The Public's Response to the U.S. Preventive Services Task Force's 2009 Recommendations on Mammography Screening

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Background: On November 16, 2009, the U.S. Preventive Services Task Force (USPSTF) released new breast cancer screening recommendations, resulting in considerable controversy.

Purpose: The purpose of this investigation was to assess the volume and framing of the public discourse around the mammography recommendations and determine if women were knowledgeable about the new recommendations.

Methods: Two different types of data collection methods were used for this study: (1) a content analysis of news stories and social media posts around the time of the USPSTF announcement and (2) a web-based survey of women aged 40–74 years conducted through Knowledge Networks from December 17, 2009, to January 6, 2010. Data were analyzed in 2010.

Results: The survey sample included 1221 women aged 40–74 years who had never had breast cancer. The majority of the articles and posts (51.9%) did not support the screening recommendations, and 17.6% were supportive. Less than one quarter of the sample could identify the new recommendations for women aged 40–49 years and 50–74 years. Results from logistic regression analyses identified characteristics associated with correct knowledge of the recommendations for each age group. Level of attention paid to the recommendations was significantly associated with accurate knowledge of the recommendations for each age group. Having a mammogram within the past 2 years, "other" race (i.e., not black or white), and having higher levels of education, confidence that recommendations were based on the latest research, and attention paid to the new guidelines were all significantly and positively associated with correct knowledge of the new recommendation for women aged 40–49 years.

Conclusions: The new recommendations confused women (30.0%) more than they helped them understand when to get a mammogram (6.2%). Confusion was greatest among women aged 40–49 years and women who had never had a mammogram or who had one more than 2 years ago. Communication about future recommendations should be pretested to identify strategies and language that may reduce confusion among providers, consumers, and advocacy groups.
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Introduction

The U.S. Preventive Services Task Force (USPSTF), an independent panel of experts in primary care and prevention, systematically reviews scientific evidence and develops recommendations for clinical pre-

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ventive services, including cancer screening.[1] Prior to November 2009, the USPSTF recommended that women aged ≥40 years receive mammography screening, with or without a clinical breast exam, every 1–2 years. (Appendix A, available online at www.ajpm-online.net/, gives information about how USPSTF recommendations are graded.) On November 16, 2009,[2,3] the USPSTF released new recommendations endorsing biennial mammography screening for women aged 50–74 years. For women aged 40–49 years, they recommended against routine mammography screening, which resulted in considerable media controversy. DeAngelis and Fontanaros[4] point out

that the term *routine* was misunderstood by the public to mean the USPSTF recommended against mammography screening in all women aged 40–49 years. On December 4, 2009, the USPSTF updated the language of their recommendation regarding women aged <50 years to clarify their original intent: "The decision to start regular, biennial mammography screening before age 50 years should be an individual one and take patient context into account, including the patient's values regarding specific benefits and harms."[1]

Reactions to the publication of the recommendations[2,3] were published in newspapers,[5,6] professional journals' editorials,[4,7–12] and position statements by the American Cancer Society and the American College of Radiology, and occurred against the backdrop of public debate over national healthcare reform, raising concerns about the potential rationing of care through such recommendations.

The public was exposed to the controversy through national news and social media, both of which shape public perceptions of and opinions about new information and topics.[13–20] Studies have shown that mixed messages and controversy about health recommendations can confuse the public about which recommendations to follow.[7–8,21,22]

Identifying how the main messages and themes of the controversy were framed and the frequency with which they appeared in the media provides the opportunity to understand both the public conversation that existed during the days and weeks following the release of the recommendations and the context for investigating the public's knowledge of and attitudes toward the recommendations. The purpose of this investigation was to (1) assess the volume and framing of the public discourse around the mammography recommendations, and (2) determine if women are knowledgeable about the new recommendations.

> See related Commentary by Pettiti in this issue.

Methods

Two methods were used: (1) a content analysis of news and social media around the time of the USPSTF announcement and (2) a web-based survey of women aged 40–74 years conducted through Knowledge Networks (KN) to assess the level of controversy presented through different media sources as well as the extent of public discourse and its impact on women.

