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Medical Care Costs for Diabetes Associated with Health Disparities Among Adults Enrolled in Medicaid in North Carolina

by

Paul A. Buescher, Ph.D.

J. Timothy Whitmire, Ph.D.

Barbara Pullen-Smith, M.P.H.

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the Office of Minority Health and Health Disparities

North Carolina Division of Public Health

Abstract

Objectives: Health disparities for many diseases are large and longstanding in North Carolina and the nation. This study examines medical care costs for diabetes associated with health disparities among adults enrolled in Medicaid in North Carolina during state fiscal year 2007–2008.

Methods: North Carolina Medicaid paid claims and enrollment data were used to calculate the diabetes prevalence rate and medical care expenditures for diabetes for total Medicaid enrollees and for whites, African Americans, and American Indians. Hispanics were not included as a separate category due to a high percentage of missing data on Hispanic ethnicity and a low prevalence of diabetes among Hispanics in North Carolina. The impacts of racial and economic health disparities on medical care costs were calculated by assuming that whites, African Americans, and American Indians enrolled in Medicaid had the same diabetes prevalence rate as whites in the general population, and that medical care expenditures would be reduced in the same proportion.

Results: The diabetes prevalence rate among Medicaid enrollees was 15.7 percent, compared to 9.1 percent for all North Carolina adults. An estimated \$225 million in diabetes-related expenditures could be saved each year by the North Carolina Medicaid program if both racial and economic disparities in diabetes prevalence were eliminated. If the disparities were cut in half, more than \$100 million could be saved each year.

Conclusions: Deep-seated social and economic inequities that contribute heavily to health disparities will be difficult to change. Comprehensive and targeted strategies are needed, including prevention, screening, and early detection. Diabetes management initiatives for Medicaid recipients can prevent complications and co-morbidities associated with diabetes and thus help reduce medical care costs for all racial groups.

Introduction

Health disparities have been defined by the National Institutes of Health as the difference in the incidence, prevalence, mortality, burden of disease, and other adverse health conditions among specific population groups in the United States. For many diseases, health disparities by race are large and longstanding in North Carolina and the nation. For a few conditions, such as suicide and chronic lung disease, the majority white population has higher rates than African Americans and other minority groups. However, for many health conditions, minority groups have much higher rates than whites. For example, the age-adjusted stroke death rate for African Americans in North Carolina is 1.5 times the rate for whites; for American Indians it is 1.2 times. For chronic kidney disease, the age-adjusted death rate for African Americans is 2.5 times the rate for whites; for American Indians it is 1.6 times. Infant death rates are roughly twice as high for African Americans and American Indians than for whites. Homicide death rates are approximately five times as high.

Differences in health measures by race are due mostly to socioeconomic differences among the racial groups. For example, in 2004 the percentage of North Carolina families living below the federal poverty level was 7.5 for whites, 25.2 for African Americans, and 19.4 for American Indians.¹ Socioeconomic disparities in health are large and well documented, with people of lower income and education having much higher rates of mortality and other adverse health outcomes.^{2,3} However, some studies show that racial differences persist even after controlling for socioeconomic status.^{3,4}

Diabetes is a disease that has been increasing steadily in recent years, and it contributes to and complicates a number of other health conditions, such as cardiovascular disease and kidney disease. For diabetes, there are very large health disparities for minority racial groups. The 2003–2007 age-adjusted diabetes death rate (for diabetes as the primary cause of death) was 53.1 deaths per 100,000 population for African Americans and 50.2 for American Indians, compared to 20.5 for whites (2.6 and 2.4 times as high, respectively).

