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Racial and ethnic disparities among state Medicaid programs for breast cancer screening☆

Florence K. Tangka [a,*], Sujha Subramanian [b], Lee Rivers Mobley [c], Sonja Hoover [b], Jiantong Wang [b], Ingrid J. Hall [a], Simple D. Singh [a]

[a] Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway NE, MS F-76, Atlanta, GA 30341-3717, United States
[b] RTI International, 307 Waverley Oaks Road, Suite 101, Waltham, MA 02452-8413, United States
[c] School of Public Health and Andrew Young School of Policy Studies, Georgia State University, 1 Park Place, Suite 700, Atlanta, GA 30341, United States

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ABSTRACT

Breast cancer screening by mammography has been shown to reduce breast cancer morbidity and mortality. The use of mammography screening though varies by race, ethnicity, and, sociodemographic characteristics. Medicaid is an important source of insurance in the US for low-income beneficiaries, who are disproportionately members of racial or ethnic minorities, and who are less likely to be screened than women with higher socioeconomic statuses. We used 2006–2008 data from Medicaid claims and enrollment files to assess racial or ethnic and geographic disparities in the use of breast cancer screening among Medicaid-insured women at the state level. There were disparities in the use of mammography among racial or ethnic groups relative to white women, and the use of mammography varied across the 44 states studied. African American and American Indian women were significantly less likely than white women to use mammography in 30% and 39% of the 44 states analyzed, respectively, whereas Hispanic and Asian American women were the minority groups most likely to receive screening compared with white women. There are racial or ethnic disparities in breast cancer screening at the state level, which indicates that analyses conducted by only using national data not stratified by insurance coverage are insufficient to identify vulnerable populations for interventions to increase the use of mammography, as recommended.

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1. Introduction

Breast cancer screening by mammography has been shown to reduce disease and death by detecting breast cancer early, when treatment is most effective (Elmore et al., 2005; Nelson et al., 2009). In 2002, the US Preventive Services Task Force (USPSTF) recommended screening mammography, with or without a clinical breast exam, every 1–2 years for women aged 40 years or older (USPSTF, 2002). In 2009, the USPSTF changed its breast cancer screening recommendations to biennial mammography for women aged 50–74 years (USPSTF, 2009) and indicated that the decision to start mammography screening before age 50 should be an individual one; similar recommendations were made in 2016 (USPSTF, 2016). The Affordable Care Act of 2010 (ACA) (Patient Protection and Affordable Care Act of 2010, n.d), on the basis of the 2002 USPSTF recommendations, requires most insurance plans to provide breast cancer screening with no cost sharing, and the Healthy People 2020 objective is to increase the proportion of women who receive a breast cancer screening to 81.1%, based on the most recent guidelines (HP, 2016). Meeting this target is a challenge for populations with low incomes, no health insurance, or no usual source of care (Brown et al., 2014).

Lower screening use has been associated with later stage diagnosis and higher morbidity and mortality rates among underserved populations, including Medicaid enrollees (Bradley et al., 2008; Kuo et al., 2010; Horner et al., 2009). Access to screening and treatment services are crucial because breast cancer has the greatest likelihood of being successfully treated when detected early (Martin and Wingfield, 2012; Malmgren et al., 2012). Use of mammography varies by several demographic characteristics, insurance status (Sabatino et al., 2015), some racial or ethnic groups (Shoemaker and White (2016a, 2016b); Cobb et al., 2014), and across states (Miller et al., 2012; Mobley et al., 2008, 2009). For example, state-level mammography use ranged from 65.7% (Idaho) to 83.8% (Delaware) during 2000–2006 (Miller et al., 2009). By using BRFSS data from 2000 at the county level, Schneider et al. (2010)

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* Corresponding author at: Centers for Disease Control and Prevention, DCPC/EARB, 4770 Buford Highway NE, MS F-76, Atlanta, GA 30341-3717, United States.
E-mail address: ftangka@cdc.gov (F.K. Tangka).

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found the highest mammography use in the New England, North and South Atlantic, and East North Central census divisions, and the lowest mammography use in the Mountain states and Texas.

Although existing studies have demonstrated substantial geographic variation in screening use (Miller et al., 2012), little is known about the geographic variation in screening patterns among Medicaid women particularly at the state level. Understanding the difference in screening rates among the states can help develop tailored breast cancer screening promotion interventions that would increase screening rates for specific populations with low screening compliance; national estimates can mask local variation. Medicaid is an important source of insurance for low-income beneficiaries and racial or ethnic minorities (KFF Brief, 2015), who are less likely to be screened than those with higher socioeconomic status (Sabatino et al., 2015). All the states and the District of Columbia's Medicaid programs cover screening mammograms, and Medicaid enrollment has also increased among states that have accepted Medicaid expansion available through the ACA (Sommers et al., 2014).

This study assesses racial or ethnic and geographic disparities in the use of breast cancer screening among Medicaid beneficiaries so that target areas may be identified to improve the use of screening services. In addition, this study provides benchmarks to help measure the potential effect of increased enrollment among the Medicaid population.

