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Equity of colorectal cancer screening: which groups have inequitable participation and what can we do about it?

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Abstract

Introduction

The National Bowel Cancer Screening Program (NBCSP) offers population-based screening for colorectal cancer (CRC) across Australia. The aims of this paper are to highlight the inequities in CRC screening in South Australia (SA) and the system-related barriers and enablers to CRC screening from the perspective of participants identified as having inequitable participation.

Methods

Firstly, de-identified data for the SA population of the NBCSP were statistically analysed and then mapped. Secondly, 117 in-depth interviews were conducted with culturally and linguistically diverse (CALD) groups, Indigenous peoples and Anglo-Australians.

Results

NBCSP participation rates were geographically and statistically significantly different ($P < 0.0001$) on the basis of gender (higher for women), age (higher for older people) and socio-economic status (higher for more affluent people). The main system-related barriers were the lack of awareness of CRC or CRC screening within these groups, the problems with language due to most of the information being in English and the lack of doctor's recommendation.

Conclusion

This study revealed that inequity exists in the NBCSP participation in SA, and we identified both barriers and facilitators to CRC screening that require action at the level of both policy and practice. There is a large role in primary healthcare to both recommending CRC screening and facilitating equitable participation.

Key words

Colorectal cancer screening, vertical equity, horizontal equity, system barriers, realised access, potential access

Running head

Equity of access to colorectal cancer screening

Introduction

Colorectal cancer (CRC) is the second most common cancer in Australia, although 90% of all deaths from this cancer may be preventable with early detection. The National Bowel Cancer Screening Program (NBCSP) was launched in August 2006 to offer population-based screening for CRC across Australia. Several studies have examined the *disparity* in CRC screening between population sub-groups, although very few have examined the *equity* of CRC screening. The purpose of this paper is twofold: firstly, to highlight the inequities in CRC screening in South Australia (SA); and secondly, to highlight the barriers and enablers (including the need for increased input in primary healthcare) to CRC screening from the perspective of population sub-groups identified as having inequitable participation. This paper builds on a previous paper by the authors (P. Ward, Javanparast, Cole, Gill, Ah Matt, Aylward et al., 2011) which presented statistical analyses of the equity of CRC screening. The current paper highlights the geographical inequities in CRC screening, using maps of participation rates, in addition to qualitative data on some of the reasons for these inequities and the potential enablers within primary health care for increasing participation rates. Within this paper we use the dual concepts of *horizontal* and *vertical equity* to describe and understand the equity of CRC screening. In using these concepts, this paper builds on much of the previous research in this field which often highlights ‘disparities’ in screening

participation rates, but does not go on to make an argument about their inherent unfairness or injustice.

Context for the study

The NBCSP currently offers free CRC screening in the form of an immunochemical FOBT test to people turning 50, 55 and 65 years of age in any given year. However, at the time of our study, invitations were restricted to people of 55 and 65 years only. The NBCSP Register mails a pre-invitation letter alerting eligible participants to the arrival of an immunochemical FOBT test kit, before sending the invitation package which includes the test kit. Invitees are requested to mail their FOBT samples to a central pathology service for analysis. The Australian program is supported by a tracking system that sends out reminder letters. Participants who return a positive result are advised by mail to visit their nominated General Practitioner (GP), who is also advised of their result, for the purpose of arranging appropriate clinical follow-up.

Conceptualisation of equity in access to healthcare

The concept of equity is generally taken to mean 'fair' or 'socially just', and within the context of healthcare, it means that individuals will have access to preventive healthcare services (in this case, CRC screening) solely on the basis of need, and not the ability to pay. This is the fundamental premise of most healthcare systems in developed countries, including Medicare in Australia (COAG, 2008; National Health and Hospitals Reform Commission, 2009). Theories of justice in philosophy have been used to provide conceptual clarity for defining and operationalising equity. Rawls provided a set of principles for understanding and researching 'justice as fairness' (Rawls, 1971) which also set some normative 'ground rules' for both the individual and institutional behaviour required for justice to prevail. These principles have since been refined (Nussbaum, 2006; Sen, 2009) and applied to both health

