



Self-reported bowel screening rates in older Australians and the implications for public health screening programs

Ian T. Zajac¹, Ingrid Flight¹, Deborah Turnbull², Graeme Young³, Steve Cole⁴, Carlene Wilson^{3,5}

1. CSIRO Preventative Health Research Flagship, South Australia

2. School of Psychology, University of Adelaide, South Australia

3. Flinders Centre for Cancer Prevention and Control, Flinders University, South Australia

4. Bowel Health Service, Repatriation general Hospital, South Australia

5. Cancer Council South Australia

RESEARCH

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Corresponding Author:

Ian T. Zajac PhD.

PO Box 10041, Adelaide, SA, 5000

lan.Zajac@csiro.au

Abstract

Background

This paper sought to determine the status of older Australians with regard to Bowel Cancer screening practices occurring outside of the National Bowel Cancer Screening Program.

Method

A random sample of N=25,511 urban Australians aged 50 to 74 years received a questionnaire via mail asking questions relating to bowel screening. N=8,762 (34.3%) returned a completed questionnaire.

Results

Approximately 33% (N=2863) of respondents indicated they had undergone colonoscopy in the preceding five years and 21% (N=1840) had used a Faecal Occult Blood Test (FOBT) in the preceding 12 months. Furthermore, 27% (N=497) of those who had completed an FOBT had also undergone colonoscopy.

Conclusion

A significant proportion of older Australians might be participating in bowel screening practices outside of the national program (NBCSP). Moreover, the proportion of

individuals reporting use of both FOBT and endoscopic services is much higher than the positivity rate of FOBT. Large population FOBT screening programs, such as the NBCSP, that do not consider participation in screening external to the program may underestimate true population screening rates.

Key Words

Colorectal Cancer Screening, Faecal Occult Blood Test, National Bowel Cancer Screening Program, Screening Participation

What this study adds:

1. This study considers self-reported bowel screening behaviour
2. Analyses show that when colonoscopy and FOBT usage are combined, the proportion of individuals up-to-date with bowel screening, according to NH&MRC guidelines, is likely higher than that estimated by the NBCSP
3. Steps should be taken to improve data collection around screening behaviour in programs like the NBCSP

Background

Colorectal cancer (CRC) is a major public health problem in Australia.¹ It is the second leading cause of cancer-related death and the most frequently diagnosed internal cancer. The most recently available data indicate that in 2007 there were 14,234 new cases and 4,047 deaths reported.² To help reduce CRC incidence and mortality, the Australian Government's National Bowel Cancer Screening Programme (NBCSP) which commenced officially in 2006, offers free Faecal Occult Blood Tests (FOBT) to Australians aged 50, 55 and 65 years of age at the time of this study.³ Although biennial screening with FOBT is recommended from age 50,⁴



the NBCSP focuses on these distinct age groups as part of a gradual roll-out of the program in order to ensure the timely availability of follow-up endoscopic procedures.³

It has been suggested that participation in CRC screening through the NBCSP is suboptimal, and recent statistics indicate a participation rate of around 40%.⁵ This rate is low when compared with that for cervical and breast screening programmes which report participation rates between 55% and 60%^{6,7} and implies that many older Australians are not up-to-date with CRC screening. Moreover, low uptake of screening has motivated research concerned with how best to improve uptake of FOBT in persons considered to be of average risk.^{1,8,9} A particular problem, however, is that this participation rate is NBCSP-specific and limited data exists regarding the actual proportion of Australians who might be considered up-to-date with CRC screening prior to receiving an invitation to screen via this program.

