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Effects of program scale-up on time to resolution for patients with abnormal screening mammography results

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Abstract

Purpose.—Effects of geographic program expansion to rural areas on screening program outcomes are understudied. We sought to determine whether time-to-resolution (TTR) varied significantly by service delivery time period, location, and participant characteristics across 19 North Texas counties.

Methods.—We calculated proportions undergoing diagnostic follow-up and resolved ≤ 60 days. We calculated median TTR for each time period and abnormal result BI-RADS 0, 4, 5. Cox proportional hazards regressions estimated time period and patient characteristic effects on TTR. Wilcoxon rank sum tests evaluated whether TTR differed between women who did or did not transfer between counties for services.

Results.—TTR ranged from 14–17 days for BI-RADs 0, 4, and 5; 12.4% transferred to a different county, resulting in longer median TTR (26 vs. 16 days; $p < .001$). Of those completing follow up, 92% were resolved ≤ 60 days (median 15 days). For BI-RAD 3, TTR was 208 days (including required 180 day waiting period). Follow-up was significantly lower for women with BI-RAD 3 (59% vs. 96%; $p < .0001$).

Conclusion.—Expansion maintained timely service delivery, increasing access to screening among rural, uninsured women. Policies adding a separate quality metric for BI-RAD 3 could encourage follow-up monitoring to address lower completion and longer TTR among women with this result.

Keywords

scale-up; rural; quality; breast cancer screening

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Introduction

Breast cancer screening has been shown to reduce mortality among women at average risk of breast cancer between the ages of 40–69.(1) A single screening episode,(2) however, may require both primary and specialty care providers, multiple procedures (e.g. screening mammogram, diagnostic mammogram, ultrasound, and biopsy), and multiple communications involving transfer of information and responsibility before a diagnostic result is reached.(3) Timely diagnostic resolution following an abnormal mammography is critical to reducing morbidity. (4) Disparities exist in the timeliness of follow-up among vulnerable populations including racial/ethnic minorities and those with limited education or income.(5) Studies show that rural-residing women are less likely to complete cancer screening and more likely to be diagnosed at a later stage.(6) Rural-related disparities are especially concerning in states like Texas where 46% of the 254 counties are classified as rural.(7)

Various system/clinic-, provider-, and patient-level barriers hinder timely completion of diagnostic follow-up after an abnormal screening mammogram including delayed result reporting, limited access to diagnostic services, timeliness of follow-up communications by providers and clinical staff, and lack of attention to patient barriers such as transportation, childcare, and other competing demands.(8, 9) Patient navigation has been shown to address many of these factors and, thereby, increase completion of diagnostic follow-up and reduce time to resolution (TTR) following an abnormal mammography screening, particularly among vulnerable populations (10–12) and for women requiring additional services such as biopsy.(13, 14) Navigation effectiveness varies by key patient demographic factors, including race/ethnicity, language, insurance status, and marital status.(15) At the system-level, the prevalence and types of barriers to timely follow-up may vary across clinics, even within integrated healthcare systems.(16, 17) Screening delivery programs able to address these multi-level factors (18) may be well-positioned to expand program reach (i.e. scale up) into similarly situated communities.

Scale-up of screening delivery programs to expand geographic reach may impact quality of care.(19) Key factors for successful program scale-up include: establishing process and outcome evaluation metrics, systematically using data to guide quality improvement efforts(20, 21) and engage program implementers, and adapting the program approach to local contexts. (19, 22) However, little is known about how to expand mammography programs across large rural regions and how expansion impacts service quality (as a measure of program maintenance). In the CDC's National Breast and Cervical Cancer Early Detection Program (NBCCEDP), reimbursement for mammography services is contingent upon a program quality metric-- timely diagnostic resolution (e.g. 60 days for 75% of women with abnormal results).(23, 24) Thus, monitoring time to resolution changes after program expansion is a practical and reasonable way to understand the impact of such regional expansion on delivery outcomes.

Previously, we tested a tool to assess county capacity (25) and demonstrated effectiveness of a decentralized rural breast cancer screening delivery model to maintain equivalent numbers of women served during program expansion from the original seven counties to 19 counties.

(26) In this paper, we evaluate a key quality metric: time to resolution (TTR), to demonstrate effectiveness of that geographic scale-up. We hypothesized that scale-up would be successful if the program achieved comparable outcomes with respect to TTR as new counties were added, irrespective of (a) when service was delivered (i.e., before versus after expansion), (b) service location (original vs. expansion county), and (b) patient sociodemographic (e.g. race/ethnicity) and patient-reported health status (e.g. “symptomatic” vs. asymptomatic, prior to clinical adjudication) characteristics.

