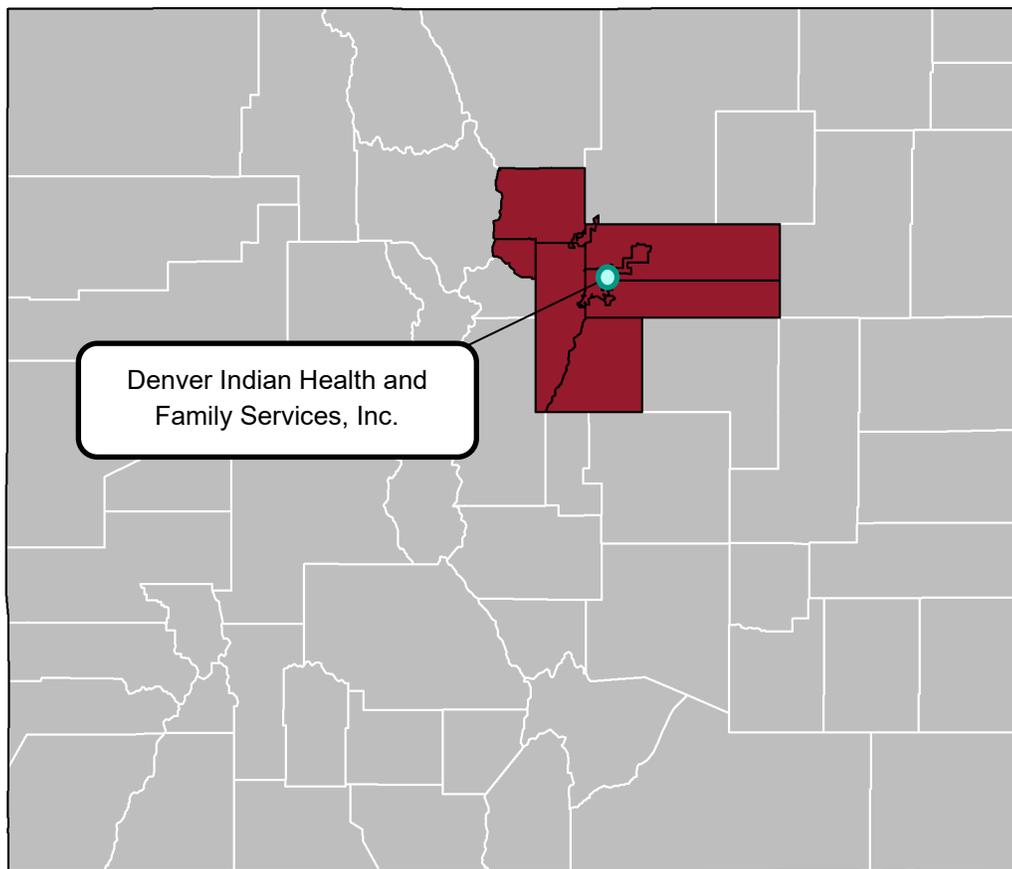


Denver Service Area

COVID-19 Case Surveillance Information for American Indians and Alaska Natives living in counties served by Urban Indian Health Programs in the Denver Service Area

MAP 1: Denver Service Area



UIHO Service Area Counties Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Gilpin, Jefferson

UIHO Service Area State Colorado



Urban Indian Health Institute
A Division of the Seattle Indian Health Board

Our mission is to decolonize data,
for indigenous people, by indigenous people.
611 12th Avenue South, Seattle, WA 98144
206-812-3030 | info@uihi.org | www.uihi.org

Introduction

The COVID-19 pandemic resulted in a disproportionate loss of life among American Indians and Alaska Natives.^{1,2} To quantify this impact, Urban Indian Health Institute (UIHI) prepared this report to provide surveillance information for areas served by Urban Indian Health Programs. This report contains information regarding COVID-19 cases, hospitalizations, and deaths. Please note that this data reflects information available from counties overall and does not represent individual organizations or providers.

About UIHI

As a Public Health Authority and one of 12 Tribal Epidemiology Centers in the country—and the only one that serves Urban Indian Health Programs nationwide—UIHI conducts research and evaluation, collects and analyzes data, and provides disease surveillance to strengthen the health of American Indian and Alaska Native communities. Urban Indian Health Institute's (UIHI) mission is the reclamation of the cultural value systems of data collection—for Indigenous people, by Indigenous people—to conduct research and evaluation with the central goal of ensuring the well-being of the community and a great future for the next generations.

Data Quality

The data used in this report is from the Center for Disease Control and Prevention (CDC) COVID-19 Case Surveillance Data which may differ from what is shown on your county's public health dashboard. To assess discrepancies in CDC and state data, we present metrics on data quality. The quality of COVID-19 data is measured in two ways: the completeness of racial data sent to the CDC and the proportion of cases sent to the CDC from the state.