North Carolina Behavioral Risk Factor Surveillance System (BRFSS) telephone survey respondents are representative of all adults age 18 and older in the general North Carolina population (www.schs.state.nc.us/SCHS/brfss). The percentage of 2007 BRFSS

respondents reporting that they have diabetes was 9.1 percent. By race, the percentage with diabetes was 13.7 percent for African Americans and 12.8 percent for American Indians, compared to 8.5 percent for whites (1.6 and 1.5 times as high, respectively). Obesity is a key risk factor for diabetes. In the same pattern as diabetes prevalence, the 2007 percentage of adults who are obese (from the BRFSS) was 38.9 for African Americans, 36.5 for American Indians, and 26.4 for whites.

One likely reason that the racial disparity ratios for diabetes death rates (about 2.5) are larger than the disparity ratios for prevalence rates (about 1.5) is that there are differences in the medical management of diabetes. People with diabetes in racial minority groups may have lower access to medical care due to factors such as a higher rate of no health insurance and living in areas with fewer primary care physicians. This could mean that they enter primary care later than whites with diabetes, and that their diabetes is not managed as well.⁵

Health equity has been defined by the National Association of County and City Health Officials as fairness in the distribution of resources and the freedom to achieve healthy outcomes between groups with differing levels of social disadvantage. There are strong arguments for eliminating or reducing health disparities, based on fairness and equity. There has been less attention to the effects of health disparities on medical care costs. This study examines medical care costs for diabetes associated with health disparities among adults enrolled in Medicaid in North Carolina during state fiscal year 2007–2008 (SFY 2008).

Methods

We selected 5.6 million diabetes-related Medicaid paid claims for persons age 18 and older with a service date of July 1, 2007 through June 30, 2008 (SFY 2008). We included all claims (medical, hospital, outpatient, home health, etc.) that had a diagnosis of diabetes (ICD-9-CM code 250) on the claim, either as the primary diagnosis or as a contributing diagnosis. We also included prescription drug claims for drugs used almost exclusively for the treatment of diabetes (various types of anti-hyperglycemic medications).

These data were then analyzed for three racial groups: whites, African Americans, and American Indians, as well as for total Medicaid enrollees. Hispanic ethnicity is reported separately from race in the Medicaid data.

Hispanics were not included as a separate category for our analyses due to a high percentage of missing data on Hispanic ethnicity in the Medicaid enrollment records (20%) and a low prevalence of diabetes among Hispanics in North Carolina (3.0%, from the 2007 BRFSS data). Hispanics are included in the “total” category presented here, and they are counted in one of the three racial groups, if that race was reported at the time of enrollment in Medicaid. Seventy-one percent of adult Medicaid enrollees with Hispanic ethnicity were reported with “unknown” race and 24 percent were reported as white race.

Since we wanted to portray the total cost to the North Carolina Medicaid program of diabetes-related services, all paid claims were included, regardless of the length of enrollment of the person during SFY 2008 and regardless of dual eligibility for Medicare.

The total cost for diabetes-related services, an unduplicated count of persons with one or more diabetes services, and the average expenditure per adult with diabetes are presented for each of the three racial groups and for total Medicaid enrollees. The prevalence of diabetes in the adult Medicaid population for each racial group and for the total group is calculated by dividing the unduplicated count of persons with one or more diabetes services by the unduplicated count of persons enrolled in Medicaid for one or more months during SFY 2008 (age 18 and older). For example, there were 127,991 Medicaid enrollees who had a diabetes paid claim during SFY 2008, out of a total of 812,717 total enrollees. This calculates to 15.7 percent of the enrollees who had diabetes.

The cost to the North Carolina Medicaid program of racial health disparities is calculated by comparing the actual diabetes expenditures for African Americans and American Indians enrolled in Medicaid to the expenditures that they would have if

they had the same diabetes prevalence rate as whites enrolled in Medicaid. It is assumed that medical care expenditures would be reduced in the same proportion as the prevalence rates. Finally, Medicaid cost savings are calculated assuming that the diabetes prevalence rate for whites, African Americans, and American Indians enrolled in Medicaid (a predominantly low-income population) could be reduced to the prevalence rate of whites in the general population, thus eliminating both racial and economic disparities.

