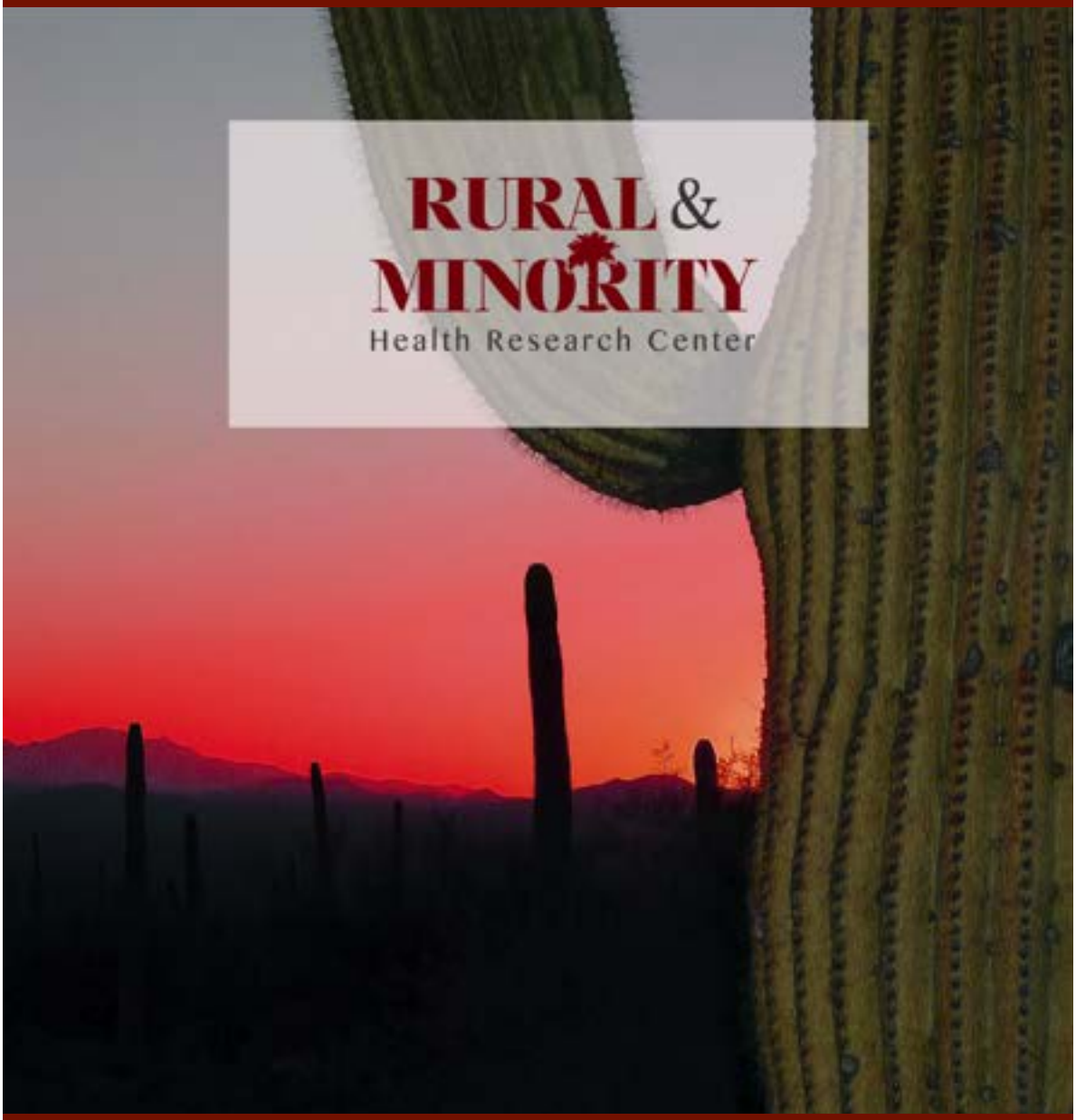
# Rural Border Health Chartbook

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# Executive Summary

The 2021 Rural Border Health Chartbook presents a variety of health indicators and social determinants of health (specified below) that have previously been identified as disparities warranting programmatic and policy interventions. The definition of rural used for the purposes of this Chartbook is based on the National Center for Health Statistics Urban-Rural Classification Scheme for Counties, where urban includes all metropolitan counties, and rural includes all non-metropolitan (micropolitan and non-core) counties. The Chartbook focuses on residents in the states of Arizona, California, New Mexico, and Texas by comparing self-reported ethnicity (Hispanic vs. non-Hispanic), rural-urban designation (rural vs. urban), and proximity to the U.S.-Mexico border (border vs. non-border). Our findings will be useful for educating public health officials, policymakers, and other organizations such as the United States Border Health Commission, the Federal Office of Rural Health Policy, and the National Rural Health Association.

Highlights include:

Population Characteristics

*Border - Non-Border Comparisons*

- Border counties had significantly greater median values of income inequality than non-border counties, in both rural and urban areas.

Physical Environment Characteristics

*Border - Non-Border Comparisons*

- A lower median percentage of households in border counties had broadband (62.6%) than households in non-border counties (75.8%).

Access to Care

*Border - Non-Border Comparisons*

- Routine medical checkups: Overall, 69.7% of adults reported such a visit in the past year, with nearly identical values for border county residents (69.2%) and residents of other counties (69.8%).
- Dental visits: Border adults were less likely to report having been seen by a dentist in the past year than were non-border residents (62.1% versus 64.6%).
- Delayed care: Residents of border counties were more likely than their non-border counterparts to report delaying care (16.0% versus 14.0%), a pattern that was present within both urban and rural counties. Rural disparities were pronounced, with 24.1% of adults in rural border counties, versus 16.1% of those in other rural counties, reporting delayed care.

*Hispanic - Non-Hispanic Comparisons within Border Residents*

- Routine medical checkups: Hispanic adults living in border counties were less likely than non-Hispanic respondents to report having a routine checkup during the past year (65.9% versus 72.5%).

- Dental visits: Hispanic adults living in border counties were less likely than other adults to report having seen a dentist in the past year (54.1% versus 70.4%).
- Delayed care: Among residents of border counties, a higher proportion of Hispanic adults reported delaying healthcare use than did other adults (22.5% versus 9.3%).

Preventive Health Services Use

*Border - Non-Border Comparisons*

- Flu vaccine: Viewed as a whole, residents of border and other counties had similar rates of flu vaccination during the past year (41.2%). However, residents of rural border counties were more likely than residents of other rural counties to report this vaccination (50.5% versus 43.0%).
- Mammogram: Overall, 70.5% of women in border counties reported receiving an age-appropriate mammogram. However, rural border residents were less likely than urban border residents to report having received this service (59.7% versus 71.0%).
- HIV test: Across the four border states, 41.3% of adults reported having been tested for HIV, with no differences based on border county status.
- Cervical cancer screening: A majority of women aged 21-65 reported undergoing cervical cancer screening, defined as having at least one Pap test in the past three years (76.5%), with no statistical differences between border and other counties.
- Colorectal cancer (CRC) screening: Border residents were less likely to have met the CRC screening standard than their non-border peers (61.7% versus 68.7%).

*Hispanic - Non-Hispanic Comparisons within Border Counties*

- Flu vaccine: Within border counties, persons identifying as Hispanic were less likely to report having received a flu vaccine in the past year than were non-Hispanic respondents (39.8% versus 45.3%).
- Mammogram: Overall, Hispanic women living in border counties did not differ statistically from women of other ethnicities in their mammogram use (71.0% versus 69.7%). However, within rural residents, Hispanic women were markedly less likely than others to report a timely mammogram (48.1% versus 82.2%).
- HIV test: Hispanic adults in border counties were less likely than non-Hispanic adults to report ever having been tested for HIV (38.4% versus 43.4%).
- Cervical cancer screening: Hispanic women were less likely than other women living in border counties to report receipt of a Pap test in the past three years (84.2% versus 89.7%)
- Colorectal cancer (CRC) screening: Across border counties, Hispanic adults were less likely to report having been screened for CRC than non-Hispanic respondents (49.7% versus 71.3%).

Health-Related Behaviors

*Border - Non-Border Comparisons*

- Physical activity: Among residents living in border counties, rural residents had lower overall reported rates of physical activity than their urban peers (57.5% versus 74.3%)
- Seatbelt use: Border residents were slightly more likely than non-border residents to report seatbelt use (95.6% versus 94.9%).
- Binge drinking: Border residents were slightly more likely to report binge drinking within the past 30 days than their non-border peers (17.9% versus 16.6%).
- Smoking: Statewide, 12.8% of residents of border states report that they currently smoke, with no difference based on border county status.

*Hispanic - Non-Hispanic Comparisons within Border Counties*

- Physical activity: Within border counties, Hispanic adults were less likely to report physical activity outside of work than were non-Hispanic residents (65.6% versus 80.9%).
- Seatbelt use: Although nearly all adults in border counties reported always or almost always wearing seatbelts while in a vehicle (95.6%), Hispanic adults were slightly less likely to report seatbelt use than non-Hispanic respondents (94.4% versus 96.8%).
- Binge drinking: No significant differences in binge drinking between Hispanic and non-Hispanic respondents within border counties were observed.
- Smoking: Among adults in border counties, 13.3% reported currently smoking tobacco, with no differences based on Hispanic ethnicity.

Adult Health Status

*Border - Non-Border Comparisons*

- Physical health: Across the four border states, 65.1% of adults reported having no time during the past 30 days when their physical health was "not good" due to illness or injury, with no differences based on border county residence.
- Mental health: An estimated 65.2% of the population living in the four-state study region reported no bad mental health days during the past month, with no significant differences between border county residents and others.
- Overweight/obesity: Across the border states, 64.6% of adults were overweight or obese using BMI categories, with no statistical difference between residents of border counties and residents of other counties. Within rural counties alone, however, adults in border counties were more likely to be obese or overweight than residents of other counties (77.2% versus 68.9%, respectively).

*Hispanic - Non-Hispanic Comparisons within Border Counties*

- Physical health: Among border county residents, Hispanic adults were more likely than their non-Hispanic counterparts to report having had no days in the past month during which their health was "not good" (67.2% versus 64.4%).
- Mental health: Hispanic respondents were more likely to report no days in the past 30 during which they felt their mental health was "not good" (68.2% versus 63.3%)

- Overweight/obesity: When limited to just those living in U.S.-Mexico border counties, Hispanic residents were consistently more likely to be overweight or obese compared to their non-Hispanic counterparts (73.5% versus 56.4%).

COVID-19

*Border - Non-Border Comparisons*

- Border counties in Arizona, California, New Mexico, and Texas had a significantly higher COVID-19 mortality rate than non-border counties.
- There were no statistically significant differences between COVID-19 vaccine uptake in border versus non-border counties.

Mortality

*Border - Non-Border Comparisons*

- Life expectancy at birth was slightly higher among border county residents, both in total (81.1 versus 80.4 years) and within both urban and rural counties across the four-state study area.
- Examining mortality across the entire study population yielded varying results. For several disease categories (heart disease, cancer, Alzheimer's disease, cerebrovascular disease, chronic lower respiratory disease), border county mortality rates were lower than in non-border counties. For other conditions, such as diabetes, the opposite held, with border counties showing higher death rates.

American Indian Health

*American Indian - Non-American Indian Comparisons*

- With a life expectancy of 5.5 years less than the overall U.S. population, American Indians/Alaska Native populations continue to face higher death rates, lower health status, and greater health disparities than the general U.S. population.
- COVID-19 significantly affected the American Indian/Alaska Native population both physically and from a mental health perspective. Limited access to healthcare, overcrowded and multigenerational housing, high rates of poverty and chronic disease, and limited access to clean water and grocery stores were some of the issues that contributed to 34% of American Indian/Alaska Native individuals versus 21% of white residents being at risk for severe illness from COVID-19.

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# Introduction

## Purpose of the Chartbook

Health policy and practice in the United States (U.S.) significantly affect the health of Hispanic, American Indian, and other populations along the more than 2,000 miles that comprise the U.S.-Mexico border region. Communities in the region typically experience worse health outcomes related to poorer access to healthcare (U.S.-Mexico Border Health Commission, 2010). Negative health outcomes are also driven by low levels of educational attainment and high levels of poverty and unemployment, especially in rural areas (Rosales et. al., 2016). The 2021 Rural Border Health Chartbook is an update and expansion of a report released in October 2014 by the Rural and Minority Health Research Center at the University of South Carolina (RMHRC, 2014). The 2021 Chartbook updates prior information and presents additional data regarding conditions in the U.S.-Mexico border region, examining potential geographic and ethnic disparities among U.S. border residents.

## Overview of the Border Region

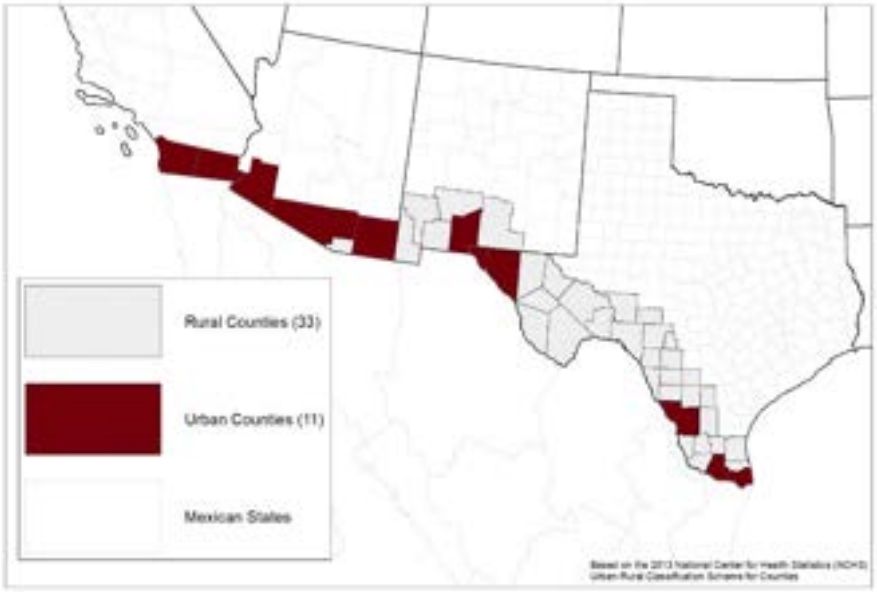
The La Paz Agreement, signed in 1983, defined the U.S.-Mexico border region (HHS, 2017; RHI Hub, 2019), and its main purpose was the "protection and improvement of the environment in the border area" (EPA, 2015). For the purposes of this Chartbook, we define the U.S.-Mexico border region as including 44 counties in the states of Arizona, California, New Mexico, and Texas within 100 kilometers/62 miles of the border, in keeping with the 1983 La Paz Agreement (EPA, 2015). The table below lists the names of the border counties in each state.

Table 1. List of Border Counties

| State | Border County Names | Number of Counties |
|---|---|---|
| **Arizona** | Cochise, Pima, Santa Cruz, and Yuma | 4 |
| **California** | Imperial and San Diego | 2 |
| **New Mexico** | Doña Ana, Grant, Hidalgo, Luna, Otero, and Sierra | 6 |
| **Texas** | Brewster, Brooks, Cameron, Crockett, Culberson, Dimmit, Duval, Edwards, El Paso, Frio, Hidalgo, Hudspeth, Jeff Davis, Jim Hogg, Kenedy, Kinney, La Salle, Maverick, McMullen, Pecos, Presidio, Real, Reeves, Starr, Sutton, Terrell, Uvalde, Val Verde, Webb, Willacy, Zapata, and Zavala | 32 |

Thirty-three of the 44 counties (or 75%) on the U.S.-Mexico border are classified as non-metropolitan (rural) areas. Rurality is defined using the Office of Management and Budget's (OMB) definition from February 2013, called "delineation of metropolitan statistical areas (MSA) and micropolitan statistical areas." For this Chartbook, the term "urban" includes all counties in metropolitan areas, and "rural" encompasses all micropolitan and non-core, non-metropolitan counties. Notably, rural counties accounted for only 5.8% of total population of the border region in 2019.

Figure 1. Map of the Four Border States, Indicating Rural and Urban Border Counties




**Analytic Approach for the Chartbook**

Because a few large urban counties contain most of the border population, data summarized across the total population are heavily influenced by those counties. For this reason, much of the data presented in the Chartbook will be provided as the median county value for the outcome or measure. In this way, the smaller rural counties are included equally in the reporting. For most of the health outcomes and behavioral indicators included, and when data were available, we compare outcomes by rural-urban status of the county and by Hispanic or non-Hispanic identification of county residents. Hispanic ethnicity follows the U.S. Census definition: "Hispanic origin can be viewed as the heritage, nationality, lineage, or country of birth of the person or the person's parents or ancestors before arriving in the United States. People who identify as Hispanic, Latino, or Spanish may be any race."

In addition, the 2021 Chartbook includes information regarding outcomes among tribes in the U.S.-Mexico border region. We also expanded the sources of data and added supplementary social determinants of health. Finally, we include a section describing the impact of COVID-19 on border populations.

Please note that we used statistical testing to determine differences between urban and rural populations, border and non-border counties, and Hispanic and non-Hispanic populations. Throughout the 2021 Chartbook, statistically different values are indicated by bolding and asterisks in charts and figures. Stylistically, the phrase "these groups differ significantly" is not repeated. Rather, two groups are only described as "different" when statistically tested differences are present.

# Population Characteristics

**Race/Ethnicity**

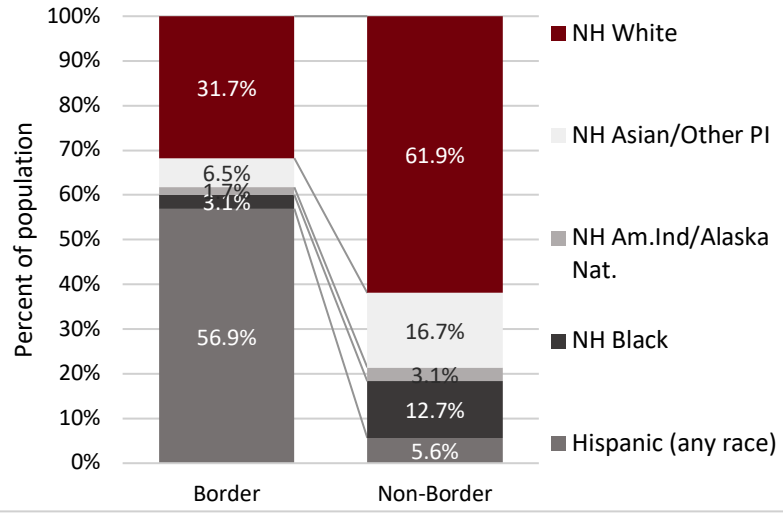
The population of the border region is highly diverse, with representation from multiple racial/ethnic groups. To document this diversity, we first present total population numbers: summaries for all persons living in the region. Next, to illustrate variation across geography, we show median county values for differing population groups across the 44 counties in the border region compared to other counties in those same states.

Overall population

In total, the 44 border counties are home to approximately 8.1 million persons. The two urban border counties in California, Imperial and San Diego, alone account for 43.5% of the total population of the border region. The 32 Texas counties form the next largest population group, contributing 34.5% of the border population. Arizona's four counties constitute 18% of the border population, and New Mexico's six counties contribute 4% of the population.

Persons who identify as Hispanic, of any race, constitute 56.9% of the total border county population versus 5.6% of the total population of non-border counties (see Figure 2, right). Non-Hispanic white residents make up the next largest group, accounting for 31.7% of the total border population versus 61.9% of the non-border population. Residents who characterize their race as non-Hispanic Asian/Other Pacific Islander, Black, or American Indian/Alaska Native are all present but account for smaller proportions of the population in border versus non-border counties. (All differences are statistically significant when measured at the population level. Details of all counties are presented in Appendix B, Table B-1).

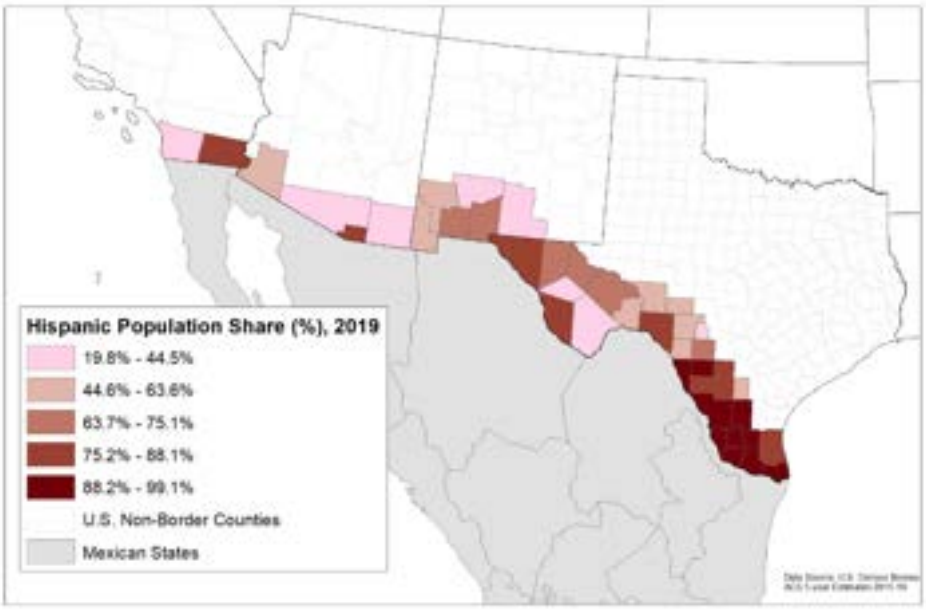
Figure 2. Population Summary by Race/Ethnicity, in Four Border States, by Border Bersus Non-Border County Location (2019 data)



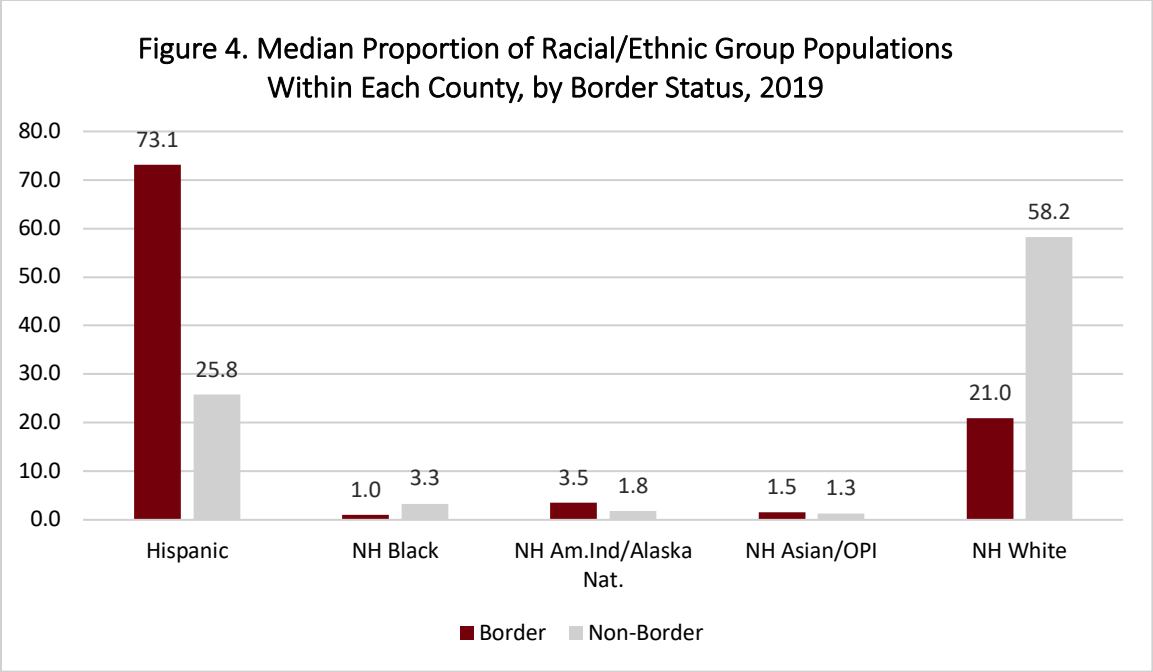
County-level population characteristics

Summary population information does not illustrate local variation in the types of racial/ethnic identities among residents in different areas. Persons identifying as Hispanic are highly represented in selected border counties. For example, nine border counties in Texas each have Hispanic or Latino populations that exceed 90% of the county population. More than 83% of residents in Santa Cruz (Arizona), 85% of those in Imperial County (California), and ~69% of persons living in Doña Ana County (New Mexico) are Hispanic or Latino (Census, 2019).

Figure 3. Hispanic Population Share, Counties in the Four Border States

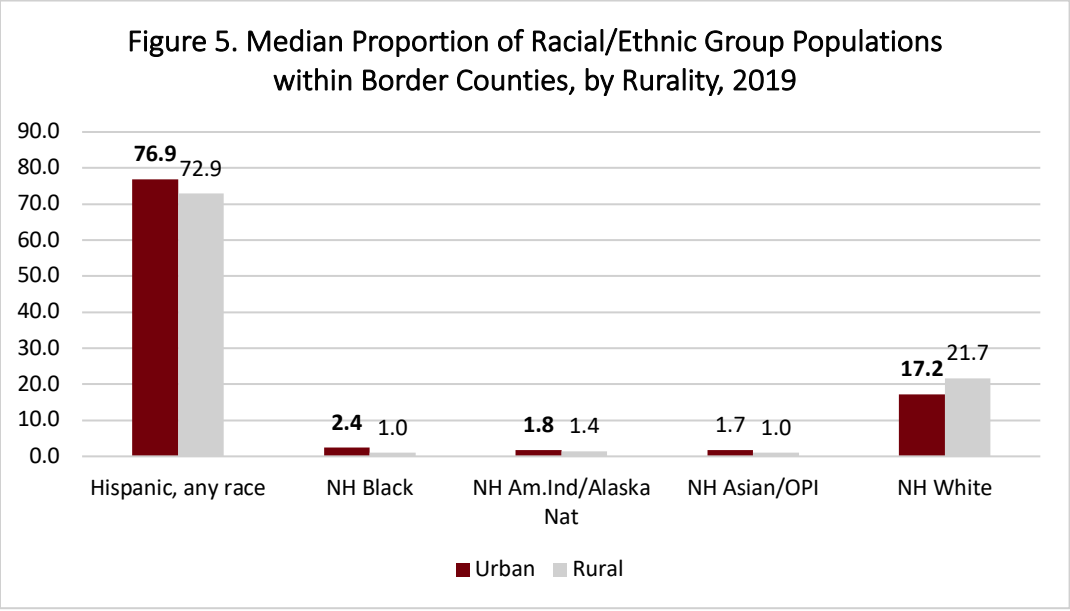


The chart below illustrates county-level racial/ethnic variation across counties in the four border states. Across the 44 border counties, the median proportion of persons identifying as Hispanic, of any race, is 73.1% versus 25.8% in the other 316 counties in those states (p = .001). Conversely, the proportion of persons who report their race/ethnicity to be non-Hispanic white is lower in border counties (21.0%) than in non-border counties (58.2%; p = .001). The median values for the proportion of the population identifying as non-Hispanic Black were higher for non-border counties (3.3%) than for border counties (1.0%; p = .001).