equity (Sen, 2006) and healthcare equity (Daniels, 1985). The principles have also been operationalised for use in research and policy as *horizontal equity* and *vertical equity* (P. Ward, 2009a, b). Horizontal equity works on the principle of equal treatment for individuals or groups with the same (or similar) levels of healthcare need, which is the underpinning principle of Medicare and the UK NHS. Vertical equity works on the principle that individuals/groups that are 'different' should be treated differently, according to their levels of need. We present a number of maps of NBCSP participation which are interpreted using the concept of horizontal equity, whereby one would expect similar participation rates in geographical areas with similar levels of need for CRC screening. Therefore, our argument is that any differences in participation rates in the maps can be interpreted as horizontal inequity, since they are not based on differences in need. In our qualitative data, we focus on vertical equity, since we highlight the current barriers to participation and the resulting strategies required to increase participation rates in specific population groups. In other words, in order to respond to the horizontal inequities identified in the maps, we need to provide targeted interventions (vertical equity) which aim specifically at increasing participation rates in the groups with the inequitable participation.

For the purposes of this paper, a key distinction needs to be made between a relatively large field of research which defines *equity in health* (Braveman, 2006; Sen, 2006; Starfield, 2006) and an emerging field of research which defines *equity in healthcare* (Oliver & Mossialos, 2004; P. Ward, 2009a, b). Our paper focuses on equity in healthcare, which has been divided into three domains: equal *access* to healthcare for people in equal need; equal *treatment* for people in equal need; and equal *outcomes* for people in equal need (Goddard & Smith, 2001). Whilst there is great merit in researching the equity of treatment and outcomes, research is still required to understand and overcome inequities at the first stage in the patient journey – access to healthcare services.

In terms of defining *access*, the terms “potential access” and “realised access”(Aday & Andersen, 1981) are used in this paper to differentiate between providing the mechanisms (i.e. potential access) for people to access CRC screening (e.g. culturally appropriate, understandable instructions) and the actual utilisation of those services (i.e. realised access). This paper deals with both potential and realised access to the NBCSP. We present data from qualitative interviews to shed light on the barriers to participation in the NBCSP which, if adequately addressed within the healthcare system, may increase potential access. We also present maps of participation rates in the NBCSP to reveal the current inequities in realised access (which may also be seen as participation).

Evidence for inequities in realised access to cancer screening

Evidence on screening uptakes for many cancers suggest inequitable patterns on the basis of a gender (Friedemann-Sanchez, Griffin, & Partin, 2007; P. R. Ward, Kelly, Tucker, & Luke, 2006), ethnicity (Walsh, Kapln, Nguyen, Gildengorin, McPhee, & Perez-Stable, 2004; Wong, Gildengorin, Nguyen, & Mock, 2005) and socio-economic status (McCaffery, Wardle, Nadel, & Atkin, 2002; Wardle, McCaffery, Nadel, & Atkin, 2004). Our own research on the equity of CRC screening in Australia has found both low and inequitable screening rates on the basis of location, age, gender, socio-economic status, language spoken at home and Indigenous status (Javanparast, Ward, Young, Wilson, Carter, Misan et al., 2010; Martini, Ward, Javanparast, Cole, Gill, Ah Matt et al., In Press; P. Ward et al., 2011).

Evidence for barriers to realised access

Inequitable CRC screening in general may reflect differing cultural expectations of cancer screening (Christie, Jandorf, & Itzkowitz, 2003; Holroyd, Twinn, & Adab, 2004; Rajaram & Rashidi, 1999) and preventive healthcare (Gannotti, Kaplan, Handwerker, & Groce, 2004;

Jenkins, Le, McPhee, Stewart, & Ha, 1996) and also different cultural meanings about cancer. In the general population, the main cited barriers to CRC screening are lack of knowledge (Berkowitz, Hawkins, Peipins, White, & Nadel, 2007), lack of trust in doctors (Lasser, Ayanian, Fletcher, & DelVicchio Good, 2008), lack of doctors' recommendation (Wardle et al., 2004), fatalistic views about cancer (Lasser et al., 2008), procrastination (Worthley, Cole, Esterman, Mehaffey, Roosa, Smith et al., 2006) and embarrassment (Rossi, Federici, Bartolozzi, Farchi, Borgia, & Guasticchi, 2005).

