



Breast cancer screening outcomes by age and source of data

See the detailed [draft recommendations](#) for more information.

RCTs analyzed results from all randomized study participants (i.e., ‘real-world’ situation where not everyone adheres to screening perfectly, maintains randomization)

Observational (case control, cohort, emulated RCT) studies analyzed data comparing those with 100% participation in screening to those who were not screened (i.e., ‘best case scenario’)

Time trend studies analyzed population data at different time points (i.e., ‘real-world’ situation but without randomization)

Modelling data assumed a 100% participation rate in screening every 2 years from initiation (i.e., age 40 or 50) to completion (i.e., age 74 or 79)

RESULTS (Per 1000 over 10 years)	40-49	50-59	60-69	70-74	75+	All ages (≥40)
Breast cancer deaths by available study type: Threshold = 0.5 and 1.0 / 1000						
RCT	0.27 fewer	0.5 fewer	0.65 fewer	0.92 fewer	No data	
Case control or cohort ¹	0.79-0.94 fewer	1.45-1.72 fewer	1.89-2.24 fewer	2.68-3.17 fewer	No data	
Time trend ²	0.3 fewer	1.3 fewer to 0.2 more	1.7 fewer (60-69) to 2.1 more (age 60-74)	0.2 more (age 70-79) to 2.1 more (age 60-74)	1.2 more	3.0-3.7 fewer
Observational (emulated RCT) ²	No data			0.81 fewer	0 fewer	No data
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40</u> -74 vs ages <u>50</u> -74: 0.52 fewer (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.16 fewer					
All-cause mortality by available study type: Threshold = 1.0 / 1000						
RCT	0.13 fewer	0.31 fewer	0.71 fewer	1.41 fewer	No data	

Stage 2 or higher by available study type: Threshold = 3.0 / 1000				
RCT	No difference	No difference	No data	3 fewer
Observational	No data			0.51 fewer
Time trend	No data			1 fewer (late stage regional)
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 1.68 fewer (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.74 fewer			
Stage 3 or higher by available study type: Threshold = 2.0 / 1000				
RCT	No data			1.0 fewer
Time trend	No data		0.7-1.3 fewer	0.1-0.3 fewer 1 fewer (late stage regional) and 0.1 fewer (late stage distant)
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 0.83 fewer (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.38 fewer			
Stage 4 by available study type: Threshold = 1.0 / 1000				
Time trend	No data			0.1 fewer (late stage distant)
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 0.25 fewer (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.09 fewer			
Chemotherapy by available study type: Threshold = 2.0 / 1000				

RCT	No data			0.14 fewer
Observational (emulated RCT)	No data	0.01 fewer	0.05 fewer	No data
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 2.23 fewer (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.19 fewer			
Mastectomy or radical mastectomy by available study type: Threshold = 2.0 / 1000				
RCT	No data			1.84 more
Observational	No data			0.4 fewer
Observational (emulated RCT)	No data	0.03 fewer	0.16 fewer	No data
Any breast surgery: Threshold = N/A				
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 0.04 more (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.28 more			
Simple mastectomy available study type: Threshold = 2.0 / 1000				
Observational	No data			0.9 more
Observational (emulated RCT)	No data	0.19 more	0.22 more	No data
Radiation by available study type: Threshold = 5.0 / 1000				
RCT	No data			2.85 more
Observational (emulated RCT)	No data	1.14 more	1.15 more	No data

Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 0.89 fewer (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.12 more					
Overdiagnosis by available study type: Threshold = 5.0 / 1000						
RCT	1.95	1.93	No data		At least 5	No data
Observational	At least 5 (age 49-52)	None (age 53-59) to 0.34 (age 50-69) to at least 5 (age 49-52)	0.34 (50-69) to 1.5 (age 60-69)	At least 5	At least 5	No data
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 0.09 more (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 0.06 more					
Additional imaging with or without biopsy (no cancer): Threshold = 150 / 1000						
Canadian jurisdictional data	367.5	365.5	257.2	220.4 (70+)		No data
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 173.3 more (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 16.66 more					
Biopsies (no cancer): Threshold = 15.0 / 1000						
Canadian jurisdictional data	54.7	46.2	32.8	30.4 (70+)		No data
Modelling ³	Incremental difference in lifetime outcomes when screening: (i) Ages <u>40-74</u> vs ages <u>50-74</u> : 15.43 more (ii) Ages <u>50-79</u> vs ages <u>50-74</u> : 1.48 more					

Footnotes:

¹ Cohort = Adherence to screen analysis

² May not be comparable (unable to calculate absolute effect using Canadian baseline risk (Coldman, 2014:

<https://pubmed.ncbi.nlm.nih.gov/25274578/>)).

³ Modelling calculations are based on lifetime follow-up comparing the incremental differences between screening scenarios of 40-74 vs 50-74 and screening age 50-79 vs age 50-75. The modelling assumes 100% adherence to biennial (every 2 years), which means everyone in the modelling is going through screening every two years over the entire screening period. Thresholds do not apply to comparisons of scenarios at age 50-79 vs 50-75 as the incremental difference time period is 5 years of screening not 10.

Certainty of the evidence
Moderate
Low
Low to very low
Very low

***No data (studies or modelling) was found on the following outcomes: Axial lymph node dissection vs sentinel lymph node biopsy, breast cancer morbidity or health related quality of life.**

Life years gained (modelling data)

Modelling data assumes 100% of participants were screened every 2 years from initiation (i.e., age 40 or 50) to completion of screening (i.e., age 74 or 79). Although life years gained is measured as X/1000 women it should not be divided per woman or per cancer as the gains would only be realized for those with breast cancer and not equally distributed.

RESULTS

Life years gained (per 1000)

Incremental difference in lifetime outcomes	(i)	Ages <u>40</u> -74 vs ages <u>50</u> -74: 16.13 more
	(ii)	Ages 50- <u>79</u> vs ages 50- <u>74</u> : 1.21 more

Health adjusted life years gained (per 1000)

Incremental difference in lifetime outcomes	(i)	Ages <u>40</u> -74 vs ages <u>50</u> -74: 11.22 more
	(ii)	Ages 50- <u>79</u> vs ages 50- <u>74</u> : 0.29 more

Certainty of the evidence

Low

Very low