Research Article

Cancer Epidemiology, Biomarkers & Prevention

Variation in Blame Attributions across Different Cancer Types

Laura A.V. Marlow, Jo Waller, and Jane Wardle

Abstract

Background: Cancer communication has begun to focus on prevention through lifestyle change. One possible consequence of this is that attitudes towards people with certain types of cancer could become increasingly negative. In this study, we assessed attributions of blame for five common cancers.

Methods: Data were collected as part of a population-based survey of women's attitudes to cancer. A sample of 1,620 women rated how much they would blame someone who had a diagnosis of breast cancer, cervical cancer, bowel cancer, lung cancer, and leukemia, as well as chlamydia and obesity.

Results: Few women attributed any blame for someone with leukemia or breast cancer (9% and 15%). The proportions attributing some blame for bowel cancer and cervical cancer were slightly higher (23% and 37%). Patients with lung cancer were considered at least partly to blame by 70% of respondents, approaching chlamydia (87%) and obesity (96%). Attributions of blame for bowel, cervical, and lung cancer were most common among those with more qualifications, and women who knew that cervical cancer was linked to sexual activity were more likely to attribute blame to it (48% versus 32%).

Conclusions: Cancers are not generally seen as a matter of personal responsibility, but lung cancer, and to a lesser extent, cervical and bowel cancer do attract blame attributions. Knowledge of the preventability of cancer seems to be associated with perceived responsibility.

Impact: Increasing awareness of the preventable nature of some cancers might affect blame attributions. Additional research is needed to explore the implications of these findings. *Cancer Epidemiol Biomarkers Prev; 19(7); 1799–805. ©2010 AACR.*

Introduction

Worldwide, more than 6.7 million people die from cancer each year and ~35% of these deaths are attributable to lifestyle risk factors (1). The population-attributable risk associated with lifestyle depends on the specific cancer type and also varies according to factors such as age, gender, and region of the world. However, it indicates that efforts to increase primary prevention through lifestyle change are likely to have a significant effect on the number of cancer deaths each year. In recent years, cancer communication has begun to focus on prevention, with information campaigns aimed at raising awareness of specific lifestyle factors that contribute to cancer risk. In 2005, Cancer Research UK launched their "Reduce the Risk" campaign, which had five key messages: "stop smoking", "stay in shape", "eat and drink healthily", "be sun smart", and "look after number one" (by being aware of cancer symptoms). In the United States, a similar campaign run by the American Cancer Society and entitled "The Great American Health Challenge" encourages the public to "check" (have regular health checks), "move" (be more active), "nourish" (eat well), and "quit" (stop smoking).

Emphasizing the preventable nature of cancer is likely to have consequences for public perceptions of cancer. Highlighting the controllability of cancer onset might diminish the image of the "Big C" that strikes completely at random, and this could help to reduce fear of cancer and encourage healthy behavior. Linking behavioral risk factors with cancer could also result in a change in public attitudes towards people with certain types of cancer. The most obvious example of this is lung cancer. Qualitative studies in patient samples already suggest that patients feel blamed for their diagnosis because of the link with smoking (2). A recent quantitative study found that compared with patients with breast and prostate cancer, those with lung cancer were more likely to agree that their "behavior contributed to their cancer", and this was associated with feelings of self-blame (3). Smoking is the most publicized behavioral risk factor for cancer and recent surveys have shown that public awareness of smoking as a cancer risk factor is very high (4, 5). Awareness of other risk factors is not as good, but as these become more widely publicized and awareness

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increases, so too may perceptions of blame. For example, cervical cancer is nearly always caused by the sexually transmitted infection human papillomavirus (HPV), bowel cancer is linked with certain aspects of diet (red and processed meat) as well as being overweight or obese, and breast cancer is linked with being overweight/obese and with alcohol consumption (1).