Not all COVID-19 cases within counties have been reported to the CDC. To assess the overall representativeness of the CDC COVID-19 Case Surveillance Data, we compare the total number of COVID-19 cases reported to the CDC by county with the total number of cases reported to the New York Times.³ The number of COVID-19 cases, reported by the New York Times, in a given county vary based on whether they include confirmed COVID-19 cases or confirmed and probable COVID-19 cases. Therefore, the cases reported by New York Times provide an upper limit for the number of COVID-19 cases in a county.

For the data presented in this report to be of high-quality, racial data needs to be both collected by states and relayed to the CDC. **Unfortunately, many states have poor collection of racial data and/or do not send most COVID-19 data to the CDC. We recommend using caution when interpreting these numbers in the absence of the quality of their data.** These data quality issues vary over time. Data is especially poor around the peaks of COVID-19 case burden. Please refer to Figure 1 and Table 1 to assess the overall quality of COVID-19 data in this service region.

Methods

The Center for Disease Control and Prevention COVID-19 Case Surveillance Data are voluntarily submitted by local health jurisdictions to the CDC using the COVID-19 Case Report Form.⁴ This data is then transmitted to the Urban Indian Health Institute for analysis. Population denominators use the 2020 postcensal estimates.

The COVID-19 Case Report Form allows for the selection of multiple racial identities independent of ethnicity, however, many states and counties do not report data to the CDC in this format. Due to the methods of data collection and reporting, American Indian/Alaska Natives (AI/ANs) were defined as non-Hispanic AI/AN alone in this report. Using other definitions of AI/ANs would result in rates that underestimate the burden of COVID-19 among AI/ANs. Because of the under-reporting of racial data, the statistics presented in this analysis are only applicable to non-Hispanic single race AI/ANs, a portion of the entire AI/AN population. The non-Hispanic White (NHW) population is included as a comparison population to assess disparities in COVID-19 incidence, hospitalization, and mortality in recognition of the effects of structural racism.

Ethnicity categories are captured as "Hispanic/Latino", "Non-Hispanic/Latino", or "Unknown". Age is calculated by the provided date of birth. Cases were assigned to individual counties based on their listed county of residence. Sex is recorded in the Case Report Form as "Male", "Female",

“Other”, or “Unknown”. The 2020 postcensal estimates do not provide estimates for individuals whose sex is not male or female, thus case rates for “Other” or “Unknown” patients cannot be calculated.

Cases were defined as individuals with a positive PCR test for COVID-19. Cases were excluded when an individual did not report county of residence. COVID-19 Case dates were assigned based on when COVID-19 Cases were reported to the CDC.

Age-adjusted case, hospitalization, and mortality rates stratified by race and gender are presented in this report. Age-adjustment for incidence rates were calculated using the direct method applying weights from the U.S. 2000 Standard Population. Age-adjustment for relative risks was performed via logistic regression.

Case counts that are less than 10 are suppressed in this report to protect confidentiality. Rates are presented with an asterisk (*) when its relative standard error (RSE) is greater than or equal to 25%. RSE provides a measure of reliability. Where the RSE is greater than or equal to 25%, the estimate is unreliable. Analyses adhere to Washington Department Of Health guidelines for the reporting of data with small numbers.⁵

Data were analyzed using R version 4.2.

GLOSSARY OF TERMS

Age Adjusted

This report refers to several analyses as age adjusted. Age adjustment is a statistical approach which allows for communities with different underlying age compositions to be compared. For example, COVID-19 has had disproportionate impacts based on age.⁶ As a population, AI/AN are younger than NHW.⁷ As a result of these two factors any analysis that does not undergo age adjustment when comparing COVID-19 rates between AI/AN to NHW may only reflect that as a population AI/AN are younger than NHW and therefore have different rates of COVID-19. To adjust for this effect, our analysis compares individuals with similar ages to one another separately and then combine those values after appropriately weighting them.

Confirmed COVID-19

COVID-19 is determined to be “Confirmed” if there is confirmatory laboratory evidence which requires detection of SARS-CoV-2 RNA in a clinical specimen using a molecular amplification detection test.

Confidence Interval

A confidence interval is a statistical tool used to describe the uncertainty of our estimates. It provides a range of values that is likely to include the true population value with a certain degree of confidence. It is often expressed as a percent whereby the true population value lies between an upper and lower interval. In this report many of our estimates are presented with 95% confidence intervals. A 95% confidence interval can be interpreted as, we are 95% confident that the true value of an estimate lies within the confidence interval range.

Incidence

Incidence refers to the occurrence, rate, or frequency of disease. In this report, incidence refers to the total number of COVID-19 infections, hospitalizations, or deaths divided by the total number of individuals at risk of infection. In this report we present incidence as the number of cases per 100,000 individuals to standardize the numbers across analyses with a different total number of individuals that could have been infected with COVID-19.

