ORIGINAL ARTICLE e-ISSN: 2349-0659 p-ISSN; 2350-0964

The Impact of Substance Abuse on US Life Expectancy from 2016 to 2021

Antonio R. Chaves*

Abstract

Background: Life expectancy in the US dropped precipitously during what are widely regarded as the worst years of COVID-19 (2020-2021), but the role of the novel virus in this event is disputed because life expectancy was already trending downwards in 2016.

Methods: All data used in the charts was retrieved from the websites of governmental and non-governmental institutions.

Results: Actuarial data from Social Security indicates that the increase in death rate for Americans over 70 never exceeded 20% above its baseline in 2019. Surprisingly, the sharpest increase in the death rate occurred for ages 30-39; where it surged 90% over its baseline in 2010.This sharp rise in death rate for the younger ages 30-39 coincides with a sharp rise in drugs overdose deaths, and eight times more Americans ages 30-39 died from drugs than from the novel virus in 2020. Statistical analysis between states indicates an inverse correlation between change in overdose death rate and change in life expectancy (Pearson = -0.655) indicating a 3.5% average reduction in life expectancy in states where overdose deaths increased more than 70% from 2019 to 2021 (p = <0.001).

Conclusions: Substance abuse (mostly opioids) drove almost the entirety of the decline in US life expectancy in 2020 and 2021. The perception that the coronavirus was unusually lethal might be attributed to a demographic transition that increased the population of Americans ages 65-75 by a whopping 40-55% from 2010-2020. Since senior citizens are more vulnerable to respiratory infections, health care facilities would have been challenged with a 40-55% surge in seniors dying from complications of influenza in 2020 and 2021, even in the absence of a novel virus.

Keywords: overdose, life expectancy, death rates, opioids, fentanyl, addiction, COVID-19, pandemic, public health

Asian Pac. J. Health Sci., (2026); DOI: 10.21276/apjhs.2026.13.2.06

Introduction

Over the last century, there were two significant declines in US life expectancy that coincided with reports of a worldwide pandemic [Figure 1], but the role of Severe Acute Respiratory Syndrome Coronavirus 2 in the more recent decline is disputed because life expectancy had already been trending downward 4 years before the coronavirus reportedly made its way into the US [Figure 2].[1,2] What was happening in America before the reports of a novel virus?

Methods

All data used in the charts was retrieved from the websites of governmental and non-governmental institutions. These include the Social Security Administration (death rates by age), the Centers for Disease Control (CDC) and Prevention (death rates from drugs, alcohol, and COVID-19 organized by age groups), Our World in Data (death rates and total deaths in 10-year age groups), and USA Facts (total population in 10-year age groups).

Results

Actuarial data collected by the Social Security Administration indicates that this drop in life expectancy is correlated with a massive surge in the death rates of both men and women between the ages of 25–42 after 2010 [Figures 3a and b, and 4]. These death rates were noticeably trending upward in 2014 and eventually exceeded 90% in the same year. Overall, life expectancy reached its lowest point in 2021 [Figure 1]. Surprisingly, the death for ages 70 and older never exceeded 20% over its lowest point in 2019 [Figure 3a and b]. How do we reconcile this discrepancy with reports on a pandemic that disproportionately affected the elderly?

Between 2010 and 2020, a massive surge in the population of aging boomers disproportionately increased the ratio of Americans more likely to die from respiratory infections [Figure 5]. This was predicted, and in 2017, the US Census publicly expressed these concerns over this anticipated rise in all-cause mortality.[5] Hence, with or without a novel virus, hospitals and hospices would still have been challenged by this "epidemic" of aging boomers. In addition, it was not out of the ordinary for 50,000 Americans to die during flu season before the pandemic.[6]

If we graph the percent change in total deaths by age group, we get a bimodal distribution with peaks for age groups 30–34 and 70–74 [Figure 6]. For the older age groups (right), the increase

Adjunct Instructor in the Department of Biology, Montgomery College in Takoma Park, Maryland, United States.

Corresponding Author: Antonio R. Chaves, Adjunct Instructor in the Department of Biology, Montgomery College in Takoma Park, Maryland, United States. E-mail: antonio.chaves@montgomerycollege.edu

How to cite this article: Chaves AR. The Impact of Substance Abuse on US Life Expectancy from 2016 to 2021. Asian Pac. J. Health Sci., 2026;13(2):34-42.

Source of support: Nil.

Conflicts of interest: None.

Received: 11/05/2026 **Revised:** 12/06/2026 **Accepted:** 16/06/2026

©2026 The Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

in total deaths is driven largely by demographics [white bars in Figure 6]. For the younger age groups (left), the increase in total deaths is driven largely by the increase in death rate [light grey bars in Figure 6].

Based on the change in death rate from 2010 (the baseline rate for ages 30–39) and 2019 (the baseline rate for ages 65–74), excess deaths exceeded deaths from COVID-19 by a factor of 8–10 for ages 30–39 [Figure 7]. Since younger people in the US are less likely to die from respiratory infections, this ratio comes as no surprise. It also comes as no surprise that deaths from COVID-19 make up almost the entirety of excess deaths for ages 65–74. Nevertheless, a 20% increase in death rates for ages 65–74 has a much lesser effect on life expectancy than an 80–90% spike in death rates for ages 30–39 [Figures 3 and 4]. Why did younger Americans die at such high rates after 2019?

The US lags behind other developed nations in combating premature death from obesity, homicide, and road injuries, but the only indicator that consistently worsened from 2000 to 2021 was drug overdose [Figure 8].[2] Additional information from the CDC on the age distribution of opioid victims and availability of synthetic opioids leaves little doubt as to their on US life expectancy [Figures 9 and 10a].[10] Opioids made up 75% of the overdose deaths in 2021, and 82% of these opioids were synthetically manufactured.[10]

Drugs are not the only form of substance abuse that contributed to higher death rates. Alcohol-related deaths also surged following the pandemic, with most deaths from alcohol centering around ages 55–64 [Figure 10a and Table 1]. Most drug overdose deaths occurred in the younger ages, but the biggest percent increase in overdose deaths occurred in ages 60-69 [Figure 10b], and the biggest percent increase in alcohol deaths occurred in ages 25-39 [Figure 10c]. Unsurprisingly, the changes in overall death rate compiled by the CDC [Figure 10d] replicates the aforementioned data compiled by Social Security [Figures 3a and 3b].

