Physicians' attitudes and behaviour toward screening mammography in women 40 to 49 years of age

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Abstract

Objective To determine family physicians' attitudes and behaviour toward screening mammography, breast self-examination, and breast awareness in women aged 40 to 49 at average risk of breast cancer.

Design Cross-sectional survey.

Setting Women's College Hospital and Sunnybrook Health Sciences Centre, both in Toronto, Ont.

Participants Family medicine residents, fellows, and staff physicians at 2 academic family practice health centres affiliated with the University of Toronto (n=95).

Main outcome measures Physicians' answers to questions about offering screening mammography and promoting breast self-examination and breast awareness.

Results Fifty-two completed surveys were returned (response rate 55%). Less than half of all surveyed family physicians (46%) routinely offered screening mammography to women aged 40 to 49 who were at average risk of breast cancer. Although 40% of physicians did not think breast cancer screening was necessary for women aged 40 to 49, 62% indicated that they would offer screening if their patients requested it. Physicians' reasons not to offer screening included no evidence of decreasing breast cancer deaths (63%), grade A recommendation to screen women starting at age 50 and not at age 40 (25%), and the harms of screening outweighing the benefits (19%). Physicians' reasons to offer screening included patient request (55%), personal clinical practice experience or mentors' recommendations (27%), and guideline recommendations (18%). Breast self-examination was not recommended by most physicians (74%), yet most encouraged women to practise breast awareness (81%).

Conclusion Many women at average risk of breast cancer are not being offered the opportunity to discuss and initiate mammographic screening before 50 years of age. While breast-self examination is not recommended, most physicians promote breast awareness.

EDITOR'S KEY POINTS

- Although most breast cancers are diagnosed in women aged 50 to 69, 19% of breast cancers occur in patients younger than 50 years.
- While there is acceptance of screening mammography in high-risk women, such as BRCA gene carriers, starting at as young as 25 or 30 years of age, the benefit of screening women aged 40 to 49 at average risk of breast cancer is highly controversial. Family physicians are confronted with inconsistencies in this area, as cancer agencies and radiologists continue to support earlier screening.
- Less than half of all surveyed family physicians routinely offered screening mammography to women aged 40 to 49 at average risk of breast cancer, even though they perceived that most of their patients in their 40s regarded breast cancer as a serious health threat, and that these patients were aware of and wanted to discuss breast cancer screening. A discrepancy exists between physicians' practice behaviour and women's desire for a discussion about screening mammography.

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Attitudes et comportement des médecins envers la mammographie de dépistage pour les femmes de 40 à 49 ans

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Résumé

Objectif Déterminer les attitudes et le comportement des médecins à l'endroit de la mammographie de dépistage, de l'autoexamen des seins et de la sensibilisation à la santé du sein chez les femmes de 40 à 49 ans à risque moyen de cancer du sein.

Concept Étude transversale.

Contexte Le Women's College Hospital et le Centre des sciences de la santé Sunnybrook, tous 2 à Toronto, en Ontario.

Participants Des résidents, des boursiers et des médecins membres du personnel en médecine familiale dans 2 centres hospitaliers universitaires en pratique familiale, affiliés à l'University of Toronto (n=95).

Principaux paramètres à l'étude Les réponses des médecins aux questions concernant l'offre d'une mammographie de dépistage et la promotion de l'autoexamen et de la santé des seins.

Résultats Parmi les questionnaires envoyés, 52 ont été remis (taux de réponse de 55%). Moins de la moitié des médecins de famille questionnés (46%) offraient systématiquement la mammographie de dépistage aux femmes de 40 à 49 ans à risque moyen de cancer du sein. Même si 40% des médecins ne croyaient pas que le dépistage du cancer du sein était nécessaire pour les femmes de 40 à 49 ans, 62% ont indiqué qu'ils offriraient le dépistage à la demande de leurs patientes. Les motifs justifiant la décision des médecins de ne pas offrir le dépistage étaient l'absence de données probantes qu'il réduisait la mortalité due au cancer du sein (63%), la recommandation de catégorie A de faire le dépistage chez les femmes à partir de 50 ans au lieu de 40 ans (25%) et les inconvénients du dépistage supérieurs à ses avantages (19%). Au nombre des raisons poussant les médecins à offrir le dépistage figuraient la demande de la patiente (55%), l'expérience clinique personnelle ou la recommandation d'un mentor (27%) et les recommandations des guides de pratique clinique (18%). La plupart des médecins (75%) ne recommandaient pas l'autoexamen des seins et, pourtant, la grande majorité des répondants (81%) encourageaient la promotion de la santé du sein.

