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Examining Racial & Ethnic Disparities in the Reach of the Medicare Shared Savings Program

by

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Abstract

It is important to understand the quality of health care for racial and ethnic minorities covered under the largest U.S. government-run insurance program, Medicare, because the demographics of the U.S. are becoming older and more diverse. A new value-based program under Medicare is the Shared Savings Program (MSSP), which creates incentives to improve care quality and health outcomes for Medicare beneficiaries with a specific focus on increasing the provision of preventive care services. This capstone project aims to understand the representation of racial/ethnic minority Medicare beneficiaries, namely African Americans/Blacks and Hispanics/Latinxs, that receive care from providers or facilities (i.e., Accountable Care Organizations [ACOs]) participating in the MSSP, as well as their representation in ACOs with the highest quality measure performance scores on colorectal cancer screening and breast cancer screening – two important preventive health services. Upon analyzing publically available data on the entire Medicare program and MSSP ACOs, the results indicated that the representation of African Americans/Blacks and Hispanics/Latinxs in MSSP ACOs was less than their representation in the entire Medicare program, as well as less in ACOs with top performance in both of the cancer screening preventive health measures. Being aware of the reach of the MSSP among racial/ethnic minority populations may help policy makers and health care organizations address barriers and establish effective strategies for racial/ethnic minority participation in the MSSP and other value-based care programs in an effort to, ultimately, promote health equity and eliminate current overarching disparities in quality of care and health outcomes that exist within these populations.

Keywords: MSSP, accountable care organizations, value-based care, race, ethnicity, health disparities, breast cancer screening, colorectal cancer screening

Chapter 1 - Introduction

<u>Significance & Aim</u>

With the United States becoming an older and more racially/ethnically diverse country, there is a persistent need to focus on improving the quality and cost of health care for these specific populations. Research shows that the aged and racial/ethnic minority populations manage more complex and chronic health conditions, resulting in higher mortality rates and costs of health care services. Mainly because of these concerns, the federal government has begun to reform health care delivery and payment with its largest program, Medicare, through the use of value-based programs that incentivize higher quality care and lower medical costs, specifically by rewarding providers whom ensure beneficiaries are receiving efficient and accessible preventive care services instead of inefficient and expensive hospital or emergency department services. One of these trademark Medicare value-based programs, launched on 2012, is the Medicare Shared Savings Program (MSSP).

However, the overall Medicare program does not specifically target racial/minority populations as much as it specifically targets the aged population through automatic eligibility for coverage of those over age 65, so it would be enlightening to see how racial/ethnic minorities are currently represented in a large value-based Medicare program like the MSSP. To understand this representativeness, the Reach dimension of the *RE-AIM* theoretical framework was applied for this capstone through statistical comparison of proportions. The *RE-AIM* framework is well-known and used to analyze the impact of public health interventions, which for this capstone, is the MSSP.

Research Questions

The first research question for this capstone involved comparing the Reach of the entire Medicare system to the MSSP:

1. What is the representation (i.e., proportion) of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs compared to the proportion of African American/Black and Hispanic/Latinx beneficiaries in the entire Medicare population?

The current literature on health disparities, discussed in the next chapter, predominantly reports that racial/ethnic minorities – specifically African Americans/Blacks and Hispanics/Latinxs – receive less preventive care, have worse overall quality of health care services, and experience poorer health outcomes. With this literature in mind, I hypothesized that the representation of African Americans/Blacks and Hispanics/Latinxs is lower in the MSSP compared to their overall representation in the entire Medicare program, since this specific program is known for providing higher quality care to improve beneficiary health outcomes. For the first research question, I aimed to see whether there was enough evidence to support my hypothesis that the proportion of African American/Black and Hispanic/Latinx beneficiaries in the entire Medicare population is greater than the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs.

The second research question is two-fold and compared all MSSP ACOs to those that have highest performance on two preventive health quality measures in which ACOs are required to report to receive incentive payments:

2. What is the proportion of African American/Black and Hispanic/Latinx beneficiaries in ACOs that achieved the highest performance on (a) Colorectal Cancer Screening and (b) Breast Cancer Screening compared to the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs?

Racial/ethnic minority health disparities literature highlights that African American/Black and Hispanic/Latinx patients receive less frequent cancer screenings and also have higher incidence and mortality rates from certain types of cancers. Because of these findings, I hypothesized that the representation of African Americans/Blacks and Hispanics/Latinxs is lower in MSSPs that have the highest performance scores on both the preventive health quality measures for colorectal cancer screenings and breast cancer screenings compared to their overall representation in the MSSP. For both parts of this research question, I aimed to see whether there was enough evidence to support my hypothesis that the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs is greater than the proportion of African American/Black and Hispanic/Latinx beneficiaries in the MSSP ACOs that achieved the highest performance scores on colorectal cancer screening and breast cancer screening measures.

Chapter 2 – Background and Literature Review

<u>The United States' Aging and Chronically Ill Population</u>

The United States of America is becoming a nation with a larger aged population. According to the Census Bureau, the largest population age group in the U.S. – The Baby Boomers (i.e., those born between World War II and the early 1960s) – will all be older than 65 by 2030[1]. A report compiled by the National Institutes of Health and the World Health Organization attributes the rapidly aging population to advancements in medical care,

technology, and living conditions, which have resulted in a global shift in leading causes of death from infectious and acute diseases to chronic and non-infectious diseases and, subsequently, increased life expectancy[2]. Despite life expectancy improvements, the changing demographics of the U.S. will have adverse implications on all of society's institutions, especially the health care system.

As a person progresses in age, their body system becomes frailer and they tend to be diagnosed with more chronic health conditions. About 60% of the aging population is likely to be managing at least one chronic condition, such as cancer, arthritis, diabetes, heart disease, stroke, and dementia[3]. It is highly likely that there will be a significant rise in the number of people diagnosed with cancer, with the number of new cancer cases projected to increase from 17 million in 2020 to 27 million in 2030 and number of cancer survivors to increase from 15.5 million in 2016 to 26.1 million in 2040[2,4].

