

Diabetes and Forgone Medical Care due to Cost in the U.S. (2011-2015): Individual-level & Place-based Disparities

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Purpose

We had two overall aims in this study. First, we wanted to identify trends in diabetes rates and forgone medical care among those with diabetes across the nation. Second, we wanted to identify geographic determinants (i.e., place-based) and other social determinants of health disparities.

Background

The World Health Organization's (WHO) Framework for Action on the Social Determinants of Health highlights the role of both structural (e.g., socioeconomic and policy-related context) and social determinants of health and health-related outcomes. Thus, both individual-level characteristics and place-based characteristics may play a role in health and health-related outcomes.

Underlying factors (e.g., residing in low-resource rural areas) of health disparities, as with the social determinants of health, have been shown to be associated with poor health-related outcomes for vulnerable populations throughout the U.S. These may include residents of rural areas, individuals that are from racial or ethnic minority populations, and individuals with lower socioeconomic status. Thus, policy makers and other key decision makers can and should consider addressing these underlying factors that may predict negative health and health-related outcomes.

Methods

We used the Behavioral Risk Factor Surveillance System (BRFSS), a nationally representative dataset of non-institutionalized adults that assesses health and health-related outcomes across multiple years. This study used data from 2011-2015 (n = 506,467 for 2011; n = 475,687 for 2012; n = 491,773 for 2013; n = 464,664 for 2014; n = 441,456 for 2015).

Key outcomes included: 1) having ever been told one had diabetes by a health care professional (versus not); and 2) among those with diabetes, assessing whether or not there was a time in the past 12 months when one needed to see a provider but did not because of cost. Diabetes (Type 1 and Type 2 combined—where Type 2 accounts for upwards of 95% of all diabetes) was based on diagnoses in all analyses. Thus, it was not possible to detect undiagnosed diabetes. Therefore, all results are based solely on diagnosed diabetes.

Key Findings

- ◆ Diabetes, particularly Type 2 diabetes, affects millions of Americans with a particular burden placed on more vulnerable populations.
- ◆ Both the South and rural areas faced a greater burden of diagnosed diabetes.
- ◆ Areas that failed to expand Medicaid through the Affordable Care Act (ACA) may face a greater burden of both diabetes and forgone medical care due to cost among those with diagnosed diabetes.
- ◆ Policies that target prevention efforts aimed at the most vulnerable populations are recommended.
- ◆ Programs that focus on proper management of diabetes among those already diagnosed are needed in the South and in rural areas and should be tailored to racial and ethnic minority individuals and those with lower incomes and low education levels.

This policy brief is the first in a series prepared by the Southwest Rural Health Research Center on the topic of diabetes. This brief, including all data and findings, are based on a larger study reported by Towne et al., (2017). Full data (e.g., Tables) are available at: <http://www.mdpi.com/1660-4601/14/5/464>

Key geospatial variables included U.S. Census Region and rurality (4-level). Key individual-level variables included income, sex, education, and race/ethnicity.

Results

Overall, rates of diabetes grew slightly from 2011 at 9.8% to 10.5% in 2015. Among those with diabetes, the rate of forgoing care due to cost was 17.9% in 2011 and 14.7% in 2015 showing a slight decline.

Diagnosed Diabetes

Overall, the percentage of U.S. adults that have ever been told they had diabetes by a health care professional rose with increasing age (e.g., less than 10% among those aged 44 and younger versus greater than 10% among those aged 45 and older), while also higher among those with lower incomes (<\$15,000; at or near 15%) versus the highest (>\$50,000; less than 10%) and higher among those with lower education (above 15% for those without a high school education) versus the highest levels of education (college/technical school graduate; less than 10%).

