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The evolution of mammography controversy in the news media: A content analysis of four publicized screening recommendations, 2009-2016

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Abstract

Background: There is longstanding expert disagreement about the age at and frequency with which women should be screened for breast cancer. These debates are reflected in the conflicting recommendations about mammography issued by major professional organizations, such as the U.S. Preventive Services Task Force (USPSTF) and the American Cancer Society (ACS). Previous

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research has shown that these recommendations garner substantial media attention—and therefore might affect women's screening perceptions and behaviors—but to date analyses of such media coverage have focused on single publicized announcements.

Methods: To assess whether media coverage of mammography screening recommendations has evolved, we conducted a content analysis of televised news from four discrete media events across 2009–2016, all of which focused on publicized screening recommendations from the USPSTF and ACS ($N=364$ total stories).

Results: Media coverage of mammography screening recommendations has featured persistent messages of conflict and/or controversy over time. The evolution of controversy was also reflected in shifts in the relative attention given to mammography screening's risks and benefits, with consistent and, in some cases, heightened attention to screening's risks during more recent media events. Overall, the accuracy of media coverage improved over time.

Conclusion: Results underscore the continued prevalence of conflicting and/or controversial information about mammography screening in the public information environment. Cumulative exposure to such messages could influence women's decision making around screening and trust in cancer prevention recommendations. Strategies are needed to better equip all women (and particularly underserved women) to negotiate mammography controversy and weigh the benefits and risks of screening.

Introduction

The past two decades have seen substantial expert disagreement about the use of mammography to screen for breast cancer. During the 1990s, this disagreement centered on the age at and frequency with which women should be screened (Fletcher, Black, Harris, Rimer, & Shapiro, 1993; NIH Consensus Development Panel, 1997), and in the early 2000s, a Cochrane meta-analysis questioned whether women should be screened at all (Olsen & Gotzsche, 2001). More recently, the general trend among major U.S. professional organizations, including the U.S. Preventive Services Task Force (USPSTF) and the American Cancer Society (ACS), has been to shift away from recommending routine screening for average-risk women beginning at age 40 toward emphasizing informed decision making, or weighing the risks and benefits of mammography before opting to begin screening. The USPSTF moved first by downgrading mammography to a C rating (recommending against routine screening for women aged 40–49) in November 2009 (Calonge et al., 2009). ACS and the American College of Obstetricians and Gynecologists (ACOG) have since followed this lead; both organizations recommend that women in their 40s (and specifically women aged 40–44, in the case of ACS) have the option to begin screening, while also encouraging them to speak with their health care provider about mammography's risks and benefits (ACOG, 2017; Oeffinger, Fontham, Etzioni, et al., 2015).

Despite this overall trend toward informed decision making for women in their 40s, conflicting recommendations remain across organizations. In October 2015, ACS began recommending annual routine mammography screening at age 45 and biennial screening starting at 55 (Oeffinger et al., 2015). In contrast, in January 2016 USPSTF reiterated its original November 2009 position, reaffirmed in its April 2015 draft recommendation

(USPSTF, 2015), that women should begin biennial routine screening at age 50 (Siu et al., 2016). ACOG recommends that women in their 40s have the option to begin screening (ACOG, 2017), while the American College of Radiology (ACR) continues to recommend that women initiate routine screening at age 40 (ACR, 2015).

These shifting mammography recommendations have garnered substantial media attention, but analyses of media coverage typically focus on a single event (i.e., a new recommendation by an expert panel or professional organization). Content analyses of these individual events suggest that coverage often emphasizes expert disagreement over screening (Holmes-Rovner & Charles, 2003; Steele, Mebane, Viswanath, & Solomon, 2005) and, particularly in the case of the 2009 USPSTF recommendation, dramatizes the conflict (Fowler & Gollust, 2015; Nagler, Fowler & Gollust, 2015). In some instances, news stories have reported uncertainty about whether women in their 40s should undergo screening (Chew, Mandelbaum-Schmid, & Gao, 2006; Schwartz & Woloshin, 2002), while in other instances coverage has been unbalanced (with a majority of stories opposed to the new recommendations; Squiers et al., 2011) and sometimes misleading (Nagler et al., 2015).