The increase in chronic diseases, like cancer, among the aging population are already coming with individual and societal implications. Individuals living with one or more chronic diseases deal with vast daily limitations, along with the need for more medical treatments and lifestyle adjustments to manage the disease which expend personal time and financial costs[5-7]. In terms of financial costs to society, costs associated with chronic diseases are already profound, totaling up $1.1 trillion or almost 6% of the country's gross domestic product in 2016[8]. It is anticipated that there will be twice as many hospital inpatient admissions and outpatient physician visits by Baby Boomers by 2030, which will be costly in time for health care providers and financially costly for health care payers[9]. Specifically, the National Cancer Institute anticipates that the costs of cancer care will reach about $174 billion in the next year and it is easy to imagine that this number will likely increase in the coming years[10].

The expanding aging population is retiring at record numbers – approximately 10,000 each day[11]. These retirees will inevitably be shifting off private employer-based insurance and becoming eligible to enroll in Medicare since hitting age 65 is currently one of the eligibility criteria for Medicare coverage, regardless of race/ethnicity, income, or U.S. geographic location. Enrollment in Medicare – a health insurance program administered solely by the federal government – is expected to cover over 80 million beneficiaries by 2030, which is almost double the number of beneficiaries in 2010, and that number is anticipated to continuously rise in the decades to follow[12]. This increase in Medicare enrollment is displayed in Figure 1 based on data from the 2013 Annual Report of the Board of Trustees of the Federal Hospital Insurance and Federal Supplementary Trust Funds.

Figure 1: Projected Change in Medicare Enrollment (in millions), 2000-2050
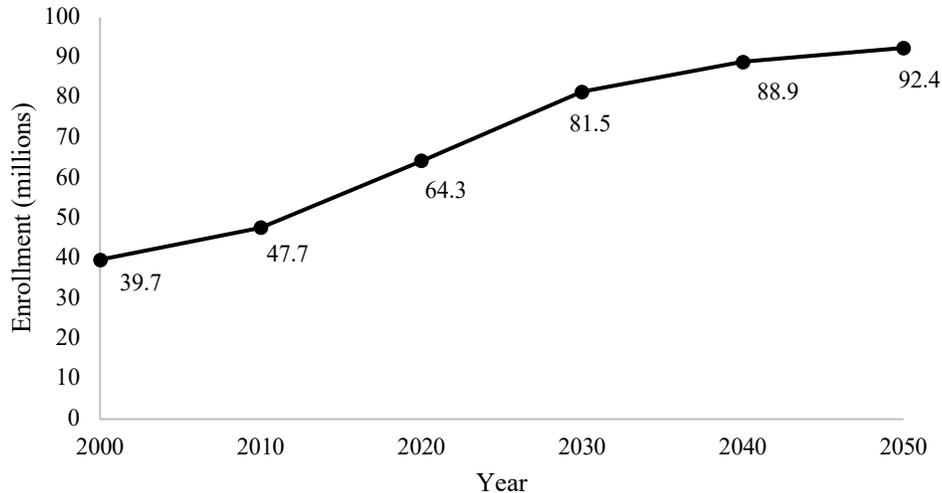
The federal government and taxpayers are already seeing the financial impacts of this shift in public insurance coverage of more older and chronically ill patients, with the total amount of Medicare benefit payments increasing from $462 billion in 2008 to $731 billion in 2018[12]. Current out of pocket spending for Medicare beneficiaries is also proven to be high, with

costs ranging from $378 to $1,792 for beneficiaries with one to five or more chronic disease,

respectively[7]. With a rapidly aging population and costly chronic disease care, health care

delivery will need to be attuned to address growing utilization of health care that will be

predominantly reimbursed by Medicare.

Racial/Ethnic Minority Health Disparities

The U.S. is also becoming a more racially/ethnically diverse nation. White Americans are

currently considered the majority at 72.6% of the population but other U.S. Census-classified

racial and ethnic minority groups – African American/Black, Hispanic/Latinx, American Indian

and Alaska Native, Asian American, and Native Hawaiian and Other Pacific Islanders – are

growing[13]. The Census Bureau projects that by 2045, those in the U.S. that identify as White will

become a minority racial/ethnic group at 49.7% of the population, whereas racial/ethnic minority

groups will cumulatively become the majority, with Hispanics/Latinxs at 24.6%, African

Americans/Blacks at 13.1%, Asian Americans at 7.9%, and 3.8% for those with more than one

race[14].

With a rapidly growing racial/ethnic minority population in the U.S., we should all

continue to hone in on the root causes of persistent health disparities that exist among these

minority groups. The root causes of racial/ethnic health inequities are largely related to

socioeconomic factors outside of the four walls of a clinic or hospital, such as discrimination,

lack of access to quality education, mistreatment in the criminal justice system, insufficient

income and employment opportunities, unsafe living and working environments, and minimal to

no access to healthy food, transportation, and/or areas for physical activity[15-18]. In succession of

these factors being prevalent among racial/ethnic minorities, these groups face obstacles in

accessing the health care system, which is likely connected to them subsequently receiving less

preventive care, having worse overall quality of health care services, and experiencing poorer health outcomes[19-23].

Specifically, one study found that out of five significant preventive primary care services delivered to aged Medicare beneficiaries (age 65+) – colorectal cancer screening, influenza vaccination, lipid screening, mammography (breast cancer screening), and Papanicolaou smear (cervical cancer screening) – there were lower rates of each of these five services for both African Americans/Blacks and Hispanic/Latinxs compared to Whites. Further, when the researchers of this study accounted for factors such as income, education level, and health status, the disparities of services between the two racial/ethnic minority groups and Whites grew wider[24].

