

Preventive Care for Low-Income Women in Massachusetts Post-Health Reform

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Abstract

Background: Before enacting health insurance reform in 2006, Massachusetts provided free breast, cervical cancer, and cardiovascular risk screening for low-income uninsured women through a federally subsidized program called the Women's Health Network (WHN). This article examines whether, as women transitioned to insurance to pay for screening tests after health reform legislation was passed, cancer and cardiovascular disease screening changed among WHN participants between 2004 and 2010.

Methods: We examined claims data from the Massachusetts health insurance exchange and chart review data to measure utilization of mammography, Pap smear, and blood pressure screening among WHN participants in five community health centers in greater Boston. We conducted a longitudinal analysis, by insurance type, using generalized estimating equations to examine the likelihood of screening at recommended intervals in the postreform period compared to the prereform period.

Results: Pre- and postreform, we found a high prevalence of recommended mammography (86% vs. 88%), Pap smear (88% vs. 89%), and blood pressure screening (87% vs. 91%) that was similar or improved for most women postreform. Screening use differed by insurance type. Recommended mammography screening was statistically significantly increased among women with state-subsidized private insurance (odds ratio [OR] 1.58, $p < 0.05$). Women with unsubsidized private insurance or Medicare had decreased Pap smear use postreform. Although screening prevalence was high, 31% of women required state safety-net funds to pay for screening tests.

Conclusion: Our results suggest a continued need for safety-net programs to support preventive screening among low-income women after implementation of healthcare reform.

Introduction

MASSACHUSETTS HAS ONE OF THE HIGHEST success rates for cancer and cardiovascular disease (CVD) risk factor screening among women in the United States.¹ Since 1993, Massachusetts has participated in state and federally supported programs to improve rates of screening among low-income uninsured women, known in Massachusetts as the Women's Health Network (WHN). Established by the Massachusetts Department of Public Health together with support from two CDC programs—the National Breast and Cervical Cancer Early Detection Program and the WISE-

WOMAN program—WHN provided free breast and cervical cancer screening tests and CVD risk factor screening tests for low-income uninsured women, as well as comprehensive health promotion and counseling interventions based on individual risk factors.² The program was open to women aged 40–64 with family earnings at or below 250% of the federal poverty level.²

With the goal of achieving near-universal healthcare coverage for its residents, Massachusetts passed its landmark healthcare reform law with the Acts of 2006, Chapter 58—An Act Providing Access to Affordable, Quality, Accountable Health Care. The legislation expanded Medicaid eligibility;

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created Commonwealth Care, a set of state-subsidized, privately administered plans for low-income individuals under 300% of the federal poverty limit; developed nonsubsidized insurance products for individuals and small businesses; and established a regulated health insurance exchange to enable individuals to access these plans. Low-income women formerly eligible for WHN coverage of breast and cervical cancer and CVD risk factor screening tests were expected to transition to insurance to pay for screening as these new insurance products became broadly available after July 1, 2007.³

Additionally, the reform legislation continued the robust safety net in place in Massachusetts prior to reform by converting its Uncompensated Care Pool to a Health Safety Net fund to provide indigent care for those not qualifying for subsidized insurance plans. Following healthcare reform, WHN funding was no longer available to pay for screening tests; however, some community health centers (CHCs) continued to receive funding from WHN and other sources to continue navigation and case management services to promote screening use.

We are unaware of studies that document the postreform patterns of insurance uptake among WHN participants as they transitioned to insurance exchange products, Medicaid, or other products to pay for care. Additionally, it is not fully known whether utilization of cancer and CVD screening changed among WHN participants after new insurance options became more broadly available to Massachusetts residents.

In this article, we first describe the current insurance status of a population of low-income women who previously received care as WHN participants in five community health centers in greater Boston. Second, we test for postreform changes in utilization of screening for breast and cervical cancer and blood pressure through chart review and examination of claims data from the Massachusetts state health insurance exchange. Last, we consider whether specific insurance products were associated with differences in screening utilization postreform.

