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Findings Brief
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Cancer and Cardiovascular Disease Rates in the Rural Counties of the U.S. Delta Region: Mapping Tool

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BACKGROUND

Nearly 10 million people live in an area of the United States known as the Delta Region.[1] The Delta Region is made up of 252 counties/parishes[2] near the lower Mississippi River in eight states (Alabama, Arkansas, Illinois, Kentucky, Louisiana. Mississippi, Missouri, and Tennessee). It has high rates of economic distress, persistent poverty, and markers for poor health outcomes. Of the 252 counties, 178 are rural/non-metro and 74 are urban/metro defined using 2020 Core Based Statistical Areas.[3]

In 2020, 234 Delta counties were economically distressed counties.[4] Sadly, as poverty and poor health are often intertwined, the Delta Region also has a history of having poorer health outcomes compared to the rest of the nation.[5] Decades ago, these communities faced higher rates of hunger and infectious disease, and now, obesity and diabetes have taken root. Residents of the Delta Region have significantly higher rates of cardiovascular disease and cancer than the rest of the nation—particularly among rural and Black residents.[5,6]

The Delta Region was originally designated by Congress in 1988 through the Lower Mississippi Delta Development Act[7] to provide federal assistance to the poorest region in the country. In 2000, Congress established the Delta Regional Authority (DRA), which serves the region by coordinating and investing federal funding in the Delta counties.[8] As most of the region is rural, the Federal Office of Rural Health Policy is one of the federal agencies investing in the health of the people of the Delta Region by enhancing health care delivery and addressing unmet health care needs and prevalent health disparities. Examples of HRSA grant programs in the Delta Region include the Delta Region Community Health Systems Development Project, the Delta States Rural Development Network Grant Program, and the Delta Region Rural Health Workforce Training Program.

To assist with these and other initiatives, we created an interactive, web-based mapping tool and provide data on rates of cancer and cardiovascular diseases[9] across the Delta Region, which have previously been shown to be 10-20% higher than peer counties (non-Delta counites in a Delta state) and the rest of the U.S., respectively.[5,10] Users can access maps and data tables. Health data specific to rural Delta Region is hard to find. The DRA provides one of the few resources of publicly available health data for the Delta Region. The DRA *Today's Delta*[11] report includes obesity, diabetes, physical inactivity, and health insurance measures, but these data are limited to four health measures and do not provide rural and urban differences. With our website, users can access 13 health indicators, with county-level rates stratified by rural and urban. Users can compare disease rates among their counties to other Delta counties. Data for metro Delta counties are also available and can be included or excluded based on the user's needs.

How to Use the Tool

Use this tool to compare rates by county, by rural-urban status, to peer counties, to the national average, to national quartiles, by the Health Resources and Services Administration (HRSA) regions, and by states. We've included features that allow users to

- Download images and data.
- Compare groups of rural and urban Delta counties.
- Visualize rates based on levels of incidence (darker colors equal greater incidence).
- Select which levels of incidence to feature on the map. For example, users can opt to show only counties with the highest incidence.
- Focus on any of the 12 HRSA-defined service regions in the Delta Region (e.g., Alabama Region A).
- Hover over each county to learn the county name, incidence, and HRSA service region.
- Click on a county and immediately be taken to a data spreadsheet with all the data.
- Filter to look at county data by state(s), rural/urban, Delta Region (yes/no).

Race and Ethnicity – State Charts

The Delta Region has a history of slavery, racial segregation, discrimination.[12] This legacy and the population demographics make race a particularly salient issue in studying and addressing challenges in the region. Cardiovascular disease and cancer are leading causes of death for all races, but Black people are 30 percent more likely to die prematurely from cardiovascular disease than Whites, and Black men are twice as likely as White men to die of stroke.[13] Most states in the Delta Region have higher proportions of Black residents than the U.S. average. Table 1 shows the Delta states populations by race in 2019 compared to the U.S average. County-level disease incidence and mortality rates by race are difficult to capture and report with public data due to small sample sizes and privacy issues (suppressed data). While not as granular as we could like, we are able to present rural and urban race and ethnicity for many populations at the state-level. The website includes a chart pack of age-adjusted mortality by race/ethnicity and rural status for eight health conditions from 2015 to 2019 in the U.S. Delta Region states. We analyzed data for the following conditions: bladder cancer, breast cancer, colorectal cancer, kidney cancer, lung cancer, skin cancer, prostate cancer, and major cardiovascular disease. The figures are stratified by race and ethnicity and rurality. We used the following race and ethnicity categories: Black or African American, White, Asian or Pacific Islander, American Indian or Alaska Native, Hispanic or Latino, and Not Hispanic or Latino. Metro included areas classified as Large Central Metro, Large Fringe Metro, Medium Metro, or Small Metro. Non-metro included areas classified as Micropolitan or Non-Core. Searches were conducted by stratifying each condition by state and race or ethnicity. Race (Black, White, Asian/Pacific Islander, and American Indian/Alaska Native) and ethnicity (Hispanic and Not Hispanic) were searched separately. Data representing ten or fewer people are suppressed. Data representing fewer than 20 people are marked as unreliable and thus not presented here. All data were retrieved from the Centers for Disease Control and Prevention (CDC) WONDER database.