If we compare deaths from substance abuse in 2020 to deaths from COVID-19 for Americans ages 20–29 and 30–39, we get ratios of 14:1 and 8:1, respectively [Figure 11 and Table 2]. COVID-19 deaths exceeded substance abuse deaths only for ages 60 and over in 2020, then 50 and over in 2021 [Table 2].

Deaths from overdose and alcohol for ages 30–39 peaked at about 63.2/100K in the same year that US life expectancy declined to its lowest point in over two decades [Figure 12a]. This is also when substance abuse deaths exceeded a third of overall deaths for this age group [Figure 12b]. For ages 55–64 (the group most affected by deaths from alcohol) drug overdose deaths exceeded alcohol deaths only after it surged in 2020 [Figure 12c]. Nevertheless, substance abuse death rates for this age group remained below 10% of overall death rates during their peak in 2023 [Figure 12d].

2021 was the deadliest for overdose deaths, and the sharpest rise occurred from 2019 to 2021 [Figure 12a]. If we proceed to compare overdose death rates by state, we encounter massive disparities, ranging from 12.3 deaths/100K in Nebraska to 95.1 deaths/100K in West Virginia [Figure 13a]. In the three states with a disproportionate number of deaths from alcohol (Alaska, New Mexico, and South Dakota) native Americans make up 10% or more of the resident population.[11] Oklahoma stands out as the exception to this pattern in that death rates from alcohol were more in line with the national average despite Native Americans making up almost 14% of the Oklahoma population.[11]

The disparity between states for changes in death rates during this time is also broad, ranging from 1% in New Hampshire to 98% in Mississippi [Figure 13b]. This disparity is strongly correlated with statewide decreases in life expectancy that occurred from 2019 to 2021 [Figure 14], indicating that overdose deaths may have (on average) reduced life expectancy by 3.5% in states where the death rate increase surged higher than 70% [Figure 15].

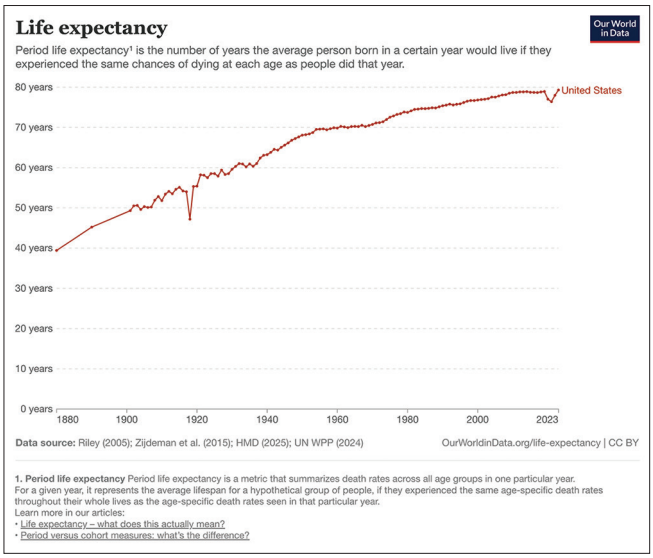

Figure 1: Graph from "Life Expectancy." Published at OurWorldinData.org[1]

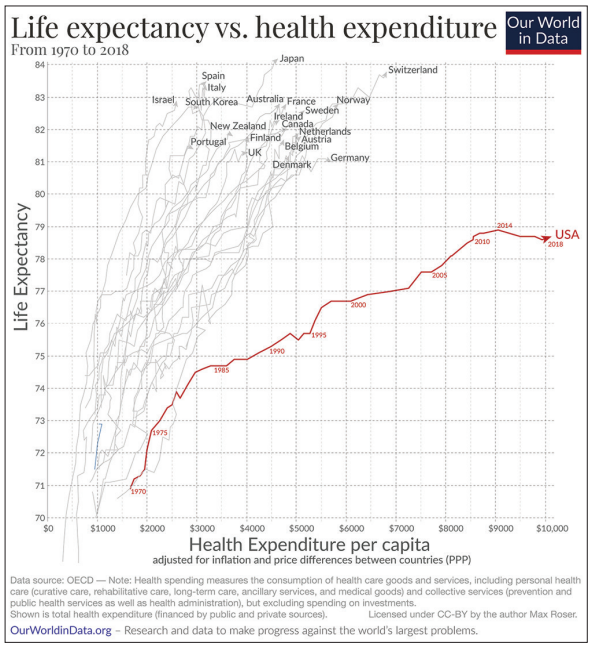

Figure 2: Graph from "Why is life expectancy in the US lower than in other rich countries?" Published at OurWorldinData.org[2]

Discussion

Overdose deaths were the main driver of life expectancy decline in 2016–2021, but 2010 was chosen as the baseline because this is when overall death rates for ages 30–39 had reached their lowest point despite overdose deaths having already risen steadily since 2000 [Figure 8]. Overall deaths for ages 30–39 proceeded to rise only after the number of overdose deaths overwhelmed confounding variables that (before 2010) had "absorbed" their impact on overall deaths. The baseline year for ages 65–74 in Figure 7 is 2019 because elderly Americans were minimally affected by drug abuse.