Analysis of News and Social Media

Content analysis was conducted of newspaper articles and social media posts about the new recommendations that were published around the time of the USPSTF announcement and the KN survey. This study focused on newspaper coverage and discussions on social media platforms, specifically blogs and Twitter, for the fol-

lowing reasons: (1) National newspapers and newswires are influential agenda-setters for other print, electronic, and broadcast media; therefore, examining coverage by these sources provides a reasonable proxy of the broader news discourse.[23,24] (2) The increasing popularity of social media platforms has undoubtedly changed the way individuals and organizations (e.g., news, health, advocacy) share and seek information; therefore, examining online discourse provides additional insight into other key players who may be shaping public perceptions. (3) Newspaper articles, blog posts, and Twitter posts (tweets) are publicly accessible and archived, making drawing representative samples and downloading content for coding feasible.

Relevant news stories and blog posts/tweets were identified using LexisNexis and Radian6. LexisNexis is a leading provider of newspaper data that archives news stories from more than 4000 sources, including national U.S. newspapers and newswires. Radian6 is an industry leader in monitoring social media, which pulls content from more than 150 million blogs and 75–100 million Twitter users. For both sources, a search syntax was developed using keywords to identify relevant newspaper articles and blog posts/tweets. LexisNexis searches focused on three leading newswires (Associated Press, Reuters, and PR Newswire) and three leading national U.S. newspapers (*New York Times*, *Washington Post*, and *USA Today*). Radian6 searches focused on blog posts and tweets but did not retrieve links within tweets. The time period of the search was from November 1, 2009 (2 weeks prior to the USPSTF announcement), to January 31, 2010.

Search results were reviewed to determine eligibility. Articles/posts that specifically mentioned the announcement were included. Duplicates were excluded. For LexisNexis, all search results retrieved ($n=228$) were examined to identify a unique sample of 163 relevant articles. Given that very few articles were published prior to the USPSTF announcement, the content analysis focused on a subset of articles ($n=80$) that were published within 2 weeks of release (November 16–30, 2009) and around the time of the KN survey (December 17, 2009–January 6, 2010). The final sample of articles/posts was coded for whether factual information was presented about the new recommendations for each age group (i.e., aged 40–49 years and 50–74 years); the main sentiment toward the recommendations (e.g., supportive, against, neutral, or confused); and the main reason cited for the sentiment. Appendix B (available online at www.ajpm-online.net), includes a more detailed description of coding definitions and measures.

For Radian6, search results retrieved more than 1000 posts. To maximize resources, the top 100 posts with the greatest audience reach were examined (i.e., comparable to examining the national U.S. newspapers with the highest level of circulation). Reach was defined as the number of unique commenters for blogs and the number of followers for Twitter profiles. These metrics served as proxy indicators of the number of people who may have read the posts. From the top 100 blog posts and top 100 tweets, a unique sample of 71 blog posts and 82 tweets was coded.

Web Survey

A web survey of a nationally representative sample of U.S. women aged 40–74 years was conducted through KN KnowledgePanel

(www.knowledgenetworks.com/knpanel/index.html and Appendix C, available online at www.ajpm-online.net, for more details). KnowledgePanel uses probability-based random sampling and includes households that do not have Internet access.[25] Sampled households are given a free computer and Internet service if they do not have them. Dennis[25] detailed the methods used to implement the panel and surveys. DiSogra[26] and Dennis[25] reported on how panel- and study-specific weights were used to ensure representation on key demographics. This study was approved by RTI's IRB on March 30, 2010.

Respondents completed informed consent when they entered the KnowledgePanel. The survey contained questions on breast cancer and mammography history, and knowledge and perceptions of the new recommendations (Appendix D, available online at www.ajpm-online.net). Knowledge items required respondents to select the correct response from several possible response options. The survey was launched on December 17, 2009, which was the earliest date possible, and continued until the target sample of 1200 was reached on January 6, 2010. The sample size was selected to allow for sufficient statistical power for comparisons in outcomes between the two age groups. For example, the sample size provides 88% power to detect a 10% difference in the proportion of women who correctly identified the new recommendations in the two age groups.

