

Utah's Demographics and COVID-19 Death Rates: A Data Update

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Utah has a lower COVID-19 per-capita death rate (also called the crude death rate, or CDR) than the U.S. as a whole. The national cumulative CDR for the year of April 1, 2020, through March 31, 2021, was 167 deaths per 100,000 people, while the Utah rate was 65 deaths per 100,000 people.¹ A 2020 report attributed a quarter of the CDR difference up through July 1, 2021, to Utah's younger population.² Using updated data including a longer time period and additional demographic characteristics, **this report indicates that approximately 50% of Utah's lower COVID-19 per-capita death rate during the first year of the pandemic can be attributed to the demographic composition of its population.** These provisional findings reinforce the importance of considering demographic details when assessing public health.

Introduction

One year ago, the Kem C. Gardner Policy Institute published a research brief comparing Utah and U.S. COVID-19 death rates. The report concluded that Utah's rate was considerably lower and that the state's younger population explained about a quarter of that difference. At that time, we had experienced only the first wave of COVID-19, and compared to national rates, Utah remained relatively unscathed.

Since then, COVID-19 has continued its spread across the globe. The U.S. has experienced approximately 700,000 deaths directly due to COVID-19, and Utah experienced approximately 3,000. These numbers are likely an underrepresentation of the true death toll as the pandemic caused people to forego health care for other conditions (either for fear of infection or low healthcare availability) and likely contributed to deaths of despair (deaths due to substance abuse or suicides).³ To put this number of deaths into perspective, Utah experienced about 18,500 total deaths for the fiscal year July 1, 2018-June 30, 2019, with an all-cause CDR of approximately 580 per 100,000.⁴

Utah's COVID-19 cumulative per-capita death rate of
64.9 deaths per 100,000
is lower than the **U.S. rate of 167.1**.*

51.4% of Utah's lower COVID-19 per-capita death rate can be attributed to the age, sex, and racial/ethnic composition of its population.*

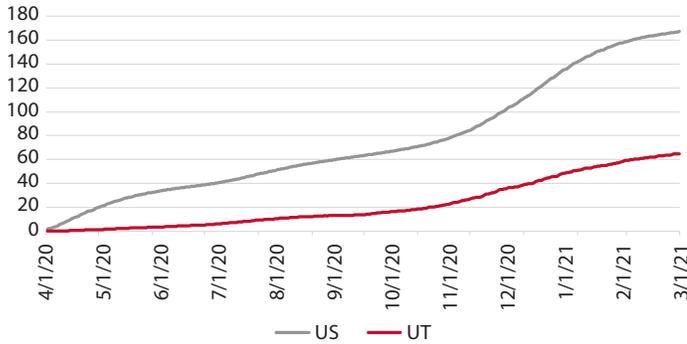
*Compared to the national COVID-19 death rate from April 1, 2020–March 31, 2021

This updated brief references data from April 1, 2020, through March 31, 2021, one full year of the pandemic. Our analysis indicates that approximately half of Utah's lower COVID-19 death rate is attributed to its demographic makeup. It also provides details on key demographic characteristics including age, sex, and basic racial/ethnic categories. Utah's death rates appear to be lower than the U.S. for nearly all of the demographic subgroups examined, but racial and ethnic minorities still suffered higher rates than non-Hispanic Whites.

The Issue

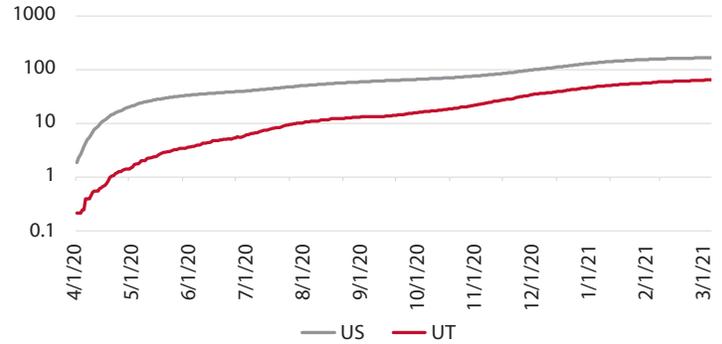
COVID-19 is generally deadlier for older age groups, males, and racial and ethnic minorities. This means that even if Utah's COVID-19 response mirrored the U.S.'s response, we would expect Utah to have a lower COVID-19 death rate. Utah has the youngest median age of all U.S. states and a lower share of racial/ethnic minorities compared to the U.S.⁵ Utah also has a high male/female sex ratio, which could raise Utah's CDR; but Utah's young population drives the high sex ratio.⁶ Additionally, we know that racial/ethnic minority populations tend to have younger median ages.⁷ These examples demonstrate how demographic risk factors confound the overall death rates. We

