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# Health outcomes for low-income older adults with diabetes who receive services from Meals on Wheels

Monyca Johnson

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# Health outcomes for low-income older adults with diabetes who receive services from Meals on Wheels

## **Abstract**

**INTRODUCTION:** As the population continues to age and healthcare costs steadily increase, identifying what factors possibly add to the risk of hospitalization will help find effective solutions targeting these issues. **HYPOTHESIS:** We hypothesized that Medicaid and Medicare dual eligibility, membership in a racial minority, and female gender would increase the risk of hospitalizations in the past year. We further hypothesized that receipt of food assistance would decrease the risk of hospitalization for older adults with diabetes. **METHODS:** For this study, we conducted a secondary analysis of data from the National Health and Aging Trends Study (NHA TS) to test the relationship between our independent variables (Medicaid/Medicare dual eligibility, receipt of food assistance, race, and gender) and hospitalization. **RESULTS:** Our hypothesis was not supported. We did not find significance between Medicaid/Medicare dual eligibility, race, gender, and hospitalizations. There was a significant finding between food assistance receipt and hospitalizations. Of our sample population, those who receive food assistance were 43% less likely to be hospitalized. **DISCUSSION/CONCLUSION:** Our findings suggest that there should be more invested into food assistance programs and policy created to make them accessible for everyone especially older adults with diabetes.

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WHO RECEIVE SERVICES FROM MEALS ON WHEELS

By

Monyca Johnson

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## **Abstract**

**INTRODUCTION:** As the population continues to age and healthcare costs steadily increase, identifying what factors possibly add to the risk of hospitalization will help find effective solutions targeting these issues.

**HYPOTHESIS:** We hypothesized that Medicaid and Medicare dual eligibility, membership in a racial minority, and female gender would increase the risk of hospitalizations in the past year. We further hypothesized that receipt of food assistance would decrease the risk of hospitalization for older adults with diabetes.

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**RESULTS:** Our hypothesis was not supported. We did not find significance between Medicaid/Medicare dual eligibility, race, gender, and hospitalizations. There was a significant finding between food assistance receipt and hospitalizations. Of our sample population, those who receive food assistance were 43% less likely to be hospitalized.

**DISCUSSION/CONCLUSION:** Our findings suggest that there should be more invested into food assistance programs and policy created to make them accessible for everyone especially older adults with diabetes.

**KEYWORDS:** diabetes, older adults, hospitalizations, food assistance, disparities

## Introduction

In this paper we examined the possible factors that can influence hospital rates amongst diabetics. We also explored which populations were more vulnerable to both diabetes and being hospitalized. Based off of literature establishing current trends in healthcare, we decided to focus our research on the aging population. Currently, there is a wide range of literature on older adults indicating that factors including income, race, gender, and receiving food assistance can significantly impact health and hospitalizations. Despite the plethora of sources highlighting the influence of these factors, there is a gap in the literature. The relationship between income, food assistance, race, and gender has not been studied in their relation to hospital rates amongst diabetics.

Over the years, the population of the United States has seen a dramatic shift: The number of older adults has steadily increased and will continue to do so. By 2030, the number of adults aged 65 and older will double to about 71 million (CDC, 2015). For the next ten years, about 10,000 Americans are expected to turn 65 each day (Tinker, 2017). As the population continues to age it is imperative to have a better understanding of the health challenges being faced by this community and how to effectively manage them. One of the most influential risk factors for disease is age. Niccoli and Partridge (2012), argue that “age is the main risk factor for major debilitating and life-threatening conditions” especially in developed countries. Since the population has continued to age, the prevalence for age related diseases has steadily grown (Niccoli & Partridge, 2012).

The World Health Organization (2005) describes age as a non-modifiable risk factor, which is to say the passage of time is inevitable. While age is a non-modifiable risk factor, the World Health Organization notes the process of aging is also the



accumulation modifiable risk factors, whose impact increase over the course of a lifetime (WHO, 2005). Modifiable risk factors include physical activity, diet, tobacco use, and alcohol consumption.

