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

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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 in-sufficient to identify vulnerable populations for interventions to increase the use of mammography, as recommended.

Keywords

Breast cancer screening; Medicaid; Spatial analysis; Mammography; Demographics; Morbidity; Mortality

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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) 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 the outcome variable is binary and when researchers are concerned with estimating robust population-level effects (Hardin and Hilbe, 2003; Gelman and Hill, 2007).

Separate regressions on the population-level estimates of disparities in mammography use among minorities and white populations in each of the 44 states included in this study resulted in a large volume of empirical findings; 44 tables each with 18 covariates used as regressors. The model includes 17 covariates that reflect both supply and demand factors at the county level, as well as individual level ‘enabling-predisposing-need’ factors from the classic Aday and Anderson (1974) framework; this formed the basis of our conceptual model (see Appendix A for more details). All variables were maintained in the model regardless of their statistical significance. To translate the findings and present the racial or ethnic disparities relative to white, we created and displayed four maps of the United States together in a single graphic. Each map displays the disparity of a single racial or ethnic group relative to white, derived from the separate regression estimates for each state. When the disparities estimate is statistically significant and negative (odds ratio < 1), the state is colored red. When the estimate is statistically significant and positive (odds ratio > 1), the state is colored blue. When the estimates for the minority are not significantly different from white, the state is colored grey. This mapping of regression coefficients for spatial translation of the research findings allows the large volume of estimates to be condensed and visually compared across all of the states.

In addition, we also present summary statistics by state for the higher and lower odds of receiving mammograms, compared to white women, to identify the magnitude of the potential differences. We provide the median (instead of mean because of outliers), range, and total number of states that have statistically significant racial or ethnic differences in mammography screening use.

3. Results

Table 1 provides the sample counts and proportions of women who received at least one mammogram during 2006–2008 among 44 states. The cohort of Medicaid beneficiaries and number of counties vary widely across the states. The highest and lowest values of the variables in the table are highlighted in bold. The state with the largest number of female Medicaid beneficiaries was California, whereas Wyoming had the smallest sample. Mammography use was the highest in Rhode Island (45%), Vermont (42%), Connecticut (41%), and West Virginia (40%), whereas it was the lowest in Maryland (17%), Arkansas (19%), Florida (19%), and Ohio (19%). The proportion of racial or ethnic groups also varied by state. Among people on Medicaid, California had the highest proportion of Hispanic women; Mississippi had the highest proportion of blacks; South Dakota had the highest proportion of AI/AN; and New York had the highest proportion of A/PI women, followed by California.

Fig. 1 shows racial and ethnic disparities in mammography use among state Medicaid programs. Overall, AI/AN women were significantly less likely to use mammography than white women in 17 states (colored red on map), and more likely to use mammography than white women in 2 states (Michigan and New Mexico; colored blue on map). In the remaining 25 states, AI/AN women were not significantly different from white women in their likelihood of using mammography (colored grey on map). Black women were significantly less likely than white women to use mammography in 13 states, whereas black women were significantly more likely to use mammography than white women in 6 states (CT, GA, MD, OH, PA, VA).

A/PI women were significantly less likely than white women to use mammography in only 4 states (IN, MO, MN, WI), whereas A/PI women were significantly more likely to use mammography than white women in 18 states. Hispanic women were significantly less likely than white women to use mammography in only 1 state, Oregon, and in 24 states Hispanic women were significantly more likely to use mammography than white women.

Table 2 presents a summary of statistics about the higher and lower median odds of receiving mammography screening for each racial or ethnic group as compared with white women. Although both AI/AN and black women have the largest number of states with lower odds of screening than among white women, AI/AN women have lower odds ratios than black women (OR of 0.59 compared to 0.85). Although A/PI women only experience screening disparities in 4 states, the odds of not receiving screening in these states are similar to those reported by AI/AN women (OR = 0.58). Hispanic women were most likely to receive screening (OR = 1.43) compared with white women, followed by A/PI women (OR = 1.32).