Figure 1. Cumulative Per Capita COVID-19 Death Rate per 100,000, Utah and the U.S., April 2020-2021



Source: Kem C. Gardner Policy Institute, National Center for Health Statistics, U.S. Census Bureau. Provisional Data.

Figure 2. Logged Cumulative Per Capita COVID-19 Death Rate per 100,000, Utah and the U.S., April 2020-2021



Source: Kem C. Gardner Policy Institute, National Center for Health Statistics, U.S. Census Bureau. Provisional Data.

Table 1. Provisional Population, COVID-19 Deaths, and COVID-19 Death Rates per 100,000 by Select Demographic Characteristics, U.S. and Utah, April 2020-2021

	UNITED STATES					UTAH				
	Population	Population Distribution	COVID-19 Deaths	Percent of Total COVID-19 Deaths	Crude Death Rate (per 100k)	Population	Population Distribution	COVID-19 Deaths	Percent of Total COVID-19 Deaths	Crude Death Rate (per 100k)
Total	331,449,281	-	553,701	-	167.05	3,271,616	-	2,122	-	64.86
0-49 Years	213,321,378	64%	22,736	4%	10.66	2,434,310	74%	147	7%	6.05
50-59 Years	42,768,715	13%	37,936	7%	88.70	313,291	10%	169	8%	53.94
60-69 Years	38,397,994	12%	88,278	16%	229.90	277,376	8%	364	17%	131.10
70-79 Years	23,912,668	7%	142,988	26%	597.96	164,224	5%	536	25%	326.65
80+ Years	13,048,527	4%	261,764	47%	2,006.08	82,415	3%	906	43%	1,099.03
Minority	132,210,024	40%	202,670	37%	153.29	726,785	22%	569	27%	78.25
Non-Hispanic White	199,239,257	60%	351,031	63%	176.19	2,544,831	78%	1,553	73%	61.04
Female	168,211,157	51%	254,571	46%	151.34	1,623,626	50%	852	40%	52.45
Male	163,238,124	49%	299,130	54%	183.25	1,647,990	50%	1,270	60%	77.08

Note: Due to the full data requirements, only the total population is from the 2020 decennial census, but the marginal demographic distributions are from the 2019 Census Bureau population estimates.

Source: Kem C. Gardner Policy Institute, Utah Department of Health, National Center for Health Statistics, U.S. Census Bureau. Provisional Data.

conduct a decomposition analysis to disentangle the impacts of these demographic differences.

Our decomposition analysis answers, in a single number, the question of how much of Utah’s COVID-19 advantage is due to the population having different demographic characteristics: about 50%. The background data and rates can also provide information on how equitable COVID’s impact has been—a critical piece of information for the community at large, particularly those disadvantaged by those inequalities, and for several key state stakeholders.⁸

Results

Figure 1 shows the cumulative COVID-19 CDR for the U.S. and Utah between April 2020 through March 2021. Because it is cumulative, the rates increase over time⁹. Utah’s rates have consistently been lower than national rates. Figure 2 shows the

same data on a log scale, which can help identify nuance in the rate of increase. Utah was largely spared the first wave of death in the initial months of the pandemic. However, between June and the end of December of 2020, the distance between the two lines shrinks, suggesting that the rate of increase in Utah’s CDR started catching up to the U.S. in the second half of 2020. During the first quarter of 2021, the rate of growth in Utah’s COVID-19 CDR roughly paralleled that of the nation. Reasons for the detailed time path of these death rates are primarily epidemiological and beyond the scope of this report. Rather, this report focuses on the difference at the end of the time series (March 31, 2021).