Relative Risk

Relative risk in this report refers to the probability of an individual who is AI/AN being infected, hospitalized, or dying from COVID-19 relative to a non-Hispanic White individual. A relative risk greater than one indicates that AI/AN individuals had a greater risk of infection, hospitalization, or death relative to NHW. Conversely, a relative risk less than one indicates that AI/AN individuals had a lower risk relative to NHWs.

Relative Standard Error (RSE)

Standard error tells you how accurate the estimate is compared to the true value. The greater the standard error is, the more likely that the estimate is an inaccurate representation of the true value. Relative standard error is used to show how large the standard error is, relative to the size of the estimated value. For this report, we determine our estimates to be unreliable when the relative standard error of an estimate is greater than 25%. We recommend caution when using estimates with an RSE greater than 25% due to their low reliability.

Rolling Average

A rolling or moving 14-day average is the average number of confirmed COVID-19 cases, hospitalizations, or deaths over a 14-day period. It is calculated for each day by averaging the values of that day and the 13 days before. This method is used to reduce fluctuations that occur on a weekly or daily basis due to external factors such as specimen processing and reporting time.

Service Area:

Urban Indian Health Organization's Service Areas are defined by the Urban Indian Health Programs who described to Urban Indian Health Institute the counties they serve.

EXECUTIVE SUMMARY:

COVID-19 Cases:

Since January 20, 2020 a total of 677 American Indian/Alaska Natives residing in the Denver UIHO service counties have been reported to the CDC as having confirmed COVID-19. This corresponds to an age adjusted incidence of 4,206 COVID-19 cases per 100,000 or approximately 4 in every 100 AI/ANs in the Denver Service Area were diagnosed with COVID-19. Compared to their non-Hispanic white counterparts of a similar age, AI/AN individuals were 8% less likely to be infected with COVID-19.

COVID-19 Hospitalizations:

Since January 20, 2020 a total of 72 American Indian/Alaska Natives residing in the Denver UIHO service counties have been reported to the CDC as hospitalized with confirmed COVID-19. This corresponds to an age adjusted incidence of 391 COVID-19 hospitalizations per 100,000 people. Compared to their non-Hispanic white counterparts of similar age, AI/AN individuals were 1.28 times more likely to be hospitalized with COVID-19.

COVID-19 Deaths:

Since January 20, 2020 a total of 23 American Indian / Alaska Natives residing in the Denver UIHO service counties have been reported to the CDC as having died due COVID-19. This corresponds to an age adjusted incidence of 57 COVID-19 deaths per 100,000 people. Compared to their non-Hispanic White counterparts of similar age, there was not a statistically significant difference in the rate of COVID-19 deaths among AI/AN individuals.

Data Quality:

Of the 359,541 total COVID-19 cases reported by the New York Times in Denver UIHO service counties, the CDC has complete race and ethnicity available for 153,951 (42.8%) of cases. This report does not contain information regarding whether COVID-19 hospitalizations or deaths were reported to the CDC. However, of the hospitalizations and deaths in the CDC data there is complete racial information available for 80.3% and 86.9% of cases, respectively.

FIGURE 1: Quality of COVID-19 Information Over Time, May 20, 2020–September 28, 2021