Conclusion De nombreuses femmes à risque moyen de cancer du sein ne se voient pas offrir la possibilité de discuter du dépistage par mammographie et d'y procéder avant l'âge de 50 ans. Si l'autoexamen des seins n'est pas recommandé, la majorité des médecins font la promotion de la santé des seins.

Cet article a fait l'objet d'une révision par des pairs.
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POINTS DE REPÈRE DU RÉDACTEUR

- Même si la plupart des cancers du sein sont diagnostiqués chez des femmes de 50 à 69 ans, 19% des cancers du sein se produisent chez des patientes de moins de 50 ans.
- S'il est accepté de procéder à une mammographie de dépistage dès l'âge de 25 ou 30 ans chez les femmes à risque élevé, comme les porteuses du gène BRCA, les bienfaits de faire le dépistage chez les femmes de 40 à 49 ans à risque moyen de cancer du sein sont très controversés. Les médecins de famille font face à des incohérences à cet égard, puisque les sociétés du cancer et les radiologistes continuent d'appuyer un dépistage précoce.
- Moins de la moitié des médecins de famille qui ont répondu au sondage offraient systématiquement une mammographie de dépistage aux femmes de 40 à 49 ans à risque moyen de cancer du sein, même s'ils croyaient que la plupart de leurs patientes considéraient le cancer du sein comme une menace sérieuse à leur santé et que ces patientes étaient au fait du dépistage du cancer du sein ou voulaient en discuter. Il existe une incompatibilité entre le comportement des médecins dans la pratique et le désir des femmes de discuter de la mammographie de dépistage.

Breast cancer affects 1 in 9 Canadian women.[1] Although most breast cancers are diagnosed in women aged 50 to 69, 19% of breast cancers occur in patients younger than 50 years.[2] Breast cancer accounts for more than 30% of all new cancer diagnoses in women aged 20 to 49 and is the leading cause of cancer deaths in young women.[1]

Evidence clearly demonstrates that screening mammography provides a statistically significant 20% to 35% decrease in breast cancer mortality for women aged 50 to 69, resulting in a grade A recommendation from the Canadian Task Force on Preventative Health Care.[3,4] While there is also acceptance of screening mammography in high-risk women, such as BRCA gene carriers, starting at as young as 25 or 30 years of age, the benefit of screening women aged 40 to 49 at average risk of breast cancer is highly controversial.[5]

Evidence from long-term follow-up of randomized controlled trials showed a modest benefit of screening in the younger age groups in each study.[6-12] In the Age trial, a statistically non-significant 17% reduction in breast cancer mortality was found.[12] Subsequently, a 2007 meta-analysis of randomized controlled mammographic screening trials in women aged 40 to 49 showed a 7% to 23% reduction in breast cancer mortality.[13] A recent Swedish screening mammography study showed that after an average follow-up of 16 years, there was a 26% to 29% reduction in breast cancer mortality in women aged 40 to 49.[14]

In 2001, the Canadian Task Force on Preventive Health Care assigned a grade C recommendation to screening mammography for women aged 40 to 49, as evidence at the time failed to support the inclusion or exclusion of this procedure in the periodic health examination for younger women at average risk of breast cancer.[5] However, the recommendation stated that "women should be informed of the potential benefits and risks of screening mammography and assisted in deciding at what age they wish to initiate the manoeuvre."[5] The 2001 recommendations were current at the time of our study. In 2011, the Canadian Task Force on Preventive Health Care changed their recommendation, advising against routine screening of women in their 40s at average risk.[15] However, it is important to note that the task force still advises that "clinicians should discuss the benefits and harms with their patients and must help each woman to make a decision that is consistent with her values and preferences."[15] Family physicians are confronted with inconsistencies in this area, as cancer agencies and radiologists continue to support earlier screening of women at average risk.[16-18]