The fact that most research on media coverage of mammography controversy has focused on single media events is consistent with a broader media influence paradigm that sometimes fails to recognize the dynamic, evolving, often competing way in which media messages operate in the public information environment (Chong & Druckman, 2007; Fowler & Gollust, 2015; Fowler, Gollust, Dempsey, Lantz, & Ubel, 2012; Kinder, 2007). In short, news media audiences do not respond anew to every news story; instead, their responses are conditioned on their past news exposure and their preexisting attitudes toward news content, which in turn varies over time in response to real-world events and citizen reactions. The current study therefore moves beyond this single-event focus, drawing on the content of television coverage of four discrete events across 2009–2016 to address our primary research question: To what extent has media coverage of mammography screening recommendations evolved, as evident in both explicit mentions of conflict and/or controversy and the relative attention given to the risks and benefits of screening? In addition, amid evidence that past media coverage has included inaccurate information about mammography screening recommendations (Nagler et al., 2015), a secondary research question is whether the accuracy of coverage has improved or deteriorated over time (see Appendix 1 for timeline of events).

There are several reasons to expect media coverage to have evolved. First, researchers have argued that controversy can be persistent or “sticky” once it becomes attached to the media presentation of a particular health issue (Fowler & Gollust, 2015). Since emphasizing conflict and/or controversy is a core news value (Shoemaker & Reese, 1996), such stickiness is likely, but empirical investigations of this possibility are needed. Second, during the time period of our study, there was growing scientific evidence about the existence of screening risks, including breast cancer overdiagnosis, from which reporters could draw (Bleyer & Welch, 2012; Jørgensen & Gøtzsche, 2009; Kalager, Adami, Bretthauer, & Tamimi, 2012); there was thus an opportunity for reporting on the risks and benefits of mammography to change over time. Last, some professional organizations changed their approach to communication about screening recommendations since 2009—for example, the USPSTF

now issues draft recommendations for public comment prior to finalizing them—and this could shape how the news media covers such announcements.

The current study focuses on television news because it remains a key source of health information for many Americans. Even as public use of online news increases, approximately half of U.S. adults still report often getting news from television (Gottfried & Shearer, 2017), and roughly 40% pay some or a lot of attention to health information, particularly cancer-related information, on local and/or national television news programs (National Cancer Institute (NCI), 2011, 2012). Importantly, television news differs from print news in several ways. The television newscast is a shorter-form visual medium, which historically has focused less on providing nuanced analysis of issues and policies than drama, sound bites, and compelling footage (Hilgartner & Bosk, 1988; Viswanath et al., 2008). News gathering pressures can be particularly strong for local television journalists, who must identify topics for which compelling footage exists—including on-camera interviews with expert sources and lay persons affected by the health issue in question (Tanner, 2004; Tanner, Friedman, & Zheng, 2015). Television news thus may be more likely than print to feature conflict and/or controversy, given the premium placed on drama, and its condensed format could provide less contextual information (Niederdeppe et al., 2014) and, potentially, greater inaccuracies.

Ultimately, it is important to accurately describe the media environment as a foundational step toward understanding whether and how information in the media affects the public. For example, several studies that examined changes in women's screening behavior following the USPSTF's November 2009 announcement found either no changes (Block, Jarlenski, Wu, & Bennett, 2013; Pace, He, & Keating, 2013) or small reductions in screening rates (Wharam et al., 2015), if only initially (Wang et al., 2014). Because media coverage could be one of several factors contributing to women's screening decisions, we evaluate this possibility by first identifying the screening recommendation messages to which women may have been exposed. Understanding these messages becomes even more critical when we consider increasing evidence that media exposure to conflicting and often controversial health information can have adverse cognitive and behavioral effects, including greater confusion about and decreased trust in cancer prevention recommendations (Nagler & LoRusso, 2017).

Methods

Data source and sampling approach

We collected U.S. local and national televised news content, including video and closed-caption transcripts, following four mammography screening recommendation announcements: 1) November 2009 USPSTF (11/16/2009–11/25/2009; video only), 2) April 2015 USPSTF draft (4/20/2015–4/28/2015), 3) October 2015 ACS (10/20/2015–10/28/2015; transcripts only), and 4) January 2016 USPSTF final (1/11/2016–1/20/2016). Data were collected during the 7–10 days following each announcement, after which coverage receded. Unlike print news coverage, which can be collected retrospectively via searchable databases (e.g., LexisNexis), there is no archive of local television news. Thus we collected all televised content prospectively, using keyword retrievals to identify stories from commercial

search engines to which the Wesleyan Media Project subscribed (ShadowTV in 2009, TVEyes in 2015–2016). We used a stratified market size approach, similar to one used by health journalism scholars (Tanner, Friedman & Zheng, 2015), to generate the sample ($N=364$ total stories across events); detailed information on the sampling approach is provided in Figure 1. We previously reported our analysis of media coverage of the 2009 USPSTF announcement (Fowler & Gollust, 2015; Nagler et al., 2015), but a subset of these data—the televised content—is also included here to enable us to assess the evolution of coverage across events in the same medium.