Results

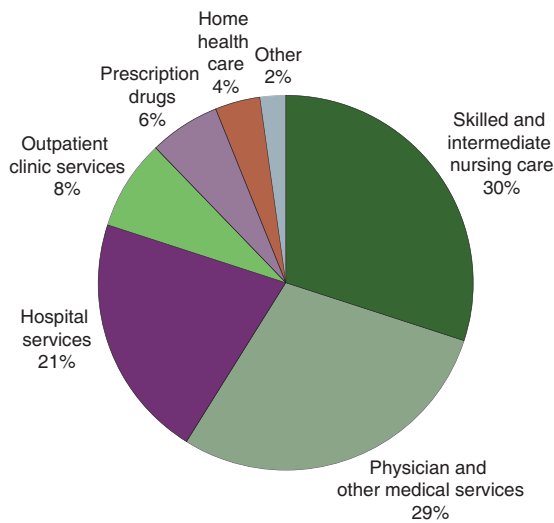
During SFY 2008, the state Medicaid program in North Carolina spent \$524,569,000 for diabetes-related medical care and prescription drugs for diabetes among adults age 18 and older. There were 127,991 adult Medicaid enrollees who had a diabetes-related paid claim during this fiscal year out of a total of 812,727 adults age 18 and older enrolled in Medicaid, which calculates to 15.7 percent of all adults enrolled in Medicaid during SFY 2008 having diabetes. The average amount spent for diabetes-related care per adult with diabetes was \$4,098. Table 1 shows these data for the total adult Medicaid population and for the three racial groups.

Table 1. Diabetes-related Data for Adults Enrolled in Medicaid in North Carolina during State Fiscal Year 2007–2008, by Racial Group

	White	African American	American Indian	All Adults in Medicaid
Diabetes-related expenditures (\$)	\$243,657,000	\$233,625,000	\$7,735,000	\$524,569,000
Number of adults with diabetes	59,238	55,437	1,921	127,991
Number of adults enrolled in Medicaid	406,227	317,313	12,836	812,717
Percent who have diabetes (prevalence)	14.6%	17.5 %*	15.0%	15.7%
Average expenditure per adult with diabetes	\$4,113	\$4,214	\$4,027	\$4,098
Note: An asterisk (*) indicates that there is a statistically significant difference between the percent with diabetes or the average expenditure for the minority group and the same measure for whites (p < .05).				

As shown in Table 1, 17.5 percent of African American adults enrolled in Medicaid had a diabetes-related paid claim, compared to 15.0 percent for American Indians

Figure 1.
Medicaid Expenditures for Diabetes by Category of Service:
North Carolina, July 2007 through July 2008,
Age 18 and Older



and 14.6 percent for whites enrolled in Medicaid. Note that the prevalence of diabetes in the population of white adults enrolled in Medicaid is 1.7 times as high as the diabetes prevalence rate in the general white population in North Carolina: 14.6 percent (from Table 1) vs. 8.5 percent in the general population (from the 2007 BRFSS data). This indicates a large socioeconomic disparity, since the Medicaid population in North Carolina has, on average, much lower income than the general population. The diabetes prevalence rates for African Americans and American Indians enrolled in Medicaid (Table 1) are about 1.2 times the prevalence rates for African Americans and American Indians in the general population (from BRFSS). The average Medicaid expenditure during the year per adult with diabetes was similar for each of the three racial groups, ranging from \$4,027 to \$4,214.

Further data show that, overall, the largest categories of Medicaid expenditures for diabetes are skilled and intermediate nursing care (30%), physician and other medical services (29%), hospital services (21%), outpatient clinic services (8%), prescription drugs (6%), and home health care (4%) (Figure 1). Among the 127,991 Medicaid enrollees with diabetes, 3 percent were ages 18–24, 18 percent 25–44, 40 percent 45–64, and 39 percent age 65 or older (Figure 2). Of the claims with a diagnosis of diabetes, 80 percent had diabetes as the

primary diagnosis and 20 percent had another primary diagnosis with diabetes listed as a contributing condition.