Data Analysis

Descriptive analyses of the news media and survey data were conducted in 2010. Responses to survey knowledge items were dichotomized into correct and incorrect with *don't know* coded as incorrect. Cross-tabulations were conducted for key variables by age. Logistic regression models were estimated to adjust for the confounding of age and to examine the relationship between demographic characteristics, history of mammography screening, attention to guidelines, knowledge of the mammography guidelines (the three knowledge items), and confidence that the guidelines were based on the latest research. Because of the smaller sample sizes, for some analyses respondents who were "non-Hispanic, other," "Hispanic," or "non-Hispanic, two or more races" were combined into one category (i.e., "Other").

Results

Media analysis results are presented first, followed by survey results. Figure 1 displays the number of newspaper articles and social media posts on the new recommendations that were published from November 2009 to January 2010. Coverage peaked in the first 2 days following release of the recommendations and remained high through the third week of November. Newspapers were the predominant source of public discourse, followed by blogs and Twitter. Coverage dropped from 194 posts and articles the week that the recommendations were released to fewer than 10 articles and posts by the time the survey was fielded.

Newspaper articles (*n*=80) were coded for explicit information about the new recommendations for the different age groups. Sixty-three percent of news articles mentioned the new recommendations for women aged
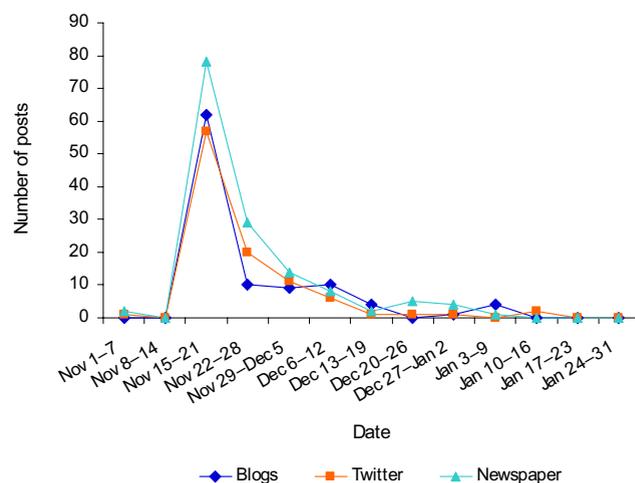
Figure 1. Trends in public discourse on mammography screening

40–49 years, 34% for women aged 50–74 years, and 9% for women aged ≥75 years.

Sentiment of Articles and Posts

Table 1 presents the overall sentiment of posts by source. Of the 233 newspaper articles, blog posts, and tweets coded, 51.9% were unsupportive, and only 17.6% were supportive. Most newspaper articles and blog posts expressed negative sentiment (55.0% and 66.2%, respectively), whereas tweets were predominantly neutral (48.8%).

Rationale for Sentiment in Articles and Posts

The rationale for the sentiment in newspaper articles and blog posts was coded, but tweets were not because they are limited to 140 characters and thus too short to contain sufficient information for coding. The most common reasons mentioned for being unsupportive of the new recommendations were the belief that delaying screening would lead to later detection of more advanced breast cancer and subsequently more breast cancer–related deaths (22.5%) and the belief that the recommendations reflected government rationing of health care (21.9%) (Table 1).

Web-Based Survey Results

At the time the survey was fielded, the new recommendations were still being discussed in the media. However, the volume of coverage had dropped significantly (since November); it continued to decrease through January 2010. A total of 2356 women aged 40–74 years in the KnowledgePanel were asked to participate in the survey; 55.1% (*n*=1298) completed the survey. Appendix E (available online at www.ajpm-online.net) compares respondents to nonrespondents. Respondents who said they had ever been diagnosed with breast cancer (*n*=65) or who said *don't know* (*n*=4) or refused to answer this

Table 1. Main sentiment and rationale for sentiment of articles and posts, *n* (%)

