The 3rd Annual SE Healthcare Improvement Case Competition

The Future of Healthcare Delivery in the Southeast

Institute for Healthcare Improvement
Open School

EMORY UNIVERSITY

Managing Chronic Disease Burden

"We've gone from a preponderance of acute and infectious disease as a source of premature death to chronic diseases, which are the preponderance of the burden of illness in most of the world."

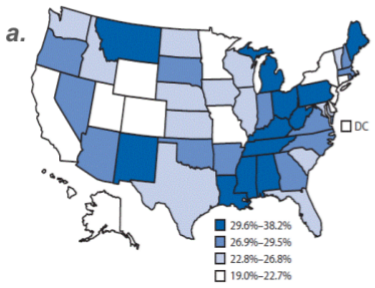
— Harvey V. Fineberg, M.D., Ph.D., Board Chair of Gordon and Betty Moore Foundation

The prevalence of chronic diseases is on the rise throughout the United States. Common conditions like diabetes, hypertension, and hyperlipidemia not only increase the risk of mortality but also contribute to the incidence of serious health issues such as heart attacks, strokes, and kidney disease. As of 2018, 51.8% of non-institutionalized U.S. adults, totaling 129 million individuals, have at least one chronic condition. Moreover, 27.2% of U.S. adults, amounting to 68 million people, suffer from two or more chronic conditions.[1]

A 2014 report from the Department of Health and Human Services (DHHS) highlighted the burden of multiple chronic conditions (MCC) across the nation, with the Southeast exhibiting the highest average prevalence of diagnosed MCCs.[2] This aligns with previous identifications of states in the "stroke belt" and the "diabetes belt" as regions experiencing chronic disease burdens surpassing the national average (Figure 1).[3,4]

Chronic Disease Burden in the U.S.

a.



b.

Region	Adults with diagnoses of MCC % (95% CI)					
		Sex		Age (yrs)		
	Total	Male	Female	18–44	45–64	≥65
United States	**25.7 (25.08–26.42)**	**24.1 (23.24–25.06)**	**27.2 (26.36–28.13)**	**7.3 (6.72–7.84)**	**32.1 (30.91–33.27)**	**61.6 (60.14–63.11)**
East North Central	28.4 (26.53–30.35)	25.3 (22.92–27.80)	31.4 (28.90–34.00)	9.1 (7.38–11.09)	34.5 (31.40–37.64)	65.8 (61.50–69.77)
East South Central	34.5 (31.89–37.16)	32.3 (28.50–36.35)	36.3 (33.14–39.63)	10.0 (7.82–12.77)	45.3 (40.21–50.42)	72.3 (67.15–76.84)
Middle Atlantic	24.1 (22.43–25.85)	24.1 (21.75–26.54)	24.1 (21.93–26.49)	6.5 (5.19–8.17)	27.0 (24.20–29.95)	58.1 (53.94–62.19)
Mountain	24.9 (22.40–27.54)	21.5 (18.78–24.59)	28.1 (24.75–31.64)	6.3 (5.02–8.01)	32.6 (28.44–37.01)	62.2 (57.24–66.86)
New England	26.5 (23.95–29.14)	23.6 (20.03–27.63)	29.0 (25.45–32.78)	6.4 (3.98–10.09)	29.1 (24.90–33.59)	59.6 (53.23–65.65)
Pacific	21.4 (19.94–22.95)	20.9 (18.92–23.04)	21.9 (19.91–24.02)	6.1 (5.05–7.26)	27.8 (25.10–30.62)	58.6 (54.59–62.47)
South Atlantic	26.5 (24.79–28.37)	24.8 (22.43–27.27)	28.1 (25.92–30.44)	7.8 (6.50–9.22)	31.8 (28.99–34.67)	60.8 (57.50–64.07)
West North Central	23.4 (21.16–25.70)	21.2 (18.46–24.21)	25.3 (22.54–28.26)	5.1 (3.64–7.17)	31.7 (28.48–35.18)	58.1 (53.26–62.70)
West South Central	26.4 (24.73–28.17)	25.8 (23.20–28.52)	27.0 (24.75–29.43)	7.7 (6.26–9.32)	36.3 (32.51–40.26)	63.1 (58.63–67.43)

Figure 1: Chronic Disease Burden in the U.S. (a) Geographic distribution of adults with multiple chronic diseases by state from a 2014 National Health Interview Survey and (b) by region.[2]

