Public Perception of Cancer Survival Rankings

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Abstract

Past research has observed that certain subgroups (e.g., individuals who are overweight/obese) have inaccurate estimates of survival rates for particular cancers (e.g., colon cancer). However, no study has examined whether the lay public can accurately rank cancer survival rates in comparison with one another (i.e., rank cancers from most deadly to least deadly). A sample of 400 Indiana adults aged 18 to 89 years (M = 33.88 years) completed a survey with questions regarding perceived cancer survival rates. Most cancers were ranked accurately; however, breast and stomach cancer survival rankings were highly distorted such that breast cancer was perceived to be significantly more deadly and stomach cancer significantly less deadly than reality. Younger participants also overestimated the survival rate for pancreatic cancer. These distortions mirror past content analytic work demonstrating that breast, stomach, and pancreatic cancers are misrepresented in the news.

Keywords

cancer, distortion, survival rates

Which cancer has a lower survival rate: stomach or breast? The answer is stomach, the third deadliest cancer, but would most U.S. adults answer breast? Past research suggests that they would, as studies have consistently documented that the U.S. public has inaccurate perceptions of cancer risk (Leventhal, Kelly, & Leventhal, 1999). This is unfortunate, because cancer risk perceptions are related to the performance of a variety of health behaviors, including cancer prevention (e.g., smoking cessation, exercise, diet/nutrition), screening, patient screening, and treatment decisions (e.g., Codori, Petersen, Miglioretti, & Boyd, 2001; Floyd, Prentice-Dunn, & Rogers, 1997; Katapodi, Lee, Facione, & Dodd, 2004; Kondryn, Edmondson, Hill, & Eden, 2011; Witte & Allen, 2000). Thus, inaccurate perceptions of cancer risk may result in suboptimal decision making across the health care continuum (Peters, McCaul, Stefanek, & Nelson, 2006).

However, there is a noteworthy gap in the cancer risk perception literature. To date, most cancer risk perception studies have examined lay estimates of susceptibility and incidence. Less common are studies of public perception of cancer survival rates. The few studies that have examined survival have focused on the public's ability to estimate an *exact rate* for a specific cancer. For example, Weinstein, Marcus, and Moser (2005) found that smokers overestimated 10-year survival rates for lung cancer and that those perceptions were related to behavioral outcomes.

Notably absent from the literature is a study examining the accuracy of public perception of survival rates across cancer types and in a comparative context (i.e., ranking). That is, no study has documented whether the public can accurately rank cancer survival rates. This is a significant gap in the literature as ranking cancers may be a more intuitive task (e.g., stomach cancer has a lower survival rate than breast cancer) as compared with estimating the exact rate (e.g., the 5-year survival rate for Stage IV stomach cancer is 4%). Consistent with this idea, research has revealed that the public is more attune to contrast and comparison—the basic components of ranking—rather than precise estimates (Klein, 2002; Wong, 2009). Even risk perception researchers and risk managers often think first in terms of rank rather than rate (e.g., Florig et al., 2002; Morgan et al., 2002). If true, then misperceptions of survival rates (e.g., stomach cancer has a 4% survival rate) may reflect underlying numeracy issues more than conceptual gaps. Indeed, approximately one third of U.S. adults have limited numerical abilities (Kutner, Greenberg, Jin, & Paulsen, 2006), a skill issue that undermines their ability to work with or process number-based information (Baker, 2006; Jensen, 2011a).

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Put another way, maybe adults do know that stomach cancer is deadlier than breast cancer (comparative judgment); however, they struggle to quantify the exact survival rate of either.

The present study addressed this gap by examining whether a sample of adults could accurately rank cancer survival rates. Rather than estimating the exact rate of a particular cancer, the participants were asked to rank 15 different cancers in terms of survival. The goal of the study was to determine if the public had accurate perceptions and, if not, what factors might explain distortions. Based on past research, both demographic factors (Leite-Pereira, Medeiros, & Dinis-Ribeiro, 2011; Tilburt et al., 2011) and news coverage/consumption (Jensen, Moriarty, Hurley, & Stryker, 2010) were examined as possible explanatory mechanisms for inaccurate rankings.