4. Discussion

In this paper, we focused on racial or ethnic disparities for receiving mammography screening (compared to white women) among Medicaid-insured women at the state level. Black and AI/AN women had lower mammography usage relative to white women in 30 and 39% of the 44 states analyzed, respectively. However, both groups showed higher mammography usage in a few states. Hispanic and Asian American women were less likely to experience disparities and had a lower probability of mammography screening compared to white women in only a few states. A recent study of Asian American women did reveal that there are differences in the patterns of mammography screening among Asian women by length of residency in the United States, insurance status, and usual source of care (Shoemaker and White (2016a, 2016b)).

National mammography screening usage reported in the 2013 National Health Interview Survey showed no differences in the proportion who had a mammogram within the past 2 years between black and white women overall, but there were large differences in mammography usage by health insurance coverage and usual source of care (Sabatino et al., 2015).

By focusing on women served by Medicaid at the state level, our results reveal that black women experience disparities in mammography screening in some geographic locations compared with white women. These differences are masked when pooled national level analyses are performed. Our state-level analysis also indicated lower screening use for AI/AN women, except in two states where the individuals had a significantly higher rate of mammography screening than white women. AI/AN women might have received screening mammograms through the Indian Health Service; hence, this information would not have been captured in the Medicaid claims, which may result in an underestimate of screening performed for AI/AN women. Cobb and colleagues also reported some regional variation in cancer screening among AI/AN women, who were less likely to be up-to-date with screening recommendation than white women (Cobb et al., 2014).

State Medicaid policies may partially explain differences between states in disparities among Medicaid insured women by race or ethnicity. However, the state Medicaid policies generally affect all women enrollees in the state and, therefore, may have negligible differential effects (Coburn et al., 1999; Baker and Royalty, 2000; Guy, 2010). A recent study using the same Medicaid data as analyzed in this study (Mobley et al., 2017) found that black residential segregation resulted in lower levels of mammography screening, that is, living among more segregated black communities had lower odds ratio compared to areas with low segregation. In addition, this study also reported that women living in states with expanded scope of practice, where nurse practitioners can provide primary care independent of physician oversight, had higher screening rates compared with women residing in more restrictive states. State level differences in these factors could result in lower levels of mammography screening, especially among minorities. Another study that analyzed Behavior Risk Factor Surveillance System data found that those with higher income and education levels were more compliant with mammography recommendations (Narayan et al., 2017). Therefore, state level differences in education and income among Medicaid minority groups could also impact disparities in breast cancer screening.

The strength of this analysis is that we are able to assess racial or ethnic differences for each state rather than compare racial disparities across the nation. Other studies that use a national perspective (e.g., Halpern et al., 2014; Jemal et al., 2012) can provide generalized estimates of disparity at the national level, but these can be confounded by racial or ethnic groups that tend to cluster geographically (Intrator et al., 2016). Some geographic areas with high prevalence of racial or ethnic groups are poorer areas where everyone uses less health care. But because racial or ethnic groups often reside in segregated communities with lower socioeconomic status, national estimates of disparities in the use of mammography will pick up differences among individuals on the basis of the differences in populations located across regions (Mobley et al., 2008). Community barriers and facilitators can explain some of the differences in disparities across the states. Local customs and cultures, as well as topography and physical barriers to access health care services, may affect some residential enclaves more than others.