Methods

Study population

We recruited participants from five greater Boston CHCs that participated in the WHN program between 2004 and 2006. The five CHCs served a racially and ethnically diverse patient population. WHN participants were contacted regarding participation in the study if they met the following eligibility criteria: (1) were enrolled in WHN between 2004 and 2006, (2) were between the ages of 40 and 64 when enrolled in WHN, (3) received care at one of the five participating CHCs, (4) did not experience a pregnancy during the enrollment period and therefore might not have received screening tests on this basis, and (5) had not been diagnosed with breast or cervical cancer during the eligibility period.

Recruitment procedures for our study have been previously described.⁴ Briefly, eligible participants were contacted by phone or during in-person health center visits between December 2008 and January 2010. Of the 2,903 WHN participants who met the eligibility criteria, 51% could not be reached, owing to inaccurate or unavailable contact information. Of the 1,386 women who were reached by phone or through in-person contact, 88% (1,214) agreed to participate. Consent for study participation was obtained by phone or in writing. Consent forms were written in English at a sixth-grade reading level and

were translated into Spanish, Portuguese, Vietnamese, Thai, Khmer, Russian, Albanian, Arabic, and Creole.

All study staff were trained in appropriate recruitment and consent processes in accordance with approved institutional guidelines. The study was approved by the Partners Human Research Committee, Boston.

Primary study measures

We evaluated whether there were differences in breast and cervical cancer screening and CVD screening from prereform (defined as the 3-year period from January 1, 2004, to December 31, 2006) compared to postreform (defined as the period from September 1, 2007, through August 31, 2010). Specifically, we examined whether WHN participants received the following screening tests between January 1, 2004, and August 31, 2010, at intervals reflecting the standard of care for recommended screening, including (1) mammography screening at 2-year intervals, (2) cervical cancer screening once in a 3-year period, and (3) blood pressure screening at 2-year intervals. Data on utilization of mammography screening and Pap smear testing were obtained from claims data, with a supplemental medical record review. Data on blood pressure screening were obtained via medical record review.

Insurance categories and demographic characteristics

We used medical record review of the patient's chart or fiscal registration record to determine the current insurance category for each participant postreform. The postreform insurance and payment categories were Commonwealth Care (a new state-subsidized insurance product created under state healthcare reform), Medicaid, Medicare, Health Safety Net (a state-run program that funds uncompensated care for the remaining uninsured), private nonsubsidized insurance, and self-pay.

Sociodemographic data, including race and ethnicity, date of birth, annual household income, primary language, and education level, were obtained at baseline from eligibility data collected by the WHN program through the Massachusetts Department of Public Health. Clinical diagnoses (hypertension, diabetes, hysterectomy) were obtained from baseline WHN data and medical record review data.

Statistical analysis

We compared the primary study measures of the utilization of mammography, Pap smear testing, and blood pressure screening prior to and after implementation of healthcare reform. The prereform period (January 1, 2004, to December 31, 2006) was the period before healthcare reform products were available. The postreform period (September 1, 2007, through August 31, 2010) was the period during which reform insurance products were broadly available for enrollment through the state insurance exchange.

We provided descriptive statistics of the products to which WHN participants enrolled and the frequency with which quality metrics for standards of care for screening utilization were met. To test for statistically significant changes in rates of screening use postreform compared to prereform, we conducted a longitudinal analysis, using generalized estimating equations (GEE) to examine the likelihood of screening at recommended intervals in the postreform period compared to the prereform period.⁵ Specifically, the GEE

analysis modeled the log odds of screening at recommended intervals and appropriately accounted for the correlation between the repeated measures (pre- and postreform) obtained on each participant. We constructed models using each of the three study outcome measures in separate longitudinal logistic regression models. We adjusted for insurance product in the models and included a time by insurance product interaction term to test whether there were statistically significant changes in utilization prereform and postreform, depending on the type of insurance product to which WHN participants enrolled. Two-tailed tests of statistical significance were conducted; statistical significance was established at the 0.05 alpha level.