Cancer Survival Rankings

Why might the public have inaccurate risk perceptions of cancer? One possibility is that inaccurate perceptions may be cultivated, in part, by news coverage of cancer. The social amplification of risk framework (SARF) posits that people cannot process all existing risk information and thus reduce overload by relying on heuristics to form risk perceptions (R. E. Kasperson et al., 1988; J. X. Kasperson, Kasperson, Pidgeon, & Slovic, 2003). Media coverage is one social process with the potential to amplify or attenuate risk perception. Amplification occurs when perceived risk surpasses actual risk whereas attenuation occurs when perceived risk is lower than actual risk (Combs & Slovic, 1979). Media coverage amplifies/attenuates risk perceptions through variations in coverage. Several studies have shown that frequency of news coverage amplifies/attenuates perceived risk (Combs & Slovic, 1979; Slovic, Fischhoff, & Lichtenstein, 1979) and influences behavior. For example, Yanovitzky and Blitz (2000) found that news stories about mammography significantly influenced women's intentions to screen.

Thus, the SARF proposes that news coverage performs an agenda-setting function (Coleman, Maxwell, Shaw, & Weaver, 2009; Dearing & Rogers, 1996), that is, stories about a particular health issue increase awareness, perceived importance, and information seeking (Niederdeppe, 2008; Slater, Hayes, Reineke, Long, & Bettinghaus, 2009; Weinstein, Sandman, & Blalock, 2008). Moreover, the agenda-setting function of the media is likely an example of accessibility bias (Scheufele & Tewksbury, 2007; Shrum, 2009). Accessibility bias is "a tendency [to inaccurately estimate] events by the ease with which they are remembered," and past research has demonstrated that accessibility can distort perceptions of illness severity or deadliness (Fischhoff, Bostrom, & Quadrel, 1993, p. 187).

If news coverage of cancer was reflective of reality, then the agenda-setting function of the media would serve to raise awareness of significant cancer threats and encourage relevant public behavior. For example, lung cancer is both deadly (second lowest survival rate) and frequent (third highest incidence rate). Given these traits, lung cancer should receive a large amount of news coverage which would in turn place it high on the public agenda. Indeed, consistent with its traits, lung cancer is frequently covered in the news (Jensen et al., 2010).

Unfortunately, content analyses of cancer news have demonstrated that coverage patterns are rarely an accurate reflection of reality (Cohen et al., 2008; Freimuth, Greenberg, DeWitt, & Romano, 1984; Greenberg, Freimuth, & Bratic, 1979; Slater, Long, Bettinghaus, & Reineke, 2008). First, cancer news coverage is more reflective of cancer incidence than cancer survival rates; for example, stomach cancer is deadly (3rd lowest survival rate) but infrequent (13th highest incidence rate) and thus rarely depicted in the news (Jensen et al., 2010). Even with incidence as a comparison metric, many cancers are underrepresented or overrepresented in the news compared with their real-world incidence patterns (Jensen et al., 2010). For cancer incidence, coverage patterns appear to be distorted by publicity events (e.g., fund raisers), celebrity cancers, and the efforts of advocacy groups (Jensen et al., 2010).

Once a threat is on the agenda, an individual decides whether to act. This decision-making process is driven by several factors, including susceptibility and severity, which are also cultivated by news coverage (Weinstein et al., 2008). Past research has shown that perceived susceptibility and severity both predict health behavior, perhaps as a multiplicative variable, such that susceptibility is significantly related to behavior if a threat is deemed sufficiently severe (Champion & Sugg Skinner, 2008). Thus, a key variable for predicting health behavior may be perceived threat severity, defined as "belief about how serious a condition and its sequelae are" (Champion & Sugg Skinner, 2008, p. 48). Consistent with this idea, several reviews have found that perceived severity is a significant predictor of health behavior (Brewer et al., 2007; DiMatteo, Haskard, & Williams, 2007; Floyd et al., 1997; Witte & Allen, 2000). Recent individual studies have yielded similar results; for example, perceived severity of cervical cancer was found to be a significant predictor of human papillomavirus vaccination among African American women (Bynum, Brandt, Sharpe, Williams, & Kerr, 2011).