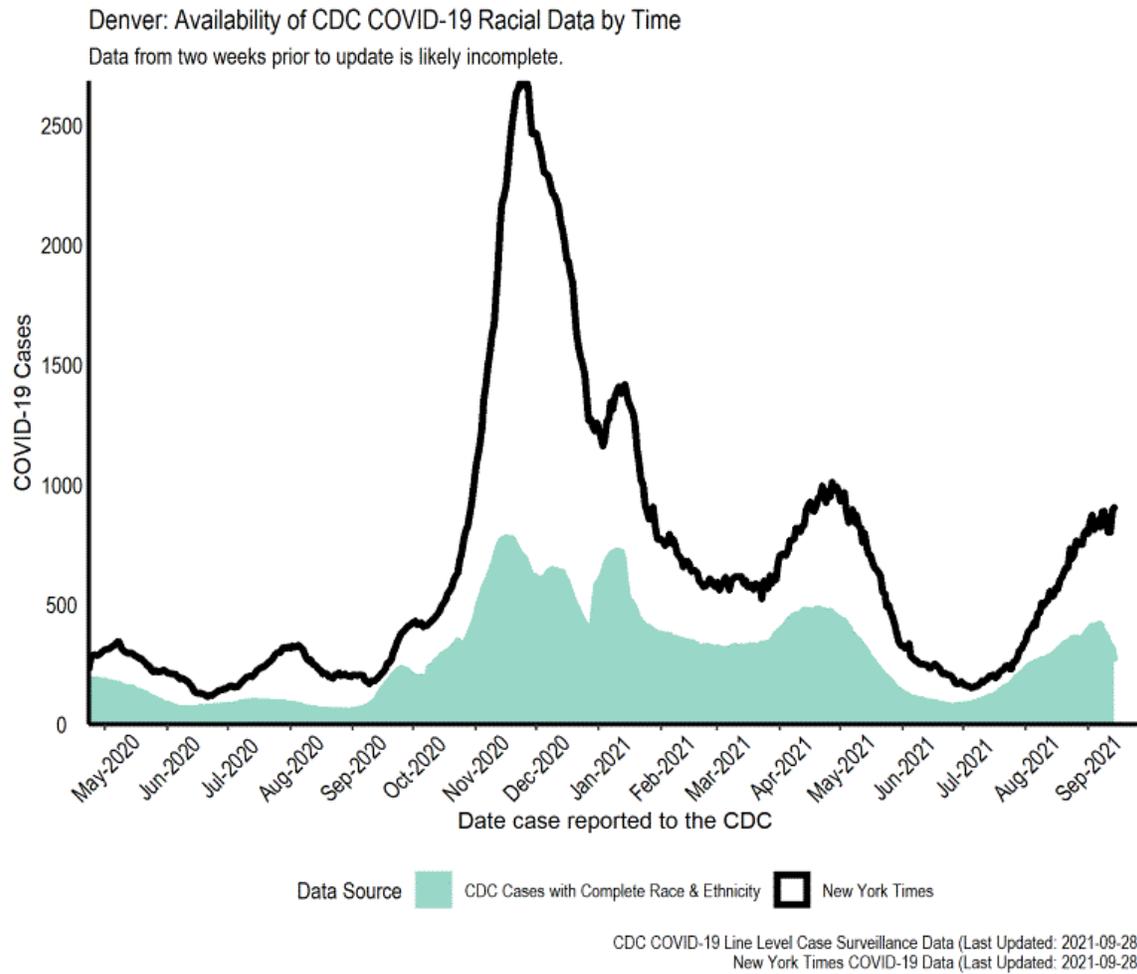


TABLE 1: Overall Data Quality for Denver Service Area COVID-19 Data, January 20, 2020–September 28, 2021

Data Quality Element	Data Source	Subset	# of COVID-19 Cases	Percent Completion
Completeness of Race & Ethnicity in CDC Dataset	CDC	Case Reported to CDC with Complete Race & Ethnicity	153,951	43.1%
	CDC	All Cases	356,894	
Completeness of Race & Ethnicity for Cases who were Hospitalized in CDC Dataset	CDC	Case Hospitalized with Complete Race & Ethnicity	16,423	80.3%
	CDC	All Hospitalized COVID-19 Patients	20,460	
Completeness of Race & Ethnicity for Cases who Died in CDC Dataset	CDC	COVID-19 Case Died with Complete Race & Ethnicity	5,060	86.9%
	CDC	All COVID-19 Cases who Died	5,820	
Cases Sent to the CDC	CDC	All Cases	356,894	99.3%
	NYT	All Cases	359,541	
Completeness of CDC Racial Data in Comparison to All Known Cases	CDC	Case Reported to CDC with Complete Race & Ethnicity	153,951	42.8%
	NYT	All Cases	359,541	

CDC = COVID-19 Case Surveillance Data Centers for Disease Control & Prevention, NYT = New York Times
 *Due to discrepancies in data reporting, CDC occasionally has greater cases than as reported by the New York Times

TABLE 2: Incidence of COVID-19 among non-Hispanic American Indian/Alaska Natives (AI/ANs) and non-Hispanic Whites (NHWs), January 20, 2020– September 28, 2021, Denver Service Area