	National U.S. newspapers (*n*=80)	Blogs (*n*=71)	Twitter (*n*=82)	Total (*n*=233)
Sentiment				
Unsupportive	44 (55.0)	47 (66.2)	30 (36.6)	121 (51.9)
Supportive	25 (31.3)	14 (19.7)	2 (2.4)	41 (17.6)
Neutral	11 (13.8)	8 (11.3)	40 (48.8)	59 (25.3)
Confused	0 (0.0)	2 (2.8)	10 (12.2)	12 (5.2)
Rationale for sentiment[a]				
Belief that delayed screening leads to more breast cancer and related deaths	22 (27.5)	12 (17.0)	NA	34 (22.5)
Concern over cost/government rationing of health care	11 (13.8)	22 (31.0)	NA	33 (21.9)
Belief that recommendations were based on science	8 (10.0)	10 (14.1)	NA	18 (11.9)
Potential harm of mammograms	13 (16.3)	3 (4.2)	NA	16 (10.6)
Concern over accuracy of mammograms	5 (6.3)	3 (4.2)	NA	8 (5.3)
Lack of confidence in screening recommendations	0 (0)	1 (1.4)	NA	1 (0.7)
Other	9 (11.3)	3 (4.2)	NA	12 (8.0)
None	12 (15.0)	17 (24.0)	NA	29 (19.2)

Note: Percentages may not total 100% due to rounding.
[a]Coded for only newspaper articles and blog posts
NA, not applicable

question (*n*=8) were excluded from the analyses. Appendix F (available online at www.ajpm-online.net) details the demographic characteristics of the sample.

Frequencies and Cross-Tabulations for Key Variables

Table 2 presents frequencies and the results of cross-tabulations and chi-square analyses by age. Almost 39% of respondents strongly agreed or agreed that they were confident that the guidelines were based on the latest research. Twenty-five percent of respondents said they paid no attention to the guidelines or had not heard of them, 27.5% said they paid *a little*, 30.2% said they paid *some*, and 17.1% said they paid *a lot* of attention. Fifty percent of respondents correctly identified the reason for the debate (i.e., *There is disagreement about whether women aged 40–49 years should get a routine annual mammogram*); 23.4% correctly identified the new recommendation for women aged 40–49 years; and 24.0% correctly identified it for women aged 50–74 years. Only 6.2% of respondents indicated that the new recommendations helped them understand when to get a mammogram, whereas 30.0% said they made them confused. Significant differences for key variables by age are presented in Table 3 and further explored through logistic regression analyses discussed below.

Results of Logistic Regression

Knowledge of the reason for the debate. Respondents who paid a little (OR=4.0, 95% CI=2.5, 6.5, *p*=0.001), some (OR=7.0, 95% CI=4.2, 11.5, *p*=0.001), or a lot of attention to the guidelines (OR=5.7, 95% CI=3.3, 9.7, *p*=0.001) attention to the guidelines were significantly more likely to correctly identify the reason for the debate compared to those who paid no attention to or had not heard of the new recommendations (Table 3). Compared to respondents with a high school degree or less, respondents with a bachelor's degree or higher (OR=1.7, 95% CI=1.1, 2.6, *p*=0.05) were significantly more likely to correctly identify the reason for the debate.

Knowledge of recommendation for women aged 40–49 years. Women aged 40–49 years (OR=0.6, 95% CI=0.4, 0.9, *p*=0.05) were less likely than women aged 50–74 years to correctly identify the new recommendation (i.e., *talk to your doctor*). Those whose race was classified as other (OR=1.8, 95% CI=1.2, 2.8, *p*=0.01); those with a bachelor's degree or higher (OR=2.4, 95% CI=1.5, 3.7, *p*=0.001); whose most recent mammogram was longer than 2 years ago (OR=1.0, 95% CI=1.0, 2.3, *p*=0.05); who strongly agreed or agreed that the guidelines were based on the latest research (OR=1.9,

Table 2. Sample demographic characteristics and awareness of USPSTF guidelines by age, *n* (%) unless otherwise indicated