Fortunately, inaccurate risk perceptions can be corrected (Kreuter & Strecher, 1995); therefore, identifying perceptual distortions could enhance the effectiveness of campaigns and interventions. Concerning the latter, the first step in a campaign could be correcting perceptual distortion by increasing news coverage or directly noting the inaccuracy in message materials.

The first goal of this study is to assess whether the public can accurately rank cancer survival rates (Research Question 1). Of course, the ability to accurately rank cancers may vary across demographic factors. A recent review of cancer risk perception research suggested that age, gender, and ethnicity could be related to perceptions of risk, although there were insufficient studies to pose directional hypotheses (Tilburt et al., 2011). Body mass index (BMI) has been linked to risk perceptions as well. For instance, overweight and obese individuals have inaccurate perceptions of their colon cancer risk (Leite-Pereira et al., 2011). Given the uncertainty in the literature, the current study examined whether perceived cancer survival rankings varied by age (Research Question 2a), gender (Research Question 2b), ethnicity (Research Question 2c), and BMI (Research Question 2d).

In line with the SARF, the decision to focus on survival rankings was driven by the finding that cancer news coverage patterns are not reflective of cancer survival data (Jensen et al., 2010). Accordingly, consumption of news could serve to distort public perception of cancer survival rankings and thus act as a barrier to progression from Stage I to Stage III (Weinstein et al., 2008). For example, Young, Norman, and Humphreys (2008) found that perceived severity estimates for a variety of diseases were correlated with the frequency of disease-related print stories. In light of these findings, the present study examined whether perceived cancer survival rankings paralleled news distortions such that cancers underrepresented in the news were perceived as less deadly (Research Question 3a) and those overrepresented in the news were perceived as more deadly (Research Question 3b). Jensen et al. (2010) examined incidence-based news distortions (i.e., compare frequency of cancer stories with actual frequency of cancers); however, the present study focuses on survival-based news distortions (i.e., compare frequency of cancer stories with actual survival rates of cancer). The latter would seem like a meaningful metric as agenda-setting theory holds that people extrapolate traits of a target based on the frequency of coverage (even if frequency is unrelated to the trait; Scheufele & Tewksbury, 2007). Relatedly, U.S. adults have a variety of news options at the moment, making it necessary to examine whether perceptual distortions are greater for those consuming more local TV news (Hypothesis 4a), national TV news (Hypothesis 4b), newspapers (Hypothesis 4c), online newspapers (Hypothesis 4d), and online news portal stories (Hypothesis 4e) as well as those paying more attention to health news in general (Hypothesis 4f).

Method

Procedure

Adults were recruited from one of seven shopping malls located in the state of Indiana. The shopping malls were located in the following cities: Lafayette, Terre Haute, Bloomington, Kokomo, Muncie, Mishewaka, and Indianapolis. At each location, managers allowed the research team to set up a table and 12 chairs in one of the main intersections of the mall. A team of three to five researchers recruited mall shoppers from 9 a.m. to 9 p.m. over a period of 7 days. When participants approached the research team they were randomly assigned to one of four different studies (one of which was the present protocol). Sixteen hundred adults were recruited and 400 of those were randomly assigned to the current study. Participants completed pen-and-paper surveys. Members of the research team provided participants with assistance by request or if a participant seemed to be struggling with questions. A few participants (n = 32) required some or all of the survey to be read to them because of literacy issues or physical limitations (e.g., poor eyesight). Participants were given a $10 gift card for completing the survey.