	Geography	AI/AN Cases	AI/AN Population	AI/AN Age-Adjusted Incidence per 100k (95% CI)	NHW Age-Adjusted Incidence per 100k (95% CI)	Relative Risk, Age-Adjusted (95% CI)
OVERALL	UIHO Service Area	677	15,157	4,206 (3,900, 4,535)	4,593 (4,561, 4,625)	0.92 (0.85, 0.99)
	State Overall	1,985	37,021	4,972 (4,758, 5,196)	4,977 (4,953, 5,002)	1.00 (0.96, 1.04)
BY SEX						
Female	UIHO Service Area	364	7,758	4,307 (3,886, 4,774)	4,673 (4,628, 4,718)	0.92 (0.83, 1.02)
	State Overall	1,087	18,380	5,328 (5,020, 5,655)	5,105 (5,070, 5,140)	1.04 (0.98, 1.11)*
Male	UIHO Service Area	306	7,399	4,001 (3,576, 4,475)	4,474 (4,429, 4,520)	0.89 (0.80, 1.00)
	State Overall	881	18,641	4,519 (4,229, 4,828)	4,816 (4,782, 4,850)	0.94 (0.88, 1.00)
Other or Unknown	UIHO Service Area	<10	NA	NA	NA	NA
	State Overall	17	NA	NA	NA	NA
BY AGE						
0–19	UIHO Service Area	106	3,124	3,393 (2,805, 4,105)	4,615 (4,549, 4,682)	0.74 (0.61, 0.89)
	State Overall	335	8,056	4,158 (3,736, 4,628)	4,401 (4,355, 4,448)	0.94 (0.85, 1.05)
20–54	UIHO Service Area	441	8,594	5,131 (4,674, 5,633)	5,206 (5,162, 5,250)	0.99 (0.90, 1.08)
	State Overall	1,286	20,028	6,421 (6,079, 6,782)	5,999 (5,964, 6,035)	1.07 (1.01, 1.13)*
55+	UIHO Service Area	130	3,439	3,780 (3,183, 4,489)	4,035 (3,986, 4,084)	0.94 (0.79, 1.11)
	State Overall	364	8,937	4,073 (3,675, 4,514)	4,518 (4,481, 4,555)	0.90 (0.81, 1.00)
Unknown	UIHO Service Area	<10	NA	NA	NA	NA
	State Overall	<10	NA	NA	NA	NA

*=Relative Standard Error > 25%, Estimate Uncertain

TABLE 3: Incidence of COVID-19 Hospitalizations among non-Hispanic American Indian/Alaska Natives (AI/ANs) and non-Hispanic Whites (NHWs), January 20, 2020 – September 28, 2021, Denver Service Area

	Geography	AI/AN Cases	AI/AN Population	AI/AN Age-Adjusted Incidence per 100k (95% CI)	NHW Age-Adjusted Incidence per 100k (95% CI)	Relative Risk, Age-Adjusted (95% CI)
OVERALL	UIHO Service Area	72	15,157	391 (310, 494)	306 (294, 319)	1.28 (1.01, 1.61)*
	State Overall	207	37,021	458 (399, 525)	327 (318, 336)	1.40 (1.22, 1.61)
BY SEX						
Female	UIHO Service Area	46	7,758	497 (371, 666)	294 (277, 311)	1.69 (1.27, 2.26)*
	State Overall	126	18,380	572 (478, 683)	317 (304, 330)	1.80 (1.51, 2.15)
Male	UIHO Service Area	25	7,399	274 (185, 405)	316 (298, 335)	0.87 (0.59, 1.28)
	State Overall	79	18,641	337 (269, 420)	332 (319, 346)	1.01 (0.81, 1.26)*
Other or Unknown	UIHO Service Area	<10	NA	NA	NA	NA
	State Overall	<10	NA	NA	NA	NA
BY AGE						
0–19	UIHO Service Area	<10	3,124	Suppressed	Suppressed	Suppressed
	State Overall	<10	8,056	Suppressed	Suppressed	Suppressed
20–54	UIHO Service Area	35	8,594	407 (292, 567)	250 (240, 259)	1.63 (1.17, 2.28)*
	State Overall	109	20,028	544 (451, 657)	276 (268, 283)	1.97 (1.63, 2.39)
55+	UIHO Service Area	35	3,439	1,018 (731, 1,417)	1,088 (1,063, 1,114)	0.94 (0.67, 1.30)
	State Overall	94	8,937	1,052 (859, 1,287)	1,107 (1,089, 1,125)	0.95 (0.78, 1.16)
Unknown	UIHO Service Area	<10	NA	NA	NA	NA
	State Overall	<10	NA	NA	NA	NA

*=Relative Standard Error > 25%, Estimate Uncertain

TABLE 4: Incidence of COVID-19 Deaths among non-Hispanic American Indian/Alaska Natives (AI/ANs) and non-Hispanic Whites (NHWs), January 20, 2020–September 28, 2021, Denver Service Area