The association between perceived causality and blame can be explained using attribution theory. Proposed by social psychologists over 50 years ago (6, 7), attribution theory posits that people are inherently interested in knowing why events occur, and in the absence of information to answer the "why" question, conclusions are made on the basis of what little information is available. According to Jones et al. (8), the person acts as a "constructive thinker searching for causes of the events confronting him and acting upon his imperfect knowledge of causal structure in ways that he considers appropriate" (p10). Additional research applying attribution theory specifically to blame, has suggested a staged process that begins with attributions of causality (e.g., he has lung cancer because he smoked), followed by responsibility attributions (e.g., he knew that smoking could cause lung cancer, but smoked anyway), and finally blame attributions are made taking into account any excuses and justifications for the behavior (e.g., he had a very stressful job so he is not really to blame).

Weiner et al. (9) applied attribution theory to perceptions of illness. They found that illnesses perceived to be more controllable (e.g., AIDS) attracted more blame, whereas cancer—which was widely seen as uncontrollable—attracted less blame. Two other studies have replicated the finding that cancer is seen as less controllable and attracts less negative reactions than diseases attributed to the individual's behavior (10, 11). They also showed that blame attributions were linked with negative emotions and behavioral reactions. In all of these studies, cancer was treated as a single entity, but with growing public understanding of the differentiation between cancer types, and awareness that some cancers have a strong behavioral etiology, there is likely to be some variation in attributions towards different cancers types.

In the present study, we assessed attributions of blame for five common cancers and two conditions widely seen as a matter of individual responsibility (obesity and chlamydia). Data were collected as part of a larger investigation of women's cancer knowledge and attitudes. On the basis of previous research, we hypothesized that:

(*a*) lung cancer would attract more blame than other cancers;
(*b*) cancers (with the possible exception of lung cancer) would attract less blame than conditions that are strongly associated with personal behaviors (e.g., obesity, sexually transmitted infections);
(*c*) awareness of the link between cervical cancer and sexual activity would be associated with blame attributions.

We were also interested in the demographic patterning of blame attributions, tentatively hypothesizing that higher levels of education could, as a result of greater awareness of preventability, be associated with blame attributions for lung cancer, cervical cancer, and bowel cancer.

Materials and Methods

Participants

Participants were a population-representative sample of British women taking part in the National Centre for Social Research Omnibus survey. Each month, participants are selected using a stratified random probability sampling frame which selects 122 postcode sectors from the Postcode Address File (a database of all UK addresses) and then randomly selects 25 addresses from each sector, resulting in 3,050 eligible addresses. One adult from each address is selected at random and mailed a letter explaining that an interviewer will call to ask them to take part in research. Face-to-face computer-assisted interviews are carried out at each consenting address. The data for the present study were collected as part of a module focusing primarily on cervical cancer and HPV, which was asked only to women and carried out between October 2006 and February 2007 in two waves. The National Centre for Social Research follows the Social Research Association Ethical guidelines.

Measures

Blame attributions were assessed in a similar way to the study by Weiner et al. (9). Participants were read the following instruction: "I want you to tell me how much you think that people with each of the following are to blame for their condition. Please answer on this scale from 1 to 10 where 1 means they are not at all to blame and 10 means they are entirely to blame." Participants were shown a card with the 1 to 10 scale printed on it and told they had the option to say if they had not heard of the condition. They were then read the name of each condition, one at a time and asked to make their rating after each one. Women responded to this question for five cancer types: breast cancer, lung cancer, bowel cancer, cervical cancer (selected for being common or screen-preventable and ranging in behavioral influence), and leukemia (selected for having low behavioral influence). The same questions were asked for two comparison conditions: obesity and chlamydia (selected for being common and preventable).

To assess awareness of the link between cervical cancer and sexual activity, women were asked an open question "Thinking of cervical cancer, what do you think is the main cause" and following their response "what, if any, are other causes of cervical cancer." This was repeated until they could not volunteer any more causes. Women who gave any response relating to sexual activity (HPV, multiple sexual partners, sex at a young age, not using condoms, frequency of sex, sexually transmitted

infections, or sexual activity in general) were coded as being aware of the link between cervical cancer and sex. More details of these responses are described elsewhere (12). Demographic information was collected by asking participants to place themselves in one of several categories in relation to age, education, and ethnicity.