The limitations of this analysis include the quality of the data available. Small samples for racial groups, especially AI/AN, could affect the amount of statistical power available to distinguish between a true and false null hypothesis (hypothesis: no racial effect). However, even when groups are small, given a strong enough signal, there will be sufficient power to detect an effect (significantly different from zero). In addition, we analyzed both fee-for-serve claims and encounter data, and because both of these Medicaid data sources are primarily collected for administrative purposes, the information may not be complete or accurate at the level of detail required for health services research. Women could have also received screening through other programs, such as National Breast and Cervical Cancer Early Detection Program (NBCCEDP) or through the Indian Health Service (IHS), and these screens would not be captured in the data analyzed. On the basis of the limited coverage of NBCCEDP and IHS, this exclusion would result in very minimal bias (Howard et al., 2015). Given the discontinuous nature of health care coverage and the multiple programs that may serve low-income women, additional studies could be performed to confirm the findings from this analysis. These studies could involve patient surveys to confirm and supplement findings from Medicaid claims data.

The findings from this study reveal that Medicaid claims information is a useful resource for analysis of racial or ethnic differences in breast cancer screening at the state level or below. Additional research should be undertaken to explain the reasons for the observed state-level variation in this study and to also perform analyses using more recent data to assess relevant policy changes. Research could be performed to understand the potential impact of changes in USPSTF recommendations and mammography screening among women 40 to 50 years of age and enrolled in Medicaid. In addition, future studies could also examine how these patterns may have changed with implementation of the ACA in 2010 and provisions phased in during the subsequent years. The ACA offers coverage for mammograms without copays in many health plans, and the effect of this policy change could be studied across racial or ethnic and geographic areas. Additional assessments could also be performed to assess the effects of these screening differences on the final outcomes of individuals using state-level cancer registry data available from the CDC's National Program of Cancer Registries or the National Cancer Institute's Surveillance, Epidemiology, and End Results program. The key finding from the present study is that state level mammography use among Medicaid beneficiaries shows racial or ethnic disparities that may be masked in national-level analyses.

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Appendix A. Statistical analysis and model variables

For each state, we estimated an independent model with person and county level covariates (see Appendix Table 1 below). Because the county data values were redundant across individuals residing in the same county, we used SAS GENMOD to adjust their standard errors for reliable inference. Residential isolation indices and a population migration measure were included as measures of social integration or support in the county of residence. By holding constant these area level factors that could influence where women decided to live, we are better able to isolate robust disparity estimates across the races and ethnicities that are comparable across the states.

Appendix Table 1

Variables used in analysis and sources.

Variables used in estimation	Source
Person level	
Age	RTI-CDC Medicaid data
Number months enrolled	RTI-CDC Medicaid data
Has disability	RTI-CDC Medicaid data
Had HMO coverage	RTI-CDC Medicaid data
AI/AN, non-Hispanic	RTI-CDC Medicaid data
Asian/PI, non-Hispanic	RTI-CDC Medicaid data
Black, non-Hispanic	RTI-CDC Medicaid data
Hispanic	RTI-CDC Medicaid data
All others	RTI-CDC Medicaid data
County level	
Isolation index, Asians 2005–2009	US Census
Isolation index, blacks 2005–2009	US Census
Isolation index, Hispanics 2005–2009	US Census
Proportion of area population who moved from another state during 2005–09	US Census
Average distance in miles to closest mammogram facility in 2006	RTI calculations based on 100% FFS Medicare files
Proportion population uninsured in 2005	US Census
Lived in a county w/persistent poverty 1979–2005	US Census
Proportion population rural in 2000	US Census

