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Original article

Screening Mammography Rates in the Medicare Population before and after the 2009 U.S. Preventive Services Task Force Guideline Change: An Interrupted Time Series Analysis

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ABSTRACT

Objective: We sought to examine longitudinal trends in screening mammography utilization and the presence of any changes in utilization associated with the 2009 U.S. Preventive Services Task Force (USPSTF) guideline change.
Methods: We use 2005 through 2012 Medicare fee-for-service claims data for a 5% sample of randomly selected beneficiaries. The primary outcome is monthly mammography rate per 1,000 women. Two comparison outcomes are monthly Papanicolaou test rate and monthly routine eye examination rate. The statistical approach is interrupted time series with segmented regression analysis and nonequivalent dependent variables.
Results: Among women age 65 and 90, monthly screening mammography rates were significantly increasing before the 2009 USPSTF guideline change. Immediately after the guidelines, there was a significant drop of 1.76 per 1,000 women ($p < .001$). Three years after the guideline, and after the initial decrease, there was no significant change in rate for those aged 65 to 74, but a continued and significant decline for those aged 75 and older. Two other preventive services (Papanicolaou test and routine eye examinations) did not show any shift associated with the pre- and post-guideline window.
Conclusions: The 2009 revision of USPSTF guidelines on breast cancer was associated with an immediate and significant decrease in screening mammography rates. The long-term impact of the guideline change differs by age and race and may not be fully quantifiable for years after its implementation.

Excluding cancers of the skin, breast cancer is the most common cancer overall and the second leading cause of cancer death among women in the United States (Jemal, Center, DeSantis, & Ward, 2010). Its incidence and mortality varies by age, race, and ethnicity. Women 65 and older have five times the incidence and ten times the mortality compared with women under 65 (420.5 vs. 81.7 for incidence and 100.5 vs. 10.9 for mortality, per 100,000 women; National Cancer Institute, 2014). Meanwhile, White women have a higher incidence yet lower mortality compared with Black women (128.0 vs. 122.8 for incidence and 21.7 vs. 30.6 for mortality; National Cancer Institute, 2014).

Although disputed by some (Bleyer & Welch, 2012; Gøtzsche & Olsen, 2000; Welch, 2010), considerable evidence indicates that mammography is effective in detecting early stage breast cancer and reducing subsequent mortality (Elmore, Armstrong, Lehman, & Fletcher, 2005; Humphrey, Helfand, Chan, & Woolf, 2002; Tabár, Duffy, Vitak, Chen, & Prevost, 1999). Relative 5-year survival is as high as 98% for localized breast cancer, yet only 25% for distant cancer cases (National Cancer Institute, 2014).

Controversies arose in November 2009 when the U.S. Preventive Services Task Force (USPSTF) revised its screening mammography guidelines 1) to recommend against routine screening mammography in women aged 40 to 49 years, 2) to recommend biennial screening for those aged 50 to 74, and 3) to make no recommendation for those aged 75 and older (USPSTF, 2009), This guideline change has prompted considerable debate and investigation. Other professional organizations, such the American Cancer Society, have continued to recommend that

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women begin screening at age 40 and continue screening annually as long as they remain in good health (Smith et al., 2002).

Previous research has examined changes in screening mammography rates associated with the USPSTF guideline change from different perspectives using various data sources. Some investigators have examined the overall screening rate using national patient perception surveys, all of which have reported nonsignificant changes in screening mammography rates for various age groups (Block, Jarlenski, Wu, & Bennett, 2013; Howard & Adams, 2012; Pace, He, & Keating, 2013). Others using administrative claims data such as Medicare, private insurance claims, or registry data have reported mixed findings (Sharpe, Levin, Parker, & Rao, 2013; Sprague et al., 2014; Wang et al., 2014). Still others have examined the rate of subsequent screening and found that, among Medicare female beneficiaries who were previously screened, the rate of subsequent screening declined after 2009, especially among Black women and those 75 and older (Jiang, Hughes, Appleton, McGinty, & Duszak, 2015).