There is also confusion surrounding breast self-examination (BSE) and breast awareness (BA). The Canadian Task Force on Preventive Health Care recommends against BSE and does not address BA, yet many health advocacy groups, such as the Canadian Cancer Society, recommend BA or "getting to know your breasts" in view of the fact that most breast cancers detected in women younger than 45 are self-detected.[19]

There are few data with respect to physicians' recommendations for screening mammography in this age group.[20] In a chart review conducted at Women's College Hospital (WCH) and Sunnybrook Health Sciences Centre (SHSC) in 2009, it was found that screening mammograms were offered to 53.2% of women aged 40 to 49 (P.L. Smith, K. Kakzanov, and R. Heisey, unpublished data, 2009). Physicians play an important role in influencing women's participation in screening programs.[21] Several factors, including physicians' personal characteristics, the characteristics of their medical practices, and their knowledge, beliefs, and attitudes toward breast cancer screening have been found to either promote or hamper breast cancer screening.[21] Further, most women in this age group who are offered mammograms opt for the procedure (P.L. Smith, K. Kakzanov, and R. Heisey, unpublished data, 2009).[22]

Considering the controversial nature of screening mammography in 40- to 49-year-old women and the influence physicians might have on a woman's decision to have a screening mammogram, little is known about physicians' attitudes and behaviour surrounding this issue. To further explore this issue we examined physician's attitudes and behaviour toward screening mammography in women at average risk of breast cancer between the ages of 40 and 49 years. This study also explored physicians' behaviour with respect to recommendations for or against BSE and BA.

METHODS

We conducted a cross-sectional survey assessing physicians' attitudes and behaviour toward screening mammography, BSE, and BA in women aged 40 to 49 at average risk of breast cancer. Ethics approval was obtained from the research ethics boards at both hospitals. All family medicine residents, fellows, and staff physicians (n=95) were invited to complete surveys that were delivered to each physician's mailbox. After providing informed consent participants completed 2-part, 2-page self-report questionnaires. A variety of multiple choice, Likert-scale, and short-answer questions were used. The first part gathered brief demographic information including physician sex, level of training, and years of clinical practice. The second part was adapted from a previously published tool—the *National Survey of Primary Care Physicians' Cancer Screening Recommendations and Practices: Breast and Cervical Cancer Screening Questionnaire*.[23] The adapted survey was first pilot-tested for face validity by 2 residents and 3 staff members to

ensure clarity. Descriptive statistics and cross-tabulations using the Fisher exact test were carried out using SPSS, version 15.

RESULTS

Response rate and demographic characteristics

In this study, 95 surveys were distributed, of which 52 were completed and returned, giving an overall response rate of 55%. Almost 60% of respondents were from WCH. There was an even distribution of staff physicians versus residents and fellows, with most being women (89%). Half of the staff physicians had at least 5 years of clinical experience, followed by 39% who had been in practice for at least 10 years (range 1 to 36 years; mean [SD] 9.9 [9.8] years).

Physicians' attitudes and practice behaviour

Screening initiation and frequency. Overall, almost half the surveyed family physicians (46%) reported routinely offering screening mammography to their female patients aged 40 to 49 who were at average risk of breast cancer (**Table 1**); however, there was a significant difference between practice sites (83% at WCH vs 17% at SHSC; $P<.004$).

Among physicians who offered screening, 77% reported starting at age 40, while 14% started at age 45. Of these, 44% offered yearly screening, followed by 26% who offered biennial screening. The remainder of physicians offered either annual or biennial screening based on joint physician-patient decisions (17%).

Reasons for offering screening mammography. There were several reasons physicians routinely offered screening mammography to these women. Almost 20% of physicians specifically indicated that they were following guidelines, and an additional 55% of physicians explicitly reported that they discussed the risks and benefits of screening with their patients, and allowed them to decide when screening mammography should be initiated. Other reasons included 1) emerging evidence of a modest decrease in breast cancer mortality, 2) detection of early-stage breast cancer, 3) improvement in imaging for detecting benign versus malignant lumps, 4) past clinical experience (2 physicians stated that they frequently found small cancers or had patients in their 40s with breast cancer), and 5) mentor recommendation of this practice.