The impact of racial health disparities on medical care costs can be calculated by assuming African Americans and American Indians enrolled in Medicaid had the same diabetes prevalence rates as the white Medicaid population (14.6%), and that medical care expenditures would be reduced in the same proportion. Reducing the African American Medicaid diabetes prevalence rate from 17.5 percent to 14.6 percent (a 17% reduction) would save the North Carolina Medicaid program \$39,716,000 in diabetes-related expenditures. Reducing the American Indian Medicaid diabetes prevalence rate from 15.0 percent to 14.6 percent (a 3% reduction) would save the North Carolina Medicaid program another \$232,000 in diabetes-related expenditures. This total projected savings of approximately \$40 million assumes that racial gaps in diabetes prevalence within the Medicaid population could be eliminated.

But we have seen that the white Medicaid population (a very low-income group) has a very high rate of diabetes (14.6%), compared to the general white population of North Carolina (8.5%). If we assume that **both racial and economic disparities** were eliminated so that all groups had a diabetes prevalence rate of 8.5 percent, the potential savings to the North Carolina Medicaid program are much greater. Table 2 shows the calculations.

Figure 2.
Medicaid Enrollees with Diabetes by Age Group:
North Carolina, July 2007 through June 2008,
Age 18 and Older

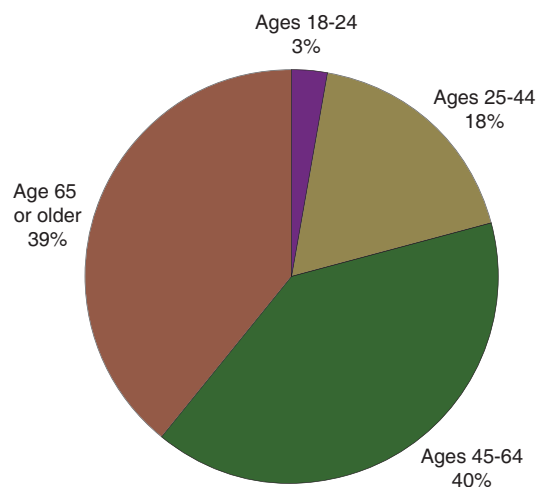


Table 2. Potential Annual Savings to the North Carolina Medicaid Program in Diabetes-Related Expenditures if both Racial and Economic Disparities in Diabetes Prevalence were Eliminated: Projections from State Fiscal Year 2007–2008 Data

	White	African American	American Indian	Total
Target rate: % of all white N.C. adults with diabetes	8.5%	8.5%	8.5%	
Actual N.C. Medicaid diabetes %	14.6%	17.5%	15.0%	
Percent reduction if target were achieved	42%	51%	43%	
Amount saved (\$) if target were achieved	\$102,336,000	\$119,149,000	\$3,326,000	\$224,811,000

The disparity for American Indians is large, but since they are a relatively small population in North Carolina, the savings from eliminating the disparity are relatively small. Nevertheless, these calculations suggest that if these three racial groups in the Medicaid population could achieve the diabetes prevalence rate of white adults in the general population, thus eliminating both racial and economic disparities in diabetes, the North Carolina Medicaid program could save nearly \$225 million per year in diabetes-related expenditures.

Discussion

A diabetes prevalence rate of 15.7 percent for North Carolina adults enrolled in Medicaid was calculated from paid claims and enrollment data. This figure is very similar to the percentage with diabetes reported by Medicaid enrollees who respond to the BRFSS telephone survey (14.3 percent for calendar year 2007), but much higher than the diabetes prevalence rate of 9.1 percent for all BRFSS respondents.

The much higher diabetes rate in the Medicaid population is not entirely a reflection of socioeconomic disparities. While many people qualify for Medicaid because they are in poverty, others qualify due to older age or disability, and both of these groups have a higher prevalence of diabetes. Also, some people may become eligible for Medicaid because they have diabetes (or other chronic conditions), and due to expenses from the

illness and its complications they “spend down” their resources and thus qualify for Medicaid.