METHODS

Setting and Study Population

In 2009, Moncrief Cancer Institute (Moncrief) created the “Breast Screening and Patient Navigation” (BSPAN) program to increase access to breast cancer screening for under- and uninsured rural-residing women in North Texas.(27) BSPAN is a virtually-integrated network of clinical providers and local community organizations across rural North Texas. (28) In 2012, the BSPAN program evolved into a de-centralized regional hub-and-spoke delivery model to better serve an expanded regional area of 19 counties. (27) As the hub, Moncrief anchors a contracted network of participating primary care and radiology facilities across these counties, delivers bilingual telephone-based, oncology nurse-driven navigation for patient intake and scheduling, and reimburses participating providers using a combination of funding mechanisms, per individual eligibility.(25) The NBCCEDP’s Texas state affiliate was the primary source followed by Medicaid, *Komen for the Cure* regional charities, Cancer Prevention Research Institute of Texas (CPRIT), and local philanthropies. A small number of patients used self-pay, Medicare, and occasionally some form of commercial insurance.. Local primary care and radiology providers serve as network spokes to deliver the full continuum of breast cancer screening services and document service delivery for reimbursement by Moncrief. The current BSPAN service area is over 90% rural, with some communities located over 120 miles from Moncrief. (7, 26) Description of the funding strategy, service population and county catchment area have been described previously.(29)

Data Collection

Moncrief created an electronic database to track program participants’ contact information, sociodemographics, receipt of screening services, radiology and pathology results, and navigation process data across the screening continuum. Navigation staff recorded each contact with participants in the database in real time. Database-derived reports assessed program metrics such as: completion of follow-up, time to resolution, proportion uninsured, proportion receiving baseline mammography, and number of cancers detected.

Sample Selection

Of >18,000 patients served during the BSPAN expansion (Oct 1, 2012 - May 31, 2015), 2,860 patients received at least one abnormal result during the screening process (Figure 1). Among patients who received multiple abnormal screening results over the three-year program, we analyzed the first abnormal result.

Outcomes

We defined as *abnormal* any outcome that required additional imaging or biopsy to reach diagnostic resolution; thus: BI-RAD scores of 0, 3, 4, and 5 or an abnormal screening mammogram. End points for calculating diagnostic resolution included: screening-normal, BIRAD 1 or 2, biopsy positive, and biopsy negative (Appendix A). We calculated the proportion that completed diagnostic evaluation of an abnormal result during the study period.

We defined *time to resolution (TTR)* as the number of days between the date the *first* abnormal screening result was documented in the database and the date when diagnostic resolution was achieved (diagnostic mammogram or biopsy). For those few patients where documentation date was unavailable, we used the date results were received (n=40) or the service date (n=20). We calculated the service date as the end point of the TTR calculation because the date when the woman was notified about the result was less consistently populated in the database. Patients without diagnostic resolution were censored at the end of the study period (May 1, 2015).

We also calculated the proportion that received diagnostic follow-up within 60 days to mirror the NBCCEDP quality metric. The American Cancer Society recommends that patients who receive a BI-RAD 3 screening result undergo repeat short-interval (within 6–9 months) follow-up imaging. (30) This planned delay of recommended follow-up, however, renders the 60-day quality metric for TTR inapplicable among those receiving BI-RAD 3 results. Thus, we stratified our TTR analysis by BI-RAD result (3 vs. 0, 4, 5, Screening Abnormal) and excluded BI-RAD 3 outcomes in our calculation of adherence to the 60-day quality metric. For women with BI-RAD 3 results, we calculated the average TTR and examined how soon after the 180 day waiting period the repeat mammogram was received. This is similar to other analyses of NBCCEDP screening results that have separated (31, 32) or excluded (23) BI-RAD 3 outcomes from analysis.

Independent variables

To examine aspects of program expansion, we created two independent variables based on patient's first abnormal service date: time period and service location. The overall number of counties as well as the number of women reached changed over time as the program expanded; therefore we created a time-based independent variable to account for the temporal changes. We grouped patients into five six-month time periods; the first two time periods were prior to program expansion (Oct 2012 - Mar 2013; Apr 2013 - Sep 2013) and the remaining three time periods were after expansion (Oct 2013 - Mar 2014; Apr 2014 - Sep 2014; Oct 2014 - Apr 2015). Service location had three categories: original/pre-expansion (seven counties and service was delivered prior to Jul 1, 2013), original/post-expansion (same seven counties with service on or after Jul 1, 2013), or additional counties, post-expansion (12 counties).