As those 65 and older face increasing amounts of health challenges, rising healthcare costs have become a major concern. The U.S. spent almost \$1.1 trillion on healthcare in 2018. A majority of those dollars spent were on Medicare, approximately \$583 billion (Tax Policy Center, 2018). The Congressional Budget Office projects that Medicare spending in 2019 will reach \$632 billion (CBO, 2018).

One of the largest contributors of high Medicare spending is hospital services. Kaiser Family Foundation reports that payments to Medicare Advantage plans have doubled from 18 percent to 30 percent of all Medicare benefits spending between the years of 2007 and 2017 (Cubanski & Neuman, 2018). The foundation also reported that “based on the latest projections in the 2018 Medicare Trustees report, the Medicare Hospital Insurance (Part A) trust fund is projected to be depleted in 2026, three years earlier than the 2017 projection” (Cubanski & Neuman, 2018).

There are several factors that have led to increased hospital rates and spending, chronic diseases are definitely among them. Chronic diseases and comorbidities are key contributors to increased hospital visits within the Medicare community. In 2018, the American Association of Retired Persons (AARP), released a report claiming that four out of every five adults have a chronic disease, resulting in over 70 million Americans, aged 50 and over who suffer from at least one chronic condition. Hypertension, cholesterol, heart disease, mental illness, diabetes, arthritis, cancer, back problems, and

COPD are listed as the most common chronic diseases among individuals 50 and over (Lind & Noel-Miller, 2011).

As the number of individuals with chronic diseases continues to increase, the amount of people with more than one chronic disease also rises. By 2017, around one in four adults were shown to have two or more chronic diseases (Tinker, 2017).

Complications from these diseases have had a significant impact on hospitalizations and increased health care cost. Raghupathi and Raghupathi (2018), cites the CDC's claim that chronic disease is responsible for 75% of the country's aggregate healthcare spending.

The study also reveals that 96 cents out of every Medicare dollar and 83 cents out of every Medicaid dollar is spent on chronic disease treatment (Raghupathi & Raghupathi, 2018). Spending on chronic disease care is a direct result of individuals with these diseases staying more frequently in the hospital, filling more prescriptions, and visiting the doctor more frequently. People living with chronic disease account for 81% of hospital admissions, 91% of filled prescriptions, and 76% of doctors visits (Fight Chronic Disease.org, 2007).

Waters and Graf (2018), found that in 2016, the total cost of direct care and treatment of chronic conditions was \$1.1 trillion, which is equivalent to 60% of the nation's gross domestic product. Diabetes, Alzheimer's, and osteoarthritis were found to be the most costly chronic conditions. Although Waters and Graf (2018), list diabetes as the fourth most prevalent chronic condition, it is the third most costly condition. Diabetes continues to be a major contributor to increased healthcare cost and failing health across the nation.

Despite the exorbitant amount of money spent to treat chronic disease, there are still a large number of deaths nationwide that can be attributed to chronic disease. Seven out of every ten deaths in the United States are a result of chronic disease (Tinker, 2017). Every year over 1.7 million individuals fall victim to chronic disease and its complications (Tinker, 2017).

Although chronic disease plays an enormous role in hospitalization rates, excessive healthcare spending, and high death tolls, there are still a multitude of other contributors. These contributors include age, race, socioeconomic status, gender, education level, and even where a person lives. More broadly, in addition to contributing to increased hospitalization rates and medical care spending, these demographic characteristics are risk factors or, that increase both the chance and burden of disease. The burden of disease can be defined as “death and loss of health due to diseases, injuries and risk factors” (WHO, 2005). In spite of the fact that the burden of disease has declined both nationally and globally, the United States remains to have the highest burden of disease in comparison to similar countries (Cox & Sawyer, 2017).