Participants

More females (56.9%) participated than males (43.1%). Participants ranged from 18 to 89 years of age, with a mean age of 33.88 years (SD = 16.10). The participants were predominantly Caucasian: 80.7% Caucasian, 5.3% African American, 4.8% Hispanic, Latino, or Spanish origin, 7.9% Asian or Pacific Islander, 0.8% American Indian or Native American, and 2.8% described themselves as "other" (participants could check more than one category). Education was distributed as follows: less than a high school degree (4.4%), high school degree (22%), 1 year of college/vocational training (21.3%), 2 to 3 years of college/vocational training (34.9%), and 4-year college graduate (16.9%).

Measures

Perceived cancer survival rates. A central component of perceived cancer severity is the likelihood of survival (Champion & Sugg Skinner, 2008); thus, in the present study, rather than estimating the exact mortality rate of a particular cancer (e.g., 4%), adults were asked to rank 15 different cancers in terms of survival. Past research has used rank as a numeric indicator of perceptual distortions (Jensen et al., 2010). Cancers were presented in a list with a blank line to the right. The order of the cancers in the list was randomly determined. A rank of 1 conveyed the cancer perceived to be most deadly and a rank of 15 the cancer to be least deadly. Lay understanding of deadliness could encapsulate survival rate (e.g., 5-year survival rate), death rate (i.e., deaths per 100,000 people), or death count (i.e., total deaths per year). The latter two are influenced by incidence as more cancer cases equates to a higher death rate/count. Thus, deadliness was defined to participants as cancers with the lowest survival rate.

News consumption. Five types of news consumption were assessed. For local TV consumption, participants used eight-point scales (0-7) to respond to two questions: "How many days of the week do you watch local morning news/local evening news" (Cronbach's α = .76, M = 2.40, SD = 2.25). National TV consumption (ABC, CBS, NBC) was measured in a similar fashion (Cronbach's α = .73, M = 2.70, SD = 2.20). Newspaper consumption was measured using a four-point scale (0-4+) and a single item: "How many newspapers do you subscribe to?" (M = 0.88, SD = 0.67). Online newspaper consumption was measured using the question, "How many online newspapers do you visit?" (M = 1.55, SD = 1.21). Finally, participants were asked about their exposure (*none, a little, some, a lot*) to online content: "Do you stop and read news articles at web portals (e.g., Yahoo!, MSNBC)?" (M = 2.65, SD = 1.09).

Attention to health news. Several studies have found that attention to health news is a key predictor or moderator of cancer news outcomes (Jensen, 2011b; Stryker, Moriarty, & Jensen, 2008). To assess attention to health news, participants used a 4-point scale (*none, a little, some, a lot*) to respond to a question borrowed from the Heath Information National Trends Survey (Nelson et al., 2004): "In general, how much attention do you pay to information about health or medical topics in the news?" (M = 2.87, SD = 0.89).

Results

Research Question 1 asked whether adults could accurately rank cancer survival rates. However, it is first necessary to examine whether the ranking varies along age, gender, ethnicity, or BMI (Research Questions 2a-2d), as the general pattern, in isolation of these demographic variables, may be misleading. To examine whether any of the four demographic variables influenced ranking, four MANCOVAs were carried out with one of the demographic variables included as a dichotomized fixed factor, the other demographics and education as covariates, and perceived cancer survival rankings as outcomes. Age, gender, ethnicity, and BMI were dichotomized as younger than 27 years (n = 184) or 27 years and older (n = 174), male (n = 151) or female (n = 209), Caucasian (n = 297) or non-Caucasian (n = 63), and overweight/obese (n = 173) or not overweight/obese (n = 183). Age was split at the 50th percentile.