Analysis

Data were analyzed using SPSS 15.0. Data for the comparison conditions (chlamydia and obesity) were normally distributed, but responses for each cancer were positively skewed, with a high proportion of respondents selecting the lowest possible blame rating. Descriptive data and analyses of sociodemographic differences were therefore carried out treating the blame ratings as dichotomous and comparing those who selected "not at all to blame" with those who attributed "any blame" (selecting 2 to 10 on the rating scale). We decided to use this categorization to maximize the size of the "blame" group and allow us to run logistic regression analyses, but analyses were also run with four different cutoff points (coding 3-10, 4-10, 5-10, and 6-10 as indicating "blame").

To compare perceptions of blame between cancers and with the comparison conditions, the ratings were treated as continuous and mean ranks were compared using Friedman's ANOVA. This nonparametric analysis involves ranking the conditions for each participant (a rank of 1 applies to the condition the participant rated lowest, rank 2 to the second lowest, etc.) and calculating the mean ranks for each condition. Monte Carlo tests were used to consider significance across the cancers/conditions because this is considered more appropriate for large samples. Post hoc tests were carried out by hand using the equation provided in Field (ref. 13, pg. 563).

Results

Response rate and sample characteristics

The overall response rate for the two waves of the National Centre for Social Research survey was 53% (2,981 of 5,585 interviews), but the questions for our module were only asked to women (n = 1,620). A small number of these women (n = 24) were excluded from the analyses because of missing data for more than four conditions. For the remaining 1,596 women, there was less than 2% missing data for any blame rating, except for chlamydia, in which a significant minority had not heard of it (14%).

Sample characteristics are shown in Table 1. The mean age of the women was 50 years (range, 16-97 years). Most were White (95%) with the rest mostly from Asian (2%) or Black backgrounds (2%). A third had no formal qualifications (33%), 29% had the lowest level of school-based qualifications [General Certificate of Secondary Education (GCSEs) or equivalent], 25% had a higher level of school qualifications (A-levels or other qualifications below degree level), and 13% had a university degree.

Table 1. Sample characteristics (n = 1,596)

	%*	N
Age (y)		
16-39	34.3	548
40-59	33.6	536
60-97	32.1	512
Education		
None	32.7	522
Low school level	28.9	461
High school level	24.7	394
University	12.9	206
Ethnicity		
White	94.5	1,509
Non-White	5.3	84

*Unaccounted percentage is missing data.

Blame attributions

Few women said they would attribute any blame to someone who had leukemia (9%) or breast cancer (15%). Slightly more attributed some blame to a person with bowel cancer (23%) or cervical cancer (37%), but this still represented a minority view. In contrast, 70% of women attributed someone with lung cancer some blame for their condition, similar to the proportion making blame attributions about chlamydia (87%). Nearly all women attributed at least some blame to someone with obesity (96%). Figure 1 shows the pattern of results when dichotomizing the data using different cutoff points. Higher cutoffs resulted in smaller proportions of participants attributing blame. Although the overall patterning across the cancer types persisted, with lung cancer remaining higher than the other cancers, the differences between the other four cancers decreased.

The mean blame rankings of the seven illnesses are shown in Table 2. Friedman's ANOVA showed that there was a significant difference in these rankings [$\chi^2(6)$ = 5,230.75; $P < 0.001$, n = 1,307]. Post hoc analyses showed that, as predicted, attributions of blame were higher for lung cancer than any other cancer type and all cancers were attributed less blame than chlamydia or obesity (all $P < 0.05$).

Awareness of the sexually transmitted nature of cervical cancer

Just under a third of women (30%) were aware of the link between cervical cancer and sexual activity. As predicted, these women were more likely to attribute at least some blame to someone with cervical cancer than women who were not aware of the link [48% compared with 32%, $\chi^2(1)$ = 40.49; $P < 0.001$].

