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Western Australians' perceptions of the survivability of different cancers: implications for public education campaigns

Sandra C. Jones, Owen B. J. Carter, Robert J. Donovan and Geoffrey Jalleh

Abstract

Issue addressed: People's decisions about whether to participate in cancer screening and to seek treatment are related to their perceptions of the survivability of cancer. However, there is little empirical evidence to suggest people's awareness of the survivability of different cancers. The object of the present study was to determine people's estimates of the survivability of 10 cancers.

Methods: In 2001, data were collected via computer-assisted telephone interviews with 1,501 randomly selected metropolitan and rural Western Australian adults. Participants were presented with a list of 10 cancers. Half the sample was asked to nominate the three most survivable, and half was asked to nominate the three *least* survivable cancers.

Results: Participants' rankings of the 10 cancers in terms of perceived survivability were consistent with cancer registry data, with the exception of bone cancer which was underrated. Respondents' average estimates of five year survival rates were also accurate ($\pm 2-6\%$) for cancers with relatively high survival rates such as breast, cervical, prostate, and other skin cancers, with the exception of melanoma, which was underestimated (20%). However, average estimated survival rates for cancers with low survivability, such as leukaemia, lung, and stomach cancers, were substantially overestimated, being 31%, 38% and 43% higher respectively.

Conclusions: Western Australians appear to have a reasonable understanding of the relative survivability of various cancers but a poorer appreciation of actual survival rates.

So what?

Public education regarding the very low survival rate of lung cancer may provide novel motivation for smokers to quit, or non-smokers not to start. Conversely, education regarding the high survival rates of other

cancers, such as melanoma, may have the potential to reduce fears and to promote earlier presentation and greater participation in cancer screening.

Key words: Cancer, screening, survivability, risk perceptions.

Introduction

The leading cause of death in Australia is cancer (28.5%), followed by heart disease (20.4%), and stroke (9.4%).¹ Several Australian²⁻⁴ and Canadian⁵ studies have suggested that cancer is consistently nominated as the most feared illness within the general population. Even in 1993, when heart disease was causing more deaths in Australia than cancer, more than 60% of the population mentioned cancer as the illness of greatest concern to them, in comparison with only 6% who mentioned heart disease.²

Although it has been well established that cancer is the illness of greatest fear within society, there have been few empirical investigations of people's appreciation of the survival rates for cancers. Such information is of interest to health promotion activities as fear of cancer is one of the factors that can lead to delays in seeking medical treatment.⁶ Conversely, knowledge of risk factors and perceptions of the survivability of various cancers have been associated with higher participation rates in cancer screening behaviours for breast cancer,^{7,8} cervical cancer⁹ and bowel cancer.¹⁰ Providing people with accurate information about bowel cancer has been shown to reduce worry, anxiety, and perceived risk, and to increase reporting of symptoms.¹¹ Many studies of cancer risk perceptions have found anomalies between actual and perceived risk of dying from cancer. For instance, previous research has suggested that two-thirds of Australian women overestimate the incidence of breast cancer and 38% overestimate the fatality rate.¹² Similarly, middle-aged and older women overestimate the risk of death from breast cancer, while underestimating the risk from lung and colon cancer.¹³

Other research has shown that nine in 10 adults from low socioeconomic circumstances believe that colorectal cancer is incurable, even if detected early, and a majority believe that detection via faecal occult blood tests would not improve their chances of survival, even though survival rates for early detection can be as high as 88% for localised cancers and 57% with regional spread.¹⁴ Perceptions of cancer risks would therefore appear to be an important mediating factor in participation rates for screening and early treatment, with lower perceptions of survivability for a cancer likely resulting in lower perceived screening efficacy.

Numerous studies have investigated people's perceptions of the risks of developing various cancers, especially smokers' perceptions of developing lung cancer. Smokers appear to recognise they are at increased risk, but engage in rationalisations and distortions of logic to reduce their perceived risk of developing smoking-related diseases.¹⁵⁻¹⁸ There have been far fewer studies that have examined people's perceptions of the survivability of, or conversely mortality from, lung cancer. Those few that have been conducted show a tendency to underestimate the likelihood of dying from lung cancer. An Australian study in the 1990s found that only one-third of smokers acknowledged smoking as their most likely cause of death, while approximately the same number chose a car accident as the most likely cause¹⁹ when, in truth, annual smoking fatalities outnumber motor vehicle fatalities by more than 10 to one.^{20,21} Similarly, studies with adult women show a tendency to overestimate the risk of death from breast cancer and underestimate the risk of death from lung cancer.^{13,22}

We were able to identify only one study that specifically examined people's perceptions of the mortality rates from different cancers. In this New Zealand survey of 438 adults, respondents were asked 'Which three cancers do you think cause the most deaths among New Zealand women?' and only 60% of men and 34% of women mentioned lung cancer as one of the three.²³ The authors concluded that, among women, it appeared that the order of the perceived causes of cancer death was probably influenced by screening programs, and that increased attention to communicating the mortality of lung and bowel cancers was warranted.

The objective of the present study was to measure the perceptions of the Western Australian public in regards to the survivability of 10 forms of cancer and to compare these perceptions with actual survivability rates.