Results

Insurance status post–healthcare reform

The sociodemographic characteristics of study participants are listed in Table 1. Loss to follow-up across study years was low (7%). Study participants were predominantly Hispanic (44%), were 40–50 years old (58%), had less than \$10,000 in annual household income (49%), and had less than high

school educational attainment (41%). Twenty-seven percent had a diagnosis of hypertension, 17% had diabetes, and 17% had a hysterectomy prior to or during the study period. Women with a hysterectomy were excluded from the analysis of Pap smear usage.

A plurality (39.5%) of WHN participants transitioned to Commonwealth Care, the state-subsidized insurance plan from the Massachusetts health insurance exchange. A large percentage (30.6%) enrolled in the Health Safety Net, a state program providing limited funding for residents ineligible for all other types of insurance. Eight percent of WHN participants enrolled in Medicaid under expanded Medicaid criteria, 5% became eligible for Medicare based on age, and fewer than 1% relied on self-pay for care. Chi-squared tests showed significant racial and ethnic differences in insurance status, with non-Hispanic white women most likely to enroll in subsidized Commonwealth Care insurance ($p < 0.0001$). Non-Hispanic black women were most likely to enroll in Commonwealth Care insurance, and Hispanic and Asian women were most likely to require Health Safety Net funds to pay for care ($p < 0.0001$). No statistically significant racial and ethnic differences were seen in Medicaid enrollment.

TABLE 1. MASSACHUSETTS WOMEN’S HEALTH NETWORK PARTICIPANTS BASELINE CHARACTERISTICS BY POST–HEALTHCARE REFORM INSURANCE TYPE

	<i>Commonwealth Care^a</i>	<i>Health Safety Net^b</i>	<i>Medicaid</i>	<i>Private coverage^c</i>	<i>Medicare</i>	<i>Self-pay</i>	<i>Unknown/lost to follow-up</i>
All $n = 1,214$	479	372	101	100	64	8	90
Age							
40–50 $n = 704$	246 (51)	274 (74)	59 (58)	68 (68)	6 (9)	8 (100)	43 (48)
51–64 $n = 510$	233 (49)	98 (26)	42 (42)	32 (32)	58 (91)	0 (0)	47 (52)
Race/ethnicity							
Non-Hispanic white $n = 345$	165 (34)	52 (14)	21 (21)	21 (21)	24 (37)	4 (50)	58 (64)
Non-Hispanic black $n = 210$	81 (17)	37 (10)	26 (26)	39 (39)	19 (30)	3 (38)	5 (6)
Non-Hispanic Asian $n = 112$	44 (9)	50 (13)	11 (11)	2 (2)	3 (5)	0 (0)	2 (2)
Hispanic $n = 535$	186 (39)	229 (62)	43 (43)	37 (37)	16 (25)	1 (12)	23 (26)
Other/unknown $n = 12$	3 (1)	4 (1)	0	1 (1)	2 (3)	0 (0)	2 (2)
Median household income							
< \$10,000 $n = 593$	218 (46)	193 (52)	52 (52)	40 (40)	40 (62)	4 (50)	46 (51)
\$10,000–\$15,000 $n = 233$	95 (20)	78 (21)	15 (15)	20 (20)	12 (19)	0 (0)	13 (14)
\$15,000–\$20,000 $n = 194$	87 (18)	58 (16)	15 (15)	18 (18)	5 (8)	2 (25)	9 (10)
> \$20,000 $n = 189$	77 (16)	43 (12)	19 (19)	21 (21)	6 (9)	2 (25)	21 (23)
Unknown $n = 5$	2 (0.4)	0	0	1 (1)	1 (2)	0	1 (1)
Educational attainment							
< High school $n = 502$	187 (39)	181 (49)	47 (47)	35 (35)	29 (45)	3 (38)	20 (22)
High school $n = 332$	148 (31)	72 (19)	31 (31)	33 (33)	19 (30)	2 (25)	27 (30)
Any college $n = 304$	106 (22)	99 (27)	18 (18)	23 (23)	12 (19)	3 (38)	43 (48)
Unknown $n = 76$	38 (8)	20 (5)	5 (5)	9 (9)	4 (6)	0	0
Has hypertension $n = 326$	141 (29)	64 (17)	42 (42)	34 (34)	39 (61)	0	6 (7)
Has diabetes $n = 209$	78 (16)	51 (14)	33 (33)	21 (21)	23 (36)	0	3 (3)
Had a hysterectomy $n = 204$	84 (18)	56 (15)	19 (19)	15 (15)	16 (25)	0	14 (16)

