



Adults' perceptions of the causes and primary prevention of common fatal cancers in New Zealand

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Abstract

Aims To assess population perceptions of the causes and primary prevention of common fatal cancers, and to help inform the New Zealand Cancer Control Strategy.

Methods A national telephone survey obtained perceptions from a random population sample, 20 years or older, identified from telephone directory listings, supplemented with self-identified Maori from electoral rolls. Quotas were set to recruit population proportions consistent with 1996 Census distributions.

Results The 438 respondents (64% participation) matched 1996 Census distributions for age, sex and ethnicity, but were socioeconomically advantaged. Among women, breast, cervical and lung cancer were most salient; among men, prostate, lung and bowel cancer – partially congruent with population statistics. There was high unprompted awareness that tobacco smoke and sun exposure affect lung cancer and skin cancer risk, respectively, but less awareness of potential protective strategies for other cancers.

Conclusions Perceptions of cancer risk and prevention are affected by high-profile programmes. Cancer prevention activities should reflect known risks and the potential for prevention. With high incidence and death rates and potentially modifiable risks, bowel cancer deserves greater attention. A comprehensive cancer prevention strategy needs to go beyond raising awareness and the promotion of individual behavioural change to the development of healthy public policies and practices that create supportive environments for health-promoting behaviours.

Cancer is the second leading cause of death in New Zealand, after cardiovascular disease,¹ and the leading cause of death among those aged 35–64 years. Potentially modifiable behavioural, social and environmental factors may be implicated in as many as 75% of cancers.² Lung cancer, the most common cause of cancer death in New Zealand,³ is linked to tobacco smoke. There is 'convincing evidence' that physical activity and vegetable consumption are protective against cancer of the large bowel,⁴ the second leading cause of cancer death. New Zealand melanoma rates are among the highest in the world.⁵ Most melanomas are attributed to excess sun exposure.⁶ New Zealand has higher cancer incidence rates than Australia, overall (for both sexes), for colorectal cancer (both sexes), and lung cancer and melanoma (females), such that priority needs 'to be given to efforts to discover reasons for the high incidence of cancer in New Zealand, and to enhance prevention, appropriate screening, and early diagnosis.'⁷ Reports about public perceptions of cancer causation and prevention have been disseminated overseas,^{8–10} but in New Zealand most reports remain unpublished.^{11–14} This is despite their relevance for primary prevention and also potential provision of insight into motivations that may affect the uptake of screening and acceptability of diagnostic and treatment services. In New Zealand,

research into 'better methods of preventing cancer, investigating the social and behavioural factors that discourage people from seeking treatment' and other social issues is 'unfortunately sparse' and uncertainty 'in prevention, socio-behaviour and epidemiology can only be answered by specific New Zealand-based research.'¹⁵ The aim of this study is to help inform the New Zealand Cancer Control Strategy.

Methods

A national telephone survey was carried out by an experienced contractor (Phoenix Research), August to September 2001, using a computer-assisted telephone interviewing system. The study was approved by the Otago Ethics Committee (reference number 00/03/10). A sample size of around 400 (20 years and older) was estimated as sufficient to obtain point estimates of population frequencies with no more than a 5% margin of error. Quotas were set to recruit proportions consistent with the 1996 Census, by 20-year age bands, sex, self-reported Maori ethnicity and geographic region. Telephone numbers were randomly selected from directory listings. To achieve the desired proportion of Maori, further contacts who identified as Maori were randomly selected from electoral rolls.

Trained interviewers asked to speak with the person in the household, 20 years of age or older, who had most recently celebrated a birthday. Contacts were advised that the questionnaire would take about 12 minutes to complete and that for quality control reasons, including the need to ensure consistency between interviewers, a supervisor would monitor a proportion of interviews. Interviewers offered to call back if the timing was inconvenient. Up to six, mostly evening, call-backs were made. All interviewers were female. In some previous research certain questions were asked of women only by female interviewers.⁸ The questionnaire included items designed to explore perceptions of the causes and prevention of cancer, and to provide demographic information. Questionnaire content drew on many sources,^{8,11-14,16-18} and was refined through consultation. Presentation of questions was dependent on sex: items about breast and cervical cancer were asked only of women and questions about prostate cancer asked only of men. Questions about melanoma, bowel and lung cancer were addressed to all. Responses are reported in the order that the questions were asked.