Reasons for not offering screening mammography. Overall, 40% of physicians did not believe screening mammography was necessary for women in their 40s at average risk, and there was a slight yet significant difference between practice sites (43% at WCH vs 57% at SHSC; $P<.04$). Reasons for not offering screening mammography included 1) no evidence that screening decreases breast cancer mortality (63%), 2) grade A recommendation is for starting screening at 50 years of age, not 40 years (25%), and 3) the risk of harm, such as increased anxiety, unnecessary radiation exposure, high false-positive rate, unnecessary biopsies, and overtreatment for benign results, outweighs the benefits (19%). Nonetheless, two-thirds of these physicians would screen if their patients requested it. In addition, three-quarters of physicians stated that lack of time was never or rarely an issue in discussing breast cancer screening with their patients aged 40 to 49.

Perception of patients' needs and understanding regarding screening mammography. Physicians perceived that most of their patients either "often" or "always" viewed breast cancer as a serious health threat (86%), were aware of breast cancer screening (80%), and wanted to discuss screening mammography (94%).

Breast self-examination versus BA. Breast self-examination was not recommended by most physicians (74%), and there was no difference between practice sites. The most important reason stated for recommending or teaching BSE was that it encouraged BA, so that women know what feels and looks normal for them, and any changes can be reported to their doctors. Other reasons included previous experiences of patients in their practices with self-detected breast cancer, and 1 physi-

Table 1. Physicians' attitudes and practice behaviour regarding screening mammography in women aged 40 to 49 at average risk of breast cancer: *N* = 52.

PRACTICE ATTITUDES AND BEHAVIOUR	OVERALL, N (%)	WCH, N (%)	SHSC, N (%)	*P* VALUE
Offers screening	24 (46)	20 (83)	4 (17)	.004
Believes screening is not necessary	21 (40)	9 (43)	12 (57)	.04
Will screen if patient asks	25 (48)	12 (48)	13 (52)	.09
Promotes BSE	13 (26)	6 (46)	7 (54)	.32
Promotes BA	42 (81)	29 (69)	13 (31)	.03

BA—breast awareness, BSE—breast self-examination, SHSC—Sunnybrook Health Sciences Centre, WCH—Women's College Hospital.

cian thought that the Canadian Task Force on Preventive Health Care gave BSE a grade B recommendation.

Most physicians promoted BA (81%), and suggestions for age of BA initiation ranged from 16 to 40 years with almost half recommending beginning at age 20 (42%), followed by age 30 (23%) and age 18 (19%). Among physicians who supported BA, 69% were from WCH versus 31% from SHSC ($P<.03$).

DISCUSSION

In our study, less than half of all surveyed family physicians routinely offered screening mammography to women in their 40s at average risk of breast cancer, even though they perceived that most of their patients in their 40s regarded breast cancer as a serious health threat, and that these patients were aware of and wanted to discuss breast cancer screening. More precisely, 40% of physicians categorically stated that they did not think it was necessary to offer breast cancer screening to younger women, which was based mainly on the lack of evidence of any significant decrease in breast cancer mortality. However, among this group, 62% would screen on their patients' request.

Many women in their 40s might not be given the opportunity to discuss the benefits and risks of screening mammography, and might not be helped to make an informed decision about when breast cancer screening should be initiated, unless they specifically request it. Interestingly, lack of time was not an issue in discussing screening mammography during a yearly physical examination. When it comes to discussing mammography with women in their 40s, it is possible that the lack of strong support by the Canadian Task Force on Preventive Health Care leaves physicians feeling somewhat conflicted in this area. Therefore, a discrepancy exists between physicians' practice behaviour and women's desire for a discussion about screening mammography. These perceptions are corroborated by earlier studies that looked at women's interest in screening mammography. In a UK pilot study conducted in 2001, 89% of women in their 40s expressed a preference for annual screening mammography,[22] as was reported in a 1999 Australian study.[24] Likewise, a chart review conducted in 2009 at WCH and SHSC as part of a family medicine resident quality assurance project found that 88% of women aged 40 to 49 elected to undergo screening mammography when it was offered to them (P.L. Smith, K. Kakzanov, and R. Heisey, unpublished data, 2009).

