

Submission

**To the House of Commons Standing Committee on
Health**

Women's Health Study

**Expert Recommendations for Breast Cancer Screening in
Canada**

Jean M Seely, MDCM, FRCPC, FSBI, FCAR,
Full Professor of Radiology, University of Ottawa

Paula Gordon, OC, OBC, MD, FRCPC, FSBI
Clinical Professor of Radiology, University of British Columbia

Shushiela Appavoo, MD, FRCPC
Associate Clinical Professor Department of Radiology and Diagnostic
Imaging, University of Alberta

Martin J. Yaffe PhD, C.M., FRSC
Professor, Department of Medical Biophysics, University of Toronto
Senior Scientist, Physical Sciences Platform,
Sunnybrook Research Institute
Co-Director, Imaging Research Program
Ontario Institute for Cancer Research

Anna N Wilkinson, MSc, MD, CCFP, FCFP
Associate Professor, University of Ottawa

Jennie Dale, MBA, Cofounder and Executive Director,
Dense Breasts Canada

Why is breast cancer screening important?

One in eight women will develop breast cancer. In 2022, 28,600 Canadian women were diagnosed with breast cancer and 5,500 died from it^[1]. Early detection by screening helps to decrease the likelihood of death. Screening has been shown to decrease breast cancer mortality in Canada by 40% overall and 44% in women aged 40-49^[2]. Living in a province that includes screening for women in their 40s is associated with a 1.9% increase in 10-year net survival^[3]. This is a similar benefit to tamoxifen, a drug used for patients with hormone positive breast cancer. Similarly, living in these provinces is associated with a lower stage of breast cancer at diagnosis in women in their 40s and 50s^[23]. In addition to decreasing deaths, early-stage diagnosis means less need for harsh treatments^[4], such as mastectomy and chemotherapy, and less disfiguring lymphedema (a permanent swelling of the arm). There is also less need for the very costly drugs used for treating advanced cancer. Early detection means better quality of life for women with cancer.

What do experts recommend?

The Canadian Association of Radiologists^[5] and the Canadian Society of Breast Imaging, as well as expert North American academic societies^[6] recommend screening annually starting at age 40^[7]. Seventeen percent of breast cancers are^[8] diagnosed in women aged 40-49, and a quarter of all years of life lost^[9] to breast cancer are to women diagnosed in their 40s. Screening women starting from age 40 results in the greatest life years gained and saves the most lives from breast cancer. Women with mammographically dense breast tissue should have annual mammograms^[10] and be offered additional MRI or ultrasound screening^[11] because dense tissue increases the risk of developing cancer as well as the risk that a cancer can be hidden on a mammogram. Supplemental screening with ultrasound^[12] or MRI^[13] has been shown to decrease interval cancers. These are the cancers diagnosed usually as a lump, after a negative screening mammogram (in the interval between planned mammograms). A reduced interval cancer rate is considered a surrogate measure of mortality reduction^[14].

What does the Canadian Task Force on Preventive Health Care (Task Force) recommend?