Coding procedure and analysis

We developed our initial codebook to capture content about the November 2009 USPSTF announcement. Coding domains included descriptive information (e.g., date, story length, news outlet); messages reflecting conflict and/or controversy about the recommendation; arguments supporting or opposing recommendation changes (i.e., arguments that emphasize risks versus benefits of screening); and messages reflecting accurate and inaccurate information. Each domain comprised several coding variables (see Tables 1-3); variable definitions were refined based on pilot coding, in which a random subset of the full set of stories were mutually coded by the coding team (see Appendix 2 for all definitions). All substantive coding variables were dichotomous (1 = yes/content present in story, 0 = no/content not present in story).

The key coding variables were those that enabled us to capture messages reflecting conflict and/or controversy. Variable definitions were guided by dictionary definitions of these terms, where *conflict* (or *conflicting*) refers to being different, opposed, or contradictory (Conflict, n.d.), and *controversy* (or *controversial*) refers to discussions characterized by opposing views (i.e., a dispute or disagreement) (Controversy, n.d.). Thus, for the “tone characterized by conflict and/or controversy” variable, coders considered a news story to be conflicting and/or controversial if there was specific reference to recommendations as a source of debate, disagreement, or conflict; rhetoric (i.e., how inflammatory the tone was) was often an important signal of controversy, but this was not necessarily determinative. For example, a news story that read “Mammogram screening has long been controversial with various task forces and groups offering difference guidance, often making recommendations that are confusing to us ladies” was coded as conflicting and/or controversial. In contrast, if a news story simply explained the new mammography recommendations without mentioning these as a source of debate, disagreement, or conflict, it was coded as not controversial. For the “on-screen words describe issue as conflicting and/or controversial” variable, stories with headlines or on-screen words that implied any conflict, dispute, or disagreement were coded affirmatively (e.g., a story with on-screen words that read “Mammography debate”).

The November 2009 codebook was also used for subsequent media events, though some coding variables were added or dropped during the pilot coding period in response to observed changes in coverage. For example, during pilot coding for the 2015–2016 events, coders observed a trend toward journalistic reference to conflict and/or controversy in news stories. We therefore added two coding variables: “reporter or news anchor explicitly mentions existence of conflict and/or controversy” and “story mentions conflict among

different organizations' recommendations." For the first variable, a story was coded affirmatively if the journalist explicitly referred to the existence of conflict, debate, or disagreement, effectively drawing the audience's attention to conflict and/or controversy (e.g., a story in which a news anchor says "it [the changing recommendations] caused a lot of outrage"). For the second variable, a story was coded affirmatively if it referred to any conflict or differences among organizations' recommendations for breast cancer screening (e.g., a story that read "At least one other influential group still recommends starting [screening] at 40. Another says mammograms aren't necessary until 50"). In addition, for the October 2015 and January 2016 events, we also added a variable to capture content on the risk of overdiagnosis (i.e., a diagnosis of breast cancer that would otherwise never have caused symptoms or death in a person's lifetime; Welch & Black, 2010); during pilot coding, coders observed a trend toward stories discussing overdiagnosis separately from related concepts, such as unnecessary biopsies and other tests.

Two coders reviewed content from November 2009 and April 2015, and three coders examined October 2015 and January 2016. Several times during pilot coding, we calculated Krippendorff's alpha to assess inter-coder reliability; once coders were interpreting the codebook consistently, we conducted final coding, whereby coders double- or triple-coded 15–20% of stories for each event and coded the remainder independently. For these double- or triple-coded stories, we conducted final inter-coder reliability analyses for the 29 coding variables reported in Tables 1–3 (see Appendix for all alphas). For each of the four events, alpha rounded to .8 for 18 coding variables and to .7 for 5 variables, where $\alpha = .00$ signals zero agreement and $\alpha = 1.00$ signals perfect agreement (Krippendorff, 2004). For the remaining 6 variables, alpha rounded to .6 for one or more of the four events (see asterisks in Appendix). Although .667 is considered acceptable for making tentative conclusions, Krippendorff acknowledges that "[except] for perfect agreement on all recording units, there is no magical number [for an acceptable level of agreement]" (Krippendorff & Bock, 2009, p. 354).