Along with being less likely to receive effective health care services, racial/ethnic minorities are also more susceptible to receiving low-value, costly care. A study in 2017 using Medicare administrative data from 2006 through 2011 found that African American/Black and Hispanic/Latinx beneficiaries had directionally similar odds of receiving more low-value and unnecessary services than White beneficiaries, including cardiac screening, pre-surgery cardiac testing, bone density screening, and opioid or butal bital prescriptions for migraines[25]. Additionally, the study found that a greater number of outpatient clinician visits were associated with higher rates of low-value care for five services among African American/Black beneficiaries and six services among Hispanic/Latinx beneficiaries.

Research has compatibly shown significant racial/ethnic differences in the frequency and timing of cancer screening and treatment, specifically among Hispanic/Latinx and Black/African American patients. According to data collected by the Centers for Disease Control and Prevention (CDC) through the Behavioral Risk Factor Surveillance System Survey, the

percentage of respondents aged 50–75 years who reported receiving a colorectal cancer screening (either a fecal occult blood test within 1 year or colonoscopy within 10 years) was lowest for Hispanics/Latinxs at 51.2%, with African Americans/Blacks reporting higher than Hispanic/Latinxs at 62.9% but less than Whites at 66.2%[26]. Lower screenings for colorectal cancer have also been attributed to African American/Black patients[27]. One analysis of Medicare claims data found that colorectal cancer screenings were lower among African American/Black beneficiaries compared to Whites, with respective screening rates of 39.0% and 48.0%[28].

A 2017 study conducted by the American Cancer Society found that for African Americans/Blacks that did receive a colorectal cancer screening (colonoscopy), they were more likely than Whites to receive this screening from less skilled health care providers[29]. In terms of breast cancer screening, one study analyzing mammography (breast cancer screening) registry data found that both African American/Black and Hispanic/Latina women were more likely than White women to have inadequate screenings[30]. Another study of the Medicare Surveillance, Epidemiology, and End Results database to compare diagnostic, treatment, and clinical delay among women diagnosed with breast cancer found that African American/Black women enrolled in Medicare had the highest percentage with a delay of diagnosis of two months or more at 22.1%, followed by White women (18.3%), and then Hispanic/Latina women (18.0%)[31].

Cancer is one of the leading causes of deaths in the U.S. and there are evident disparities in incidence and mortality rates among the two largest racial/ethnic minority populations – African American/Blacks and Hispanic/Latinxs – compared to White populations, which are likely connected to differences in screening and treatment. Most notably, extensive research has shown that African American/Black women are diagnosed with more advanced stages of breast cancer and are almost twice as likely as to die of breast cancer compared to White women, with a

40% higher mortality rate[32-34]. Additionally, compared to all racial/ethnic groups, African Americans/Blacks have higher mortality rate of colorectal cancer and are also diagnosed with later stages of the disease[35-37]. Specifically, African American/Black men have a 5-year survival rate of colorectal cancer at 55.7% compared to White men having a 65.6% 5-year survival rate[38]. According to the American Cancer Society, nearly 1 in 3 African American/Black men and women will be diagnosed with cancer and about 1 in 5 will die from it[36]. Hispanics/Latinxs have been shown to have lower rates of cancer incidence and mortality; however, research has shown that they are more likely to be diagnosed with more advanced stages of cancers compared to Whites[39]. In 2018, breast cancer was estimated as the leading cause of cancer deaths and had the highest amount of new cancer cases for Hispanic/Latina women[40].

Differences in care quality and health outcomes among racial/ethnic minority groups, specifically among the two largest groups – Hispanics/Latinxs and African Americans/Blacks – highlights a critical need to focus on equity in the provision of high quality preventive care for salient chronic diseases such as cancer. Improving care and outcomes among racial/ethnic minorities could have profound effects not only on patients' quality of life and burden of death, but also on financial costs throughout the health care system. A 2009 Urban Institute estimated that the Medicare program could save $15.6 billion per year if health disparities in preventable diseases among the Hispanic/Latinx and African American/Black communities were reduced[41]. These possibilities should be an acute focus for all stakeholders looking to improve the U.S. health care system.

U.S. Health Care and Policy Reform

Although the U.S. is considered one of the most medically-advanced countries in the world, it spends the most money on its health care system yet presents with some of the worst

health outcomes. According to the Organization for Economic Cooperation and Development 2016 data comparing the U.S. and thirty-three countries, the U.S. spends about 17.2% of its GDP on health care, which is nearly half as much as the OECD country GDP median of 8.9%[42-43].

Despite the U.S. allotting a large amount of money into health care, utilization and outcomes – especially among racial/ethnic minorities – are poor. The National Academies Institute of Medicine found that compared to sixteen other high-income countries, the U.S. has higher rates of chronic conditions, such as heart disease, diabetes, and obesity, along with lower overall life expectancy[44]. Additionally, the U.S. has significantly large populations that are uninsured or are insured but face difficulties accessing health care due to various socioeconomic reasons. That is, many people are not able to afford health care services and resources to improve their health[44]. Most recently, the U.S. Census Bureau released a report that indicated the uninsured rate in the U.S. is beginning to rise again after steadily declining for a decade, with the percentage moving from 25.6 million in 2017 to 27.5 million in 2018[45]. Americans have also self-reported worries about costs, with a recent survey showing that 85% of adults are concerned about their medical costs and 62% of those that rated their care as "poor" or "very poor" reported that, even with insurance coverage, their out-of-pocket healthcare costs have increased[46].