There are, in fact, a number of methods through which Australians may participate in screening outside of the NBCSP. For example, individuals can screen using FOBT in conjunction with their General Practitioner, by purchasing an FOBT kit from a pharmacy without prescription, or by obtaining a kit from a non-government organisation such as the Cancer Council. In addition to accessing screening via these non-government sources, people who undergo some endoscopic procedures — even when they are not specifically for the purpose of CRC screening but other bowel related concerns — might be considered up-to-date because polyps and other abnormalities should have been identified if present during the procedure. The recommendations outlined by the National Health and Medical Research Council indicate that an individual aged 50 years or over with no family history of the disease could at a given point in time be considered up-to-date with screening if an FOBT had been completed in the preceding two years, or colonoscopy or sigmoidoscopy within five years.⁴

Indeed, it is acknowledged that there has been a marked growth in the provision of colonoscopies in Australia, a substantial number of which might be conducted outside of NH&MRC guidelines as a method of primary screening.¹⁰ Besides the demonstrated imperative to encourage practitioners to adhere to NH&MRC screening guidelines and use colonoscopy as a diagnostic rather than screening tool, it is necessary to ponder whether screening outside of the NBCSP impacts cost effectiveness of the program as kits are sent unnecessarily to individuals who might otherwise be considered up-to-date.

In light of the various screening pathways outlined herein which are available outside of the NBCSP, the actual status of older Australians in terms of being up-to-date with CRC screening is not fully understood. It is probable that the number of individuals who screen for CRC is higher than indicated by NBCSP program participation rates, especially when endoscopic procedures such as sigmoidoscopy and colonoscopy are included. The purpose of the present study, therefore, was to survey older Australians in order to establish better estimates of the proportion of this population who might be considered as having screened for bowel cancer. These estimates will prove beneficial for improving our understanding of screening within the NBCSP.

Method

A mailed self-report survey that formed part of a larger research trial exploring the effectiveness of an internet-based CRC decision aid to improve screening behaviour⁸ was used to collect the data reported herein. The survey was distributed to N=25, 511 Australians identified from the Australian Electoral Roll aged between 50 and 74 years from April through August, 2010, and it was used to assess the eligibility of participants for inclusion in a larger Randomised Controlled Trial (RCT).⁸ Survey invitees resided in urban electoral divisions in New South Wales (N=6,213), Queensland (N=4,595), South Australia (N=4,654), Victoria (N=5,287) and Western Australia (N=4,762). All invitees received a letter requesting their participation in the larger research trial. The letter indicated that the trial related to cancer screening behaviour in general; no further information was given regarding the actual cancer of interest or what the eligibility criteria were for inclusion. Survey recipients were asked simply to complete and return the short survey if they were interested in participating in our trial. As an incentive, all participants who returned the survey were entered into a draw to win a grocery-shopping voucher.

The total invited participant pool was reduced to N=25, 057 after excluding those who did not reside at the recorded address (N=343), would be absent due to travel (N=8), were deceased (N=20), did not want to participate due to other self-reported medical problems (N=17), or who cited other (N=14) or no reason (N=52) for not being able to participate in the survey. Of this pool, N=8,762 returned a completed survey resulting in a participation rate of 35%. Data collected consisted of demographic variables as well as information concerning: 1) whether the individual had been diagnosed with CRC; 2) whether they had undergone colonoscopy in the previous five years; and 3) whether they had used an FOBT in the preceding 12 months. The question regarding FOBT use was not compulsory for those who



answered 'yes' to having undergone colonoscopy, although the majority of the sample (88%) answered both questions.

Results

Table 1 provides a breakdown of survey participants and survey non-participants according to key demographics. Chi-square analyses revealed significant differences between these groups for all variables and examination of standardised residuals showed that, generally speaking, survey participants were more likely to be female and older than 60 years of age than survey non-participants. Furthermore, survey participants were of higher socio-economic status (SES) and more likely to reside in South Australia and Western Australia than the other states. Around 53% of survey participants were currently employed – full time or part time – and 57% had completed some form of post-school education.