For fixed-response questions, interviewers read out permitted answers and electronically recorded responses. For open-ended questions, codes for categorising anticipated answers were provided to the contractor. Other answers were recorded verbatim, coded by one researcher and checked by the other. Where several verbatim responses were similar, a new code was created to encompass them. For questions where multiple responses were permitted, after each response, participants were asked 'Anything else?' until either they could provide no further answers or a maximum of 10 replies was reached.

The terms used by respondents for cancer types were categorised to correspond with those used in official cancer databases so that, for example, the category 'bowel cancer' includes all mentions of colorectal cancer and cancers of the colon and rectum, whereas stomach cancers form a distinct and separate group. Little difficulty was experienced in classifying responses in this way.

Results

Sample characteristics Of 1565 attempts to perform interviews (Table 1), 1130 contacts were made and 689 were deemed eligible, according to population quotas. Of these, 251 refused to participate, producing 438 completed interviews (64% participation).

The age, sex and self-defined ethnicity distributions of the 438 respondents were similar to the 1996 Census population (Table 2).

Table 1. Attempted and completed interviews, by call status and contact source

Call status	Telephone directory	Electoral rolls	Total
Contact made:			
Completed interviews	427	11	438
Quota full/non-qualifier	424	17	441
Refusals	248	3	251
No contact made:			
Disconnected number	62	4	66
Invalid number	16	0	16
Language barrier	36	0	36
Unable to contact	17	6	23
Engaged	19	0	19
Answering machine	68	0	68
Fax machine	91	0	91
No answer	115	1	116
Total	1523	42	1565

Table 2. Demographic characteristics of the sample and 1996 Census population

	Sample n	Sample %	Census* %
Sex:			
Females	231	52.7	51.8
Males	207	47.3	48.2
Age:			
20–39 years	183	41.7	44.5
40–59 years	144	32.9	33.4
60+ years	111	25.4	22.1
Ethnicity:			
NZ Maori	47	10.7	10.8
Non-Maori:			
Pacific Island	9	2.1	4.0
Asian	8	1.8	4.2
European	361	82.4	80.6
Other	13	3.0	0.4
Subtotal non-Maori	391	89.3	89.2

*Statistics New Zealand¹⁹

Respondents were asked to indicate all ethnic groups with which they identified; those reporting more than one were coded according to the census hierarchy (Table 2). If a person said 'Maori and European', their primary coding was Maori, whereas if someone said 'Asian and Pacific Island' it was Pacific Island. Of the 47 Maori participants, 11 were recruited through supplementary Maori sampling procedures.

Compared with the 1996 Census population, the geographic distribution of the sample included 6% more respondents from the Auckland region and 5% more from the Waikato, but otherwise differed by no more than 3%. The sample was better educated, with considerably fewer reporting no school qualifications (11.6% vs 32.3%) and more reporting secondary (40.0% vs 23.7%) or tertiary qualifications (45.7% vs 27.9%).²⁰ The sample also contained more in full-time employment (56.2% vs 47.6%) and fewer unemployed (2.1% vs 4.2%).²¹

Female cancers In response to the question ‘Which three cancers do you think cause the most deaths among New Zealand women?’ most women were able to name three (55%), 31% two, and 11% one. Only 3% (seven women) were unable to name any. The full results are presented in Table 3, where the cancer sites listed in italics were not specifically included in survey questions.

Table 3. Selected causes of cancer deaths, ranked by 1998 New Zealand population statistics* and frequency of mention by sample, by sex