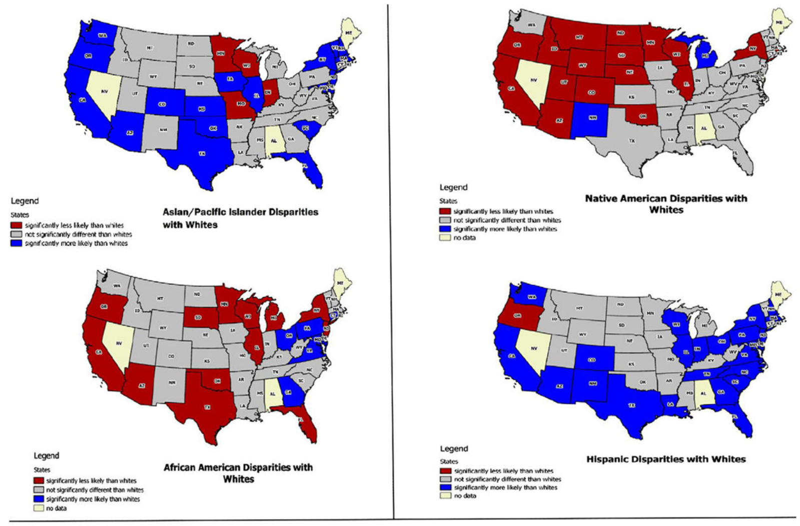

Fig. 1.

Disparities in Medicaid population mammography use 2006–2008: racial or ethnic groups relative to whites. Fig. 1 MAPS LEGEND: We used Medicaid claims and enrollment files to assess racial or ethnic disparities in the use of breast cancer screening (mammography use over a 3-year period) among Medicaid-insured women at the state level. All disparities are statistically significant differences relative to white groups. States colored blue are those with a mammography screening use among racial or ethnic groups that is significantly higher than white groups. States colored red are those with mammography screening use among racial or ethnic groups that is significantly lower than white groups. States colored grey have the same mammography screening use among racial or ethnic groups and white groups. States colored pale yellow are those that did not meet the inclusion criteria.

Source: 2006–2008 Medicaid claims and encounter data merged with county level data from the 2000 US Census.

Table 1

Mammography use among the Medicaid beneficiaries by state, 2006–2008[a]. Source: 2006–2008 Medicaid claims and encounter data.

State	No. of women in Medicaid sample	Proportion ever using mammography during 2006–2008	Proportion of Medicaid beneficiaries by race or ethnicity						No. of counties in state
			% black, non-Hispanic	% American Indian and Alaska Native, non-Hispanic	% Asian/ Pacific Island, non-Hispanic	% Hispanic	% Others[b]	% white, non-Hispanic	
Arkansas	28,008	19%	34.6	*c*	2.5	1.6	*c*	61.0	75
Arizona	134,864	31%	6.1	10.4	2.1	34.5	*c*	46.9	15
California	**845,801**	23%	9.8	*c*	12.8	**54.5**	*c*	**22.3**	58
Colorado	13,672	22%	9.1	1.5	3.8	30.8	*c*	54.8	8
Connecticut	15,931	41%	20.4	*c*	2.2	1.2	31.7	44.4	8
Florida	160,591	19%	28.5	*c*	1.2	27.7	*c*	42.4	67
Georgia	72,800	28%	57.6	*c*	1.2	*c*	*c*	40.4	159
Iowa	22,088	22%	9.6	*c*	1.3	2.9	1.1	84.4	99
Idaho	7629	29%	1.4	2.9	*c*	*c*	*c*	94.4	44
Illinois	150,073	27%	38.2	*c*	3.0	11.0	4.0	43.7	102
Indiana	57,046	23%	20.6	*c*	*c*	4.3	*c*	74.4	92
Kansas	15,554	25%	18.2	1.7	2.0	*c*	6.8	71.3	105
Kentucky	48,797	34%	10.3	*c*	*c*	*c*	1.0	88.0	120
Louisiana	51,006	31%	57.6	*c*	1.0	1.0	*c*	39.8	64
Massachusetts	74,256	33%	10.8	*c*	7.4	13.7	*c*	67.8	14
Maryland	58,949	**17%**	57.9	*c*	2.6	3.5	*c*	35.6	24
Michigan	133,147	24%	35.8	*c*	1.6	3.2	*c*	59.1	83
Minnesota	46,046	32%	18.3	4.4	8.2	*c*	5.4	63.6	87
Missouri	44,653	32%	19.3	*c*	*c*	*c*	*c*	79.5	115
Mississippi	32,882	29%	**60.8**	*c*	*c*	*c*	*c*	37.9	82
Montana	6484	28%	*c*	22.8	*c*	2.1	*c*	74.3	56
North Carolina	93,574	30%	44.5	1.6	1.2	2.3	1.3	49.1	100
North Dakota	4526	24%	2.4	29.8	*c*	*c*	3.0	63.9	53
Nebraska	9485	32%	16.3	4.4	1.9	*c*	8.6	68.9	93
New Hampshire	6677	35%	2.7	*c*	1.0	4.2	*c*	91.9	10
New Jersey	54,143	34%	31.7	*c*	3.9	18.3	*c*	45.8	21

