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A simple epidemiological analysis of 2020 mortality in the US



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A screenshot of the Centre for Evidence-Based Medicine (CEBM) website. The browser address bar shows 'cebm.ox.ac.uk'. The website header includes the Nuffield Department of Primary Care Health Sciences logo and navigation links: ABOUT, RESEARCH, STUDY WITH US, TEAM, PUBLIC INVOLVEMENT, NEWS, and EVENTS. The main content area features the CEBM logo and the text 'Centre for Evidence-Based Medicine'. Below this is a navigation bar with links: HOME, ABOUT US, STUDY WITH US, RESOURCES, RESEARCH, NEWS & VIEWS, and EVENTS. A search bar is located on the right. The main announcement is for 'The Lack of Scientific Freedom: Causes, Consequences and Cures conference Copenhagen, Denmark 24 - 25 October 2022'. Below the title, there is a 'FORMS LIBRARY' section with links to 'ABSTRACT Submission Form' and 'EBHC skill workshops - express your interest!'. The abstract submission form link includes the text 'The deadline for submissions is July 31st 2022.' and 'Abstracts will be reviewed and notifications of decisions sent by June 30th 2022.'

US Mortality Data 2020



Provisional Mortality Data — United States, 2020

Weekly / April 9, 2021 / 70(14);519–522

On March 31, 2021, this report was posted online as an MMWR Early Release.

Please note: This report has been corrected. An [erratum](#) has been published.

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Summary

What is already known about this topic?

The COVID-19 pandemic caused approximately 375,000 deaths in the United States during 2020.

Article Metrics

Altmetric:

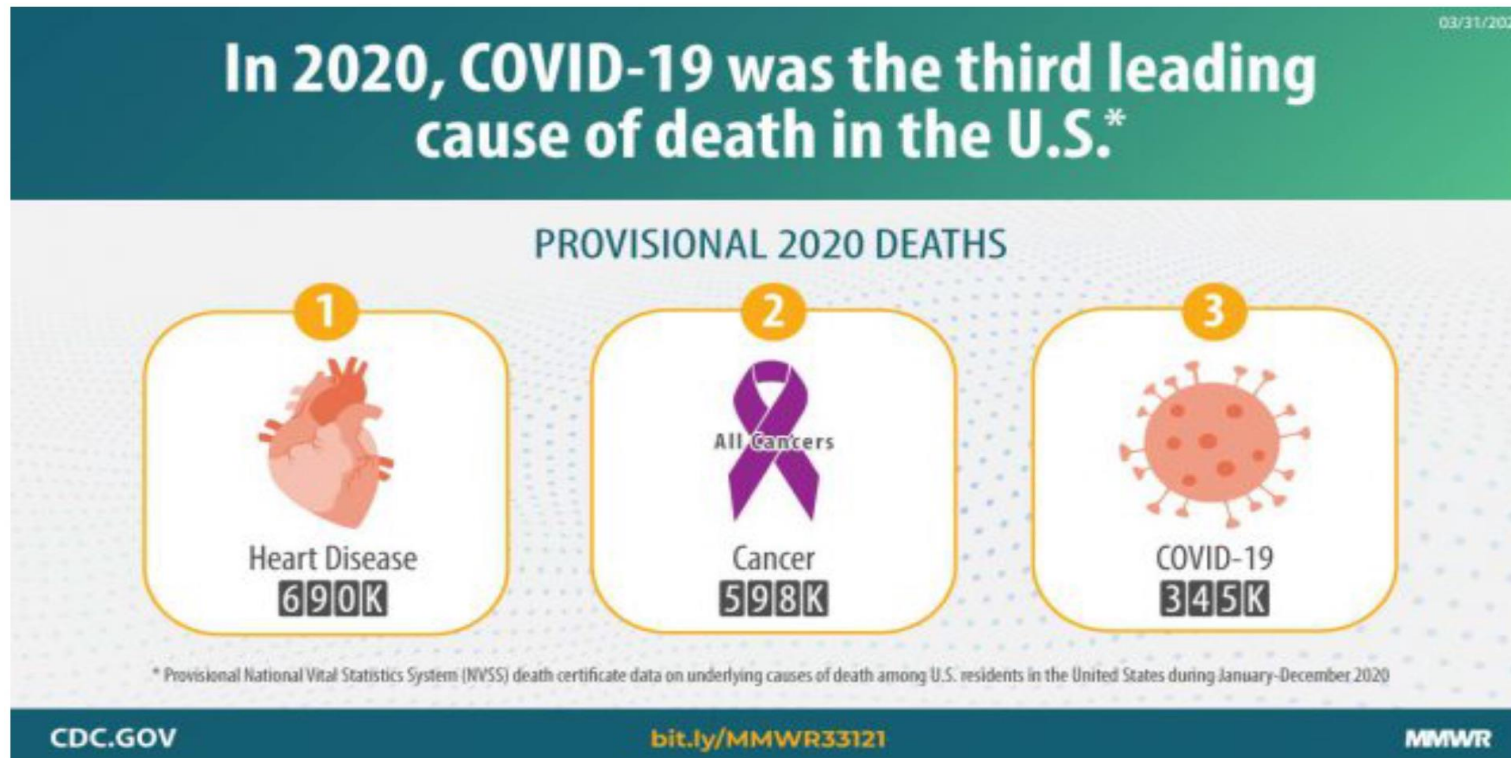


Covid-19 "third leading cause of death"