Previous authors had singled out drug overdose as the leading cause of life expectancy decline, but these articles were written before the countermeasures that exacerbated the drug epidemic in 2020.[13,14] A handful of articles written after the start of the pandemic acknowledged the effect of overdose on life expectancy, but only while placing more emphasis on deaths from the coronavirus even as 3–6 times more Americans aged 18–39 were dying from drugs and alcohol [Table 2 and Figure 11] and over 70% of adult coronavirus deaths were occurring in people over the age of 69 in 2020.[9,15-18]

Dr. Pierre Kory rose to national prominence in 2020 after testifying before congress on alternative treatments for COVID-19,[19] and in 2023 Kory co-authored an article in USA Today on the "unknown phenomenon" of excess deaths for Americans aged 35–44 years old in 2021.[20] Later, in a follow-up interview, Kory blamed these deaths on vaccine injury even though life expectancy had already dropped precipitously in the year before the rollout of these vaccines.[21] More astonishingly, Kory then went on to downplay the significance of the opioids by arguing that fentanyl "had already been around 10 years."[22] Since this questionable hypothesis is shared widely among skeptics of the COVID vaccines, it merits further rebuttal: According to reports submitted to the CDC's Vaccine Adverse Event Reporting System*, annual deaths from vaccine injury rose from the single digits 2015–2019 to

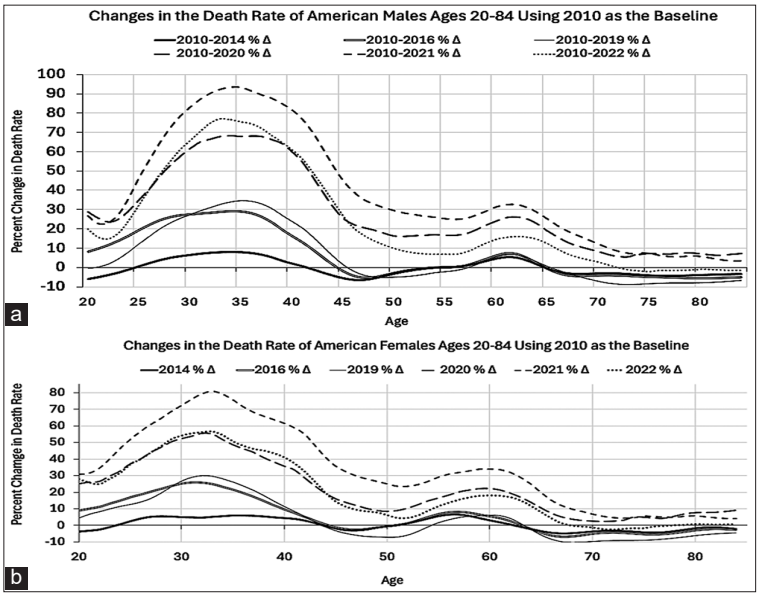

Figure 3: (a and b) Graphs generated from data published on the US Social Security Administration website[3]

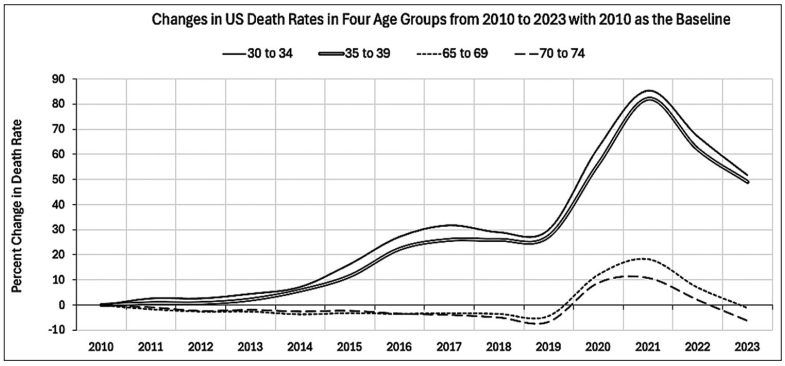

Figure 4: Graph generated from data published at OurWorldinData.org[4]

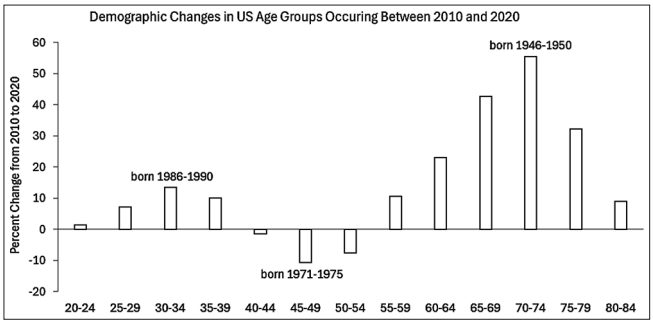

Figure 5: Graph generated from data published at USA Facts[7]

220 in 2021 for Americans aged 30–39 [Table 3].[23] This spike is troubling and merits further investigation, but even if these vaccine-attributed deaths are underreported by a factor of ten, they would still add up to <10% of the 28,695 deaths attributed to drugs during the same year for this age group [Table 2]. In addition, 76% of adult deaths attributed to vaccination in 2021 occurred in ages 65 and older [Table 3], and yet, the elderly were far less affected by the 2021 surge in death rates [Figures 3 and 4].

During the worst 5 years of the opioid epidemic (January 2020–December 2024), 497,205 Americans died from drug overdose. This adds up to nearly 100,000 per