Urban-rural differences in border county racial/ethnic composition

Within the 44 border counties, the proportions of residents of different racial/ethnic identifications within urban and rural counties were generally similar. Hispanic residents, of any race, were the largest group in both rural and urban counties (median 76.9% and 72.9%; n.s.). Non-Hispanic whites were the second largest group, followed by non-Hispanic Black and non-Hispanic American Indian/Alaska Native persons (see details in Figure 5, below). The median value for the proportion of residents identifying as non-Hispanic Asian/Other Pacific Islander (Asian/OPI) was higher in urban border counties, at 1.7%, than in rural border counties, at 1.0% ($p = 0.037$). Across urban border counties, the proportion of residents with non-Hispanic Asian/OPI identification ranged from 13.2% in San Diego County, CA, to 0.7% in Webb County, TX.




In the next sections of the Chartbook, we explore the demographic characteristics of the populations of border and non-border counties.

## Children Living in Poverty

The median county-level percent of children living in poverty was higher for border counties than for non-border counties in the four border states (34.0% versus 24.0%). Within both border and non-border counties, childhood poverty was more common among rural than urban counties.

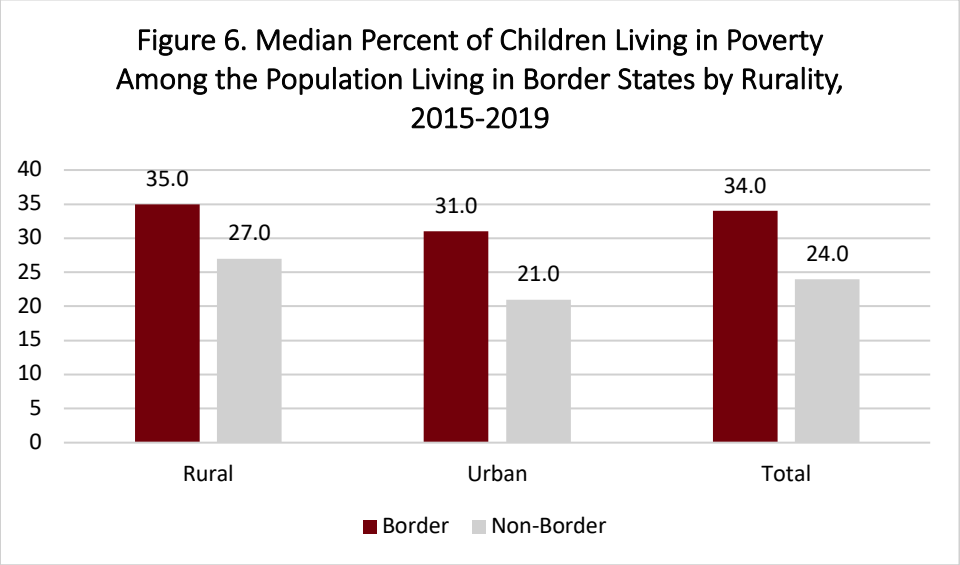
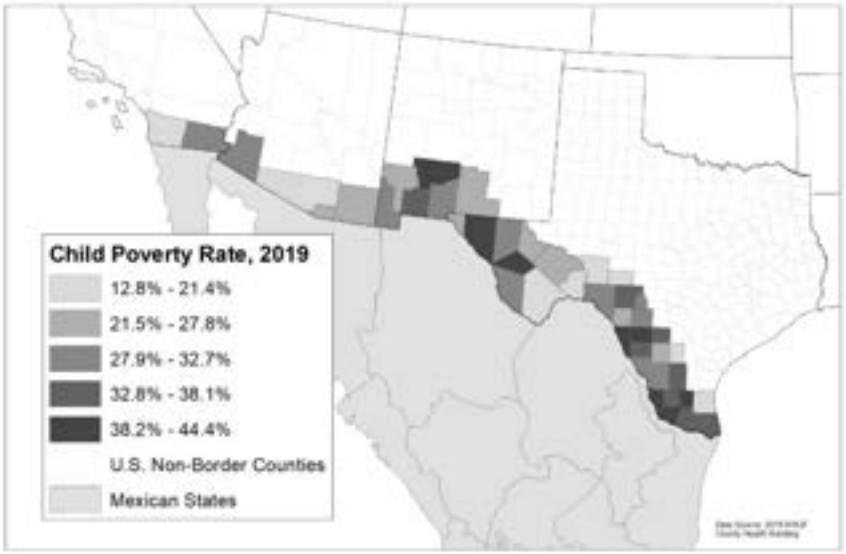



Figure 7. Child Poverty Rates by County, 2019

The map to the right shows the child poverty rate along the border, with darker coloring indicating higher rates of child poverty in a border county in 2019.

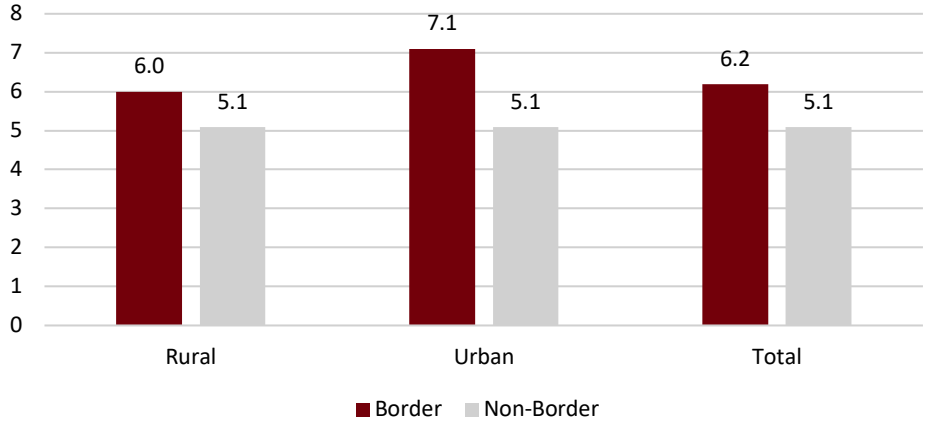



*Data for child poverty extracted from RWJF County Rankings, 2021*

## Employment

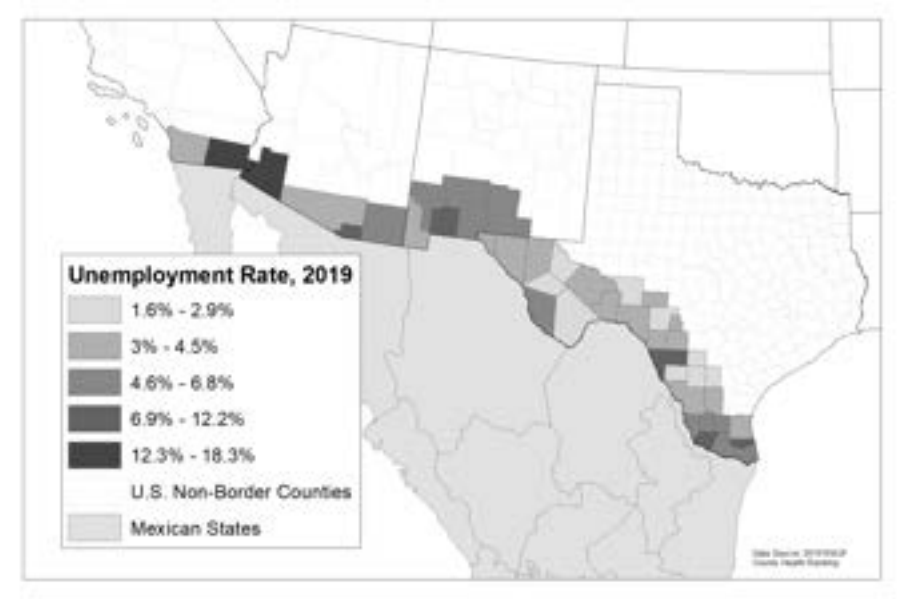
The median unemployment rate was higher among border counties (6.2%) than among non-border counties (5.1%) in the same states. Within border counties, the median percent of adults who reported being unemployed was higher in urban border areas than rural border areas (7.1% versus 6.0%). No rural-urban difference was seen for non-border counties.

Figure 8. Median County Percent of Adults Living in Border States Who Are Unemployed, by Rurality, 2019




The unemployment rate varied widely across border counties, however, as indicated in the map below.

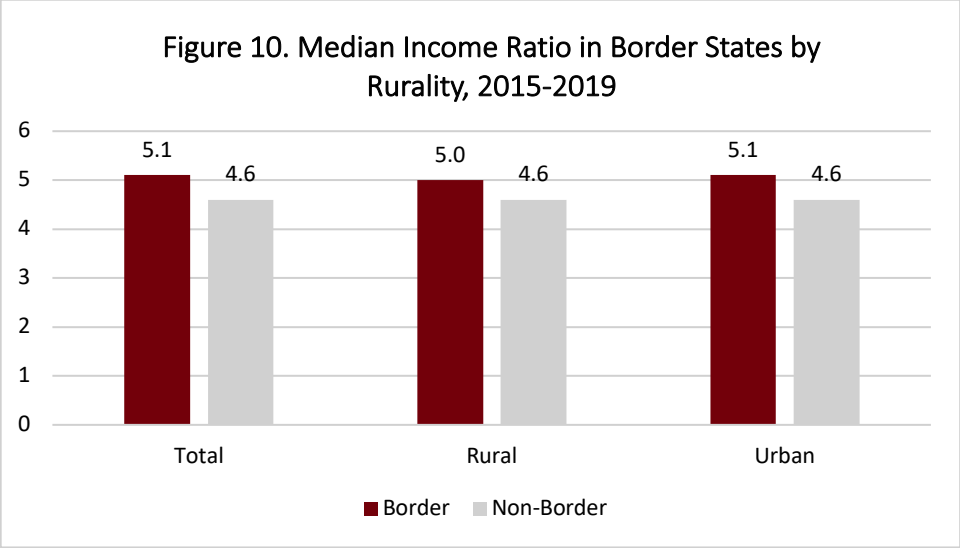
Figure 9. Unemployment Rate by County, 2019




*Data for unemployment from the Bureau of Labor Statistics, 2019 extracted from RWJF County Rankings, 2021*

## Income Inequality

Beyond individual or household income, income inequality within a community can have a broad-ranging impact on health, with greater inequality being associated with poorer health and health-related outcomes. Using the Robert Wood Johnson Foundation's (RWJF) income inequality metric, the chart below shows the median ratio of the income level representing the 80$^{th}$ percentile for household income divided by the income level representing the 20$^{th}$ percentile for household income. A larger ratio indicates greater income inequality. These numbers show that border counties had significantly greater median values of income inequality than non-border counties in both rural and urban areas ($p < .001$).



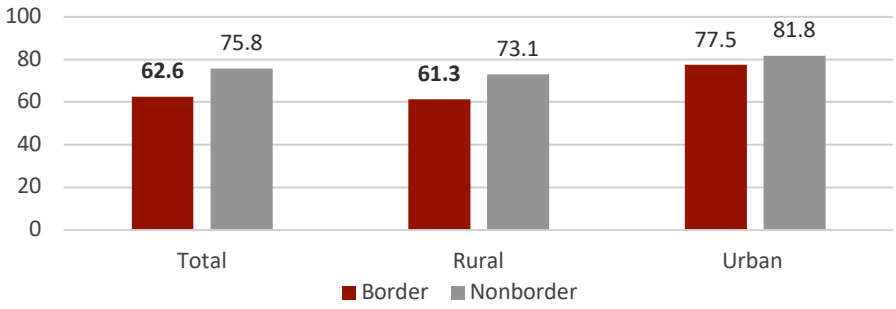

*Data for income inequality based on the American Community Survey 5-year estimates, 2015-2-19, extracted from RWJF County Rankings, 2021*

# Physical Environment Characteristics

## Broadband Access

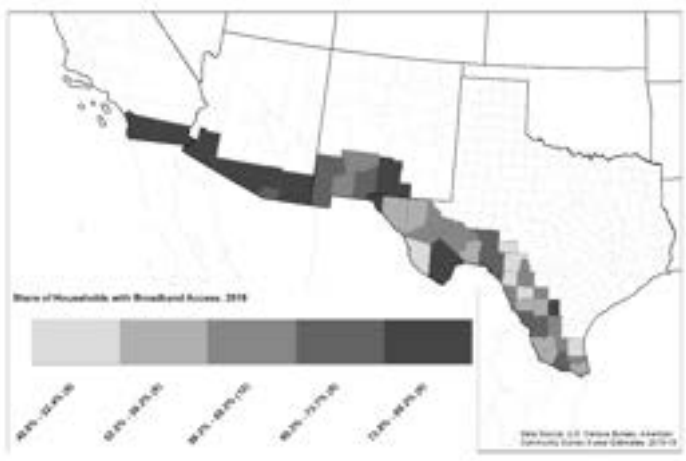
A lower percentage of households in border counties (62.6%) reported broadband internet access than in non-border counties (74.5%; Figure 11). Within urban counties, border and non-border county median broadband rates did not differ statistically. Within rural counties in the four states, however, border counties had lower proportions of households with broadband access than did non-border counties. Overall, rural border counties had the lowest median rates of broadband access (61.3%), while non-border urban counties had the highest broadband access rates (81.8%).

Figure 11. Median county percent of households with broadband access, by border status and rurality




Broadband access varied across the border region, from a high of 90.2% of households to a low of 45.9%.

Figure 12. Broadband Access Across Border Counties

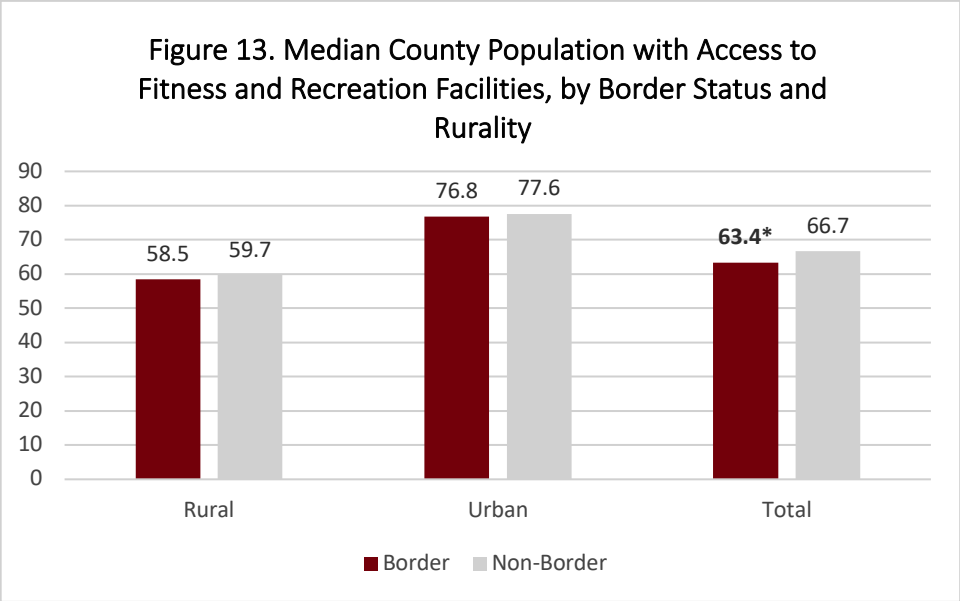


*Data for broadband access extracted from RWJ County Health Rankings 2021*

## Fitness and Recreation Facilities

Participation in non-occupational physical activity is facilitated by the presence of recreational facilities, such as parks, gyms, or community centers. The RWJF County Health Rankings dataset compiles information from multiple sources to estimate the proportion of persons who live in a census block within a half mile of a park, an urban census block within one mile of a recreational facility, or a rural census block within three miles of a recreational facility.

A lower median percent of residents of border counties lived near a park or other recreational facility (e.g., gyms, community centers) than residents of non-border counties (63.4% vs. 66.7%). Within rural or urban counties, the median proportion of residents with access to recreational facilities was similar for border and non-border counties. Rurality reduced access to recreational facilities, with lower median levels of access in rural than urban counties.

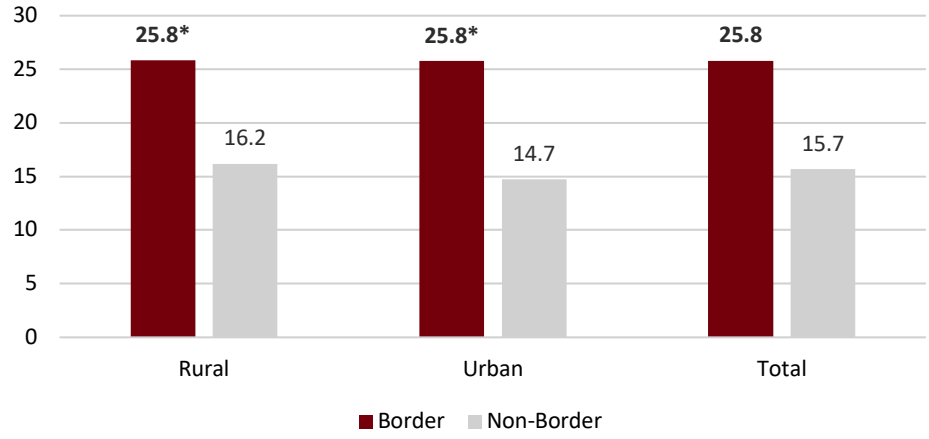



*Data for fitness and recreation facilities extracted from RWJF County Health Rankings, 2021*

**Food Assistance - Supplemental Nutrition Assistance Program (SNAP)**

The median proportion of the county population receiving Supplemental Nutrition Assistance (SNAP) support for the purchase of food was higher in border counties than in non-border counties (25.8% versus 15.7%; $p < .001$). Higher participation in SNAP was observed in both rural and urban border counties (see Figure 14, below).

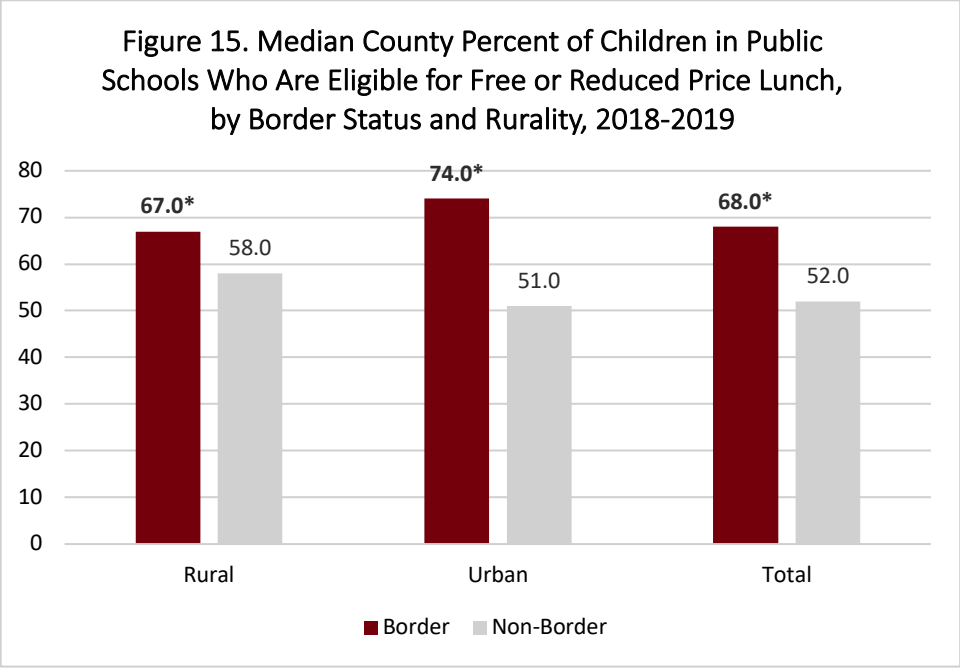
Figure 14. Median Proportion of County Population Receiving SNAP Assistance, by Border Status and Rurality




*Data for Supplemental Nutrition Assistance Program pertains to 2017; extracted from USDA Food Environment Atlas, 2020*

## Children Eligible for Free or Reduced-Price Lunch

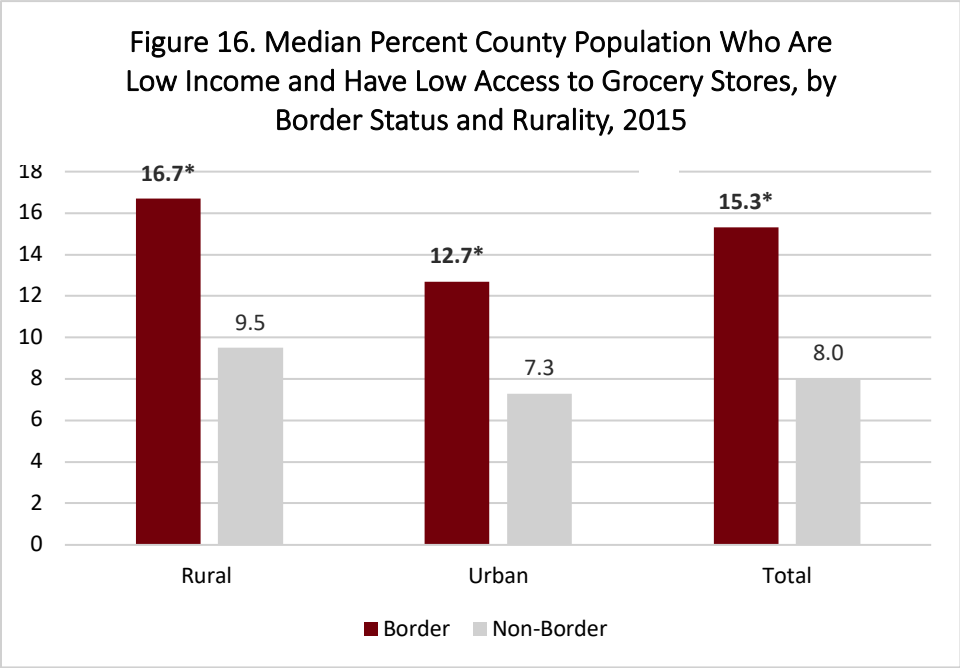
Considering only those children enrolled in public schools, border counties had a higher median percentage of children eligible for free or reduced-price lunch through the National School Lunch Program than did non-border counties (68.0% versus 52.0%; $p < .001$). This pattern was evident in both rural and urban areas, although the difference was greater within urban areas.




*Data for free and reduced lunch comes from the National Center for Education Statistics, years 2018-2019; extracted from RWJF County Health Rankings, 2021*

### Access to Grocery Stores in the Low-Income Population

Lack of a grocery store close to home can be more important for low-income persons than others, as they may find it more difficult to find foods that qualify for SNAP assistance benefits and proportionately more expensive to travel to full-service groceries. Thus, the proportion of persons who are both low-income and lack convenient access to a grocery store affects health outcomes. The median percent of persons who were both low-income and experienced low access to grocery stores was significantly higher in border counties than in non-border counties (15.3% versus 8.0%; $p < .001$). This disadvantage was present within both urban and rural counties in the four border states.




*Data for the population that is both low income and with low grocery access, extracted from USDA Food Environment Atlas, 2020*

## Food Environment Index

The Food Environment Index used by the RWJF County Health Rankings program combines two community descriptors: the percentage of low-income residents who do not live close to a supermarket or large grocery store (defined as less than one mile in urban areas and less than 10 miles in rural areas) and the percentage of all residents who experienced food insecurity in the past year. Higher values on the Index represent a better food environment; the national median value for all U.S. counties was 7.6.

There were no overall differences in Food Environment Index score between border and non-border counties overall or between border and non-border counties within rural areas. Within urban counties, however, non-border counties had better Food Environment Index scores than border counties (7.2 versus 6.9; $p < .001$).