4:46 PM Mon Oct 17

cdc.gov

22%



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CDC's National Vital Statistics System (NVSS) collects and reports annual mortality statistics using data from U.S. death certificates. Because of the time needed to

Age groups

4:35 PM Mon Oct 17

cdc.gov

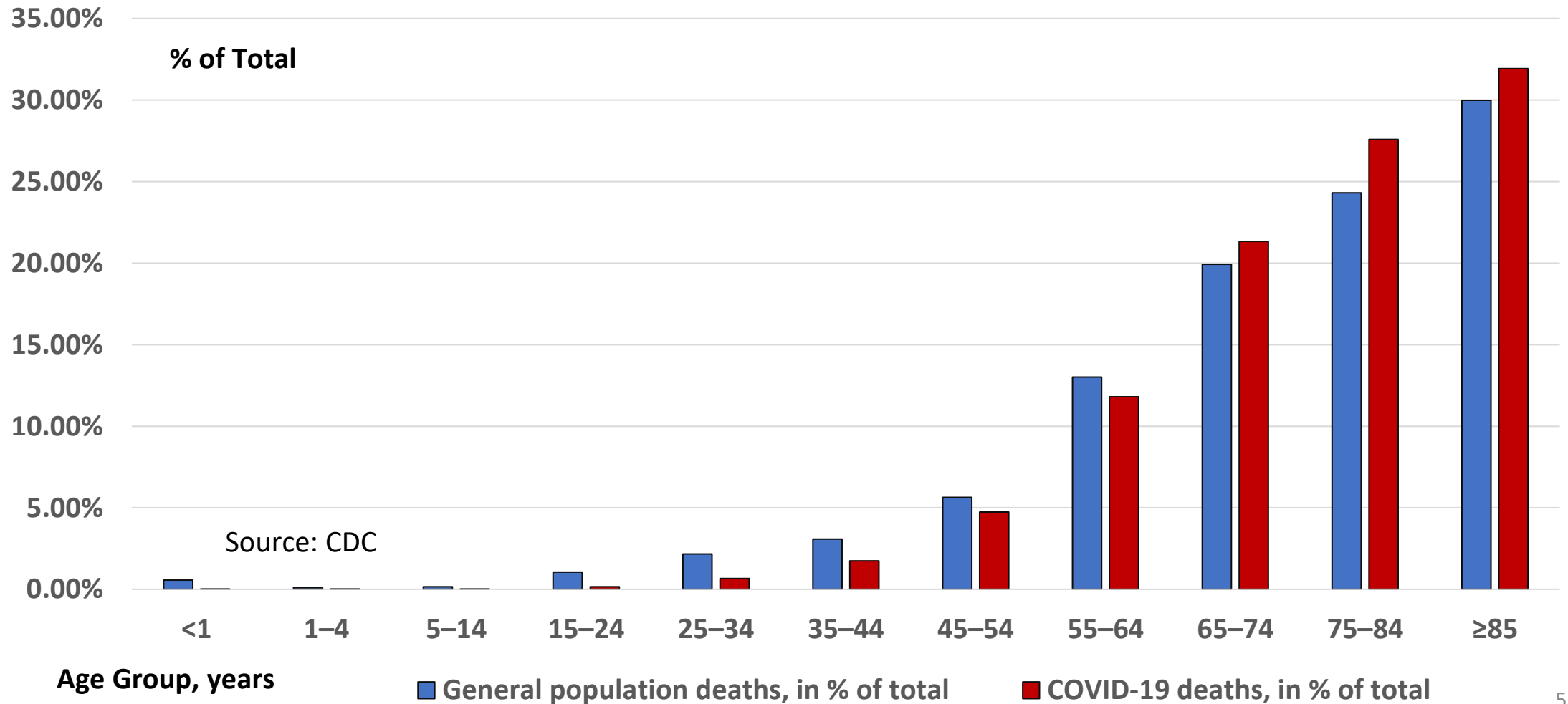
22%

TABLE. Provisional* number and rate of total deaths and COVID-19-related deaths, by demographic characteristics — National Vital Statistics System, United States, 2020