Cancer site (ICD code)	Population		Sample	
	Rank	n deaths (%) [†]	Rank	% mention
Females				
Breast (174)	1	629 (17.1)	1	93
Bowel (153, 154)	2	554 (15.1)	4	18
Lung (162)	3	526 (14.3)	3	34
<i>Pancreas (157)</i>	4	178 (4.8)	-	0
<i>Ovary (183)</i>	5	177 (4.8)	5=	10
<i>Lymphomas (200–202)</i>	6	171 (4.7)	8=	2
<i>Leukaemia (204–208)</i>	7	124 (3.4)	8=	2
<i>Stomach (151)</i>	8	120 (3.3)	8=	2
Melanoma (172)	9	105 (2.9)	5=	10
<i>Brain (191)</i>	10	91 (2.5)	13=	<1
<i>Uterus (179, 182)</i>	11	85 (2.3)	8=	2
Cervix uteri (180)	12	77 (2.1)	2	56
<i>Kidney (189)</i>	13	66 (1.8)	-	0
<i>Oesophagus (150)</i>	14	58 (1.6)	-	0
<i>Bladder (188)</i>	15	53 (1.4)	-	0
<i>Liver (155)</i>	16	37 (1.0)	8=	2
<i>Gall bladder (156)</i>	17	34 (0.9)	-	0
<i>NMSC (173)</i>	18	26 (0.7)	7	7
<i>All other cancers</i>	-	560 (15.3)	13=	<1
TOTAL		3671		
Males				
Lung (162)	1	855 (21.9)	2	60
Bowel (153, 154)	2	569 (14.5)	3	40
Prostate (185)	3	524 (13.4)	1	70
<i>Stomach (151)</i>	4	183 (4.7)	6	9
<i>Pancreas (157)</i>	5	165 (4.2)	14=	<1
<i>Lymphomas (200–202)</i>	6	159 (4.1)	7=	6
Melanoma (172)	7	143 (3.7)	4	17
<i>Leukaemia (204–208)</i>	8	133 (3.4)	7=	6
<i>Bladder (188)</i>	9	116 (3.0)	14=	<1
<i>Brain (191)</i>	10	112 (2.9)	12	3
<i>Kidney (189)</i>	11	108 (2.8)	14=	<1
<i>Oesophagus (150)</i>	12	104 (2.7)	13	1
<i>Liver (155)</i>	13	87 (2.2)	9	5
<i>Pleura (163)</i>	14	51 (1.3)	-	0
<i>Gall bladder (156)</i>	15	27 (0.7)	5	14
<i>NMSC (173)</i>	16	40 (1.0)	-	0
<i>Testis (186)</i>	17	5 (0.1)	10=	4
<i>All other cancers</i>	-	530 (13.6)	10=	4
TOTAL		3911		

*New Zealand Health Information Service²²; †percentage of all cancer deaths

NMSC = non-melanoma skin cancer

When asked 'Do you know of anything that increases the risk of getting breast cancer?' 54% of women were unable to suggest anything. The most commonly mentioned risk factors were a family history of breast cancer (21%), and tobacco smoking (10%). The wide range of other replies included: 'not having (medical) checks' (6%); hormone replacement therapy and diet (5% each); and use of the contraceptive pill, not breast feeding and high fat intake (4% each). No other factors were mentioned by more than 2%. When asked 'In what age group do you think a woman is most likely to develop breast cancer?' nearly half (47%) gave age ranges with upper limits of 50 years or less. In addition, 13% said 'any age', 5% 40–60 years, and 2% said risk increased with age.

When asked 'Do you know of anything that increases the risk of getting cervical cancer?' nearly half of the women (47%) could not name any risk factors. One woman declined to answer. Most frequently mentioned were multiple sex partners (23%), not having regular smear tests (9%) and a range of other factors including having sex or a sexually transmissible disease (6% each), having genital wart virus, specifically (4%), tobacco smoking (4%), early intercourse (3%), and having a sex partner who has had several sex partners (2%). 'Other' responses (15% in total) included polyps, tampons, diet, genetics, the contraceptive pill, IUD, fatty food and 'uncircumcised men'.

Male cancers In response to the question 'Which three cancers do you think cause the most deaths among New Zealand men?' most men were able to name three (59%), 22% two, 10% one, and 8% could not name any (Table 3). When asked, 'Do you know of anything that increases the risk of getting prostate cancer?' most men (80%) could not suggest anything. The most common risk factor mentioned was diet (8%) followed by 'other' (7%), which included vasectomy, smoking, not drinking or urinating enough, and cycling. Increasing age and a lack of regular medical checkups were mentioned by 3% each, and a family history of prostate cancer and being overweight or inactive by 2%. When asked 'In what age group do you think a man is most likely to develop prostate cancer', less than 2% said that likelihood increases with increasing age. A substantial proportion (41%) mentioned age ranges with upper limits of 50 years or less, 4% said that it was most likely within the 40–60 age group, and 2% said the risk occurred at any age.

Other cancers Men and women were asked 'What do you understand by the term 'melanoma'?' Unprompted answers were coded according to a hierarchy used for presenting earlier survey results,¹⁶ with one answer per person. Overall, 64% were aware that melanoma is a type of skin cancer. An additional 11% mentioned moles and freckles, 9% the sun or UV radiation, 5% cancer, and 3% described melanoma as a 'skin condition'. Only 3% said that they didn't know what it was. When asked, 'Do you know of anything that increases the risk of getting melanoma?' only 2% were unable to describe any risk factors and most (84%) mentioned exposure to excess solar UV radiation. Also mentioned were having skin that burns easily (9%), moles (5%), unprotected sun exposure at an early age (4%), sun-lamp use (3%), and a family history of melanoma (2%). Over half (55%) replied in the affirmative to the question 'Have you or anyone else deliberately checked your skin for changes which could be melanoma or other skin cancer in the last 12 months?' Most of the checks were either performed by a doctor/specialist (32%), self-examinations (16%) or carried out by family members (7%). Few mentioned friends and partners (1%).