In order to explore the proportion of individuals who had participated in colonoscopy within five years or FOBT within the preceding 12 months, we excluded participants who indicated they had previously been diagnosed with CRC (N=171; 2% of sample) from all further analysis. Subsequent frequencies analysis of all remaining participants indicated that 33% (N=2863) reported having undergone colonoscopy in the preceding five years and 21% (N=1840) had used an FOBT in the preceding 12 months. In only those who had answered both the colonoscopy and FOBT questions, colonoscopy use was 27% (N=2047) and FOBT use was 24% (N=1844). Approximately 28% (N=497) of those who had completed an FOBT (N=1844) reported having also undergone a colonoscopy within the preceding five years.

Following these analyses we performed multinomial logistic regressions to identify predictors of FOBT use and colonoscopy use. The results of these analyses are presented as Table 2. As can be seen, those of higher education and higher socioeconomic status are more likely to have undergone colonoscopy and there is a general trend of colonoscopy usage increasing with age. In regards to FOBT use, higher education was again a significant multivariate predictor. The age effects for FOBT were not the same as for colonoscopy however, and the odds ratios indicate that FOBT usage is highest in the age groups encompassing the NBCSP targeted ages (50, 55 and 65 years of age). Figure 1 illustrates colonoscopy and FOBT usage according to age groups.

Discussion

The purpose of this study was to examine the status of older Australians with regards to CRC screening. Specifically, it looked beyond NBCSP participation rates in order to develop a more robust estimate of the proportion of

individuals that might be considered up-to-date with CRC screening according to NH&MRC guidelines. The present results indicate that up to 33% of our sample reported they had undergone a colonoscopy in the preceding five years and around 20% reported they had completed an FOBT in the preceding 12 months. Regression models showed that colonoscopy usage is associated with a higher-than-school education and higher SES. These models also revealed quite different trends for colonoscopy and FOBT use mainly reflecting the NBCSP's focus on three specific age groups (50, 55 and 65 years of age).

The status of older Australians in terms of their involvement with all forms of CRC screening procedures should be considered in terms of its impact on large population based screening programmes. For example, in this study we found that 27% of those who have used FOBT have also undergone colonoscopy within five years. Hypothetically speaking, this rate should be lower, around 7%, if colonoscopy usage was in-line with the FOBT positivity rate.³ Furthermore, people may not be participating in an organised program because they regard themselves as up to date with screening. Consider, for example, the self reported screening rates for 60-64 and 70-74 year age bands shown in Figure 1. The FOBT rate averages around 10% for each of these age groups and the colonoscopy rate for both is in the vicinity of 35%. If all individuals within these two groups were to be invited to screen for bowel cancer potentially 35-40% might decline due to being up-to-date either because of FOBT or colonoscopy usage (though they may not report this fact). The observed program participation rate is consequently affected and under-represents the proportion of individuals in those groups who are actually screened. Individuals who participate despite being already up-to-date might not be described as misusing FOBT, but rather simply as over-users of screening services.

A consequence of bowel screening which occurs outside of the program is that individuals might simply not complete the NBCSP kit due to previous involvement with screening procedures. The NBCSP offers an opt-out/suspension process but only around 9% of invitees do so.³ Thus, invitees might not be informing the NBCSP of their reasons for abstaining and are consequently being regarded as screening non-participants. In order to improve the data collected via the NBCSP and the ability of invitees to opt-out of their current offer due to participation in alternate screening methods, a stand-alone opt-out card might be feasible. This approach would encourage participants to opt-out without them having to read the NBCSP information booklet. This opt-out data could, when combined with NBCSP screening participation rates, provide a more



complete understanding of the proportion of older Australians who are up-to-date with CRC screening.

Limitations of the present study should be addressed in future surveys of this nature. More specifically, rural Australians were excluded from this study due to the requirements of the larger trial through which these data were collected.⁸ The participation of rural and urban Australians in screening is likely to be different and should be considered further. Additionally, data should be collected in the future concerning the source of FOBT kits — such as whether it was obtained through the NBCSP, from a doctor et cetera — in order to better understand the nature of screening participation more generally. The present study might also have suffered some self-selection bias, whereby those more familiar with bowel screening were more likely to complete the survey than others, resulting in an over estimation of screening behaviour in Australia.