Variable	Overall (N=1221)	Aged 40–49 years (n=336)	Aged 50–74 years (n=885)	Aged 40–49 vs 50–74 years, *p*-value
Race				
White	977 (72.1)	259 (69.6)	718 (73.2)	0.374
Black	108 (11.4)	30 (10.4)	78 (11.9)	
Other	136 (16.5)	47 (20.0)	89 (14.9)	
Education				
Bachelor's degree or higher	474 (42.5)	87 (30.9)	387 (47.9)	<0.001
Some college	358 (28.8)	107 (29.7)	251 (28.3)	
High school or less	389 (28.7)	142 (39.5)	247 (23.8)	
Income ($)				
<50,000	544 (48.5)	111 (39.1)	433 (52.9)	<0.001
≥50,000	677 (51.5)	225 (60.9)	452 (47.1)	
Marital status				
Married	768 (58.8)	238 (67.0)	530 (54.9)	0.002
Not married	453 (41.3)	98 (33.0)	355 (45.1)	
Most recent mammogram				
≤2 years ago	909 (72.7)	225 (64.5)	684 (76.5)	0.001
>2 years ago or never	294 (27.3)	107 (35.5)	187 (23.5)	
Confident that guidelines are based on latest research				
Strongly agree/agree	423 (38.6)	119 (39.8)	304 (38.1)	0.660
Strongly disagree/disagree	770 (61.4)	207 (60.2)	563 (61.9)	
Attention to guidelines				
A lot	242 (17.1)	48 (12.6)	194 (19.2)	0.049
Some	393 (30.2)	109 (28.9)	284 (30.7)	
A little	329 (27.5)	93 (28.6)	236 (27.1)	
None/didn't hear about it	254 (25.2)	85 (29.9)	169 (23.0)	
Reason for debate				
Correct response	633 (50.4)	181 (53.1)	452 (49.2)	0.335
Incorrect response	584 (49.6)	154 (47.0)	430 (50.8)	
Guidelines for women aged 40–49 years				
Correct response	307 (23.4)	72 (20.3)	235 (24.9)	0.142
Incorrect response	906 (76.6)	263 (79.8)	643 (79.1)	
Guidelines for women aged 50–74 years				
Correct response	316 (24.0)	77 (19.8)	239 (25.9)	0.050
Incorrect response	888 (76.0)	256 (80.2)	632 (74.1)	
Impact of guidelines				
Made me confused	301 (30.0)	110 (40.1)	191 (25.5)	0.003
Helped me understand	59 (6.2)	15 (5.1)	44 (6.7)	
Did not affect understanding	670 (63.8)	154 (54.8)	516 (67.9)	

Note: Percentages are weighted to account for survey design and differential nonresponse. The number of respondents for each question varies because of missing values, refusals, or *don't know* responses.
USPSTF, U.S. Preventive Services Task Force

Table 3. Logistic regression models of USPSTF guidelines (N=1221), OR (95% CI)