Deaths, Population, and Rates

Table 1 displays per capita rates and breaks them down into basic demographic age, racial/ethnic, and sex groups. Utah is on average much younger than the U.S. Less than a quarter of Utahns identify as a racial/ethnic minority, compared to about

40% for the nation. Utah has a higher proportion of males, but this is mainly related to age structure. On average, more males are born than females, and females live longer than males, so older populations tend to have a higher proportion of females.

The death rates increase exponentially with age, and rates are higher for males than females. This is clearly seen in Figures 3 and 4, which show the detailed rates by age, sex, and race, displayed on different scales. For racial/ethnic groups in our dataset, the per-capita rate for minorities is higher than non-Hispanic Whites in Utah, but the reverse is seen at the national level. This emphasizes the importance of considering age effects, because within age and sex groups, the U.S. and Utah rates are always higher for minorities than non-Hispanic Whites. What appears to be a discrepancy in Table 1 is actually the effect of minorities being much younger, on average, than non-Hispanic whites—an example of *Simpson's Paradox*.¹⁰ Additionally, these numbers are subject to the data source, and some research suggests minority COVID-19 statistics are underreported.¹¹ Within each age group, rates are highest for minority males, consistent with national research suggesting male minorities, especially Black and Hispanic men, suffered significant drops in life expectancy over the past year.¹²

Finally, Utah rates are substantially lower than U.S. rates for all groups outlined in Table 1. Figures 3 and 4 show that the Utah

Table 2. Difference in Utah's COVID-19 Death Rate, Attributed to Demographic Composition vs. Other Factors, April 2020-2021

	Death Rate (per 100k)	Percentage
Demographic Composition	52.56	51.4%
Other Factors	49.63	48.6%
Total	102.19	100%

Source: Kem C. Gardner Policy Institute.

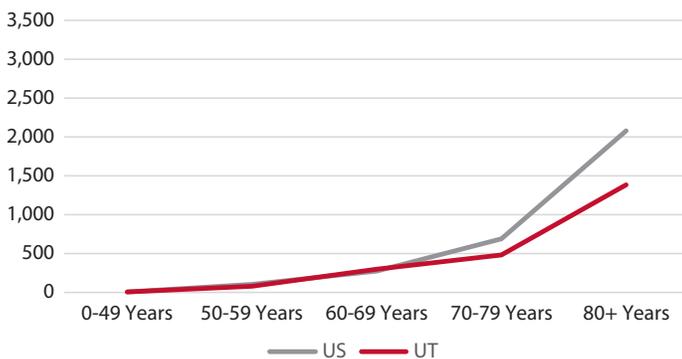
rates are also lower than U.S. rates within each age, sex, and race grouping; the two exceptions being minority females aged 60-69 years and minority males aged 70-79 years. However, we reiterate that these are provisional findings, and any single data point could be an anomaly due to data quality or random noise.

Decomposition

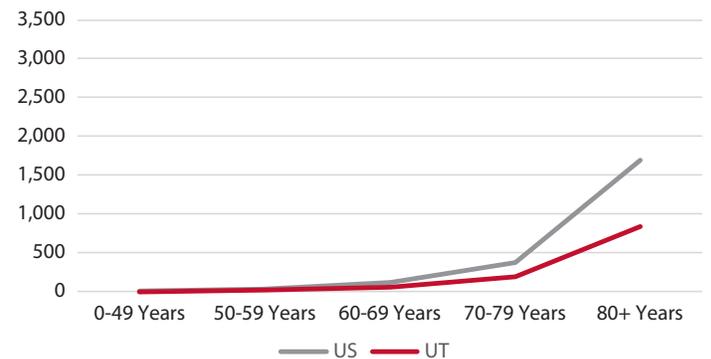
The per-capita rate is composed of a population's demographic makeup and the health outcomes for each demographic subgroup, similar to how a symphony is composed of multiple instruments of various volumes and timbers. Since no symphony member acts independently, the result is often more than the sum of its parts. It is difficult to determine precisely how much each member contributed to the outcome. The same is true of

Figure 3: Provisional Death Rate (per 100k) Comparisons by Age, Sex, and Race/Ethnicity, United States and Utah, April 2020-2021