Other literature has found that TTR is associated with patient characteristics such as age, race-ethnicity, poverty level, insurance status, and BI-RAD category of abnormal screening result;(5, 12, 18) therefore, we also evaluated these variables as potential covariates, in

addition to language preference and patient-reported health status (symptomatic/asymptomatic) at intake.

Data Analysis

We used counts and percentages to summarize demographic and clinical characteristics of the women, as well as the proportion undergoing diagnostic follow-up during the study period. We used Kaplan-Meier plots to calculate median TTR for each abnormal result type and program expansion time period, as well as to calculate the proportion of women who were resolved by 60 days. Unadjusted and adjusted Cox proportional hazards models were used to estimate hazard ratios for time to resolution according to program expansion time period, service location, and patient characteristics. Variables were included in the multivariable (adjusted) model if a *p*-value of 0.05 was attained in the univariate (unadjusted) analysis. Analyses were performed using *SAS 9.4 System for Windows* (SAS Institute Inc., Cary, NC, USA, 2008).

Some counties did not have a provider to perform certain diagnostic procedures; thus, some women were navigated to receive diagnostic services from another county. We used the non-parametric Wilcoxon rank sum test to evaluate *a priori* whether TTR differs between women who received services in one vs. more than one county among women who reached diagnostic resolution (n=2,362).

RESULTS

We identified 2,860 women (62.6%) who had an abnormal screening mammogram as their first abnormal result (Table 1). The majority of women were between the ages of 40 and 64 (78.7%) and uninsured (92.6%). Over half (52.1%) of the women were Hispanic, 73.3% were asymptomatic at intake, and 63.7% received a service in an expansion county.

Completion of Diagnostic Follow-up

Nearly 91% of women (n=2,599) completed diagnostic follow-up of an abnormal result during the study period. Median time to resolution for all women with an abnormal result was 15 days (range: 0 – 877 days).

Factors Associated with Time to Resolution

For women with a BI-RADs 0, 4, and 5 result, hazard ratios for TTR were significant in univariate analysis for program expansion time period, patient age, patient race/ethnicity, patient symptomatic status at intake, and patient insurance status at intake; all variables remained significant in the multivariable model (Table 2). Service location, language preference, and federal poverty level at intake were not significantly associated with TTR. Below we report the difference in TTR in days; both days and Hazard ratios are found in Table 2.

Time to resolution for each program expansion time period was similar (range: 14–18 days; Figure 2). Although significantly shorter for the 2nd, 4th and 5th time periods when compared to the 1st (14–16 days vs. 17 days, respectively), the time difference is not clinically

meaningful. Compared to women aged 40–49 years (15 days), older women had longer TTR (19 days for age 50–64 and 23 days for 65 and older); by contrast, women less than age 40 had shorter TTR (13 days). Compared to Whites (15 days), TTR was longer for Hispanics (16 days), Blacks (19 days), and Other/Unknown race-ethnicity (20 days). TTR was longer for women with insurance compared to no insurance (21 days vs 15 days) and asymptomatic women compared to those reporting symptoms at intake (18 days vs 12 days).

For women who reached diagnostic resolution and who did not have a first abnormal result of BI-RAD 3 ($n=2,362$; 82.3%), we evaluated whether TTR differs between women who received services in one versus more than one county. Only a small proportion of women needed to transfer to a different county for resolution ($n=293$; 12.4%). Time to resolution differed significantly between the two groups (Wilcoxon 2 sample test, $p < .001$); median time to resolution was 15 days for women who received services in one county compared to 26 days for women who received services in more than one county. Despite needing to transfer to a different county, 91.5% of women were resolved within 60 days; comparatively, 96.2% of women who did not transfer were resolved within that same timeframe.

Proportion achieving NBCCEDP Quality Metric

Overall, 92% of the women were resolved within 60 days - well above the NBCCEDP quality metric of 75%. The percentage of those resolved within 60 days ranged from 81% to 96% for each program expansion time period and patient characteristic (Table 2).