[Return](#)

Characteristic	No. (rate) [†]	
	Total deaths	COVID-19 deaths [§]
Total	3,358,814 (828.7)	377,883 (91.5)
Age group, yrs		
<1	19,146 (506.0)	43 (1.1)
1–4	3,469 (22.2)	24 (0.2)
5–14	5,556 (13.6)	67 (0.2)
15–24	35,470 (83.2)	587 (1.4)
25–34	72,678 (157.9)	2,527 (5.5)
35–44	103,389 (246.2)	6,617 (15.8)
45–54	189,397 (467.8)	17,905 (44.2)
55–64	436,886 (1,028.5)	44,631 (105.1)

US 2020 General population / Covid-19 mortality, in % of their total numbers, per age group



Age distribution of mortality

- Epidemiological "null hypothesis": Covid-19 deaths are part of normal and unavoidable population mortality
 - Similar age distribution
 - Superior mean age of death
 - Disease and patient characteristics
 - Common cold / flu virus
 - Co-morbidities of patients dying "of or with" Covid
- Covid 19 deaths additional to "normal" population mortality? ("Spiegelhalter postulate")
 - Excess deaths would have to show same age distribution

2:37 PM Tue Oct 18

bmj.com

79%

ANALYSIS

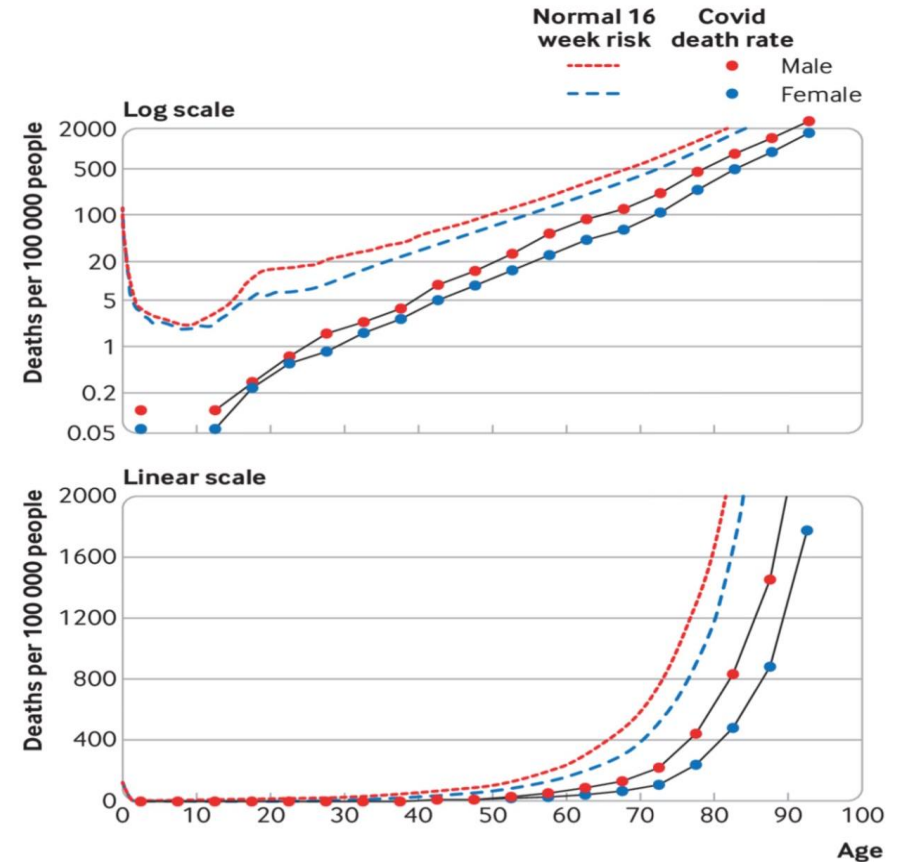


Fig 1 | Observed population fatality rates for 49 607 deaths mentioning covid-19, registered in England and Wales between 7 March and 26 June 2020. The covid-19 death rates create a remarkably straight line on a logarithmic scale (top), indicating an exponential increase of risk with age. The "normal" risk (dashed lines) is the actuarial annual mortality, scaled by a factor 16/52 to reflect the risk over 16 weeks.