When asked 'Do you know of anything that increases the risk of getting bowel cancer?' 51% were unable to describe any risk factors. Most frequently mentioned were unspecified dietary factors (28%), inadequate fibre (18%), excess fat (9%), and a family history of bowel cancer (8%). Meat consumption (6%), lack of regular bowel movements (5%), alcohol (4%), smoking (3%) and stress (2%) were other factors mentioned.

In response to the question 'Do you know of anything that increases the risk of getting lung cancer?' almost all (98%) identified the relationship between tobacco smoking and lung cancer. Other factors included asbestos (16%), exposure to workplace hazards (14%), second-hand smoke and chemicals (12% each). Some other replies, no more than 3% each, referred to dust, genetic factors, alcohol and non-tobacco smoke. To assess perceived health gain from quitting, respondents were asked 'How much do you think that a regular smoker can reduce their risk of lung cancer by quitting smoking?' Most considered that quitting would either 'greatly' (53%) or 'moderately' (25%) reduce lung cancer risk, whereas only 7% thought that it would 'completely eliminate' risk, 8% that it would 'slightly' reduce risk and 1% not reduce risk at all.

Discussion

The present study appears to be the only one of its kind published in New Zealand recently, although a number of unpublished reports have been produced.^{11-14,16} The 64% response rate obtained exceeds levels reported for earlier population-based surveys where that information is provided.^{11,12} Nevertheless, our findings tend to confirm patterns identified previously, although there are difficulties comparing results obtained from prompted and unprompted questionnaire items and telephone and postal surveys. For example, although all surveys report very high levels of awareness of the link between tobacco smoking and lung cancer, surveys where prompts were provided recorded far greater awareness of other risk factors for lung cancer. In one postal survey,¹¹ exposure to asbestos was selected by 83% from a list of possible factors, whereas in the present study asbestos was mentioned, unprompted, by only 16%. Nevertheless, asbestos ranked second as a risk factor in both studies.

When women were asked to name the three most commonly fatal cancers among New Zealand women, 45% named fewer than three. Those perceived as most common included the three most frequent causes of cancer death, but in an order probably influenced by screening programmes. Lung and bowel cancers each cause around seven times more deaths among women than cervical cancer, and they warrant increased attention. Lung cancer is mostly caused by tobacco smoke and is readily preventable; bowel cancer is linked to nutrition⁴ and there is 'sufficient evidence' that colon (and breast) cancers are related to physical inactivity and many are, therefore, also potentially preventable.²³ The far greater prominence afforded breast cancer relative to lung and bowel cancers has been noted elsewhere.²⁴

Despite awareness of the cancers, about half the women were unable to name any risk factors for cervical cancer and breast cancer. Although there was moderate awareness that cervical cancer was related to sexually transmissible infections, any increased publicity should support preventive empowerment rather 'victim blaming'. The prominence of 'family history' as an explanation for breast cancer requires qualification, as most cases have no such history. There was a lack of consensus about the age at which women are most likely to develop breast cancer. Nearly half gave

ages less than 50 years old – the age at which the national breast screening programme in New Zealand presently begins. Although this may reflect a possible greater impact of cases among acquaintances that occurred at a younger age, women may also have been influenced by a promotion featuring Lucy Lawless, an actress in her 30s. This demonstrates the need to frame and target messages appropriately in order to avoid unnecessarily raising anxiety. The dissemination of primary prevention information (healthy nutrition and physical activity) among younger women could complement the secondary prevention focus (breast screening) among older age groups.

The cancers most commonly perceived as fatal by men in New Zealand included the three most common, but in a different order. As among women, lung and bowel cancer deserve greater prominence. There was limited appreciation that prostate cancer mainly affected older age groups, with 40% including ages younger than 50 years as the age of greatest risk. As mentioned with respect to breast cancer among women, this may reflect the possible greater impact of cases when cancer occurs at a young age. There is currently inadequate evidence to support prostate screening, though GPs are likely to refer men over 50 years of age for tests.²⁵ There was little knowledge about causation, reflecting a lack of evidence of risk factors for prostate cancer, although a recent New Zealand study found that vasectomy did not increase risk.²⁶