Combining the strengths of the previous studies in terms of data source and analytical approach, the objective of this study is to assess the short- and long-term effects of the 2009 USPSTF guideline changes on screening mammography utilization among women age 65 and older. We use 2005 through 2012 Medicare fee-for-service claims data for a 5% random sample of beneficiaries and an interrupted time series (ITS) design with nonequivalent dependent variables and segmented regression analysis to examine the longitudinal trend overall, and by age and race.

Methods

Study Design

We use an ITS design with nonequivalent dependent variables and segmented regression analysis to assess the short- and long-term effects of the 2009 USPSTF guideline changes on screening mammography utilization. ITS represents a special type of time series that requires knowing the specific point in a series when an intervention occurred. The causal hypothesis is that if the intervention has an effect, the postintervention observations will have a different slope or level from those before the intervention (Shadish, Cook, & Campbell, 2002). Compared with simple pre- and post-mean comparison, ITS is better suited for evaluating interventions or policy changes because it also takes baseline trends into consideration (Penfold & Zhang, 2013; Shadish et al., 2002; Zhang, Wagner, Soumerai, & Ross-Degnan, 2002). Such an approach has been widely applied in many areas of healthcare such as cancer screening promotion (Michielutte, Shelton, Paskett, Tatum, & Velez, 2000), Medicaid expansion (Zur & Mojtabai, 2013), drug withdrawal policy (Hawton et al., 2009, 2012), and tobacco taxation (Ma, Kuller, Fisher, & Ostroff, 2013).

Segmented regression analysis is a statistical approach to model ITS data and draw more formal conclusions about the impact of an intervention or policy change (Wagner et al., 2002). Assuming a linear relationship between time and the outcome within each segment defined by intervention(s), one can fit a least-squares regression line to each segment, and compare the estimates for intercept and slope before and after the intervention. A change in intercept represents an abrupt intervention effect, whereas a change in slope represents a gradual change (Wagner et al., 2002). One can also obtain the intervention effect as the absolute difference (or ratio) between the predicted outcome after the intervention and the counterfactual outcome (projected outcome based on baseline intercept and slope).

A major threat to the validity of ITS analysis is that unobserved forces other than the intervention may influence the outcome at the same time the intervention was introduced. We controlled for this possibility, as suggested by Shadish et al. (2002), by adding two nonequivalent dependent variables to the design—variables that should not be affected by the intervention but should respond to other external factors the same way as the primary dependent variables. If mammography utilization changed relating to the 2009 USPSTF guideline change and nonequivalent dependent variables did not, the causal relationship between the USPSTF guideline change and mammography utilization change would be strengthened.

Data

We used Medicare claims data derived from reimbursement records of approximately 49 million beneficiaries (as of 2012) annually. In addition to financial information, Medicare data provide rich information about medical services used by beneficiaries, such as dates of admission and discharge, diagnosis, procedures, and source of care. It also provides enrollees' demographic information, such as date of birth and death, gender, race, and place of residence. With that information, claims data can be linked easily to other data sources, such as census files, cancer registries, national or state vital statistics, and surveys. Although Medicare claims data lack nuanced clinical information, they still represent an excellent source of information to study population health.

In this study, we used 2005 through 2012 Medicare claims data for a 5% random sample of beneficiaries. Mammography utilization was captured from Physician/Supplier Part B and Outpatient files, because screening mammography can take place in either physician offices or hospital outpatient settings. Demographic, enrollment, and vital status of beneficiaries was obtained from the associated denominator file. These datasets were studied under an exemption from our institutional review board.

The denominator population for screening mammography each year was defined as female fee-for-service beneficiaries between 65 and 90 years old who 1) had continuous part A and B coverage that year, 2) resided in the 50 U.S. states or the District of Columbia, and 3) were alive at the end of that year. Women who had any evidence of a breast cancer diagnosis in a particular year were excluded from the denominator population in subsequent years (because further mammograms for this subpopulation were thus very likely diagnostic, rather than screening, examinations).