Source: Ward, B. W. (2016). State and Regional Prevalence of Diagnosed Multiple Chronic Conditions Among Adults Aged ≥18 Years—United States, 2014. MMWR. Morbidity and Mortality Weekly Report, 65. https://doi.org/10.15585/mmwr.mm6529a3

Abbreviations: CI = confidence interval; MCC = multiple chronic conditions.
* Adults with diagnoses of MCC are persons who had been told by a health care professional that they had two or more of the following 10 conditions: arthritis; asthma (current); cancer; chronic obstructive pulmonary disease which includes emphysema (ever), chronic obstructive pulmonary disease (ever), or chronic bronchitis (past 12 months); coronary heart disease; diabetes; hepatitis (ever); hypertension; stroke; or weak/failing kidneys (past 12 months).

Undoubtedly, social determinants of health (SDOH) play a pivotal role in contributing to poor outcomes and disparities, particularly affecting poorer patients residing outside metropolitan areas who may bear a heightened burden of chronic diseases. Additionally, racial and ethnic disparities further exacerbate the situation, with minorities facing up to twice the risk of chronic diseases.[5] Disparities in health outcomes are intertwined with factors such as educational level, access to healthy foods, and levels of physical activity.[6] The consequences extend beyond the direct costs associated with treating diseases, including expenses for medicines, procedures, and hospitalizations, to indirect costs like lost productivity and impaired mobility.[7]

A Government Accountability Office study revealed that a substantial portion, over 54%, of the $383.6 billion government healthcare spending in 2018 was allocated to treating cerebrovascular disease, cancer, and diabetes alone.[8] The cumulative direct and indirect costs of all chronic conditions to the U.S. annually range from tens of billions to trillions of dollars, depending on the information source.[9,10]

And, to underscore the significance of SDOH, it is essential to recognize that only 10-15% of preventable mortality could potentially be avoided through improvements in the quality of medical care.[11]

Additional Resources:

2018 Milken Institute Report
2021 United States Government Accountability Organization Report

HIV in the South

"We will stand with you every step of this journey until we reach the day that we know is possible, when all men and women can protect themselves from infection; a day when all people with HIV have access to the treatments that extend their lives; the day when there are no babies being born with HIV or AIDS, and when we achieve, at long last, what was once hard to imagine -- and that's an AIDS-free generation."

— Barack Obama, President of the United States, World AIDS Day 2013

Over 1 million people in the United States live with HIV, and more than 30,000 new cases are diagnosed each year.[12] HIV is a virus that attacks the immune system and can progress to acquired immunodeficiency syndrome (AIDS), a chronic and potentially life-threatening disease. Left untreated, the infection results in a 90% death rate within 8 to 10 years.[13] However, significant progress has been made in the past two to three decades with the development of highly effective antiretroviral therapies (ART). ART can reduce HIV viral load to zero, preventing both virus transmission and disease progression. Now, with prompt identification and treatment, individuals with HIV can expect a normal lifespan, although some side effects from ART, lingering HIV, and other comorbidities may persist.[14] Cessation of ART, however, leads to a return to disease progression.

Despite the advancements in ART, the South still bears a considerable HIV burden, accounting for about 47% of HIV-related deaths in 2016.[15] This higher mortality rate is likely attributed to lower awareness of the disease burden compared to other regions in the U.S.[16] Additionally, the South represents 52% of all new annual HIV diagnoses (Figure 2).[17]

Of note, five of the fourteen states identified by the CDC with high HIV prevalence are located in the South, including Florida, Georgia, North Carolina, Louisiana, and Texas. These geographical disparities are closely tied to socioeconomic factors like poverty, limited healthcare access, and longstanding stigmas.[17]

