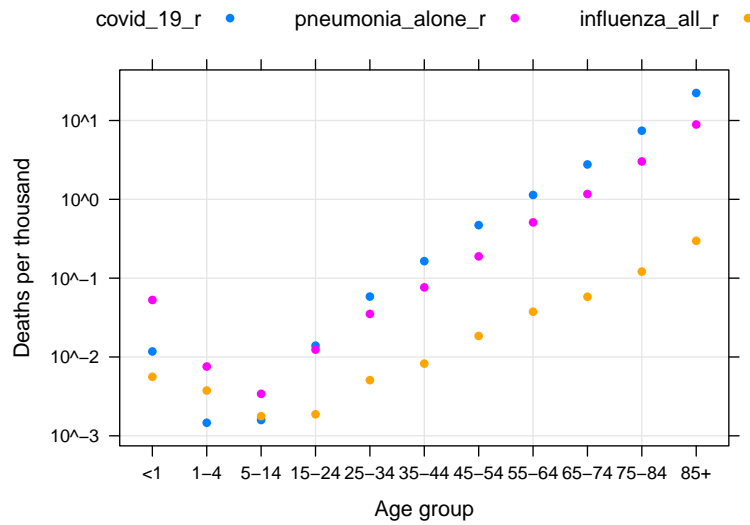

Figure 2: Deaths per thousand, between Jan 01 2020 and Jan 30 2021 from Covid-19, from pneumonia alone, and from influenza (all)

Figure 2 compares death rates where Covid-19 was involved with those from pneumonia alone, and those where influenza was involved. Except for those aged under 15, influenza made only a small contribution to total deaths. For those 83 or older, deaths from influenza were just over 1.3% of those from Covid-19.

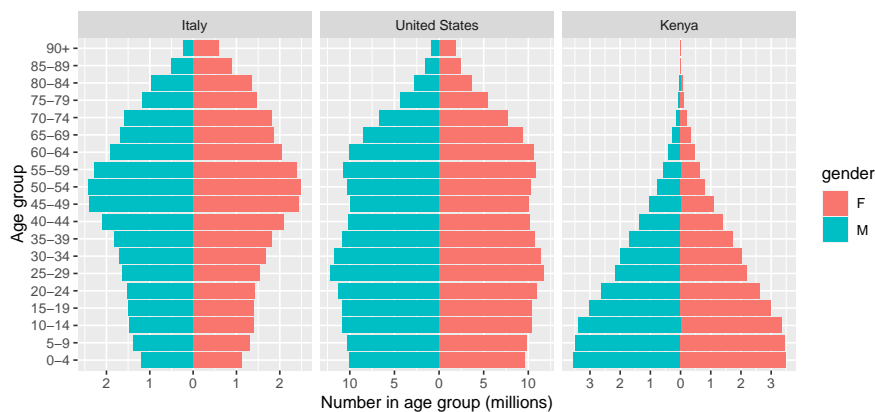## How might US age-specific death rates translate to other countries?

Figure 3: Population pyramids, compared between Italy, Germany, and Kenya.

Observe how the rates shown in Figure 1 flow through when comparisons are attempted between countries with very different age structures. Figure 3 compares the population pyramids between Italy, the United States, and Kenya.

The following compares deaths per 100,000 between the USA Germany, Italy, and Kenya, noting also the numbers that might be expected if the proportions by age that are given for the USA were applied in those countries.

```
                          Italy USA Kenya
Reported deaths per 100000   132.8 146  68.2
Expected, at US rates by age 225.9 146  23.7
```

The point is to emphasize the difference that differences in population structure can make. Those differences will feed through in different ways to the calculation of different summary measure that may be of interest — e.g., infection rates or hospital admissions. In all cases, numbers from different countries may not, because of differences in the completeness of the data and in recording protocols, be strictly comparable. Case numbers, because of the extent to which they can be influenced by testing rates, are likely to be substantial undercounts, to an extent that varies from country to country.

A table on the web page Hospitalization and Death by Age shows how, in the US, hospitalization and death varied with age. Whereas death rates for those 85 years of age or older have been 810 times those of 5-17 year olds, for hospitalization the multiplier has been 52. The rates for 0-4 year olds were around twice those for 5-17 year olds. Overall rates varied, in both cases, with ethnicity. Compared to white non-hispanics, the hospitalization rate was 4.1 times greater for hispanics or Latinos, while the death rate was 2.8 times greater.

Source Sweave & data files, and code used to download data

The Sweave source file can be downloaded thus:

```
url <- "https://github.com/jhmaindonald/dataR/raw/main/covid/agestruc.Rnw"
download.file(url, 'agestruc.Rnw')
```

Required packages are `lattice`, `ggplot2`, and `mgcv`. To create this pdf, load this file into RStudio, and click *Compile PDF*.

The Rcode used to download the data can be downloaded thus:

```
url <- "https://github.com/jhmaindonald/dataR/raw/main/covid/UScovid.R"
download.file(url, 'UScovid.R')
```

This will download more recent versions of the CDC datasets.