All study participants were uninsured at baseline between 2004 and 2006 prior to the implementation of healthcare reform in Massachusetts. All were participants in the Massachusetts Women’s Health Network (WHN) program, which provided coverage of mammography, Pap smear testing, and cardiovascular disease screening for uninsured low-income women prior to the implementation of the Massachusetts 2006 reforms. Listed insurance represents women’s most recent insurance coverage postimplementation of Massachusetts healthcare reform between June 2007 and August 2010.

^aCommonwealth Care is a subsidized Massachusetts insurance exchange product offered by private insurance providers.

^bHealth Safety Net funds uncompensated care for patients who remain uninsured.

^c“Private coverage” indicates non-subsidized insurance products that are not administered by the state’s insurance exchange. Figures are unadjusted number (%).

TABLE 2. CANCER AND CARDIOVASCULAR DISEASE SCREENING UTILIZATION BEFORE AND AFTER MASSACHUSETTS HEALTHCARE REFORM AMONG WOMEN'S HEALTH NETWORK PARTICIPANTS

	All WHN participants n=1,201	Transitioned to Commonwealth Care postreform n=479	Eligible for Health Safety Net postreform n=372	Transitioned to Medicaid postreform n=101	Transitioned to private coverage postreform n=100	Transitioned to Medicare postreform n=64	Lost to follow-up postreform n=85
Had a mammogram within 2 years							
Prereform	1,035 (86)	409 (85)	337 (91)	82 (81)	83 (83)	55 (86)	69 (81)
Postreform	915 (88)	410 (90)	311 (92)	73 (75)	72 (80)	49 (79)	—
Had a Pap smear within 3 years							
Prereform	865 (88)	345 (88)	279 (89)	70 (85)	75 (93)	39 (85)	57 (84)
Postreform	771 (89)	343 (91)	273 (94)	62 (82)	63 (80)	30 (64)	—
Had blood pressure checked within 2 years							
Prereform	1,041 (87)	418 (87)	327 (88)	91 (90)	90 (90)	56 (88)	59 (69)
Postreform	945 (91)	380 (89)	325 (92)	90 (93)	89 (93)	61 (97)	—
Women with hypertension who had blood pressure checked within 2 years							
Prereform	304 (93)	130 (92)	61 (95)	41 (98)	31 (91)	35 (90)	6 (100)
Postreform	296 (94)	134 (96)	56 (89)	38 (93)	30 (94)	38 (97)	—

All participants had screening test covered through the Women's Health Network prior to the passage of the 2006 Massachusetts healthcare reform law ("prereform"). After passage of the 2006 law ("postreform"), study participants transitioned to insurance to pay for screening tests.

Utilization of screening post-healthcare reform

Patterns of screening utilization pre- and postreform are listed in Table 2. Across all insurance categories, utilization patterns were similar pre- and postreform for mammography use (86% vs. 88%) and Pap smear testing (88% vs. 89%) at recommended intervals. A 3% increase in the percentage of women who obtained blood pressure screening at recommended intervals (87% vs. 91%) did not appear to be owing to blood pressure evaluation during treatment for women with hypertension, where blood pressure measurement was unchanged pre- and postreform (93% vs. 94%).

Patterns of care utilization differed within insurance categories (Table 2). Notably, the percentage of women who obtained mammography at recommended intervals increased 5% among women who enrolled in Commonwealth Care. There was a trend toward a decrease in mammography utilization among women who enrolled in Medicaid, unsubsidized private insurance, and Medicare. Additionally, the percentage

of women who had Pap smear testing at recommended intervals increased 5% among women covered under the Health Safety Net. A trend toward decreased Pap smear testing postreform was seen among women enrolled in Medicaid, unsubsidized private insurance coverage, and Medicare.