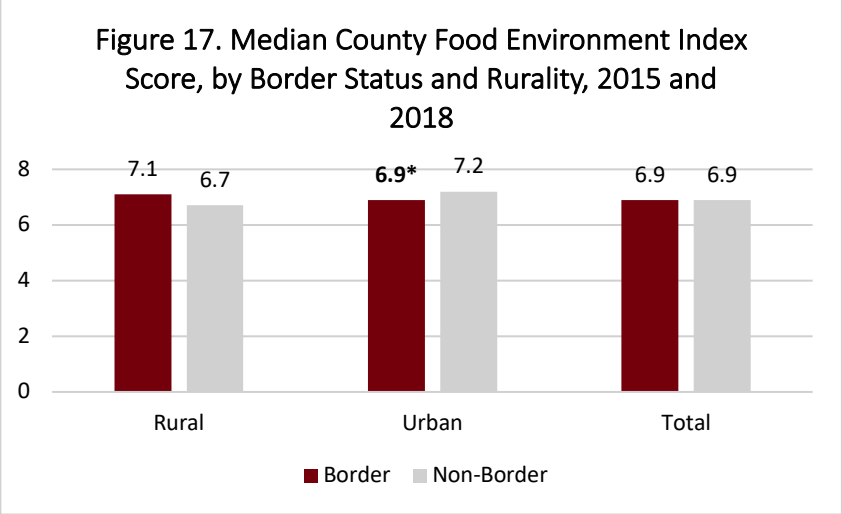
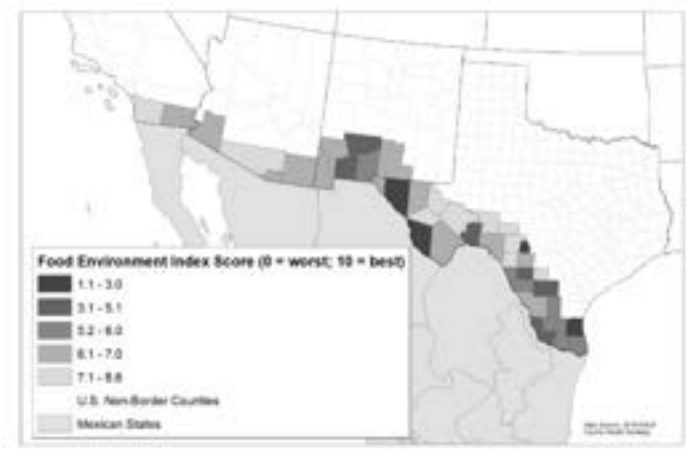



Figure 18. Food Environment Index Scores, by County



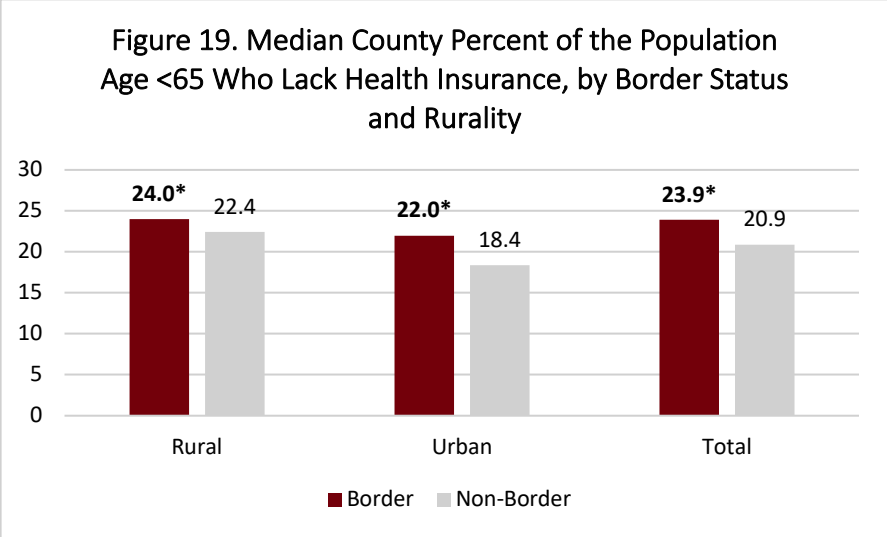

*The food environment index combines data from 2015 and 2018; extracted from RWJF County Health Rankings, 2021*

# Access to Care

***Potential Access***

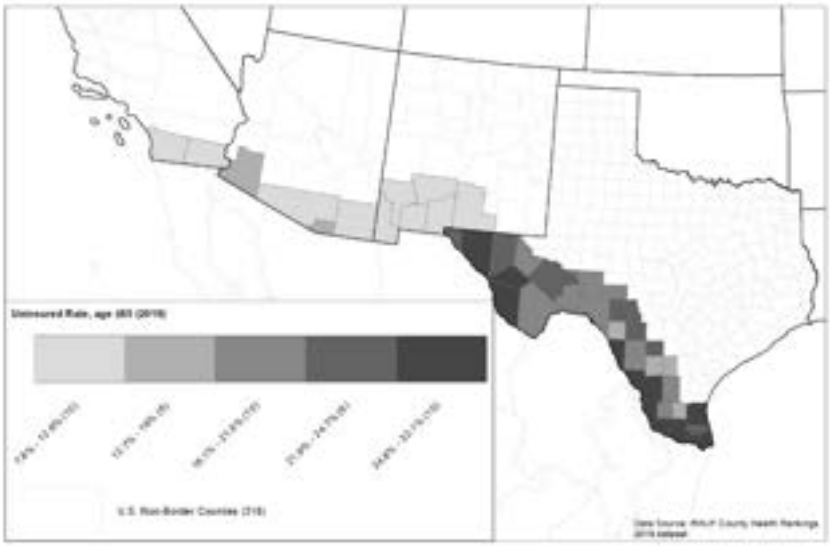
**Health Insurance**

In 2018, the proportion of the population age <65 years who lacked health insurance was higher in border counties than in non-border counties (23.9% versus 20.9%). This pattern was present within both rural and urban counties, as illustrated in Figure 19, right.




It should be noted that uninsured rates were highest in Texas, the only border state that did not expand Medicaid after the passage of the Affordable Care Act (ACA) in 2010.

Figure 20. Proportion of Persons Age Less than 65 Who Are Uninsured, by County

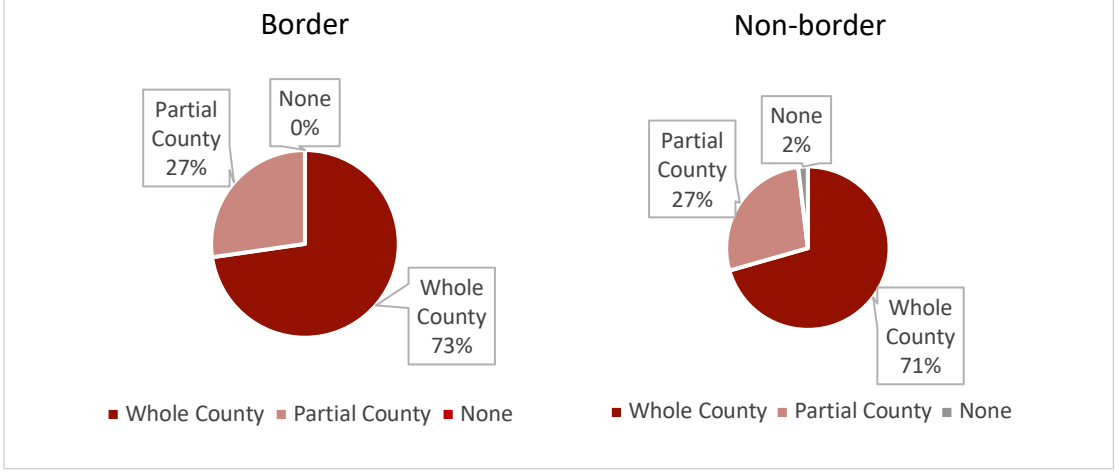


*Data for health insurance derived from RWJF County Health Rankings, 2021*

**Primary Healthcare Professional Shortage Area**

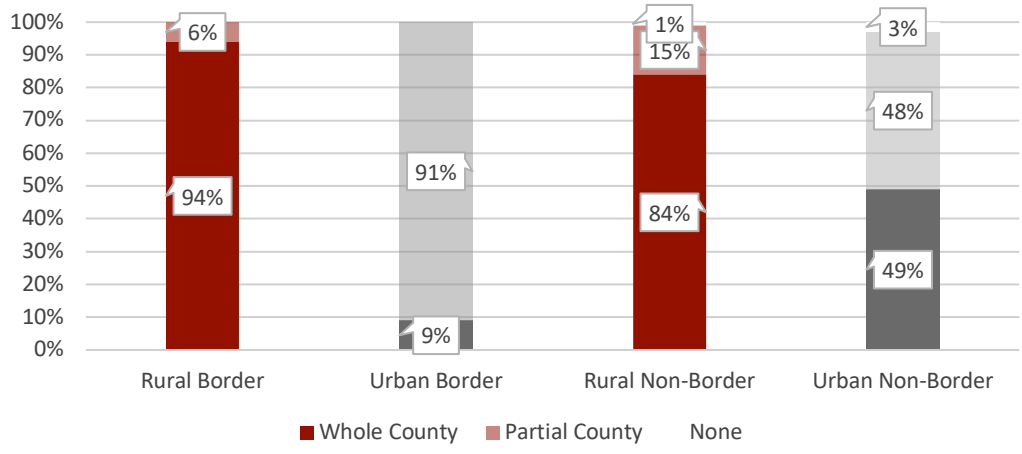
All border counties were either whole- or partial-county HPSAs for primary care (criteria for primary care HPSAs are provided in Appendix A). The proportion of whole and partial primary care HSPAs was similar across both border and non-border counties, with 73% of border counties and 71% of other counties experiencing these shortfalls, and 27% of both being partial county HPSAs (see Figure 21, below).

Figure 21. Primary Care Health Professional Shortage Area Status, by Border Location, 2022




Overall, rural counties were more likely to be whole-county HPSAs (85.5%) than were urban counties (45.5%; $p < .001$). Within urban counties alone, border counties were less likely than non-border counties to have whole-county primary care HPSA status (9.1% versus 48.5%) and correspondingly more likely to have partial HPSA status (90.9% versus 47.9%; overall $p = .024$). Within rural counties alone, border and other counties did not differ.

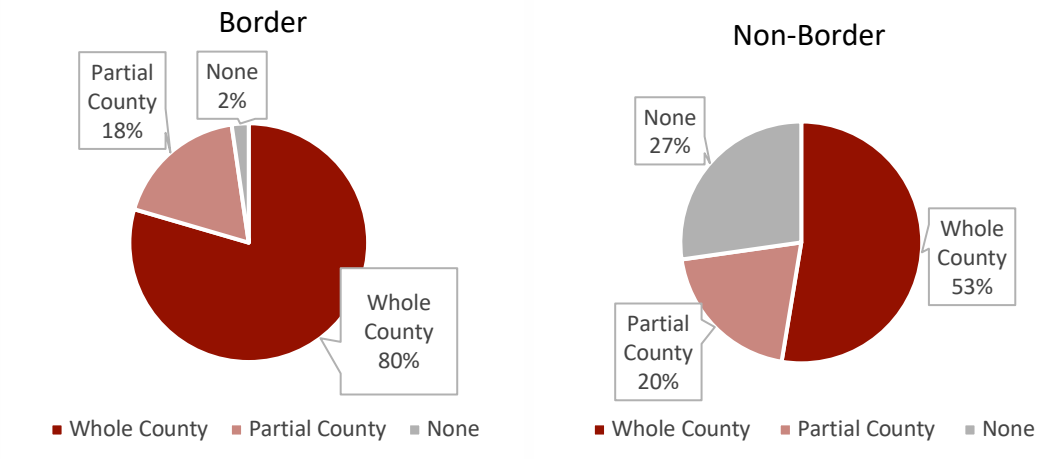
Figure 22. County Primary Care HPSA Status, by Border Versus Non-Border Location and rurality, 2022



### Dental Care Health Professional Shortage Area Status

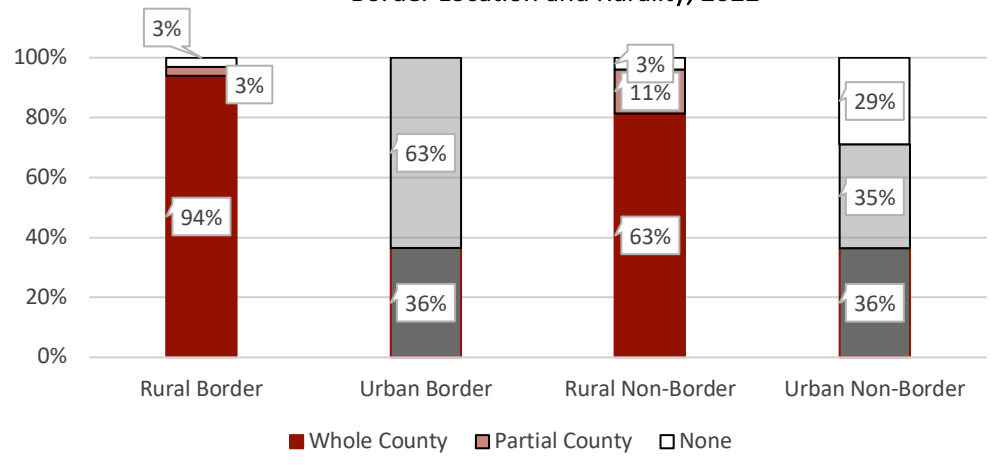
Border counties were more likely than other counties in the border states to be whole- or partial-county shortage areas for dental care (see Appendix A for definitions). Only one border county had no shortage indicator for dental care (2.3%), versus 27.2% among non-border counties (p = .001). Conversely, 79.6% of border counties, versus 52.5% of other counties, were whole-county dental care HPSAs.

Figure 23. Dental Care Health Professional Shortage Area Status, by Border Location, 2022




Across the border states, rural counties were more likely than urban counties to be whole-county HPSAs for dental care (67.1% versus 36.4%; p = .001). Within urban counties alone, border and non-border counties did not differ statistically (see Figure 24, below). Within rural counties, however, rural border counties were more likely to be whole-county dental care HPSAs than were other rural counties (93.9% versus 62.6%; p = .002).

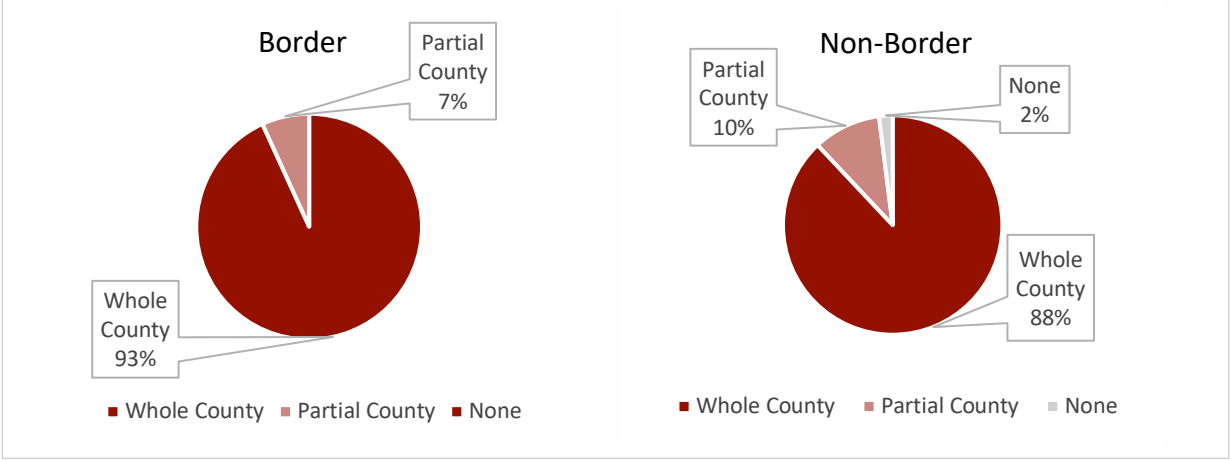
Figure 24. County Dental Care HPSA Status, by Border Versus Non-Border Location and Rurality, 2022



### Mental Health Professional Shortage Area Status

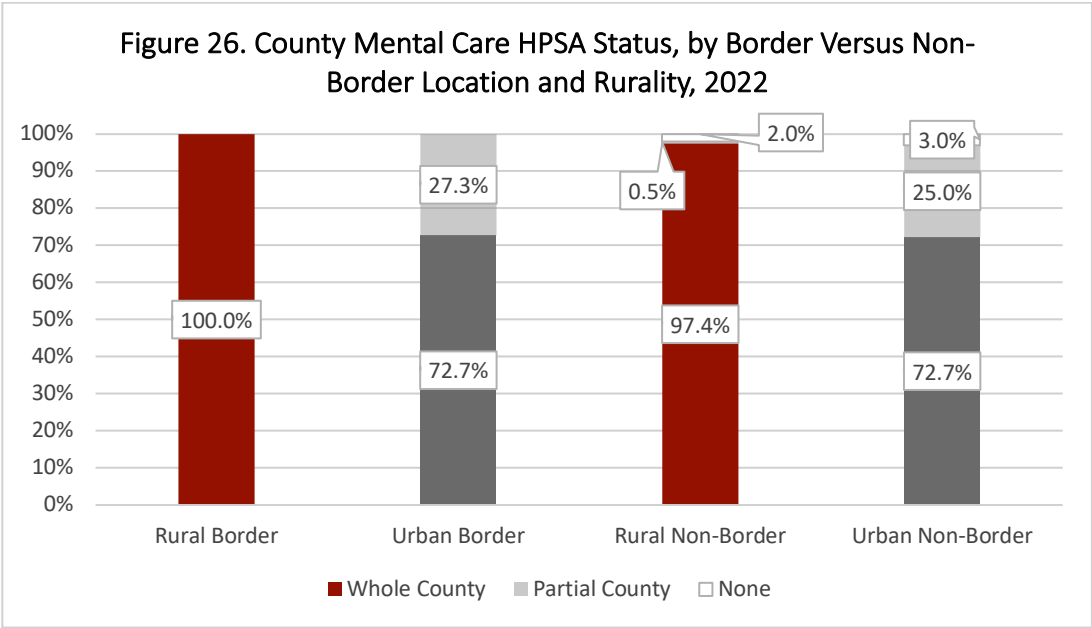
The majority of border counties were either whole-county (93.2%) or partial-county (6.8%) HPSAs for mental health care (see definitions in Appendix A). Border counties did not differ statistically from non-border counties (see Figure 25, below).

Figure 25. County Mental Healthcare HPSA Status, by Border Location, 2022




All rural counties were more likely than urban counties to be whole-county mental health HPSAs, both within border counties only ($p = .002$) and in non-border counties ($p < .001$).

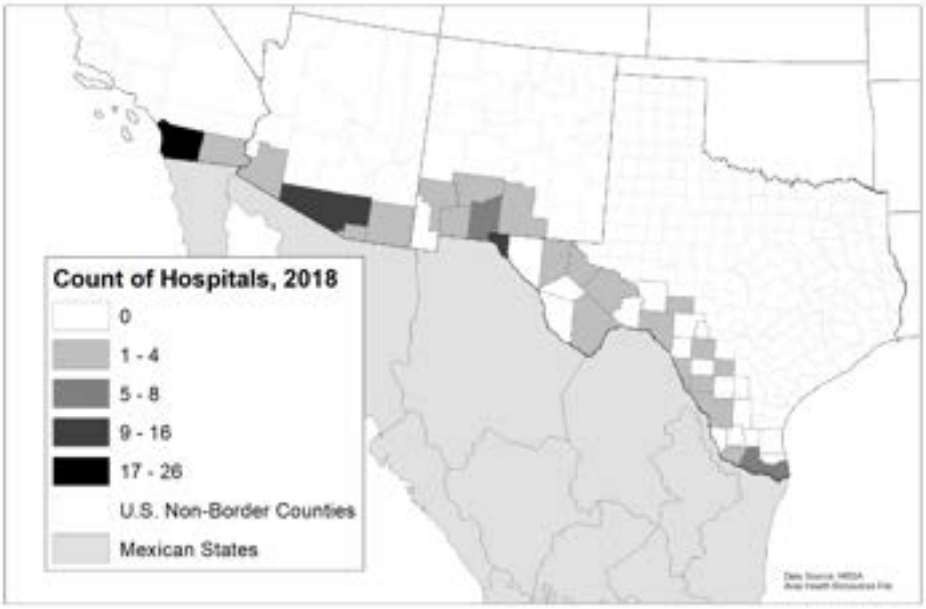
Figure 26. County Mental Care HPSA Status, by Border Versus Non-Border Location and Rurality, 2022



## Hospital Availability

Across the border states, 40.9% of border counties lacked any hospital in 2018, versus 21.4% of non-border counties in the same states (p = .005). Within border counties, rural counties were more likely not to have a hospital than were urban counties (53.1% versus 8.3%, p = .007). Urban border county hospital numbers ranged from 19 hospitals in San Diego, CA through none (0) in Hudspeth County, TX. Across rural border counties, 17 (53.1%) had no hospital, 13 counties (40.1% had one hospital, and two rural counties each had 2 hospitals (6.3%)

Figure 27. Hospital Count by County, 2018

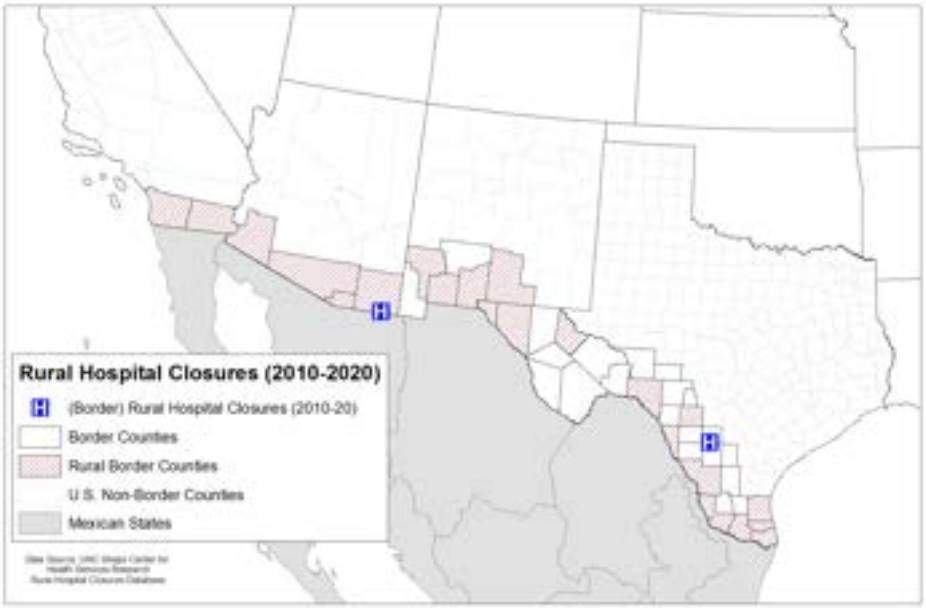



*Data for hospital availability extracted from CDC Interactive Atlas of Heart Disease and Stroke, health care delivery section*

## Hospital Closures

Rural hospital closures potentially exacerbate rural-urban differences in healthcare capacity within the border region. According to data compiled by the Sheps Center for Health Services Research at the University of North Carolina, two counties in the border region experienced rural hospital closures between 2010 and 2020. The first closure, a 25-bed critical access hospital, Cochise Regional Hospital (Cochise County, AZ), closed in 2015. This closure resulted in Cochise County residents having to seek care 10 miles across the border in Mexico or 30 miles away in Tucson, AZ. The second rural hospital closure in this region was the 18-bed Nix Community Hospital in Dilley, TX (Frio County), which closed in 2016. Residents in Frio County now must travel up to 27 miles to access the nearest short-term acute care hospital. Both hospitals were "complete" closures, in that the building was not converted to other health care uses.

Figure 28. Hospital Closures, 2010 – 2020, by County

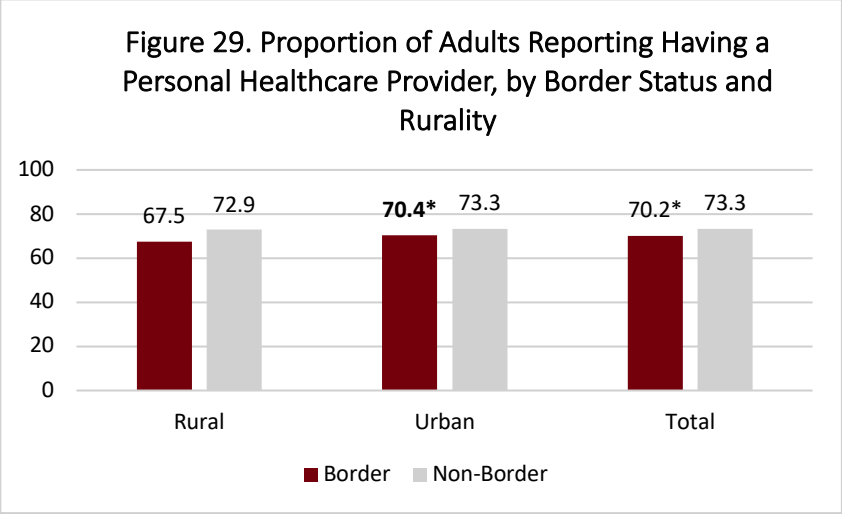



*Data for hospital closures extracted from UNC Sheps Center, 2021*

## ***Realized Access***

### Usual Source of Care

Most adults in the border region, 73.0%, reported having one or more persons whom they considered their personal doctor or healthcare provider. However, this value was lower among residents in border counties compared to others (70.2% versus 73.3%; $p < .001$). Within urban counties, 70.4% of border county residents, versus 73.3% of those in other counties, reported having a personal provider ($p < .001$). Across rural counties in the four border states, 72.5% reported having a usual care provider, with no significant difference between residents of rural border counties versus other rural counties.




Across border counties, 61.3% of Hispanic adults, versus 79.5% of other adults, reported having one or more individuals whom they considered their personal healthcare provider ($p < .001$). Disparities between Hispanic and non-Hispanic residents were found among adults in both urban and rural counties.

Table 2. Percent of Border County Adults Reporting A Usual Source of Healthcare by Rurality and Ethnicity, BRFSS 2015-2019

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 70.2 | 61.3 | 79.5 | .000 |
| Rural | 67.5 | 63.4 | 79.0 | .001 |
| Urban | 70.4 | 61.1 | 79.5 | .000 |
| p-value for rurality | ns | ns | ns | |

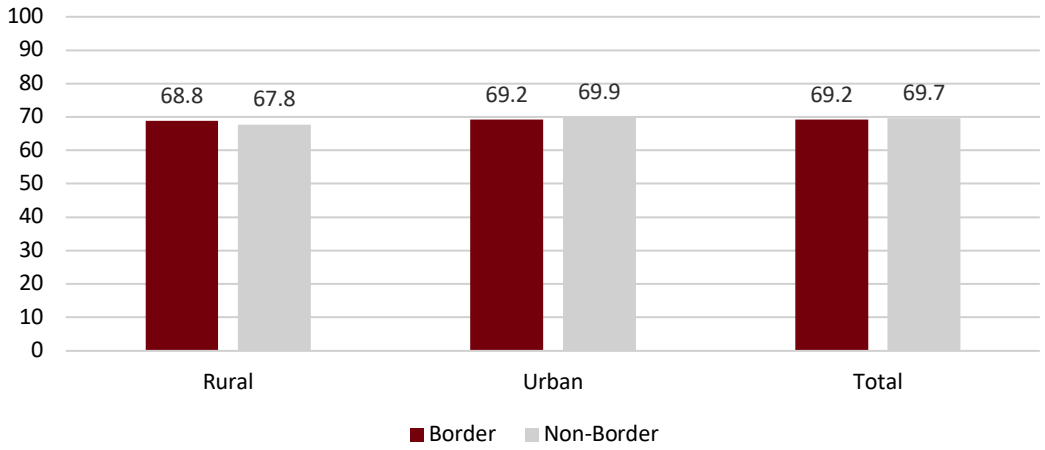
Responses to the BRFSS questions, "Do you have one person you think of as your personal doctor or health care provider?" and "Is there more than one person who you think of as your personal doctor or health care provider?
"ns" indicates that the comparison is not statistically significant.

*Data for usual source of care extracted from BRFSS, Border States only, 2015-2019*

## Routine Medical Checkup

Similar proportions of border and non-border adults reported having a routine checkup in the past year. Overall, 69.7% of adults reported such a visit, with nearly identical values for border county residents (69.2%) and residents of other counties (69.7%). Similarly, there were no statistical differences in the proportion of residents who had a routine checkup during the past year within either urban or rural border counties. In non-border counties, rural residents were slightly less likely to report having a checkup in the past year than urban residents (67.8% versus 69.9%; p = .003).

Figure 30. Proportion of Adults Who Reported a Routine Medical Checkup Within the Past Year, by Border Status and Rurality




Within border counties, Hispanic residents were less likely to report having visited a provider within the past 12 months than their non-Hispanic counterparts, both overall (65.9% versus 72.5%; p < .001) and within urban counties (65.7% versus 72.6%; p < .001). Within rural counties, Hispanic and non-Hispanic adults did not differ significantly (see Table 3, below).

