

Population-Based Health Engagement Opportunities Through Breast Imaging: A Population-Based Cross-Sectional Survey

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Abstract

Purpose: As health care payment systems transition from fee-for-service to bundled payments, there is an increasing opportunity for radiologists to collaborate to improve population-based health care outcomes. Our purpose was to estimate the extent to which patients engaged in mammography underwent other additional imaging- and non-imaging-based preventative health services using Centers for Disease Control National Population Health Surveys.

Methods: Women aged 40 to 74 in the 2014 Behavioral Risk Factor Surveillance System cross-sectional survey without histories of breast cancer who reported having a mammogram within the past 2 years were included. Adherence to recommended preventative services was based on US Preventive Services Task Force Recommendations, relative to the time at which the survey participant responded to the survey. Among women reporting being engaged in mammography, proportions of eligible women obtaining recommended preventative health services were calculated and stratified by demographics.

Results: Of 172,245 women, 122,434 (71.1%) reported mammography within 2 years. The following percentages obtained recommended flu vaccines (49.2%), pneumococcal vaccines (69.5%), colorectal cancer screening (74.8%), and Papanicolaou test (93.2%). Women reporting mammography within the last 2 years with lower levels of education and income and who lacked health insurance or personal doctors were less likely to report receiving recommended preventative services ($P < .001$).

Conclusions: National population-based survey results suggest that large proportions of women engaged in mammography report are not up to date with a wide variety of recommended preventative health services, suggesting ample opportunities for radiology practices to partner with providers to improve population-based health outcomes and add value to health care systems.

Key Words: Mammography screening, public health, Imaging 3.0, population-based imaging, preventative health services

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INTRODUCTION

As health care payment systems transition from fee-for-service to bundled payments, there is an increasing role for health care providers to collaborate to improve population-based health care outcomes. As health care delivery systems become increasingly integrated into managed care organizations, radiologists will increasingly

have to justify their value as a specialty that improves overall population health metrics [1].

Nearly 72% of women report mammography screening within the last 2 years [2]. With millions of women presenting to breast imaging suites every year, mammography screening represents an important opportunity for radiology departments to impact population-based health outcomes by promoting not only mammography screening but also a wide variety of additional preventative health services. Our purpose was to estimate the extent to which patients presenting for mammography screening underwent other additional imaging- and non-imaging-based preventative health services using the population health survey data from the Centers for Disease Control (CDC).

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METHODS

Because our study used publically available de-identified data, it was exempt from institutional review board review and did not require data usage agreements.

To evaluate eligibility for recommended preventative services, our study used previously collected cross-sectional survey data from the 2014 Behavioral Risk Factor Surveillance System (BRFSS) [3]. The survey asks participants to report their health-related risk behaviors, chronic health conditions, and use of preventative services. The BRFSS is sponsored by the CDC and other federal agencies to conduct landline and cell phone surveys in all 50 states, the District of Columbia, and 3 US territories. The BRFSS conducts over 400,000 adult interviews each year, making it the largest continuously conducted health-related survey in the world. By collecting behavioral health risk data at the state and local level, BRFSS has become a powerful tool for targeting and building health promotion activities. The 2014 survey was conducted by phone (January-December) with oversampling for underrepresented groups and adjustment for nonresponders (response rate 48.7% landline, 40.5% cell phone). The BRFSS survey is conducted in both English and Spanish.

Women aged 40 to 74 in the 2014 BRFSS survey without histories of breast cancer reporting that they underwent mammography within the last 2 years were included. Of women responding to the survey, 5.8% indicated that they did not know or refused to state when they had their last mammogram. These individuals were excluded from our study. Although different guidelines recommend either annual or biennial screening [4-6], proportions of eligible women undergoing recommended preventative health services who reported undergoing mammography within the last 2 years were calculated and stratified by demographics.

Primary outcomes include the proportion reporting participation in recommended health services derived from

the US Preventive Services Task Force (grade A and B recommendations) and the CDC [7]. Relevant recommendations included annual flu vaccinations, pneumococcal vaccinations in immunocompetent adults greater than 65 years old (13-valent pneumococcal conjugate vaccine followed by 23-valent pneumococcal polysaccharide vaccine at least 1 year after PCV13), colorectal cancer screening in patients above 50 years old until age 75 (colonoscopy within 10 years, sigmoidoscopy within 5 years, or fecal occult blood test within 1 year), cervical cancer screening in women age 21 to 65 years with cytology (Papanicolaou test) every 3 years or for women age 30 to 65 years screening with a combination of cytology (Papanicolaou test) and human papillomavirus testing every 5 years.

The BRFSS survey asks questions that closely mirror preventative service recommendations (Table 1). For each preventative service, adherence was determined based on the time at which the survey participant responded to the survey, not based on the time at which the survey participant reported undergoing mammography. For flu vaccines, respondents who answered yes to the FLUSHOT6 question were considered up to date with the influenza vaccination. For pneumococcal vaccinations, respondents between the ages of 65 to 74 who answered yes to the PNEUVAC3 question were considered up to date with the pneumococcal vaccination. For colorectal cancer, respondents between the ages of 50 and 74 who answered yes to receiving fecal occult blood test within 1 year, colonoscopy within 10 years, or sigmoidoscopy within 5 years were considered as meeting the USPSTF recommendation for colorectal cancer screening. For cervical cancer, respondents between the ages of 40 and 64 years old were considered up to date with cervical cancer screening if they indicated that they have received a Papanicolaou test and stated that they received a Papanicolaou test within the last 3 years.

Table 1. Definitions and sample sizes of preventative health care services, 2014 Behavioral Risk Factor Surveillance System

Preventative Care Measure	Eligibility Criteria	Time Interval	Sample Size
Mammography	Women age 40-74 years without histories of breast cancer	Past 2 years	122,434
Papanicolaou tests	Age 40-64 with no history of hysterectomy	Past 3 years	81,821
Colorectal cancer screening tests	Age 50-74 years	Past 1 year (fecal occult blood test), past 5 years (sigmoidoscopy), past 10 years (colonoscopy)	101,035
Pneumococcal vaccination	Age 65-74 years	Ever	40,613
Influenza vaccination	Age 40-74	Past year	122,434

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