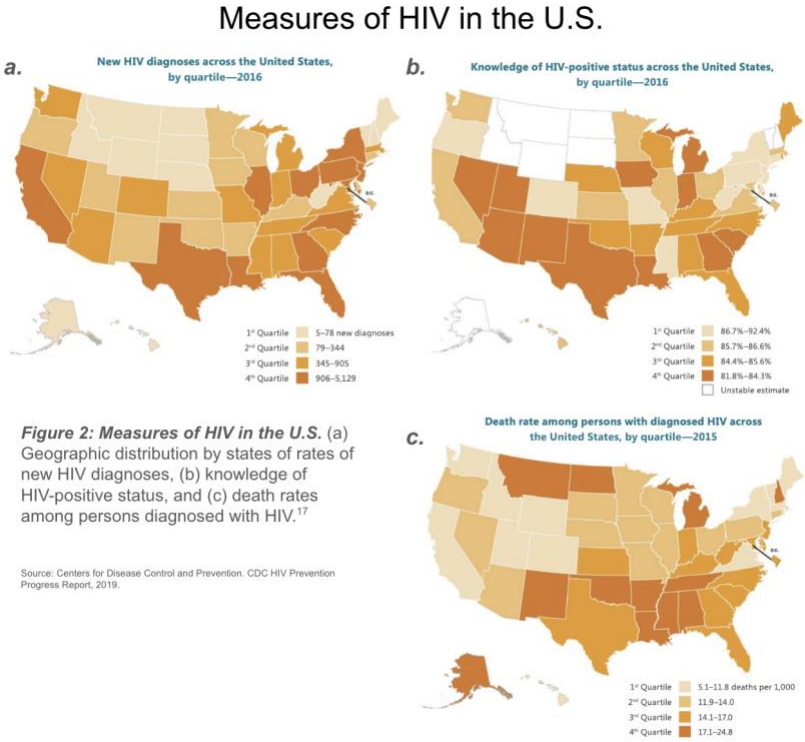


Figure 2: Measures of HIV in the U.S. (a) Geographic distribution by states of rates of new HIV diagnoses, (b) knowledge of HIV-positive status, and (c) death rates among persons diagnosed with HIV.[17]

Source: Centers for Disease Control and Prevention. CDC HIV Prevention Progress Report, 2019.

Additional Resources:

2019 CDC Report

Behavioral Health & Substance Use Treatment

"For generations, society's treatment of mental health has been based on a lie: The problem is yours alone, so the fix is yours, too. This stigmatizes and often criminalizes people struggling with their health. We know better now."

- Patrick Kennedy, Former U.S. House of Representatives and Mental Health Advocate

Mental health conditions affect 1 in 5 adults in the United States, with nearly 50 million adults currently experiencing a mental illness. Despite the prevalence, over half of the adults with mental illness in the U.S. do not receive treatment, leaving more than 27 million individuals without the necessary support.[18]

Mental health challenges were exacerbated during the COVID-19 pandemic, with Southern states particularly bearing the brunt of these issues.[19] Alongside the mental health crisis, in 2021 alone, there were over 100,000 drug overdose deaths in the United States, resulting in an age-adjusted rate of 32.4 per 100,000. Over the past two decades, there has been a fivefold increase in drug overdose deaths.[20]

The demand for behavioral health services, encompassing mental health and substance abuse treatment, has been steadily increasing. However, the Southern region encounters significant barriers to access, including a shortage of mental health professionals, limited funding for mental health programs, and the persistent stigma surrounding mental health issues (Figure 3).[21]

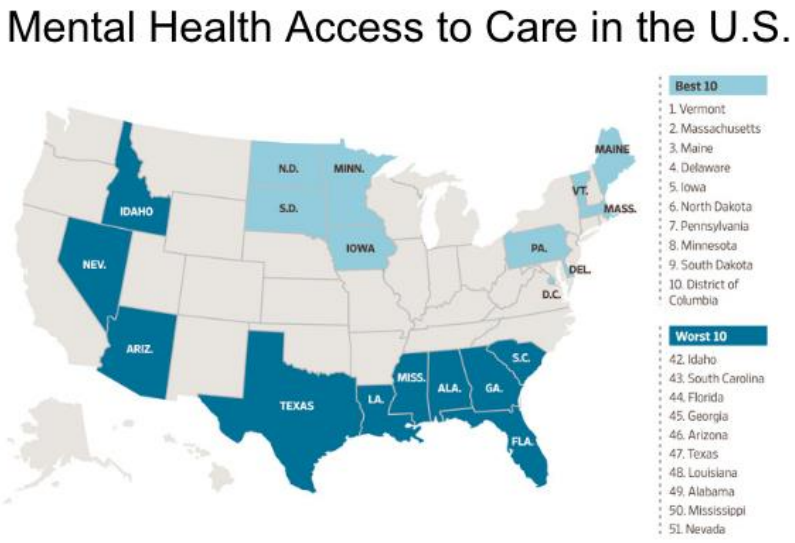


Figure 3: Mental Health Access to Care in the U.S. Rankings of states access to mental health care by Mental Health America via measures including access to insurance, access to treatment, quality and cost of insurance, access to special education, and workforce availability.[18,21]