Table 3. Percent of Border County Adults Who Reported a Doctor Visit During the Past 12 Months by Rurality and Ethnicity, 2015-2019

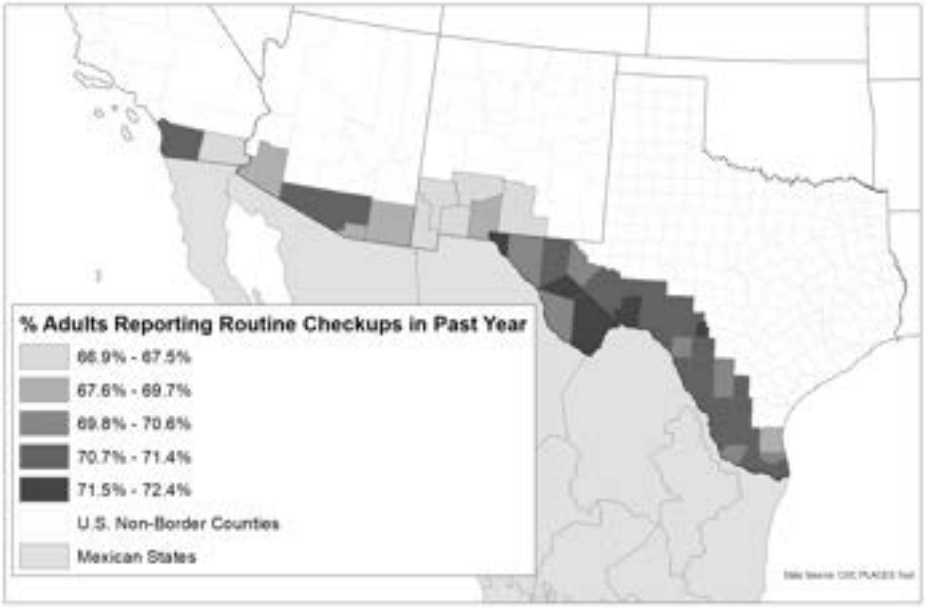
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 69.2 | 65.9 | 72.5 | .000 |
| Rural | 68.8 | 68.2 | 70.5 | ns |
| Urban | 69.2 | 65.7 | 72.6 | .000 |
| p-value for rurality | ns | ns | ns | |

Responses to the BRFSS question, "About how long has it been since you last visited a doctor for a routine checkup? [A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.]?"
"ns" indicates that the comparison is not statistically significant.

*Data for routine checkups extracted from BRFSS, Border States only, 2015-2019*

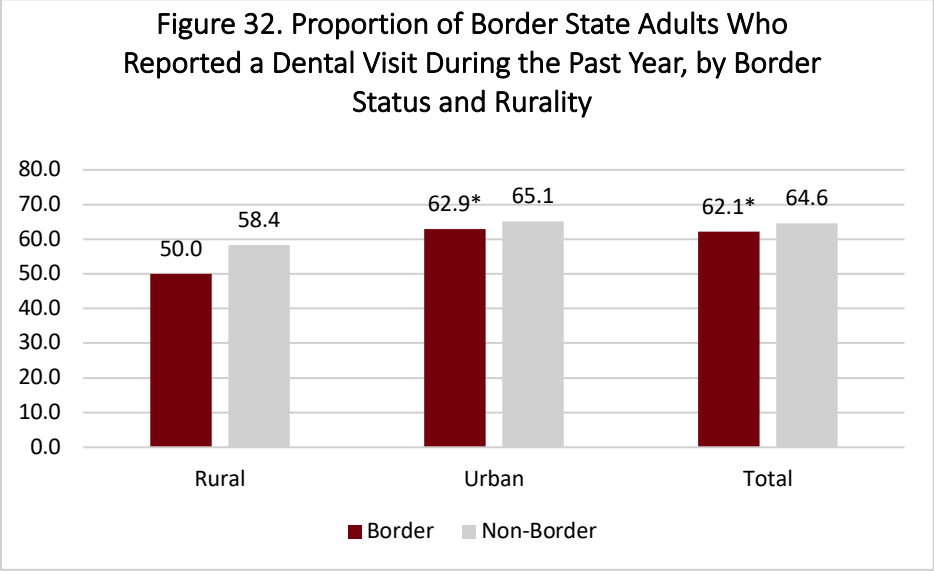
Based on estimates provided in the CDC PLACES dataset, all border counties in New Mexico except one belonged to the group with the lowest reported rates of personal provider visits, whereas most counties in Texas had rates in the top two groups for this variable (see Map).

Figure 31. County-Level Estimates of the Proportion of Adults with Routine Checkups During the Past Year (source: CDC PLACES)



## Dental Visits

Across the four border states, 64.3% of adults reported that they had visited a dentist during the past year, with border residents being less likely to have seen a dentist than non-border residents (62.1% versus 64.6%; p = .008). Within urban counties, 62.9% of border adults, versus 65.1% of adults in other counties, reported this care (p = .023). Within rural counties, however, border and non-border residents did not differ significantly. Overall, rural border residents were less likely to have made a dental visit in the past year than urban border residents (50.0% versus 62.9%; p = .004).




Overall, Hispanic adults living in border counties were less likely than other adults to report having seen a dentist in the past year (54.1% versus 70.4%; p < .001). Rural residents were disadvantaged in dental visits, regardless of Hispanic identification. The lowest visit rates were reported by rural Hispanic residents (48.1%), whereas urban non-Hispanic respondents had the highest visit rates (70.9%). Disparities based on rural residence were significant for non-Hispanic adults (55.4% versus 70.9%; p = .006).

Table 4. Percent of Border County Adults Who Reported a Dental Health Visit During the Past Year, by Rurality and Ethnicity

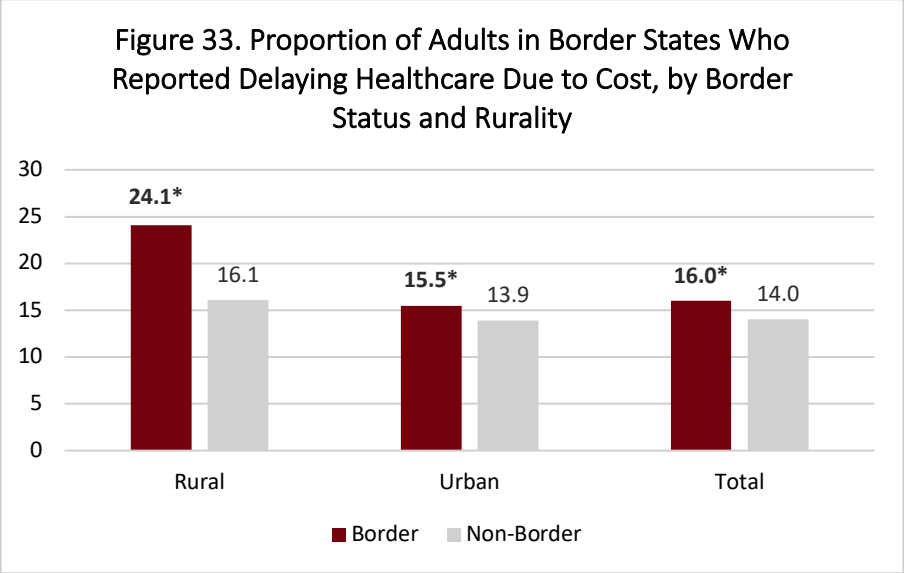
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 62.1 | 54.1 | 70.4 | .000 |
| Rural | 50.0 | 48.1 | 55.4 | ns |
| Urban | 62.9 | 54.7 | 70.9 | .000 |
| p-value for rurality | .000 | ns | .006 | |

Responses to the BRFSS question, "How long has it been since you last visited a Dentist or Dental clinic for any reason?" Adults who have visited a dentist, dental hygienist, or dental clinic within the past year.
"ns" indicates that the comparison is not statistically significant.

*Data for dental visits extracted from BRFSS, Border States only, 2016, 2018*

## Delayed Healthcare

An estimated 14.2% of adults residing in the border region reported delaying healthcare because of cost. Residents of border counties were more likely than their non-border counterparts to report delaying care (16.0% versus 14.0%; $p < .001$), a pattern that was present within both urban and rural counties. Thus, 15.5% of adults in urban border counties, versus 13.9% of those in other urban counties, reported delaying care ($p < .001$). Rural disparities were particularly pronounced, with 24.1% of adults in rural border counties, versus 16.1% of those in other counties, reporting delayed care ($p = .001$)




Among residents of border counties, a higher proportion of Hispanic adults reported delayed healthcare use than did other adults (22.5% versus 9.3%; $p < .001$; see Table 5, below). Hispanic residents had high rates of delayed care in both rural and urban counties. Among non-Hispanic border residents, rural respondents were more likely than their urban peers to report delayed care (18.0% versus 9.0%; $p = .001$).

Table 5. Percent of Border County Adults Who Had Delayed Healthcare by Rurality and Ethnicity

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 16.0 | 22.5 | 9.3 | .000 |
| Rural | 24.3 | 26.3 | 18.0 | ns |
| Urban | 15.5 | 22.2 | 9.0 | . 000 |
| p-value for rurality | .000 | ns | .001 | |

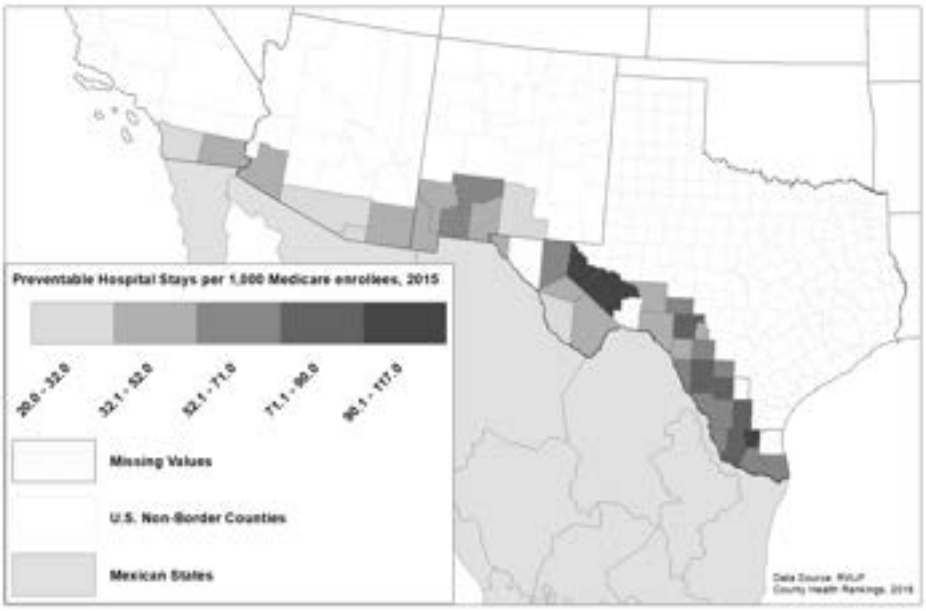
Responses to the BRFSS question, "Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?"
"ns" indicates that the comparison is not statistically significant.

*Data for delayed healthcare extracted from BRFSS, Border States only, 2015-2019*

## Preventable Hospitalization

In 2015, preventable hospitalizations, defined as avoidable hospitalizations for conditions that can be managed through timely primary and preventive care, such as asthma, diabetes, and chronic obstructive pulmonary disease (McDermott and Jiang, 2017), were higher among Medicare beneficiaries in rural counties compared with urban counties, and this pattern was consistent within border and non-border counties. Among all counties in the four states, the number of preventable hospital stays (hospital stays for ambulatory care-sensitive conditions) ranged from 18 to 128 per 1,000 Medicare beneficiaries for rural counties and 20 to 100 per 1,000 for urban counties.

Figure 34. Preventable Hospital Stays per 1,000 Medicare Enrollees, 2015

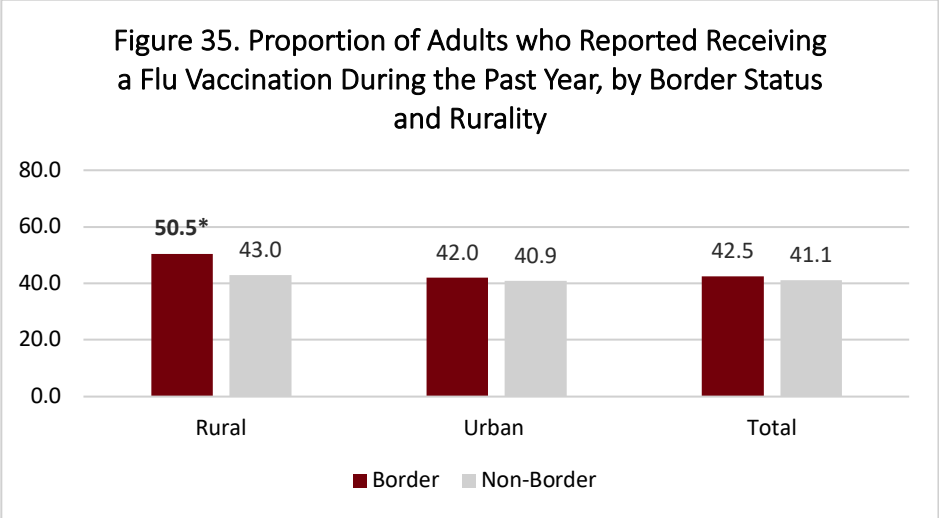



*Data for preventable hospitals extracted from RWJF County Health Rankings, 2021*

# Preventive Services Use

## Flu Vaccination

Overall, 41.2% of adults in the four border states reported receiving a flu vaccination, either injected or inhaled, during the previous year, with no statistical differences based on border residence. The same pattern was present among urban counties in the border states, where an average of 42.0% of adults reported receiving the flu vaccine. Within rural counties, border residents were more likely than their non-border counterparts to report receiving a flu vaccination (50.5% versus 43.0%; p = .016).




Within urban border counties, persons identifying as Hispanic were less likely to report receiving a flu vaccination than their non-Hispanic peers (38.7% versus 45.1%; p < .001). Ethnicity-based differences were not found within rural border counties. However, Hispanic adults in rural counties were more likely to report having been vaccinated than urban adults (50.6% versus 38.7%; p = 0.004; see Table 6, below).

Table 6. Percent of Border County Adults Who Have Had the Flu Vaccination by Rurality and Ethnicity

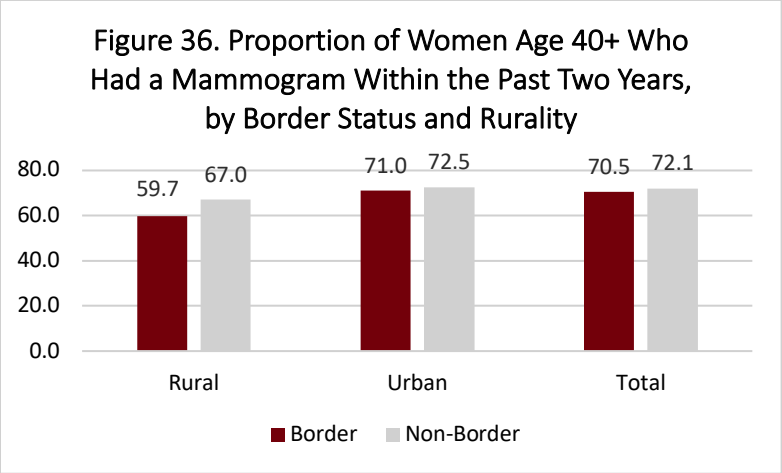
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 42.5 | 39.8 | 45.3 | .000 |
| Rural | 50.5 | 50.6 | 50.4 | ns |
| Urban | 42.0 | 38.7 | 45.1 | .000 |
| p-value for rurality | .008 | .004 | ns | |

Responses to the BRFSS questions, "Have you had either flu vaccine that was sprayed in your nose or flu shot injected into your arm?"
"ns" indicates that the comparison is not statistically significant.

*Data for flu vaccination extracted from BRFSS, Border States only, 2015-2019*

## Mammogram

Across the border states, 71.9% of women aged 40 and older reported having a mammogram during the past two years, with no difference based on border residence. Similarly, 72.3% of urban women in border states reported a timely mammogram, with no difference between residents of border and non-border counties. Within rural counties, variations between women residing in border counties versus other counties were not statistically significant. However, rural border residents were less likely than urban border residents to report having received an age-appropriate mammogram in the previous two years (59.7% versus 71.0%; p =.018).




Rural and Hispanic disparities within border counties were marked. Across all counties in border states, rural women were less likely than their urban peers to report receipt of a mammogram (59.7% versus 71.0%; p = .018). Within Hispanic women, this contrast was even greater, with only 48.1% of Hispanic women in rural border counties reporting an age-appropriate mammogram within the past two years compared to 82.2% of their non-Hispanic peers (p < .001).

Table 7. Percent of Border County Women 40 and Older Reporting a Mammogram in the Past Two Years, by Ethnicity and Residence

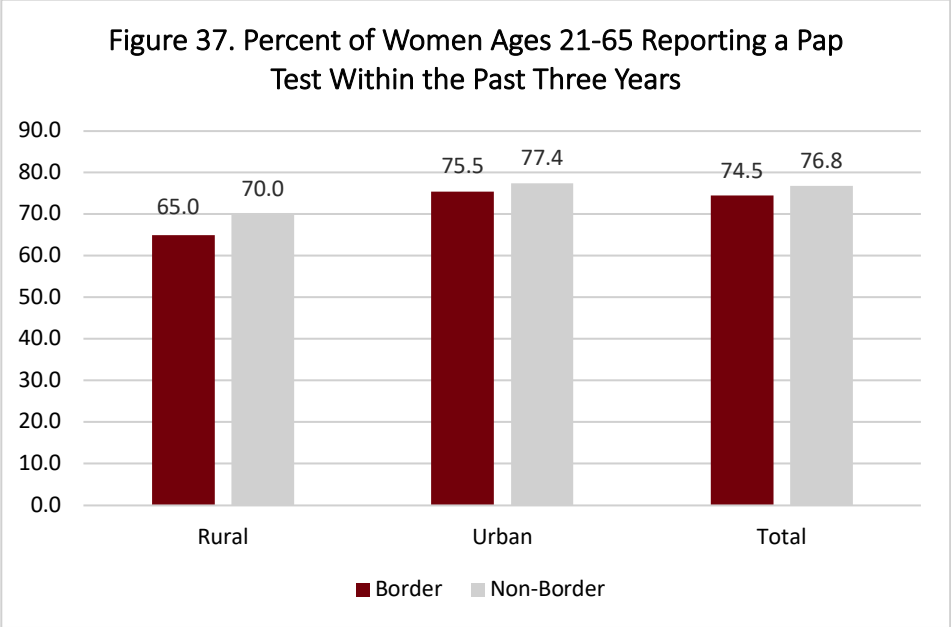
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 70.5 | 71.0 | 69.7 | ns |
| Rural | 59.7 | 48.1 | 82.2 | .000 |
| Urban | 71.0 | 71.6 | 70.7 | ns |
| p-value for rurality | .018 | .002 | .032 | |

Variable calculated by the states based on two BRFSS questions" ,"Have you ever had a mammogram" and "How long has it been since your last mammogram?" These questions were only present for the year 2016 & 2018
"ns" indicates that the comparison is not statistically significant.

*Data for mammogram use extracted from BRFSS, Border States only, 2016 & 2018*

## Cervical Cancer Screening

A majority of women aged 21-65 in the four-state region reported cervical cancer screening, defined as having at least one Pap test in the past three years (76.5%), with no statistical difference between border and other counties. Across the border states, women residing in urban counties were more likely to report having received a Pap test in the appropriate time period than were rural women (77.2% versus 69.0%; $p < .001$). Within both urban and rural counties, border location was not statistically associated with receipt of a Pap test.




Because the number of women in the 21-65 age group who responded to the BRFSS was relatively small, comparisons of Pap receipt within three years based on ethnicity were not possible when studying only border residents. Instead, receipt of a Pap at any time was used. Hispanic women living in border counties were less likely than non-Hispanic women to have received a Pap at any time (84.2% versus 89.7%; $p = .012$). This disparity was also found among urban women (84.5% versus 89.9%; $p = .009$) but not within rural residents (see Table 8, below).

Table 8. Percent of Border County Women Aged 21-65 Who Had a Pap Test Ever by Rurality and Ethnicity

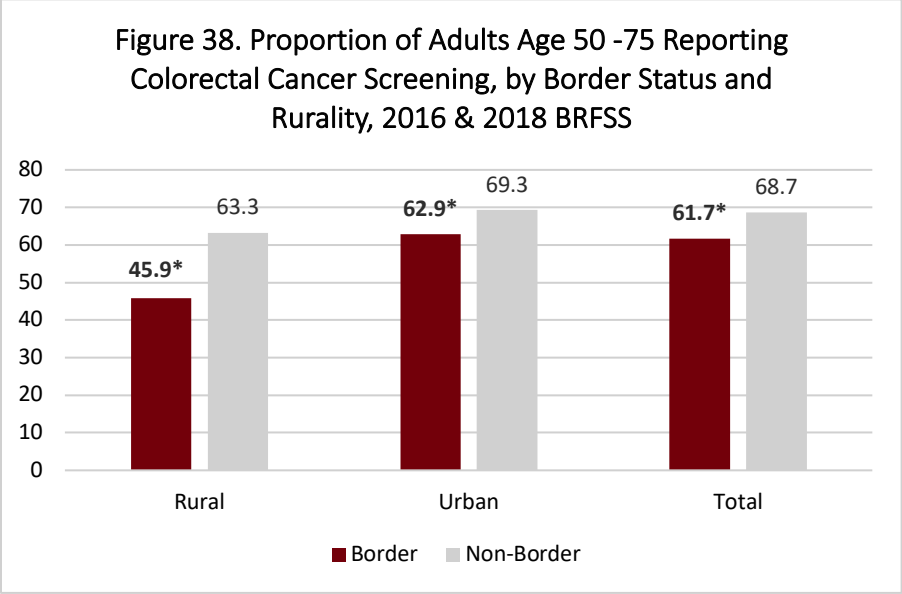
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 86.7 | 84.2 | 89.7 | .012 |
| Rural | 83.3 | 82.4 | 86.4 | ns |
| Urban | 87.0 | 84.5 | 89.9 | .009 |
| p-value for rurality | ns | ns | ns | |

Responses to the BRFSS question, "Have you ever had a Pap test?."
"ns" indicates that the comparison is not statistically significant.

*Data for Pap test use extracted from BRFSS, Border States only, 2015, 2016, 2018*

## Colorectal Cancer Screening

Across border states, 68.0% of adults aged 50-75 had fully met the US Preventive Services Task Force (USPSTF) recommendations for colorectal cancer (CRC) screening, defined as colonoscopy within the past 10 years, flexible sigmoidoscopy within the past five years, or a blood stool test in the past year. Border residents were less likely to have met the CRC screening standard than their non-border peers (61.7% versus 68.7%; p = .009). Border disparities were present among residents of both urban and rural counties. Fewer than half (45.9%) of adults in rural border counties reported CRC screening versus 62.9% in urban border counties (p = .009)




Within border counties, Hispanic residents were less likely than non-Hispanic residents to report CRC screening, both overall (49.7% versus 71.3%; p < .001) and within urban counties (50.2% versus 72.5%; p < .001; see Table 9, below). Receipt of CRC screening was markedly lower among rural residents than others (45.5% versus 62.9%; p = .008), with no additional disparities associated with Hispanic ethnicity.

Table 9. Percent of Border County Adults Aged 50-75 Who Reported Receiving Colorectal Cancer Screening, by Rurality and Ethnicity, 2016 and 2018 BRFSS

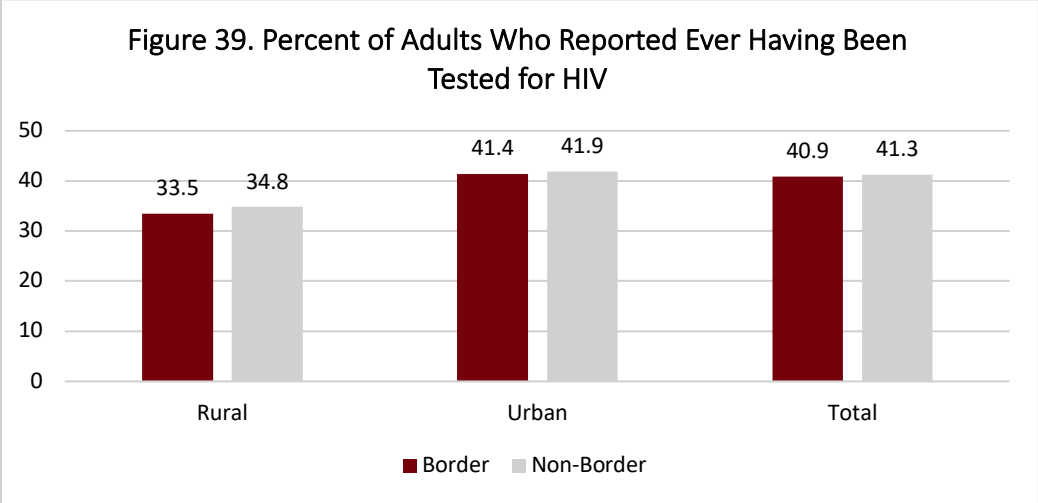
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 61.7 | 49.7 | 71.3 | .000 |
| Rural | 45.5 | 45.6 | 45.3 | ns |
| Urban | 62.9 | 50.2 | 72.5 | .000 |
| p-value for rurality | .008 | ns | .001 | |

Respondents aged 50-75 who have fully met the USPSTF CRC screening recommendations with at least one modality
"ns" indicates that the comparison is not statistically significant.

*Data for colorectal cancer screening use extracted from BRFSS, Border States only, years 2016 & 2018*

## HIV Screening

Across the border states, 41.27% of adults reported that they had been tested for HIV at some point in their lives (tests associated with blood donation are excluded), with no difference based on border versus other residence. Within urban and rural counties, rates were parallel between border and non-border counties. Rural differences, however, were notable. In both border and other counties, rural residents were less likely to report ever having been tested for HIV. As testing is essential for the initiation of both treatment and preventive behaviors, this difference is a source for concern.




As shown in Table 10 below, Hispanic adults living in the border region were less likely to report ever having received an HIV test than non-Hispanic adults, across both rural (30.3% versus 42.0%; p = .026) and urban counties (39.3% versus 43.5%; p = .001). Within Hispanic adults, rural residents were less likely to report ever having been tested (30.3%) than were urban residents (39.3%; p = .025).

Table 10. Percent of Border County Adults Who Reported Ever Having Been Tested for HIV, by Ethnicity and Area of Residence

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 40.9 | 38.4 | 43.4 | .000 |
| Rural | 33.5 | 30.3 | 42.0 | .026 |
| Urban | 41.4 | 39.3 | 43.5 | .001 |
| p-value for rurality | .013 | .025 | ns | |

Response to the BRFSS question: "Have you ever been tested for HIV? Do not count tests you may have had as part of a blood donation. Include testing fluid from your mouth."
"ns" indicates that the comparison is not statistically significant.