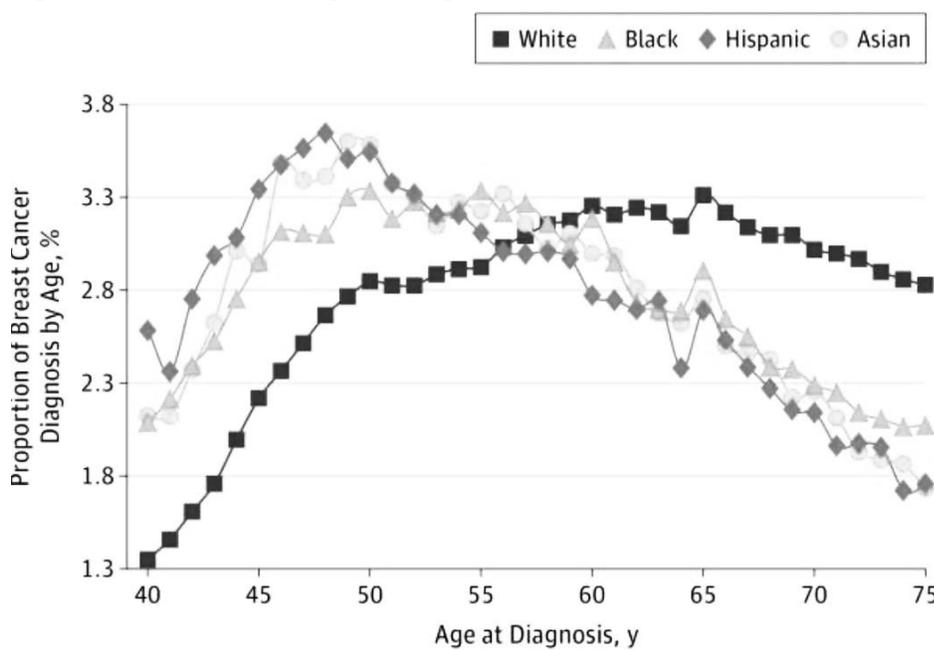
The 2018 breast screening guidelines^[15] recommend against screening women aged 40-49, and recommend screening women 50-74 years every 2-3 years. They say that women should not do breast self-exams, that family doctors and nurse practitioners should not do routine breast exams, and that there is no evidence to support supplemental screening for women with dense breasts. Estimates using well validated Canadian and US computer models demonstrate that not screening women aged 40-49 will result in over 400 avoidable deaths every year^[16]. Screening women 50+ only every 2-3 years, and not performing supplemental screening for women with dense breasts would bring that to a total of over 1000 avoidable deaths annually.

Why is there a difference between what experts recommend and what the Task Force recommends?

While Task Force members are experts in their own fields, they are not breast cancer experts or specialists in fields directly related to breast cancer. They are mainly family physicians. There are some specialists, but they do not participate in guidelines in their own areas of expertise. For example, a nephrologist^[17] (kidney specialist) chaired both the 2011 and 2018 Task Force guidelines on breast cancer screening. With lack of expert clinical involvement there are errors in the choice of and interpretation of evidence; clinical context is lacking in the guidelines.

The current guidelines were issued in 2018. They and all the prior guidelines were largely based on research from the 1960s to the 1980s called randomized clinical trials, all of which were performed in Europe and North America, mainly with white subjects. It is known that Black, Asian, and Hispanic women develop breast cancer younger than white women. Their peak incidence is in the mid-forties (Figure)^[18]. Black women are more likely to develop aggressive cancers, and are 40% more likely to die of breast cancer^[19]. White women are the only group whose peak incidence is older than age 50. Preliminary data with Stats Canada (not yet published) suggests the same findings in Canada. If we are to give equitable access to early detection to all women, it is essential that screening begin at age 40. Moreover, breast cancer is increasing^[20] in younger women across the globe, so data from the 1960s to 1980s is outdated. All women at average risk should have access to screening mammography at age 40.

Figure : Distribution of Age at Diagnosis for Women with Breast Cancer



The Task Force stated that it had analyzed the “benefits” and “harms” of mammograms, and concluded that the balance between benefit and harm was less favourable for younger women, than for older women. Given that the benefits include 44% fewer breast cancer deaths^[21], and better quality of life, you might wonder what the “harms” are. The one they’re most concerned about is the anxiety that women experience, if they are recalled after a screening mammogram for additional tests, and they pejoratively call these “false positives.” A better term would be “recalls for further imaging” and these happen with all screening tests. The anxiety is transient, and dissipates quickly, given that 95% of recalled women^[22] are told that they do not have cancer, after the additional tests. The Task Force gives a false equivalence to these false alarms: in the benefits to harms weighting, they equate transient anxiety to avoidable death.