Methodology

Subjects

In 2001, computer-assisted telephone interviews (CATI) were conducted with 1,501 Western Australian adults, with a two thirds/one-third split between metropolitan Perth (n= 1,001) and rural Western Australia (n=500), including 750 males and 751 females. Professional telephone interviewers made contact with

households randomly drawn from the Electronic White Pages. Three attempts were made to contact each selected telephone number. If more than one adult resided within the household the 'next birthday' technique was used. No respondents were offered inducements for participation in the survey and all did so of their own volition. A total of 3,194 suitable households were successfully contacted before 1,501 residents participated, equating to a participation rate of 47%.

Materials

The questionnaire collected information on participant demographics and the perceived survivability of 10 cancers, selected from the 2001 Western Australian Cancer Registry.²⁴ The 10 selected cancers consisted of the five most prevalent in Western Australia in 2001, which were lung, melanoma, bowel, breast and prostate cancers, plus five cancers that were not necessarily prevalent but considered likely to be recognised and/or understood by participants, including leukaemia, cervical, stomach, bone, and 'other skin' cancers. The survey was piloted on a random sample of 60 people via CATI, allowing for amendments to the questions based on responses and feedback from the interviewers and interviewees.

Procedure

Participants were asked demographic questions covering sex, age, ethnicity and level of education, followed by a series of items in relation to cancer survivability. To counter the potential confounding of perceptions of 'most' versus 'least' survivable, participants were randomly assigned to one of two conditions. Half were read the statement "I am going to read out a list of cancers. I would like you to tell me which one you think is the *most* survivable." They were then read the list of 10 cancers and asked to nominate the *most* survivable. The remaining nine cancers were then read out again and participants were asked to nominate the cancer they thought was next most survivable. This procedure was repeated a final time with the remaining eight cancers. The same procedure was used for the other half of participants, except they were asked to nominate what they thought was the *least* survivable cancer, and so on. After each participant had nominated three cancers that they judged to be either *most* or *least* survivable, all respondents were asked for each of the cancers "Out of 100 people with [type of cancer], how many do you think would die within five

years?". For the three gender-specific cancers (breast, cervical, and prostate), the question wording was sex-relevant (e.g. "Of 100 women with breast cancer... ").

Table 1: Comparison of participant demographics with 2001 Census data.

	Survey participants (n=1,501)	2001 Census data Western Australia
Mean age (years)	46.0	47.1% ^a
Australian born	70.3%	67.1%
12 or more years of education	43.5%	43.0% ^b
Full or part-time employed	93.4%	92.5% ^b

(a) Aged 18+ years

(b) Aged 15+ years

Results

The demographics of participants are matched to 2001 Census data for Western Australia in Table 1.

Mean participant responses regarding perceived survivability of the 10 cancers are shown in Table 2. A preliminary analysis by participant demographics (age, sex, ethnicity, education, and geography) yielded no significant differences in the rank ordering of the survivability of cancers.

Table 2: Western Australians' mean five-year survival rate estimates and rankings of the most and least survivable cancers (n=1,501).

Cancer	Five-year survival rates			Proportion of estimates		Most survivable (n=751)		Least survivable (n=750)	
	WACR ^a %	Participant estimates ^b %	Difference %	Under %	Over %	1st %	1 st , 2 nd or 3 rd %	1st %	1 st , 2 nd or 3 rd %
Melanoma	94	74	-20	73	27	25	56	6	21
Other skin cancers	83	85	+2	32	68	41	73	1	3
Breast cancer	81	76	-5	57	43	15	65	3	19
Prostate	80	74	-6	41	46 ^c	8	36	1	13

cancer									
Cervical	72	76	+4	35	65	4	24	3	15
cancer									
Bone	69	58	-9	55	45	0	5	21	49
cancer									
Bowel	56	68	+12	33	67	2	16	10	35
cancer									
Leukaemia	32	63	+31	18	82	2	10	19	43
Stomach	18	61	+43	7	93	2	8	11	41
cancer									
Lung	12	50	+38	11	89	1	7	26	61
cancer									

(a) Based upon 2001 Western Australian Cancer Registry figures, which give separate statistics for males and females but not always a combined total. For the purposes of this comparison overall survival rates for non-sex-specific cancers have been calculated by averaging the two figures. It is acknowledged that this results in approximations only- although quite close ones as the survival rates for the seven non-sex-specific cancers varied between sexes by only 2-4%. This adjustment was necessary as respondents were not asked about sex-specific survival rates.

(b) Participants were asked to nominate death rates rather than survival rates within five years. These results are therefore 100% minus mean suggest death rates.

(c) 13% correctly suggested 20 out of 100 men with prostate cancer would die within five years.