Only a few relationships emerged for gender, ethnicity, and BMI. Gender was a significant predictor of lymphatic survival rankings, $F(1, 355) = 7.34$, $p = .007$. Men perceived lymphatic cancer as having a lower rate of survival (M = 7.22, SD = 3.77) than women did (M = 8.40, SD = 3.97). Ethnicity was a significant predictor of several survival rankings, including bladder, $F(1, 355) = 4.40$, $p = .037$; bone, $F(1, 355) = 4.34$, $p = .036$; kidney, $F(1, 355) = 14.91$, $p < .001$; and melanoma, $F(1, 355) = 4.52$, $p = .034$. Bone, blood, and kidney were perceived as less deadly and melanoma was perceived as more deadly by Caucasian participants (bladder, M = 10.07, SD = 3.97; bone, M = 7.92, SD = 4.12; kidney, M = 9.43, SD = 3.64; melanoma, M = 8.95, SD = 4.53) as compared with non-Caucasian participants (bladder, M = 9.08, SD = 4.16; bone, M = 6.40, SD = 3.48; kidney, M = 7.44, SD = 4.01; melanoma, M = 10.37, SD = 3.86). BMI was not significantly related to cancer survival rankings although colon cancer survival rankings approached significance, $F(1, 350) = 2.68$, $p = .103$. Overweight/obese individuals had a lower colon cancer survival ranking (M = 6.97, SD = 3.91) than individuals who were not overweight/obese (M = 7.97, SD = 3.76).

Age was a significant or marginally significant predictor of 9 of the 15 cancers, including bladder, $F(1, 353) = 3.63$, $p = .057$; blood, $F(1, 353) = 13.51$, $p < .001$; bone, $F(1, 353) = 3.78$, $p = .053$; colon, $F(1, 353) = 6.60$, $p = .011$; female reproductive, $F(1, 353) = 5.77$, $p = .017$; head/neck, $F(1, 353) = 7.40$, $p = .007$; lymphatic, $F(1, 353) = 4.99$, $p = .026$; pancreatic, $F(1, 353) = 18.89$, $p < .001$; and thyroid, $F(1, 353) = 5.11$, $p = .024$. For mean differences by age, see Table 1. Given the large number of differences by age it seemed logical to segment the rest of the analyses by this demographic factor.

Returning to Research Question 1, can the public accurately rank cancer survival rates? To answer this question it is necessary to compare actual and perceived cancer survival rankings. Of the 15 cancers considered in the survey, pancreas (5.6% survival rate), lung (15.8%), stomach (26.0%), head/brain (35.1%), and blood/leukemia (54.1%) had the lowest 5-year survival rates based on SEER cancer risk data (Altekruse et al., 2010). From a perceptual standpoint, participants aged 18 to 26 years perceived the top-five deadliest cancers to be (in descending order): blood/leukemia, head/brain, lung, breast, and bone/muscle. In other words, younger participants correctly rated three of the top-five deadliest cancers. Pancreatic and stomach cancer were ranked considerably lower than reality (perceived to be 8th and 11th) and breast cancer was ranked higher (perceived to be 4th). Participants aged 27 years and older perceived the top-five deadliest cancers to be (in descending order): lung, pancreas, blood/leukemia, head/brain, and colon (four of the top five correct). Although pancreatic cancer was ranked much more accurately by older participants, they still perceived stomach cancer as less deadly than reality (11th) and breast cancer as more deadly (6th).

Table 1 depicts participants average ranking for each cancer (a low score conveys higher perceived deadliness), the corresponding perceived deadliness rank (1st-15th), the actual 5-year survival rankings (Altekruse et al., 2010), and a perceptual difference score (actual survival rank minus perceived deadliness rank). The latter reflects the degree of distortion between perception and reality. For example, for older participants, stomach cancer has a perceptual difference score of a −8 because it is has a low survival rate (3rd out of 15 cancers) yet participants perceived it to have a high survival rate (11th).

