

CHANGES IN LIFE EXPECTANCY BETWEEN 2019 AND 2021: UNITED STATES AND 19 PEER COUNTRIES

Ryan K. Masters, PhD¹, Laudan Y. Aron, MA², Steven H. Woolf, MD, MPH³

ABSTRACT

BACKGROUND

Prior studies reported large decreases in US life expectancy during 2020 as a result of the COVID-19 pandemic, disproportionately affecting Hispanic and Black populations and vastly exceeding the average change in life expectancy in other high-income countries. Life expectancy estimates for 2021 have not been reported. This study estimated changes in life expectancy during 2019-2021 in the US population, in three US racial/ethnic groups, and in 19 peer countries.

METHODS

US and peer country death data for 2019-2021 were obtained from the National Center for Health Statistics, the Human Mortality Database, and overseas statistical agencies. The 19 peer countries included Austria, Belgium, Denmark, England and Wales, Finland, France, Germany, Israel, Italy, Netherlands, New Zealand, Northern Ireland, Norway, Portugal, Scotland, South Korea, Spain, Sweden, and Switzerland. Life expectancy was calculated for 2019 and 2020 and estimated for 2021 using a previously validated modeling method.

RESULTS

US life expectancy decreased from 78.86 years in 2019 to 76.99 years in 2020 and 76.60 years in 2021, a net loss of 2.26 years. In contrast, peer countries averaged a smaller decrease in life expectancy between 2019 and 2020 (0.57 years) and a 0.28-year *increase* between 2020 and 2021, widening the gap in life expectancy between the United States and peer countries to more than five years. The decrease in US life expectancy was highly racialized: whereas the largest decreases in 2020 occurred among Hispanic and non-Hispanic Black populations, in 2021 only the non-Hispanic White population experienced a decrease in life expectancy.

DISCUSSION

The US mortality experience during 2020 and 2021 was more severe than in peer countries, deepening a US disadvantage in health and survival that has been building for decades. Over the two-year period between 2019 and 2021, US Hispanic and non-Hispanic Black populations experienced the largest losses in life expectancy, reflecting the legacy of systemic racism and inadequacies in the US handling of the pandemic. Reasons for the crossover in racialized outcomes between 2020 and 2021, in which life expectancy decreased only in the non-Hispanic White population, could have multiple explanations.

¹ Department of Sociology, University of Colorado Boulder, Boulder, CO

² Health Policy Center, Urban Institute, Washington, DC

³ Center on Society and Health, Virginia Commonwealth University, Richmond, VA

Correspondence: Steven H. Woolf, MD, MPH, Center on Society and Health, Virginia Commonwealth University School of Medicine, 830 East Main Street, Suite 5035, Richmond, VA 23298-0212. Email: steven.woolf@vcuhealth.org

INTRODUCTION

In 2020, the United States (US) experienced a much larger decline in life expectancy than did other high-income countries, with disproportionately large losses in its Hispanic and Black populations.¹ Although the introduction and availability of effective vaccines were expected to curb US mortality rates in 2021, slow vaccine uptake and the spread of the Delta variant produced large surges in mortality. This study used official mortality data for 2018-2020 and provisional mortality data for 2021 to estimate changes in life expectancy in the US population, in three US racial/ethnic groups, and in 19 peer countries.

METHODS

Methods used previously to estimate life expectancy for 2020 based on provisional death counts¹ were replicated for 2021. Official and provisional mortality data for US populations were obtained from the National Center for Health Statistics.^{2,3} Data for 19 other high-income peer countries were obtained from the Human Mortality Database (HMD), direct sources, and the HMD Short-term Mortality Fluctuation series.⁴ Data for all countries were stratified by sex, and US data were further stratified by race and ethnicity for Hispanic and non-Hispanic Black and White populations (see supplementary material for details). A credible range (CR) for life expectancy in 2021 was calculated by simulating life tables from estimated age-specific mortality rates and allowing for 10% random error.

RESULTS

US life expectancy decreased by 0.40 (CR = 0.22-0.57) years between 2020 and 2021, adding to an historic 1.87-year reduction in 2020 (**Figure 1**). As in 2020, the decrease in US life expectancy in 2021 was highly racialized, but it followed a distinctly different pattern: whereas Hispanic and Black populations experienced disproportionately large decreases in life expectancy in 2020, life expectancy in the Hispanic population increased negligibly in 2021 (0.05 [CR=0.12-0.23] years), and life expectancy in the Black population *increased* by 0.42 (CR = 0.23-0.62) years. The non-Hispanic White population experienced a further decline of 0.34 (CR = 0.17-0.52) years, which occurred disproportionately among men (**Table 1**).