The Task Force changed the recommendation in 2011 to not routinely screen women in their 40s. Prior to that the recommendation was to encourage dialogue and choice for women in their 40s. Unfortunately, the Task Force is not accountable for its guidelines, and does not research the outcomes of their guidelines or consider data showing the impact (positive or negative) of its actions. Canadian data confirm that in provinces/territories where women do not have access to screening until age 50, that women are significantly more likely to be diagnosed with more advanced cancers (associated with poorer survival) from age 40-59, than in jurisdictions that start screening at age 40^[23]. And there was a 10.3% increase in stage IV breast cancer^[23] in women in their 50s and 10.8 % increase in women in their 40s between 2011 and 2020. This is especially important given that treatment costs for advanced disease have increased exponentially in the past ten years^[24].

Unfortunately, the federal government does not provide oversight for the Task Force guidelines. Both the Health Ministry and the Public Health Agency of Canada have repeatedly stated that they are at arm's length from the Task Force, and they decline to intervene^[25]. Most Canadians believe that their healthcare guidance is developed by specialists in the appropriate fields and are disappointed to learn that specialists are largely excluded from guideline development.

As the Task Force has no accountability structure, the errors in its guideline have persisted for years. The Task Force has previously asked for input from experts, but ignored the submissions. For example, the Pan Canadian Study^[26] of Canadian breast screening programs was recommended as pertinent to the 2018 revision by multiple consulted content experts. It is the largest observational screening program study in the world and uniquely pertinent to the Canadian population, yet it was neither in the references, nor in the list of excluded evidence for the 2018 guideline.

The Ministry recently provided \$500,000 funding^[27] to expedite the next review, and the Task Force has ostensibly consulted more experts for evidence review and working group teams, and included patient partners, and public submissions of evidence. Unfortunately, however, these experts and patients have no voting capacity on the guideline panel. If past behaviour predicts future behaviour, it is unlikely that such expert input will be meaningfully incorporated in the creation of the guideline update.

Why does this matter?

The Task Force recommendations strongly influence provincial clinical practice guidelines and women's access to screening across the country. The existence of Task Force guidelines whose trustworthiness is questionable has led to variability in screening policies across provinces and territories and this, in turn, has led to inequity in access for women. Women in some provinces can access screening at 40, while others cannot. This has resulted in differences in stage at diagnosis^[23] for women, based on the province in which they live, which affects their survival^[3].

There are many women whose cancers could have been caught earlier if content expert guidelines were used instead of Task Force guidelines. In particular, the avoidable late-stage diagnoses in younger women have a large impact on their families and workplaces. There is a deep and generational trauma and resonance for the families of these women.

What are the Guidelines internationally?

For screening mammography, 7 countries start screening at age 40: Iceland, Sweden, USA, Brazil, Japan, Korea, and Turkey. Austria, Cyprus, Hungary, Israel, Columbia, and Portugal start at 45, but women in Austria and Hungary may opt in to start at 40. The remainder start at age 50 and screen every 2 years, except for the UK which screens every 3 years.

Supplemental screening for women with dense breasts is recommended in Austria, Bulgaria, Croatia, Cyprus, France, Greece, Hungary, Lithuania, Serbia, Spain, and Switzerland.

This chart shows that although the incidence of breast cancer in Canada is lower than Norway, Austria, Sweden and the USA, our mortality is higher ^[28].

Country	Age standardized Incidence/100,000	Age standardized Mortality/100,000
Norway	83.1	10.7
Australia	96	11.7
Sweden	83.9	12.0
United States	90.3	12.4
Canada	82.1	13.3
UK	87.7	14.0
France	99.1	15.6
World	47.8	13.6

What are the financial costs of poor screening practices?

Inadequate screening results in avoidable late-stage diagnosis. We now know the financial costs of late-stage diagnosis. Researchers recently derived costs ^[24] (see table 1) for each stage and molecular subtype of breast cancer, and using Ontario figures, showed the exponentially increased costs with increasing stage. Metastatic (stage IV) breast cancer was up to 11x more costly to treat than stage I breast cancer: \$25,247 for stage I; and as high as \$516,415 for stage IV. Moreover, those are underestimates because they are based on the stage at diagnosis, and do not account for women diagnosed at earlier stages who progress to and are treated for stage IV.

Table 1. Cost per treatment of case of breast cancer by subtype and stage. All costs in 2023C\$.