Sociodemographic differences in blame attributions

Sociodemographic correlates of blame attributions were considered for each type of cancer using logistic

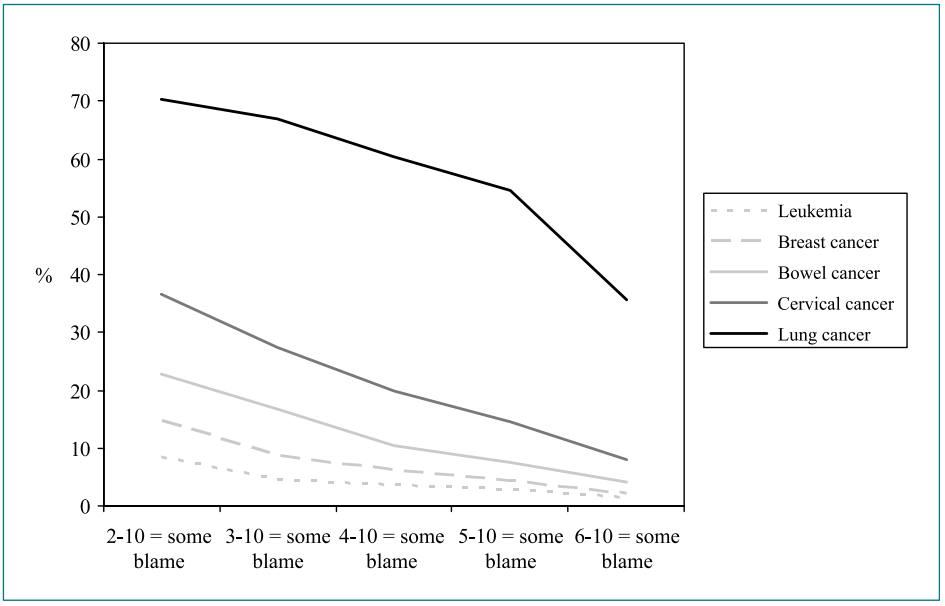

Figure 1. Variation in blame attributions across five cancer types using different cutoffs.

regression (see Table 3). Compared with the younger age groups (age 16-39 years), older women were less likely to attribute any blame for leukemia or breast cancer. Higher education was associated with greater blame for bowel, cervical, and lung cancer, although the significance of the differences between levels of education varied between cancers. There were also some ethnic differences, with non-White participants more likely to attribute some blame to leukemia and breast cancer. All variables remained significant in multivariate analyses, suggesting that the age, education, and ethnicity effects were independent of one another.

Discussion

We observed variation in blame attributions across the five cancers, with the proportion of women attributing at least some blame ranging from 9% to 72%. Overall, few women attributed any blame at all to leukemia or breast cancer. Lung cancer on the other hand, was attributed at least some blame by nearly three-quarters of respondents, supporting our first hypothesis. Interestingly, blame for cervical cancer and bowel cancer was placed somewhere between leukemia and lung cancer. None of the cancers were attributed as much blame as either obesity or chlamydia, supporting our second hypothesis.

More than 20 years ago, Weiner et al. used the same method to compare reactions to different illnesses (9). Cancer was treated as a single disease and was attributed significantly less blame than AIDS or drug addiction. The present study suggests that although less blame is still attributed to cancer than some other diseases, a distinction is made between different types of cancer. In the 20 years since the study by Weiner et al., the link between

Table 2. Mean ranks and mean rank pair-differences for blame attributions

		Blame attribution rank differences						
	Mean blame ranking	Leukemia	Breast cancer	Bowel cancer	Cervical cancer	Lung cancer	Chlamydia	Obesity
Leukemia	2.50	—	—	—	—	—	—	—
Breast cancer	2.67	0.17	—	—	—	—	—	—
Bowel cancer	2.86	**0.36**	0.19	—	—	—	—	—
Cervical cancer	3.26	**0.76**	**0.59**	**0.40**	—	—	—	—
Lung cancer	4.87	**2.37**	**2.20**	**2.01**	**1.61**	—	—	—
Chlamydia	5.58	**3.08**	**2.91**	**2.72**	**2.32**	**0.71**	—	—
Obesity	6.26	**3.76**	**3.59**	**3.40**	**3.00**	**1.39**	**0.68**	—

NOTE: Values in boldface indicate that the difference between the two rankings was significant (i.e., greater than the critical value of 0.182 for $P < 0.05$).