Overall, the highest rates of diagnosed diabetes were found among American Indian or Alaska Native populations (approximately 15-17%) followed by Black or African American (approx. 13-15%) and Hispanic

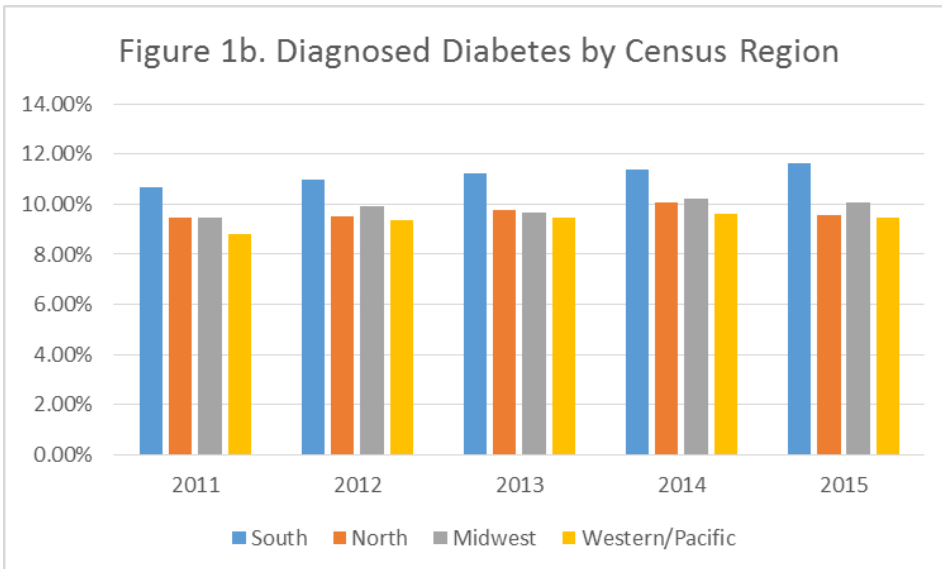
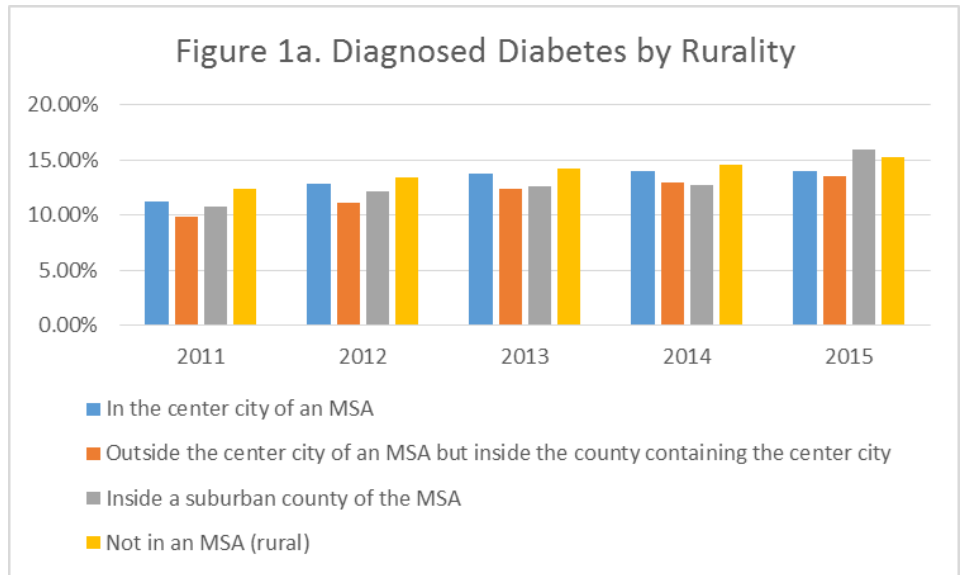
(approx. 10-11%) individuals.

When assessing place-based differences, considering a simple dichotomous variable for rurality we found higher diagnosed diabetes among residents of rural areas (12-15%) versus urban areas (11-14%). A more detailed display of diagnosed diabetes by a 4-level measure of rurality is presented in Figure 1a.

Figure 1b presents diagnosed diabetes by Census Region. Overall, those in the South had higher rates versus those in other regions (by at least 1%).