Subtype	Stage				
	DCIS	I	II	III	IV
HR+		28,201	60,289	117,269	256,693
HR+/HER2+		C\$ 56,401	76,547	86,653	516,415
HER2+	14,505	47,201	67,136	75,954	514,992
TN		25,247	101,811	C110,798	193,490
Mean	14,505	39,263	76,446	97,668	370,398

Recommendations specific to breast cancer screening

Experts recommend screening women 40-49 annually and screening women 50 and older every 1 to 2 years for as long as they are in good general health, with a life expectancy of 10 years. They also recommend that women be notified of their breast density and offered supplemental density screening if they have category C or D density. The content experts' opinions are based on understanding of evidence, along with specialized training, experience, and compassion for our patients.

Recommendations regarding the Task Force

While there is an ongoing revision of the 2018 Task Force breast screening guideline, the chair has publicly demonstrated significant bias ^[29] against screening women 40-49. The use of biased non-content-experts, excluding experts, places Canadian women at risk. Several reforms are needed.

1. Content experts, who are more aware of the clinical context and changing data, should lead the development of guidelines in their areas of specialty, rather than non-experts.
2. Epidemiology experts should play a supportive role in guideline development.
3. Accountability should be built into the Task Force structure and protocols. This is critical in ensuring that guideline errors are acknowledged and corrected in a timely fashion and that expert advice is not ignored.



References

1. Lee, S. (2022, May). *Breast cancer statistics*. Canadian Cancer Society. <https://cancer.ca/en/cancer-information/cancer-types/breast/statistics>
2. Coldman, A., Phillips, N., Wilson, C., Decker, K., Chiarelli, A. M., Brisson, J., Zhang, B., Payne, J., Doyle, G., & Ahmad, R. (2014). Pan-Canadian study of mammography screening and mortality from breast cancer. *Journal of the National Cancer Institute*, *106*(11), dju261. <https://doi.org/10.1093/jnci/dju261>
3. Wilkinson, A. N., Ellison, L. F., Billette, J.-M., & Seely, J. M. (2023). Impact of breast cancer screening on 10-year net survival in Canadian women age 40-49 years. *Journal of Clinical Oncology*, *41*(29), 4669–4677. <https://doi.org/10.1200/jco.23.00348>
4. Yaffe, M. J., Jong, R. A., & Pritchard, K. I. (2019). Breast cancer screening: Beyond mortality. *Journal of Breast Imaging*, *1*(3), 161–165. <https://doi.org/10.1093/jbi/wbz038>
5. Appavoo, S., Aldis, A., Causer, P., Crystal, P., Kornecki, A., Mundt, Y., Seely, J., & Wadden, N. (2016, September 17). Car Practice Guidelines and Technical Standards for Breast Imaging and Intervention. https://car.ca/wp-content/uploads/car_breastimagingguidelines_2016_en.pdf
6. Joe, B., Price, E., & Parkinson, B. (n.d.). Screening in the 40–49 age group. <https://assets-002.noviams.com/novi-file-uploads/sbi/pdfs-and-documents/breast-screening-leadership-group-resources/screening-in-the-40-49-age-group.pdf>
7. Willey, S. C., Whitworth, P., Boolbol, S. K., Boughey, J. C., Dietz, J., Hollingsworth, A., Hughes, K. S., Jatoi, I., Margenthaler, J., Newman, L., & Taylor, W. A. (2019, April 10). Position Statement on Screening Mammography. <https://www.breastsurgeons.org/docs/statements/Position-Statement-on-Screening-Mammography.pdf>
8. National Cancer Institute. (2022). *Cancer of the breast (female) - cancer stat facts*. SEER. <https://seer.cancer.gov/statfacts/html/breast.html>
9. Grimm, L. J., Avery, C. S., Hendrick, E., & Baker, J. A. (2022). Benefits and risks of mammography screening in women ages 40 to 49 years. *Journal of Primary Care & Community Health*, *13*, 215013272110583. <https://doi.org/10.1177/21501327211058322>
10. Seely, J. M., Peddle, S. E., Yang, H., Chiarelli, A. M., McCallum, M., Narasimhan, G., Zakaria, D., Earle, C. C., Fung, S., Bryant, H., Nicholson, E., Politis, C., & Berg, W. A. (2022). Breast Density and Risk of Interval Cancers: The Effect of Annual Versus Biennial Screening Mammography Policies in Canada. *Canadian Association of Radiologists Journal*, *73*(1), 90–100. <https://doi.org/10.1177/08465371211027958>
11. Wu, T., & Warren, L. J. (2022). The Added Value of Supplemental Breast Ultrasound Screening for Women With Dense Breasts: A Single Center Canadian Experience. *Canadian Association of Radiologists Journal*, *73*(1), 101–106. <https://doi.org/10.1177/08465371211011707>
12. Ohuchi, N., Suzuki, A., Sobue, T., Kawai, M., Yamamoto, S., Zheng, Y. F., Shiono, Y. N., Saito, H., Kuriyama, S., Tohno, E., Endo, T., Fukao, A., Tsuji, I., Yamaguchi, T., Ohashi, Y., Fukuda,