Conclusion

Overall, the findings of the present study indicate that large scale population CRC screening programs that do not collect and consider screening behaviour outside of that specific program might significantly underestimate the proportion of individuals who have reportedly screened for CRC. It is probable that the proportion of individuals considered up-to-date with screening is higher than the 40% participation rate reported by the NBCSP. Future studies should examine more closely the impact of participation in screening via alternate pathways and its impact, if any, on the NBCSP. Consideration should also be given to collecting more accurate data reflecting wider participation in CRC screening procedures.

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PEER REVIEW

Not commissioned.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests

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ETHICS COMMITTEE APPROVAL

This project was approved by the CSIRO Human Research Ethics Committee. Application #09/33.

**Table 1: Demographic characteristics of survey participants (N=8,762) and survey non-participants (N=16,749)**

		Survey Participants		Survey Non-Participants		χ^2
		N	%	N	%	
Sex	Male	4194	47.9	8496	50.7	18.18*
	Female	4568	52.1	8253	49.3	
Age	50 - 54	2061	23.5	4606	27.5	71.48*
	55 - 59	2083	23.8	3966	23.7	
	60 - 64	1991	22.7	3551	21.2	
	65 - 69	1547	17.7	2481	14.8	
	70 - 74	1080	12.3	2145	12.8	
SEIFA ¹	Lower	2395	27.3	5652	33.7	190.48*
	Higher	6367	72.7	11097	66.3	
Location	NSW	1805	20.6	4408	26.3	109.50*
	QLD	1634	18.6	2961	17.7	
	SA	1843	21.0	2811	16.8	
	VIC	1658	18.9	3629	21.7	
	WA	1822	20.8	2940	17.6	
Education ²	Higher Education	5000	57.1	-	-	
	School Only	3725	42.5	-	-	
Employment ³	Working	4679	53.4	-	-	
	Other	4034	46.0	-	-	

* $p < .001$ ¹SEIFA = Index of Relative Socio-economic Advantage and Disadvantage. Groups based on average Australian SEIFA score of 1000 points.²'Higher Education' includes certificates, diplomas, bachelor degrees and all other post-school qualifications. Missing Values N=37.³'Working' includes Full-Time and Part-Time. 'Other' includes retired, home duties, and unemployed. Missing Values N=49.

NOTE: Data unavailable for Survey Non-Participants for Education and Employment variables.



Table 2: Multinomial logistic regression analysis to identify predictors of Colonoscopy use (N=8,516) and FOBT use (N=7,655)

Variable	Reference Variable	Colonoscopy Use			FOBT Use		
		Sig.	OR	95% CI for Odds Ratio	Sig.	OR	95% CI for Odds Ratio
Female	Male	.571	1.03	0.94, 1.13	.920	0.99	0.89, 1.11
Higher Education ¹	School Only	.031	1.11	1.01, 1.22	.000	1.33	1.19, 1.49
Employed ²	Other	.147	0.92	0.82, 1.03	.836	1.01	0.89, 1.16
Higher SEIFA ³	Lower SEIFA	.000	1.33	1.20, 1.48	.058	1.13	0.99, 1.28
70-74	50-54	.000	1.83	1.52, 2.19	.475	0.92	0.74, 1.15
65-69		.000	1.68	1.43, 1.98	.000	1.89	1.58, 2.27
60-64		.000	1.38	1.20, 1.59	.000	0.60	0.51, 0.72
55-59		.025	1.17	1.02, 1.35	.000	1.32	1.14, 1.53

¹ Includes certificates, diplomas, bachelor degrees and all other post-school qualifications

² Includes Full-Time and Part-Time. 'Other' includes retired, home duties, and unemployed.

³ Index of Relative Socio-economic Advantage and Disadvantage. Groups based on average Australian SEIFA score of 1000 points.



Figure 1: Colonoscopy and FOBT usage according to study age groups.