BI-RAD 3 Results

Four hundred women (14%) received an abnormal result of BI-RAD 3 during the study period. Only 59.3% ($n=237$) of the BI-RAD 3 results were resolved during the study window; most of the women were resolved with one service (94.9% or $n=225$). The most common resolution result after a BI-RAD 3 was another BI-RAD 3 (57.8% or $n=137$). Not surprisingly, median TTR differed significantly between women with BI-RAD 3 results and women with the remaining abnormal results (208 days vs. 16 days, respectively; Figure 3); however given the required 180 day (6 month) waiting period between first and second services, the remaining 28 day median result falls well within the NBCCEDP quality standards.

DISCUSSION

Our findings demonstrate that our screening and navigation delivery model maintained a high quality of service during expansion of the program to rural underserved populations, as measured by time to resolution. Further, TTR following an abnormal screening result followed patterns similar to national-level NBCCEDP data.(5, 12, 18, 23)

We provide important data on an under-studied population: a large, mostly uninsured, community-based rural sample in which many participants lacked a primary provider for preventive care.(14, 31, 33) BSPAN served women from across a large rural region and, because some counties did not have access to certain diagnostic procedures, many participants were navigated across county lines through the BSPAN provider network.(26, 34) Moreover, a significant proportion of women in our analysis were minority (64% Black

or Hispanic) and preferred to receive services in Spanish (42%). Sustaining quality metrics in this underserved population is critical, given disparities in TTR and screening completion rates among rural-residing, racial/ethnic minority, poor, and uninsured populations nationally. (5, 35)

Our findings are important to rural areas, like North Texas, where there are few integrated healthcare systems and delivery of cancer screening services must be coordinated among providers with different clinical information systems. Most studies of cancer care delivery among rural populations have largely focused on treatment, addressing challenges facing interdisciplinary community oncology teams,(36) remote communications like tele- and video- conferencing,(37) and remote supervision of local clinicians treating patients in rural settings.(38) Less is known about how to optimize community-based programs that navigate women through the breast cancer *screening* process across different clinical provider networks.(27) Our program demonstrates that a virtually-integrated network of providers can be effective in extending access to high quality breast cancer screening services among rural-residing, uninsured, underserved women.(26) Longer time to resolution (~1-5 days) for older, minority and Spanish-speaking women suggest that all programs should monitor for potential disparities to determine if provider-level solutions should be implemented (e.g. recruit more Spanish-speaking staff among contracted providers or utilize telephone-based interpreter assistance).

Currently, NBCCEDP state affiliates require contractors to provide screening mammograms within 60 days of clinical breast exams, and time from initial abnormal result to diagnosis within 60 days for contracted providers to be eligible for reimbursement.(39) However, these metrics enable service providers to exclude patients with BI-RAD 3 results from their quality reporting, given the ACR-recommended 9 month follow-up. To facilitate comparison with other studies, we chose to exclude BI-RAD 3 patients from the TTR analysis;(23) and report BI-RAD 3 rate of completing subsequent imaging.(10) Our data indicate that women with BI-RAD 3 results (14% of our sample) have lower completion rates. NBCCEDP should consider a separate quality metric for BI-RAD 3 outcomes that recognizes that this subset of women still require timely follow-up to diagnostic resolution.

Literature on timeliness emphasizes abnormal follow-up, with start time defined as the date of abnormal result and the end time as the date of diagnostic resolution. We are unaware of studies evaluating the time from patient-initiated request for screening services to patients' receipt of "normal" results. This presents an important gap in knowledge, particularly among rural-residing women who may face delays between clinical breast exams and screening mammography due to the relative scarcity of mammography resources.(40) To evaluate time to receipt of results among women with normal results, programs would need to systematically document when a woman initiates contact seeking to schedule a screening appointment; perhaps with stronger linkages between EHRs and navigation tracking. Some evidence suggests lack of provider responsiveness to initial patient inquiry (e.g. to review eligibility or schedule an appointment) can negatively impact patient screening services completion, especially among indigent or uninsured women.(8, 41–43) In this sense, although statistically significant, the one to three day differences between time periods that

we identify were not clinically meaningful but might well impact to patient satisfaction and thereby rates of loss-to-follow-up.

If NBCCEDP contractors were required to report quality metrics for TTR regardless of screening results, then contractors would have to document outcomes for all patients who initiate screening requests. Dissatisfaction with information and communication during the screening process,(44) long wait times or inconvenient times for appointments,(45) and delays in the receipt of test results(41) may be associated with dissatisfaction with screening experiences and go on to impact compliance to subsequent biennial screening.(46, 47) Future mixed-method studies could enhance understanding of mechanisms by which negative screening experiences may affect subsequent primary and preventive care services at recommended intervals.