Forgone Medical Care among those with Diagnosed Diabetes

We found that nearly 18% (2011-2012) of those whom have ever been told by a health care professional/provider that they had diabetes also reported not seeking care in the past 12 months due to cost. This forgone medical care was highest among those with lower age, with rates higher than 30% among those aged 18-24 for 2011 to 2013. Further, rates of forgone medical care were higher among those with lower incomes (<\$15,000; 24-31%) versus the highest (at/greater than \$50,000; less than 10%), and higher for those with lower levels of education (without high school diploma/equivalent; above 20%)



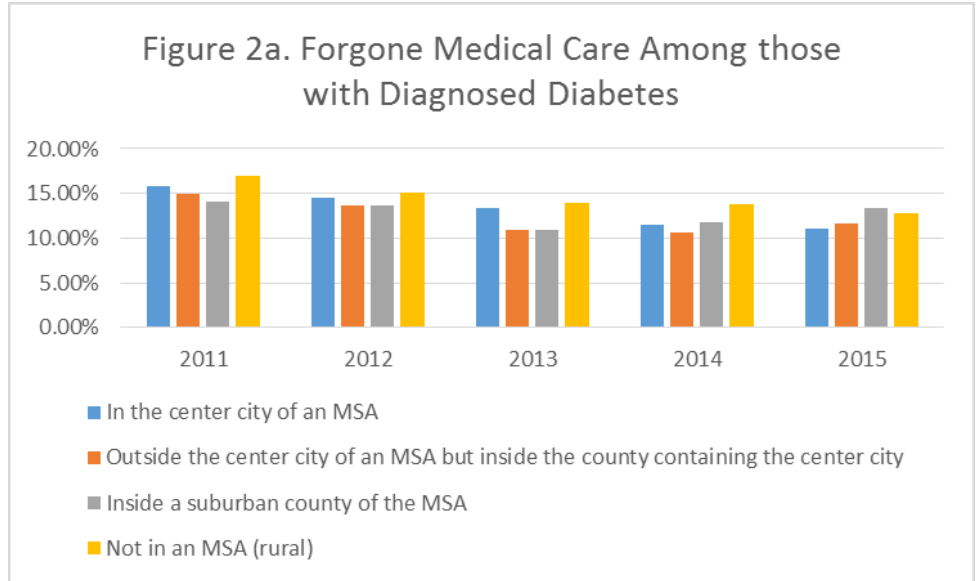
versus all other higher education categories (ranging from 9-18%).

Hispanic individuals with a diabetes diagnosis had the highest rates of forgone medical care (as high as 28% in 2011 and nearly 23% in 2015), followed by American Indian or Alaska Native populations (20-25%) and Black or African American individuals (18-22%) with lower rates for Asian (12-15%) and White (11-14%) individuals.

When assessing place-based characteristics considering a simple dichotomous variable (2-level) for rurality, we find that residents of rural areas with a diagnosis of diabetes had higher rates of forgone medical care (13-17%) than those in urban areas (11-15%). A more detailed display of forgone medical care among those with diagnosed diabetes by a 4-level measure of rurality is presented in Figure 2a.

Further, when assessing differences across Census Region (Figure 2b) among those with a diagnosis of diabetes, we found the highest levels of forgone medical care among residents of the South, with rates higher than 20% in 2011 and 2012 and ranging from approximately 18% to 19% in 2013 to 2015.

We also included a dichotomy of categorizing states that eventually expanded Medicaid through the