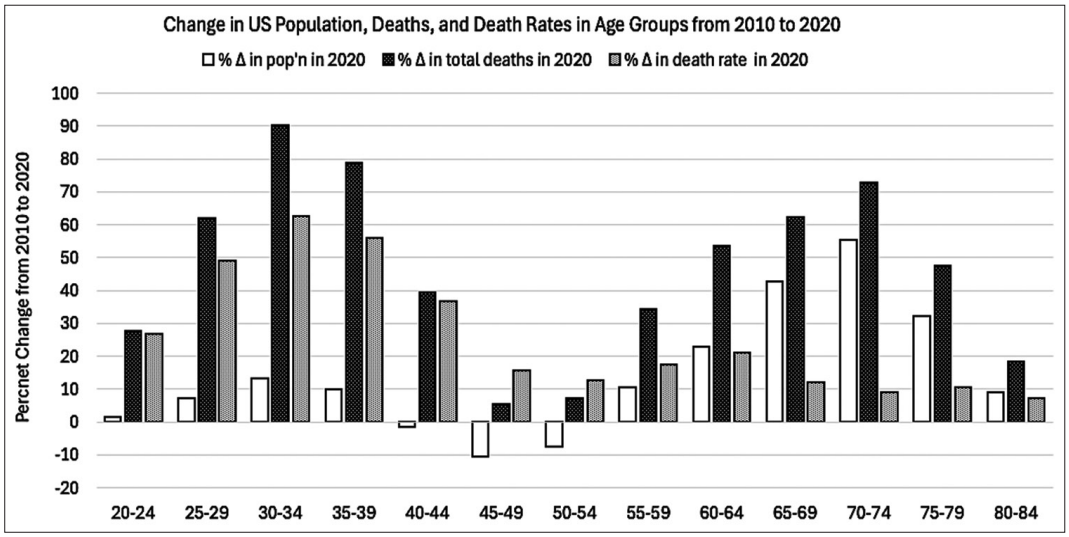

Figure 6: Graph generated from data from "Annual Death Rates by Age Group" at OurWorldinData.org,[4] USA Facts,[7] and "Annual deaths by age group, United States" at Our World in Data[8]

Table 1: Table generated from data published on the centers for disease control Wonder website[9] and OurWorldinData.org[4]

Age	*Drug deaths/100K in 2010*	*Drug deaths/100K in 2020*	*Alcohol deaths/100K in 2010*	*Alcohol deaths/100K in 2020*	*Total deaths/100K in 2010*	*Total deaths/100K in 2020*	*Percentage Δ in death rate 2010–2020*
20–24	13.1	26.2	0.5	0.7	86	109	26.7
25–29	18.5	43.1	1.4	3.4	96	143	49.0
30–34	19.8	54.7	3	8.6	110	179	62.7
35–39	20.5	58.1	5.3	14.0	139	217	56.1
40–44	22.9	53.2	9.6	18.2	201	275	36.8
45–49	27.2	49.1	16.9	22.6	325	376	15.7
50–54	25.9	49.1	21.4	32.3	492	554	12.6
55–59	20.1	45.9	23.2	39.7	710	834	17.5
60–64	11.7	33.6	20.4	39.0	1,015	1,229	21.1
65–69	6	19.2	17.6	31.5	1,528	1,712	12.0
70–74	4.3	9.2	13.2	21.8	2,335	2,542	8.9
75–79	4	5.1	10.7	16.1	3,728	4,120	10.5
80–84	4	4.5	8.1	11.6	6,379	6,833	7.1

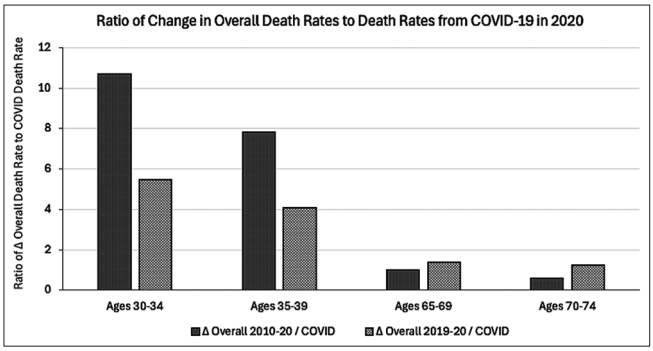

Figure 7: Graphs generated from data published on the Centers for Disease Control Wonder website[9]

year.[25] For perspective, 416,800 Americans were killed in action during their 3.7 years of combat in World War II.[25] If we add in the 5 years before 2020, the total surges to 823,445 over 10 years.[26]

In 2025, annual overdose deaths proceeded to decline from a maximum of 111,451 in 2023 to pre-pandemic levels of 68,372 per year, but sadly, this far exceeds the 17,415 deaths recorded in 2000; the year before US death rates from opioids started to trend upward at a rate that surpassed the rates reported in the other affluent nations (Graph 8).[2,9] For additional perspective, more Americans died of overdose in 2025 than during the entire 8 years of combat in Vietnam War.[26]

These numbers are sobering, but what is even more astonishing is how an overdose epidemic that nearly doubled

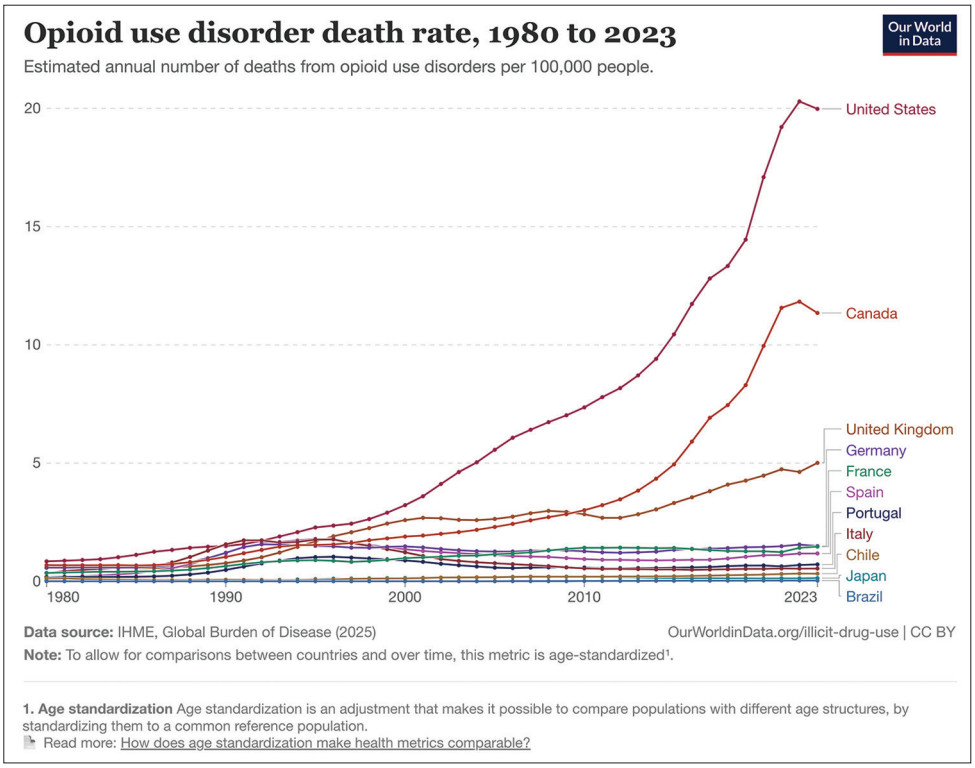

Figure 8: Graph from "Why is life expectancy in the US lower than in other rich countries?" Published at OurWorldinData.org.[2]