For each recommendation event, we used Stata 14 to calculate descriptive statistics (i.e., frequencies and confidence intervals) to assess the prevalence of messages reflecting conflict and/or controversy, arguments supporting or opposing changes, and messages reflecting accurate and inaccurate information. We performed chi-square analyses (and, as appropriate, Fisher's exact tests) to assess whether the prevalence of messages varied significantly across the four events.

Results

Prevalence of messages reflecting conflict and/or controversy about mammography screening recommendations

Although the number of stories using on-screen words to underscore conflict and/or controversy declined across the events, the tone of stories covering screening recommendations often emphasized conflict and/or controversy (Table 1). For the November 2009 event, the tone of nearly all stories (96.5%) was characterized by conflict and/or controversy; this dropped to 59.8% of stories in April 2015, leveling off at roughly half of stories in October 2015 and January 2016. Additionally, one-third to one-half of 2015–2016

stories featured a reporter or news anchor who explicitly highlighted the existence of conflict and/or controversy, and stories often pointed out that recommendations conflicted across professional organizations.

Prevalence of arguments supporting or opposing changes in mammography screening recommendations

Across events, there was a shift in the relative attention given to mammography screening's risks and benefits (Table 2). More recent events contained greater discussion of screening risks that can outweigh benefits. Attention to the risk of false positive results in the 2015 ACS coverage was nearly double (76.4%) that of 2009 (38.9%) and 2016 (36.0%) USPSTF coverage. Other risks of screening that received attention in 2009 USPSTF stories were still discussed in 2015 ACS and 2016 USPSTF stories, including the risk of unnecessary biopsies—which was especially prominent in ACS coverage (39.3%)—and the risk of anxiety and/or psychological harm. Final coding results showed that fewer than 10% of 2015 ACS and 2016 USPSTF stories discussed overdiagnosis as a discrete concept.

As was the case in 2009 USPSTF coverage, more recent media events also featured messages about the benefits of screening (Table 2). For example, arguments about saving lives at any cost and early detection being the best cancer prevention strategy remained prevalent in 2015 ACS coverage and, to a lesser extent, 2016 USPSTF coverage. The exception was April 2015 USPSTF coverage, which generally saw little discussion of either risks or benefits.

Prevalence of messages reflecting accurate and inaccurate information about mammography screening recommendations

Results suggest some gains in the accuracy of media coverage of USPSTF recommendations over time (Table 3). For example, there was a trend toward more accurate reporting of the recommended age at and frequency with which women should be screened. In November 2009, nearly two-thirds of stories correctly reported that women aged 40–49 should not get routine screening; this increased to 94.3% and 89.3% in April 2015 and January 2016 coverage, respectively. In addition, while one-half of 2009 USPSTF stories falsely reported that women aged 40–49 should *not* get screened, this content decreased substantially in 2015 USPSTF draft coverage, and pilot coding for the 2016 USPSTF event suggested that such inaccuracies had disappeared from media coverage altogether. Yet inaccuracies remained in the language used to describe the USPSTF. Across all three USPSTF events, between one-third and one-half of stories incorrectly described the task force as a “government panel”; accurate descriptions of the task force as an “independent panel” were rare.

In contrast to the USPSTF events, pilot coding for the 2015 ACS event suggested that coverage was largely accurate (so the codebook did not include false statements). Final results substantiated that reporting on the ACS recommendation was generally strong (Table 3). Looking across both the USPSTF and ACS events, there was a trend toward greater discussion of the scope of the recommendations (i.e., relevant only to average-risk women) and the emphasis on individual decision making for women in their 40s (specifically, women aged 40–49 for USPSTF and 40–44 for ACS).

Discussion

The primary goal of this study was to move beyond the single-event focus that has dominated prior research on media coverage of mammography controversy and assess whether coverage of screening recommendations has evolved, as evident in both explicit mentions of conflict and/or controversy and the relative attention given to the risks and benefits of screening. A secondary goal was to evaluate whether the accuracy of coverage has improved or deteriorated over time.