Given the current literature, including our own papers, highlighting the demographic and socio-economic inequities in CRC participation rates, this paper adds to the literature by presenting data on the geographical variation and inequity in NBCSP participation rates (i.e. realised access). In addition, qualitative data are presented from diverse cultural and socio-economic groups on the main system-related barriers and enablers to participation in CRC screening (i.e. potential access), which extends the current literature which is often based on general population groups, rather than specifically focussed on groups with currently inequitable access to CRC screening.

Data, methods and analysis

We employed a mix methodology approach including quantitative and qualitative methods. In phase one of the study, a quantitative, ecological analysis of equity of bowel cancer screening in SA was undertaken. Whilst the national monitoring report of the National Bowel Cancer Screening Program (NBCSP) (AIHW, 2009) released annually by the Australian Institute of Health and Welfare are useful, they do not provide the necessary details at a state-based level (and lower levels of aggregation such as postcodes) required to inform local service planning. Moreover, the reports do not highlight the specific geographical areas that might benefit from renewed attempts at targeted interventions designed to improve the equity of participation. In

this phase de-identified data for the South Australian population invited to participate in Phase 1 of the NBCSP (January 2007 - July 2008) were obtained from Medicare Australia. In total there were 92,279 people in the dataset. In addition to the statistical analysis presented elsewhere (XXX, 2011), NBCSP participation rates were also mapped using a Geographic Information Systems Package, according to South Australia postcode map. Postcodes with less than 20 invitees have been considered to have insufficient data for mapping.

The second phase of the study employed a qualitative methodology to develop a detailed understanding of the barriers and facilitators to participation in the NBCSP among different sub-groups of SA population who had been identified as having lower (and inequitable) participation rates in the NBCSP from our statistical analysis (Javanparast, Ward, Cole, Gill, Ah Matt, Aylward et al., 2010; Martini et al., In Press; P. Ward et al., 2011). In-depth interviews were conducted with three population sub-groups aged between 35-75 years. Group 1 included members of three specific ethnic groups: Greek, Vietnamese and Iranian. Population size in South Australia, average population age, average length of stay in Australia, resources available to ensure study feasibility, and whether the community has already been studied on this question were criteria for selection of ethnic groups. The second group included Australian participants who were native English speakers (referred to as Anglo-Australians within this paper). The last group included Indigenous peoples living in South Australia. In total we interviewed 121 people: 24 Iranian, 23 Greek, 24 Vietnamese, 27 Australian, and 23 Indigenous.

Participants from who identified themselves as Greek, Vietnamese or Iranian were recruited through liaising with staff and putting up posters at community associations in South Australia and advertisements on local radio stations in relevant languages. The Anglo-Australian participants were recruited through advertisements in local free newspapers. On

the basis of the findings of our geographical analysis of NBCSP participation rates in Adelaide, we selected a number of geographical areas with high and low rates of NBCSP participation, and advertised in local newspapers in these areas. People were interviewed, from both genders, a range of ages, and all areas sampled. The final group of study participants included Indigenous peoples from metropolitan Adelaide, and rural and remote South Australia. Collaborations with SA Health and the Aboriginal Health Council of SA (AHCSA) resulted in interviews conducted at Umoona Tjutagku Health Service, Coober Pedy and Central Northern Adelaide Health Service (CNAHS). Whilst robust data do not exist on the age of onset of CRC for Indigenous peoples, meetings with the AHCSA and literature on the epidemiology of CRC in Indigenous populations suggest a lower age of onset. Therefore, we recruited Indigenous peoples from age 35 years, as opposed to 50 years with the other groups.

Interviews lasted for almost one hour and were run at a venue convenient to the participants. Interviewers explored knowledge and experience of bowel cancer and the screening tests, and barriers to and facilitators of bowel cancer screening uptake with a focus on the NBCSP and whether or not the participants had been invited and/or participated in the program. The screening pathway was explained and the test kit was shown to those participants who had not been invited into the screening program.