Table 2: Table generated from data published on the centers for disease control Wonder website[9]

Age	*Drug deaths in 2020*	*Alcohol deaths in 2020*	*COVID deaths in 2020*	*Drug deaths in 2021*	*Alcohol deaths in 2021*	*COVID deaths in 2021*	*Ratio drugs and alcohol to COVID in 2020*	*Ratio drugs and alcohol to COVID in 2021*
20–24	5,653	158	383	5,802	184	1,050	15.17	5.70
25–29	10,007	787	792	10,498	859	2,099	13.63	5.41
30–34	12,482	1,958	1,462	14,166	2,168	4,034	9.88	4.05
35–39	12,691	3,058	2,267	14,529	3,523	6,296	6.95	2.87
40–44	10,806	3,686	3,812	13,242	4,274	9,710	3.80	1.80
45–49	9,803	4,508	6,598	11,143	5,216	14,702	2.17	1.11
50–54	10,008	6,580	10,366	11,721	7,097	22,179	1.60	0.85
55–59	9,910	8,577	16,631	11,606	8,987	31,205	1.11	0.66
60–64	6,988	8,102	25,459	8,926	8,973	42,520	0.59	0.42
65–69	3,438	5,628	33,501	4,591	6,431	48,149	0.27	0.23
70–74	1,346	3,196	42,776	1,652	3,547	54,567	0.11	0.10
75–79	508	1,609	47,201	649	1,728	51,583	0.04	0.05
80–84	291	752	49829	331	772	47224	0.02	0.02
85+	336	431	109529	316	462	80934	0.01>	0.01>

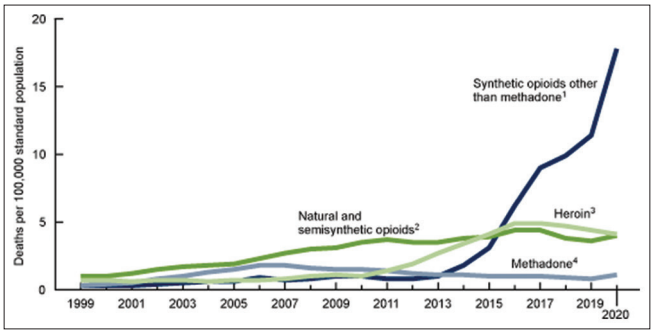

Figure 9: Graph from "Age-adjusted rates of drug overdose deaths involving opioids, by type of opioid: United States, 1999–2020" Published in Data Briefs Number 428. December 2021[10]

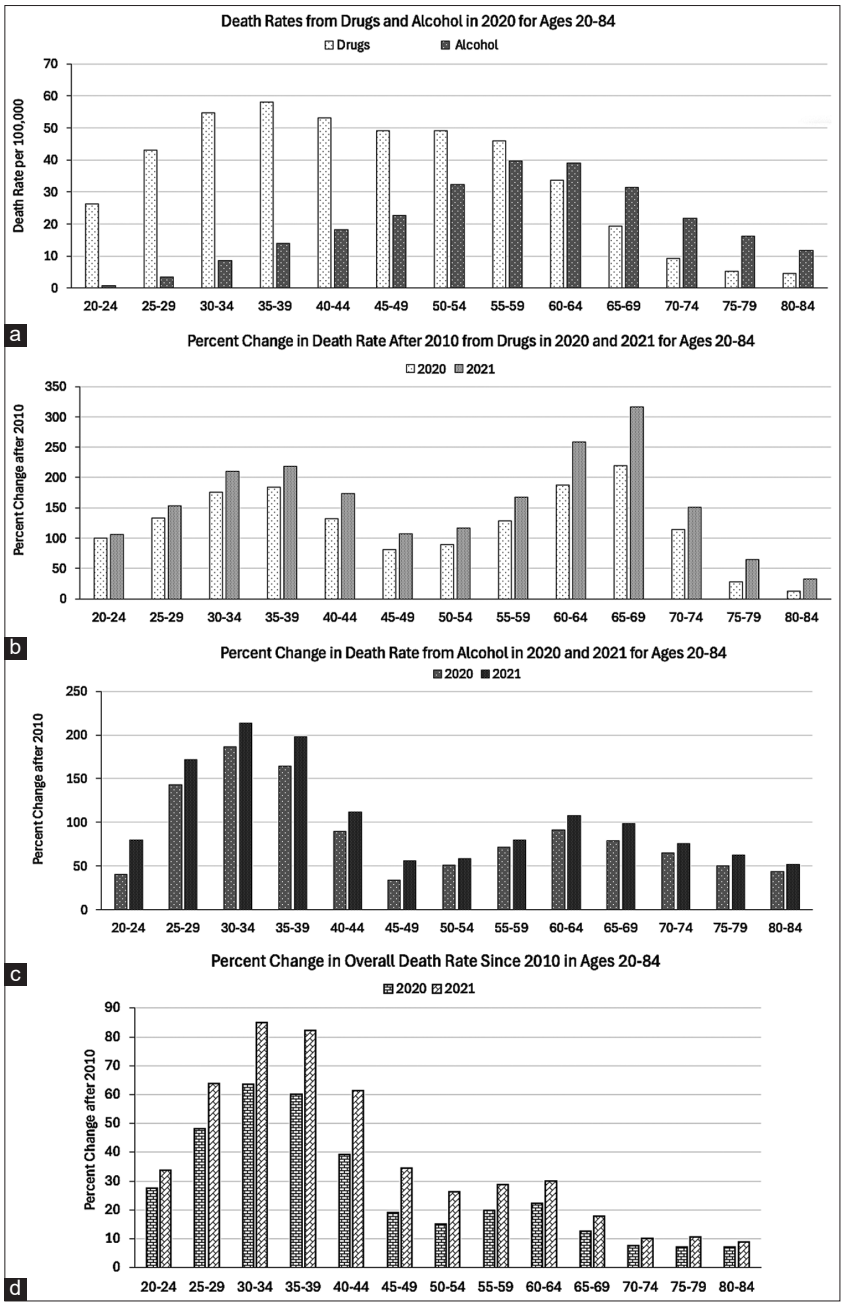

Figure 10: (a-d) Graphs generated from data published on the Centers for Disease Control Wonder website under the database category "Underlying Cause of Death" followed by subcategory "Drug/Alcohol Induced" organized by "Five-Year Age Groups"[9]