In addition to high awareness among both sexes of the link between lung cancer and smoking, most respondents (85%) considered that quitting would reduce risk of lung cancer. This promising result suggests that in New Zealand health promotion campaigns about the risks of smoking and the benefits of quitting have successfully raised public awareness about causation and the efficacy of preventive strategies. Nevertheless, around 25% of New Zealanders over the age of 15 years remain daily smokers and the prevalence of smoking has not declined significantly in recent years.²⁷ Clearly, high awareness of risk and preventive strategies is not sufficient to further reduce smoking prevalence. The addictive nature of nicotine reinforces the need to strengthen tobacco control efforts and maintain a broad approach that goes beyond individual behaviour change and removes social and environmental support for smoking. The creation of smoke-free workplaces and public places is one such strategy. Tobacco control efforts could be funded directly from tobacco taxes, which raise around \$800 million a year; at present, less than 10% of this amount is spent on tobacco control, despite smoking being the leading cause of preventable, premature death. In Australia, the public health benefits of tobacco control are well appreciated,²⁸ but the estimated amount committed per death in 1998 was low (less than \$500 compared with \$419 619 for road safety, \$34 603 for cervical cancer, and \$20 172 for breast cancer programmes).²⁹ A similar pattern is likely to exist in New Zealand, but appears to be undocumented.

Our results confirm high levels of awareness that melanoma is a skin cancer related to excess sun exposure,^{11,13} yet there is little evidence of recent improvement in adults' sun protective attitudes and behaviours.³⁰ This may be due, at least partly, to the widely held,¹³ and correct, perception that melanoma is largely curable if treated early. In order to reduce the frequency of risk behaviour there is a need to build stronger social and environmental support for sun protection. For example, this can be achieved through policies and practices that promote shade provision at recreational

facilities and the rescheduling of outdoor activities to times outside the hours of highest solar UV risk. As is the case with smoking, focusing on individual responsibility alone would prevent fewer cancers. The promotion of cosmetic tanning by 'health' centres, despite evidence that it increases the risk of melanoma and other skin cancers, is another case in point. Given doubts about the effectiveness of voluntary standards, solaria could be included under radiation protection legislation, presently under review.³¹ Considering the preventability of skin cancer and significant health service costs (conservatively estimated at \$30 million a year³²) it is surprising that, since the demise of the Public Health Commission in 1994, preventive efforts have been left almost entirely to the Cancer Society and the Health Sponsorship Council. Nevertheless, skin cancer has recently been identified as a cancer prevention priority.¹⁵

Lack of unprompted awareness about the protective role of physical activity in reducing bowel cancer risk³⁴ suggests that more publicity is needed, especially given New Zealand's high incidence rates, particularly among women.⁷ With respect to causation, large proportions in an earlier study selected items, such as poor diet and family history,¹¹ that were perceived to increase the risk. In response to an unprompted question, however, 51% of our sample could not name any risk factors. Nevertheless, the high ranking of nutritional factors is common to New Zealand studies.^{11-13,16}

There was considerable variation in awareness about different cancers, and knowledge about the relative frequency with which specific cancer deaths occur among the population may be better than knowledge about appropriate preventive strategies for most cancers. The proportions saying that they did not know of anything that increased cancer risk ranged from 1% for lung cancer (there was almost universal awareness of the causal link with smoking) and 2% for melanoma (linked with excess sun exposure), to 51% for bowel cancer and 80% of men for prostate cancer (reflecting that causation is not scientifically well understood). It is perhaps more surprising that about half of the women did not know of any risk factors for cervical cancer (46%) or breast cancer (54%). Overall, there is a need for clear, consistent, and coordinated messages that reflect current evidence about risk and prevention. It is likely that the socioeconomically advantaged nature of the study sample, in terms of education and employment when compared with the 1996 Census population, has resulted in an underestimate of this need. Furthermore, our study mostly focused on relatively high-profile issues. Known key modifiable risk factors to be targeted should include exposure to tobacco smoke (lung cancer), physical inactivity (bowel, breast, possibly prostate and other cancers), obesity (bowel, oesophageal, and post-menopausal breast cancer), inappropriate nutrition (oral, stomach and bowel cancer), alcohol consumption (oral, pharynx, oesophagus, larynx and possibly breast cancers), transmission of infectious diseases (liver, cervical and stomach cancers), excess sun exposure (skin cancer), and occupational exposures.¹⁵ Preventive activities need to go beyond raising awareness and encouraging individual behaviour change to include modification of the social and economic environment. The comprehensive New Zealand Cancer Control Strategy provides opportunities for promoting policies and practices that assist the development of health-promoting behaviours.

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