All interviews were audio-recorded and transcribed by a professional transcriber (Anglo-Australian and Indigenous groups), interviewer (Iranian and Vietnamese groups) or the interpreter (Greek group). Following transcription and checking for accuracy, interview data were loaded into the qualitative software package, NVivo 8. A coding structure was developed by SJ in collaboration with the other research team members. This coding structure combined inductive and deductive elements. The coding structure emphasised key concepts

from the research questions. These were: perceptions about disease prevention; perceptions about cancer and cancer prevention; knowledge and experience about bowel cancer; participation in bowel cancer screening; barriers and enablers for screening test uptake; and cultural issues. However, in addition to these deductively derived codes, the team also generated codes inductively to capture unexpected concepts in participants' accounts. This combined coding structure was used to code all of the data. Same coding structure was applied across all study groups to enable comparisons between groups.

Ethics committee approval was granted by the Departmental Ethics Committee of the Commonwealth Department for Health and Ageing, Social and Behavioural Research Ethics Committee of Flinders University, and the Aboriginal Health Research Ethics Committee for different stages of the study.

Results

Equity of participation rates (realised access)

Of the 92,279 invitees, 46.9% (n=43,323) participated in the NBCSP in South Australia. Participation rates were statistically significantly different ($p < 0.001$) by IRSD quintiles and IRIA classifications, with results revealing a gradient in participation linking increasing affluence with increasing participation, although after the middle quintile, participation rates began to plateau. Participation rates are similar in metropolitan and remote areas (45.6% and 46.0% respectively), although rates are slightly higher in rural areas (48.6%). We have published findings on the inequity in participation rates, which were statistically significantly different ($P < 0.0001$) on the basis of gender (higher for women), age (higher for older people) and socio-economic status (higher for more affluent people) (P. Ward et al., 2011).

Figures 1 and 2 demonstrate the general rates of participation in South Australia as well as Adelaide metropolitan areas. This reveals the concept of horizontal equity (or in this case inequity), since one would not expect such marked variations in participation rates by postcode, since there is no basis to assume that need would vary to this extent by postcode. This logic is applied to all of the maps presented in this paper, which all reveal horizontal inequities in participation in the NBCSP.

Figure 1 Overall participation in SA

Figure 2 Overall participation in Adelaide Metropolitan

Figure 2 reveals the large differences in participation in metropolitan Adelaide. There are generally higher participation rates in the south and east, and lower participation rates in the centre, west and north of the area. This pattern mirrors the socio-economic make-up of Adelaide, with more affluent postcodes in the south and east, and more disadvantaged postcodes in the north and west. This fits with the notion of the inverse care law (Tudor Hart, 1971; P. Ward, 2009b). It is also worthy of note that the highest participation rates in rural SA were 70%, whereas in the metropolitan area, this was 79%.

Overall, participation rates were higher among women (51.3%) than men (48.7%). Figures 3 and 4 below reveal gender inequity in CRC cancer screening in Adelaide Metropolitan area.

Figure 3 Female participation rates

Figure 4 Male participation rates

For both genders, participation varied by postcode which reflects geographical inequity in screening participation. There were generally higher participation rates in south and south-

east, and lower participation rates in centre, north and north-west of the Adelaide metropolitan area. A similar pattern of gender disparity in screening participation can be seen in rural and remote areas.

This study compared screening participation between 55 and 65 years old as these age groups were the target groups for phase 1 of the NBCSP. Participation rates were 42.8% and 51.2% in 55 and 65 years old respectively demonstrating a statistically significant difference in participation rates on the basis of age ($p < 0.0001$). Figures 5 and 6 compare rate of screening participation between these two age groups in Adelaide metropolitan area.

Figure 5 Participation by age 55

Figure 6 Participation by age 65

Barriers and enablers to participation in the NBCSP (potential access)

The qualitative phase of the study aimed to provide an understanding of the barriers and enablers to participation in the NBCSP by undertaking in-depth interviews with different population sub-groups. We only present data here which relates to system-related barriers, since these can potentially be overcome within and by the healthcare system, and therefore have most direct relevance for this journal. Table 1 shows the characteristics of study participants.