State	No. of women in Medicaid sample	Proportion ever using mammography during 2006–2008	Proportion of Medicaid beneficiaries by race or ethnicity						No. of counties in state
			% black, non-Hispanic	% American Indian and Alaska Native, non-Hispanic	% Asian/ Pacific Island, non-Hispanic	% Hispanic	% Others[b]	% white, non-Hispanic	
New Mexico	38,347	26%	2.1	16.8	1.1	47.0	*c*	33.0	33
New York	585,984	37%	24.4	*c*	**14.5**	2.7	29.5	28.3	62
Ohio	135,973	19%	29.1	*c*	*c*	2.4	*c*	67.6	88
Oklahoma	33,711	22%	14.7	8.7	1.3	*c*	3.9	71.4	77
Oregon	35,699	35%	4.4	2.8	4.0	4.5	1.0	83.3	36
Pennsylvania	39,316	31%	9.2	0.2	1.0	3.7	1.3	84.7	67
Rhode Island	11,552	**45%**	11.6	0.3	3.5	28.9	*c*	55.7	5
South Carolina	42,937	25%	54.9	*c*	*c*	1.4	*c*	43.0	46
South Dakota	4621	21%	2.9	**35.6**	*c*	*c*	10.2	50.8	66
Tennessee	80,187	34%	30.1	*c*	*c*	1.4	*c*	67.4	95
Texas	146,467	26%	27.6	*c*	2.2	36.2	*c*	33.5	**254**
Utah	18,879	19%	2.6	3.8	3.3	*c*	11.6	78.8	29
Virginia	42,473	32%	43.9	*c*	2.2	2.6	*c*	51.1	134
Vermont	11,645	42%	1.0	*c*	*c*	*c*	*c*	**97.6**	14
Washington	35,873	32%	7.1	6.5	6.0	4.1	*c*	76.3	38
Wisconsin	46,022	34%	17.5	2.1	3.4	5.0	1.77	70.2	72
West Virginia	25,102	40%	3.7	*c*	*c*	*c*	*c*	96.2	55
Wyoming	**2896**	26%	1.7	9.9	*c*	*c*	7.0	80.8	23
TOTAL	3,526,366								

[a]Bolded values indicate highest and lowest values.

[b]The ‘Other’ group includes all individuals not categorized into any racial or ethnic group and all who identify with more than one race.

[c]Indicates values of <1%.

Table 2

Summary of higher or lower odds of mammography use compared with white groups. Source: 2006–2008 Medicaid claims and encounter data.

	Lower odds of mammography for the racial or ethnic groups compared with white groups[a]	Higher odds of mammography for the racial or ethnic groups compared with white groups[a]
	Median [range] (no. of states)	**Median [range] (no. of states)**
Non-Hispanic black	0.85 [0.60–0.93] (*n* = 13)	1.10 [1.08–1.23] (*n* = 6)
Non-Hispanic American Indian/Alaska Native	0.59 [0.36–0.88] (*n* = 17)	1.21 [1.13–1.28] (*n* = 2)
Non-Hispanic Asian/Pacific Islander	0.58 [0.36–0.66] (*n* = 4)	1.32 [1.17–2.11] (*n* = 18)
Hispanic	0.73 [n/a] (*n* = 1)	1.43 [1.08–2.04] (*n* = 24)

[a]Only statistically significant differences are included in these estimates.