Outcome and Measures

The primary outcome was the monthly screening mammography rate, defined as the number of women undergoing screening mammography per 1,000 female beneficiaries each month. We used routine eye examinations as a nonequivalent outcome; prior researchers have used eye examinations as an outcome anticipated to repeat on a regular basis in the Medicare population (Welch, Hayes, & Frost, 2012). An eye examination is a preventive service (recommended by the American Optometric Association to be repeated every 12 months for adults age 61 and older) but should not be affected by the 2009 USPSTF mammography guideline (American Optometric Association, 2014). As a robustness check, we also included a second nonequivalent outcome—the Papanicolaou test (commonly known as the "Pap smear")—which is a covered preventive service, particularly relevant to women, but also not one anticipated to be impacted by the 2009 USPSTF mammography guideline. Previous and current USPSTF guidelines have both recommended cervical cancer screening every 3 years for women up to age 65 and recommends against screening for cervical cancer in women older than age 65 years who have had adequate prior screening and are not otherwise at high risk for cervical cancer (USPSTF, 2003, 2012). However, The Centers for Medicare and Medicaid Services (CMS) covers a Pap smear test once every 24 months for all women and once every 12 months if a woman is at high risk for cervical or vaginal cancer, or if she is of childbearing age and have had an abnormal Pap test in the past 36 months (Centers for Medicare and Medicaid Services, 2012). Pap smear testing has also been used by previous researchers in ITS studies examining mammography in the Medicare population (Salloum et al., 2014) and privately insured populations (Wang et al., 2014).

The monthly routine eye examination rate was calculated using the same denominator population as for screening mammography. We examined Pap smear testing for cervical cancer screening in a manner similar to how we approached mammography (i.e., women with a prior cervical cancer diagnosis or prior hysterectomy were excluded from our cervical cancer screening denominator population in subsequent years).

Time-related variables included an indicator variable for whether a month was before or after the USPSTF guideline change (0 for any month before or in November 2009 and 1 for December 2009 and forward); the number of months since the starting period of the study (range, 1–96 months); the number of months since the guideline change (0 for any month before or in November 2009 and 1–37 months for December 2009 and forward). Other considered variables include beneficiary age group (65–74, 75–84, and 85–90), and race (White, Black, and other/unknown). Both of these were used to define subgroups for stratified analysis.

Appendix A provides a list of International Classification of Diseases, Ninth Revision (ICD-9) codes, Healthcare Common Procedure Coding System (HCPCS) codes, and Revenue Center codes used to define various diagnoses and services.

Statistical Analysis

Following steps outlined by Wagner et al. (2002) and Penfold and Zhang (2013), we defined two time segments: a baseline (January 2005 to November 2009) and a post-USPSTF guideline period (December 2009 to December 2012). We used the following segmented regression equation:

$$Y = \beta_0 + \beta_1 Time + \beta_2 Indicator\_Guideline\_Change + \beta_3 Time\_Post\_Guideline + \varepsilon_{time}$$

The coefficient β_0 estimates the baseline monthly screening mammography rate at the beginning of the study period; β_1 estimates the baseline trend before the guideline change; β_2 estimates the change in screening level after the guideline change; β_3 estimates the change in slope after the guideline change; and ε is a random error term at time t. In addition to these coefficients, we also estimated the effect of the guideline change, as the absolute difference between the estimated rate at a certain time point with the guideline change and the predicted rate at the same time based on the screening mammography trend before the guideline change. It is represented in the following equation:

$$\widehat{Y}_{t_{with\ guideline}} - \widehat{Y}_{t_{no\ guideline\ change}} = \beta_2 + \beta_3 X time\_after\_guideline\_change$$