Source: Where Are the Mental-Health Providers? - WSJ. (n.d.). Retrieved January 9, 2024, from https://www.wsj.com/articles/where-are-the-mental-health-providers-1424145646, Mental Health America

Additional Resources:

2022 SAMHSA Report

Maternal Mortality

"So, let us all say unequivocally: Maternal mortality and morbidity is a serious crisis and one that endangers both public health and economic growth, which means everyone is impacted by it. Because just think about it: Mothers are the backbone of our economy, and their children are the future of our economy.""

— Kamala Harris, Vice President of the United States, 2021

The US witnessed a decline in maternal mortality starting in the early 1930s which can be attributed to medical advancements such as the discovery of antibiotics, safer surgeries, and improved maternal care. However, in the early 2000s, maternal mortality began to rise in the United States and continues to rise today (Figure 4). In 2017, the World Health Organization reported that the United States and the Dominican Republic were the only two countries to experience an increase in maternal mortality since 2000. Currently, the U.S. ranks last among all other industrialized countries.[22]

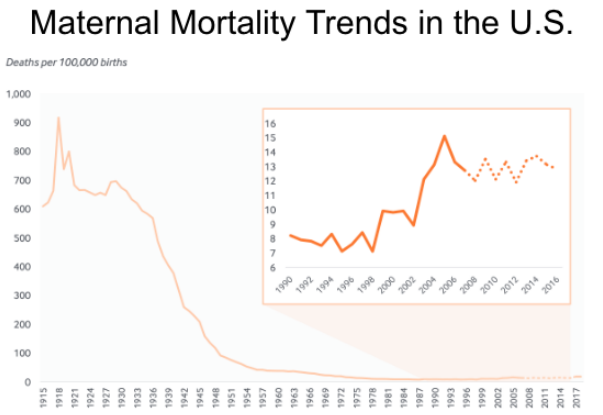


Figure 4: Maternal Mortality Trends in the U.S. Maternal mortality rates have slowly declined since the 1920s, however since the late 90s there has been a slight increase in rates.[22]

Source: Maternal Mortality in the United States: A Primer. (2020, December 16). https://doi.org/10.26099/ta1q-mw24

These trends are particularly pronounced in the South, where high rates of maternal mortality further contribute to the national figures. In 2018, a report by the CDC and the US Department of Health and Human Services revealed that the four southern states — Alabama, Arkansas, Kentucky, and Oklahoma — had the highest rates of maternal morbidity per 100,000 (Figure 5). A 2020 study examining regional variations in maternal mortality across the United States reiterated the South's distinction, reporting the

highest regional maternal mortality rate and a substantial 30% increase during the study period of 2009-2017.[23]

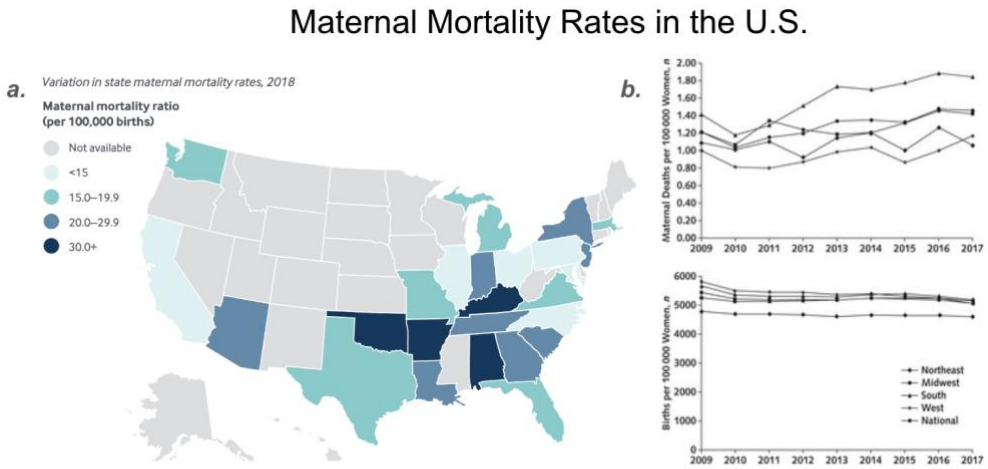


Figure 5: Maternal Mortality Rates in the U.S. (a) Geographic distribution by state of maternal mortality ratios showing higher ratios in the southeastern U.S. (b) and by region compared to birth rates.[22,23]