Variable	Correct responses to questions about guidelines		Impact of guidelines		
	Reason for debate	Knowledge of guidelines for women aged 40–49 years	Knowledge of guidelines for women aged 50–74 years	Helped vs did not affect understanding[a]	Confused vs did not affect understanding[a]
Age (years)					
40–49	1.3 (0.9, 1.9)	0.6 (0.4, 0.9)*	0.7 (0.5, 1.0)	1.2 (0.6, 2.6)	2.0 (1.3, 3.1)***
50–74	ref	ref	ref	ref	ref
Race					
White	ref	ref	ref	ref	ref
Black	0.8 (0.5, 1.4)	0.8 (0.4, 1.4)	0.8 (0.4, 1.5)	2.2 (0.9, 5.5)	1.3 (0.7, 2.4)
Other	1.2 (0.9, 1.8)	1.8 (1.2, 2.8)**	1.5 (1.0, 2.2)	1.6 (0.6, 4.0)	1.4 (0.8, 2.5)
Education					
Bachelor's degree or higher	1.7 (1.1, 2.6)*	2.4 (1.5, 3.7)***	1.2 (0.8, 1.9)	0.2 (0.1, 0.6)**	0.7 (0.4, 1.1)
Some college	1.1 (0.6, 1.9)	0.6 (0.3, 1.0)	0.5 (0.3, 0.9)*	0.8 (0.4, 1.6)	0.5 (0.3, 0.8)**
High school or less	ref	ref	ref	ref	ref
Income ($)					
≥50,000	1.1 (0.8, 1.7)	1.1 (0.8, 1.7)	1.3 (0.9, 1.9)	0.6 (0.3, 1.2)	0.8 (0.5, 1.3)
<50,000	ref	ref	ref	ref	ref
Marital status					
Married	1.0 (0.7, 1.5)	1.3 (0.9, 1.9)	0.9 (0.6, 1.4)	1.0 (0.5, 2.0)	1.1 (0.7, 1.6)
Not married	ref	ref	ref	ref	ref
Most recent mammogram					
>2 years or never	0.8 (0.6, 1.2)	1.5 (1.0, 2.3)*	1.2 (0.8, 1.7)	0.7 (0.3, 1.7)	1.9 (1.3, 2.9)**
≤2 years ago	ref	ref	ref	ref	ref
Confident that guidelines are based on latest research					
Strongly agree/agree	0.8 (0.6, 1.1)	1.9 (1.3, 2.7)**	0.9 (0.7, 1.3)	7.6 (3.4, 17.1)***	0.8 (0.5, 1.2)
Strongly disagree/disagree	ref	ref	ref	ref	ref
Attention to guidelines					
A lot	5.7 (3.3, 9.7)***	2.9 (1.5, 5.5)**	3.3 (1.7, 6.4)***	0.7 (0.2, 2.1)	0.7 (0.4, 1.4)
Some	7.0 (4.2, 11.5)***	2.8 (1.5, 5.1)**	4.0 (2.2, 7.3)***	0.6 (0.2, 1.5)	1.2 (0.6, 2.1)
A little	4.0 (2.5, 6.5)***	2.4 (1.3, 4.4)**	2.8 (1.5, 5.2)**	0.6 (0.3, 1.6)	1.2 (0.7, 2.3)
None/didn't hear about it	ref	ref	ref	ref	ref

Note: ORs are adjusted for age, race, education, income, marital status, mammography history, confidence that guidelines based on latest research, and attention to guidelines.
[a]Conducted through multinomial logistic regression
*p=0.05, **p=0.01, ***p=0.001
USPSTF, U.S. Preventive Services Task Force

95% CI=1.3, 2.7, p=0.01); and who paid a little (OR=2.4, 95% CI=1.3, 4.4, p=0.01), some (OR=2.8, 95% CI=1.5, 5.1., p=0.01), or a lot of (OR=2.9, 95% CI=1.5, 5.5, p=0.01) attention were significantly more likely to correctly identify the new recommendation.

Knowledge of recommendation for women aged 50–74 years. Only education and attention to the guidelines were related to correctly identifying the new

recommendation for women aged 50–74 years. Respondents with some college (OR=0.5, 95% CI=0.3, 0.9, p=0.05) were less likely to correctly identify the recommendation. Respondents who paid a little (OR=2.8, 95% CI=1.5, 5.2, p=0.01), some (OR =4.0, 95% CI=2.2, 7.3, p=0.01), or a lot of (OR=3.3, 95% CI=1.7, 6.4, p=0.001) attention to the guidelines were significantly more likely to correctly identify the new recommendation.

Perceived effect of new recommendations. A multinomial logistic regression model of responses concerning the impact of the new recommendations on respondents' understanding of when to get a mammogram was conducted (Table 3). Participants with a bachelor's degree or higher (versus high school or less) were significantly less likely to report that the guidelines helped (OR=0.2, 95% CI=0.1, 0.6, p=0.002), whereas those who were confident that the guidelines were based on the latest research were significantly more likely to report that the guidelines helped (OR=7.6, 95% CI=3.4, 17.1, p=0.001) when compared to their counterparts.