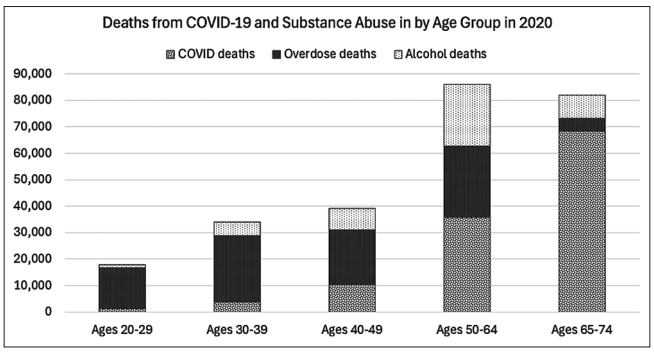

Figure 11: Graph generated from data published on the centers for disease control Wonder website[9]

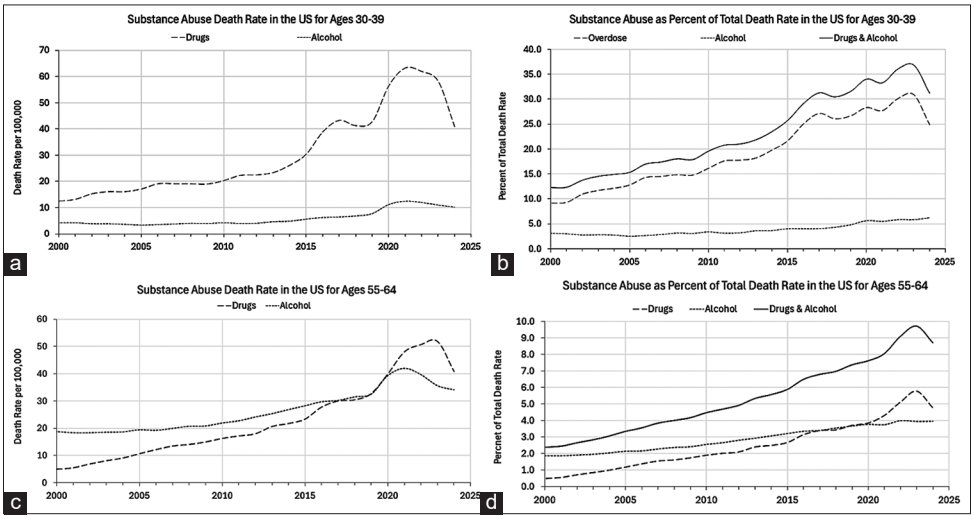

Figure 12: (a-d) Graphs generated from data published on the Centers for Disease Control Wonder website under the database category "Underlying Cause of Death" followed by subcategory "Drug/Alcohol Induced" organized by "Ten-Year Age Groups"[9]

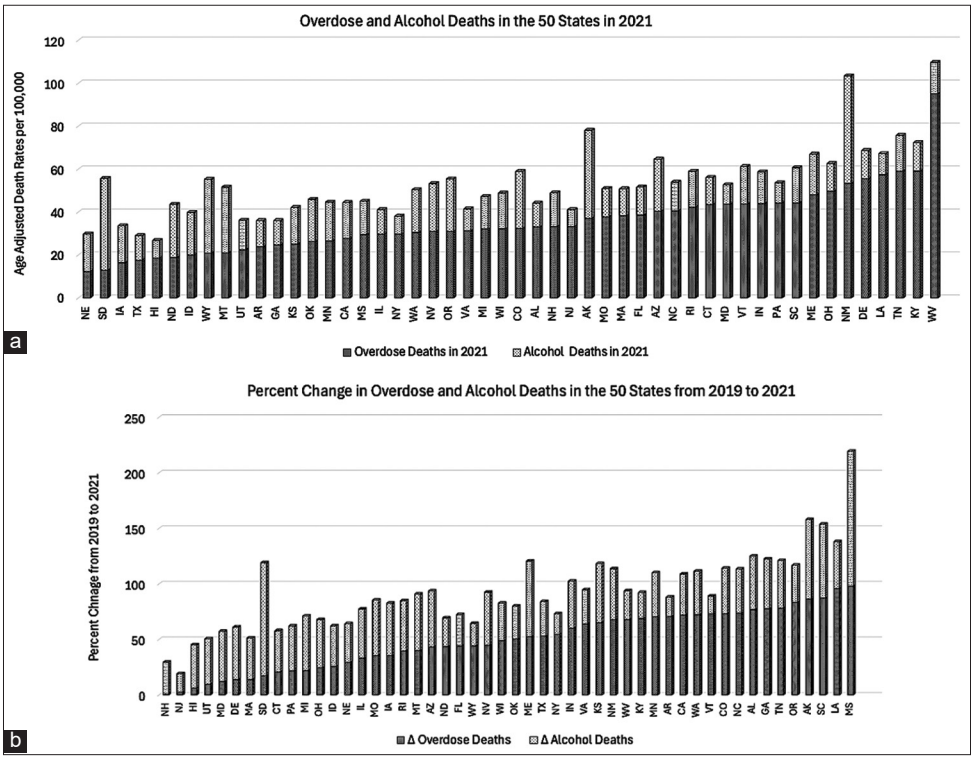

Figure 13: (a and b) Graphs generated from data published on the Centers for Disease Control Wonder website under the database category "Underlying Cause of Death" followed by subcategory "Drug/Alcohol Induced" organized by "State"[9]