Table 1 Characteristics of study participants

System-related barriers to participation in the NBCSP

Overall, very few participants were aware of CRC or CRC screenings. Low knowledge, and hence lack of awareness of high prevalence or mortality rates from CRC in addition to

potential for prevention through screening, was cited as a major barrier to participation in the NBCSP. This is conceptualised as a system-barrier, since much more can be done within and outside the healthcare system to increase knowledge and awareness of these issues.

Language barrier was considered a key issue for the majority of non-English speaking participants. Not being able to read in English and to follow the instruction on sample collection delayed or prevented people completing the FOBT, in spite of their willingness to participate in screening. None of the participants were aware that the translations of relevant documents are supplied in other languages including Vietnamese and Greek in the NBCSP website. Most participants had to rely on their family members to find out information and interpret for them, which in some occasions seemed difficult to discuss issues around faecal sampling with their children. None of the English-speaking participants perceived language as a barrier to screening. In contrary, they believed that the instructions were easy to follow.

“I read the instructions but it was not easy for me to understand what exactly I should do. They provided a phone number to call if we need help but I needed somebody to help me. I decided to call the phone but I did not feel comfortable.” (Iranian female, 56 yrs)

“Yes, I received this and then they sent a couple of letters to me and followed it up. I did not know what to do. You know, I read it but I did not understand what it is talking about. My English is not perfect...usually Farsi translations are hardly available...you know I was very motivated but I couldn't do it. If I could understand the instruction I would definitely have done it.” (Iranian female, 53 yrs)

Although physician recommendation was acknowledged by all participants as potentially encouraging of participation, lack of doctor recommendation was the most commonly cited barrier amongst Anglo-Australians; almost all people reported the high influence of their

doctor's endorsement or encouragement on their decision to screen. The importance of the doctor's recommendation was strongly linked with the issue of trust and the doctor-client relationship.

"I'd see it as more important coming from a doctor" (Indigenous female, 59 yrs)

"If my doctor asked me to do it I would do it because my doctor – you know, I've got a lot of respect for him and he's looked after me wonderfully" (Anglo-Australian female, 61 yrs)

System-related enablers to participation in the NBCSP

Having the chance for early detection of cancer and peace of mind were commonly reported as an encouraging factor by all members of the study groups particularly when they are not charged for the test kit. A few people who had previously taken the test privately compared the cost and expressed their sense of appreciation for receiving a free test kit. Familiarity with the bowel screening test and having done the test before were helpful to overcome the shame factor in some of our participants.

"Then you've got peace of mind and then just get on with what you're doing and when the results come back you can deal with it then" (Indigenous male, 56 yrs)

"It costs me a lot of money when I go to the doctor, so if this is free and it is for my health, off course I would do it." (Greek male, 75 yrs)

Although having the opportunity to do the test in private, at home, was considered a facilitating factor that encouraged FOBT uptake by most Anglo-Australian people, non-English speaking participants preferred an alternative way of completing the test through a health worker or clinic to get further assistance in undertaking the test.

One unexpected theme that arose in some interviews was the reported “moral” obligation, or citizen responsibility, to utilise a government-funded cancer preventive health service. This notion was highlighted in interviews with immigrants to the country but was also noted by some Anglo-Australians:

“A sense of duty to a program that’s – I mean if they’re going to spend a lot of money – if the government is going to spend a lot of money on this there’s a reason for that, they’re not just doing it for no purpose at all, so it’s all – I think it’s almost you’re obliged as a citizen to respond to that.” (Anglo-Australian female, 51 yrs)

Study limitations

Firstly, although not a limitation, it needs to be recognised that the determination of ‘inequity’ in CRC screening rates from our epidemiological and geographical data is part of an argument, rather than being ‘proven’ in our analyses. Our analyses ‘prove’ differences or disparities in participation rates by geographical areas and population sub-groups. However, we utilise the concept of horizontal equity to make an argument that these disparities are inequitable, since they do not necessarily reflect concomitant differences in need for CRC screening.

Secondly, this study has revealed some key issues that appear differently relevant in different population groups; however the logic of our sample was purposive rather than representational. Further research could further develop these ideas and test their prevalence in different cultural groups.