- M., Ishida, T., & J-START investigator groups (2016). Sensitivity and specificity of mammography and adjunctive ultrasonography to screen for breast cancer in the Japan Strategic Anti-cancer Randomized Trial (J-START): a randomised controlled trial. *Lancet (London, England)*, 387(10016), 341–348. [https://doi.org/10.1016/S0140-6736\(15\)00774-6](https://doi.org/10.1016/S0140-6736(15)00774-6)
13. Bakker, M. F., de Lange, S. V., Pijnappel, R. M., Mann, R. M., Peeters, P. H. M., Monninkhof, E. M., Emaus, M. J., Loo, C. E., Bisschops, R. H. C., Lobbes, M. B. I., de Jong, M. D. F., Duvivier, K. M., Veltman, J., Karssemeijer, N., de Koning, H. J., van Diest, P. J., Mali, W. P. T. M., van den Bosch, M. A. A. J., Veldhuis, W. B., van Gils, C. H., ... DENSE Trial Study Group (2019). Supplemental MRI Screening for Women with Extremely Dense Breast Tissue. *The New England Journal of Medicine*, 381(22), 2091–2102. <https://doi.org/10.1056/NEJMoa1903986>
 14. Kuhl C. K. (2021). A Call for Improved Breast Cancer Screening Strategies, Not Only for Women With Dense Breasts. *JAMA Network Open*, 4(8), e2121492. <https://doi.org/10.1001/jamanetworkopen.2021.21492>
 15. Klarenbach, S., Sims-Jones, N., Lewin, G., Singh, H., Thériault, G., Tonelli, M., Doull, M., Courage, S., Garcia, A. J., & Thombs, B. D. (2018). Recommendations on screening for breast cancer in women aged 40–74 years who are not at increased risk for breast cancer. *Canadian Medical Association Journal*, 190(49). <https://doi.org/10.1503/cmaj.180463>
 16. Yaffe, M. J., Mittmann, N., Lee, P., Tosteson, A. N., Trentham-Dietz, A., Alagoz, O., & Stout, N. K. (2015). Clinical outcomes of modelling mammography screening strategies. *Health reports*, 26(12), 9–15. <https://pubmed.ncbi.nlm.nih.gov/26676234/>
 17. Scott Klarenbach. Canadian Task Force on Preventive Health Care. (n.d.). <https://canadiantaskforce.ca/teachers/scott-klarenbach/>
 18. Stapleton, S. M., Oseni, T. O., Bababekov, Y. J., Hung, Y. C., & Chang, D. C. (2018). Race/Ethnicity and Age Distribution of Breast Cancer Diagnosis in the United States. *JAMA Surgery*, 153(6), 594–595. <https://doi.org/10.1001/jamasurg.2018.0035>
 19. Giaquinto, A. N., Sung, H., Miller, K. D., Kramer, J. L., Newman, L. A., Minihan, A., Jemal, A., & Siegel, R. L. (2022). Breast cancer statistics, 2022. *CA: A Cancer Journal for Clinicians*, 72(6), 524–541. <https://doi.org/10.3322/caac.21754>
 20. Heer, E., Harper, A., Escandor, N., Sung, H., McCormack, V., & Fidler-Benaoudia, M. M. (2020). Global burden and trends in premenopausal and postmenopausal breast cancer: A population-based study. *The Lancet Global Health*, 8(8). [https://doi.org/10.1016/s2214-109x\(20\)30215-1](https://doi.org/10.1016/s2214-109x(20)30215-1)
 21. Coldman, A., Phillips, N., Wilson, C., Decker, K., Chiarelli, A. M., Brisson, J., Zhang, B., Payne, J., Doyle, G., & Ahmad, R. (2014). Pan-Canadian study of mammography screening and mortality from breast cancer. *JNCI: Journal of the National Cancer Institute*, 106(11). <https://doi.org/10.1093/jnci/dju261>
 22. Gao, Y. J., Zakaria, D., Fung, S., Xu, J., Payne, J., Doyle, G., Muradali, D., Chiarelli, A. M., Sam, J., Walker, M., Major, D., Mai, V., Lockwood, G., Crosskill, A., & Irwin, C. (2012, December). Breast cancer screening in Canada: Monitoring and evaluation of quality indicators.