Our use of prescription medications to help identify people with diabetes may result in some false positives, since medications like glucophage/metformin are increasingly used for diagnoses other than diabetes. However, the addition of the prescription drug claims added very little to the identification of people with diabetes. With the drug claims plus claims with a diagnosis code of 250, we identified 127,991 people with diabetes. With the diagnosis claims and excluding drug claims, we identified 125,473. So there were very few people with a drug claim that did not also have a diagnosis claim.

The diabetes prevalence rate for whites in the general population of 8.5 percent is not a “gold standard” to achieve, but rather just a relative point of comparison for this study. In fact, the white diabetes rate in North Carolina has increased from 5.9 percent in 2000 to 8.5 percent in 2007, so there is certainly room for improvement here also.

A North Carolina study of children born in 1992 showed that Medicaid expenditures for African American children were significantly less than the expenditures for white children, controlling for other variables.⁶ This difference was attributed to factors such as shortages in the community of health care providers who accept

Medicaid patients, and racial discrimination among health care providers.⁶ The present study of SFY 2008 diabetes-related expenditures for adults enrolled in Medicaid in North Carolina did not show lower average expenditures among the two minority groups, compared to whites. Our results show that, once there is a diagnosis of diabetes, annual Medicaid expenditures per person are about the same for each of the racial groups.

Since we wanted to portray the total cost to the North Carolina Medicaid program of diabetes-related services, all paid claims were included, regardless of the length of enrollment of the person during SFY 2008 and regardless of dual eligibility for Medicare. Therefore, we do not have complete health care cost information for all of the people in our study. Thirty-nine percent of the people in this study were age 65 and older, and most of them were dually eligible for Medicare. For this group, Medicaid pays only a small portion of medical care costs, with the exception of nursing care. As a result, the average cost figures presented here will be lower than the actual average cost per person.

Missing data on race may have some effect on the results presented here. For SFY 2008, 8.6 percent of the 5.6 million paid claims used for this analysis had missing information on race. These records were used in the total Medicaid data shown in Table 1, but could not be assigned to one of the three racial groups.

Racial and economic disparities in diabetes clearly result in increased medical care expenditures for the minority and low-income groups. Our results suggest that if these disparities could be eliminated, the North Carolina Medicaid program could save \$225 million per year in diabetes-related expenditures. One could ask the question: how much of a reduction in diabetes disparities is realistic? At least in the short run, it is probably more feasible that racial and economic disparities in diabetes can be reduced, rather than completely eliminated. Still, closing the gap in diabetes prevalence by half between whites in the general population and the three Medicaid racial groups could result in savings to the North Carolina Medicaid program of more than \$100 million per year in diabetes-related expenditures.

An estimated 40 percent of all people in the United States with diabetes are undiagnosed.⁷ Therefore, the expenditure figures shown in this study underestimate the true cost of diabetes in North Carolina, since they are based only on diagnosed cases.⁸ And the savings in diabetes-related

expenditures from reducing health disparities in diabetes prevalence will also be underestimated.

Health disparities result in large part from deep-seated social and economic inequities that will be difficult to change. With rapidly rising rates of obesity in North Carolina and the nation, reducing the prevalence of diabetes in Medicaid and racial minority groups is certainly a big challenge. Comprehensive and targeted strategies are needed, including prevention, screening, and early detection. A comprehensive approach must focus on interventions at the individual, community, and health care policy levels.

In addition, improvements in disease management are needed. For example, recent diabetes management initiatives have been successful in the Community Care of North Carolina (CCNC) enhanced primary care program for Medicaid recipients. These CCNC initiatives can prevent complications and co-morbidities associated with diabetes, avoid some hospitalizations, and thus help reduce medical care costs for all racial groups.^{9,10}

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