Standard errors were calculated according to the method proposed by Zhang et al. (2002). Because screening mammography is expected to repeat every 12 months or longer and the prior month's mammography utilization may be correlated with next month's rate, we used a model that can incorporate autocorrelation and seasonality. We did this using "PROC AUTOREG" from SAS software, version 9.2 for Windows (SAS Institute, Inc., Cary, NC), with backward selection for a model not only including variables for time and guideline change indicator, but also up to 12 lags of the dependent variable. The Durbin-Watson statistic of all final models was examined to ensure it is close to the preferred value of 2, indicating no serious autocorrelation. Statistical tests were two-sided with $\alpha = 0.05$.

To assess whether longitudinal trends differ by age and race, we conducted the same set of analyses stratified by age and race groups. To strengthen the causal inference on the impact of USPSTF guideline change on screening mammography, we also examined the outcomes involving the nonequivalent dependent variables of routine eye examinations and Pap smears.

Results

Table 1 presents the demographic characteristics of our study sample. On an annual basis, approximately 42% to 47% of the sample was between age 65 and 74, 37% to 42% between age 75 and 84, and 15% between 85 and 90. The percentage of female Medicare beneficiaries age 65 to 74 has steadily increased over time. Accordingly, the percentage of those between 75 and 84 has decreased. Across all years, the majority of female Medicare beneficiaries are White.

Table 2 provides the results of the segmented regression analysis using monthly screening mammography as the outcome. The upper panel provides the coefficients and standard errors for the rate and slope before and after the guideline, with statistical significance marked by stars at conventional levels. Overall, the slope of screening mammography utilization was increasing significantly before the release of the 2009 USPSTF guidelines. After the guideline change, however, there was an immediate decrease in screening rates by1.76 per 1,000 female Medicare beneficiaries ($p < .001$). In addition, the slope after the guideline was no longer increasing significantly. Figure 1 provides a graphic description of this trend.

Three years after the guideline change, different subgroups showed different utilization patterns. Those aged 65 to 74 now have the highest baseline screening rate (36.2 per 1,000 women; $p < .001$), followed by those age 75 to 84 (28.6 per 1,000 women; $p < .001$), then those age 85 and older (14.5 per 1,000 women; $p < .001$). All had a significantly increasing slope before the 2009 USPSTF guideline change, albeit at slightly different paces. After the guideline change, all three age groups had an immediate rate decrease ranging from 1.3 to 1.9 per 1,000 women. Furthermore, for the two groups of women age 75 and older, there was also a significantly decreasing slope at the pace of 0.05 to 0.06 per month ($p < .05$) after the guideline. We additionally found that, compared with Black women, White women had a higher baseline rate (30.7 vs. 24.5 per 1,000 women), slower pace of increase in slope before guideline change, and a sharper decrease

Table 1
Descriptive Statistics for Female Medicare Beneficiaries in Our Study, 2005–2012

	2005	2006	2007	2008	2009	2010	2011	2012
Denominator population	846,887	808,810	774,543	748,603	731,391	724,385	716,405	708,686
Age group (%)								
65–74	43.2	43.0	43.1	43.9	44.4	44.9	45.6	47.1
75–84	42.5	42.0	41.5	40.5	39.8	39.3	38.7	37.6
85–90	14.3	15.0	15.4	15.5	15.8	15.8	15.7	15.3
Race (%)								
White	87.8	87.8	87.7	87.6	87.2	86.8	86.6	86.4
Black	8.0	8.0	7.8	7.7	7.9	8.0	8.1	8.1
Other/unknown	4.2	4.3	4.5	4.7	5.0	5.2	5.3	5.5

immediately after the guideline change. Neither group's slope after the guideline change was significant. Figure 2 provides the longitudinal trends by these subgroups.