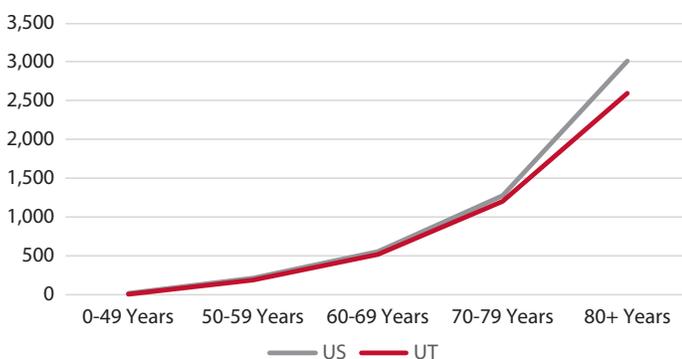
Female/Minority



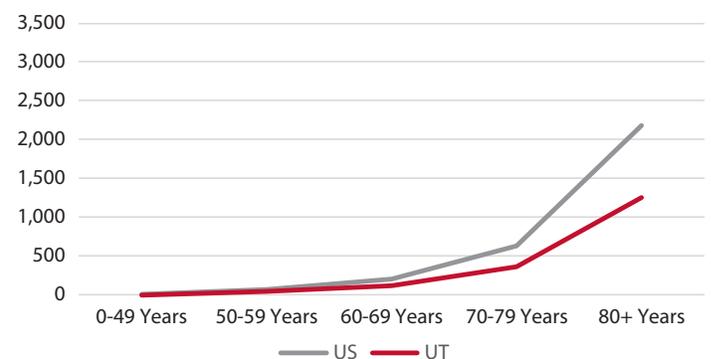
Female/Non-Hispanic, White



Male/Minority



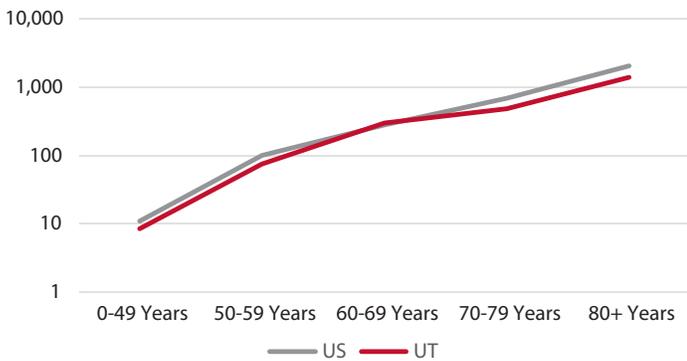
Male/Non-Hispanic, White



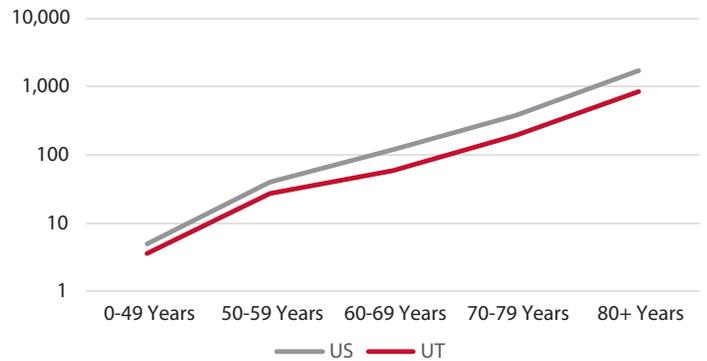
Source: Kem C. Gardner Policy Institute, National Center for Health Statistics, Utah Department of Health, U.S. Census Bureau. Provisional Data.

Figure 4: Logged Provisional Death Rate (per 100k) Comparisons by Age, Sex, and Race/Ethnicity, United States and Utah, April 2020-2021