The decline in US life expectancy over two years between 2019 (78.86 years) and 2021 (76.60 [CR =76.43-76.77] years) was substantial, a decrease of 2.26 (CR = 2.09-2.44) years, with larger losses in the Hispanic and non-Hispanic Black populations (3.65 [CR = 3.47-3.82] years and 2.80 [CR = 2.60-2.99] years, respectively) than in the

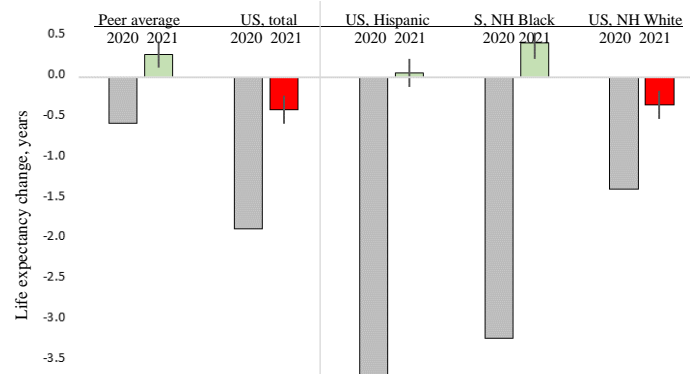


Figure 1. Changes in US life expectancy and average changes in life expectancy among 19 peer countries, 2019-2020 and 2020-2021. NH = Non-Hispanic. Vertical bars for 2021 estimates depict the credible range based on 10% uncertainty. Separate figures for females and males are in the supplement.

non-Hispanic White population (1.72 [CR = 1.55-1.90] years).

Compared to the US, peer countries experienced smaller disruptions in life expectancy; on average, life expectancy in peer countries decreased by 0.57 years between 2019 and 2020 and then increased by 0.28 (CR = 0.12-0.45) years between 2020 and 2021 (**Figure 2**). The life expectancy gap between the US and its peers grew from 3.29 years in 2019 to 4.59 years in 2020 and 5.27 (CR = 4.93-5.60) years in 2021.

DISCUSSION

As a summary measure of a population's mortality experience, estimates of life expectancy help one compare how different countries have experienced the COVID-19 pandemic. Compared to its peers, the US experienced much higher mortality rates and larger drops in life expectancy in both 2020 and 2021. Between 2019 and 2021, US life expectancy decreased by 2.26 (CR = 2.09-2.44) years, a decline not experienced since 1943, the deadliest year for Americans in World War II.⁶

Among peer countries, the largest loss in life expectancy between 2019 and 2021 was 0.93 (CR = 0.73-1.09) years in England and Wales (combined) and Northern Ireland (CR = 0.77-1.10), while three countries (New Zealand, Norway, and South Korea) gained life expectancy between 2019 and 2021. The gap between US life expectancy and the peer average rose to more than 5 years in 2021, further deepening a US disadvantage in health and survival that has been building for decades.⁵

Table 1. Life expectancy in United States and 17 peer countries: 2019, 2020, and 2021

	Life expectancy (years), and confidence range (CR) for 2021 estimates								
	Total population			Female population			Male population		
	2019	2020	2021 (CR)	2019	2020	2021 (CR)	2019	2020	2021 (CR)
United States	78.86	76.99	76.60 (76.42-76.77)	81.39	79.88	79.63 (79.46-79.80)	76.32	74.19	73.67 (73.49-73.86)
US Hispanic	81.86	78.16	78.21 (78.04-78.39)	84.40	81.58	81.60 (81.44-81.77)	79.08	74.77	74.83 (74.64-75.01)
US NH Black	74.76	71.54	71.96 (71.77-72.16)	78.08	75.37	75.76 (75.58-75.95)	71.30	67.76	68.16 (67.95-68.36)
US NH White	78.78	77.40	77.06 (76.88-77.23)	81.26	80.10	79.92 (79.76-80.09)	76.33	74.80	74.31 (74.14-74.49)
Peer Average	82.15	81.58	81.86 (81.70-82.03)	84.32	83.87	84.14 (83.98-84.30)	79.95	79.31	79.63 (79.46-79.79)
Austria	81.91	81.04	81.28 (81.12-81.44)	84.20	83.47	83.78 (83.63-83.94)	79.54	78.57	78.74 (78.57-78.91)
Belgium	81.84	80.79	81.78 (81.62-81.94)	84.02	83.06	84.18 (84.02-84.34)	79.60	78.53	79.36 (79.20-79.53)
Denmark	81.43	81.55	81.58 (81.42-81.75)	83.42	83.51	83.45 (83.29-83.61)	79.44	79.58	79.71 (79.55-79.88)
England/Wales	81.71	80.43	80.78 (80.62-80.95)	83.53	82.43	82.79 (82.63-82.95)	79.85	78.43	78.78 (78.61-78.95)
Finland	81.91	81.87	82.03 (81.87-82.19)	84.53	84.66	84.96 (84.80-85.12)	79.22	79.08	79.54 (79.37-79.71)
France	82.76	82.06	82.62 (82.46-82.78)	85.62	85.04	85.58 (85.43-85.73)	79.75	79.01	79.56 (79.39-79.73)
Germany	81.16	80.77	80.67 (80.50-80.83)	83.67	83.37	83.32 (83.16-83.48)	78.94	78.48	78.34 (78.17-78.51)
Israel	82.51	82.12	81.85 (81.69-82.02)	84.51	84.36	84.06 (83.90-84.22)	80.67	80.05	79.82 (79.65-79.99)
Italy	83.34	82.15	82.64 (82.48-82.80)	85.40	84.43	84.81 (84.66-84.97)	81.14	79.83	80.37 (80.21-80.54)
Netherlands	82.05	81.25	81.37 (81.21-81.53)	83.56	82.94	83.00 (82.84-83.16)	80.46	79.55	79.73 (79.57-79.89)
New Zealand	81.65	82.36	81.99 (81.83-82.15)	83.49	84.16	83.75 (83.60-83.92)	79.96	80.70	80.37 (80.21-80.53)
Northern Ireland	80.92	79.83	79.99 (79.82-80.15)	82.75	81.72	81.91 (81.74-82.07)	79.00	77.91	78.04 (77.88-78.21)
Norway	82.96	83.20	83.33 (83.17-83.49)	84.70	84.90	84.89 (84.73-85.05)	81.18	81.48	81.75 (81.59-81.91)
Portugal	81.71	81.07	81.29 (81.13-81.45)	84.56	84.00	84.24 (84.09-84.40)	78.64	77.96	78.16 (77.99-78.33)
Scotland	79.29	78.29	78.43 (78.27-78.60)	81.26	80.56	80.49 (80.33-80.66)	77.28	76.02	76.36 (76.19-76.53)
South Korea	83.29	83.48	83.65 (83.49-83.81)	86.30	86.47	86.62 (86.47-86.78)	80.27	80.49	80.71 (80.55-80.88)
Spain	83.56	82.29	83.06 (82.90-83.22)	86.21	85.02	85.92 (85.77-86.08)	80.83	79.56	80.28 (80.11-80.45)
Sweden	83.06	82.43	83.22 (83.06-83.38)	84.73	84.29	85.02 (84.87-85.18)	81.35	80.60	81.40 (81.24-81.56)
Switzerland	83.79	83.07	83.85 (83.69-84.01)	85.58	85.08	85.93 (85.77-86.08)	81.89	81.00	81.84 (81.68-82.00)