The lower panel of Table 2 provides the estimated effects of the guideline change on monthly mammography screening rate and the 95% confidence interval (CI). As mentioned, we use the absolute difference between the estimated rate after the guideline and the counterfactual rate at the same time point assuming the pre-guideline trend continues. Because the pre-guideline slope was increasing significantly and the post-guideline slope was not changing significantly, the longer time elapses from the guideline change forward, the greater the observed decrease in screening mammography rates. For example, 1 year after the USPSTF guideline change, there is a decrease of 1.97 (95% CI, 0.39–3.6) per 1,000 female Medicare beneficiaries for those age 65 to 74; that drop increases to 2.48 (95% CI, 0.49–4.48) at 3 years after the guideline change.

Table 3 provides our estimates of rate and slopes after the guideline change using nonequivalent outcomes. For the two models where screening mammography is involved as an outcome, there is a significant decrease in the rate immediately after the 2009 guideline change, but there is no change in the slope, except for the age 85 and older group for the model of mammography versus Pap smear. When no screening mammography is involved as an outcome, we did not see any change in rate or slope after the guideline change except in two subgroups: Black women and women age 65 to 74 years. These alternative outcome models strengthen our confidence in attributing the drop in screening mammography rate to the 2009 USPSTF guideline change.

Discussion

Using Medicare claims data and an interrupted time series analysis, we identified a short-term decrease in screening mammography rates for all female Medicare beneficiaries associated with the 2009 USPSTF guideline change, but a long-term decreasing trend only for those aged 75 and older. Such findings provide a different yet complimentary perspective on ongoing guidelines controversies in screening mammography. Prior studies using national patient perception surveys had reported no change in screening mammography rates for various age groups in association with the new USPSTF guidelines (Block et al., 2013; Howard & Adams, 2012; Pace et al., 2013). In contrast, our findings reveal a significant decrease in screening rates immediately after the guideline change, which returned the screening rate back to the level of March 2006. A simple before-and-after comparison would not have captured this change.

A prior study using Medicare claims data found a gradual increase from 2005 to 2009 and a modest 4.3% decrease between 2009 and 2010 (Sharpe et al., 2013). That study used aggregate procedure-level claims and only reported unadjusted rate of mammography studies per 1,000 women. It thus cannot be directly compared with our study, which used personal-level claims. Nonetheless, their reported trend is consistent with ours.

Another prior study employed an ITS analysis using private insurance claims and showed decreasing slopes for age groups 40 to 49 and 50 to 64 years old before the guideline change, and an increasing slope after the guideline for ages 40 to 49 (Wang et al., 2014). Those findings in younger patients are the opposite of what we observed in the Medicare population, and

Table 2
Effect of USPSTF Guideline Change on Monthly Screening Mammography Utilization Rate, 2005–2012

Sample	Overall	Age 65–74	Age 75–84	Age 85–90	White	Black
Parameter estimates†						
Baseline rate (b_0)	29.902 (0.392)***	36.218 (0.476)***	28.614 (0.404)***	14.482 (0.564)***	30.698 (0.424)***	24.538 (0.339)***
Slope before the guideline (b_1)	0.04 (0.011)***	0.039 (0.013)**	0.053 (0.011)***	0.032 (0.011)**	0.041 (0.011)***	0.071 (0.009)***
Change in rate after the guideline (b_2)	−1.757 (0.48)***	−1.717 (0.519)**	−1.927 (0.532)***	−1.279 (0.353)***	−1.795 (0.466)***	−1.313 (0.456)**
Slope after the guideline (b_3)	−0.026 (0.023)	−0.021 (0.026)	−0.051 (0.024)*	−0.064 (0.022)**	−0.031 (0.024)	−0.022 (0.021)
Absolute effects of guideline‡						
12 Months after the guideline	−2.07 (−3.34, −0.81)	−1.97 (−3.56, −0.39)	−2.54 (−3.8, −1.27)	−2.04 (−4.15, 0.07)	−2.17 (−3.58, −0.76)	−1.58 (−2.64, −0.52)
24 months after the guideline	−2.38 (−3.8, −0.97)	−2.23 (−3.95, −0.51)	−3.15 (−4.58, −1.71)	−2.8 (−5.02, −0.58)	−2.54 (−4.08, −1.01)	−1.84 (−3.04, −0.65)
36 months after the guideline	−2.7 (−4.41, −0.99)	−2.48 (−4.48, −0.49)	−3.75 (−5.51, −2)	−3.57 (−5.97, −1.16)	−2.92 (−4.7, −1.13)	−2.11 (−3.58, −0.64)