Respondents aged 40–49 years were more likely to report that they were confused by the guidelines (OR=2.0, 95% CI=1.3, 3.1, p=0.001), as were those who had never received a mammogram or who had received one more than 2 years ago (OR=1.9, 95% CI=1.3, 2.9, p=0.003). Those with some college education were less likely to report being confused than those with a high school degree or less (OR=0.5, 95% CI=0.3, 0.8, p=0.001).

Conclusion

Results from this study will allow public health professionals to understand how the USPSTF's 2009 mammography screening recommendations were discussed in the media and whether women understood the reason for the debate and the new recommendations approximately 1 month after their release. Media coverage of the new recommendations peaked immediately following their release and was unbalanced. The majority of news articles and social media posts were unsupportive of the recommendations. The new recommendations were released during the heated debate about healthcare reform legislation, so it is not surprising that they were portrayed by some as an example of how the Obama administration planned to ration health care if the legislation passed.

National news stories described the recommendations for women aged 40–49 years almost twice as often as the recommendations for women aged 50–74 years. These results are consistent with previous studies that suggest a media bias in favor of mammography screening. Wells, Marshall, Crawley, and Dickersin[27] found that newspaper coverage on mammography screening from 1990 to 1997 predominantly focused on screening for women aged 40–49 years and was twice as likely to support screening rather than oppose it, and that this position changed little over time and rarely reflected changes in recommendations from national organizations. Schwartz and Woloshin[21] examined news media coverage of the NIH consensus panel's decision not to recommend routine screening for women in their 40s in January 1997 and

the National Cancer Institute's (NCI's) subsequent reversal in March 1997, and found that in both instances most stories favored routine mammography screening (59% of the articles regarding the NIH consensus panel decision and 96% regarding the NCI reversal). The media's bias for mammography screening may reflect the strong historical influence of breast cancer advocacy efforts.[28,29] These studies highlight the challenges that organizations like the USPSTF face in making recommendations that do not necessarily support regular screening and underscore the need for educating journalists and media organizations.

The majority of respondents reported paying attention to the recommendations. Level of attention was the variable most strongly related to correctly identifying the reason for the debate and the new recommendations for women aged 40–49 years and 50–74 years. Generally, as the level of attention increased, knowledge increased.

Despite the media flurry, only 20.3% of women aged 40–49 years and 23.4% of all women in the sample correctly identified the mammography recommendation for women aged 40–49 years. Overall, the new recommendations confused women more than they helped them understand when to get a mammogram. Women aged 40–49 years were significantly more likely to be confused about when they should get a mammogram than the older age group. Because the mammography recommendation for women aged 50–74 years (i.e., every 2 years) was not dramatically different from the previous recommendation (i.e., every 1–2 years), this finding is not surprising.

The current study had several limitations. First, leading national U.S. newspapers were sampled rather than all news media. It is possible that smaller newspapers covered the story differently than major newspapers and that these findings are not representative of all media during the study period. Second, only the content of tweets was coded. Thus, because the amount of information that newspapers and blogs contain is much greater than the amount of information in a tweet, Twitter results should be interpreted with caution. Third, the survey was fielded 1 month after the release of the recommendations. Although this time lag is advantageous in that it allowed women's opinions to develop based on weeks of news stories, it limits the ability to understand the immediate effects of the media coverage during the peak of the public discourse. Fourth, despite weighting, some groups are slightly underrepresented. Because all KnowledgePanel participants had or were given Internet access, results may not be generalizable to those without Internet access.

The USPSTF should consider strategies to develop clear messages regarding new recommendations for audiences such as clinicians, consumers, and the media. In addition, recommendations could be accompanied by

consumer-focused materials explaining the methods used to review the scientific studies on which new recommendations are based. The USPSTF plays a vital role in reviewing the latest scientific evidence and advising providers and consumers about prevention. For recommendations to be accepted by both groups, they first must be understood. In the field of health communication, message testing with individuals is frequently used to ensure that messages are understandable, credible, and use language that resonates with the target audience. Using message testing in the future may help identify specific components or words (e.g., *routine*, *against*) within the recommendations that could cause providers, consumers, and advocacy agencies to be confused or concerned.

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Appendix

Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.amepre.2010.12.027.