When discussing trends in healthcare the CDC (2015), mentioned race as a good indicator because “many risk factors, including health behaviors, disease prevalence, mortality rates, health insurance coverage, and access to and utilization of health services, differ substantially by race and ethnicity.” Race can also be used as a tool to predict socioeconomic status, life expectancy, education level, and much more. As the country continues to grow in diversity, race will continue to be an important health trend indicator.

Education can also be used as a health indicator. Life expectancy can also be predicted by education level. Olshansky et al. (2015), discovered that both American men and women with less than 12 years of education had life expectancy rates comparable to all of the adults in the country between the 1950s and 1960s. Once they factored in race, their findings were much worse. Both non-Hispanic white females and males outlived African American men and women at every age and level of education, except for the age of 60. African American women had a slightly higher chance of longevity at age 60. (Olshansky et al., 2015). These findings are significant because they highlight the disparities in both education and healthcare that people of color face.

In addition to age, race, and education level, socioeconomic status is a huge risk factor. Socioeconomic status is the income bracket an individual falls into combined with the status or class they are members of. An individual's socioeconomic status can significantly influence their health. Bravemen, Cubbin, Egerter, Williams and Pamuk (2011) found that "Those at the bottom—the poor and least educated—generally experience the worst health, but even those with intermediate levels of income and education are less healthy than the wealthiest and most educated." This finding is substantial because race, age, gender, and education level can all impact a person's socioeconomic status. Health can be impacted and influenced by a number of factors. While each factor alone may only have a slight impact, when combined with other factors their determining power grows immensely. Today, our aging population faces multiple factors that put them at an increased risk of multiple health problems.

## **America's Diabetes Epidemic**

Out of the long list of chronic diseases adding to hospitalization rates, larger amounts of healthcare spending, and death, diabetes is at the top of the list. The CDC has reported that diabetes is the seventh leading cause of death in the United States (2017). Nearly 11 million US adults aged 65 years and older are affected by diabetes (Caspersen, Thomas, Boseman, Beckles, & Albright, 2012). Choi et al. (2017) noted that those 65 and older have a prevalence of diabetes anywhere between two to six times higher than any other age group in the United States. This statistic supports Lee and Halter's (2017) findings that individuals over the age of 65 are developing diabetes three times faster than younger adults. By 2050, 55% (26.7 million people) of senior citizens will be impacted by diabetes (Caspersen et al, 2012).

In 2007, older adults accounted for \$64.8 billion (56%) of direct diabetes medical costs, \$41.1 billion of that was for institutional care, including hospitals. Caspersen et al. (2012) also reported that the incidence of diagnosed diabetes among Americans aged 65 to 79 years increased by 65% from 1997 to 2003, while from 1980 to 2004, the estimated number of Medicare beneficiaries with diabetes increased from 2.3 million to 5.8 million, leading to diabetes accounting for 32% of all Medicare spending. One in three Medicare dollars is spent on care for people with diabetes (Ashkenazy & Abramson, 2006).

Not only has diabetes had a major impact on Medicare spending and hospitalization rates, it has also played an enormous role in shaping the overall health of diabetics. Over the years diabetes has been shown to affect both the mental and physical health of those with diabetes, especially those in the age group of 65 and older.

According to Kirkman et al. (2012) older Americans with diabetes have the highest rates

of lower extremity amputations, myocardial infarctions (heart attacks), visual impairments, and end-stage renal disease. Every thirty seconds a lower limb is amputated as a result of diabetes (Fight Chronic Disease.org, 2007).

Research also suggests that diabetes in older adults can also be linked to higher levels of mortality, reduced functionality, and a larger risk of institutionalization (Kirkman et al, 2012). A prediction from the CDC as cited in Kirkman et al. (2012), suggests that even if incidence rates of diabetes start to steady, the prevalence of diabetes will still double in the next twenty years. This astounding rate of growth can partially be attributed to the constantly increasing number of individuals ages 65 and up being diagnosed with diabetes.