*$p < .05$; **$p < .01$; ***$p < .001$.
† Standard error in parenthesis.
‡ The 95% confidence interval is in parenthesis.

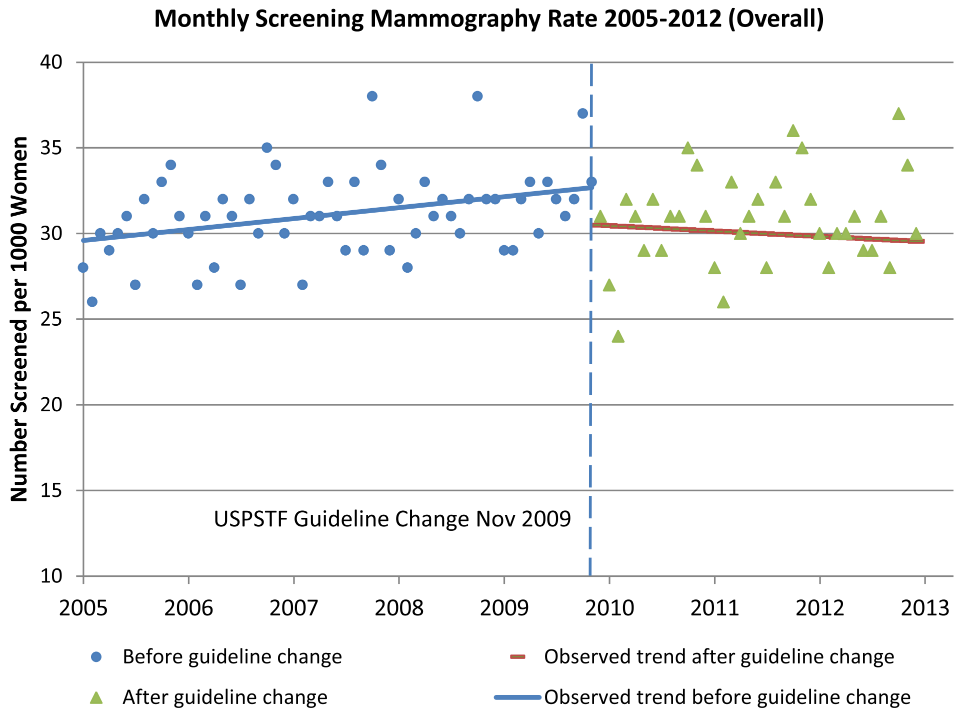

Figure 1. Overall monthly mammography screening rate, 2005 through 2012.

are somewhat counterintuitive given the USPSTF guideline change. The authors attributed this trend to intense media coverage and the national economic recovery, but did not discuss possible insurance coverage changes as a potential contributing factor.

What can potentially explain the longitudinal trend in screening mammography rates demonstrated in our study? Coverage does not seem to be an issue, because CMS continues to cover screening mammography fully on an annual basis—both before and after the 2009 USPSTF changes. Other