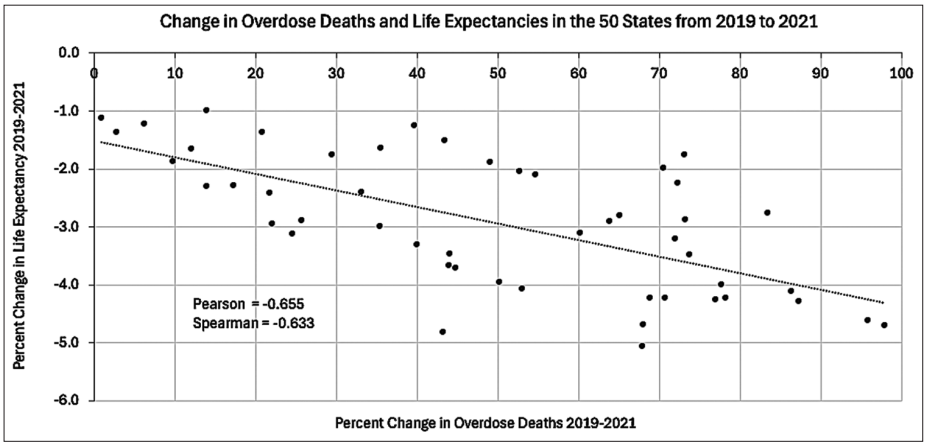

Figure 14: Scatter plot generated from data published on the Centers for Disease Control Wonder website under the database category "Underlying Cause of Death" followed by subcategory "Drug/Alcohol Induced" organized by "Age Adjusted Rates" and "States"[9]

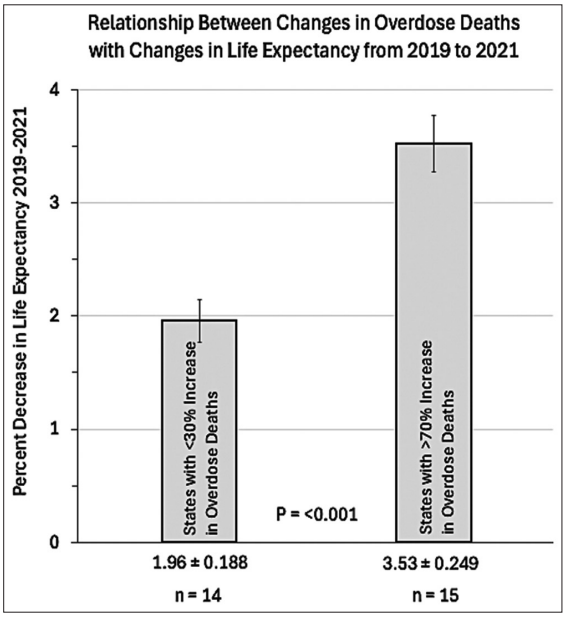

Figure 15: Bar graph generated from data published on the Centers for Disease Control Wonder website under the database category "Underlying Cause of Death" followed by subcategory "Drug/Alcohol Induced" organized by "Age Adjusted Rates" and "States" [9]

Table 3: This table was made from data published on the centers for disease control Wonder website based on reports submitted to the vaccine adverse event reporting system[24]

Age	*Deaths attributed to vaccination in 2021**
18–29	134
30–39	220
40–49	363
50–59	779
60–64	755
65–79	3,546
80+	3,572

*The Vaccine Adverse Event Reporting System was organized solely for the purpose of detecting overall safety signals, but due to a lack of routine verification, there is no guarantee that each report is accurate

the death rate Americans in their prime working years was overshadowed by a pandemic that killed senior citizens at a rate comparable to that of a bad flu season. Strategies for scaling back this ongoing crisis are beyond the purview of this investigation, but for starters, we need to call on conscientious policymakers who are open to the challenge of re-ordering the priorities of public health.

Conclusion

Substance abuse (mostly opioids) drove almost the entirety of the decline in US life expectancy in 2020 and 2021. The perception that the coronavirus was unusually lethal can be attributed to a demographic transition that increased the population of Americans ages 65-75 by a whopping 40-55% from 2010-2020. Since senior citizens are more vulnerable to respiratory infections, health care facilities would have been challenged with a 40-55% surge in seniors dying from complications of influenza in 2020 and 2021, even in the absence of a novel virus.

Acknowledgments

I would like to thank data analysts Mark Kulacz for sharing his insight on the opioid epidemic, neurobiologist and biology coach Jonathan Couey for explaining the role of demographics, and mathematics instructor Stephen Kcenich for directing me to the Social Security's actuarial life table that formed the centerpiece of this investigation.

Copyright and Permission Statement

I confirm that the materials included in this chapter do not violate copyright laws. Where relevant, appropriate permissions have been obtained from the original copyright holder(s). All original sources have been appropriately acknowledged and/or referenced.

Asian Pacific Journal of Health Sciences applies the Creative Commons Attribution (CC-BY) license to published articles. Under this license, authors retain ownership of the copyright for their content, but they allow anyone to download, reuse, reprint, modify,

distribute, and/or copy the content as long as the original authors and source are cited. Appropriate attribution can be provided by simply citing the original article.