There appears to be some confusion about the differences between BSE, which has a grade D recommendation, and BA, which is not addressed by the Canadian Task Force on Preventive Health Care. Although almost one-quarter of physicians reported teaching women BSE, most were actually describing BA. Therefore, it is likely that some of the approximately 20% of physicians who did not recommend BA actually mistook it for BSE. Most physicians see distinct value in encouraging women to know what is normal for their breasts.

Limitations

The limitations of this study include the small sample size and lack of generalizability. This study might not be generalizable to male physicians or to community practice settings, as female physicians were overrepresented and the study was conducted at 2 urban academic family practice centres. Future research could target community family physicians to inquire about their screening mammography habits in women aged 40 to 49 at average risk of breast cancer. Focus groups with patients would help further clarify women's perspectives on screening mammography.

It has been reported that physicians' attitudes and practice behaviour can influence women's compliance with screening recommendations, and that many women prefer to share the decision-making process with their physicians (a practice encouraged by the Canadian Task Force on Preventive Health Care) (P.L. Smith, K. Kakzanov, and R. Heisey, unpublished data, 2009).[15,21] However, in our study, it appears that many women at average risk of breast cancer in their 40s are not being offered the opportunity to discuss screening mammography. It is imperative that these women be given the opportunity to engage in an informed decision-making process about the best age for them to start screening mammography.

Conclusion

This survey of predominantly female physicians practising in an urban setting suggests that many 40- to 49-year-old women at average risk of breast cancer are not being offered the opportunity to discuss and initiate screening mammography unless they specifically request it, and most physicians are now recommending BA rather than BSE.

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Contributors
All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