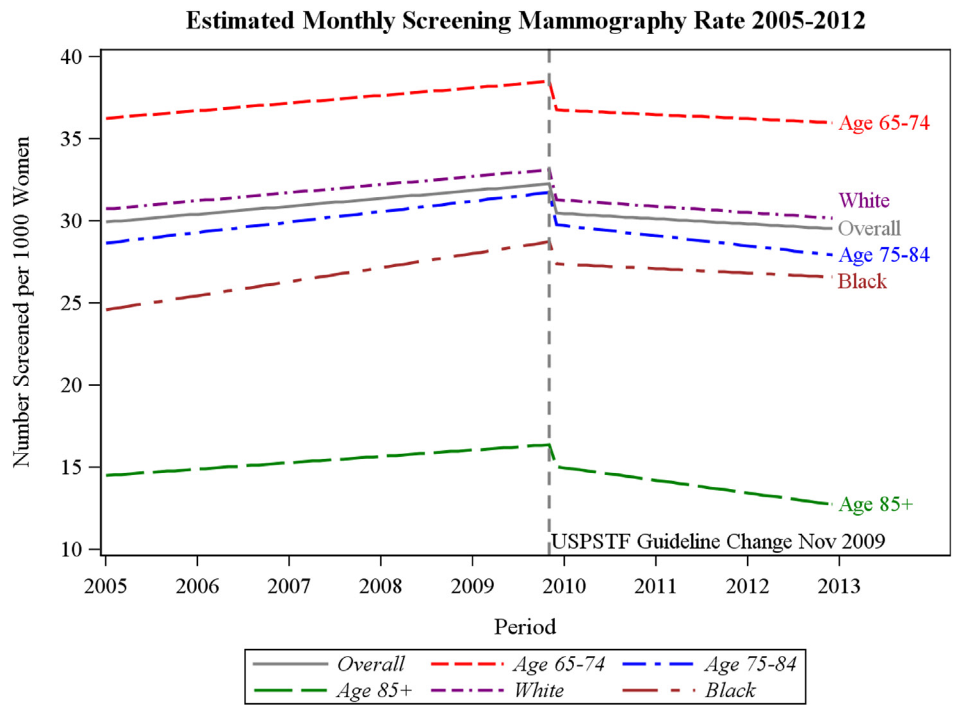

Figure 2. Estimated monthly screening mammography rate, 2005 through 2012 (subgroups).

Table 3
Sensitivity Analysis Using Nonequivalent Dependent Outcomes

Models†	Overall	Age 65–74	Age 75–84	Age 85–90	White	Black
Mammography vs. eye examination						
Change in rate after the guideline (β_2)	−2.098 (0.623)**	−1.936 (0.461)***	−1.967 (0.708)**	−2.063 (0.948)*	−2.408 (0.597)***	−2.281 (0.705)**
Slope after the guideline (β_3)	0.016 (0.037)	0.007 (0.027)	−0.027 (0.042)	−0.008 (0.047)	0.022 (0.037)	0.029 (0.038)
Mammography vs. pap smear test						
Change in rate after the guideline (β_2)	−0.917 (0.345)**	−0.869 (0.358)*	−1.094 (0.461)*	−1.35 (0.34)***	−1.372 (0.395)***	−0.892 (0.432)*
Slope after the guideline (β_3)	−0.028 (0.021)	−0.002 (0.022)	−0.044 (0.027)	−0.053 (0.018)**	−0.022 (0.022)	0.004 (0.024)
Pap smear test vs. eye examination						
Change in rate after the guideline (β_2)	1.179 (0.728)	1.114 (0.527)*	0.906 (0.868)	0.763 (1.084)	1.01 (0.717)	1.681 (0.782)*
Slope after the guideline (β_3)	−0.038 (0.039)	−0.001 (0.027)	−0.01 (0.047)	−0.046 (0.053)	−0.037 (0.044)	−0.019 (0.035)

*$p < .05$; **$p < .01$; ***$p < .001$.
†Standard error in parenthesis.

issues, such as media coverage, patient and physician confusion, and an overall lack of confidence in conflicting guidelines from USPSTF and other medical societies are probably weighing heavily on physician and patient preferences and behavior (Kachalia & Mello, 2013; Pace et al., 2013; Wang et al., 2014).