<https://www.partnershipagainstcancer.ca/wp-content/uploads/2019/01/Breast-Cancer-Screen-Quality-Indicators-Report-2012-EN.pdf>

23. Wilkinson, A. N., Billette, J. M., Ellison, L. F., Killip, M. A., Islam, N., & Seely, J. M. (2022). The Impact of Organised Screening Programs on Breast Cancer Stage at Diagnosis for Canadian Women Aged 40-49 and 50-59. *Current oncology (Toronto, Ont.)*, 29(8), 5627–5643. <https://doi.org/10.3390/curroncol29080444>
24. Wilkinson, A. N., Seely, J. M., Rushton, M., Williams, P., Cordeiro, E., Allard-Coutu, A., Look Hong, N. J., Moideen, N., Robinson, J., Renaud, J., Mainprize, J. G., & Yaffe, M. J. (2023). Capturing the True Cost of Breast Cancer Treatment: Molecular Subtype and Stage-Specific per-Case Activity-Based Costing. *Current oncology (Toronto, Ont.)*, 30(9), 7860–7873. <https://doi.org/10.3390/curroncol30090571>
25. Don Davies. (2019, April 12). *Don questions the Health Minister on the government's new breast cancer screening guidelines*. [Video]. YouTube. https://www.youtube.com/watch?v=62yyMigVclQ&ab_channel=DonDavies
26. Coldman, A., Phillips, N., Wilson, C., Decker, K., Chiarelli, A. M., Brisson, J., Zhang, B., Payne, J., Doyle, G., & Ahmad, R. (2014a). Pan-Canadian study of mammography screening and mortality from breast cancer. *JNCI: Journal of the National Cancer Institute*, 106(11). <https://doi.org/10.1093/jnci/dju261>
27. Canada, P. H. A. of. (2023, June 8). *Government of Canada to help advance work on breast cancer screening*. Canada.ca. <https://www.canada.ca/en/public-health/news/2023/06/government-of-canada-to-help-advance-work-on-breast-cancer-screening.html>
28. World Health Organization. (n.d.). *Cancer Today*. Global Cancer Observatory. https://gco.iarc.fr/today/online-analysis-table?v=2020&mode=population&mode_population=continents&population=900&populations=900&key=asr&sex=2&cancer=20&type=1&statistic=5&prevalence=0&population_group=0&ages_group%5B%5D=17&group_cancer=1&include_nmsc=0&include_nmsc_other=1
29. Bains, C. (2023, May 12). *Some doctors, patients want Canada to follow U.S. proposal for earlier mammograms*. Toronto Star. https://www.thestar.com/life/health-wellness/some-doctors-patients-want-canada-to-follow-u-s-proposal-for-earlier-mammograms/article_9bfba9c8-2ec7-5c05-ab9b-e906b39bc580.html