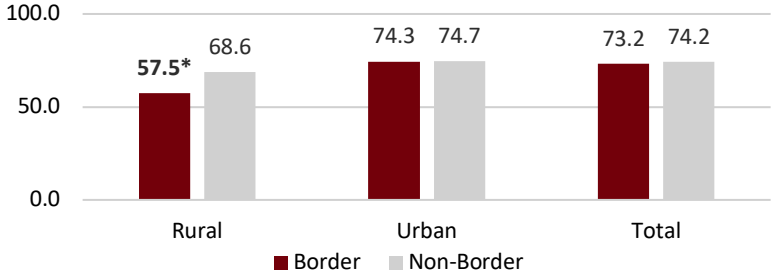
*Data for HIV screening use extracted from BRFSS, Border States only, years 2015 - 2019*

# Health-Related Behaviors

## Physical Activity

Across the border states, 74.1% of adults reported getting some physical activity outside of work, with no statistical difference between residents of border versus other counties. Exercise rates were also similar within border and non-border urban counties, with 74.7% of adults reporting some exercise. Within rural counties, however, residents of border counties were less likely than those of other counties to report exercise outside of work (57.5% versus 68.6%; p. = .0002). Residents of rural counties across the four states were less likely to report non-work physical activity than urban residents (67.8% versus 74.7%; $p < .001$).

Figure 40. Proportion of Adults Reporting Physical Activity Outside of Work, by Border Status and Rurality, BRFSS 2015-2019




Within border counties, rural residents were less likely to report physical activity than their urban peers (57.5% versus 74.3%; $p < .001$), and Hispanic residents had lower reported rates of physical activity outside of work than their non-Hispanic peers (65.6% versus 80.9%; $p < .001$; see Table 11 below). Overall, rural Hispanic adults had the lowest rate of reported physical activity, 54.5%, whereas urban non-Hispanic residents had the highest rates of physical activity (81.5%).

Table 11. Percent of Border County Adults Who Reported Physical Activity or Exercise by Rurality and Ethnicity, 2015-2019

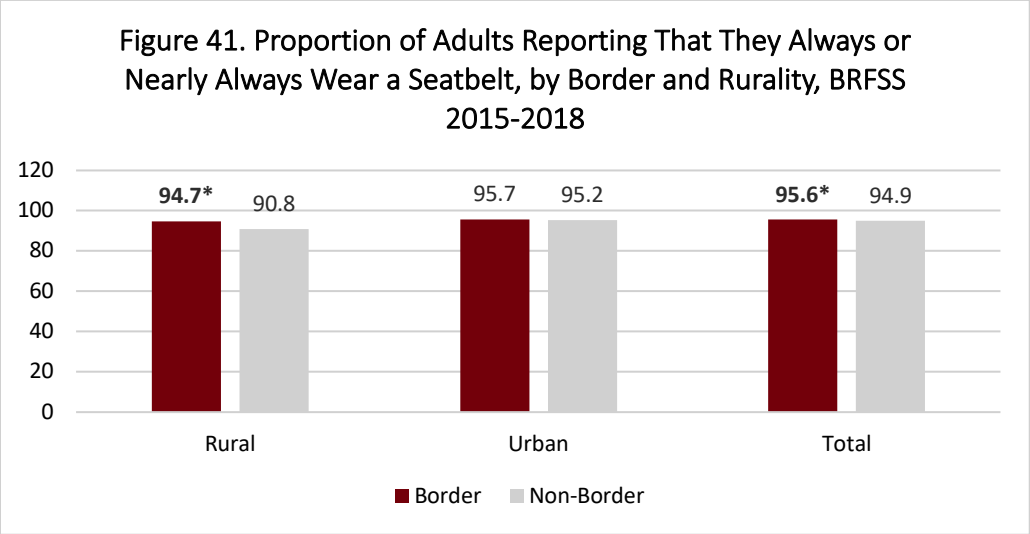
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 73.3 | 65.6 | 80.9 | .000 |
| Rural | 57.5 | 54.4 | 66.0 | .037 |
| Urban | 74.3 | 66.8 | 81.5 | .000 |
| p-value for rurality | .000 | .000 | .000 | |

Based on the BRFSS item "Adults who reported physical activity/ exercise during past 30 days other than their regular job"

*Data for physical activity extracted from BRFSS, Border States only, 2015-2019*

## Use of Seatbelts

Across the four border states, 94.9% of adults reported wearing a seatbelt always or nearly always when in a vehicle, with border residents being slightly more likely than non-border residents to report seatbelt use (95.6% versus 94.9%; p = .023). Within rural counties, adults in border counties were more likely than those in other rural counties to report seat belt use (94.7% versus 90.8%; p = .003).




Within border counties, 95.6% of adults reported using a seatbelt always or nearly always when in a car. Non-Hispanic adults were more likely than Hispanic adults to report seatbelt use 96.8% versus 94.4%; p < .001), although overall reported use was high. Within non-Hispanic respondents, rural residents were less likely than residents of urban counties to report consistent seat belt use (93.5% versus 96.9%; p = .008).

Table 12. Percent of Border County Adults Who Report Always or Nearly Always Wearing Seatbelts by Rurality and Ethnicity, 2015-2019

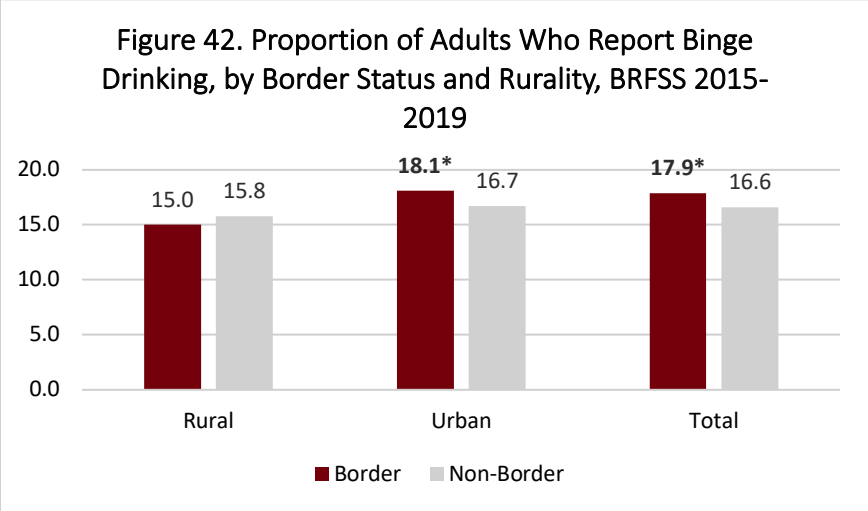
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 95.6 | 94.4 | 96.8 | .000 |
| Rural | 94.7 | 95.1 | 93.5 | ns |
| Urban | 95.7 | 94.3 | 96.9 | .000 |
| p-value for rurality | ns | ns | .008 | |

Responses to the BRFSS question, "How often do you use seatbelts when you drive or ride in a car?"
"ns" indicates that the comparison is not statistically significant.

*Data for seat belt use extracted from BRFSS, Border States only, 2015-2018*

## Binge Drinking

Binge drinking is defined as consuming multiple alcoholic drinks in a single sitting. Based on differences in average size and, thus, anticipated blood alcohol content, the criterion for binge drinking is five or more drinks for men and four or more for women. Border residents were slightly more likely to report binge drinking within the past 30 days than their non-border peers (17.9% vs. 16.6%; p = .0055). Among urban residents, those in border counties were more likely to report binge drinking than those in non-border counties (18.1% versus 16.7%; p = .0034). Differences within rural residents were not statistically significant.




The proportion of adults reporting binge drinking during the past 30 days was fairly consistent across border residents, with no significant differences based on residence or Hispanic ethnicity (see Table 13, below)

Table 13. Percent of Border County Adults Who Report Binge Drinking by Rurality and Ethnicity, 2015-2019

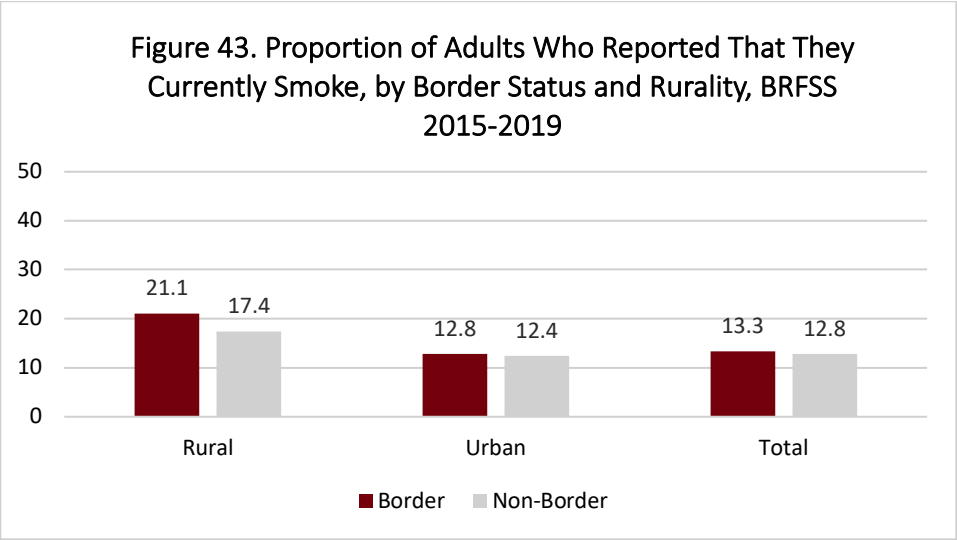
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 17.9 | 18.3 | 17.6 | ns |
| Rural | 15.0 | 14.8 | 15.7 | ns |
| Urban | 18.1 | 17.7 | 18.1 | ns |
| p-value for rurality | ns | ns | ns | |

Data comes from BRFSS item, "Binge drinkers (males having five or more drinks on one occasion, females having four or more drinks on one occasion) during the past 30 days."
"ns" indicates that the comparison is not statistically significant.

*Data for binge drinking extracted from BRFSS, Border States only, 2015-2019*

## Smoking

Statewide, 12.8% of residents of border states reported that they currently smoke, with no difference based on border status, either in total or within rural or urban counties. Rural residents as a whole, however, in both border and non-border counties, were significantly more likely to smoke than their urban peers.




Across border residents, Hispanic ethnicity was not associated with the proportion of adults reporting that they currently smoke. Rural residents were significantly more likely to report smoking, within both Hispanic (20.4% versus 12.9%; p = .006) and non-Hispanic (23.0% versus 12.7%; p = .001) respondents (see Table 14, below).

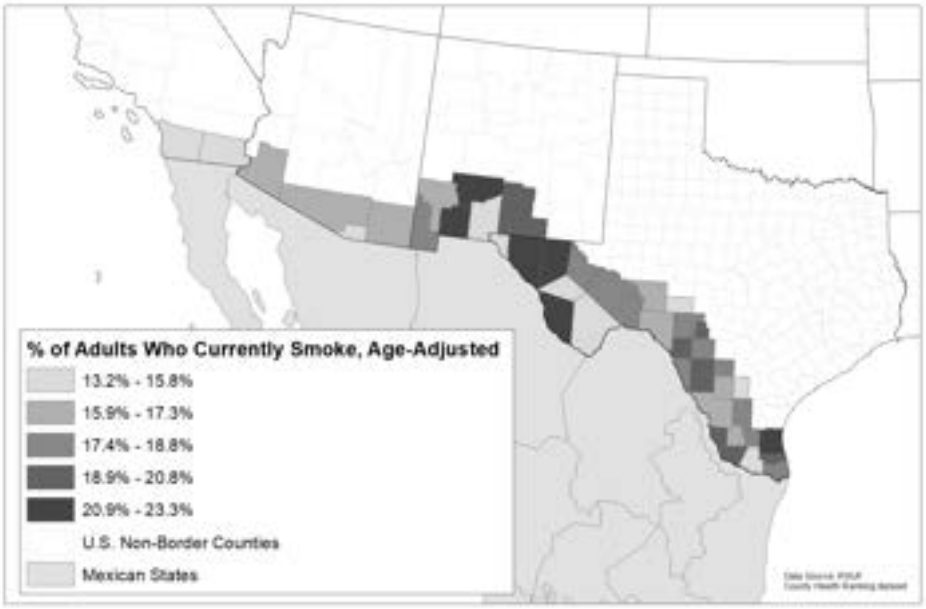
Table 14. Percent of Border County Adults Who Currently Smoke by Rurality and Ethnicity, 2015-2019

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 13.3 | 13.6 | 13.0 | ns |
| Rural | 21.1 | 20.4 | 23.0 | ns |
| Urban | 12.8 | 12.9 | 12.7 | ns |
| p-value for rurality | .003 | .006 | .001 | |

Data comes from BRFSS item, "Adults who are current smokers."
"ns" indicates that the comparison is not statistically significant.

*Data for current smoking extracted from BRFSS, Border States only, 2015-2019*

Figure 44. County-Level Estimates of the Proportion of Adults Who Currently Smoke (source: RWFJ County Health Rankings Dataset, 2020)

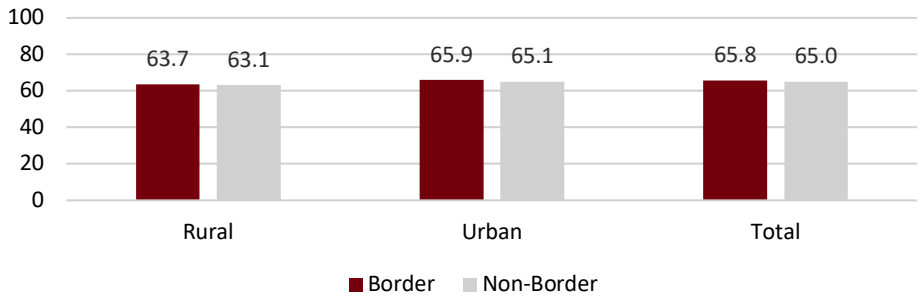


# Health Status

## Self-Reported Physical Health

Across the four border states, 65.1% of adults reported that at no time during the past 30 days had their physical health been "not good" due to illness or injury, with no differences based on border residence. Within border counties, urban versus rural county of residence was not associated with reported days of poor health.

Figure 45. Proportion of Adults Reporting No Days During the Past Month on Which They Felt That Their Physical Health Was Not Good, by Border Status and Rurality, BRFSS 2015-2019




Among border county residents, Hispanic adults were consistently more likely than their non-Hispanic counterparts to report having had no days in the past month during which their health was "not good." These diffeences were present within both urban (67.2% versus 64.7%; p = .016) and rural (66.9% versus 54.9%; p = .013) residents.

Table 15. Percent of Border County Adults Reporting No Bad Physical Health Days by Rurality and Ethnicity, 2015-2019

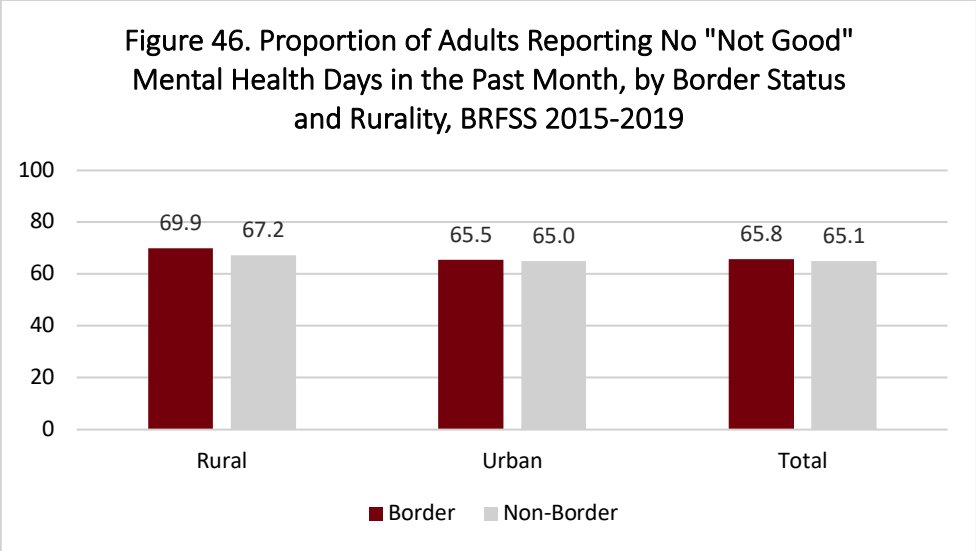
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 65.8 | 67.2 | 64.4 | .006 |
| Rural | 63.7 | 66.9 | 54.9 | .013 |
| Urban | 65.9 | 67.2 | 64.7 | .016 |
| p-value for rurality | ns | ns | .013 | |

Responses to the BRFSS question, "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?"
"ns" indicates that the comparison is not statistically significant.

*Data for physical health extracted from BRFSS, Border States only, 2015-2019*

## Self-Reported Mental Health

An estimated 65.2% of the population living in the four-state study region reported no bad mental health days during the past month, with no significant differences by border status. Within non-border counties, the proportion of adults with no bad mental health days was significantly higher among rural adults (67.2%) than among urban respondents (65.0%; p = .001).




Among adults living in border counties, Hispanic respondents were consistently more likely to report no days in the past 30 during which they felt their mental health was "not good" (68.2% versus 63.3%; p < .001; see Table 16, below).

Table 16. Percent of Border County Adults Who Reported No Bad Mental Health Days by Rurality and Ethnicity, 2015-2019

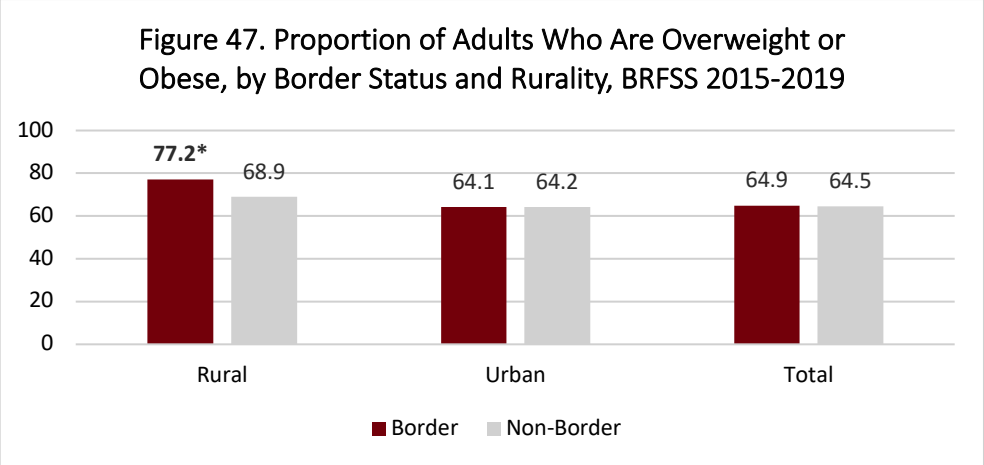
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 65.8 | 68.2 | 63.3 | .000 |
| Rural | 69.9 | 73.2 | 60.6 | .011 |
| Urban | 65.5 | 67.7 | 63.4 | .000 |
| p-value for rurality | ns | ns | ns | |

Responses to the BRFSS question, "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"
"ns" indicates that the comparison is not statistically significant.

*Data for mental health extracted from BRFSS, Border States only, 2015-2019*

## Overweight and Obesity

The BRFSS uses body mass index (BMI) calculated from reported height and weight to define overweight (BMI of 25 or more, but less than 30) and obesity (BMI equal to or greater than 30). These two categories are grouped in this analysis. Across the four border states, 64.6% of adults were overweight or obese, with no statistical differences based on border residence either overall or among urban counties. Among rural counties, the picture was more complex. A higher proportion of rural adults than urban adults were overweight or obese, both within border counties alone and within other counties. Within all rural counties, border counties had the highest rates of adult obesity (77.2% versus 68.9%; p = .002; see Figure 47, below).




When limited to just those living along the U.S.-Mexico border, Hispanic residents were consistently more likely to be overweight or obese compared to their non-Hispanic counterparts (73.5% versus 56.4%; p < .001). Among Hispanic residents of rural border counties, 82.8% were overweight or obese, which is significantly higher than among urban Hispanic adults (72.5%; p < .001; see Table 17, below).

Table 17. Percent of Border County Adults Who Are Overweight or Obese by Rurality and Ethnicity, 2015-2019

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 64.9 | 73.5 | 56.4 | .000 |
| Rural | 77.2 | 82.8 | 62.0 | .000 |
| Urban | 64.1 | 72.5 | 56.2 | .000 |
| p-value for rurality | .000 | .000 | ns | |

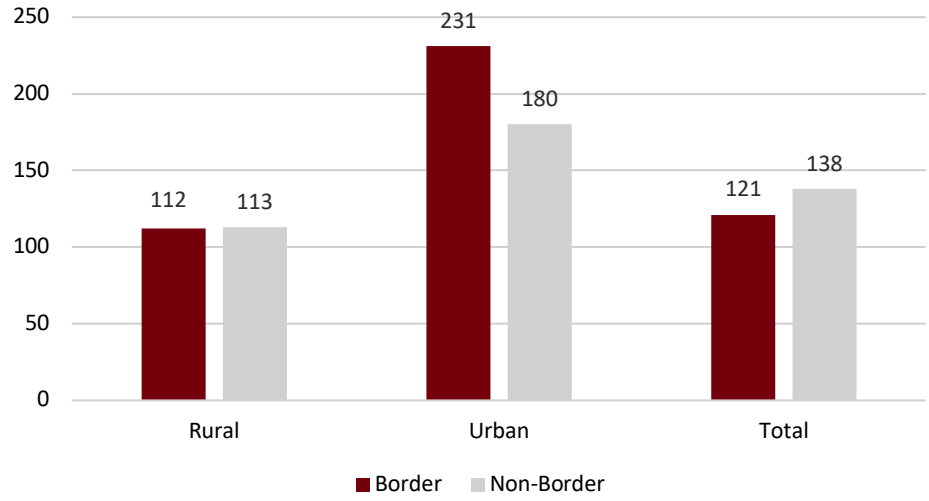
Calculated based on height and weight, dichotomized at a BMI of 25.00, "Adults who have a body mass index greater than 25.00 (Overweight or Obese)."
"ns" indicates that the comparison is not statistically significant.

*Data for weight status extracted from BRFSS, Border States only, 2015-2019*

## HIV/AIDS

The median HIV/AIDS prevalence rate in rural border counties was not significantly different than in rural non-border counties (112 vs. 113 per 100,000). Likewise, the median HIV/AIDS prevalence rate in urban border counties was not significantly different than in urban non-border counties (231 vs. 180 per 100,000). Finally, when comparing border counties and non-border counties, the median HIV/AIDS prevalence rate in border counties was not significantly different than in non-border counties (121 vs. 138 per 100,000).

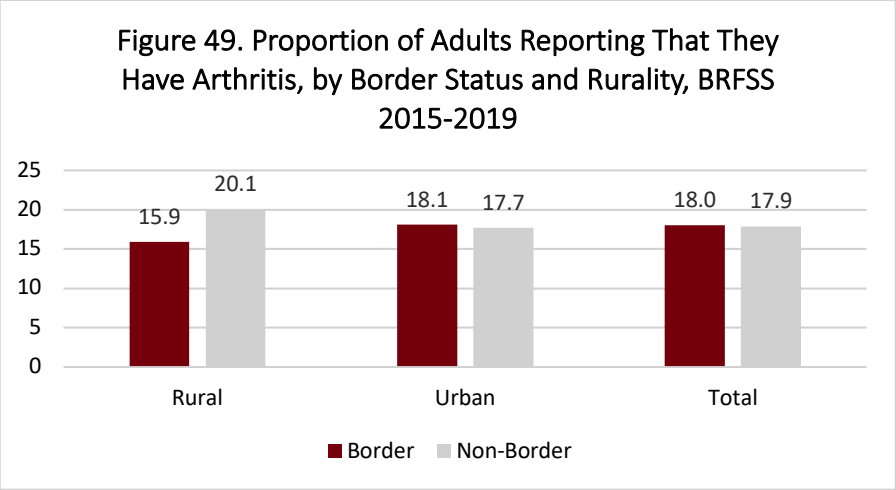
Figure 48. Median County Prevalence of People Living with HIV/AIDS, by Border Status and Rurality, 2018




*Data for HIV/AIDS prevalence extracted from AIDSVu, 2021*

## Arthritis Prevalence

Across the border states, 17.9% of adults reported having been told by their healthcare provider that they have arthritis, with no overall difference between border and non-border residents. Within border counties, the prevalence of arthritis was not different between rural and urban counties. Within non-border counties, however, rural residents were more likely to report having arthritis than urban residents (20.1% versus 17.7%; $p < .001$)




Within border counties, the prevalence of reported arthritis was lower in Hispanic vs. non-Hispanic border residents, both in total (12.7% versus 23.3%; $p < .001$) and within urban counties (12.6% versus 23.5%; $p < .001$).

Table 18. Percent of Border County Adults with Arthritis by Rurality and Ethnicity, 2015-2019

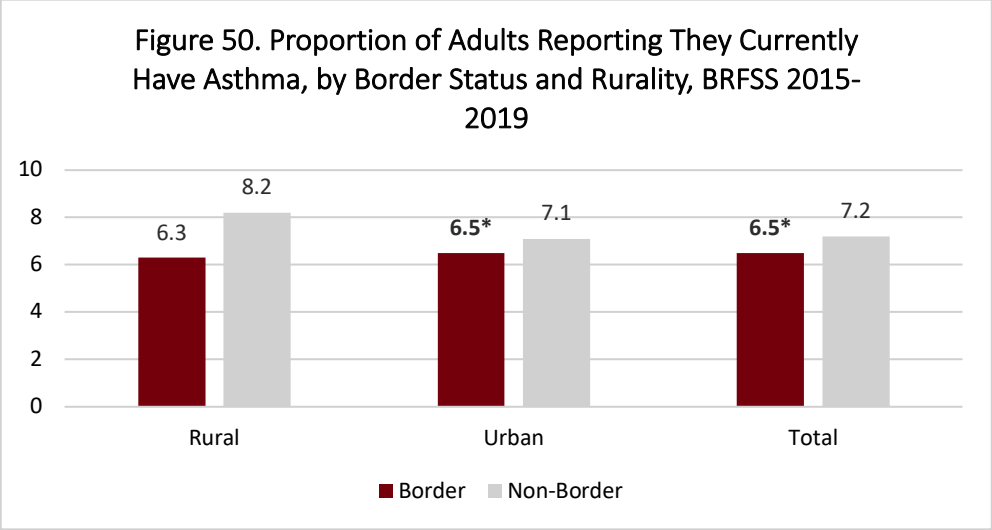
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 18.0 | 12.7 | 23.3 | .000 |
| Rural | 15.9 | 14.3 | 20.2 | ns |
| Urban | 18.1 | 12.6 | 23.5 | .000 |
| p-value for rurality | ns | ns | ns | |

Responses to the BRFSS question, "(Ever told) (you had) some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?
"ns" indicates that the comparison is not statistically significant.

*Data for arthritis extracted from BRFSS, Border States only, 2015-2019*

## Asthma Prevalence

Border residents were slightly less likely to report having asthma than their non-border counterparts (6.5% vs. 7.2%; p= .009). This difference was also present among residents of urban counties (6.5% versus 7.1%; p = .020). Within rural counties, values for border and non-border residents were not statistically different. Although urban versus rural residence was not associated with asthma prevalence in border counties, in non-border counties asthma was more prevalent among rural than urban adults (8.2% versus 7.1%; p < .001).