Results showed that, across most indicators, television news coverage contained persistent messages of conflict and/or controversy. Almost all 2009 USPSTF coverage emphasized conflict and/or controversy, and although this was attenuated in subsequent events, it remained stable at roughly 50% of coverage. This persistence reflects the stickiness of controversy once it becomes attached to the media presentation of a given health issue (Fowler & Gollust, 2015)—stickiness that may be explained, at least in part, by journalistic norms, such as the core news value that privileges conflict and/or controversy (Shoemaker & Reese, 1996). This finding is also consistent with previous empirical research, which found that controversy over screening was a theme in almost 30% of a convenience sample of online news coverage of mammography over a nine-year period (Young Lin & Rosenkrantz, 2017). Moreover, even as we observed a sharp decline in the number of 2015–2016 stories using on-screen words to describe screening recommendations as conflicting and/or controversial, we still found substantial evidence of explicit on-air journalistic references to conflict. Explicitly underscoring conflict may produce more powerful effects on viewers than simply implying conflict by referencing different screening recommendations (Nagler & LoRusso, 2017).

The evolution of mammography controversy is also reflected in shifts in the relative attention given to mammography screening's risks and benefits. We find consistent and, in some cases, heightened attention to screening's risks over time, with greater recognition that such risks can sometimes outweigh screening's benefits. This shift is consistent with journalists' recognition that describing both benefits and risks may be important to increase the audience's understanding of health information, although this presentation could disproportionately benefit more health-literate audiences (Hinnant & Len-Ríos, 2009). Our results are also in line with those from recent content analytic studies, which have identified discussion of both risks and benefits in media coverage of breast, prostate, and other cancer screening (Elstad et al., 2014; Smith, Kromm, & Klassen, 2010); in contrast, older content analyses found that the benefits of screening generally received more attention (Katz et al., 2004; MacKenzie, Chapman, Barratt, & Holding, 2007; Schwartz & Woloshin, 2002). The discussion of risks was particularly pronounced in television news coverage of the October 2015 ACS event, with three-quarters of stories discussing the risk of false positive results and over one-third discussing the risk of unnecessary biopsies and other tests. It is possible that ACS, recognizing that the 2015 recommendation was a clear departure from its longstanding recommendation that annual screening begin at age 40, wanted to emphasize the risk-benefit balance that informed this change. Yet despite attention to risks, coverage of the 2015 ACS event still prominently featured information on screening's benefits, especially the importance of early detection. This was also true of coverage of the 2016

USPSTF event, although there was comparatively less attention to screening's benefits compared to 2009 USPSTF coverage. In contrast, the April 2015 coverage of the USPSTF draft recommendation saw little discussion of risks or benefits of screening. This is likely because the stories 1) were shorter on average than those following other events (Figure 1) and 2) largely focused on the USPSTF process (i.e., issuing a draft recommendation that is open to public comment for a set period of time prior to issuing a final recommendation) rather than substantive content.

One mammography screening risk in particular that is gaining scientific attention is overdiagnosis (Hersch, Nickel, Ghanouni, Jansen, & McCaffery, 2017). Even at its peak, in January 2016 USPSTF coverage, our results show that fewer than 1 in 10 stories discussed the concept. This may help explain recent evidence that fewer than 17% of women in a nationally-representative U.S. sample were aware of the potential of breast cancer overdiagnosis (Nagler, Fowler, & Gollust, 2017). It is important to better understand how journalists think about potential harms of cancer screening and, in turn, how this shapes health news production (Walsh-Childers & Braddock, 2018).

The current study also had a secondary goal: Given prior evidence that media coverage of the 2009 USPSTF recommendation featured inaccurate information (Nagler et al., 2015), we asked whether the accuracy of coverage improved or deteriorated over time. Comparing 2009 to 2015–2016 USPSTF coverage, results suggest that the accuracy of coverage generally improved. However, many stories continued to refer incorrectly to the task force as a “government” panel. This description is concerning, as it could trigger processes known as motivated reasoning: When messages include political cues (e.g., reference to a panel as a “government” entity), this can increase the likelihood that those messages will be processed in filtered or biased ways, consistent with one's prior beliefs and values (Taber & Lodge, 2006). In fact, a recent survey showed that only one-third of Americans would trust a “government task force” to make guidelines for clinical preventive services (Lantz, Evans, Mead, Alvarez, & Stewart, 2016). Future research should assess whether the inclusion of political cues in messages about mammography and other women's health controversies shapes public response to those messages.