Based on these findings, increased investment in health policy and care delivery reform at the organizational and policy levels is truly unavoidable. Public and private sectors in the U.S. have recognized these issues in our current system and have been exploring ways to reduce the burdens of chronic diseases and health care costs. Primarily, they are working to transition the overall health care system to one less focused on volume of high cost treatments and procedures (i.e., fee-for-service [FFS]) to one focused more on higher quality, enhanced accessibility, and lower costs – known as value-based care.

Under the current Medicare FFS program, Medicare generally makes a separate payment to licensed providers for each item or service furnished to a beneficiary during treatment. Because the total payments received by a provider depends on the amount of items and services furnished to a beneficiary, there is an assumption that providers may feel financially incentivized to increase the volume of items and services unnecessarily to receive more payments[47,48]. Medicare FFS also seems to diminish an incentive for providers to invest in quality improvement and care coordination activities that could reduce the incidence of chronic conditions among patients because these activities would likely result in delivering less costly services, and thus, lower payments to providers.

Value-based care shifts away from this paradigm by doing two main things 1) making providers more financially responsible for the cost and quality of care and 2) encouraging better coordination among providers and community partners to promote preventive care and reduce the amount of costly services needed within hospitals and clinics[49-52]. The Quadruple Aim – based off the Institute of Health's Triple Aim – succinctly lists the main goals in the transformation towards value in health care: improved population health, enhanced patient experience, reduced cost of care, and increase provider satisfaction[53].

The Centers for Medicare and Medicaid Services (CMS) – the federal government agency that administers and regulates Medicare and other health programs – has spearheaded the reform efforts to fulfill the Quadruple Aim through the development of value-based care delivery and payment programs. This is due in large part to the fact that the U.S. federal government is quickly becoming the top purchaser of health care services with the rising coverage of the Baby Boomers under Medicare, so they are looking for ways to promote better providers and consumers to address the proliferating health care cost and quality concerns.

With the necessity for health care interventions that improve quality and lower costs for patients, value-based care programs administered by CMS have continued to develop. The move to push Medicare away from predominantly FFS reimbursement to value-based reimbursement accelerated with the passage of the Affordable Care Act of 2010 (ACA).

Under authority granted by the ACA, the MSSP was launched in 2012. The MSSP is a value-based payment model in which groups of providers and facilities join together to form Accountable Care Organizations (ACO) to better coordinate patient care, reduce costs, and improve quality. ACO participants in the MSSP are collectively held responsible for all Medicare Part A (Hospital Insurance) and Part B (Medical Insurance) expenditures for an assigned population of Medicare FFS patients, as well as for performance on quality, utilization, and patient satisfaction measures[54].

For the 2016/2017 performance measurement reporting year, the MSSP ACO quality measures include the following domains: Patient/Caregiver Experience, Care Coordination/Patient Safety, Preventive Health, and At-Risk Population[55]. Participating ACOs are incentivized to achieve high performance scores on these quality measures because higher scores make them eligible to earn additional money (i.e., shared savings). Conversely, low performance – depending on the amount of financial risk the ACO voluntarily chooses to take on – can result in losing money (i.e., shared losses)[54]. The anticipated result of the MSSP over time is that participating providers and facilities will implement organizational-level interventions like efficient care coordination, robust data infrastructure, and promotion of preventive care services, because doing so will ensure higher performance scores and higher likelihood of earning shared savings[56]. Ultimately, these interventions should meet the vision of the Quadruple Aim and improve quality, costs, and outcomes for Medicare patients.

There are already results showing improved care and outcomes for ACOs participating in the MSSP since its inception seven years ago. The U.S. Department of Health and Human Services Office of Inspector General reported that in the first 3 years of the MSSP, ACOs improved performance on 82% of the individual quality measures, with a small set of high-performing ACOs showing high performance on quality measures along with increased use of primary care preventive health services and reduced use of costly services like emergency department visits[57]. The report also showed that ACOs outperformed FFS providers on 81% of the quality measures.

<u>Understanding the Reach of the MSSP on Racial/Ethnic Minority Medicare Beneficiaries</u>

With a progressively aging population in the U.S. being covered by Medicare, the likely result is that more individuals – regardless of race/ethnicity, income, or geographic location – will be receiving care from ACOs participating in Medicare valued-based programs like the MSSP. All areas of the U.S. health care system, from providers in hospitals and clinics to payers like Medicare, will need to prepare for the many challenges of increased demand and address current challenges in massive disparities in care and outcomes through systemic improvements.

The Preventive Health domain measures that MSSP ACOs are required to report and financially incentivized to perform well on focus on chronic conditions that disproportionately affect racial/ethnic minority populations. Most of the measures have to do with screenings, which are vital tools for early detection and reduction in premature deaths caused by chronic diseases. The CDC alleges that chronic diseases that could be avoided or managed through proper preventive health care services make up 75% of U.S. health care spending and if everyone in the country received recommended clinical preventive care, 100,000 lives could be saved each year[58]. ACOs quality performance is graded based on the percentage of each of these services

that are completed and documented by ACO providers, with 0.0 being the worst score and 100.0

being the best score. Table 1 shows the nine Preventive Measures for the 2016/2017 MSSP

quality performance reporting year[55].

Table 1: 2016/2017 Reporting Year MSSP ACO Quality Measures
Preventive Care and Screening: Influenza Immunization
Pneumonia Vaccination Status for Older Adults
Preventive Care and Screening: Body Mass Index (BMI) Screening and Follow Up
Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention
Preventive Care and Screening: Screening for Clinical Depression and Follow-up Plan
Colorectal Cancer Screening
Breast Cancer Screening
Preventive Care and Screening: Screening for High Blood Pressure and Follow-up Documented
Statin Therapy for the Prevention and Treatment of Cardiovascular Disease

Considering that more Medicare beneficiaries will be receiving care from ACO-

participating providers that are held accountable for performing well on these measures, they

should expectantly begin to receive better preventive care as providers are incentivized to reduce

incidence and mortality rates of certain chronic conditions. Focus on addressing preventive

health care through increased screenings is a feature of performance measurement in value-based

payment models like the MSSP and may be a beneficial intervention to address racial/ethnic

health disparities in care for chronic conditions, like breast and colorectal cancer.