Given characteristics of the BSPAN target population, our findings may not be easily generalizable to higher income populations or those with insurance. Due to Texas NBCCEDP eligibility guidelines, our cohort of women includes many reporting breast health issues at initial presentation and many less than 40 years old (the latter are considered eligible if they report symptoms or a family history of breast cancer).(39) The NBCCEDP program and other payers (e.g., Komen Foundation) emphasized increasing access among uninsured, underserved, rural populations; this program focus may have inadvertently led patient navigators to prioritize getting uninsured women to complete follow-up and resulted in the slightly elevated TTR among insured women. Thus, the shorter TTR rate among uninsured vs. insured women (15 vs. 21 days, respectively) may not be reflected in other rural settings with higher rates of insurance coverage or with different protocols for managing follow-up.(48)

CONCLUSION

Maintaining high quality of services during geographic scale-up is possible for screening delivery programs caring for rural, uninsured and minority women through a virtually-integrated provider network. Others programs implementing regional service delivery models should evaluate if loss to follow-up across the screening continuum is minimized for other populations experiencing breast cancer health disparities. Importantly, we stratified our analysis of TTR (BIRADS 0, 4, 5 vs. BI-RADS 3), and recognized that guidelines recommend a 180-day waiting period before performing a repeat mammogram for BI-RADS 3 (indeterminate) results. This analytic approach revealed sub-optimal completion of follow-up among women with a BI-RADS 3 not visible in previous reports. To ensure appropriate and timely follow-up of all abnormal mammograms, a separate performance metric for BI-RADS 3 should be considered by policymakers and administrators of screening programs.

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All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by UT Southwestern Institutional Review Board (STU 022012–009; PI: Lee).

Appendix

Appendix A.

Breast Cancer Screening Continuum: Analysis by Screening Test, Result, and Follow-up Recommendations

Screening test	Screening result	Clinically recommended follow-up(49)	Analysis
SCR-m	Normal	None	Diagnostic resolution
	Abnormal	Additional imaging 3 months	Abnormal, additional testing needed
DX-m	BI-RAD 0 Incomplete	Repeat imaging 3 months	Additional testing needed
	BI-RAD 1 Negative	None	Diagnostic resolution
	BI-RAD 2 Benign	None	Diagnostic resolution
	BI-RAD 3 Probably benign	Additional imaging 9 months	Analyzed separately
	BI-RAD 4 Suspicious abnormality	Additional imaging or biopsy 3 months	Abnormal, additional testing needed
	BI-RAD 5 Highly suggestive of malignancy	Additional imaging or biopsy 3 months	Abnormal, additional testing needed
Biopsy	Positive	None	Diagnostic resolution
	Negative	None	Diagnostic resolution

SCR-m = screening mammogram

DX-m = diagnostic mammogram

BI-RAD = Breast Imaging-Reporting and Data System

Additional imaging may include mammography, digital tomosynthesis, ultrasound, or MRI

Acronyms:

BCCS	Breast and Cervical Cancer Services (Texas' NBCCEDP-funded program)
BSPAN	Breast Screening and Patient Navigation program
BI-RAD	Breast Imaging-Reporting and Data System
NBCCEDP	National Breast and Cervical Cancer Early Detection Program
TTR	time to resolution

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Figure 1.
Consort diagram of BSPAN participants selected for analysis

Figure 2.
Time to Resolution by Time Period

Figure 3. Time to Resolution by Type of Abnormal Result.

The American Cancer Society recommends that patients who receive a BI-RAD 3 screening result undergo repeat short-interval (within 6–9 months) follow-up imaging.(30) Therefore we would expect that by 180 days following an abnormal result the women with a BI-RAD 3 result would start to reach the same proportion resolved as the women with BI-RAD 0, 4, 5 and Screening-Abnormal results.

Table 1.