Table 3. Sociodemographic differences in cancer blame attributions (with outcome of "any blame")

	Leukemia		Breast cancer		Bowel cancer		Cervical cancer		Lung cancer	
	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Age (y)										
16-39	13	1.00	19	1.00	24	1.00	36	1.00	74	1.00
40-59	6	**0.46 (0.30-0.71)**	13	**0.62 (0.44-0.86)**	24	0.98 (0.74-1.29)	33	0.87 (0.68-1.12)	71	0.83 (0.63-1.08)
60-97	7	**0.52 (0.34-0.80)**	13	**0.63 (0.45-0.88)**	21	0.86 (0.64-1.15)	41	1.22 (0.95-1.57)	65	0.65 (0.50-0.85)
Education										
None	10	1.00	14	1.00	19	1.00	34	1.00	62	1.00
Low	9	0.86 (0.55-1.33)	15	1.03 (0.72-1.47)	21	1.09 (0.80-1.50)	40	**1.30 (1.00-1.69)**	70	**1.47 (1.12-1.92)**
Medium	8	0.52 (0.51-1.30)	15	1.07 (0.74-1.55)	27	**1.56 (1.14-2.13)**	35	1.03 (0.77-1.36)	77	**2.04 (1.52-2.74)**
High	6	0.63 (0.33-1.17)	16	1.15 (0.74-1.80)	29	**1.73 (1.19-2.51)**	38	1.16 (0.83-1.63)	79	**2.26 (1.54-3.30)**
Ethnicity										
White	8	1.00	14	1.00	23	1.00	36	1.00	71	1.00
Non-White	17	**2.33 (1.27-4.30)**	23	**1.77 (1.04-3.02)**	27	1.29 (0.79-2.11)	44	1.37 (0.88-2.15)	66	0.79 (0.50-1.26)

NOTE: Participants who selected 2 to 10 were coded as attributing "any blame." Boldface indicates significance ($P < 0.05$).
Abbreviations: OR (95% CI), odds ratio (95% confidence interval).

smoking and lung cancer has been universally publicized, and in the last 5 years, health education efforts have begun to focus on the behavioral risk factors for other cancers. This growing emphasis on the preventable nature of some cancers is likely to have contributed to the variation in blame attributions found in this study. In further support of this, we found that variation in blame attributions for cervical cancer depended on whether women were aware of the link between cervical cancer and sex. We also found that education level was associated with blame ratings for lung, cervical, and bowel cancer, and given that previous research has shown associations between socioeconomic status and knowledge of cancer risk factors (14), this lends further support to the idea that awareness of the preventable nature of cancer is associated with blame attributions.

The attributions that women made were relatively accurate and, for the most part, reflected the true order in which the cancers are preventable through lifestyle change. The exception was breast cancer, to which only 15% of women attributed any blame. Breast cancer is in fact related to a number of behavioral risk factors including drinking alcohol and being overweight/obese, and a recent review suggested that more cases of breast than bowel cancer are attributable to lifestyle (1). However, breast cancer risk factors do not seem to be widely understood (15, 16), in which case, this pattern is consistent with our earlier arguments. Heritability is the most commonly known risk factor for breast cancer and this is likely to mean many women see it as uncontrollable. Alternatively, the higher incidence of breast cancer could mean that women have more experience of it among their friends and family and are therefore less likely to attribute blame.

Based on our findings and on the literature, we hypothesize a number of implications, both negative and positive, that variation in blame attributions across cancers could have. Firstly, blame attributions have been associated with behavioral reactions (e.g., willingness to help) in student studies (9, 10) and with service providers who work with HIV/AIDS patients (17). If these associations are generalizable to professionals working with cancer patients, there could be implications for standards of care and treatment depending on cancer type. Secondly, if attributions made by patients are similar to those made by the women in this study, patients with certain types of cancer might be at an increased risk of self-blame and this could affect adjustment and quality of life (3). Attributions about certain types of cancer could also affect donations to cancer charities and research funding in particular cancer fields.

A more positive implication could be that higher perceived controllability of cancer might mean more motivation to engage in health-protective behaviors. If, for example, women believe that breast cancer risk could be lowered by reducing alcohol intake, they might be more motivated to change their own behavior to reduce their risk. When thinking about behavior change, attributions in relation to the behavior, as well as the disease, are important. Weiner highlighted the importance of locus (internal versus external), stability, and controllability in people's attributions for the success or failure of their previous behavior-change attempts (18). People are more likely to try to change behaviors which they see as being under internal control and in which past failures could be attributed to unstable, rather than stable, factors. Future research might consider variations in attributions of locus and stability in relation to the risk of different types of cancer.