	Geography	AI/AN Cases	AI/AN Population	AI/AN Age-Adjusted Incidence per 100k (95% CI)	NHW Age-Adjusted Incidence per 100k (95% CI)	Relative Risk, Age-Adjusted (95% CI)
OVERALL	UIHO Service Area	23	15,157	57 (36, 90)	39 (32, 48)	1.48 (0.98, 2.22)*
	State Overall	65	37,021	61 (45, 82)	38 (31, 45)	1.62 (1.27, 2.06)*
BY SEX						
Female	UIHO Service Area	12	7,758	54 (30, 99)*	33 (27, 42)	1.63 (0.93, 2.86)*
	State Overall	35	18,380	60 (41, 89)	31 (25, 38)	1.96 (1.41, 2.74)*
Male	UIHO Service Area	11	7,399	64 (34, 121)*	48 (37, 61)	1.34 (0.75, 2.41)*
	State Overall	30	18,641	66 (44, 99)	49 (40, 60)	1.33 (0.93, 1.91)*
Other or Unknown	UIHO Service Area	<10	NA	NA	NA	NA
	State Overall	<10	NA	NA	NA	NA
BY AGE						
0–19	UIHO Service Area	<10	3,124	Suppressed	Suppressed	Suppressed
	State Overall	<10	8,056	Suppressed	Suppressed	Suppressed
20–54	UIHO Service Area	11	8,594	128 (71, 231)*	21 (19, 24)	6.05 (3.30, 11.09)*
	State Overall	27	20,028	135 (92, 197)	24 (22, 27)	5.51 (3.74, 8.12)
55+	UIHO Service Area	12	3,439	349 (198, 614)	540 (523, 558)	0.65 (0.37, 1.14)*
	State Overall	38	8,937	425 (309, 584)	509 (497, 521)	0.84 (0.61, 1.15)
Unknown	UIHO Service Area	<10	NA	NA	NA	NA
	State Overall	<10	NA	NA	NA	NA

*=Relative Standard Error > 25%, Estimate Uncertain

TABLE 5: Incidence of COVID-19 among non-Hispanic America Indians/Alaska Natives (AI/AN) and non-Hispanic Whites (NHW), January 20, 2020–September 28, 2021, Denver Service Area

County	Geography	AI/AN Cases	AI/AN Population	AI/AN Age-Adjusted Incidence per 100k (95% CI)	NHW Age-Adjusted Incidence per 100k (95% CI)	Relative Risk Age Adjusted (95% CI)
Adams	County	147	2,992	4,758 (4,047, 5,594)	5,281 (5,182, 5,382)	0.90 (0.77, 1.06)
Arapahoe	County	138	2,795	4,810 (4,071, 5,684)	4,976 (4,900, 5,052)	0.97 (0.82, 1.14)
Boulder	County	41	1,288	2,532 (1,867, 3,434)	3,567 (3,484, 3,652)	0.71 (0.52, 0.96)
Broomfield	County	14	302	4,250 (2,533, 7,130)*	4,910 (4,708, 5,122)	0.87 (0.52, 1.45)*
Denver	County	208	3,615	5,087 (4,438, 5,830)	4,321 (4,244, 4,399)	1.18 (1.03, 1.35)*
Douglas	County	28	1,099	2,486 (1,722, 3,588)	5,043 (4,951, 5,137)	0.49 (0.34, 0.71)
Gilpin	County	<10	56	Suppressed	2,694 (2,178, 3,332)	Suppressed
Jefferson	County	99	3,010	3,194 (2,623, 3,888)	4,178 (4,114, 4,243)	0.76 (0.63, 0.93)
All Colorado	State	1,985	37,021	4,972 (4,758, 5,196)	4,977 (4,953, 5,002)	1.00 (0.96, 1.04)

*=Relative Standard Error > 25%, Estimate Uncertain

FIGURE 2: Rolling 14 day average Incidence of COVID-19 by Date Reported to the CDC, May 20, 2020–September 28, 2021, Denver Service Area