Of particular note in our results is a post-guideline decline in screening mammography rates in women age 75 and older. A similar decline has also been observed in another Medicare study examining subsequent screening rates (Jiang et al., 2015). These findings indicate that women aged 75 and older are indeed following the new USPSTF guidelines. Because randomized trials evaluating screening mammography did not include women over age 74 (USPSTF, 2009), however, little is known about the benefits of screening mammography in this population. Controversies surrounding screening in this older population will likely linger until more clinical data emerge. Nonetheless, this age group has both a higher breast cancer incidence and mortality rate compared with those aged 65 to 74. As noted, these women as a group have 5-fold the incidence and 10-fold of the mortality compared with those under 65 (National Cancer Institute, 2014). This likely explains why current American Cancer Society guidelines recommend ongoing screening until a woman is no longer in good health (Smith et al., 2002) and recent observational studies have advocated continued screening in women with a life expectancy of greater than 10 years (Walter & Schonberg, 2014). As our population ages, more research will clearly be necessary in this population to inform future payment and coverage policy.

Our data also demonstrate a significant racial disparity in screening mammography rate between White and Black women. Such a disparity may in part be contributing to the fact that White women have higher incidence of breast cancer, yet a lower mortality compared with Black women (National Cancer Institute, 2014). This is an important topic that merits further research, but beyond the scope of our retrospective claims-based investigation.

Despite the strengths of our study, it has several limitations inherent in the use of administrative claims data. First, our sample was restricted to Medicare fee-for-service beneficiaries at least 65 years old. Accordingly, our findings cannot be generalized to younger age groups or to those enrolled in Medicare managed care plans. With regard to the latter, however, we are unaware of any reason to indicate that ordering physicians approach screening mammography differently for their Medicare fee-for-service versus managed care patients. Second, although we used what we believe are among the best comparable nonequivalent dependent variables to strengthen our causal comparison, the selection of perfect comparative screening studies is problematic. With the implementation of the Affordable Care Act, more preventive services are now covered by Medicare on an annual basis (e.g., annual wellness visits, screening for depression) and this expanded coverage may offer additional candidates for future similar research. And finally, because ITS methodology requires a large number of data points both before and after an intervention to detect a trend, we can at this time only examine monthly screening rates. With the passing of time, we fully anticipate that longer follow-up periods will permit us and other investigators to examine annual and biennial screening mammography rates.

Implications for Practice and/or Policy

Our findings demonstrate that the release of new USPSTF screening mammography guidelines in 2009 was associated with an immediate drop in screening rates per 1,000 Medicare female beneficiaries. Women 75 and older have been affected most significantly; previous slow growth in screening rates in this group is now in decline. The introduction of new and conflicting guidelines has likely resulted in patients and physicians alike reconsidering long-standing patterns of care. Behavioral changes should be anticipated when professional organizations issue competing guidelines; their important public policy implications may impact distinct demographic groups differently, and their results may not be fully quantifiable for many years after their implementation.

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Appendix A. Definitions of Health Care Categories Used in the Analysis by Code Type

Healthcare Category	CTP/HCPCS	ICD-9 CM	Revenue Center
Screening mammography	76092,77057, G0202		0403
Pap smear test	88142-88145, 88147, 88148, 88150-88154, 88156-88158, 88164-88167, 88174, 88175, G0101, G0123, G0141, G0144, G0145, G0147, G0148, P3000, P3001, Q0091		0311
Mastectomy	19160, 19162, 19180, 19182, 19200, 19220, 19240, 19301-19307	85.41-85.48	
Hysterectomy	51925, 58150, 58152, 58200, 58210, 58240, 58260, 58262, 58263, 58267, 58270, 58275, 58280, 58285, 58290-58294	68.3-68.5, 68.51, 68.59, 68.6, 68.7, 68.9	
Breast cancer		233.0, 174, V10.3	
Cervix Cancer		180.0, 180.1, 180.8, 180.9	
Routine eye examination	92002, 92004, 92012, 92014		