Competing interests
None declared

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References

1. Canadian Cancer Society, National Cancer Institute of Canada. *Canadian cancer statistics 2007*. Toronto, ON: Canadian Cancer Society; 2007. Available from: **www.cancer.ca/Canada-wide/About%20us/Media%20centre/CW-Media%20releases/CW-2007/~/media/CCS/Canada%20wide/Files%20List/English%20files%20heading/pdf%20not%20in%20publications%20section/2007%20Canadian%20Cancer%20Statistics%20%20PDF%20English_1816216925.ashx**. Accessed 2011 Mar 20.
2. Canadian Cancer Society. *Canadian cancer statistics 2011*. Toronto, ON: Canadian Cancer Society; 2011. Available from: **www.cancer.ca/Canada-wide/About%20cancer/Cancer%20statistics/~/media/CCS/Canada%20wide/Files%20List/English%20files%20heading/PDF%20-%20Policy%20-%20Canadian%20Cancer%20Statistics%20-%20English/Canadian%20Cancer%20Statistics%202011%20-%20English.ashx**. Accessed 2012 Aug 27.
3. Fletcher SW, Elmore JG. Clinical practice. Mammographic screening for breast cancer. *N Engl J Med* 2003;348(17):1672-80.
4. Morrison BJ. Screening for breast cancer. In: Canadian Task Force on the Periodic Health Examination. *Canadian guide to clinical preventive health care*. Ottawa, ON: Public Health Agency of Canada; 1994. p. 788-95. Available from: **www.phac-aspc.gc.ca/publicat/clinic-clinique/pdf/s10c65e.pdf**. Accessed 2012 Aug 14.
5. Ringash J; Canadian Task Force on Preventive Health Care. Preventive health care, 2001 update: screening mammography among women aged 40-49 years at average risk of breast cancer. *CMAJ* 2001;164(4):469-76.
6. Shapiro S, Venet W, Strax P, Venet L. *Periodic screening for breast cancer. The health insurance plan project and its sequelae, 1963-1986*. Baltimore, MD: Johns Hopkins University Press; 1988.
7. Nyström L, Andersson I, Bjurstam N, Frisell J, Nordenskjöld B, Rutqvist LE. Long-term effects of mammography screening: updated overview of the Swedish randomised trials. *Lancet* 2002;359(9310):909-19.
8. Tabár L, Vitak B, Chen HH, Duffy SW, Yen MF, Chiang CF, et al. The Swedish two-county trial twenty years later. Updated mortality results and new insights from long-term follow-up. *Radiol Clin North Am* 2000;38(4):625-51.
9. Bjurstam N, Björneld L, Warwick J, Sala E, Duffy SW, Nyström L, et al. The Gothenburg breast screening trial. *Cancer* 2003;97(10):2387-96.
10. Alexander FE, Anderson TJ, Brown HK, Forrest AP, Hepburn W, Kirkpatrick AE, et al. 14 years of follow-up from the Edinburgh randomised trial of breast-cancer screening. *Lancet* 1999;353(9168):1903-8.
11. Miller AB, To T, Baines CJ, Wall C. The Canadian national breast screening study-1: breast cancer mortality after 11 to 16 years of follow-up. A randomized screening trial of mammography in women age 40 to 49 years. *Ann Intern Med* 2002;137(5 Part 1):305-12.
12. Moss SM, Cuckle H, Evans A, Johns L, Waller M, Bobrow L, et al. Effect of mammographic screening from age 40 years on breast cancer mortality at 10 years' follow-up: a randomised controlled trial. *Lancet* 2006;368(9552):2053-60.
13. Armstrong K, Moye E, Williams S, Berlin JA, Reynolds EE. Screening mammography in women 40 to 49 years of age: a systematic review for the American College of Physicians. *Ann Intern Med* 2007;146(7):516-26.
14. Hellquist BN, Duffy SW, Abdsaleh S, Björneld L, Bordás P, Tabár L, et al. Effectiveness of population-based service screening with mammography for women ages 40 to 49 years: evaluation of the Swedish Mammography Screening in Young Women (SCRY) cohort. *Cancer* 2011;117(4):714-22. DOI:10.1002/cncr.25650. Epub 2010 Sep 29.
15. Canadian Task Force on Preventive Health Care, Tonelli M, Gorber SC, Joffres M, Dickinson J, Singh H, et al. Recommendations on screening for breast cancer in average-risk women aged 40-74 years. *CMAJ* 2011;183(17):1991-2001. Erratum in: *CMAJ* 2011;183(18):2147.
16. Canadian Cancer Society. *Early detection and screening for breast cancer*. Toronto, ON: Canadian Cancer Society; 2009. Available from: **www.cancer.ca/Canada-wide/Prevention/Getting%20checked/Breast%20cancer%20NEW.aspx?sc_lang=en**. Accessed 2012 Aug 27.
17. American Cancer Society [website]. *American Cancer Society guidelines for the early detection of cancer.* Atlanta, GA: American Cancer Society; 2010. Available from: **www.cancer.org/Healthy/FindCancerEarly/CancerScreeningGuidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer**. Accessed 2011 Aug 14.
18. Lee CH, Dershaw DD, Kopans D, Evans P, Monsees B, Monticciolo D, et al. Breast cancer screening with imaging: recommendations from the Society of Breast Imaging and the ACR on the use of mammography, breast MRI, breast ultrasound, and other technologies for the detection of clinically occult breast cancer. *J Am Coll Radiol* 2010;7(1):18-27.
19. Coates RJ, Uhler RJ, Brogan DJ, Gammon MD, Malone KE, Swanson CA, et al. Patterns and predictors of breast cancer detection methods in women under 45 years of age (United States). *Cancer Causes Control* 2001;12(5):431-42.
20. Nguyen MN, Larocque D, Paquette D, Irace-Cima A. Quebec breast cancer screening program: a study of the perceptions of physicians in Laval, Que. *Can Fam Physician* 2009;55:614-20.
21. Chamot E, Charvet A, Perneger TV. Women's preferences for doctor's involvement in decisions about mammography screening. *Med Decis Making* 2004;24(4):379-85.
22. Mokbel K, Lirosi F, al-Sarakbi W, Leris C. Women's views on the introduction of annual screening mammography to those aged 40-49 years (a pilot study). *Curr Med Res Opin* 2001;17(2):111-2.
23. National Cancer Institute. *National survey of primary care physicians' cancer screening recommendations and practices: breast and cervical cancer screening questionnaire.* Rockville, MD: National Cancer Institute; 2006. Available from: **http://healthservices.cancer.gov/surveys/screening_rp/screening_rp_breast_cervical_inst.pdf**. Accessed 2012 Aug 14.
24. Cockburn J, Pit S, Redman S. Perceptions of screening mammography among women aged 40-49. *Aust N Z J Public Health* 1999;23(3):318-21.