Yet, analyzing the proportion of racial and ethnic minority patients that are receiving care

under the MSSP appears to be minimal, with only a couple of studies specifically looking at

ACO quality performance in the context of race and ethnicity. One study published in 2017

found that MSSP ACOs with a higher proportion of all racial/ethnic minority beneficiaries had worse quality performance on 26 out of 33 MSSP ACO performance measures[59]. Another study found that in eight rural Nebraska ACOs, White patients had higher colorectal cancer screening rates than racial/ethnic minority patients[60].

As the U.S. health care system implements novel efforts to incentivize providers to improve care quality and lower costs, these efforts should appropriately consider the current care experiences of racial/ethnic minority patients and work to address any existing inequities. The evaluation done for this capstone project is aimed to support these efforts by providing insight into how racial/ethnic disparities in care access and quality, particularly among the two largest racial/ethnic minority groups – Hispanics/Latinxs and African Americans/Blacks – are being addressed in our country's largest public health insurance program. The information gleaned from this capstone may help researchers, policymakers, payers, and providers better understand the current accessibility of an extensive, value-based care intervention program on racial/ethnic minority Medicare beneficiaries, along with their receipt of two preventive care screenings for breast and colorectal cancer – two chronic conditions that disproportionately affect racial/ethnic minorities.

Chapter 3 – Data and Methods

Data Sources

This capstone project involved conducting a cross-sectional analysis utilizing publicly available and non-individually identifiable secondary data from 2017. The publicly available data that was used for this capstone were two datasets released by CMS that include data on Medicare beneficiaries, ACOs, and the MSSP: 1) Total Medicare Enrollment: Part A and/or Part

B Enrollees, by Demographic Characteristics, Calendar Year 2017 File and 2) 2017 Shared

Savings Program ACO Public Use File (PUF).

The Total Medicare Enrollment: Part A and/or Part B Enrollees, by Demographic

Characteristics, Calendar Year 2017 File includes data from 2017 on the entire Medicare FFS

(i.e., Medicare Parts A and B) beneficiary population separated by the following demographic

characteristics: age, sex, and race/ethnicity[61]. This dataset is available at

https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-

Reports/CMSProgramStatistics/2017/2017_Enrollment.html and can be exported as a Microsoft

Excel file.

The 2017 Shared Savings Program ACO PUF includes an updated list from 2017 of all

472 ACOs participating in the MSSP and also includes the following data for each ACO, as

applicable[62]:

- Financial data (minimum loss rate, minimum sharing rate, and calculations of
  generated savings and losses)

- Quality performance data (overall quality performance score and performance
  score on each of the 33 quality measures)

- Demographic data on assigned ACO beneficiaries (age, sex, and race/ethnicity)

- Data on expenditures and utilization

- Data on providers and suppliers

The 2017 Shared Savings Program ACO PUF is accessible at

https://data.cms.gov/Special-Programs-Initiatives-Medicare-Shared-Savin/2017-Shared-Savings-

Program-SSP-Accountable-Care-O/gk7c-vejx and can be exported as a Microsoft Excel file.

Measurement

The research questions for this capstone investigated the Reach of the MSSP on racial/ ethnic minorities Medicare beneficiaries, specifically African American/Black and Hispanic/Latinx beneficiaries, using the first dimension of the *RE-AIM* framework. The *RE-AIM* theoretical framework is used to understand the public health impact of an intervention which, in this case, is the MSSP. Reach is defined as the "absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative[63]." This capstone study assessed the Reach of the MSSP measuring proportion and using the two population proportion statistical test. This statistical test is used because the single variable of the research questions is race/ethnicity, which is a categorical variable. The proportions were calculated by dividing the total number of African American/Black and Hispanic/Latinx beneficiaries (numerator) by the total number of beneficiaries (denominator). The tests were one-sided because I wanted to see if one proportion was higher or lower than the other proportion. To obtain the z-score and *p*-value for the two population proportion tests, the calculations were input into an online z-score calculator accessible at https://www.socscistatistics.com/tests/ztest/default2.aspx. The results of the two population proportion z-test were assessed using a significance level of *p*<0.05. If the *p*-values computed by the calculator were less than 0.05, then the null hypothesis would be rejected.

Research Question 1 compared the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs to the proportion of African American/Black and Hispanic/Latinx beneficiaries in the entire Medicare population.

For the MSSP ACO population proportion, I extracted data from the 2017 Shared Savings Program ACO PUF. To calculate the total number of MSSP ACO assigned beneficiaries (denominator), I added up all of the numbers from six columns:

- N_Ben_Race_White: Total assigned beneficiaries, Non-Hispanic White

- N_Ben_Race_Black: Total assigned beneficiaries, Black

- N_Ben_Race_Asian: Total assigned beneficiaries, Asian

- N_Ben_Race_Hisp: Total assigned beneficiaries, Hispanic

- N_Ben_Race_Native: Total assigned beneficiaries, North American Native

- N_Ben_Race_Other: Total assigned beneficiaries, Other

To calculate the total number of African American/Black and Hispanic/Latinx MSSP ACO assigned beneficiaries (numerator), I added up all of the data from two columns: N_Ben_Race_Black: Total assigned beneficiaries, Black and N_Ben_Race_Hisp: Total assigned beneficiaries, Hispanic.

For the entire Medicare population proportion, I extracted data from the Total Medicare Enrollment: Part A and/or Part B Enrollees, by Demographic Characteristics, Calendar Year 2017 File. From this dataset, I obtained the total number Medicare FFS beneficiaries (denominator) and then also added the total number of African American/Black Medicare FFS beneficiaries with the total Hispanic/Latinx Medicare FFS beneficiaries (numerator).