Source: Maternal Mortality in the United States: A Primer. (2020, December 16). https://doi.org/10.26099/ta1q-mw24, Snyder, J. E., Stahl, A. L., Streeter, R. A., & Washko, M. M. (2020). Regional Variations in Maternal Mortality and Health Workforce Availability in the United States. Annals of Internal Medicine, 173(11 Suppl), S45–S54. https://doi.org/10.7326/M19-3254

Additionally, a 2022 report by the CDC revealed a 3% increase in the infant mortality rate, marking the first rise since 2001.[24] The report identified four states — Georgia, Iowa, Missouri, and Texas — as states that experienced an increase in the infant mortality rate.

The disparities observed in southern states in both maternal and infant mortality rates are influenced by socioeconomic factors. Access to healthcare providers and prenatal care has been analyzed for their impact on these rates, highlighting the need for targeted interventions to address these underlying issues (Figure 6).

Maternal Mortality vs Health Provider Availability

Table 1. Maternal Mortality Rates and Women's Health Provider Availability in 2017, by U.S. Census Region and Nationally

Variable	Rate per 100 000 Women Aged 15-50 Years (95% CI)				
	National	Northeast	Midwest	South	West
Maternal mortality	1.46 (1.37-1.54)	1.06 (0.9-1.24)	1.42 (1.25-1.62)	1.84 (1.69-2.00)	1.17 (1.02-1.33)
Women's health provider availability					
Direct childbirth providers	206.77 (205.76-207.79)	199.73 (197.36-202.13)	236.97 (234.58-239.38)	190.94 (189.36-192.53)	211.04 (208.94-213.15)
Obstetrician-gynecologists	59.65 (59.10-60.19)	74.35 (72.90-75.81)	58.53 (57.35-59.73)	56.57 (55.71-57.44)	54.72 (53.65-55.79)
Family medicine physicians	137.62 (136.79-138.45)	112.91 (111.13-114.72)	168.78 (166.77-170.82)	126.63 (125.34-127.92)	146.31 (144.57-148.07)
Certified nurse-midwives	9.51 (9.29-9.73)	12.47 (11.89-13.08)	9.66 (9.19-10.15)	7.75 (7.43-8.07)	10.01 (9.56-10.47)
Primary care physicians*	295.55 (294.33-296.77)	351.89 (348.73-355.08)	317.15 (314.38-319.94)	260.12 (258.27-261.98)	291.83 (289.37-294.31)
Internal medicine physicians	157.93 (157.04-158.82)	238.98 (236.38-241.60)	148.37 (146.48-150.28)	133.50 (132.17-134.83)	145.52 (143.78-147.27)
All women's health providers	364.71 (363.35-366.06)	438.71 (435.18-442.27)	385.34 (382.29-388.41)	324.44 (322.37-326.52)	356.56 (353.83-359.30)

Variable	Regional-National Rate Ratio (95% CI)				
	National	Northeast	Midwest	South	West
Maternal mortality	1.00 (reference)	0.73 (0.61-0.87)†	0.98 (0.84-1.13)	1.26 (1.14-1.40)†	0.80 (0.69-0.93)
Women's health provider availability					
Direct childbirth providers	1.00 (reference)	0.97 (0.95-0.98)†	1.15 (1.13-1.16)†	0.92 (0.91-0.93)†	1.02 (1.01-1.03)†
Obstetrician-gynecologists	1.00 (reference)	1.25 (1.22-1.27)†	0.98 (0.96-1.00)	0.95 (0.93-0.97)†	0.92 (0.90-0.94)†
Family medicine physicians	1.00 (reference)	0.82 (0.81-0.83)†	1.23 (1.21-1.24)†	0.92 (0.91-0.93)†	1.06 (1.05-1.08)†
Certified nurse-midwives	1.00 (reference)	1.31 (1.24-1.38)†	1.02 (0.96-1.07)	0.81 (0.78-0.85)†	1.05 (1.00-1.11)
Primary care physicians*	1.00 (reference)	1.19 (1.18-1.20)†	1.07 (1.06-1.08)†	0.88 (0.87-0.89)†	0.99 (0.98-1.00)
Internal medicine physicians	1.00 (reference)	1.51 (1.49-1.53)†	0.94 (0.93-0.95)†	0.85 (0.84-0.86)†	0.92 (0.91-0.93)†
All women's health providers	1.00 (reference)	1.20 (1.19-1.21)†	1.06 (1.05-1.07)†	0.89 (0.88-0.90)†	0.98 (0.97-0.99)†

* Includes family medicine physicians and internal medicine physicians.
† Regional results differed from national results at a level unlikely to be due to chance alone ($P < 0.001$), as determined by exact Poisson tests.