The rank ordering for cancers was consistent in terms of the first cancer nominated versus top three nominations. Likewise, the rank orderings were inversely consistent for 'most' and 'least' survivable cancers, with the minor exception of melanoma and breast cancer. The highest five ranked 'most' survivable cancers were also the lowest five ranked 'least' survivable cancers and visa versa. The ranking of respondents' average five-year survival estimates for each cancer was similar to the rankings of respondents' nominations of the most and least survivable cancers, suggesting internal consistency in participant responses. Mean participant estimates for the five-year survival rates of the five *least* and five most survivable cancers differed by only 17% (60% versus 77% respectively), when actual five-year survival rates for these groupings differ by 45% (37% versus 82%). On average, 63% of participants overestimated the five-year survival rates of cancers.

Discussion

The participation rate in the present study was typical for such a survey, and the close match between the demographics of the sample and 2001 Census data discounts the likelihood of a response bias. As such, the results are likely to be generalisable to the adult population of Western Australia. This population appears to be surprisingly knowledgeable about the survivability of various cancers, with relative rankings being largely consistent with actuality. The minor exception appears to be bone cancer, for which survivability was distinctly under-ranked. It is possible that respondents confused primary and secondary bone cancers, of which the latter has much lower survival rates. The prevalence of bone cancer (as a primary cancer) is relatively rare, and it is therefore understandable that the public is unfamiliar with the relative survivability of such. Other skin cancers, which excludes melanomas and non-malignant basal and squamous cell carcinomas, are also relatively rare and there is a danger that some participants would have been unable to clearly distinguish between this category and melanoma. However, the difference in responses evident between these two categories, in terms of both ranked survivability and five-year survival rates, suggests that they remained distinct in the minds of respondents.

Participants were surprisingly accurate in terms of estimated five-year survival rates for the more survivable cancers, such as breast, prostate, cervical and other skin cancers. The exception to this rule was melanoma, for which the survival rate was markedly underestimated. Bowel cancer survival rate estimations were moderately overestimated, but estimations for cancers with low survivability, such as leukaemia, stomach and lung cancers, were highly overestimated. Not too much should be attributed to the fact that 13% of participants exactly nominated the five-year survival rate for prostate cancer as it was the only cancer for which the survival rate was exactly divisible by 10; it was usual for participants to make estimations to the nearest five or 10. An explanation for the limited variability between perceived five-year survival rates of the various cancers is that the public simply believes most cancers have approximately equal survivability. It may also be indicative of an overall tendency for non-discrimination between cancers. However, participants were able to rank the relative survivability of the various cancers with surprising accuracy. Therefore it seems more likely that they can discriminate between various cancers, but are simply unfamiliar with actual survival rates.

It is noteworthy that the perceived five-year survivability for even the least survivable cancers was 50% or greater, implying that the public expects a majority of people to survive an encounter with cancer, regardless of the site. Consistent with previous literature, the present sample substantially underestimated fatalities from lung cancer. This has serious implications for efforts to encourage smokers to quit (or non-smokers not to start). If smokers (and potential smokers) have unrealistically low fears of dying from lung cancer, then public education about the extremely low survival rates of lung cancer may serve as a novel motivator for smokers to quit (or non-smokers not to start). This warrants further investigation.

It has previously been demonstrated that screening behaviours for breast, cervical and bowel cancers are positively associated with perceived survivability.⁷⁻¹⁰ For the present sample, perceived survival rates were fairly realistic for these cancers, as well as for prostate and other skin cancers. There were also no demographic subgroups for which markedly lower perceptions of survivability were evident. As such, there may be little gained in further public awareness of the survival rates for breast, cervical, prostate, and other skin cancers.

There would also be no immediately obvious gain from correcting perceived survival rates for bowel cancer, which was moderately overestimated, and leukaemia and stomach cancer, which were greatly overestimated. The public already seems to accurately appreciate that these cancers are relatively less survivable than the other cancers, but increasing public awareness of the low survival rates for such may increase fear and negatively affect the early reporting of symptoms.

Finally, the tendency to underestimate survival rates for melanoma is of particular interest. For a cancer such as melanoma, which is highly detectable and for which early treatment has been conclusively shown to increase survival, it would seem important that people have accurate perceptions of the high survival rates in order to increase the likelihood of engaging in screening behaviours. This also warrants further investigation.

A limitation of the present study was that it only asked sex specific survival rates for breast, cervical and prostate cancers, when the survival rates for each of the other cancers differ by sex, if only modestly. Future investigations of the perceived survivability of cancers could ask participants to rank and estimate the survival rates of cancers for their own sex. Another limitation is that the survey was conducted in 2001. In Western Australia, five-year survival rates have since improved for many of the cancers, most notably for melanoma (98%), breast (91%), prostate (94%) and bowel cancers (63%),but not for lung cancer (still 12%).²⁵ There are no obvious historical factors that would have caused significant changes in perceived survival rates for these cancers if the survey were to be repeated now, as there have been no major communication campaigns or other interventions that are likely to have had an impact on people's awareness of the survivability of specific cancers. The focus of recent campaigns has rather been on the high prevalence of cancers. Therefore it is possible that perceived survivability rates for these cancers have remained static while survival rates have actually improved, causing average survival estimations to become increasingly underestimated.

Future studies could explore relationships between perceived survivability of various cancers to psychological state (anxiety, fear, worry) and actual behaviours (screening, reporting of symptoms and early treatment), especially in the case of lung cancer and melanoma.

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