After adjustment for demographic and clinical characteristics, blood pressure screening at recommended intervals was statistically significantly increased across all payers, whereby women had 44% higher odds of obtaining blood pressure screening at 2-year intervals postreform compared to the prereform period (Table 3). The relative odds of having a screening test in the post- versus prereform period within the payment categories, obtained from the statistically significant time by insurance category interaction terms, are shown in Table 3. The use of mammography screening at recommended intervals was statistically significantly increased postreform among women enrolled in Commonwealth Care (OR 1.58, $p < 0.05$). Pap smear utilization was statistically significantly increased among women covered under the Health Safety Net

TABLE 3. RELATIVE ODDS OF CANCER AND CARDIOVASCULAR DISEASE SCREENING AFTER HEALTHCARE REFORM BY INSURANCE TYPE, ADJUSTED FOR SELECTED CHARACTERISTICS: ODDS RATIO (95% CONFIDENCE INTERVALS)

	Mammography screening	Pap smear screening	Blood pressure checked for all	Blood pressure checked for women with hypertension
Prereform	Reference	Reference	Reference	Reference
Postreform, all payers	1.11 (0.89, 1.40)	1.02 (0.77, 1.36)	1.44 (1.09, 1.92) ^a	1.12 (0.55, 2.27)
Postreform by payer				
Commonwealth Care	1.58 (1.10, 2.27) ^a	1.30 (0.82, 2.05)	1.10 (0.73, 1.67)	1.98 (0.65, 6.00)
Health Safety Net	1.15 (0.69, 1.94)	1.98 (1.10, 3.57) ^a	1.48 (0.88, 2.48)	0.38 (0.08, 1.74)
Medicaid	0.70 (0.38, 1.28)	0.73 (0.31, 1.74)	1.42 (0.48, 4.15)	0.29 (0.03, 3.21)
Private coverage	0.85 (0.45, 1.61)	0.31 (0.13, 0.78) ^a	1.44 (0.52, 3.99)	1.54 (0.19, 12.4)
Medicare	0.54 (0.23, 1.24)	0.29 (0.11, 0.80) ^a	6.77 (0.74, 61.52)	3.41 (0.28, 41.12)

Figures are odds of having a screening test in the post-healthcare reform period compared to the pre-healthcare reform period, adjusted for age, race, diabetes, hypertension, household income, and insurance payer. Figures exclude women with missing insurance product postreform and those with unknown race. Women with hysterectomies excluded from Pap smear screening analysis.

^a $p < 0.05$.

but was statistically significantly decreased among women who enrolled in unsubsidized private insurance products or in Medicare. No specific differences were seen for blood pressure screening based on insurance category, including screening among women with hypertension.

Discussion

Our study examined the postreform insurance status and quality of care provided to a diverse population of low-income women who participated in WHN programs prior to the passage of the Massachusetts healthcare reform. We found that these patients enrolled primarily in the state's Commonwealth Care products for insurance coverage rather than becoming eligible for Medicaid under the expanded Medicaid eligibility criteria. However, a substantial number of women in this study population required coverage through the state's Health Safety Net fund to pay for their preventive care rather than an insurance product. Overall, women's cancer screening prevalence in our study was unchanged postreform, although blood pressure screening increased in the postreform period. Our data also show that women who enrolled in the state's subsidized Commonwealth Care products were more likely to receive mammography screening at recommended intervals postreform, compared to their prereform utilization practices. Postreform, Pap smear utilization was increased among women who accessed care through Health Safety Net funds, whereas women who enrolled in unsubsidized private insurance plans or who became eligible for Medicare as their primary insurance had decreased Pap smear utilization postreform. We note that women who became age-eligible for Medicare may have decreased their Pap screening use owing to changing screening guidelines in this population.

Taken together, our results suggest that either similar or improved care was achieved for low-income women on several types of insurance, including Commonwealth Care or Medicaid, but that the low-income women in our study who enrolled in unsubsidized private plans or Medicare may have been less likely to access Pap smear screening.