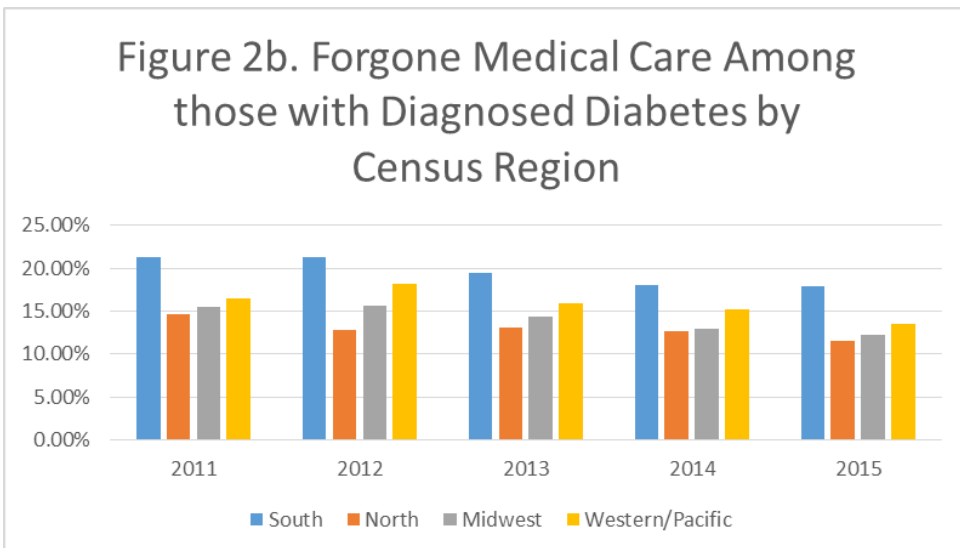


ACA. Over time we found slightly lower rates of diabetes in states categorized as eventual expansion states. At the same time, rates of forgone care among those diagnosed with diabetes were nearly 20% in 2011 for non-expansion states and nearly 16% for states that eventually expanded Medicaid through the ACA reaching 17% and 13% in 2015, respectively.

Discussion

This study highlights the critical role that both individual-level and place-based (i.e., geospatial factors), namely region and rurality, may play in diabetes and forgone medical care among those diagnosed with diabetes.

Key social and geospatial determinants of health continue to play a role in both diabetes and access to medical care. Further, major gaps in both diabetes and access to care face more vulnerable populations with lower incomes and lower education levels. Race and ethnicity also showed stark disparities in diabetes and forgone medical care affecting American Indian or Alaska Native, Black or African American, and Hispanic individuals. Further, forgone treatment can lead to increased health care costs (e.g., ER admissions for preventable complications) and higher morbidity resulting from poor diabetes self-care. Thus, this study provides



an update of diagnosed diabetes across the U.S. and informs targets for action.

Implications

Practical applications of this study include a call for increased focus on prevention, diagnosis, and diabetes self-care education and proper maintenance of diabetes among at-risk populations.

Funding for prevention efforts spanning sectors ranging from health care (e.g., diabetes education, screening/diagnosis) to urban planning focusing on the built environment (e.g., walkable community designs) is critical to preventing diabetes onset and related diseases. Further, support for social and/or community agencies that may help improve access to healthy foods should also be a priority. The integration of multidisciplinary efforts that seek to ameliorate diabetes and disparities facing vulnerable populations is critical and timely.

Also critical are efforts to target proper maintenance of diabetes among those already diagnosed with diabetes in an attempt to lessen preventable complications. These efforts may impact not only health and quality of life, but also high health care costs.

This study can provide actionable information for policy makers and other key stakeholders in terms of providing targets for outreach and funding priorities such as: education around healthy eating and physical activity, especially among at-risk populations; diabetes testing; diabetes self-care programs in communities; policies affecting the built environment and walkable communities, etc. Efforts seeking to target the most at-risk populations may begin by targeting those in the South and in rural areas, while also tailoring interven-

tion strategies for those with lower education levels and lower incomes and those from certain ethnic or minority groups.

Recommendations

Continued monitoring of diabetes rates throughout the nation is recommended in order to evaluate the impact of prevention efforts. While targeting diabetes before it starts in younger age groups (e.g., education around healthy eating and physical activity) is crucial, providing strategies for proper disease maintenance is also recommended, especially among the older adult population.

References

Towne SD Jr, Bolin J, Ferdinand AO, Nicklett EJ, Smith ML, Ory MG. (2017). Assessing Diabetes and Factors Associated with Forgoing Medical Care among Persons with Diabetes: Disparities Facing American Indian/Alaska Native, Black, Hispanic, Low Income, and Southern Adults in the U.S. (2011–2015). *International Journal of Environmental Research & Public Health*. 2017, 14(5), 464; doi:[10.3390/ijerph14050464](https://doi.org/10.3390/ijerph14050464) Available at: <http://www.mdpi.com/1660-4601/14/5/464>

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