The results of this study have implications for women's breast cancer screening decision making. Media coverage of both the risks and benefits of mammography, as this study identified, could prove beneficial, insofar as exposure to this information may help women to make informed decisions about when to begin screening. In addition, across the USPSTF and ACS events, there was a trend toward greater discussion of the appropriate scope of the recommendations (i.e., relevant only to average-risk women) and the emphasis on individual decision making for women in their 40s. Providing these factually correct parameters could prove important as women consider the applicability and utility of the recommendations in their own decision making with their providers. Yet it is not clear whether such informed decision making is taking place. Providers tend to overestimate cancer screening's benefits and underestimate its potential harms (Hoffmann & Del Mar, 2017), and some women have reported that providers have not engaged in conversations about mammography's risks and benefits (Nagler, Lueck, & Gray, 2017) or, more generally, mammography choice (Spring, Marshall, & Warner, 2017). Moreover, exposure to media messages about both risks and

benefits of screening could serve as an additional source of conflicting information—particularly in combination with explicit mentions of conflict and/or controversy about screening recommendations. Ultimately, such exposure could produce fatalistic beliefs (Smith et al., 2010) and confusion about cancer screening and prevention, but to date there has been little empirical attention to this question of media effects (Nagler et al., 2015).

The results of this study should be considered in light of several limitations. First, we focused on television news since it remains an important source of health information (NCI, 2011, 2012). The results cannot be generalized to print news or other sources, particularly since television news content may be more likely than print to feature conflict and/or controversy, given the medium's prioritization of drama (Hilgartner & Bosk, 1988; Viswanath et al., 2008). Future research should examine whether the trends identified here are present in other traditional news media outlets or social media, given growing evidence of conversation about mammography and screening recommendations on Facebook (Huesch, Chetlen, Segel, & Schetter, 2017) and Twitter (Nastasi et al., 2017). Second, the coding instrument varied slightly across media events. Select variables were added over time, in response to observed changes in coverage; these variables could not be retrospectively assessed for prior media event(s), as televised content had to be collected prospectively (there is no available archive of local television news). Third, 6 out of 29 coding variables had lower reliability ($\alpha < 0.667$) for some media events, but these were still included given their theoretical and substantive importance (and for future researchers to adapt and improve upon). There may be several reasons for lower reliability: Some variables required nuanced analysis and interpretation rather than mere counts of the presence or absence of words, and because we collected and analyzed data prospectively over several years, different coder teams were used. Variation in coding team composition over time could explain, at least in part, some of the fluctuations in variables' alpha levels across media events. Fourth, we did not have any *a priori* hypotheses for whether certain story elements (such as accuracy) would co-occur with controversy, but future research should test this possibility, as well as whether coverage could vary across different news outlets (e.g., based on their political leanings). Fifth, news stories may have varied in the degree of conflict and/or controversy present, yet our dichotomous coding scheme would not have captured this variation; future studies should consider a more nuanced coding approach. Last, we focused on mammography screening recommendations, and trends observed here may not translate to media coverage of recommendations for other types of cancer screening.

Implications for practice and/or policy

Ultimately, this study raises several questions for future research and has implications for both practice and policy. As previously noted, there is little empirical research on the effects of exposure to media messages that emphasize conflict and/or controversy about mammography. Researchers have speculated that media coverage of mammography controversy may be one source of influence on women's attitudes and screening patterns (Wharam et al., 2015), and our content analysis results underscore the prevalence of such messages in the public information environment—but whether women notice this information, and whether it actually translates into effects on women (such as confusion about

screening or reduced screening intentions), is not yet known. Future research should rigorously test whether exposure to conflicting and/or controversial information about cancer screening influences affective, cognitive, or behavioral outcomes. Also unknown is whether exposure to mammography controversy might differentially affect underserved women, who already face persistent cancer and cancer screening disparities. A communication inequalities perspective—which emphasizes differences in social groups' abilities to access, attend to, process, retain, and act on information (Viswanath et al., 2012)—would suggest that, for example, women with lower levels of health literacy might struggle to make sense of conflicting messages about mammography, and women without a medical home (Arend, Tsang-Quinn, Levine, & Thomas, 2012) might have fewer opportunities to discuss any confusion with clinicians.

For clinical guidelines to realize their potential at shaping the services patients actually receive, practitioners and policymakers need a better understanding of the numerous ways in which these recommendations get disseminated with intentional or unintentional impacts on diverse patients and providers. It may be important to work with practitioners to better equip all women (and particularly underserved women) to negotiate conflicting mammography recommendations and weigh the benefits and risks of screening. It may also be worthwhile to work with journalists to improve communication about these complex issues, as health professionals are important sources from which local journalists draw (Viswanath et al., 2008). There is already some effort to do so—for example, researchers have conducted in-depth interviews with health journalists to assess how they think about potential harms such as overtreatment (Walsh-Childers & Braddock, 2018)—but there is a need to better understand and potentially strengthen health news reporting amid conflicting recommendations and expert disagreement.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Note. USPSTF=U.S. Preventive Services Task Force; ACS=American Cancer Society.