Reading the Map

In the map, darker blue colors denote higher rates based on national quartiles; thus, by assessing the overall color prevalence, the user can see how the distribution among Delta counties compares to the national distribution. Urban/ metro counties are grey. Counties where data are suppressed are light green. Hover over counties to see individual county name, rate, and HRSA Delta Region. Click on a county to see the data table.

Table 2 provides definitions and data sources related to the maps and measures.

Impact of Small Populations

Population numbers for rural (nonmetro) Delta Region counties range from 1,327 (Issaquena County, Mississippi) to 82,124 (St. Landry Parish, Louisiana). Rates for counties with **smaller populations** are affected in two ways. First, the rate is automatically suppressed for any county with 10 or fewer cases in the period, and the rate is deemed “unstable” with fewer than 20. We combined both these categories to create a single *suppressed* category. The impact of data suppression varies. Up to 37% of Delta counties had suppressed data for some conditions -- bladder cancer (60 counties suppressed), breast cancer (4), Colon cancer (5), kidney cancer (43), lung cancer (1), skin cancer/melanoma (65), prostate cancer (6).

Second, and more fundamentally, counties with smaller populations (and thus smaller denominators) have more variability in their rates; a couple of cases can have a much larger impact on the rate for small counties than for large counties. Statistically, we expect lower-population counties to have the highest (and lowest) rates, so the maps should be interpreted with that in mind.

DATA SOURCES

Cancer incidence rates. We used the age-adjusted incidence rates per 100,000 by cancer site for 2013-2017 using Centers for Disease Control and Prevention (CDC) U.S. Cancer Statistics. We selected eight cancer sites based on those with the most complete data and highest incidence across the region. We include incidence rates for all-sites (combined cancer incidence), bladder cancer, breast cancer, colon cancer, kidney cancer, lung cancer, melanoma, and prostate cancer.

Cardiovascular-related incidence and prevalence rates. The diabetes and obesity prevalence rates for adults aged 20 and above are from the CDC (2017).[14,15] Diabetes incidence rates per 1,000 population are also included (2017).[16] Cardiovascular disease and stroke hospitalization rates are per 1,000 Medicare Beneficiaries aged 65 and older, 2015-2017.[17]

State Mortality Rates: The state mortality rates are from the 2019 CDC Multiple Cause of Death File.[18]

Table 1. Population Estimates for Delta States with Race and Ethnicity, Percentages, July 1, 2019[19]

	AL	AR	IL	KY	LA	MO	MS	TN	US
Population estimates	4,903,185	3,017,804	12,671,821	4,467,673	4,648,794	6,137,428	2,976,149	6,829,174	328,239,523
Race (%)									
White alone	69.1%	79.0%	76.8%	87.5%	62.8%	82.9%	59.1%	78.4%	76.3%
Black or African American alone	26.8%	15.7%	14.6%	8.5%	32.8%	11.8%	37.8%	17.1%	13.4%
American Indian and Alaska Native alone	0.7%	1.0%	0.6%	0.3%	0.8%	0.6%	0.6%	0.5%	1.3%
Asian alone	1.5%	1.7%	5.9%	1.6%	1.8%	2.2%	1.1%	2.0%	5.9%
Native Hawaiian and Other Pacific Islander alone	0.1%	0.4%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.2%
Two or More Races	1.8%	2.2%	2.1%	2.0%	1.8%	2.4%	1.3%	2.0%	2.8%
Ethnicity (%)									
Hispanic or Latino	4.6%	7.8%	17.5%	3.9%	5.3%	4.4%	3.4%	5.7%	18.5%
White alone, not	65.3%	72.0%	60.8%	84.1%	58.4%	79.1%	56.4%	73.5%	60.1%

Table 2. Definitions and Sources

Label	Definition
Incidence	Incidence is the rate at which new events occur in a population. The numerator is the number of new events that occur in a defined period; the denominator is the population.
Prevalence	Prevalence is the total number of all individuals who have an attribute or disease at a particular time (or during a particular period) divided by the population.
Quartile	Data for each indicator are displayed in quartiles - four groups based on the distribution of the national data. The first quartile has the lowest 25% of the values; the second quartile has between 25% and 50%; the third quartile has between 50% and 75%; and the fourth quartile has the highest 25% of the values. Displaying the data by quartiles shows the user the relative severity of the indicator compared to national data.