Thirdly, this study explored the perceptions of participants with regards to the NBCSP. However, only 34 of the 121 participants in the qualitative study had actually received the NBCSP. Whilst these 34 people could talk specifically about their barriers and enablers to

the NBCSP, the interviewer took the NBCSP test kit along to all interviews as a way of getting reactions from all participants to their perceived barriers and enablers. In addition, we were interested in interviewing some people who were slightly younger than the nominated age of people receiving the NBCSP, since these people will be receiving the test kit within the next few years, and may be more likely to participate now they have initial information.

Discussion

Overall, the statistical and geographical findings of our study are consistent with the results from other studies that highlighted a higher rate of screening participation among women compared to men (Ananthakrishnan, Schellhase, Sparapani, Laud, & Neuner, 2007; Cole, Young, Esterman, Cadd, & Morcom, 2003; McGregor, Hilsden, Li, Bryant, & Murray, 2007). This finding is very important, given the epidemiological literature showing that CRC risk and incidence is higher in men – this suggests an inequitable pattern of NBCSP participation (i.e. realised access) on the basis of gender. It may be the case that women have higher screening rates for CRC due to their involvement in, or at least awareness of, other population-based screening programs. Therefore, it may not be the case that women view themselves at higher risk of CRC, but that they perceive the potential benefits of screening for a whole range of illnesses and risk factors. Policy makers and health planners may therefore want to focus attention on increasing awareness of the benefits of illness prevention and health promotion, in addition to the usual focus on the risks of CRC. In this way, a higher proportion of men may be likely to view themselves at a higher risk of CRC in addition to understanding the benefits of illness prevention through screening. With respect to the relationship between age and participation, most studies exploring the association between age and CRC screening participation indicated an inverted “U” shaped function with lowest rates of participation in 50-55 years old and those 70-80 (Cole et al., 2003; Ko, Kreter, & Baldwin, 2005; McGregor et al., 2007; Seeff, Nadel, Klabunde, Thomson, Shapiro, Vernon et

al., 2004). The finding of this study which compared two age groups of 55 and 65 also demonstrated an increasing trend of participation from 55 to 65 years old. Furthermore, our findings indicated a general pattern of lower bowel cancer screening test participation in more socioeconomic disadvantaged groups in Adelaide. Both men and women from the more disadvantaged areas (north and north-west) of Adelaide were less likely to return an initial home test kit than are southern areas.

In relation to our qualitative findings, we found that key barriers to the NBCSP were lack of knowledge about bowel cancer and screening tests in general and the NBCSP in particular which is consistent with other research in this area (Bastani, Gallardo, & Maxwell, 2001; Brouse, Basch, Wolf, Shmukler, Neugut, & Shea, 2003). This lack of awareness calls for greater attention to social marketing to increase both awareness and health literacy in this area. Indeed, members of all sampled groups including CALD groups, Anglo-Australian people and Indigenous group placed a special emphasis on the importance of public education and increased awareness about bowel cancer and its screening tests.

A further key barrier for the CALD and Indigenous groups in this study were the language and English literacy barriers, since the invitation letter and guidance for the NBCSP were provided in English. The interviews with Greek, Vietnamese and Iranian participants were undertaken in their own languages since they felt most comfortable in this situation, therefore providing NBCSP in English is rather problematic for these participants. Whilst the interviews with Indigenous participants were undertaken in English, numerous suggestions were made about other Indigenous peoples and groups for whom English is not appropriate or spoken. Whilst we understand the difficulties of providing mailed invitation letters in relevant languages, it may be possible to work at a local level through relevant community

organisations to increase support and awareness for the NBCSP, thereby reducing this barrier to access for these groups, and thereby increasing the equity of participation.