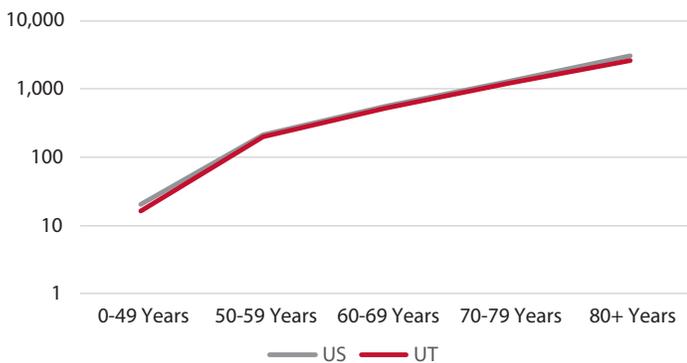
Female/Minority



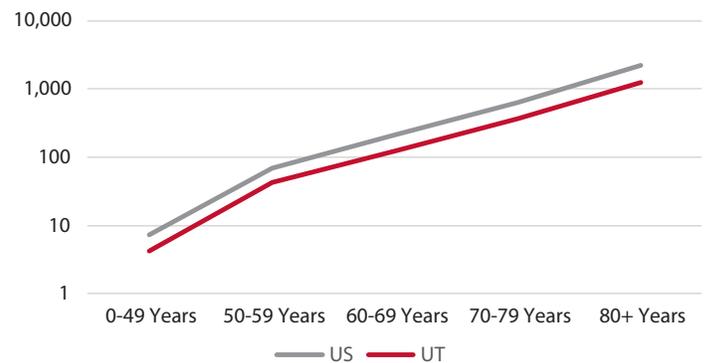
Female/Non-Hispanic, White



Male/Minority



Male/Non-Hispanic, White



Source: Kem C. Gardner Policy Institute, National Center for Health Statistics, Utah Department of Health, U.S. Census Bureau. Provisional Data.

population rates, but there are various ways to decompose the differences into the population composition as compared to other factors.

As shown in Table 2, we found that Utah’s higher-than-average share of people at a lower risk of death from COVID-19 contributes to approximately half the difference between national and statewide per-capita death rates. The other half is due to additional variables such as public health response, personal health behaviors, social support networks, and many other factors. Understanding the exact impacts of each would require more detailed and complete data.

Data and Methods

Data

Population

All populations are Census definition of resident population. Total populations for the U.S. and Utah came from the 2020 decennial census. Age/sex/racial/ethnic distributions of population for the U.S. and Utah were from the vintage 2019 U.S. Census Bureau population estimates. Ideally, these would have come from the same dataset, but the detailed 2020 census data are not yet available.

Deaths

All deaths are by place of occurrence. A death was attributed to COVID-19 if the ICD-10 code was prefixed by U07.1. Total deaths were from COVID-19 Cases and Deaths by State over Time, NCHS.¹³ Age/sex/racial/ethnic distributions of deaths for the U.S. were from COVID-19 Case Surveillance Public Use Data.¹⁴ Utah data were provided by the Utah Department of Health.

Challenges

COVID-19 death rates present many challenges, the biggest involving time delays, which is why published public health research is often labeled “provisional.” Delayed reporting results in substantial missing data and measurement errors. Causes of deaths may also be misreported or inconsistent across the U.S. Also, deaths are by place of occurrence, not residence. People do not always die in the state they live in. This means the rates do not have a one-to-one correspondence between the numerator and denominator. It takes the NCHS several years to obtain records of all deaths, properly ascertain where each person lived, and properly recode the death to place of residence. Additionally, the decennial census population numbers are still not available in the necessary age/sex/racial/ethnic detail, which

is why we combined data from the 2019 population estimates with 2020 census totals. This final source of error likely has a minor impact on findings as population denominator errors tend to have more significant impacts with larger rates.

Methods

The CDR was calculated as total COVID-19 deaths over the entire period divided by total Census 2020 population multiplied by 100,000. If M_i is the death rate for age/sex/race/ethnic group i , f_i is the age distribution of deaths, and C_i the age distribution of population, then $M_i = f_i / C_i * CDR$. Decomposition was performed using the Kitagawa method.¹⁵

Conclusion

Utah has maintained a lower per-capita COVID-19 death rate than the U.S. since the pandemic began, but demographic differences play a part in the magnitude of these death rates. With a full year's worth of preliminary data available, about half

of that difference is attributable to Utah's younger age structure, different racial and ethnic composition, and sex distribution. The other half of the difference is likely due to multiple environmental and socioeconomic conditions, local pandemic responses, vaccination rates, and other epidemiological factors.