Across all border counties, non-Hispanic residents were more likely to report having asthma than were their Hispanic peers (7.7% vs. 5.2%; p < .001); this difference was also significant within urban counties (7.7% versus 5.2%; p < .001). Within each ethnicity group, rural versus urban residence was not linked to reported asthma prevalence.

Table 19. Percent of Border County Adults With Asthma by Rurality and Ethnicity, 2015-2019

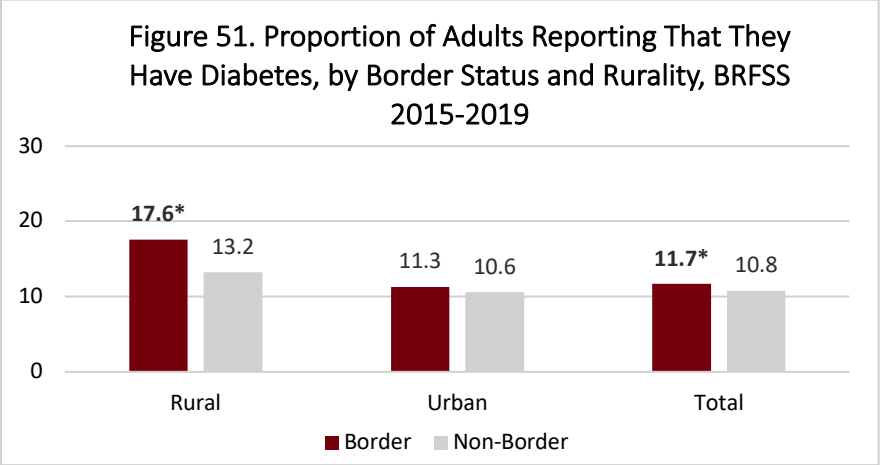
| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 6.5 | 5.2 | 7.7 | .000 |
| Rural | 6.3 | 5.6 | 8.5 | ns |
| Urban | 6.5 | 5.2 | 7.7 | .000 |
| p-value for rurality | ns | ns | ns | |

Responses to the BRFSS question, "(Ever told) you had asthma?"
"ns" indicates that the comparison is not statistically significant.

*Data for asthma extracted from BRFSS, Border States only, 2015-2019*

## Diabetes Prevalence

Across the border states, border residents were slightly more likely to report having diabetes than were adults in non-border counties (11.7% versus 10.8%; p = .020). Within urban counties, border and non-border rates for diabetes did not differ; within rural counties, however, border residents were more likely than others to report diabetes (17.6% versus 13.2%; p = .032). Within both border and other counties, rural residents were more likely than residents of urban counties to report having diabetes (see Figure 51, below).




Across all border residents, Hispanic respondents were more likely to report a diabetes diagnosis than were non-Hispanic adults (14.0% versus 9.4%; p < .001; see Table 20, below). There were also statistically significant differences within Hispanic and non-Hispanic urban residents (13.6% versus 9.2%; p < .001). Rural disparities were present across both ethnicity categories, with rural residents being more likely than urban residents to report having been diagnosed with diabetes (17.6% versus 11.3%; p = .001).

Table 20. Percent of Border County Adults With Diabetes by Rurality and Ethnicity, 2015-2019

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 11.7 | 14.0 | 9.4 | .000 |
| Rural | 17.6 | 18.9 | 14.1 | ns |
| Urban | 11.3 | 13.6 | 9.2 | .000 |
| p-value for rurality | .001 | .042 | .028 | |

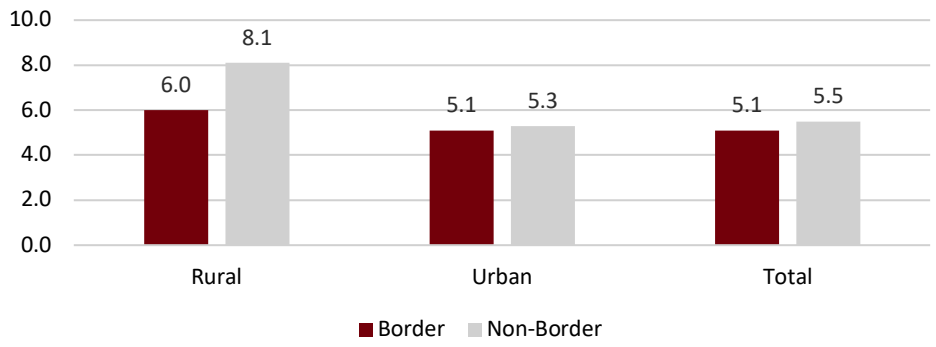
Responses to the BRFSS question, "(Ever told) (you have) diabetes? " Excludes pre-diabetes, borderline diabetes and gestational diabetes.
"ns" indicates that the comparison is not statistically significant.

*Data for diagnosed diabetes extracted from BRFSS, Border States only, 2015-2019*

## Heart Disease Prevalence

Overall, 5.4% of adults living in border states reported having a diagnosis of heart disease (angina or coronary heart disease or a history of heart attack). Border residents did not differ statistically from non-border residents, either in total or among only urban or rural residents. Within border residents, heart disease prevalence did not significantly differ between rural and urban respondents. Within non-border counties, however, rural residents were more likely than urban residents to report heart disease (8.1% versus 5.3%; $p < .001$).

Figure 52. Proportion of Adults Who Reported Having Coronary Heart Disease or a Heart Attack, by Border Status and Rurality, BRFSS 2015-2019




Among all border residents, Hispanic adults had lower rates of reported heart disease than their non-Hispanic counterparts, both in total (4.4% versus 5.8%, respectively; $p = .001$) and within urban residents (4.4% versus 5.7%, respectively; $p = .002$). Differing values for Hispanic and non-Hispanic rural residents were not statistically significant.

Table 21. Percent of Border County Adults Reporting Heart Disease by Rurality and Ethnicity, 2015-2019

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 5.1 | 4.4 | 5.8 | .001 |
| Rural | 2.8 | 5.0 | 9.0 | ns |
| Urban | 5.1 | 4.4 | 5.7 | .002 |
| p-value for rurality | .000 | ns | .037 | |

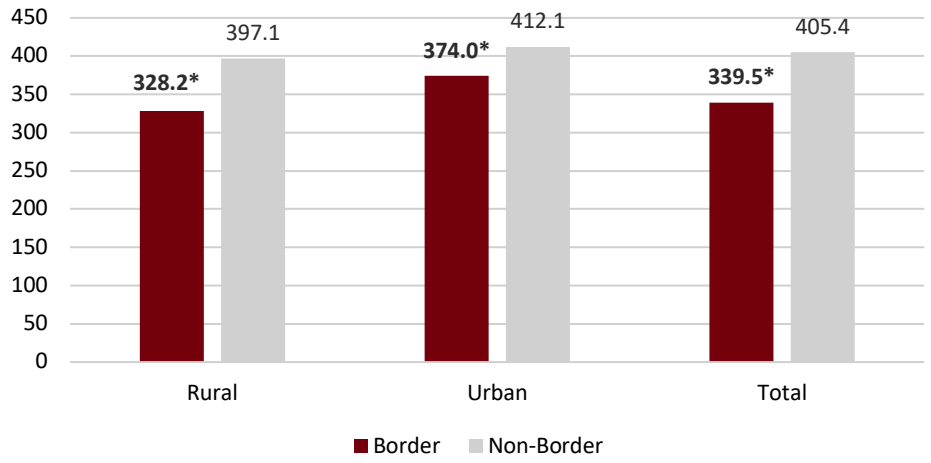
Responses to the BRFSS question, "(Ever told) you had angina or coronary heart disease?"
"ns" indicates that the comparison is not statistically significant.

*Data for reported diagnosis of heart disease extracted from BRFSS, Border States only, 2015-2019*

## Cancer Incidence

The median cancer incidence rate in border counties was significantly lower than in non-border counties (339.5 versus 405.4 per 100,000). Both rural and urban border counties had significantly lower incidence rates than their non-border counterparts (rural: 328.2 versus 397.1 per 100,000; urban: 374.0 versus 412.1 per 100,000). When looking at the five-year trend (data not shown), the largest gap in cancer incidence was between urban border and urban non-border counties. Specifically, urban non-border residents had significantly larger reductions in cancer incidence versus their urban border peers ($p < .001$).

Figure 53. Median County-level Age-Adjusted Cancer Incidence Rate Per 100,000 in Border States by Rurality, 2015-2019

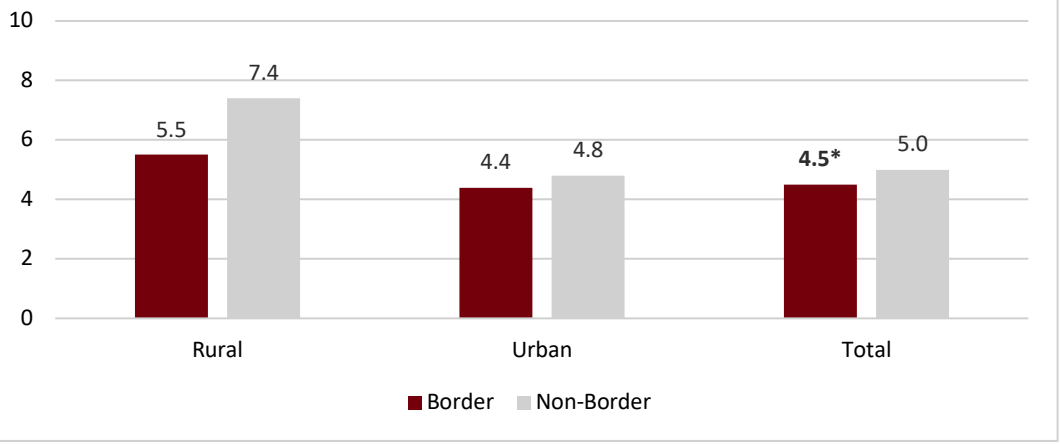



*Data for county-level cancer incidence extracted from the National Cancer Institute, 2021*

## Chronic Obstructive Pulmonary Disease (COPD) Prevalence

Adults living along the U.S.-Mexico border were slightly less likely to report having COPD than persons from other counties (4.5% versus 5.0%; p=.031). Values for border versus other residents within both urban and rural counties, however, did not differ statistically.

Figure 54. Proportion of Adults Reporting COPD, by Border Status and Rurality, BRFSS 2015-2019




Within border residents, Hispanic adults were less likely to report being diagnosed with COPD than were non-Hispanic aults (3.1% versus 10.7%; p < .001). Non-Hispanic adults living in rural counties were more likely to report having been diagnosed with COPD than those in urban counties (13.7% versus 5.6%; p < .001). The number of Hispanic respondents living in rural areas and reporting COPD was too low for valid estimation of population values.

Table 22. Percent of Border County Adults Reporting Chronic Obstructive Pulmonary Disease, by Rurality and Ethnicity, 2015-2019

| Area of Residence | Ethnicity | | | |
|---|---|---|---|---|
| | Total | Hispanic | Non-Hispanic | p-value for ethnicity |
| Total | 4.5 | 3.1 | 10.7 | 0.000 |
| Rural | 4.8 | ** | 13.7 | ** |
| Urban | 4.4 | 3.1 | 5.6 | 0.000 |
| p-value for rurality | ns | ** | .000 | |

** Too few observations for valid estimation.
Responses to the BRFSS question, "(Ever told) you have chronic obstructive pulmonary disease, C.O.P.D., emphysema or chronic bronchitis?"
"ns" indicates that the comparison is not statistically significant.

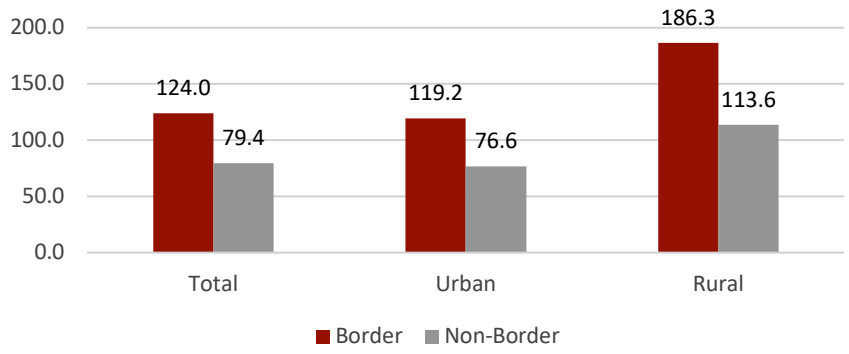
*Data for diagnosed COPD extracted from BRFSS, Border States only, 2015-2019*

# COVID-19

## COVID mortality

In 2020, there were 73,463 deaths across the 4 border states attributable to COVID 19 (ICD-10 code, U07.01), within which 11,478 involved residents of border counties. Age-adjusted death rates per 100,000 residents were higher in border counties (124.0/100,000) than other counties in the same states (79.4/100,000). Death rates were higher in border than other counties among both urban and rural counties. The age-adjusted death rate for rural border counties, 186.3/100,000, is more than twice as high as the rate in urban, non-border counties, 76.6/100,000.

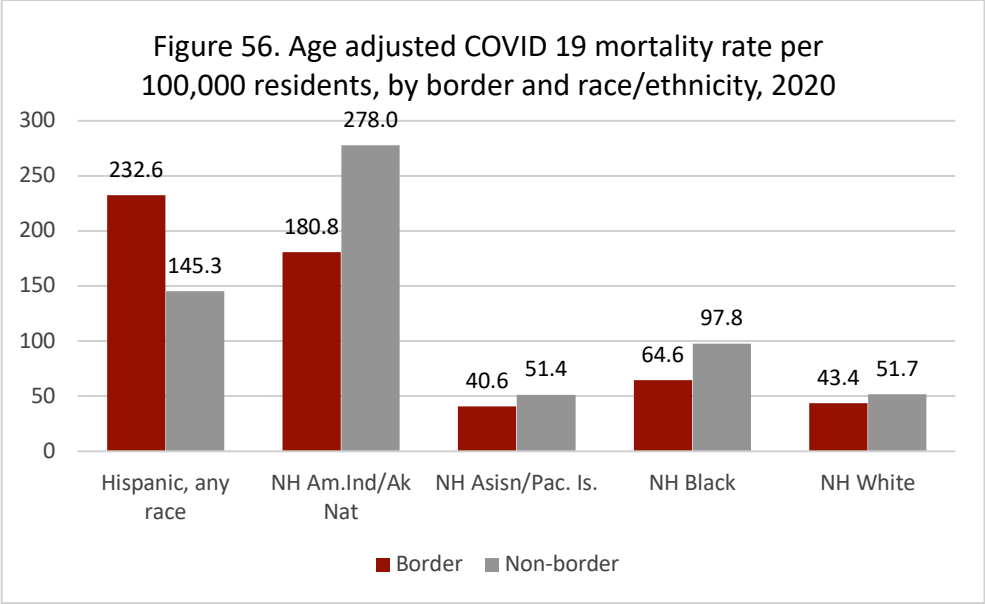
Figure 55. Age-adjusted COVID-19 mortality rate per 100,000 residents, by border location and rurality, 2020




COVID-19 mortality analyses use information from 2020, the most recent year for which fully verified, age-adjusted data were available when this Chartbook was prepared. During 2020, COVID vaccines had not yet become available and nonpharmaceutical interventions, such as mask wearing, handwashing, and avoiding crowds, were the principal means of disease prevention. Medication for COVID was first authorized in May 2020 (the anti-viral remdesivir) and vaccines were first authorized in December 2020. [Centers for Disease Control and Prevention, CDC Museum COVID-19 Timeline. Available at https://www.cdc.gov/museum/timeline/covid19.html]

Mortality by race/ethnicity

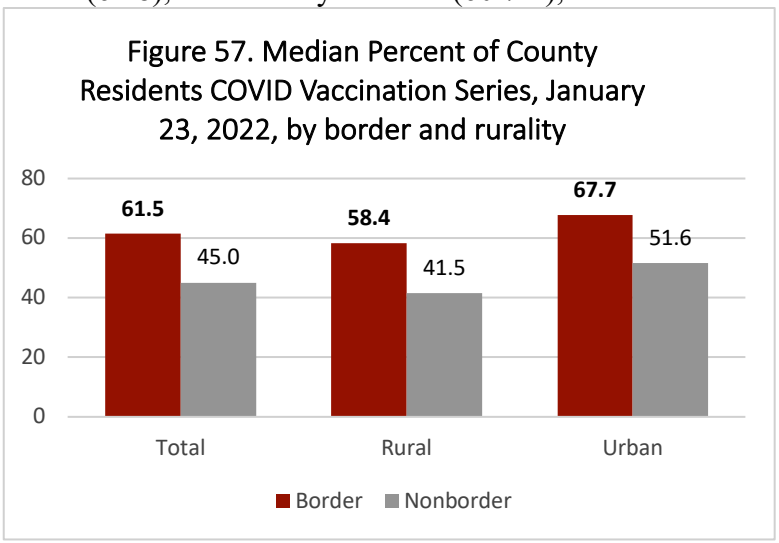
The COVID-19 pandemic in the border states disproportionately affected Hispanic and American Indian/Alaska Native populations. Within border counties, age-adjusted mortality rates ranged from a low of 40.6/100,000 among Asian/Pacific Islander residents to a high of 232.6/100,000 among Hispanic residents. In non-border counties, age-adjusted mortality rates ranged from a low of 51.4/100,000 among Asian/Pacific Islander residents to a high of 278.0/100,000 among American Indian/Alaska Native residents. (See Figure 56, next page.) Complete information, with 95% confidence intervals, is provided in Appendix B.




## COVID Vaccination Rates (January 2022)

With the advent of effective COVID-19 vaccines in late December 2020, public health outreach for vaccination was initiated. Median county-level vaccination rates, defined as a complete two-shot series, were highest in New Mexico (62.8), followed by Arizona (60.7%), California (58.4%) and Texas (43.5%).

Vaccination rates were higher across border counties (61.5%) than across non-border counties (45.0%; $p < .001$). County vaccination rates were significantly higher for border counties among both rural and urban counties, as shown in Figure 57, at right.




*Data for COVID-19 mortality from CDC WONDER.*
*Vaccination data from CDC, extracted January 22, 2022*

# Mortality

In the following sections, we describe border region and border state outcomes for:

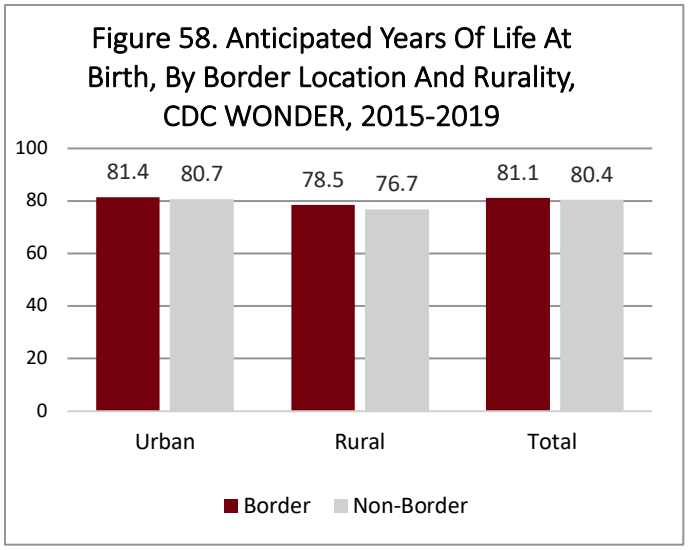
- Anticipated life span at birth
- Overall mortality, with specific presentations for each racial/ethnic category
- Deaths across the lifespan, with age-specific indications for the leading cause of death

Each section includes a summary of findings, together with detailed tables. Because our analyses look at subgroups within the total border population, it was necessary to calculate mortality based on deaths occurring over a five-year period, 2015-2019. Additional information on how analyses in this section were conducted is provided in Appendix A.

*Data for Mortality section extracted from CDC WONDER, 2021*

## Anticipated Life Span at Birth

Life expectancy at birth was slightly higher among border residents, both in total (81.1 versus 80.4 years) and within both urban (81.4 versus 80.7 years) and rural (78.5 versus 76.7 years) counties across the four-state area (see Figure 58, right; all differences are statistically significant).




Distinctions across border and non-border residents associated with race/ethnicity were larger than those across the population as a whole. Hispanic individuals, who constitute the majority of border residents, had a longer anticipated lifespan than the non-Hispanic population (see Table 23, below), in both border (81.6 versus 81.0 years) and non-border (82.9 versus 78.2 years) counties.

Table 23. Life Expectancy at Birth, in Years, by Border Status, Rurality, and Race/Ethnicity (2015-2019)

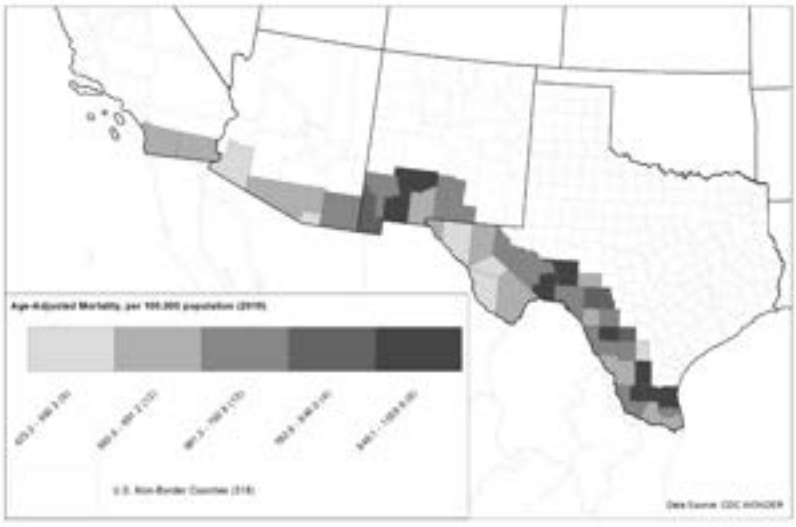
| | Border residents | | | Non-border residents | | |
|---|---|---|---|---|---|---|
| | Years | 95% Confidence Interval | | Years | 95% Confidence Interval | |
| | | LCL | UCL | | LCL | UCL |
| Total | 81.1 | 81.1 | 81.2 | 80.4 | 80.4 | 80.4 |
| By rurality | | | | | | |
| Urban (metro) | 81.4 | 81.3 | 81.4 | 80.7 | 80.7 | 80.7 |
| Rural (nonmetro) | 78.5 | 78.4 | 78.7 | 76.7 | 76.7 | 76.8 |
| By Race/Ethnicity | | | | | | |
| Hispanic, any race | 81.6 | 81.5 | 81.7 | 82.9 | 82.9 | 83.0 |
| Non-Hispanic, any race | 81.0 | 80.8 | 81.1 | 78.2 | 78.2 | 78.2 |
| Asian/Pacific Is. † | *88.1-88.2* | *87.8* | *88.5* | 87.7 | 87.6 | 87.7 |
| Amer.Ind/AK Nat.† | *75.0-75.3* | *74.2* | *76.1* | 76.3 | 76.1 | 76.5 |
| Black † | *76.6-76.6* | *76.2* | *77.0* | 75.7 | 75.7 | 75.8 |
| White | 80.6 | 80.5 | 80.7 | 79.5 | 79.4 | 79.5 |

† For the italicized values, some age group cells needed for calculating life expectancy had very small, and thus suppressed, death counts. As counts less than 10 were suppressed, we estimated deaths for those categories twice: once with a "1" and once with a "9." The minor differences in outcome are shown; lower and upper confidence levels show the extremes across both estimates.

## Overall Age-Adjusted Mortality

Overall mortality includes all deaths, regardless of age. Because areas can differ in the distribution of older and younger residents, and thus their risk of death, overall mortality rates are age-adjusted. Border county residents experienced lower age-adjusted mortality than non-border residents, among both urban and rural residents. Mortality rates differed across and within states, as shown in the map below.

Figure 59. County-Level Estimates of Age-Adjusted Mortality per 100,000, 2015-2019



Lower overall mortality rates within border areas may stem from the high representation of Hispanic residents. As shown in Table 24 below, overall and within both urban and rural counties, age-adjusted mortality was consistently lower for Hispanic than for non-Hispanic border residents.

Table 24. Overall Age-Adjusted Mortality Per 100,000 Residents, Border Counties, by Hispanic Ethnicity and Rurality, CDC WONDER, 2015-2019

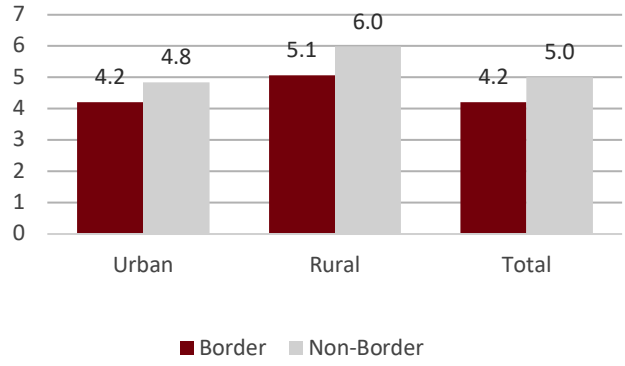
| | All residents | | | Hispanic residents | | | Non-Hispanic residents | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rate | 95% Confidence Interval | | Rate | 95% Confidence Interval | | Rate | 95% Confidence Interval | |
| | | LCL | UCL | | LCL | UCL | | LCL | UCL |
| Total | 632.2 | 629.8 | 634.5 | 613.4 | 609.7 | 617.1 | 640.3 | 637.2 | 643.5 |
| Urban | 623.0 | 620.5 | 625.4 | 598.7 | 594.8 | 602.6 | 633.3 | 630.1 | 636.6 |
| Rural | 749.2 | 739.7 | 758.7 | 730.8 | 719.0 | 742.7 | 792.6 | 775.4 | 809.8 |

## Infant Mortality

Infant mortality rates were lower in border counties than non-border counties, both overall and within urban counties (4.2 versus 4.8 per 1,000; Figure 60, at right). Because the small number of infant deaths in rural counties yielded estimates with wide standard errors, rural infant death rates did not differ significantly based on whether the county fell into the border region.

Within border counties, there were no significant differences based on Hispanic ethnicity, either overall or within urban or rural counties.