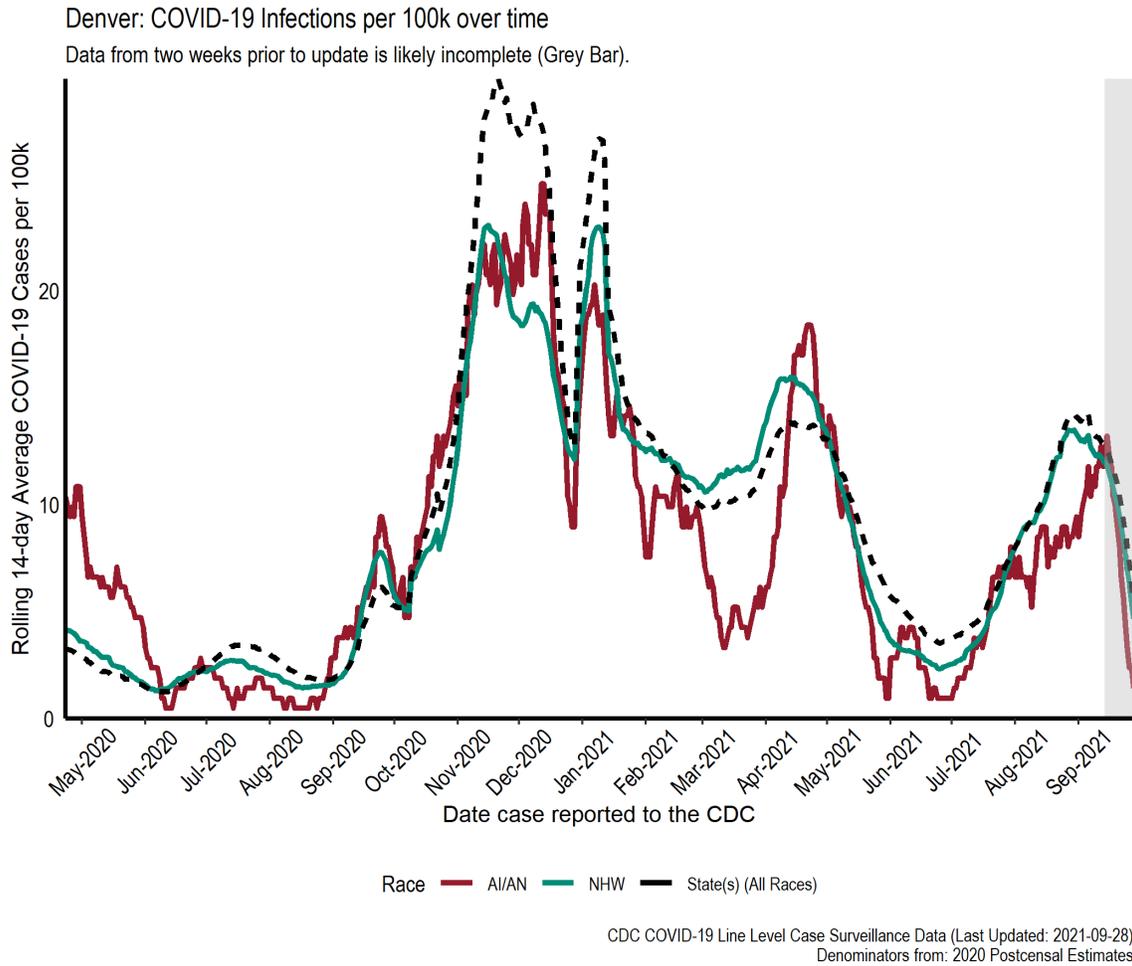


FIGURE 3: Rolling 14 day average Incidence of COVID-19 Hospitalizations by Date Reported to the CDC, May 20, 2020– September 28, 2021, Denver Service Area