Note: CR = credible range; NH = Non-Hispanic. Red shading indicates a decrease in life expectancy and green shading indicates an increase; significant decreases and increases in 2021 are determined by the CR, with no color applied to changes in 2021 that lacked significance (i.e., when 2020 values fell within the CR for 2021).

Reasons for the surprising crossover in racialized outcomes between 2020 and 2021—in which Hispanic and Black populations saw the largest drops in life expectancy in 2020 but increases in 2021, while White non-Hispanic Americans saw a further decline—are not entirely clear and likely have multiple explanations. Nonetheless, over the 2-year period (2019-2021), Hispanic and Black populations clearly experienced much

larger losses in life expectancy than did the White population. These patterns reflect a long history of systemic racism and its attendant injustices and inadequacies in how the pandemic was managed in the US.⁷⁻⁹ Although highly effective COVID-19 vaccines became available in 2021, their uptake was limited by public skepticism and inadequacies in distribution and access.

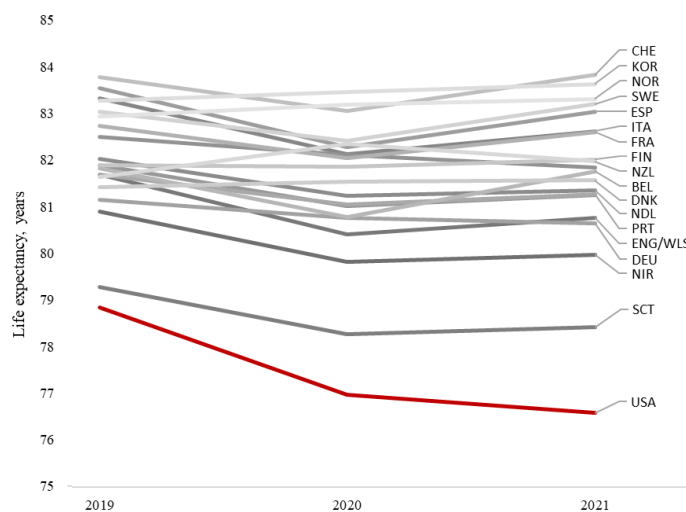


Figure 2. Life expectancy, 2019-2021, United States and 19 peer countries. Country codes and names: BEL (Belgium), CHE (Switzerland), DEU (Germany), DNK (Denmark), ENG/WLS (England and Wales), ESP (Spain), FIN (Finland), FRA (France), ITA (Italy), KOR (South Korea), NDL (Netherlands), NIR (Northern Ireland), NOR (Norway), NZL (New Zealand), PRT (Portugal), SCT (Scotland), SWE (Sweden), USA (United States). Life expectancy values for 2021 are estimated from provisional data; see table for credible ranges.

Limitations of this analysis include the reliance on provisional data for 2021 and extrapolation of population counts based on data from 2017-2020, cross-country variation in reporting of deaths, and the exclusion of some high-income countries (e.g., Australia, Japan) and US racial groups (e.g., American Indian/Alaska Native) due to insufficient data.

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