Figure 60. Infant Deaths Per 1,000 Live Births by Border Region and Rurality, CDC WONDER, 2015-2019




| Table 25. Infant Mortality Rate per 1,000 population, 2015-2019, by State, Border Region, and Rurality | | | | | | |
|---|---|---|---|---|---|---|
| | All infants | | Hispanic infants | | Non-Hispanic infants | |
| | Rate | SE | Rate | SE | Rate | SE |
| Total | 4.3 | 0.1 | 4.3 | 0.1 | 4.0 | 0.2 |
| Urban | 4.3 | 1.2 | 4.3 | 0.1 | 3.9 | 0.2 |
| Rural | 5.1 | 0.3 | 4.8 | 0.4 | 6.2 | 1.0 |

Leading causes of death among infants

The leading cause of infant deaths, defined as deaths at age less than one year, in the 2015-2019 period was congenital malformations, with similar rates across border (111.9 per 100,000 infant residents, SE 4.5) and non-border (113.0 per 100,000 infant residents, SE 0.8) counties in the four border states. As shown in Table 26, below, the four next leading causes of death were maternal complications of pregnancy, short gestation/low birthweight, unintentional injury, and sudden infant death syndrome.

Across the top five causes of death for infants, only two rates differed significantly between border and non-border counties: problems of short gestation/low birthweight and sudden infant death syndrome, both of which were present at higher rates in non-border than border counties (short gestation/low birthweight: 71.7 versus 36.5 per 100,000; sudden infant death syndrome: 28.0 versus 15.0 per 100,000).

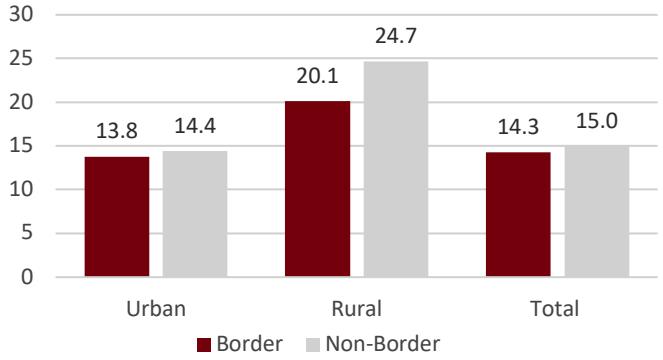
Due to the low number of infant deaths, no additional analyses, such as by ethnicity or rurality, were possible.

| Table 26. Five Leading Causes of Infant Death, by Border Versus Non-Border County of Residence, 2015-2019 | | | | | | |
|---|---|---|---|---|---|---|
| Leading Causes of Death (Infants)* | Border Counties | | | Non-Border Counties | | |
| | | 95% Confidence Interval | | | 95% Confidence Interval | |
| | Rate | Lower | Upper | Rate | Lower | Upper |
| Congenital malformations, deformations, and chromosomal abnormalities (Q00-Q99) | 111.9 | 103.2 | 120.6 | 113 | 109.8 | 116.1 |
| Newborn affected by maternal complications of pregnancy (P01) | 38.6 | 33.5 | 43.7 | 32.9 | 31.2 | 34.6 |
| Disorders related to short gestation and low birth weight, not elsewhere classified (P07) | 36.5 | 31.5 | 41.5 | 71.7 | 69.2 | 74.3 |
| Accidents (unintentional injuries) (V01-X59) | 23.2 | 19.2 | 27.2 | 18.2 | 16.9 | 19.4 |
| Sudden infant death syndrome (R95) | 15.0 | 12.0 | 18.6 | 28.0 | 26.5 | 29.6 |
| *Only causes of death with 85 or more occurrences among border counties across the period are listed. Inclusive codes for causes of death are provided in the Technical Appendix. | | | | | | |

## Child Mortality

Across the four border states, age-adjusted mortality rates were similar among children residing in border and non-border counties, in both urban and rural areas (see Figure 61, at right).

Figure 61. Age Adjusted Mortality per 100,000 Residents, Children Ages 1-14, by Border Location and Rurality, 2015-2019




Within racial/ethnic categories, the same pattern was found; there were no significant differences within urban and rural children based on Hispanic/non-Hispanic ethnicity.

Although calculations for mortality within each group yielded the differing estimates shown here, the 95% confidence intervals for all estimates in Figure 61 and within Table 27 overlap. Deaths in childhood are relatively rare, leading to estimates with broad confidence intervals. CDC data show only 1,130 total child deaths in border counties over the five-year period studied.

Table 27. Age-Adjusted Mortality per 100,000 Residents Among Border County Children Ages 1-14 Years, by Rurality and Hispanic Ethnicity, 2015-2019

| | All children ages 1 - 14 | | | Hispanic children | | | Non-Hispanic children | | |
|---|---|---|---|---|---|---|---|---|---|
| | Rate | 95% Confidence Interval | | Rate | 95% Confidence Interval | | Rate | 95% Confidence Interval | |
| | | Lower | Upper | | Lower | Upper | | Lower | Upper |
| Total | 14.3 | 13.5 | 15.2 | 14.5 | 13.5 | 15.5 | 13.9 | 12.4 | 15.4 |
| Urban | 13.8 | 13.0 | 14.7 | 14.0 | 13.0 | 15.1 | 13.4 | 11.9 | 14.9 |
| Rural | 20.1 | 16.5 | 23.7 | 19.1 | 15.4 | 23.4 | *25.6* | *16.4* | *38.0* |

*Italicized cells are based on a small number of observations (24 deaths) and thus estimated rates are unreliable.

Leading causes of death, children ages 1-14 years

Deaths are very rare in children who have survived their first year of life. Thus, only the top five causes of death could be presented for the limited geographic areas studied.

Among children through the early teen years, the two most common causes of death were conditions originating in the perinatal period and congenital problems (see Table 28, below). These were followed by unintentional injuries, cancer, and homicide.

Due to the very low number of child deaths, no additional analyses, such as by ethnicity or rurality, were possible.

Table 28. Age-Adjusted Mortality per 100,000 Residents for the Five Leading Causes of Death, Children Ages 1-14 Years, by Border Versus Non-Border Residence

| Causes of death: | Border counties | | | Non-border counties | | |
|---|---|---|---|---|---|---|
| | | 95% Confidence Interval | | | 95% Confidence Interval | |
| | Rate | Lower | Upper | Rate | Lower | Upper |
| Certain conditions originating in the perinatal period | 12.6 | 11.9 | 13.4 | 15.6 | 15.3 | 15.9 |
| Congenital malformations, deformations and chromosomal abnormalities | 8.4 | 7.8 | 9.0 | 8.5 | 8.2 | 8.7 |
| Accidents (unintentional injuries) | 5.2 | 4.7 | 5.6 | 5.4 | 5.2 | 5.6 |
| Malignant neoplasms | 2.0 | 1.7 | 2.3 | 2.1 | 2.0 | 2.2 |
| Assault (homicide) | 0.9 | 0.7 | 1.1 | 1.2 | 1.1 | 1.3 |

*Inclusive codes are provided in the Technical Appendix.

## Leading Causes of Death, All Ages

Mortality rates for the fifteen most common causes of death in the border region are shown in Table 29, below, together with corresponding rates for non-border counties in the border states.

Examining mortality across the entire population yields varying results. For several disease categories (heart disease, cancer, Alzheimer's disease, cerebrovascular disease, chronic lower respiratory disease), border county mortality rates were lower than those in non-border counties. For other conditions, such as diabetes, the opposite held, with border counties showing higher death rates.

Differing age groups within the population experience differing risks of death, as well as deaths due to different causes.

Table 29. Age-Adjusted Mortality Per 100,00 For The 15 Leading Causes of Death by Border Region, CDC WONDER, 2015-2019 †

| | Border | | Non-Border | |
|---|---|---|---|---|
| **UCD – 15 Leading Causes of Death** | Rate | SE | Rate | SE |
| Diseases of heart (I00-I09,I11,I13,I20-I51) | 137.6 | 0.6 | 152.1 | 0.2 |
| Malignant neoplasms (C00-C97) | 133.5 | 0.6 | 140.6 | 0.2 |
| Accidents (unintentional injuries) (V01-X59,Y85-Y86) | 37.5 | 0.3 | 38.1 | 0.1 |
| Alzheimer disease (G30) | 33.5 | 0.3 | 36.9 | 0.1 |
| Cerebrovascular diseases (I60-I69) | 34.1 | 0.3 | 38.0 | 0.1 |
| Chronic lower respiratory diseases (J40-J47) | 29.8 | 0.3 | 36.5 | 0.1 |
| Diabetes mellitus (E10-E14) | 25.6 | 0.2 | 21.5 | 0.1 |
| Chronic liver disease and cirrhosis (K70,K73-K74) | 15.4 | 0.2 | 13.1 | 0.1 |
| Intentional self-harm (suicide) (*U03,X60-X84,Y87.0) | 12.6 | 0.2 | 12.6 | 0.1 |
| Influenza and pneumonia (J09-J18) | 11.5 | 0.2 | 13.3 | 0.1 |
| Essential hypertension and hypertensive renal disease (I10,I12,I15) | 10.2 | 0.2 | 10.8 | 0.1 |
| Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27) | 9.6 | 0.1 | 11.1 | 0.1 |
| Septicemia (A40-A41) | 8.3 | 0.1 | 7.6 | 0 |
| Parkinson disease (G20-G21) | 8.3 | 0.1 | 8.5 | 0 |
| Pneumonitis due to solids and liquids (J69) | 4.9 | 0.1 | | |
| Assault (homicide) (*U01-*U02,X85-Y09,Y87.1) | | | 5.7 | 0 |

† The 15th cause differed for Border and non-Border areas.

# American Indian Health

## Overview

With a life expectancy of 5.5 years less than all U.S. races overall, American Indians and Alaska Natives continue to face higher death rates, lower health status, and greater health disparities than the general U.S. population. Both chronic illness, including diabetes mellitus, chronic liver disease and cirrhosis, heart disease, and chronic lower respiratory disease, and injuries, including unintentional injuries, assault/homicide, and intentional self-harm/suicide, have a higher prevalence in the American Indian population than others and contribute to the higher death rates (IHS, 2019; OMH, 2021). Lower life expectancy, increased death rates, and disproportionate burden of disease are due to historically long-standing lower health status and increased disparities and inequities from increased poverty, decreased access to education and health services, and cultural and social conditions. Exacerbated by other issues from life in the U.S.-Mexico border region, life expectancy is an average 1.9 years less for those that reside in this area than their fellow American Indians living across the rest of the United States not in the border region (Genuso, et. al., 2021).

Tribal lands in the border region are divided into six geographic regions through the National Institutes of Health Tribal Health Research Office (see map below): the California Area (California), Phoenix Area, Navajo Area, Tucson Area, Albuquerque Area (Colorado and New Mexico), and Oklahoma City Area (Kansas, Oklahoma, and Texas).

Figure 62. Map of Tribal Lands

There are 24 tribal nations along the U.S.-Mexico border, with an additional five indigenous communities in Mexico that are a part of U.S. Tribes. Upon the creation of the border, many indigenous communities found themselves separated by this "imaginary" and now "walled" line. The legal boundary between the United States and Mexico divided nations such as the Yaqui, O'odham, Cocopah, Kumeyaay, Pai, Apache, and Kickapoo. The members of the nations are represented by 26 sovereign tribal nations in the United States, with relatives residing in both the United States and Mexico. The border is not only an imaginary barrier, and in some locations a physical barrier, but also a psychological, mental, social, religious, and ceremonial barrier. The border separates tribal members from family and tribal resources and, also, violates the religious freedom of many tribal nations.

In American Indian culture, religion and spirituality are anchored in land. Land is not a monetary asset but rather a sacred spiritual and religious artifact that has souls and spirits. Land anchors families and generations (Indian Law Resource Center, 2021). In many cases, the presence of the border wall violates this sacred artifact, as well as the American Indian Religious Freedom Act of 1978 and the Native American Graves Protection Act of 1990. As sovereign indigenous nations, the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) confirms the right of indigenous peoples to maintain connections to their homelands and peoples across international borders and states that to not allow open connections to one's tribe is a human rights violation. However, international human rights law is not currently recognized in the U.S., and therefore, at the present time, many tribes who span the U.S.- Mexico border typically cross just for ceremonial and feast days (National Park Service, 2021; United Nations, 2007).

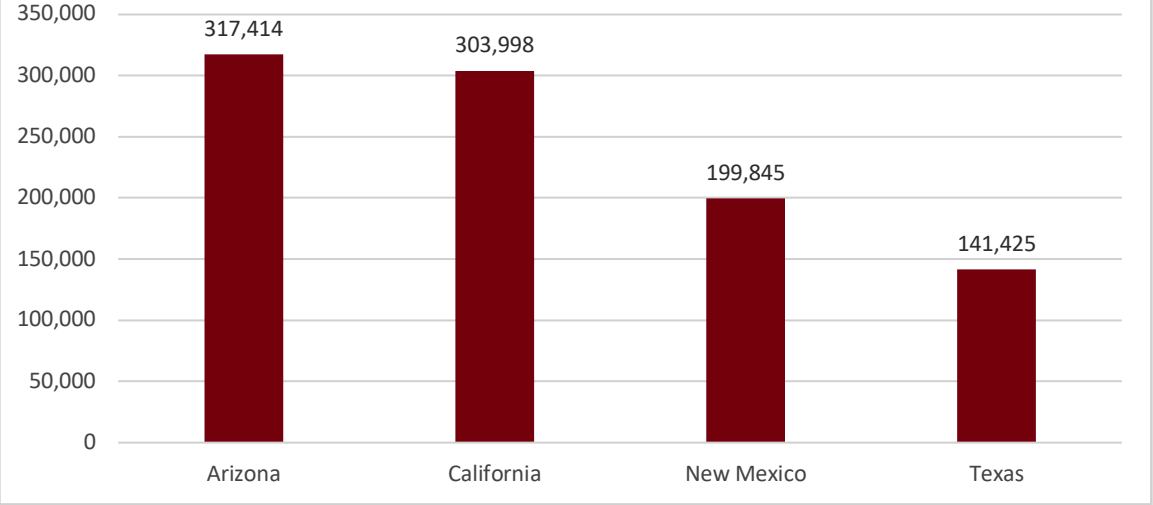
Table 30. Tribal Nations Along the U.S.-Mexico Border

| State | Name of Tribes | Number of Tribes/ Reservations |
|---|---|---|
| **Arizona** | Cocopah<br>Pascua Yaqui<br>Quechan<br>Tohono O'Odham | 4 tribes |
| **California** | Barona Band of Mission Indians*<br>Campo Kumeyaay Nation*<br>Capitan Grande Reservation (land)<br>Ewiaapaayp Band of Kumeyaay Indians<br>Inaja-Cosmit Band of Mission Indians<br>Jamul Indian Village<br>La Jolla Band of Luiseno<br>La Posta Band of Mission Indians<br>Los Coyotes Band of Cahuilla and Cupeno Indians<br>Manzanita Band of Kumeyaay Nation<br>Mesa Grande Band of Indians<br>Pala Band of Mission Indians<br>Pauma Band of Mission Indians<br>Pechanga Band of Luiseno Indians<br>Rincon Band of Luiseno Indians | 18 tribes/19 reservations |

| | | |
|---|---|---|
| | San Pasqual Band of Mission Indians<br>Iipay Nation of Santa Ysabel<br>Sycuan Band of the Kumeyaay Nation<br>Viejas Band of the Kumeyaay Indians* | |
| **Texas** | Kickapoo Traditional Tribe of Texas<br>Ysleta Del Sur Pueblo | 2 tribes |
| **US-Mexico Border** | Cucapa (Cocopah)<br>Kikapu (Kickapoo)<br>Kumiai (Kumeyaay)<br>Paipai<br>San Francisquito (Tohono O'Odham) | |

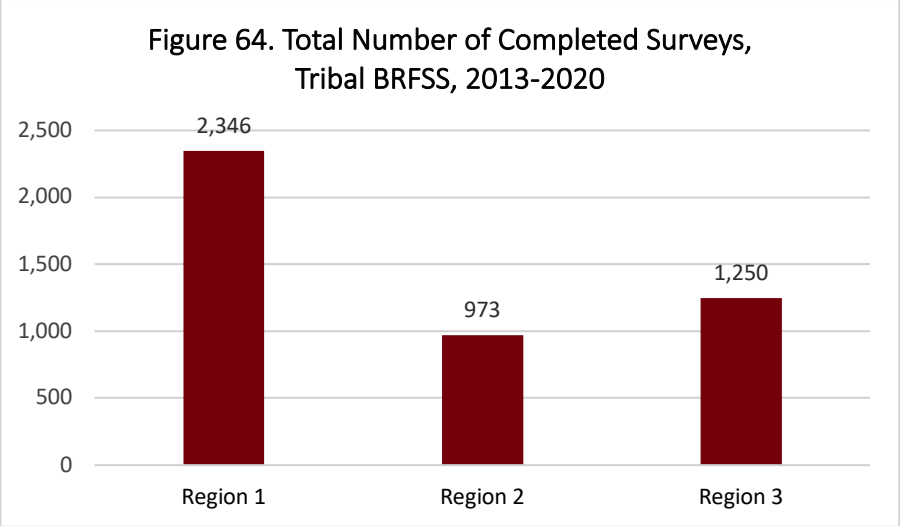
First counted on the United States Census in 1860, the American Indian/Alaska Native population increased from 5.2 million to 9.7 million between 2010 and 2020, an 86.5% increase. In 2021, 15 states had American Indian/Alaska Native populations of at least 100,000. According to the U.S. Census, the majority (78%) of American Indian/Alaska Native persons live away from tribal lands, with 22% residing on reservations or other trust lands. Sixty percent live in metropolitan areas, and 40% live in rural areas. American Indians in combination with Alaska Natives represent 2.9% of the U.S. population. Four of the fifteen states with American Indian/Alaska Native populations of a least 100,000 (California, Oklahoma, Arizona, Texas, and New Mexico) are border states and account for more than one-third of the total U.S. American Indian/Alaska Native population.

Figure 63. American Indian Population in Border States, American Community Survey, US Census Bureau, 2019




*Data for American Indian population extracted from the U.S. Census Bureau, 2021*

Based on the 2020 Census, 3.7 million people identify as only American Indian/Alaska Native in the U.S., 5.9 million identify as a combination of one race or more, and 9.7 million identify as either American Indian/Alaska Native alone or a combination of one race or more. According to the 2020 Census, individuals who identify as only American Indian/Alaska Native comprise the second largest population of multiple states, including New Mexico, at 8.9 % of the state's population. The American Indian/Alaska Native population has increased slightly over time to 3.7 % of the overall Arizona population, 1.6% of the overall California population, and 1.1% of the overall Texas population.




The Tribal Behavioral Risk Factor and Surveillance Survey (TBRFSS) has been adapted by American Indians for use in American Indian populations in the U.S. In this section, American Indian Health, we report data from 4,569 completed surveys conducted by selected tribal areas in border states. Each region has different health priorities based on adapted BRFSS surveys conducted by their respective tribal epidemiology center.

The mission of tribal epidemiology centers (TECs) is "to improve the health status of American Indians and Alaska Native people by identification and understanding of health risks and inequities, strengthening public health capacity, and assisting in disease prevention and control." There are 12 TECs in the U.S., and each serves the federally recognized tribes within one of the 12 Indian Health Service (IHS) areas where it is located. In addition to disease investigation, these centers also work on disease prevention and management efforts, conduct tribal public health emergency preparedness and disaster response efforts, and collaborate tribal efforts with other public health authorities. See the map on p. 59. (Please note, El Paso, TX, and Ysleta Del Sur Pueblo are part of Albuquerque Area Southwest.)

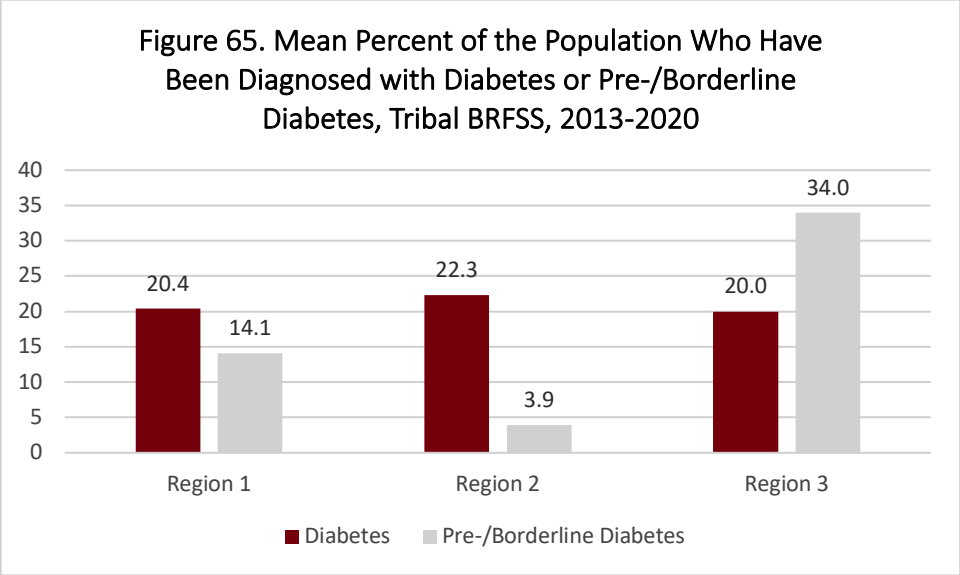
Below we report on socioeconomic status, general health and health conditions, tobacco use, and access to healthcare.

*Data for American Indian surveys extracted from Tribal BRFSS, 2013 - 2020*

## ***General Health and Health Conditions***

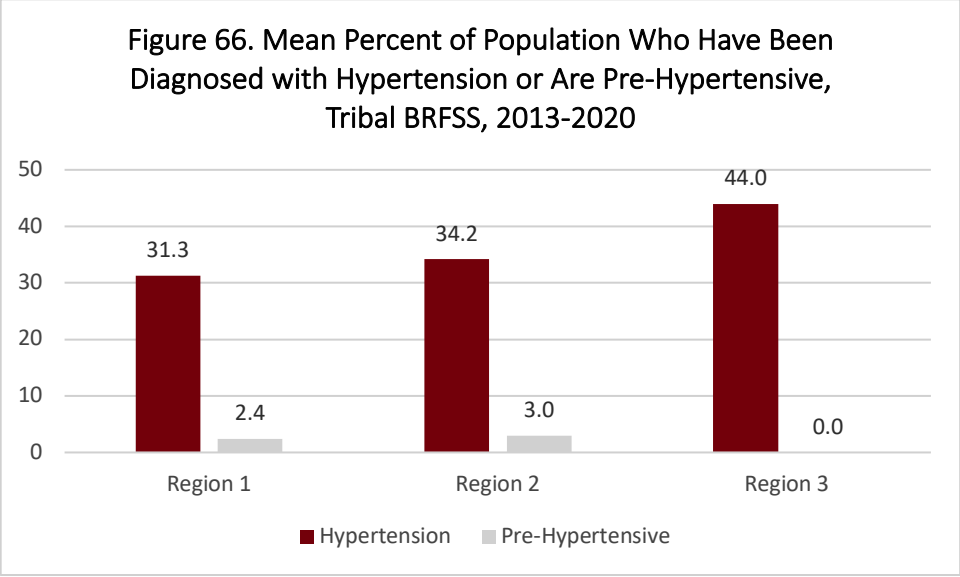
### Diabetes or Pre-Diabetes Prevalence

Compared with all other racial and ethnic groups in the U.S., American Indians/Alaska Native populations have a lower life expectancy and higher rates of death from chronic health conditions such as diabetes, at 3.2-times higher than the overall population (IHS, 2019). Overall, the percent of the population with diabetes was consistent in several tribal regions in the border area (20.4%, 22.3%, and 20%); the regions all reported that about one in five individuals have been diagnosed with diabetes.



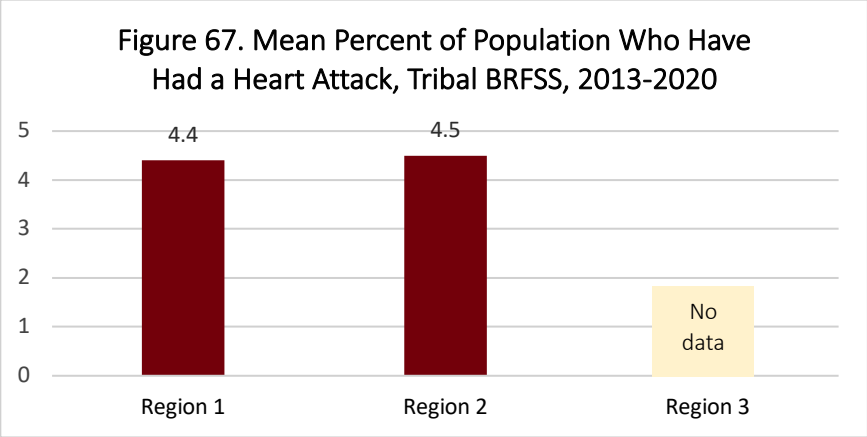

### Hypertension or Pre-Hypertension Prevalence

American Indian/Alaska Native adults were 10% more likely than non-Hispanic white adults to have high blood pressure (OMH, 2021).



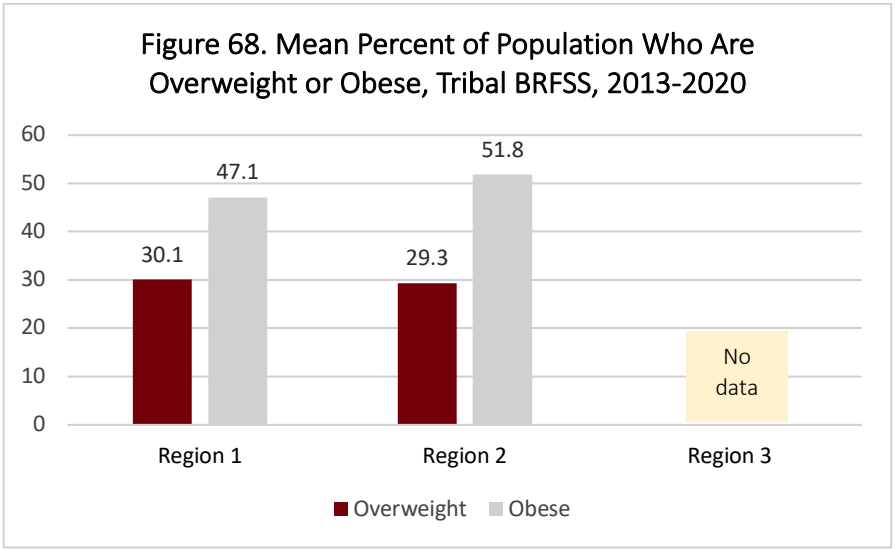
### Heart Attack Prevalence

American Indians/Alaska Native people die from heart disease at rates 1.3-times higher than those of all other races and ethnic groups (IHS, 2019). Their increased incidence of obesity and cigarette smoking, which are risk factors for heart disease, likely contribute to this increased mortality risk (OMH, 2021). The percent of the population who experienced a heart attack was consistent across the two tribal regions in the border area for which data were available (4.5% and 4.4%).




### Overweight or Obese

American Indian/Alaska Native adults are 50% more likely to be obese than non-Hispanic whites, and American Indian/Alaska Native adolescents are 30% more likely than non-Hispanic white adolescents to be obese (OMH, 2021). About three in four American Indian/Alaska Native individuals were considered overweight or obese in tribal regions in the border area for which data were available.