Figure 6: Maternal Mortality vs. Health Provider Availability. Maternal mortality rates regionally compared to the health provider availabilities thus showing the impact of access on mortality rates.[23]

Source: Regional Variations in Maternal Mortality and Health Workforce Availability in the United States. Annals of Internal Medicine, 173(11 Suppl), S45–S54. https://doi.org/10.7326/M19-3254

Additional Resources:

2020 The Commonwealth Fund Report
2022 Urban Institute Report
2023 Milken Institute Report

Cancer in the Southeast

"Cancer begins and ends with people. In the midst of scientific abstraction, it is sometimes possible to forget this one basic fact."

— June Goodfield, PhD, British writer, historian, and scientist (The Siege of Cancer, 1975)

On average, Americans face a 40% lifetime risk of developing cancer, with a 20% chance of succumbing to the disease.[25] A significant portion of this risk, approximately 80%, occurs after the age of 55.[26] Individual risk of disease is influenced by various factors, with social determinants of health (SDOH) playing a key role. Notably, a greater burden of social determinants of health correlates with higher cancer mortality, contributing as much as 70% to the overall occurrence of cancer.[27, 28]

For nearly four decades, the American Cancer Society (ACS) has been reporting on cancer disparities, providing a comprehensive view of the landscape in the U.S. over the past few decades.[29] While overall cancer mortality appears to be decreasing, the years of life lost remains stable.[30] The ACS reports a heightened burden of cancer mortality in the Southeast, historically associated with a greater prevalence of tobacco-related cancers in this region.[31] Furthermore, the federal data above underscores significant differences in cancer death rates by race (Figure 9).

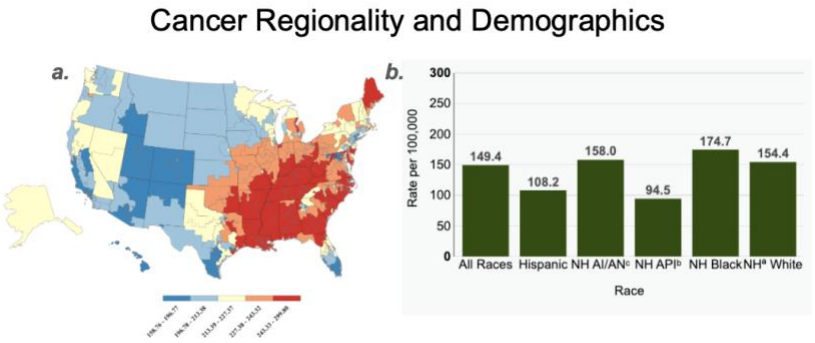


Figure 9: Cancer Regionality and Demographics. (a) Cancer death rates per 100,000 among men by region.[32] (b) Cancer death rates (U.S., 2016-2020) also vary by reported ethnicity.[33]

Sources: Siegel, R. L., Sahar, L., Portier, K. M., Ward, E. M., & Jemal, A. (2015). Cancer death rates in US congressional districts. CA: A Cancer Journal for Clinicians, 65(5), 339–344. https://doi.org/10.3322/caac.21292. Cancer Disparities—Cancer Stat Facts. (n.d.). SEER. Retrieved January 22, 2024, from https://seer.cancer.gov/statfacts/html/.html

Multiple challenges also compound. For instance, during the pandemic, Black and Hispanic individuals were more likely to experience delays in cancer treatment due to COVID-19 infections compared to non-Hispanic White individuals.[34] Additionally, rural women were more likely to receive a cancer diagnosis at a later stage, and rural Americans, in general, encountered barriers in accessing medical and oncologic care.[35, 36] The need to better understand these disparities has led to the founding of research centers like The Winship Center for Cancer Health Equity Research in Atlanta, Georgia. The new center focuses on understanding the factors that drive disparate outcomes for different patient populations.

Additional Resources:

CDC State Cancer Profiles

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