The actuarial risks show an early peak related to congenital diseases and birth trauma, then a minimum at around age 9 or 10 and a

steady increase, which is remarkably linear apart from a bump in the late teens and early 20s associated with deaths from non-natural

Death rate per 100,000 people in age group

4:35 PM Mon Oct 17 cdc.gov 22%

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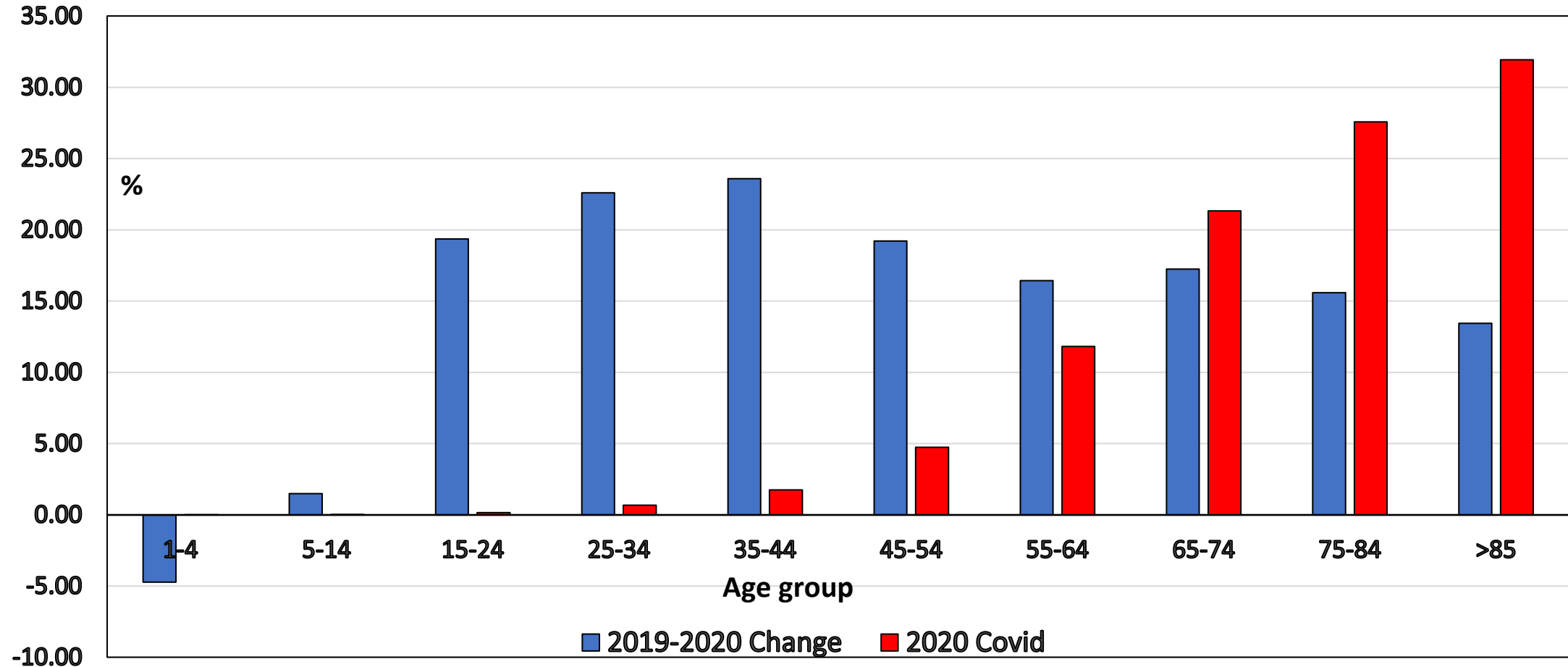
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Change from 2019, compared to Covid-19 death rate in 2020

	US Death Rates per 100,000 population			
	Total 2019	Total 2020	Change	COVID19 2020
Age Group				
1-4	23.3	22.2	-1.1	0.2
5-14	13.4	13.6	0.2	0.2
15-24	69.7	83.2	13.5	1.4
25-34	128.8	157.9	29.1	5.5
35-44	199.2	246.2	47	15.8
45-54	392.4	467.8	75.4	44.2
55-64	883.3	1,028.5	145.2	105.1
65_74	1,764.6	2068.8	304.2	249.2
75-84	4,308.3	4,980.2	671.9	635.8
>85	13,228.6	15,007.4	1,778.8	1,797.8
Source: CDC				

Percentage increase (2020 vs. 2019) of all-cause mortality in age groups, compared to age-group specific percentage of Covid-19 mortality



Calculated from CDC age-specific

US Mortality 2020 – Conclusions from CDC Data

- Momentous mortality rate increase (>20%) in younger age groups
 - Historical changes much smaller (see CDC comparison 2019 vs. 2018)
 - Cannot be due to Covid-19 (rates in these age groups far too low)
 - In absolute terms, more than 50,000 additional young deaths – many life years lost
- Mechanisms responsible for this rise likely to have contributed to the mortality rate increase in elderly populations as well
 - Approximate numerical fit with Covid rates does not prove causation
- Epidemiologically compelling hypothesis: Non-pharmaceutical interventions and their consequences have led to excess mortality in the US in 2020
- *Why has institutionalised epidemiology not analysed these simple data?*