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Diabetes mortality rates among African Americans: A descriptive analysis pre and post Medicaid expansion

Christopher J. King[a,*], Jonathan Moreno[a], Susan V. Coleman[b], John F. Williams[a]

[a] Georgetown University, Department of Health Systems Administration, United States of America
[b] Georgetown University, Department of Professional Nurse Practice, United States of America

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ABSTRACT

Background: Compared with other racial and ethnic groups, African Americans are disproportionately burdened by high rates of deaths due to diabetes. Insurance coverage and access to primary care are critical for prevention and chronic disease management.

Purpose: To examine the difference in age-adjusted diabetes mortality rates in African Americans before and after Medicaid expansion.

Methods: Using ICD-10 Cause List E10–E14, age-adjusted diabetes mortality rates among African Americans were extracted from the Centers for Disease Control and Prevention's Compressed Mortality File. Sufficient and reliable data were available for 36 states and the District of Columbia. With a 95% confidence interval, two periods were analyzed: pre-Medicaid expansion - years 2008, 2009, 2010 and post-Medicaid expansion - years 2014, 2015, 2016. Three-year means for both periods were calculated for each state. Differences for each state are presented and contextualized as a state that opted in or out of expanding Medicaid coverage.

Results: There was a slight reduction in diabetes mortality in African Americans (41.14/100,000 pre-expansion and 38.94/100,000 post-expansion). We found variability across states – regardless of expansion status. Differences in rates ranged from a decrease of 15.43/100,000 to an increase of 9.53/100,000. Out of all states that met our criteria, 24 states expanded coverage; age-adjusted diabetes death rates declined in 16 of those states. There were also reductions in eight states that did not expand coverage.

Conclusion: Future research is needed to explore if Medicaid expansion is associated with reductions in diabetes mortality in the African American community.

1. Introduction

Since the passage of the Affordable Care Act (ACA), there has been a downward trend in the incidence of diabetes in the United States and prevalence rates have been fairly stable. According to the most recent data, approximately 30.3 million individuals or 9.4% of the US population is living with the condition and it is the 7th leading cause of death in the general population (Anon, n.d.-a). African Americans continue to be disproportionately burdened; nearly 13% are living with the disease and it represents the 5th leading cause of death in the African American population (Anon, n.d.-a, n.d.-b). Compared with Whites, African Americans are two times more likely to die from diabetes (Anon, n.d.-c).

Treatment for the disease is a significant contributor to approximately 18% of the nation's GDP on healthcare expenses. Associated care is estimated to cost the country $237 billion in direct medical costs annually (Association AD, 2013). Due to late detection and other psychosocial barriers, African Americans are more likely to consume services during tertiary stages, which escalates costs and hinders productivity. They are 4.2 times more likely to develop end stage renal disease, 3.5 times more likely to be admitted to the hospital due to lower extremity amputation, and nearly 2 times more likely to be admitted and discharged from the hospital due to a diabetes related complication (Anon, n.d.-c).

Insurance coverage is a critical component for early detection and effective disease management. Routine clinical services such as HbA1c testing, complete foot exams, and comprehensive dilated eye exams are important for sustaining productivity, reducing diabetes complications, and associated mortality. As a result of the ACA federal mandate, more Americans are likely to benefit from preventive screenings and disease management services due to the expansion of Medicaid, and government subsidies offered through insurance marketplace plans. Nearly 20

* Corresponding author.
E-mail address: ck806@georgetown.edu (C.J. King).

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million nonelderly individuals became newly insured between 2010 and 2015 and insured rates have increased for every state since 2010 (Garrett and Gangopadhyaya, 2016). Non-Hispanic Blacks represent 2.8 million or 15% of the total number (Garrett and Gangopadhyaya, 2016).

While social, economic, and environmental factors outside of the healthcare delivery system influence health status and exacerbate racial differences in health outcomes, the significant gain in the number of African Americans with insurance coverage brings promise for reducing the aggregate number of individuals who die from diabetes. In this investigation, we conduct a descriptive analysis to explore age-adjusted diabetes mortality rates in the non-Hispanic Black population before and after Medicaid expansion. To the best of our knowledge, this is the first state-by-state examination of its kind. It contributes to the literature by offering baseline data to stimulate future research questions and subsequent investigations.

Although the true effects of Medicaid expansion on diabetes mortality may not be realized for some time, we hypothesize a reduction in diabetes mortality post the insurance expansion period – particularly in states that expanded Medicaid eligibility for childless adults (i.e. nonelderly adults with incomes up to 138% of the federal poverty level). Our reasoning is motivated by prior evidence, which suggests Medicaid expansion is linked to a reduction in premature mortality among non-Whites, residents of poorer counties, and older adults (Sommers and Epstein, 2010; Sommers et al., 2014; Wilper et al., 2009). In addition, researchers have found coverage is linked to increased receipt of preventive health services, earlier detection of chronic disease, and more timely access to medication (Wherry and Miller, 2016; Miller and Wherry, 2017; Sommers et al., 2017; Chen et al., 2016; Sommers et al., 2012). Furthermore, newly insured persons in tertiary stages of diabetes or those living with more advanced comorbid disease interactions are likely to benefit from lifesaving interventions via pharmacological therapies and comprehensive diabetes management education.