Research Question 2a compared the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs compared to the proportion of African American/Black and Hispanic/Latinx in ACOs that achieved the highest performance (top 25% of scores) on the Colorectal Cancer Screening quality measure.

For the MSSP ACO population proportion, I extracted the same data from the 2017 Shared Savings Program ACO PUF that was utilized in Research Question 1 and also completed the same calculations for the total number of MSSP ACO assigned beneficiaries and the total number of African American/Black and Hispanic/Latinx MSSP ACO assigned beneficiaries.

For the top 25% of scores on the Colorectal Cancer Screening MSSP ACO population proportion, I also extracted data from the 2017 Shared Savings Program ACO PUF. First I sorted all ACOS from highest to lowest performance score for ACO 19: Colorectal Cancer Screening. After this sorting, I selected the highest performing ACOs by extracting the first 118 rows of ACOs, which is 25% of the total amount of ACOs. From this new sample of 118 ACOs, I calculated the total number of MSSP ACO assigned beneficiaries by adding up all of the numbers from the same six N_Ben_Race columns as Research Question 1 (denominator). To calculate the total number of African American/Black and Hispanic/Latinx MSSP ACO assigned beneficiaries (numerator), I added up all of the data from two columns: N_Ben_Race_Black: Total assigned beneficiaries, Black) and N_Ben_Race_Hisp: Total assigned beneficiaries, Hispanic.

Research Question 2b compared the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs compared to the proportion of African American/Black and Hispanic/Latinx in ACOs that achieved the highest performance (top 25% of scores) on the Breast Cancer Screening quality measure.

For the MSSP ACO population proportion, I extracted the same data from the 2017 Shared Savings Program ACO PUF that was utilized in Research Question 1 and 2a and also completed the same calculations for the total number of MSSP ACO assigned beneficiaries and

the total number of African American/Black and Hispanic/Latinx MSSP ACO assigned beneficiaries.

For the top 25% of scores on the Colorectal Cancer Screening MSSP ACO population proportion, I also extracted data from the 2017 Shared Savings Program ACO PUF. First I sorted all ACOS from highest to lowest performance score for ACO 20: Breast Cancer Screening. After this sorting, I selected the highest performing ACOs by extracting the first 118 rows of ACOs, which is 25% of the total amount of ACOs. From this new sample of 118 ACOs, I calculated the total number of MSSP ACO assigned beneficiaries by adding up all of the numbers from the same six N_Ben_Race columns as Research Question 1 and 2a (denominator), To calculate the total number of African American/Black and Hispanic/Latinx MSSP ACO assigned beneficiaries (numerator), I added up all of the data from two columns: N_Ben_Race_Black: Total assigned beneficiaries, Black and N_Ben_Race_Hisp: Total assigned beneficiaries, Hispanic.

Chapter 4 - Results

Research Question 1

The hypothesis test for the first research question was the following:

Null hypothesis (H_0) = Proportion 1 (P_1) $\leq$ Proportion 2 (P_2)

Alternative hypothesis (H_a) = $P_1 > P_2$

The calculation for P_1 included the total number African American/Black and Hispanic/Latinx beneficiaries in all of Medicare FFS as the numerator and the total number of all beneficiaries in all of Medicare FFS as the denominator. These numbers can be found in table 2. The calculation for P_1 was 0.1950659.

Table 2: 2017 Medicare FFS Proportion Data	
Total African American/Black & Hispanic/Latinx Medicare FFS beneficiaries	11,403,015
Total Medicare FFS beneficiaries	58,457,244

The calculation for P_2 included the total number of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs (n=472) as the numerator and the total number of beneficiaries in all MSSP ACOs as the denominator. These numbers can be found in table 3. The calculation for P_2 was 0.097845119.

Table 3: 2017 MSSP ACO Proportion Data	
Total African American/Black & Hispanic/Latinx beneficiaries in all MSSP ACOs	879,910
Total MSSP ACO beneficiaries	8,992,886

The z-score calculated based on the two proportions (P_1 and P_2) was 703.28 and the significance level was $p<0.001$. Because this p-value was less than 0.05, I rejected the null hypothesis and I have enough evidence to support the alternative hypothesis that P_1 is greater than P_2.

Research Question 2a

The hypothesis test for the second research question is similar to the first research question:

$H_0 = P_1 \leq P_2$

$H_a = P_1 > P_2$

The calculation for P_1 was the same as the calculation for P_2 in the first research question. These numbers can be found in table 3 and the calculation was 0.097845.

The calculation for P_2 included the total number of African American/Black and Hispanic/Latinx beneficiaries in the MSSP ACOs with the top of 25% of performance scores for colorectal cancer screening measure (n=118) as the numerator and the total number of all

beneficiaries in the MSSP ACOs with the top of 25% performance scores for colorectal cancer

screening measure as the denominator. These numbers can be found in table 4. The calculation

for P_2 was 0.073337.

Table 4: 2017 MSSP ACO Colorectal Cancer Screening Performance Proportion Data	
Total African American/Black & Hispanic/Latinx beneficiaries in MSSP ACOs with top 25% performance scores for colorectal cancer screening measure	162,084
Total MSSP ACO beneficiaries with top 25% performance scores for colorectal cancer screening measure	2,210,134

The z-score calculated based on the two proportions (P_1 and P_2) was 112.39 and the

significance level was $p<0.001$. Because this p-value was less than 0.05, I rejected the null

hypothesis and I have enough evidence to support the alternative hypothesis that P_1 is greater

than P_2.

Research Question 2b

The hypothesis test for the third research question is similar to the previous two research

questions:

$H_0 = P_1 \leq P_2$

$H_a = P_1 > P_2$

The calculation for P_1 was the same as the calculation for P_2 in the first research question

and P_1 in the second research question. These numbers can be found in table 3 and the

calculation was 0.097845.