Researchers found that individuals with diabetes were shown to have a worse baseline cognitive performance in all cognitive domains (Bangen et al., 2015). Cognitive domains were comprised of memory, language, processing speed/executive processing, and visuospatial abilities. Although the rates among the elderly population were similar, older adults with diabetes tended to perform at a lower rate.

In addition to affecting cognitive performance and rising healthcare cost, diabetes can also influence mortality rates. Baena-Diez et al. (2016), claimed that “Individuals with diabetes had significantly higher risk of death than the population without diabetes.” The American Diabetes Association (2018), reported that in 2015, 79,535 death certificates listed diabetes as the underlying cause of death, and 252,806 death certificates listed diabetes as either an underlying or contributing cause of death. Although death is a possible result of diabetes, so is hospitalization.

Both the physical and mental effects of diabetes has severely impacted the rising number of hospitalizations. Schneider et al. (2016) wrote that diabetics are “3 times more likely than those with no history of diabetes to be hospitalized. Substantial excess rates of hospitalizations in persons with diagnosed diabetes were for endocrine, infection, and iatrogenic/injury causes, which may be preventable with improved diabetes care.” Researchers have also reported that “the largest component of diabetes-related medical expenditures in 2012 was related to inpatient hospital care, which comprised 43% of the total estimated cost” (Schneider et al. 2016). Since such a high percentage of diabetes cost was related to inpatient hospital care, we decided further examination of hospitalizations among diabetics was important.

As the number of people affected by Diabetes continues to rise, it is imperative to get a clear understanding of the disease, its impact, and the risk factors associated with it. The health outcomes of those with diabetes are also important. Significant implications and patterns can be drawn from the outcomes of diabetics.

### **Unequal Risks, Unequal Outcomes**

Although diabetes is a national epidemic, researchers have found that individuals exposed to certain risk factors are more likely to have the disease compared to their less exposed counterparts. These risk factors include but are not limited to race, income, and education. While these risk factors do not guarantee a diabetes diagnosis or hospitalization, they do significantly increase the likelihood. Studies have also found that those exposed to multiple risk factors have an even higher probability of having diabetes.

Echouffo-Tcheugui, Caleyachetty, Muenning, Narayan, and Golden (2016), suggest that “accumulation of social risk factors most likely has a more significant influence on the odds of diabetes than social risk factors taken individually.”

One of the biggest risk factors that can influence odds of an individual having diabetes is race. The CDC (2016) has also stated that, “Although members of certain ethnic groups are more prone to be at higher risk for particular diseases, risks vary from case to case.”

Over the years, several publications have discussed the link between diabetes and race. Chow, Foster, Gonzalez, and McIver (2012), reported that racial and ethnic minorities have a higher prevalence and increased burden of diabetes when compared to non-Hispanic whites. It has also been proven that certain minority groups experience more complications.

Chow et al. (2012), found that African Americans have a 77% higher chance of being diagnosed with diabetes than non-Hispanic white Americans. 18.7% (4.9 million) of African Americans over the age of twenty have diabetes, either diagnosed or undiagnosed. Only 7.1% of white Americans have diabetes (Chow et al., 2012). Other minorities who are disproportionately affected by diabetes include Hispanics, American Indians, Alaska Natives, and Asian Americans, Native Hawaiians, and Pacific Islanders. Lynch et al. (2015), identified that among those with diabetes, African Americans and individuals who live in rural areas had the largest of both burden and risk of multimorbidity. Researchers also found that high-level multimorbidity increased with age.



Education can also be used as a health indicator. Life expectancy can also be predicted by education level. Olshansky et al. (2015), discovered that “US adult men and women with fewer than twelve years of education had life expectancies not much better than those of all adults in the 1950s and 1960s.” Once they factored in race, their findings were much worse. “White males and females outlived black males and females, respectively, at every age and level of education—with the exception of age sixty, where black females have a slight longevity advantage over white females.”(Olshansky et al., 2015). These findings are significant because they highlight the disparities in both education and healthcare that people of color face.