*Data for general health and health conditions extracted from Tribal BRFSS, 2013 - 2020*

**Limitations Due to Disability**

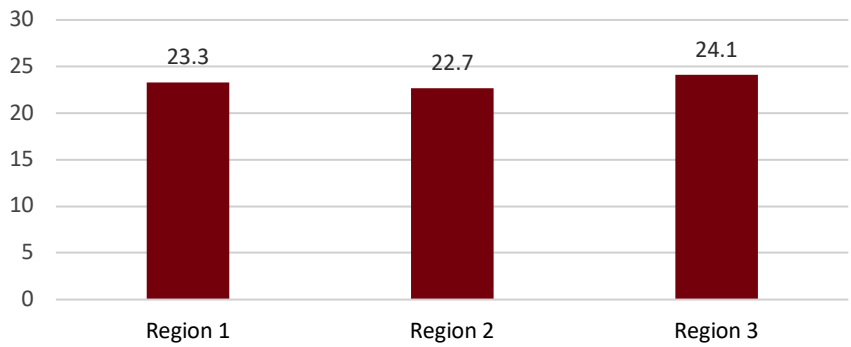
The risk of depression among America Indians/Alaska Native individuals is three times higher than the general population, they have a two-times higher risk of suicide, and a six-times higher risk for alcohol use disorder than the general population. Although some of this increased risk is said to be linked to genetics, much of it is linked to historical trauma, which has led to years of inequity. This effect is exacerbated in the border region, where families and tribal nations are separated by citizenship and border wall issues and are no longer able to freely partake in tribal life as they once were (Sandoiu, 2020).

"*Historical trauma is like generational post-traumatic stress."* -Dr. R. Dale Walker, Cherokee

COVID-19 significantly affected the American Indian/Alaska Native population, not just physically but from a mental health perspective as well. Limited access to healthcare, over-crowded and multigenerational housing, high rates of poverty and chronic disease, and limited access to clean water and grocery stores were some of the issues that contributed to 34% of American Indian/Alaska Native residents compared to 21% of white residents being at risk for severe illness from COVID-19. In New Mexico, although the American Indian population accounted for 8% of the overall population, COVID-19 deaths accounted for over 60% of all deaths. These statistics took a mental health toll on American Indian/Alaska Native residents. In the 2020 tribal BRFSS, 29% of American Indians/Alaska Native adults reported having a mental health illness. "Native/Indigenous people in America report experiencing serious psychological distress 2.5 times more than the general population" (Mental Health America, 2020).

Due to increased death rates from the pandemic, as of May 2021, American Indians/Alaska Native persons have a higher COVID-19 vaccination rate than any other racial/ethnic group in the United States, in both rural and urban areas. The "strong sense of responsibility to protect the Native community and cultural ways" was the reason behind the success of the vaccine rollout (National Indian Council on Aging, 2021).

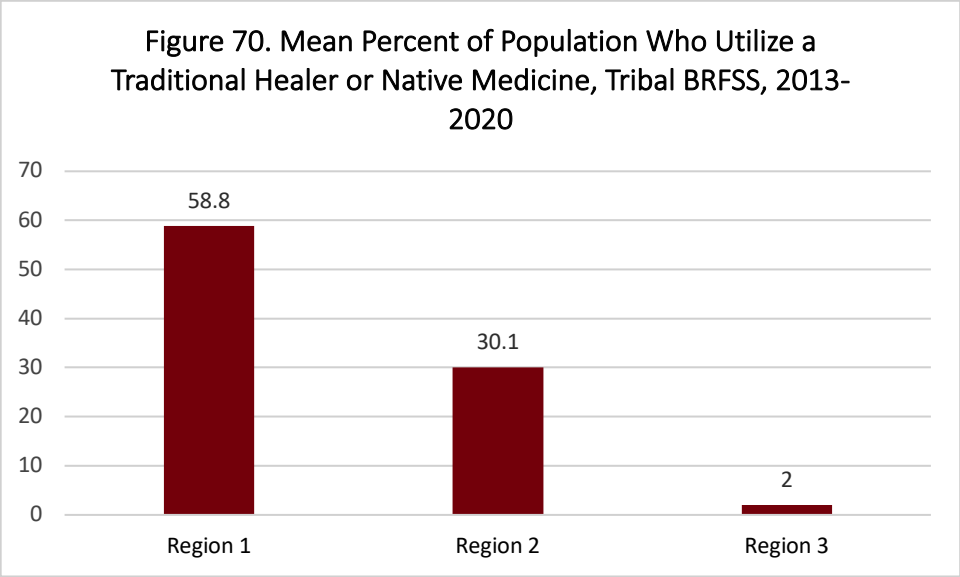
Figure 69. Mean Percent of Population Who Reported Being Limited Due to a Physical, Mental, or Emotional Problem, Tribal BRFSS, 2013-2020




*Data for disability extracted from Tribal BRFSS, 2013 - 2020*

## Traditional Healer or Native Medicine Use

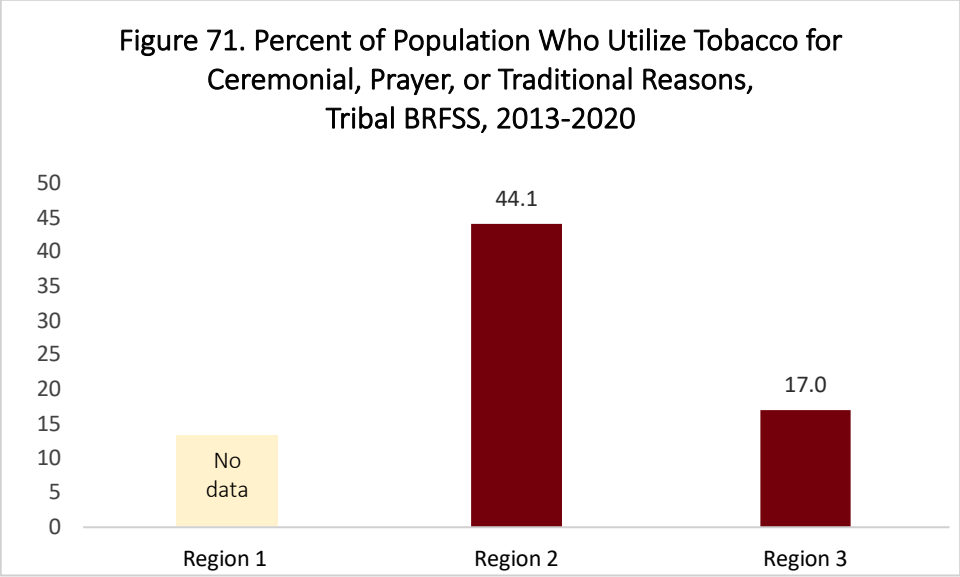
American Indians/Alaska Native communities have combined research-based modern medicine with traditional healing ceremonies for centuries. Traditional healing refers to various practices ranging from smudging for cleansing and purification and the use of traditional plants and herbs to the use of a sweat lodge for purification and healthy living. Native healing ceremonies are sacred and spiritual. Traditional healing ceremonies may only be conducted by Native Healers or a Native Healer facilitator. The Native healing tradition is about connecting the physical body to the spiritual, as the body and spirit must be healthy together for wellness (National Library of Medicine, 2021). Based on the TBRFSS data that was reported, the use of traditional healers or native medicine remains commonplace in tribal regions along the border area.




*Data for traditional healer and native medicine extracted from Tribal BRFSS, 2013 - 2020*

### Tobacco Use for Ceremonies, Prayer, or Tradition

American Indians/Alaska Native groups have a high prevalence of and risk factors for mental health and suicide, unintentional injuries, obesity, and substance use. “These symptoms extend to future generations with anxiety, depression, reduced coping mechanisms, and impulsive behavior. Substance use disorders and suicide incidence are increased” (Sandoiu, 2020). Tobacco, however, has been used by American Indian cultures for centuries for ceremonial, religious, spiritual, and medicinal purposes. American Indians/Alaska Native populations have the highest prevalence of cigarette smoking compared to other racial and ethnic groups in the United States; however, many studies do not distinguish between ceremonial and recreational use (Odani et. al, 2017). It is critical to distinguish between ceremonial/traditional tobacco use and recreational/commercial tobacco use. Many tribes maintain cultural connectedness and pass down generational sharing of traditions and stories on the origins of tobacco. In many tribes, the preparation of traditional tobacco is an honor left to the tribal elders, who are dedicated to keeping it sacred (Northern California Indian Development Council, 2022; CDC, 2019). Respondents from Region 1 reported the use of chewing tobacco more than smoke tobacco, but there was no data reported for this region for the TBRFSS question “Do you use tobacco for ceremonial, prayer, or traditional reasons?”




*Data for tobacco extracted from Tribal BRFSS, 2013 - 2020*

# Appendices

## Appendix A: Technical Notes

### Data Sources

CDC Behavioral Risk Factor Surveillance System (BRFSS)

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual telephone-based survey that collects information about health behaviors and healthcare use from about 400,000 U.S. residents. The survey began in 1984 and is the "largest continuously conducted health survey system in the world." Border states' data was provided to the Rural and Minority Health Research Center directly from each state (Arizona, California, New Mexico, and Texas). To allow adequate estimations for subgroups within the four-state area, we aggregated data across the 2015-2019 period. For additional information about BRFSS data, please visit: https://www.cdc.gov/brfss/index.html

For the analyses presented in this report, a total of 202,474 BRFSS entries were available in the years of data provided by the border states. All analyses were restricted to persons with valid information regarding a) whether they lived in the border region, b) metropolitan (urban) versus non-metropolitan (rural) county of residence, and c) Hispanic versus non-Hispanic ethnicity, for a total of 192,932 responses. Within this group, 26,360 respondents lived in border counties and 166,617 lived in other counties in the border states. For each specific topic, analyses were limited to valid responses, excluding persons who replied "don't know" or refused to answer.

Note: BRFSS values for sex and race/ethnicity are those reported by the respondent. The question regarding sex asks "Are you male or female?" (Question LL07); no other options, such as "sex at birth," are routinely provided. The race/ethnicity questions, including interviewer prompts, are as follows:

- Ethnicity:
  - Questions C08.02: Are you Hispanic, Latino/a, or Spanish Origin? If the respondent answers "yes," they are given four options: 1] Mexican, Mexican/American, Chicano/a; 2] Puerto Rican; 3] Cuban; 4] Another Another Hispanic, Latino/a, or Spanish origin.
- Race:
  - Question C08.03: Which one or more of the following would you say is your race? Options are read to the interviewee: 1] White; 2] Black or African American; 3] American Indian or Alaska Native; 4] Asian 5] Pacific Islander. Subsets are available under the Asian and Pacific Islander categories.
  - Question C08.04: This question asks persons who indicated multiple races which category "best represents your race?"

Tribal BRFSS data

Because the national BRFSS does not adequately sample data from American Indian/Alaska Native populations, many tribal groups have elected to use the BRFSS format to survey their own populations. Tribal BRFSS data was given to the Rural and Minority Health Research Center directly by three tribal areas located in the border states. Detailed information about the names or precise locations of these areas is protected information and is not provided in this Chartbook.

The survey respondents and years surveyed in the TBRFSS differ from the national BRFSS (see Table A-1, below). Tribal BRFSS data from Region 1 included 2,346 completed surveys from 2013 and 2016. Tribal BRFSS data from Region 2 contained 973 completed surveys from 2013 only. Tribal BRFSS data from Region 3 contained 1,250 completed surveys from 2016 and 2020. For additional information about tribal areas, please visit: https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=62

Table A-1. Data from the Tribal Behavioral Risk Factor Surveillance Survey (TBRFSS) in the Border Area

| Region 1 | Region 2 | Region 3 |
|---|---|---|
| 2,346 completed surveys | 973 completed surveys | 1,250 completed surveys |
| Data Year(s): 2013 and 2016 | Data Year(s): 2013 | Data Year(s): 2016 and 2020 |

CDC PLACES Tool

The CDC PLACES Tool is a collaboration between CDC, the Robert Wood Johnson Foundation (RWJF), and the CDC Foundation. The PLACES Tool was created for local health departments and similar jurisdictions to visualize spatial differences in health outcomes. The PLACES Tool assists users in planning public health interventions. Population-level analyses incorporate census tract information, including ZIP Code Tabulation Areas (ZCTAs), across the United States. The PLACES Tool evolved from the 500 Cities Project, which provided estimates for disease risk factors, health outcomes, and preventive services utilization for the 500 largest U.S cities. For additional information about CDC PLACES, please visit: https://www.cdc.gov/places/index.html

CDC WONDER

All mortality data were obtained from the U.S.-Mexico Border Multiple Cause of Death files, accessible through CDC WONDER. The ability to specifically identify border counties through CDC WONDER was added in 2019, at the request of the Border Commission. To ensure

sufficient observations for stable estimates across multiple groups and for detailed diagnoses, we obtained mortality rates calculated over a five-year period, 2015-2019.

| Causes of death and inclusive codes |
|---|
| Diseases of heart (I00-I09,I11,I13,I20-I51) |
| Malignant neoplasms (C00-C97) |
| Accidents (unintentional injuries) (V01-X59,Y85-Y86) |
| Alzheimer disease (G30) |
| Cerebrovascular diseases (I60-I69) |
| Chronic lower respiratory diseases (J40-J47) |
| Diabetes mellitus (E10-E14) |
| Chronic liver disease and cirrhosis (K70,K73-K74) |
| Intentional self-harm (suicide) (*U03,X60-X84,Y87.0) |
| Influenza and pneumonia (J09-J18) |
| Essential hypertension and hypertensive renal disease (I10,I12,I15) |
| Nephritis, nephrotic syndrome and nephrosis (N00-N07,N17-N19,N25-N27) |
| Septicemia (A40-A41) |
| Parkinson disease (G20-G21) |
| Pneumonitis due to solids and liquids (J69) |
| Assault (homicide) (*U01-*U02,X85-Y09,Y87.1) |

Anticipated life span was calculated from CDC WONDER data using the County Health Rankings Mortality and Life Expectancy Calculator, available at:

https://www.countyhealthrankings.org/resources/mortality-and-life-expectancy-calculator

Estimated life span and mortality rates are presented for five race/ethnicity categories: Hispanic decedents of any race, and non-Hispanic Asian/Pacific Islander, American Indian/Alaska Native, Black, and white decedents. For brevity, "non-Hispanic" is not repeated throughout the report but defined here. CDC requires that each subcategory have at least 20 deaths over the period studied to calculate age-adjusted mortality rates. In some cases, for example, a single county or a small population group (e.g., such as rural, border, Asian American/Pacific Islander residents), this threshold is not met, even when estimating mortality rates across a five-year period. Instances in which a mortality rate could not be calculated are noted as appropriate.

Race/ethnicity issues in death reporting: Because we present race/ethnicity-specific mortality data, it is important to address the accuracy of this information. Analyses conducted by the National Center for Health Statistics have found that the level of accuracy for white and Black race designations approaches 100% (Arias, et. al., 2016). For Asian/Pacific Islander and Hispanic populations, errors are relatively low at the national level, and correction for errors only minimally affects white/other comparisons (for example, a national adjustment only increased Hispanic death rates from 74% to 76% and Asian/Pacific Islander deaths from 57% to 59% of the white rates). The rate of error for Asian/Pacific Islander and Hispanic decedents is lowest in areas where these groups are a large proportion of the population, which is the case for the border region. American Indian/Alaska Native mortality calculations, however, may

underestimate the true mortality rate within this population. For additional information about CDC WONDER, please visit:
https://wonder.cdc.gov/wonder/help/main.html#What%20is%20WONDER

Cecil G. Sheps Center for Health Services Research

The Cecil G. Sheps Center for Health Services Research (Sheps Center) is a research center at the University of North Carolina, Chapel Hill. The Center collects information on various topics, including hospital closures. Data utilized in this Chartbook were obtained and analyzed by UNC faculty at the Sheps Center. For additional information about the Sheps Center, please visit:
https://www.shepscenter.unc.edu/about-us/

HRSA Area Health Resource File 2019

The Area Health Resources Files (AHRF) include data from over 50 sources primarily focused on healthcare facilities and healthcare professional shortages, including physicians, nurses, and dentists. Additional information collected includes hospital utilization and expenditures. Data are available at the county, state, and national levels. The AHRF is released every fiscal year by the Bureau of Health Workforce. For additional information, please visit:
https://data.hrsa.gov/topics/health-workforce/ahrf

Robert Wood Johnson Foundation County Health Rankings

Robert Wood Johnson Foundation data used in this Chartbook include County Health Rankings & Roadmaps (CHR&R), which includes factors that influence health and support community leaders working to improve health and increase health equity. The Rankings include almost every county in all 50 states. The CHR&R is an initiative of the University of Wisconsin Population Health Institute. For additional information, please visit:
https://www.countyhealthrankings.org/

USDA Food Environment Atlas

The Food Environment Atlas provides information on the availability of food, food choice, and health. Additional information is focused on participants in government programs that addresses food insecurity, such as the Supplemental Nutrition Assistance Program (SNAP). For additional information, please visit: https://www.ers.usda.gov/data-products/food-environment-atlas/

**Key Definitions**

Border states and counties are identified as those along the United States and Mexico border (Arizona, California, New Mexico, and Texas). Border counties are those identified in the 1983 La Paz Agreement.

Rurality is based on the National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties. For this Chartbook, the urban category consists of metropolitan areas, and the rural category consists of non-metropolitan/non-core/micro counties. The 2013 NCHS Urban-Rural Classification Scheme for Counties used in this Chartbook is based on the Office of Management and Budget's (OMB) February 2013 "delineation of metropolitan statistical areas (MSA) and micropolitan statistical areas."

Ethnicity is considered as Hispanic or non-Hispanic based on the U.S. Census definition: "Hispanic origin can be viewed as the heritage, nationality, lineage, or country of birth of the person or the person's parents or ancestors before arriving in the United States. People who identify as Hispanic, Latino, or Spanish may be any race."

**Healthcare Professional Shortage Area Status Definitions**

Healthcare Professional Shortage Areas (HPSAs) are designated by the Health Resources and Services Administration, U.S. Department of Health and Human Services. HPSA designations have two overall types. First, certain facilities are automatically defined as shortage institutions for purposes such as National Health Services Corps loan repayment; these facilities include Federally Qualified Health Centers, Rural Health Clinics, and other facilities treating at-risk populations. Second, and relevant for this Chartbook, areas such as counties can be designated as HPSAs based on a combination of provider availability and population need.

- Primary care HPSA status is calculated using four criteria: the population-to-provider ratio, the percent of the population below 100% of the Federal poverty level (FPL), infant health as measured by the infant mortality rate or low birth weight rate, and time to the nearest source of care out of the area being assessed.
- Dental care HPSA status is based on four criteria, with an oral health focus: the population-to-provider ratio, the percent of the population below 100% of the FPL, water fluoridation status in the community, and time to the nearest source of care out of the area.
- Mental health HPSA status uses the broadest set of criteria. As with primary and dental care, the mental health HPSA status is based on the population-to-provider ratio, the percent of the population below 100% of the FPL, and time to the nearest care out of the area. It also examines the percent of the population over age 65, percent of the population under age 18, alcohol abuse prevalence, and substance abuse prevalence.

At the county level, which is used in this Chartbook, a county may lack healthcare professionals in its entirety (whole-county HPSA), only part of the geographic area may lack appropriate professionals (partial-county HPSA), or no parts of the county may lack providers (HPSA status of "none"). Data on HPSA designations are provided by the Health Resources and Services administration and were downloaded from the Rural Health Information Hub (https://www.ruralhealthinfo.org/).

**Data Analysis**

All descriptive statistics, including statistical significance tests, were conducted using STATA 17. Statistical significance tests were conducted for the three primary interests in this Chartbook: border/non-border, rural/urban, and Hispanic/non-Hispanic. Differences were considered statistically significant if the p-value was less than .05

**Accuracy of Results and Data Limitations**

All screenings included in the Chartbook (e.g., mammograms, colorectal cancer screenings, Pap tests, etc.) were based on recommendations made by the United States Preventive Services Task

Force (USPSTF) during 2015-2019, to coincide with the data used. Screenings for colorectal cancer were updated in 2021 to begin at age 45 instead of 50 (the age used in this Chartbook). For additional information on USPSTF recommendations, please visit: https://uspreventiveservicestaskforce.org/uspstf/

Missingness: It should be noted that we eliminated potential variables that are important social determinants of health based on 10% or greater missing responses.

## Appendix B. Additional Data

Table B-1. Racial/ethnic identification of border county residents, 2019, by state*

| | Percent of county residents who identify as: | | | | |
|---|---|---|---|---|---|
| County | Hispanic, any race | Non-Hispanic Black | Non-Hispanic American Indian/Alaska Native | Non-Hispanic Asian/Native Hawaian/ Pacific Islander | Non-Hispanic White |
| Arizona | | | | | |
| Cochise County | 35.7 | 3.8 | 1.8 | 2.7 | 54.8 |
| Pima County | 37.8 | 3.4 | 4.4 | 3.6 | 51.2 |
| Santa Cruz County | 83.3 | 0.4 | 1.4 | 0.9 | 15.0 |
| Yuma County | 64.6 | 1.9 | 2.3 | 1.8 | 30.1 |
| California | | | | | |
| Imperial County | 85.0 | 2.4 | 2.5 | 2.3 | 10.0 |
| San Diego County | 34.1 | 4.7 | 1.3 | 13.2 | 45.0 |
| New Mexico | | | | | |
| Dona Ana County | 68.8 | 1.6 | 2.3 | 1.5 | 26.7 |
| Grant County | 50.4 | 0.8 | 2.5 | 1.0 | 45.8 |
| Hidalgo County | 58.0 | 1.1 | 1.5 | 0.8 | 38.9 |
| Luna County | 67.9 | 1.0 | 2.5 | 1.3 | 28.5 |
| Otero County | 38.6 | 3.4 | 8.3 | 1.8 | 48.3 |
| Sierra County | 31.0 | 0.6 | 3.1 | 1.1 | 64.0 |
| Texas | | | | | |
| Brewster County | 45.2 | 1.3 | 1.8 | 1.9 | 49.8 |
| Brooks County | 91.4 | 0.5 | 0.7 | 1.2 | 6.8 |
| Cameron County | 90.0 | 0.4 | 0.7 | 0.9 | 8.6 |
| Crockett County | 66.0 | 0.5 | 2.4 | 1.1 | 31.3 |
| Culberson County | 72.9 | 1.6 | 2.5 | 2.2 | 21.7 |
| Dimmit County | 87.6 | 1.1 | 0.8 | 0.8 | 10.2 |
| Duval County | 89.3 | 1.0 | 0.9 | 0.6 | 8.8 |
| Edwards County | 55.3 | 0.5 | 2.4 | 0.7 | 42.3 |
| El Paso County | 82.9 | 3.1 | 1.1 | 1.6 | 11.6 |
| Frio County | 79.9 | 3.0 | 1.0 | 2.8 | 14.1 |
| Hidalgo County | 92.5 | 0.4 | 0.5 | 1.1 | 5.9 |
| Hudspeth County | 76.9 | 3.0 | 2.0 | 1.7 | 17.2 |
| Jeff Davis County | 32.3 | 0.6 | 1.5 | 1.6 | 62.9 |
| Jim Hogg County | 92.7 | 0.6 | 0.7 | 0.6 | 5.5 |
| Kenedy County | 73.3 | 2.2 | 1.7 | 1.7 | 20.3 |

| | | | | | |
|---|---|---|---|---|---|
| Kinney County | 62.1 | 1.1 | 1.6 | 0.8 | 34.3 |
| La Salle County | 87.0 | 0.7 | 0.9 | 0.5 | 11.1 |
| McMullen County | 42.1 | 2.2 | 0.5 | 0.7 | 53.8 |
| Maverick County | 95.1 | 0.3 | 1.8 | 0.7 | 2.7 |
| Pecos County | 69.0 | 3.9 | 1.4 | 1.4 | 24.8 |
| Presidio County | 82.0 | 1.0 | 1.7 | 3.1 | 12.9 |
| Real County | 27.8 | 0.9 | 2.0 | 0.8 | 68.4 |
| Reeves County | 74.6 | 4.9 | 1.0 | 1.6 | 18.2 |
| Starr County | 96.4 | 0.1 | 0.4 | 0.3 | 3.3 |
| Sutton County | 63.8 | 0.4 | 1.4 | 0.6 | 35.1 |
| Terrell County | 51.4 | 1.0 | 3.6 | 1.2 | 43.2 |
| Uvalde County | 72.7 | 0.7 | 1.2 | 1.0 | 25.2 |
| Val Verde County | 82.3 | 1.4 | 1.0 | 1.1 | 14.7 |
| Webb County | 95.4 | 0.3 | 0.6 | 0.7 | 3.6 |
| Willacy County | 88.5 | 1.9 | 0.7 | 0.9 | 8.5 |
| Zapata County | 94.7 | 0.3 | 0.5 | 0.3 | 4.6 |
| Zavala County | 94.0 | 0.6 | 1.1 | 0.4 | 4.9 |

*Percents may not add to 100% due to rounding and due to exclusion of persons who identify as multiracial

**Table B-2. Total Deaths and Age-Adjusted Mortality per 100,000 residents Due to COVID-19 (ICD 10 code U.071), 2020**

| Location | Deaths | Age-Adjusted Mortality per 100,000 residents | 95% Confidence Interval | |
|---|---|---|---|---|
| | | | Lower | Upper |
| **Border** | | | | |
| Total | 11,487 | 124.0 | 121.7 | 126.3 |
| By rurality: | | | | |
| Urban counties | 10,217 | 119.2 | 116.8 | 121.5 |
| Rural counties | 1,270 | 186.3 | 175.9 | 196.7 |
| By race/ethniciy | | | | |
| Hispanic, any race | 8,839 | 232.6 | 227.7 | 237.5 |
| Non-Hispanic: | | | | |
| American Indian/Alaska Native | 109 | 180.8 | 146.1 | 215.5 |
| Asian/Pacific Islander | 240 | 45.3 | 35.4 | 45.8 |
| Black | 151 | 64.6 | 54.0 | 75.2 |
| White | 2,113 | 43.4 | 41.5 | 45.3 |
| **Nonborder** | | | | |
| Total | 61,976 | 79.4 | 78.8 | 80.0 |
| By rurality: | | | | |
| Urban counties | 55,033 | 76.6 | 75.9 | 77.2 |
| Rural counties | 6,943 | 113.6 | 110.8 | 116.4 |
| By race/ethniciy | | | | |
| Hispanic, any race | 25,442 | 145.3 | 143.4 | 147.2 |
| Non-Hispanic: | | | | |
| American Indian/Alaska Native | 2,062 | 278.0 | 265.7 | 290.3 |
| Asian/Pacific Islander | 4,570 | 58.2 | 56.5 | 59.9 |
| Black | 5,427 | 97.8 | 95.2 | 100.5 |
| White | 24,349 | 51.8 | 51.2 | 52.5 |

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