2. Methods

We used 3 years of Medicaid claims and enrollment files from 2006 to 2008 for this analysis. Our inclusion and exclusion criteria were as follows: (1) included Medicaid enrollees aged 40–64 years; (2) excluded individuals previously diagnosed with cancer, pregnant, residing in long-term care facilities, or who were dual Medicare/Medicaid enrollees; and (3) excluded enrollees with restricted benefits because of alien status, pregnancy-related services, and Breast and Cervical Cancer Prevention and Treatment Act benefits.

We used both fee-for-service (FFS) claims and encounter (managed care) data provided by the Centers for Medicare and Medicaid Services. We included encounter data because research shows that encounter data quality has improved (Byrd and Dodd, 2012), and omitting these data would reduce the sample of Medicaid-insured women considerably among states in which managed care penetration is pervasive. We compared mammography use by using FFS and encounter claims to assess the quality of the encounter data and to verify completeness in each state. When mammography use was lower by using encounter data versus FFS data (>3 percentage points), we only included FFS claims for those specific states to ensure that potentially incomplete encounter data were not included. We excluded six states and District of Colombia (DC): three states (Alabama, Delaware, and Nevada) did not have sufficient sample to run the model by using only FFS claims to assess quality of the available data; three other states (Alaska, Hawaii, and Maine) did not have complete data for all necessary variables; and DC did not have sufficient sample size to perform a meaningful analysis. The study population included 3,821,084 women from 44 states.

For our outcome variable, based on the 2002 USPSTF recommendations, we created a personal indicator of whether mammography had been received at least once by the individual during a 3-year interval. Pooling 3 years of data provides more robust usage profiles than 1 or 2 years of data, (i.e., a woman is more likely to be screened during a 3-year interval than during 1 or 2-year intervals). In addition, because women who use Medicaid often experience gaps in coverage, using a longer timeframe is likely to provide more consistent estimates. Thus we used 3-years interval to ensure that we have an adequate timeframe to capture women with recommendations of undergoing mammograms every 2 years. If there were some delays then we would still capture their mammograms with a 3-year window instead of a 2-year window. Our goal was to capture as much mammography use behavior by the population who uses Medicaid as we could so that disparities in use can be examined. We linked the annual files by using de-identified Medicaid personal identifiers and created an indicator of whether a woman used mammography during the 3-year interval. This indicator was the outcome variable in a multilevel regression model using individual and county-level variables. We combined the person-specific Medicaid data with the area-level data on the basis of county of residence.

2.1. Empirical model specification

By using data from the eligible sample of women who use Medicaid, we estimated separate regression models for each state, including person and county covariates. This approach allowed us to assess screening disparities relative to white women at the state level. We specified race on the basis of the coding provided in the Medicaid enrollment data; race was categorized as white, non-Hispanic (white); black, non-Hispanic (black); American Indian/Alaska Native, non-Hispanic (AI/AN); Asian/Pacific Islander, non-Hispanic (A/PI); and Hispanic. Person-level characteristics included in the model were age, race or ethnicity, type of insurance (FFS or managed care), and disability status. Number of months enrolled in Medicaid was included as a control variable because people with shorter tenure would have lower observed odds of use.

We included county-level factors from a public database (RTI, 2016; Mobley and Kuo, 2016; Mobley et al., 2017) on the basis of the county of person's residence because social forces, such as racial segregation and poverty, may be important determinants of demand. To make our findings comparable with recent literature, we used the county-level isolation index of residential segregation to reflect societal factors (Mobley et al., 2012). Residential segregation indices (by several race or ethnicity groups relative to white) measured the degree to which minorities live together, rather than among white populations. We included *persistent poverty* as a measure of deprivation, which records the county's status during the past 25 years. Other contextual variables that may affect demand conditions were migration and percentage uninsured. The migration variable reflected the proportion of residents who moved into the county from another state during the past 5 years. The migration variable was included to reflect communities that were growing more rapidly, and may suggest growing demand for health care services. The percentage of uninsured persons reflects the populations not eligible for Medicaid, as well as those who voluntarily avoid or cannot afford health insurance coverage. The percentage uninsured reflects communities with lower health care services demand.

To reflect supply-side factors, we included the proportion of the county population who are living in rural areas and the average distance to closest provider, calculated on the basis of ZIP code centroids within the county and Medicare patient flows. These average distances from 100% FFS Medicare populations to closest provider of mammography services within their county of residence were included in an extensive public-use geospatial database (RTI, 2016). It is the most comprehensive measure of distance-based accessibility available to describe the spatial layout of providers across the entire United States. Rural aspect is measured by the proportion of the county population living in rural areas, as defined by the US Census in 2000 from decennial census data.

2.2. Estimation and translation of findings

Recognizing that individual states' political, regulatory and health service environments are unique, we examine states separately. The two-level model nests Medicaid-eligible women in their counties of residence, and includes person-level characteristics with county-level contextual variables. The statistical model is a Generalized Estimating Equations (GEE) multilevel specification estimated by using SAS GENMOD. The GEE model adjusts the standard errors of the county-level contextual variables to reduce the bias to standard errors that results from repeated (redundant) county measures for all women living in each county (Oakes, 2004). The GEE approach is appropriate when

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