^a Included video and closed-caption transcripts (video only for November 2009, transcripts only for October 2015).

^b Within each strata, markets were randomly selected from different geographical regions: Strata 1=New York, Los Angeles, Chicago, Philadelphia, Dallas; Strata 2=San Francisco, Washington DC, Detroit, Miami; Strata 3=Sacramento, St. Louis, Portland, Pittsburgh; and Strata 4=Ft. Meyers, Madison, Austin, Tucson.

^c November 2009 included only evening broadcasts.

^d Duplicate and unrelated stories were excluded. For November 2009 and April 2015 events, census approach was used to identify stories. For October 2015 and January 2016 events, keyword searches yielded high volume of stories (N=242 and N=161, respectively); thus stories were identified for coding by taking 50% random sample that reflected the underlying variation in coverage by media market. For example, Philadelphia had a large number of relevant hits, so more stories from this market were included in the sample.

Figure 1.

Four media events about mammography screening recommendations (2009–2016): Content analytic sampling approach

Percentage of televised news stories that present messages reflecting conflict and/or controversy about mammography screening recommendations

Table 1.

	Nov. 2009 USPSTF N=113	Apr. 2015 USPSTF draft N=87	Oct. 2015 ACS N=89	Jan. 2016 USPSTF final N=75
	% (95% CI) ^a	% (95% CI) ^a	% (95% CI) ^a	% (95% CI) ^a
On-screen words describe issue as conflicting and/or controversial ^b	35.4 (26.6–44.2)	8.0 (2.3–13.7)	—	0.0
Tone characterized by conflict and/or controversy	96.5 (93.1–99.9)	59.8 (50.0–70.0)	50.6 (40.2–61.0)	54.7 (43.4–66.0)
Reporter or news anchor explicitly mentions existence of conflict and/or controversy ^c	—	33.3 (23.5–43.1)	52.8 (42.4–63.2)	44.6 (33.4–55.8)
Story mentions conflict among different organizations' recommendations ^c	—	—	46.1 (35.7–56.5)	36.0 (25.1–46.9)

Note. USPSTF=U.S. Preventive Services Task Force; ACS=American Cancer Society; CI=confidence interval.

^a All chi-square tests (or, as appropriate, Fisher's exact tests) significant at $p < .05$ except "story mentions conflict among different organizations' recommendations."

^b Transcripts only for October 2015, thus no on-screen words.

^c Coding variables added in response to observed changes in coverage (i.e., trend toward explicit journalistic reference to conflict).

Table 2.

Percentage of televised news stories that present arguments supporting or opposing changes in mammography screening recommendations

	Nov. 2009 USPSTF N=113	Apr. 2015 USPSTF draft N=87	Oct. 2015 ACS N=89	Jan. 2016 USPSTF final N=75
	% (95% CI) ^a	% (95% CI) ^a	% (95% CI) ^a	% (95% CI) ^a
Arguments supporting changes in recommendations (i.e., emphasizing risks of screening)				
Risks of screening may outweigh benefits	25.7 (17.6–33.8)	1.1 (0.0–3.2)	30.3 (20.8–39.8)	36.0 (25.1–46.9)
Risk of false positive results	38.9 (30.0–47.9)	14.9 (7.4–22.4)	76.4 (67.6–85.2)	36.0 (25.1–46.9)
Risk of anxiety/psychological harm	19.5 (12.2–26.8)	3.4 (0.0–7.2)	10.1 (3.8–16.4)	16.0 (7.7–24.3)
Risk of unnecessary biopsies	33.6 (24.9–42.3)	4.6 (0.2–9.0)	39.3 (29.2–49.4)	6.7 (1.0–12.4)
Risk of overdiagnosis ^b	—	—	4.5 (0.2–8.8)	9.3 (2.7–15.9)
Risk of radiation	12.4 (6.3–18.5)	0.0	1.1 (0.0–3.3)	0.0
Arguments opposing changes in recommendations (i.e., emphasizing benefits of screening)				
Saving lives is worth any costs	30.1 (21.6–38.6)	4.6 (0.2–9.0)	32.6 (22.9–42.3)	16.0 (7.7–24.3)
Early detection is best strategy for cancer prevention/control	32.7 (24.1–41.3)	4.6 (0.2–9.0)	36.0 (26.0–46.0)	14.7 (6.7–22.7)
Less screening in younger women will cause some to die	18.6 (11.4–25.8)	3.4 (0.0–7.2)	20.2 (11.9–28.5)	16.0 (7.7–24.3)
Breast cancer occurs in younger women (burden of disease)	13.3 (7.0–19.6)	0.0	4.5 (0.2–8.8)	17.3 (8.7–25.9)
Insurers might stop covering screening for women in need	14.2 (7.8–20.6)	4.6 (0.2–9.0)	19.1 (10.9–27.3)	8.0 (1.9–14.1)