One source of these distortions could be cancer news coverage. Research Questions 3a and 3b questioned whether perceptual distortions paralleled coverage distortions. To answer these questions it was necessary to estimate news distortion. The final two columns of Table 1 contain news difference scores calculated using news rank data from Jensen et al. (2010). These scores were calculated similar to the perceptual scores except that news coverage rank (i.e., how frequently a type of cancer appeared in the news) was

Table 1. Public Perception of Cancer Survival Rates for Participants Aged 18 to 26 Years.

	18- to 26-Year-Olds		27+-Year-Olds						
	Perceived Deadliness Rating (2010)	Perceived Deadliness Rank (2010)	Perceived Deadliness Rating (2010)	Perceived Deadliness Rank (2010)	Actual Deadliness Rank (2006)	Perceptual Distortion (18-26 Years)	Perceptual Distortion (27+ Years)	News Difference Score (2003)	News Coverage Rank (2003)
Blood/leukemia	4.51 (3.54)	1	6.02 (4.25)	3	5	+4	+2	0	5
Head/brain	4.94 (4.32)	2	6.38 (4.37)	4	4	+2	0	−4	8
Lung	5.47 (3.96)	3	5.53 (3.78)	1	2	−1	+1	0	2
Breast	6.92 (4.14)	4	7.23 (4.71)	6	12	+8	+6	+11	1
Bone/muscle	7.19 (4.07)	5	8.24 (4.02)	8	7	+2	−1	−7	14
Lymphatic	7.48 (3.95)	6	8.43 (3.83)	9	10	+4	+1	+1	9
Colon	8.02 (3.64)	7	6.90 (3.99)	5	6	−1	+1	+2	4
Pancreas	8.43 (4.48)	8	5.82 (4.51)	2	1	−7	−1	−9	10
Female rep.	8.73 (3.64)	9	7.60 (4.04)	7	9	0	+2	+3	6
Kidney	8.99 (3.76)	10	9.13 (3.79)	12	8	−2	−3	−4	12
Stomach	9.14 (4.03)	11	8.97 (3.85)	11	3	−8	−8	−10	13
Melanoma	9.26 (4.46)	12	8.91 (4.50)	10	13	+1	+3	+6	7
Male rep.	9.42 (3.89)	13	10.00 (3.42)	14	15	+2	+1	+12	3
Thyroid	9.49 (4.18)	14	10.61 (4.02)	15	14	0	−1	−1	15
Bladder	10.21 (3.91)	15	9.55 (4.11)	13	11	−4	−2	0	11

Note. rep. = reproductive. Actual deadliness rank was calculated using 5-year survival data from the 1999-2006 SEER data set. Perceptual distortion was calculated by subtracting perceived deadliness rank from actual deadliness rank. A positive score means that the deadliness of the cancer was overestimated and a negative score means that it was underestimated. News difference scores were calculated by comparing news coverage rank from Jensen, Moriarty, Hurley, and Stryker (2010) with the 5-year survival data from the 1999-2006 SEER data set. News coverage rank data from Jensen et al. is included in the final column for comparative purposes.

subtracted from actual survival rate. So, for example, stomach cancer was underrepresented in the news relative to its low survival rate (news difference score of −10). A comparison of news and perceptual difference scores reveals many commonalities, including high perceptual difference scores for cancers overrepresented in the news (i.e., breast, melanoma) and low perceptual difference scores for cancers underrepresented in the news (i.e., pancreatic, stomach, kidney). However, there are also marked differences in the scores. For example, bone cancer is underrepresented in the news but perceived accurately by both age groups. Moreover, there is a noticeable difference between age groups for one cancer. Pancreatic cancer is highly underrepresented in the news (−9), a distortion that is mirrored by younger participants (−7) but not older participants (−1).

Finally, Research Questions 4a to 4f asked whether perceptual distortions would be related to consumption of varied media and/or attention to health news generally. To address these questions, partial correlations (controlling for age, ethnicity, gender, and education) were examined among various types of exposure and participant rankings (see Tables 2 and 3). For younger participants, stomach cancer was perceived less accurately by those that consumed more local news. Cancers of the stomach and breast were perceived less accurately by those who paid closer attention to health news. For older participants, stomach cancer was perceived more accurately by those who consumed more news at online news portals. Pancreatic cancer was perceived more accurately by those who watched more national news and blood cancer was perceived more accurately by frequent online newspaper consumers.