Table 2. Definitions and Sources (Continued)

Label	Definition	Data Source
Delta Region	The Delta Region is a region in the southern United States made up of 252 counties and parishes in eight states—the Mississippi River Delta and Alabama regions. States include Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee.	Map Room. Delta Regional Authority. Available at: https://dra.gov/about-dra/map-room/.
Metro/ Non-metro	The Office of Management and Budget (OMB) designates counties as Metropolitan, Micropolitan, or Neither. A Metro area contains a core urban area of 50,000 or more population, and a Micro area contains an urban core of at least 10,000 (but less than 50,000) population. All counties that are not part of a Metropolitan Statistical Area (MSA) are considered rural. Micropolitan counties are considered non-Metropolitan or rural along with all counties that are not classified as either Metro or Micro.	Core based statistical areas for 2020; U.S. Office of Management and Budget and U.S. Census Bureau; 2018.
All-Sites Cancer Incidence	Rate of new cancers (incidence) for all sites combined per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC) and National Cancer Institute (NCI), released in June 2020. Available at: https:// www.cdc.gov/cancer/uscs/dataviz/ download_data.htm.
Bladder Cancer Incidence	Rate of new urinary/bladder cancers (incidence) per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. DHHS, CDC and NCI, released in June 2020. Available at: https:// www.cdc.gov/cancer/ uscs/dataviz/ download_data.htm.
Breast Cancer Incidence	Rate of new female breast cancers (incidence) per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. DHHS, CDC and NCI, released in June 2020. Available at: https:// www.cdc.gov/cancer/ uscs/dataviz/ download_data.htm.
Colon/Rectum Cancer Incidence	Rate of new colon/rectum cancers (incidence) per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. DHHS, CDC and NCI, released in June 2020. Available at: https:// www.cdc.gov/cancer/ uscs/dataviz/ download_data.htm.
Kidney Cancer Incidence	Rate of new kidney cancers (incidence) per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. DHHS, CDC and NCI, released in June 2020. Available at: https:// www.cdc.gov/cancer/ uscs/dataviz/ download_data.htm.

Table 2. Definitions and Sources (Continued)

Label	Definition	Data Source
Lung Cancer Incidence	Rate of new lung and bronchus cancers (incidence) per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. DHHS, CDC and NCI, released in June 2020. Available at: https:// www.cdc.gov/cancer/ uscs/dataviz/ download_data.htm.
Melanoma Incidence	Rate of new melanoma (incidence) per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. DHHS, CDC and NCI, released in June 2020. Available at: https:// www.cdc.gov/cancer/ uscs/dataviz/ download_data.htm.
Prostate Cancer Incidence	Rate of new prostate cancer (incidence) per 100,000 people age adjusted to the 2000 U.S. Standard population. Includes all races/ ethnicities and male and female. 2013-2017.	U.S. Cancer Statistics Working Group. U.S. Cancer Statistics, based on 2019 submission data (1999-2017): U.S. DHHS, CDC and NCI, released in June 2020. Available at: https:// www.cdc.gov/cancer/ uscs/dataviz/ download_data.htm.
Cardiovascular Disease Hospitalization Rate (Medicare Beneficiaries)	Total cardiovascular disease hospitalization rates are per 1,000 Medicare Beneficiaries age 65 and older, all races/ethnicities, male and female, 2015-2017.	CDC. Interactive Atlas of Heart Disease and Stroke. 2015-2017. Available at: http:// nccd.cdc.gov/ DHDSP Atlas. Accessed on [8-12-2020].
Stroke Hospitalization Rate (Medicare Beneficiaries)	Total ischemic stroke hospitalization rates are per 1,000 Medicare Beneficiaries age 65 and older, all races, male and female, 2015-2017.	CDC. Interactive Atlas of Heart Disease and Stroke. 2015-2017. Available at: http:// nccd.cdc.gov/ DHDSP Atlas. Accessed on [8-12-2020].
Diabetes Incidence Rate	Newly diagnosed diabetes cases per 1,000 population total, adults aged 20+ Years, age-adjusted percentage	Newly Diagnosed Diabetes. U.S. Diabetes Surveillance System. CDC. 2017. Available at: https:// gis.cdc.gov/grasp/diabetes/ DiabetesAtlas.html#
Diabetes Prevalence Rate (%)	Percent of adults (age 20+) diagnosed with diabetes, age-adjusted percentage, 2017.	Diagnosed Diabetes. U.S. Diabetes Surveillance System. CDC. 2017. Available at: https:// gis.cdc.gov/grasp/diabetes/DiabetesAtlas.html
Obesity Prevalence Rate (%)	Percent of adults (age 20+) with a body mass index (BMI ≥ 30), age-adjusted percentage, 2017.	Obesity. U.S. Diabetes Surveillance System. CDC. 2017. Available at: https://gis.cdc.gov/grasp/ diabetes/ DiabetesAtlas.html

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