Consistent with other studies in Australia (Cole, Smith, Wilson, Turnbull, Esterman, & Young, 2007; Cole, Young, & Byrne, 2002; Zajac, Whibley, Cole, Byrne, Guy, Morcom et al., 2010) and internationally (Brouse et al., 2003; Damery, Clifford, & Wilson, 2010; Federici, Rossi, Bartolozzi, Farchi, Borgia, & Guastacchi, 2006; Ferreira, Dolan, Fitzgibbon, Davis, Gorby, Ladewski et al., 2005; Klabunde, Frame, Meadow, Jones, Nadel, & Vernon, 2003; Myers, Sifri, Hyslop, Rosenthal, Vernon, Cocroft et al., 2007; Rossi et al., 2005; Vernon, 1997), our study also revealed that doctor's recommendation and endorsement is one of the strongest predictors of CRC screening. Studies in the UK which use sigmoidoscopy as the method of CRC screening also highlight the importance of GP endorsement and recommendation (Brotherstone, Vance, Edwards, Miles, Robb, Evans et al., 2007; McCaffery, Borril, Williamson, Taylor, Sutton, Atkin et al., 2001; Power, Van Jaarsveld, McCaffery, Miles, Atkin, & Wardle, 2008; Robb, Power, Kralj-Hans, Edwards, Vance, Atkin et al., 2010; Sutton, Wardle, Taylor, McCaffery, Williamson, Edwards et al., 2000), although the relevance of these studies may be questioned due to the different type of CRC screening test used. Nevertheless, If the potential benefits of bowel cancer screening are to be realised, GPs must be actively engaged (Damery et al., 2010; Klabunde, Lanier, Breslau, Zapka, Fletcher, Ransohoff et al., 2007; Zajac et al., 2010). Within our study, the engagement of and endorsement by GPs and nurse practitioners in the program and offering the screening test through them were highly recommended by the Anglo-Australian participants. This suggests a need to more fully understand the role of health providers and to implement strategies such as office policies, payment system, reminders and/or audit (Sarfaty & Wender, 2007) that increase practitioners' involvement and commitment in CRC screening program. Although GP involvement is recommended as a priority intervention, many factors including frequency

of GP visits particularly in groups with lower rates of screening participation would impact on the effectiveness of recommended strategy.

Overall, the findings reported in this paper add to the evidence on inequity in participation in CRC screening by age and gender, which was analysed through a horizontal equity analysis using realised access as our conceptual framework. In addition, our qualitative data highlighted the current barriers to participation in the NBCSP (i.e. potential access) and the resulting strategies or interventions required for specific population sub-groups (i.e. vertical equity) to increase screening uptake.

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Conflicts of Interest

There is no conflict of interest to disclose.

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Tables

Table 1 Characteristics of study participants

Study groups	Total No. of participants	Gender		Age range							Invited in the NBCSP
		M	F	<50	50-54	55-59	60-64	65-69	70-75	unknown	
Iranian	24	10	14		7	4	4	2	7		6
Greek	23	5	18		1	0	3	11	8		8
Vietnamese	24	12	12		0	9	5	7	3		4
Anglo-Australian	27	15	12		4	5	5	9	4		8
Indigenous	23	11	12	6	5	8	1	1	1	1	8
Total	121	53	68	6	17	26	18	30	23	1	34

Figures

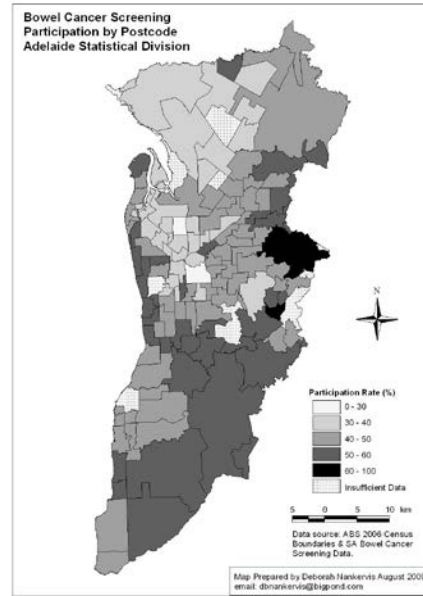
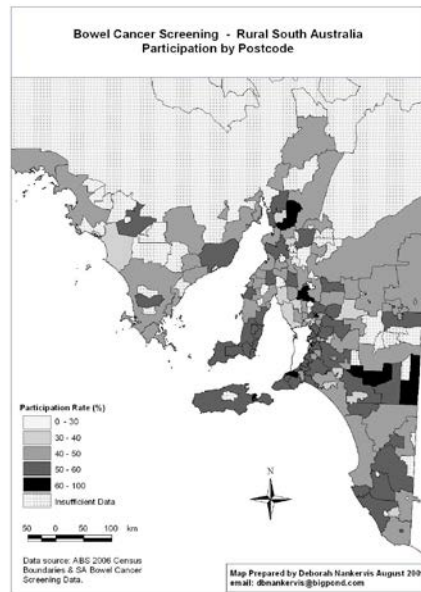