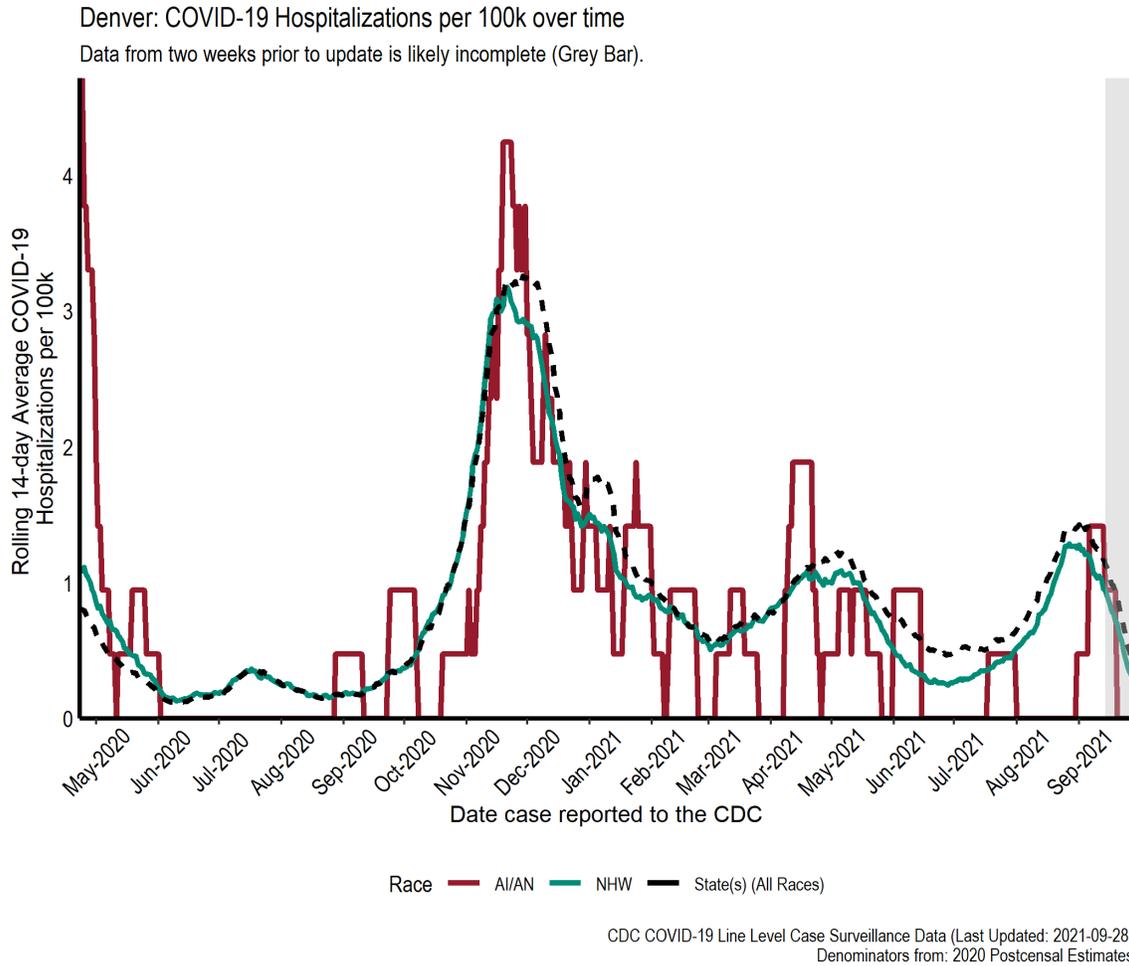
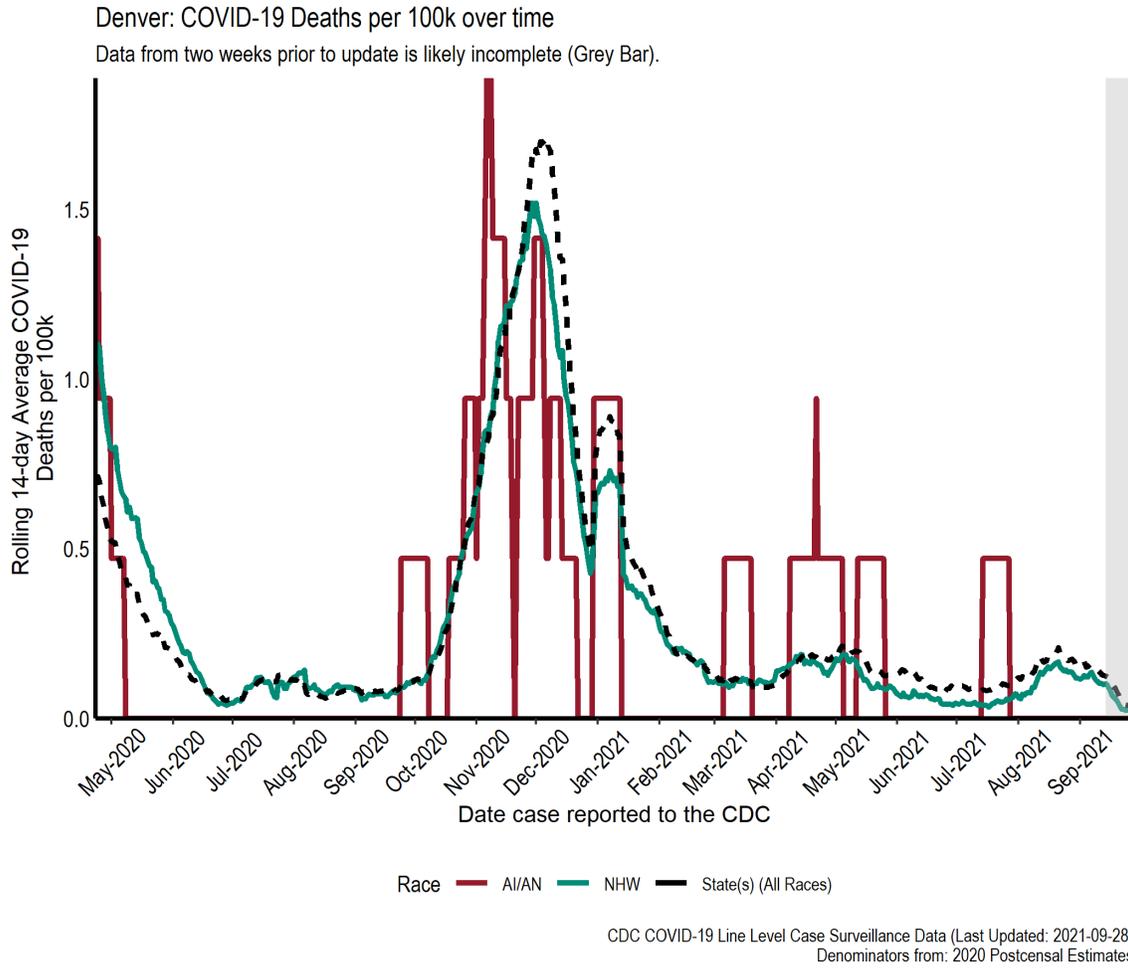


FIGURE 4: Rolling 14 day average Incidence of COVID-19 Deaths by Date Reported to the CDC, May 20, 2020–September 28, 2021 Denver Service Area



To request technical assistance in interpreting this report, or to request additional information you can reach out to Scott Erickson at scotte@uihi.org

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