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Covid-19 and the growing disadvantage in US life expectancy

ORIGINAL RESEARCH Simulations of provisional mortality

Effect of the covid-19 pandemic in 2020 on life expectancy across populations in the USA and other high income countries

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Study question How did life expectancy change in the United States and in 16 other high income countries during 2010-18 and 2018-20, and how did changes in life expectancy in the US differ across racial and ethnic groups?

Methods Life expectancy (at birth and at ages 25 and 65) was calculated for 2010-18 from life tables from the National Center for Health Statistics and the Human Mortality Database. Life expectancy in 2020 was estimated by simulating life tables from estimated age specific mortality rates in 2020 and allowing for 10% random error. Estimates for 2019

Life expectancy at birth in the United States, by race and ethnicity, and in peer countries, for 2010-18 and 2020. Data obtained from the National Center for Health Statistics, US Census Bureau, and Human Mortality Database. Data for 2019 could not be calculated because life table data were unavailable for many peer countries.

* Gap in life expectancy between US and peer countries (years)
were not possible because life tables were unavailable for many peer countries. Results for the US and peer countries were analysed by sex, and the US results were also analysed for Hispanic, non-Hispanic Black, and non-Hispanic White populations.

**Study answer and limitations** During 2010-18, peer countries had a larger increase in life expectancy compared with the US. The resulting gap in life expectancy (3.05 years) widened further (to 4.69 years) in 2020. Between 2018 and 2020, life expectancy in the US decreased by 1.87 years, 8.5 times the average decrease in peer countries. Life expectancy in the US decreased disproportionately in Hispanic and Black populations, declining by 3.88 and 3.25 years, respectively, between 2018 and 2020, whereas the decrease in the non-Hispanic White population was 1.36 years. The study relied on simulations of provisional mortality data for 2020 and could not include all high income countries or all US racial groups.

**What this study adds** This study suggests that the covid-19 pandemic of 2020 produced a much larger decrease in life expectancy in the US than in peer countries, disproportionately affecting systematically marginalised racial and ethnic groups and deepening the health divide between the US and its peers.

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**COMMENTARY** The pandemic magnified pre-existing vulnerabilities in US society

With 600 000 deaths from covid-19 as of mid-June 2021, more people have died of the disease in the United States than in any other country. As shown in the paper by Woolf and colleagues, not only have Americans been dying from covid-19 at faster rates than their peers in other comparable countries, but they have also been dying at younger ages, resulting in a disproportionately large number of years of life lost to the virus than elsewhere.

The US disadvantage in mortality compared with other high income democracies in 2020 is neither new nor sudden

is not solely attributable to the large disparities in race and ethnicity within the US, although such disparities are undeniable. It is absolutely true that mortality rates from covid-19 have been much higher among African-Americans than among White Americans, reversing the progress in reducing the gap in life expectancy between the two groups that had been achieved over the previous 20 years. Hispanic people, who had enjoyed higher life expectancy at birth than non-Hispanic people, have also had an unprecedented increase in mortality, eliminating their previous advantage.

However, even White Americans lost more years of life than their counterparts in peer countries (1.36 years v 0.22 years).

Even before the pandemic, the US international ranking on life expectancy was poor. According to the most recent data published by the World Health Organization, in 2019 the US ranked 41st for men and 42nd for women in life expectancy. Life expectancy in the US was shorter than in other high income democracies, such as those in western, northern, and southern Europe, Canada, and Australia, and especially in Japan and the Republic of Korea, the top ranking countries.
Big spender

This poor ranking was not related to a lack of funding for healthcare.

In 2017, the US was by far the largest spender, with 17% of its gross domestic product (GDP) dedicated to healthcare. The next highest spender was Switzerland at 12%, where people could expect to live 4.7 years longer than in the US. In Italy, which spent only 9% of its GDP on healthcare, the expectation of life at birth was 3.8 years higher than for Americans in 2017.

The US disadvantage in mortality compared with other high income democracies in 2020 is neither new nor sudden. It is part of a long term trend that had further deteriorated in the years leading to the pandemic. In 1950, the country ranked comfortably above the average of its peers for both men and women. After multiple decades of rapid growth resulting from the control of infectious diseases and the introduction of new treatments and vaccination programmes, progress slowed or stalled altogether from the mid-1950s to about 1970 in all advanced countries, including the US. The cardiovascular revolution allowed progress to resume starting around 1970 but more slowly in the US than in other high income market economies.

The gap in life expectancy at birth in the US further increased in the 21st century, progressively at first, and more rapidly after 2010. This long term trend of falling behind other peer countries has been attributed to a range of factors. However, the accelerated deterioration since 2010 is largely a result of the drug overdose epidemic, affecting mostly working age adults of both sexes, and to a considerable slowing down of declines in cardiovascular mortality, both in absolute terms and relative to other countries.

The covid-19 pandemic has thus operated as a magnifier of already existing vulnerabilities within the US population. Understanding the reasons for the disproportionate toll of the disease on the US population and developing appropriate interventions and policies provides an opportunity to correct the structural factors that have historically hampered US progress in life expectancy and that have driven large social and racial and ethnic inequities in the risks of death.

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Characterising the background incidence rates of adverse events of special interest for COVID-19 vaccines in eight countries

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Study question What are the background incidence rates of potential adverse events of special interest (AESIs) for COVID-19 vaccine safety surveillance?

Methods This multinational network cohort study mapped electronic medical records and health claims data from Australia, France, Germany, Japan, the Netherlands, Spain, the UK, and the US to a common data model. Events of interest were 15 prespecified AESIs (see figure). Incidence rates of AESIs were obtained from historical data stratified by age, sex, and database.

Rates were pooled across databases using random effects meta-analyses and databases using random effects meta-analyses and classified according to Council for International Organizations of Medical Sciences frequency categories (very common, common, uncommon, rare, or very rare).

Study answer and limitations Background rates varied greatly between databases. Deep vein thrombosis ranged from 387 (95% confidence interval 370 to 404) per 100000 person years in the UK Clinical Practice Research Datalink GOLD data to 1443 (5416 to 1470) per 100000 person years in US IBM MarketScan Multi-State Medicaid data among women aged 65 to 74 years. Some AESIs increased with age. For example, myocardial infarction rates in men increased from 28 (27 to 29) per 100000 person years among those aged 18-34 years to 1400 (1374 to 1427) per 100000 person years in those > 85 years in US Optum electronic health record data. Other AESIs were more common in young people—rates of anaphylaxis among boys and men were 78 (75 to 80) per 100000 person years in those aged 6-17 years and 8 (6 to 10) per 100000 person years in those > 85 years in Optum electronic health record data. Meta-analytic estimates of AESIs were classified according to age and sex. The outcomes estimations may have been subject to measurement error.

What this study adds A wide range of adverse effects associated with COVID-19 vaccines are being monitored, from very rare neurological disorders to more common thromboembolic conditions. This study found large variations in the observed historical rates of AESIs by age group and sex, showing the need for stratification or standardisation before using background rates for safety surveillance. Considerable population level heterogeneity in AESIs rates was found between databases.

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