#### **Low Income Individuals & Dual Eligibles**

In addition to age and race, income and socioeconomic status can also impact the health of an individual. Although diabetes severely impacts the 65 and older demographic, it continues to disproportionately affect low income members of the group. Sattler, Lee, and Bhargava (2014), reported that around 36% of Medicare spending can be accredited to those who are dual eligible for Medicaid and Medicare. In 2012, Jacobson, Neuman, and Damico reported that 9 million Americans were eligible for both Medicaid and Medicare. The authors also found that dual eligibles had higher rates of hospitalizations compared to those only on Medicare and that the average spending for dual eligibles was around 1.8 times higher than those enrolled in Medicare alone (Jacobson et al., 2012).

Studies have shown that diabetics who are low income have a harder time managing their disease. Seligman, Jacobs, Lopez, Tschann, and Fernandez (2012), argued that food insecurity could be an independent predictor of glycemic control. Those with

## Discussion

Although our hypothesis was only partially supported, our findings were statistically and practically significant. We were able to identify that amongst Medicare eligible diabetics, those who received some form of food assistance were 43% less likely to be hospitalized compared to those with diabetes who did not receive food assistance. As the number of diabetics and Medicare recipients continues to rise, being able to lower hospitalization rates among them is crucial. This finding can be used to shed light on the benefits of food assistance programs on the health of individuals and highlight the great need to invest more in them. Our study can also be used to fill the gap in literature when looking at the relationship between the hospitalization rates of diabetics and being low income, receiving food assistance, race, and gender.

Even though our study produced a significant finding, there are limitations to our study. For our purposes, we analyzed only one year of data. Results could vary based upon the analyzation of multiple years of data. Depending on the year, hospitalization rates could vary. Variation in our independent variables and the sample population could also change year to year. These changes could impact the significance of our findings negatively or positively.

Despite its limitations, our study yields major implications. One indication of our study is that increased funding to programs like Meals on Wheels and SNAP will lead to lower hospitalization rates among elderly diabetics. Lower hospital rates will eventually result in decreased healthcare spending. Today, the average cost for one year of meals for Meals on Wheels recipient is about \$2765 (Fottrell, 2017). This annual cost includes meal delivery service five days a week and a combination of hot and frozen meals. One

year of SNAP benefits for a house with at least one individual 65 or older, is estimated to be around \$1536 (CBPP, 2017). Even though hospital cost can fluctuate depending on the hospital and its location, a single night in the hospital is predicted to fall around \$2271 (Fottrell, 2017).

While the cost of one night in the hospital is just under \$500 cheaper than an entire year of Meals on Wheels services, individuals who are admitted to the hospital generally spend more than one night in the hospital. With all these things in consideration, investing in food assistance programs appears to a simple solution to a number of problems. These problems include increasing hospital rates, rising healthcare cost, and food insecurity. Despite the many benefits of food assistance programs, many of them have lost funding or lowered the amount of people they can serve. As mentioned earlier, Meals on Wheels has reported that they serve fewer meals today than they did in 2005 (Meals on Wheels, 2018).

One of the future directions for this research includes conducting a cost benefit analysis. Completing a cost benefit analysis will provide us with a more in depth comparison of the cost of food assistance programs and hospital stays. A multi-year study is also another possible direction for this study. Conducting a multi-year study could be beneficial because changes in years and sample size could lead to finding significant results linked to our other variables including Medicaid/Medicare dual eligibility, race, and gender. Multiple years of data could also result in finding greater significance between the relationship of food assistance and hospitalization rate among diabetics. Although, further research would support the idea that programs like SNAP

and Meals on Wheels should be more heavily funded, our current study suggest that changes should be made now.

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