Cancer prevention programs face a challenge: they must maximize the positive effect of information about lifestyle change in reducing the risk of cancer while minimizing the

possible negative effects of blame attributions. Stage models of blame suggest that after making responsibility attributions, perceivers take into account possible "justifications" for the behavior before attributing blame. If health education that focuses on behavioral risk factors also acknowledges that health behavior change is difficult, perhaps the attributions will stop at responsibility. Despite the very strong link between smoking and lung cancer, ~10% of lung cancer patients are not smokers (19), and many other smokers will have repeatedly struggled to quit. In the case of cervical cancer, although a sexually transmitted infection is the key etiologic factor, HPV infection is ubiquitous, and therefore other factors such as immune responses must explain why some HPV infections are cleared. Emphasizing details such as these could limit blame attributions.

Strengths and weaknesses

The present study offers the first consideration of blame attributions across different cancer types and the data were collected from a population-representative sample, unlike other studies of blame attributions which have been carried out with university students. However, because of the cost of running this type of survey, we were unable to ask many questions that would have allowed us to dig deeper into why blame attributions were made. In addition, the conclusions that can be drawn are limited by the cross-sectional design of the study.

We found that more educated women were more likely to blame someone with lung cancer, but we were not able to directly assess differences in knowledge of the link between smoking and lung cancer. In addition, there are other variables that might be expected to be associated with blame attributions including personal health behaviors (e.g., smoking status) or experience (e.g., personal or family history of cancer). We did not include questions on these variables and thus we were not able to consider the effects that these factors had on blame attributions. This means that the implications described above are tentative and more research is needed to explore the consequences that blame attributions have for patients, practitioners, and the general public.

Data were collected as part of a larger investigation of women's cancer knowledge and attitudes, so the sample was limited to female participants. This meant that it was not possible to look at gender differences. In addition, although we were able to offer possible explanations for the effect of education on blame attributions towards bowel, cervical, and lung cancer, there were also age and ethnic differences in blame attributions for breast cancer and leukemia, and the reason behind this is not clear. It could be that they relate to experience of cancer (e.g., younger women might have less experience of breast cancer) or personal health behaviors (e.g., non-White women are less likely to smoke), but as these variables were not measured, we cannot explore these explanations. These are variables that should be considered by researchers who plan to extend this work.

The sample size for this study was large, but because the results were skewed, we had to recode the blame ratings into those who attributed "some" versus "no blame." Although the pattern of blame attributions remained the same using different cutoffs, the differences between the cancers (with the exception of lung cancer) were small when using higher cutoffs. Conclusions about variation in blame attributions across the other four cancers should therefore be interpreted with caution. In addition, we only used a single item to assess blame attributions, which means that there might have been a significant amount of error in participant response. This could be overcome by using a multiple item scale, which should be considered for future research. Blaming someone with cancer for their illness is not socially desirable, and the effect of this on responses might have been exacerbated by the fact that the data were collected during face-to-face interviews. If participants had responded in an online study, levels of blame could have been higher.

Conclusions

This study found that a single concept of "cancer" is not appropriate when considering the issue of blame attributions. It seems that the public differentiates between cancer types to some extent, and this is most likely determined by the extent to which different cancers are seen as preventable by personal behavior and lifestyle choices. This has probably been influenced by educational campaigns emphasizing the preventability of cancer over the last 10 years. Further increases in knowledge of behavioral risk factors for cancer might begin to affect attitudes and this has implications for cancer epidemiology and prevention. The preventable nature of lung cancer is well known and a much greater proportion of women attributed blame to this type of cancer. The preventable nature of cervical cancer is not as well known, but women who were aware of the link were more likely to make blame attributions. In addition, higher levels of education, which has been found to be related to greater awareness of the preventability of cancer, was associated with greater blame for bowel, cervical, and lung cancer. Additional research is needed to explore the implications of these findings.

Disclosure of Potential Conflicts of Interest

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