Patient characteristics for BSPAN women with an abnormal result

	Overall N=2,860 n (%)
Age, years^a	
<40	546 (19.1)
40–49	1,242 (43.4)
50–64	1,011 (35.3)
65	61 (2.1)
Race/Ethnicity	
Hispanic	1,491 (52.1)
White	907 (31.7)
Black	329 (11.5)
Other-Unknown	133 (4.7)
Preferred Language^b	
English	1,648 (57.6)
Other	1,212 (42.4)
Uninsured^c	
	2,647 (92.6)
Federal Poverty Level^c	
0–100	1,550 (54.2)
101–200	1,060 (37.1)
201	250 (8.7)
Symptom Status^c	
Asymptomatic	2,095 (73.3)
Symptomatic	765 (26.7)
Time Period	
Oct 2012-Mar 2013	323 (11.3)
Apr 2013-Sep 2013	610 (21.3)
Oct 2013-Mar 2014	680 (23.8)
Apr 2014-Sep 2014	666 (23.3)
Oct 2014-Apr 2015	581 (20.3)
County of Service^d	
Original, pre-expansion	475 (16.6)
Original, post-expansion	563 (19.7)
Expansion	1,822 (63.7)
1st Abnormal Result	
Abnormal Screening Mammogram	1,791 (62.6)
BI-RAD 3	400 (14.0)
BI-RAD 4	520 (18.2)
BI-RAD 5	118 (4.1)

	Overall N=2,860 n (%)
BI-RAD 0	31(1.1)

^aWomen < 40 years were screened due to symptomatic presentation or high risk

^bOther category includes 98.9% Spanish language preference

^cStatus at intake

^dOriginal, pre-expansion (7 counties with service prior to 7/1/13), Original, post-expansion (same 7 counties with service on or after 7/1/13), or Expansion (12 counties)

Table 2.

Univariate and multivariable results for Time to Resolution (TTR) of abnormal results

Characteristic	Time to Resolution, Days Median (IQR)	% Resolved within 60 Days ^a	Unadjusted Model HR (95% CI)	Adjusted Model ^b HR (95% CI)
Time Period				
Oct 2012-Mar 2013	17 (10,32)	87%	Ref.	Ref.
Apr 2013-Sep 2013	14 (9,24)	93%	1.36(1.17,1.59)	1.30 (1.12,1.52)
Oct 2013-Mar 2014	17 (11,31)	91%	1.14(0.98,1.32)	1.10 (0.95,1.28)
Apr 2014-Sep 2014	15 (10,28)	93%	1.24(1.06,1.44)	1.19 (1.02,1.39)
Oct 2014-Apr 2015	14 (10,23)	93%	1.40(1.19,1.63)	1.38 (1.18,1.62)
County of Service				
Original, pre-Expansion (n=7)	16 (10,30)	89%	Ref.	
Original, post-Expansion (n=7)	15 (10,27)	93%	1.12(1.01,1.25)	
Additional, post-Expansion (n=12)	16 (10,29)	91%	1.05 (0.91,1.20)	
Age, years				
<40	12 (7,19)	96%	1.32(1.18,1.48)	1.15 (1.01,1.30)
40–49	15 (10,26)	94%	Ref.	Ref.
50–64	19 (11,35)	89%	0.78 (0.71,0.86)	0.77 (0.70,0.85)
65	22 (11,38)	81%	0.62 (0.46,0.83)	0.66 (0.49,0.90)
Race-Ethnicity				
White	14 (9,26)	94%	Ref.	Ref.
Black	18 (11,36)	88%	0.75 (0.66,0.87)	0.72 (0.62,0.82)
Hispanic	15 (10,27)	92%	0.91 (0.83,1.00)	0.79 (0.72,0.88)
Other-Unknown	19 (10,37)	87%	0.67 (0.55,0.83)	0.70 (0.57,0.86)
Language Preference				
English	15 (9,27)	92%	Ref.	
Other	16 (11,29)	92%	0.96 (0.89,1.04)	
Symptom Status				
Asymptomatic	17 (11,31)	91%	Ref.	Ref.
Symptomatic	11 (7,19)	94%	1.57(1.43,1.73)	1.35 (1.21,1.51)
Insurance Status				
No	15 (10,27)	92%	Ref.	Ref.
Yes	20 (12,34)	90%	0.78 (0.67,0.91)	0.81 (0.69,0.96)
Federal Poverty Level				
0–100	15 (10,29)	90%	Ref.	
101–200	16 (10,27)	95%	1.11 (1.01,1.20)	
201	16 (11,26)	93%	1.00 (0.86,1.16)	

IQR: Interquartile Range; HR: Hazard Ratio; CI: Confidence Interval “National Breast and Cervical

^aCancer Early Detection Program Quality Metric^bMultivariable model adjusted for Time Period, Age, Symptom status, Race-Ethnicity, and Insurance status