Figure 1 Overall participation in SA **Figure 2 Overall participation in Adelaide**

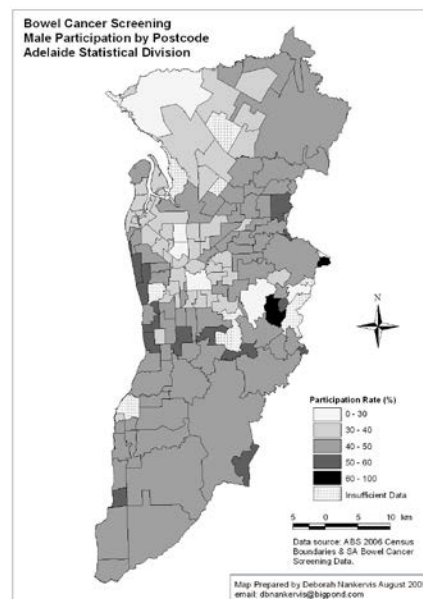
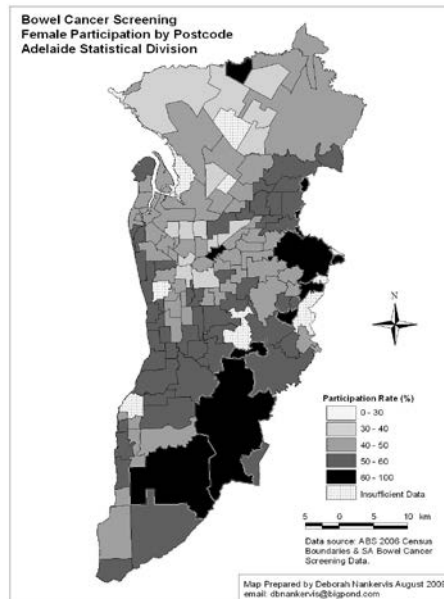


Figure 3 Female participation rates

Figure 4 Male participation rates

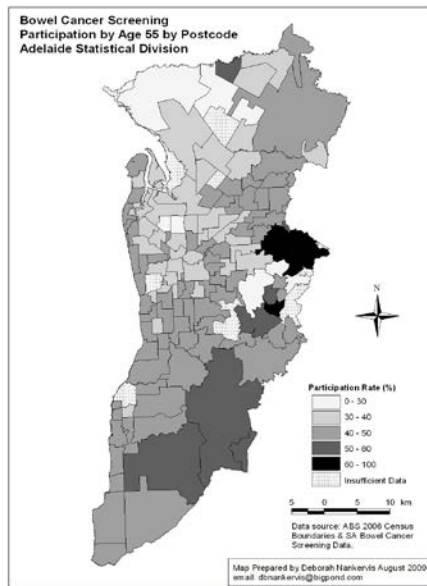


Figure 5 Participation by age 55

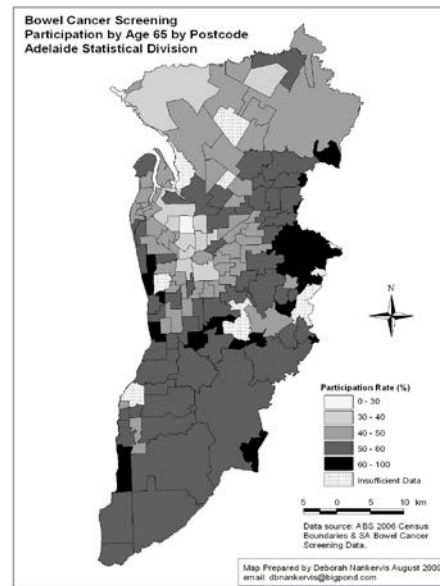


Figure 6 Participation by age 65