References

1. Dattani S, Rodés-Guirao L, Ritchie H, Ortiz-Ospina E, Roser M. Life Expectancy. United Kingdom: Our World in Data; 2023. Available from: https://ourworldindata.org/life-expectancy [Last accessed on 2026 May 20].
2. Roser M. Why is Life Expectancy in the US Lower than in Other Rich Countries? United Kingdom: Our World in Data; 2020. Available from: https://archive.ourworldindata.org/20260512-185716/us-life-expectancy-low.html [Last accessed on 2026 May 20].
3. Social Security Actuarial Life Table. USA: Social Security Administration; Available from: https://www.ssa.gov/oact/STATS/table4c6.html [Last accessed on 2026 Feb 15].
4. Our World in Data Human Mortality Database - with Minor Processing by Our World in Data. UK: Our World in Data; 2025. Central Death Rate at Birth - HMD - Period Tables". Human Mortality Database. Available from: https://ourworldindata.org/grapher/annual-death-rate-by-age-group?time=2006 [Last accessed on 2026 Apr 20].
5. Devine J. Two States, a Third of Counties have more Deaths than Births. USA: US Census Bureau; 2017; Available from: https://www.census.gov/library/stories/2017/10/aging-boomers-deaths.html [Last accessed on 2026 Feb 15].
6. About Estimated Flu Burden. Atlanta, GA: CDC; Available from: https://www.cdc.gov/flu-burden/php/about/index.html [Last accessed on 2026 May 15].
7. USA Facts. USA: How Many People Live in the US; 2026; Available from: https://usafacts.org/answers/how-many-people-live-in-the-us/country/united-states/?enddate=2021-01-01&startdate=2010-01-01 [Last accessed on 2026 Apr 15].
8. Our World in Data. UK: Deaths by Age group, United States UN, World Population Prospects [2024] - Processed by Our World in Data. "Number of Children who Die before Age 5 - UN WPP" [dataset]. United Nations, "World Population Prospects"; United Nations, "World Population Prospects - Interim Update". Available from: https://ourworldindata.org/grapher/annual-deaths-by-age?time=2010&country=~usa [Last accessed on 2026 Apr 15].
9. CDC Wonder. Atlanta, GA: National Center for Health Statistics Mortality Data. Available from: https://wonder.cdc.gov/vaers.html [Last accessed on 2026 May 15].
10. Hedegaard H, Miniño A, Rose Spencer M, Warner M. Drug Overdose Deaths in the United States, 1999-2020. NCHS; 2021; Data Brief No. 428. Available from: https://www.cdc.gov/nchs/products/databriefs/db428.htm [Last accessed on 2026 Apr 15].
11. World Population Review. Lancaster, PA: Native American Population by State 2026. Available from: Review. Available from: https://worldpopulationreview.com/state-rankings/native-american-population [Last accessed on 2026 Apr 15].
12. CDC National Center for Health Statistics. Atlanta, GA: U.S. Life Expectancy by State and Sex, 2018-2022. Available from: https://www.cdc.gov/nchs/data-visualization/state-life-expectancy/2022.htm?total=total [Last accessed on 2026 Apr 15].
13. Tavernise S. Life Expectancy for White Americans Drops Sightly; Analysts Cite Drug Overdoses. New York: New York Times; 2016.
14. Tavernise S, Goodnough A. Life Expectancy of Americans Rises for First Time in Four Years. New York: New York Times; 2020.
15. Katz J, Sanger-Katz M. It's Huge, 'It's Historic, It's Unheard-of': Drug Overdose. New York: New York Times; 2021.
16. Shmerling R. Why Life Expectancy in the US is Falling: COVID-19 and Drug Overdoses are the Biggest Contributors; 20220. Harvard Health Publishing. Available from: https://www.health.harvard.edu/blog/why-life-expectancy-in-the-us-is-falling-202210202835 [Last accesssed on 2026 Apr 30].
17. Mahr K. Covid-19 and Overdose Deaths Drive U.S. Life Expectancy to a 25-Year Low. Politico; 2022. Available from: https://www.politico.com/news/2022/12/22/covid-19-and-overdose-deaths-drive-u-s-life-expectancy-to-a-25-year-low-00075081
18. Daley J. Colorado Sees a Drop in Life Expectancy not Seen Since WWII, Driven by COVID and Overdose Deaths. Colorado Public Radio News; 2022. Available from: https://www.cpr.org/2022/06/25/colorado-life-expectancy-falls-covid-overdose-deaths [Last accessed on 2026 Apr 30].
19. US Senate Committee on Homeland Security and Governmental Affairs. Testimony of Pierre Kory, MD Homeland Security Committee Meeting: Focus on Early Treatment of COVID-19; 2020. Available from: https://www.hsgac.senate.gov/wp-content/uploads/imo/media/doc/Testimony-Kory-2020-12-08.pdf [Last accessed on 2026 May 15].
20. Kory P, Pfeiffer M. More Young Americans are Dying - and it's not COVID. Why aren't we Searching for Answers? USA Today; 2023. Available from: https://www.usatoday.com/story/opinion/2023/08/11/more-americans-dying-than-before-pandemic-covid-deaths/70542423007/ [Last accessed on 2026 May 15].
21. Capuzzo M. 5 Takeaways from Washington Post's Investigation into Chronic Disease and Decline in U.S. Life Expectancy. The Defender. Available from: https://childrenshealthdefense.org/defender/washington-post-life-expectancy-covid-vaccines [Last accessed on 2026 May 15].
22. Jimmy Dore Show. Young People are Dying at Staggering Rates! w/ Dr. Pierre Kory. Interview Recording; 2024. Available from: https://rumble.com/v48tlk6-young-people-are-dying-at-staggering-rates-w-dr.-pierre-kory.html [Last accessed on 2026 May 15].
23. CDC Wonder. Atlanta, GA: Vaccine Adverse Event Reporting System; 2026. Available from: https://wonder.cdc.gov/vaers.html cited 2026 May 15].
24. CDC. Atlanta, GA. Provisional Drug Overdose Death Counts; 2026. Available from: https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm [Last accessed on 2026 May 30].
25. The National World War II Museum. New Orleans, LA: Research Starters: Worldwide Deaths in World War II. Available from: https://www.nationalww2museum.org/students-teachers/student-resources/research-starters/research-starters-worldwide-deaths-world-war [Last accessedon 2026 May 30].
26. Electronic Records Reference Report from the National Archives. College Park, MD: Vietnam War U.S. Military Fatal Casualty Statistics; 2022. Available from: https://www.archives.gov/research/military/vietnam-war/casualty-statistics [Last accessed on 2026 May 30].