The calculation for P_2 included the total number of African American/Black and

Hispanic/Latinx beneficiaries in the MSSP ACOs with the top of 25% of performance scores for

breast cancer screening measure (n=118) as the numerator and the total number of all

beneficiaries in the MSSP ACOs with the top of 25% performance scores for breast cancer

screening measure as the denominator. These numbers can be found in table 5. The calculation

for P_2 was 0.080619.

Table 5: 2017 MSSP ACO Breast Cancer Screening Performance Proportion Data	
Total African American/Black & Hispanic/Latinx beneficiaries in in MSSP ACOs with top 25% performance scores for breast cancer screening measure	183,130
Total MSSP ACO beneficiaries with top 25% performance scores for breast cancer screening measure	2,271,548

The z-score calculated based on the two proportions (P_1 and P_2) was 79.35 and the

significance level was $p<0.001$. Because this p-value was less than 0.05, I rejected the null

hypothesis and I have enough evidence to support the alternative hypothesis that P_1 is greater

than P_2.

Chapter 5 – Conclusion

The principle aim of this capstone project was to understand the representation of African

American/Black and Hispanic/Latinx beneficiaries in a fairly new widespread Medicare value-

based care program called the MSSP. To do this, I first aggregated 2017 data from two public

datasets on racial/ethnic demographics of Medicare beneficiaries both in the entire Medicare

system and in MSSP ACOs. Next, I calculated and tested proportions of African American/Black

and Hispanic/Latinx beneficiaries. The results provided sufficient evidence for the following

conclusions:

- The proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs was lower than the proportion of African American/Black and Hispanic/Latinx beneficiaries in the entire Medicare FFS population.

- The proportion of African American/Black and Hispanic/Latinx beneficiaries in ACOs that achieved the highest performance on Colorectal Cancer Screening and was lower than the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs.

- The proportion of African American/Black and Hispanic/Latinx beneficiaries in ACOs that achieved the highest performance on Breast Cancer Screening and was lower than the proportion of African American/Black and Hispanic/Latinx beneficiaries in all MSSP ACOs.

These results underscore my overall hypothesis that racial/ethnic minorities, specifically the two largest minority groups (African American/Black and Hispanic/Latinx), are less likely to be represented in MSSP ACOs, as well as represented in ACOs performing well on quality measures in this value-based care program, because of the current overarching disparities in quality of care and health outcomes that exist in these groups. Other research has shown that African American/Black and Hispanic/Latinxs receive less preventive care and experience higher incidence and mortality from chronic diseases, especially cancer, so it is understandable that they would not be a high proportion of beneficiaries in a federal government payer intervention program prioritizing and incentivizing preventive care like colorectal and breast cancer screenings.

The lower level of representation of racial/ethnic minority groups in MSSP ACOs may be due to the lower participation of certain types of healthcare organizations who serve more

racial/ethnic minority populations, such as Federally Qualified Health Centers[64]. These organizations may experience higher barriers to meet the reporting requirements of being a member ACO with MSSP, such as low staffing or insufficient infrastructure. Another reason might be that there are higher proportions of patients covered by different payers, such as Medicaid, served by these organizations. There are some states that offer Medicaid ACO programs to ensure quality and lower costs for these organizations but policy makers will need to consider strategies to promote more expansive participation of health care organizations that serve minority populations in value-based programs like the MSSP or Medicaid ACOs[65].

The results of this capstone align with the findings of other studies that have assessed race and ethnicity, ACO performance, and cancer screenings. The two studies mentioned previously did not look at the overall proportion of racial/ethnic minorities in MSSP ACOs, these studies provide evidence to support similar underlying ideas. The study by Lewis et al (2017) that found MSSP ACOs with a higher proportion of all racial/ethnic minority beneficiaries had worse quality performance on almost all of the MSSP ACO performance measure is similar to the findings of this capstone because they both support the idea that MSSP ACOs performing well on quality measures have less representation of racial/ethnic minorities[59]. The second study, by Wang et al (2017), which found White patients had higher colorectal cancer screening rates than racial/ethnic minority patients in Nebraska ACOs is similar to the findings of this capstone because they both support the idea that racial/ethnic minorities in ACOs are receiving less colorectal cancer screenings[60]. This was indicative in Research Question 2a of this capstone because racial/ethnic minorities were less representative in MSSP ACOs performing well on the colorectal cancer screening measures (i.e., providers are providing more colorectal cancer screenings).

Although this capstone gave a sufficient snapshot of the entire Medicare program and MSSP, the data analyzed in this capstone only provided a high-level view of the characteristics of MSSP ACOs and Medicare beneficiaries and is lacking analysis on individualized data for beneficiaries and ACOs. First, instead of clumping the racial/ethnic minority group together, it may be insightful to separately look at the proportions of African American/Black beneficiaries from Hispanics/Latinx when comparing the colorectal and breast cancer screenings performance of MSSP ACOs, since these two racial/ethnic groups have shown different incidence and mortality rates from colorectal and breast cancer (e.g., Black women have higher incidence and mortality from breast cancer). Further research and analysis should also be done on the characteristics of the providers and organizations providing care to the highest proportions of racial/ethnic minority beneficiaries. Additionally, it would be beneficial to see whether these providers and ACOs have the resources they need to provide preventive services, like colorectal and breast cancer screenings, not only to provide appropriate and necessary care to patients but to perform well on MSSP quality measures and be successful in the value-based care world.

Further research should also be conducted on individual socioeconomic barriers that racial/ethnic minority Medicare beneficiaries face that may hinder them from receiving care under a MSSP ACO, even more so a high-performing MSSP ACOs. This capstone also only analyzed two racial/ethnic minority groups, so more expansive research should be done that not only includes other patient-level characteristics, like income, geographic location, or education, but also more racial/ethnic minority groups.