Discussion

With the exception of breast, stomach, and pancreatic cancers, participants in this study had relatively accurate perceptions of cancer survival rankings. This is unexpected as past research has consistently found that lay adults have inaccurate perceptions of cancer risks, including cancer incidence and survival rates for specific cancers (Leventhal et al., 1999). One explanation for this difference is that ranking cancer survival rates may be more intuitive than estimating exact rates. This does not mean that research examining estimates of exact rates is less valuable. Rather, researchers should continue to explore whether lay adults fair better with ranking tasks and what the implications of that might be. Regardless, it is encouraging to know that the public may be capable of correctly ranking cancer in terms of survival. Yet the findings also raise questions about why some cancer perceptions are inaccurate (e.g., incidence) whereas others are not.

One possibility is that cancer survival may be more visible to the public than cancer incidence. Funerals and obituaries, for example, provide an ongoing tally of cancer deadliness that offset media distortions or at least provide the public with experiences that inform cancer estimates.

Table 2. Perceived Cancer Survival Ranks and News Consumption for Participants Aged 18 to 26 Years.

	Local TV	National TV	Newspaper	Online Newspapers	Online Portal News	Health News Attention
Bladder	−.08	.07	−.05	−.09	.03	−.03
Blood	−.13	−.11	−.02	.03	−.07	.02
Bone/muscle	−.08	−.01	.01	.06	.18*	.01
Breast	−.08	−.05	.06	.07	.00	−.14†
Colon	−.10	−.05	−.04	.08	.05	−.11
Female reproductive	−.11	−.01	−.03	.06	−.18*	−.09
Head/brain	−.04	−.04	−.03	.07	.08	.03
Kidney	.04	.01	.00	−.08	.05	.01
Lung	.01	−.02	−.09	−.01	.02	−.10
Lymphatic	−.01	−.13†	.01	−.08	−.09	.05
Male reproductive	−.01	−.03	−.13†	−.01	−.05	−.07
Melanoma	−.01	−.10	−.05	−.05	−.06	−.11
Pancreatic	.07	.07	.01	−.17*	−.03	−.11
Stomach	.15†	.09	.04	−.02	.05	.16*
Thyroid	.17*	.08	.00	−.10	−.02	.11

Note. Numbers are partial correlations controlling for age, ethnicity, gender, and education. A positive correlation means with increased consumption a cancer was ranked less deadly. A negative correlation means with increased consumption a cancer was ranked more deadly. All significance tests were two-tailed.
†$p < .10$. *$p < .05$.

Table 3. Perceived Cancer Survival Ranks and News Consumption for Participants Aged 27+ Years.

	Local TV	National TV	Newspaper	Online Newspapers	Online Portal News	Health News Attention
Bladder	.11	.09	−.02	−.07	−.03	.07
Blood	.08	.07	−.01	.21*	.12	−.01
Bone/muscle	.18†	.11	.11	−.04	.03	.23*
Breast	.00	.13	−.05	.08	.12	−.12
Colon	.03	−.04	−.05	.05	.01	−.05
Female reproductive	−.03	−.03	−.06	−.06	−.02	−.15
Head/brain	.15	.14	.05	−.01	−.03	.07
Kidney	.05	.00	−.13	.02	.05	.08
Lung	−.14	−.11	.20*	−.04	−.06	−.14
Lymphatic	−.18†	−.19*	.05	.06	−.04	−.08
Male reproductive	−.08	−.14	.11	−.07	−.03	−.08
Melanoma	−.09	−.05	−.05	.15	.09	−.13
Pancreatic	−.12	−.18†	.05	−.07	−.04	.05
Stomach	−.08	−.15	.05	−.15	−.21*	−.01
Thyroid	.03	.00	.04	−.13	−.01	−.01

Note. Numbers are partial correlations controlling for age, ethnicity, gender, and education. A positive correlation means with increased consumption a cancer was ranked less deadly. A negative correlation means with increased consumption a cancer was ranked more deadly. All significance tests were two-tailed.
†$p < .10$. *$p < .05$.