2. Methodology and data source

Data were extracted from the Compressed Mortality File of the Centers for Disease Control and Prevention (Anon, n.d.-d). The sample was restricted to non-Hispanic Blacks. The primary outcome was age-adjusted death rates due to Diabetes Mellitus during two periods: 2008, 2009, 2010 and 2014, 2015, 2016. Mean mortality rates were determined for years 2008, 2009, and 2010 because the time periods are pre-Medicaid expansion and pre-Affordable Care Act (ACA) legislation. Mean mortality rates for years 2014, 2015, and 2016 were selected because most states that expanded Medicaid did so after January 1, 2014. The sample is restricted to deaths due to diabetes as an underlying cause of death. We restricted our query to ICD-10 Cause List E10–E14, which includes insulin-dependent diabetes mellitus, non-insulin dependent diabetes mellitus, malnutrition related diabetes mellitus, and diabetes NOS. For each state and the District of Columbia, a mean age-adjusted death rate per 100,000 for the three years before the expansion period was calculated, as well as for the three years after expansion. We showcase the difference to explore directional changes in diabetes mortality rates across both periods. States that expanded Medicaid coverage and those that did not expand coverage are identified. Pennsylvania, Louisiana, and Indiana expanded coverage after various initiation periods post January 1, 2014. Those states are still classified as a state that "expanded coverage" in our analysis. AK, HI, IA, ID, ME, MT, ND, NH, NM, RI, SD, UT, VT, and WY were excluded from the sample due to insufficient samples or unreliable data.

3. Results

Overall, our findings were consistent with prior trends. Age-adjusted diabetes mortality rates in African Americans were almost two times higher than the general population across both measurement periods. The trend was fairly consistent across both measurement periods. In the general population, average rates for all states and the District of Columbia was 21.80/100,000 pre-expansion and 21.59/100,000 post-expansion (Table 1). Among African Americans, average rates for all states and the District of Columbia were 41.14/100,000 pre-ACA and 38.94/100,000 post-ACA (Table 1). Overall differences in age-adjusted diabetes mortality rates across all states between the periods 2008–2010 and 2014–2016 ranged from a 15.43/100,000 decrease to a 9.53/100,000 increase. Mortality rates dropped in 24 states; 16 expanded Medicaid (Fig. 1). Rates also dropped in the District of Columbia, which expanded Medicaid. While seven states that expanded coverage experienced worse mortality rates, there were improvements in eight states that did not expand coverage. Six states that did not expand coverage had higher mean mortality rates in the post expansion period. Among states that expanded coverage, Oregon (−15.43), Kentucky (−9.87), New Jersey (−8.27) and Colorado (−7.83) had the most noteworthy reductions. Among states that did not expand coverage, Alabama (−10.37), Tennessee (−9.57), Texas (−6.97) and Nebraska (−5.30) had the most noteworthy reductions (Table 1; Fig. 1). Although Arizona, California, Indiana, Massachusetts, Minnesota, Nevada, and Pennsylvania expanded coverage, rates were worse in those states during the post expansion period. For example, Indiana had a 9.53/100,000 increase. Mean rates also increased in six states that did

Table 1
African American mean age-adjusted mortality rates before and after Medicaid expansion.

State	Mean pre-expansion (2008–2010)	Mean post-expansion (2014–2016)	Change	Medicaid expansion
Alabama	49.50	39.13	−10.37	Not adopted
Arizona	38.67	44.97	6.30	Adopted
Arkansas	47.53	45.30	−2.23	Adopted
California	39.57	40.40	0.83	Adopted
Colorado	39.07	31.23	−7.83	Adopted
Connecticut	29.60	27.90	−1.70	Adopted
Delaware	35.97	29.43	−6.53	Adopted
District of Columbia	35.87	32.50	−3.37	Adopted
Florida	41.97	37.50	−4.47	Not adopted
Georgia	33.40	35.03	1.63	Not adopted
Illinois	35.17	33.43	−1.73	Adopted
Indiana	38.77	48.30	9.53	Adopted
Kansas	40.53	47.17	6.63	Not adopted
Kentucky	51.20	41.33	−9.87	Adopted
Louisiana	46.17	39.43	−6.73	Adopted
Maryland	35.53	30.87	−4.67	Adopted
Massachusetts	23.37	27.97	4.60	Adopted
Michigan	37.67	37.57	−0.10	Adopted
Minnesota	31.57	34.60	3.03	Adopted
Mississippi	52.53	54.13	1.60	Not adopted
Missouri	38.80	34.67	−4.13	Not adopted
Nebraska	55.83	50.53	−5.30	Not adopted
Nevada	19.53	21.57	2.03	Adopted
New Jersey	41.40	33.13	−8.27	Adopted
New York	31.33	30.50	−0.83	Adopted
North Carolina	43.80	43.47	−0.33	Not adopted
Ohio	45.30	42.20	−3.10	Adopted
Oklahoma	53.60	56.37	2.77	Not adopted
Oregon	63.57	48.13	−15.43	Adopted
Pennsylvania	31.13	32.63	1.50	Adopted
South Carolina	44.50	41.53	−2.97	Not adopted
Tennessee	51.53	41.97	−9.57	Not adopted
Texas	39.60	32.63	−6.97	Not adopted
Virginia	36.90	37.13	0.23	Not adopted
Washington	49.63	47.57	−2.07	Adopted
West Virginia	58.47	49.63	−8.83	Adopted
Wisconsin	33.53	39.00	5.47	Not adopted
Total mean	41.140	38.94	−2.2	
General population	21.80	21.59	−0.21	

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