As Utah progresses through another wave of cases triggered by the Delta variant, having a low death rate is only one (albeit crucial) measure of a successful response, especially now that vaccinations reduce the likelihood of death. It is important to note that the results presented in this paper occurred before the present Delta variant wave was the major driver of cases. If the current or future virus epidemiology and public health response results in higher death rates among different subgroups (for example, younger Utahns), Utah's demographic structure may no longer provide much advantage. We will continue to monitor demographic patterns of COVID-19 death rates and update this research as more data become available.

Endnotes

1. These rates were derived from NCHS data and Census Bureau 2020 resident population counts. It is important to note that the CDRs can change depending on the data used. Unless otherwise specified, these are the two CDRs compared in this report.
2. Hollingshaus M. (2020). Is Utah's relatively low COVID-19 death rate due to its younger population? Kem C. Gardner Policy Institute. DOI: 10.26052/0D-HZXM-JGQV. Retrieved from <https://gardner.utah.edu/wp-content/uploads/C19-Age-Brief-July2020.pdf>
3. Ahmad, F. B., Rossen, L. M., Spencer, M. R., Warner, M., & Sutton, P. (2018). Provisional drug overdose death counts. National Center for Health Statistics. Retrieved from <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>
4. Harris, E. (2020). State and county population estimates for Utah: 2020. Kem C. Gardner Policy Institute. Retrieved from <https://gardner.utah.edu/wp-content/uploads/State-County-PopEst-Dec2020.pdf>
5. Backlund, M., Bateman, M., Brandley, A., Christensen, M., Dean, P., Downen, J., ... & Wood, J. (2021). Diversity in Utah. Kem C. Gardner Policy Institute. Retrieved from <https://gardner.utah.edu/wp-content/uploads/DiversityDataBook-May2021.pdf?x71849>
6. Male/female sex ratios correlate negatively with age. In almost all human populations more males are born than females, but females live longer.
7. Hollingshaus M., Harris E., Perlich P.S. (2019). Utah's increasing diversity: population projections by race/ethnicity. DOI: 10.7278/S50D-701K-JGW8. Kem C. Gardner Policy Institute. Available from: <https://gardner.utah.edu/wp-content/uploads/Utah-Projections-Race-Ethnicity-2019.pdf>
8. Salt Lake Chamber. (2020). Utah compact on racial equity, diversity, and inclusion. Retrieved from <https://slchamber.com/public-policy/utah-compact/>
9. A few trivial declines in the data are due to minor data corrections reported over time.
10. Frey, W.H. (2020). The nation is diversifying even faster than predicted, according to new census data. *Brookings Institute*. Retrieved from <https://www.brookings.edu/research/new-census-data-shows-the-nation-is-diversifying-even-faster-than-predicted/>
11. Fast, A. (2021, September 1). Millions of people are missing From CDC COVID data as states fail to report cases. *NPR*. <https://www.npr.org/2021/09/01/1032885251/millions-of-people-are-missing-from-cdc-covid-data-as-states-fail-to-report-case>; see also Jarosz, B. (2021). *Tracking and projecting trends in Hispanic/Latino pandemic deaths: the challenge of missing racial/ethnic data* [Conference presentation]. Population Association of America Applied Demographic Conference, Alexandria, Virginia.
12. Arias, E., Tejada-Vera, B., Ahmad, F., Kochanek, K.D. (2021). Provisional life expectancy estimates for 2020. *Vital Statistics Rapid Release*, 15. National Center for Health Statistics. Retrieved from <https://www.cdc.gov/nchs/data/vsrr/vsrr015-508.pdf>
13. COVID-19 cases and deaths by state over time. (2021, September 17). Centers for Disease Control and Prevention. Retrieved from <https://data.cdc.gov/Case-Surveillance/United-States-COVID-19-Cases-and-Deaths-by-State-o/9mfq-cb36>
14. COVID-19 case surveillance public use data. (2021, September 9). Centers for Disease Control and Prevention. Downloaded from <https://data.cdc.gov/Case-Surveillance/COVID-19-Case-Surveillance-Public-Use-Data/vbim-akqf> on April 9, 2021. We used only those cases where age, sex, and race/ethnicity were known. Patterns of missing data could introduce bias, but sensitivity tests using other sources showed the decomposition results to be fairly robust.
15. Preston, S.H., Heuveline, P., & Guillot, M. (2001). *Demography, measuring, and modeling population processes*, 24-28. Blackwell Publishers Ltd.