Incidence, on the other hand, may be easier to conceal. Of course, one could also argue that incidence is more visible than survival as it is more frequent (and thus may be more frequently encountered).

Though participants ranked most cancers accurately, perceptions of two cancers (breast and stomach) significantly varied from reality across age groups. Breast cancer survival rates were greatly underestimated which is surprising given the extensive community outreach/education efforts of breast cancer advocacy groups. It is also of concern, as past research has observed that heightened feelings of breast cancer deadliness can exacerbate feelings of fatalism as well as discourage screening behavior (Champion et al., 2004; Fair et al., 2010; Powe, & Weinrich, 1999; Talbert, 2008). Interestingly, the perception that breast cancer was deadlier than reality was not moderated by gender. Both men and women underestimated survival, an observation that suggests that personal experience is not the driving force behind the distortion. Breast cancer receives heavy news coverage, tends to be fear-laden, and is overrepresented compared with its incidence and deadliness (Clarke & Everest, 2005; Jensen et al., 2010; Slater et al., 2008). It is tempting to argue that distorted news coverage underlies this perceptual distortion; however, in the present study, no correlations emerged between news consumption and perceived breast cancer survival rankings.

Stomach cancer survival rankings, on the other hand, were overestimated and for younger participants linked to consumption of local TV news and online news consumption. Likewise, a reanalysis of Jensen et al. (2010) examining survival rates rather than incidence rates did find strong evidence that newspapers underrepresent stomach cancer relative to its lethality. Moreover, content analyses have observed that stomach cancer is not commonly covered in other news formats (e.g., Slater et al., 2008). One reason stomach cancer is underrepresented in the news is that it rarely receives event coverage (e.g., fund raising, race for the cure) or profile stories (i.e., stories of famous or nonfamous people with cancer; see Jensen et al., 2010). Still, researchers should continue to investigate why media effects appear to be present for stomach cancer survival rankings but not other cancers (e.g., bone, pancreatic). Pancreatic cancer perceptions may be more accurate now, for instance, because of certain high-profile deaths that have received heavy media coverage (especially on national TV news). Consistent with this explanation, older participants had more accurate perceptions of pancreatic cancer survival, a perception that was linked to increased consumption of national TV news.

In a larger sense, the findings from the current study provide support for a basic postulate of the SARF, namely that media coverage can amplify/attenuate perceived risk. In the current data, the best example of this phenomenon is stomach cancer, in that the ability of news coverage to distort perception of this cancer, while unfortunate, reveals the power that media have to shape the public agenda. This finding also adds to a growing body of literature that has demonstrated that news coverage of cancer can influence public perception in significant, and often troubling, ways (Brechman, Lee, & Cappella, 2011; Jensen, 2008; Jensen et al., 2011).

The current study has several limitations. It is possible, for example, that the news distortions documented in the past (news years 1979, 1980, 2002-2005) were not representative of the year or region in which the survey was conducted. A future project might conduct a small content analysis of local news coverage shortly before conducting a survey of cancer survival perceptions. The strength of this approach is that it would reduce error between news consumption and risk perception measures. The current study opted to examine more macro-level relationships at the expense of precision. On a similar note, the perspectives of those in the sample may not be representative of adults in other regions of the United States. For example, the sample was younger than the population as a whole, a limitation that was partially addressed by segmenting the analyses by age.

Despite these lingering questions, it is encouraging to discover that the public can rank cancers accurately in relation to one another. Health care practitioners, researchers, and educators should be mindful of this, and perhaps use it as a building block, when interacting with the public.

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