Additionally, this is only data on Medicare and MSSP, so the findings of this capstone cannot be generalized to other patients with different types of health insurance coverage or receiving care under different value-based care programs. To broaden the scope of understanding

the Reach for racial/minority patients, additional research should be done to analyze the representation of racial/ethnic minorities under different value-based care programs, as these program are not just existent in Medicare and are progressively being administered in the Medicaid and private payer spaces.

The information from this capstone on the Reach of the MSSP among African American/Black and Hispanic/Latinxs Medicare beneficiaries may be helpful for researchers, policy makers, and health care organizations in addressing obstacles that may be influencing racial/ethnic minority beneficiaries not to participate or receive care from an MSSP ACO or other value-based care delivery and payment programs, which are rapidly appearing within the U.S. health care system. Ensuring appropriate representativeness of racial/ethnic minorities in these value-based programs may encourage equitable access to effective, high-quality, less costly health care for all, regardless of race/ethnicity. It is the hope that this will steer us in a direction that eradicates differences in care and health outcomes that unjustly exist within the racial/ethnic minority populations in the U.S.

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Biography

Lindsey Arneson is a Master of Public Health candidate in Health Promotion at the University of Nebraska Medical Center. She is currently employed as a Health Policy Analyst for Novant Health, an integrated health care system based in Winston-Salem, North Carolina. Outside of work and school, she enjoys exploring the Blue Ridge Mountains, attending performing and visual art events, and reading a good book or news article.

CV

Lindsey Arneson

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Qualification Summary

- Highly proficient in federal, state, and local policy implementation, administration, and communication
- Appropriate education and experience in social science research methodology and statistical analyses
- Proven aptitude for delivering concise, detail-oriented oral and written communication and resolving conflicts in a timely matter

Education

Master of Public Health   *Expected December 2019*
University of Nebraska Medical Center, Omaha, NE
Concentration: Health Promotion, Social and Behavioral Health

Bachelor of Arts with Distinction
May 2015
University of Nebraska-Lincoln (UNL), Lincoln, NE
Majors: Global Studies and Sociology
Minor: Anthropology

Thesis: "Socioecological Impacts on Malaria Transmission: A Systematic Review and Citation Network Analysis" (Advisors: Dr. Kirk Dombrowski and Dr. Lisa Kort-Butler)

Member of Alpha Kappa Delta International Sociology Honor Society

Member of Omicron Delta Kappa National Senior Honor Society

Professional Experience

Health Policy Analyst   *August 2018 - Present*
Novant Health, Winston-Salem, NC

- Summarize proposed and final state and federal regulations in oral and written deliverables for internal leaders to understand, strategize, and operate effectively within the changing health care policy environment
- Develop internal educational materials, such as a policy e-newsletter, issue briefs, and white papers, to identify and share key regulatory, legislative, and industry initiatives
- Collaborate with the government relations team to share information with internal leaders and external policy makers as it relates to health care services

Research Compliance Services Specialist   *September 2015 – July 2018*
Student Worker   *September 2014 – September 2015*
UNL Office of Research and Economic Development, Lincoln, NE

- Administer procedures for the UNL Human Research Protection Program, as mandated by the U.S. Department of Health and Human Services (DHHS) Office of Human Research Protections, to ensure that UNL faculty, staff, and students are conducting university human subjects research in compliance with federal, state, and university policies and regulations
- Work with grant liaisons and conduct grant congruency reviews to ensure submitted research projects are consistent with what is described in applicable proposal documents provided to the awarding agencies
- Sustain communication with research investigators and provide campus trainings and educational sessions to promote a culture of ethical standards and regulatory compliance
- Plan, facilitate, and document monthly Institutional Review Board meetings
- Participate in developing and maintaining institutional policies, standard operating procedures, and guidance documents to ensure Research Compliance Services and the UNL campus community are upholding organized operations

Temporary Project Assistant   *May 2015 – September 2015*
UNL Social and Behavioral Sciences Research Consortium, Lincoln, NE

- Assist in the creation of a supplement report for the 2015 Nebraska Statewide Health Improvement Plan in collaboration with the Nebraska DHHS Office of Community and Rural Health
- Use Microsoft Excel and Word to summarize and formulate figures of state data

Human Resources Coordinator   *May 2013 - January 2014*
The Lincoln Marriott Cornhusker Hotel, Lincoln, NE

- Facilitate recruitment and hiring procedures for all hotel positions, such as reviewing job applications, completing phone screening, and conducting onboarding procedures.

- Ensure proper policies, procedures, and reporting are applied to comply with federal, state, local, and corporate policies
- Manage confidential associate information in both the computer system and physical files
- Communicate effectively to promote positive work ethic and attitudes among staff

Technical Knowledge

- Certified IRB Professional, Public Responsibility in Medicine and Research
  September 2017 – December 2020
- Health Navigation/Community Health Worker Course, Nebraska DHHS
  August 2017 – January 2018

Volunteer & Leadership Experience

- Flourish Program Mentor, The Shalom Project
  May 2019 - Present
- Member, The Women's Fund of Winston-Salem Research, Education, and Advocacy Committee
  February 2019 - Present
- Student Member, Public Health Association of Nebraska
  January 2018 – January 2019
- Refugee Family Mentor, Lutheran Family Services of Nebraska, Inc.
  Fall 2016 – Present
- Four Directions Youth Program Assistant, Indian Center, Inc. of Lincoln, Nebraska
  January 2014 – May 2014
- Vice President of Organization, Sigma Chapter of Kappa Kappa Gamma Fraternity
  January 2013 – December 2013
- Vice President of Academic Excellence, Sigma Chapter of Kappa Kappa Gamma Fraternity
  January 2012 – December 2012