Note. USPSTF=U.S. Preventive Services Task Force; ACS=American Cancer Society; CI=confidence interval.

^a All chi-square tests (or, as appropriate, Fisher's exact tests) significant at $p < .05$ except "risk of overdiagnosis."

^b Coding variable added in response to observed changes in coverage (i.e., trend toward discussing overdiagnosis separately from unnecessary biopsies and other tests).

Table 3.

Percentage of televised news stories that present accurate and inaccurate information about mammography screening recommendations^a

	Nov. 2009 USPSTF N=113	Apr. 2015 USPSTF draft N=87	Oct. 2015 ACS N=89	Jan. 2016 USPSTF final N=75
	% (95% CI) ^b	% (95% CI) ^b	% (95% CI) ^b	% (95% CI) ^b
Factual information about USPSTF recommendations (T = true, F = false)				
Task force is described as government panel (F)	44.3 (35.1–53.5)	47.1 (36.6–57.6)	—	37.3 (26.4–48.2)
Task force is described as independent panel (T)	14.2 (7.8–20.6)	0.0	—	6.7 (1.0–12.4)
Women aged 40–49 should <i>not</i> get screened (F) ^c	46.9 (37.7–56.1)	3.4 (0.0–7.2)	—	—
Women aged 40–49 should not get <i>routine</i> screening and/or routine screening should start at age 50 (T)	64.6 (55.8–73.4)	95.4 (91.0–99.8)	—	89.3 (82.3–96.3)
Women aged 50–74 should get screened every 2 years (T)	58.4 (49.3–67.5)	83.9 (76.2–91.6)	—	94.7 (89.6–99.8)
Insufficient evidence to evaluate screening for women aged 75+ (T)	2.7 (0.0–5.7)	10.3 (3.9–16.7)	—	17.3 (8.7–25.9)
Recommendation applies to average-risk women (T) ^d	32.7 (24.1–41.3)	20.7 (12.2–29.2)	—	53.3 (42.0–64.6)
Recommendation emphasizes individual decisions (T) ^e	10.6 (4.9–16.3)	83.9 (76.2–91.6)	—	82.7 (74.1–91.3)
Factual information about ACS recommendations (T = true)				
Routine screening should start at age 45 (T)	—	—	94.4 (89.6–99.2)	—
Women aged 45–54 should get screened annually (T)	—	—	65.2 (55.3–75.1)	—
Women aged 55+ should get screened every 2 years (T)	—	—	70.8 (61.4–80.2)	—
Women in good health who are expected to live 10+ years should continue screening (T)	—	—	3.4 (0.0–7.2)	—
Recommendation applies to average-risk women (T) ^d	—	—	64.0 (54.0–74.0)	—
Recommendation emphasizes individual decisions (T) ^e	—	—	50.6 (40.2–61.0)	—

Note. USPSTF=U.S. Preventive Services Task Force; ACS=American Cancer Society; CI=confidence interval.

^a Given factual differences between the USPSTF and ACS recommendations (e.g., differences in the age at and frequency with which women should be screened), factual information is reported separately for each professional organization.

^b All chi-square tests (or, as appropriate, Fisher's exact tests) significant at $p < .05$ except "task force is described as government panel."

^c Coding variable dropped in response to observed changes in coverage (i.e., little evidence of this false statement during 2016 pilot coding).

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Average risk defined as no personal history of breast cancer, no strong family history of breast cancer, no known genetic mutation known to increase breast cancer risk (e.g., BRCA1, BRCA2), and no chest radiation therapy before age 30.

For USPSTF, emphasis is individual decision making for women aged 40–49; for ACS, emphasis is individual decision making for women aged 40–44.