Few published data monitor access to care in this diverse low-income population. Nationally, for example, Behavioral Risk Factor Surveillance Survey (BRFSS) data show flat or declining trends in mammography and Pap smear screening rates in low-income women during the study period, which may be related to changing recommendations for women's cancer screening.⁶⁻⁸ Across all income groups in Massachusetts, data from the BRFSS show that mammography use declined during our study period between 2004 and 2010 and could not be directly attributed to healthcare reform practices.⁹ It is possible that the sustained high access to mammography screening we observed, which was available via Commonwealth Care insurance in this low-income population, reflects low financial barriers to care,¹⁰ including the absence of physician-visit copayments. Importantly, in the diverse population we studied here, we note that a high percentage of women, particularly Hispanic and non-Hispanic Asian populations, required safety-net funds to pay for their preventive care. We did not collect data on the reasons why women enrolled in specific insurance plans or accessed safety-net funds. However, it is possible that a lack of eligibility for Medicaid or state-subsidized programs, including immigration or documentation status, led to the high reliance on safety-net funds

we observed.¹¹ Although high levels of preventive-care screening were observed in this population, we note that our data were collected during the implementation of Massachusetts reforms through 2010. During this period, WHN and other special-grant programs continued to provide funding for a model of care that included lifestyle counseling and patient navigation support embedded at the CHCs we studied. Prior work shows that patient navigation improves utilization of mammography screening in diverse low-income populations.¹² Such programs are not reimbursed under current fee-for-service payment models. Additional data will be required to monitor trends in utilization among low-income women associated with future systems changes for healthcare access in these groups, particularly if embedded counseling and navigation-support models are not sustained through special programs or integrated into payment models.

Our study has important limitations that should be considered. Although our data are longitudinal and collected prospectively, our study did not include control groups outside of WHN. Based on the study design, we can infer associations but cannot draw strong causal inferences between insurance product status and care utilization from the associations we observed. Another limitation is that our study monitored only care received within the CHC and did not gather data on women who may have left the CHC owing to network transitions caused by changing insurance eligibility status, or "churning."¹³ Thus, we cannot comment on the care provided to former WHN participants who left the CHCs we studied. We note that we could not reach 51% of women we attempted to contact for recruitment into the study, owing to inaccurate or out-of-date contact information. These women may have been receiving care at other institutions or may have gone without care. If these women were less connected to primary care than the patients we recruited, the screening rates we report may overestimate screening in this population. However, we note that the participation rate among women who were asked to participate was very high (88%) and that very few women (7%) who participated in the study were lost to follow-up, which provides a measure of confidence in our findings on care provided to women who remained at the CHCs we studied. To further minimize incomplete data collection in our study population, we used chart review to supplement Commonwealth Care claims data. Last, we also note that the high prevalence of cancer and CVD risk screening we document likely reflects that this study population was connected to primary care or a usual provider.^{14,15} Thus, our results generalize to a population of low-income women who benefited from patient navigation services provided within CHCs. Given these limitations, our study also has important strengths, including the rarely available data on diverse low-income women, the longitudinal design, a high recruitment rate, and a low loss to follow-up.

In summary, we found that the quality of care for women's cancer and CVD screening in the diverse low-income women we studied was chiefly unchanged postreform and was moderately improved in the case of blood pressure screening. Recommended screening use under most insurance categories was similar or improved postreform, with some decrease in Pap smear usage for women on unsubsidized private plans or Medicare.

These results have policy implications, namely, that high-quality care can be provided to low-income women who participate in subsidized insurance products managed by

private payers or through Medicaid, particularly in settings that have patient-navigation services. Additional strategies may be needed to ensure continuous quality of care for low-income women who transition to Medicare or to unsubsidized private insurance-coverage products. Last, a key finding of our study is the high use of the Health Safety Net fund among low-income populations cared for by the CHCs we studied. Low-income Hispanic and Asian women in our study were particularly vulnerable and should be monitored in future work. As other states plan to provide care for low-income women, it is important to note the need to provide systems for caring for populations whose needs are not met, even with near-comprehensive strategies for insurance coverage.¹⁶

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Author Disclosure Statement

Paula Johnson is an Independent Director of West Pharmaceutical Services and holds stock of less than 1% in the company. For all other authors, no competing financial interests exist.

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