European Commission

EUROPEAN COMMISSION INITIATIVE ON BREAST CANCER

RECOMMENDATIONS

European Commission

QUESTION

If you are aged 40 to 44, should you attend an organised mammography screening programme?

RECOMMENDATION

The ECIBC's Guidelines Development Group suggests that women between 40 and 44 years old, who are not at high risk of breast cancer and do not have symptoms, should not have mammography screening.

European Commission

ASSESSMENT

POPULATION	Women aged 40 to 44
INTERVENTION	organised mammography screening
COMPARISON	no mammography screening
MAIN OUTCOMES	Breast cancer mortality (short case accrual); Breast cancer mortality (longest case accrual available); All-cause mortality; Other cause mortality; Stage IIA breast cancer or higher; Stage III+ breast cancer or tumour size ?40 mm; Rate of mastectomies; Provision of chemotherapy; Overdiagnosis (long case accrual); Quality of life (inferred from psychological effects); False-positive related adverse effects (psychological distress); and False-positive related adverse effects (biopsies and surgeries)
SETTING	European Union
PERSPECTIVE	Population (National Health System)
BACKGROUND	Although mammography screening has both potential benefits and harms, many countries have organised programmes for women aged 50 or older. However, there continues to be debate about recommendations for mammography screening (Jorgensen 2009, Arie 2014) particularly for women aged 40 to 49 (Petitti 2010).

JUDGEMENTS

Is the problem a priority?

- ◯ No
- ◯ Probably no
- ◯ Probably yes
- ⊗ Yes
- ◯ Varies
- ◯ Don't know

Breast cancer is the second most common cancer in the world and, by far, the most frequent cancer among women with an estimated 1.67 million new cancer cases diagnosed in 2012—accounting for 25% of all cancers (GLOBOCAN 2012). Breast cancer ranks as the fifth leading cause of cancer death worldwide and the second leading cause of cancer-related death in developed regions (GLOBOCAN 2012). In the European Union, 367 090 women were diagnosed with breast cancer and 92 000 women died from the disease in 2012 (Ferlay 2013). Breast cancer ranks fourth among the top five cancers with the highest disease burden (Tsilidis 2016). Annual incidence of breast cancer in the EU, in women aged 40 to 44 is 1.2 per 1 000 and mortality is 0.1 per 1 000 (GLOBOCAN 2012)

How substantial are the desirable anticipated effects?

- ◯ Trivial
- ⊗ Small
- ◯ Moderate
- ◯ Large
- ◯ Varies
- ◯ Don't know

Outcomes	? of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	**Anticipated absolute effects*** **(95% CI)**	
				Risk with no mammography screening	**Risk difference with organised mammography screening**
Breast cancer mortality (short case accrual) for women aged 40 to 44 follow up: mean 16.8 years	348306 (8 RCTs)	???? MODERATE[a,b,c]	**RR 0.89** (0.79 to 1.01)	Low	
				400 per 100,000[d]	**44 fewer per 100,000** (84 fewer to 4 more)
				High	
				700 per 100,000[e]	**77 fewer per 100,000** (147 fewer to 7 more)
Breast cancer mortality (longest case accrual available) for women for women aged 40 to 44 follow up: mean 15.2 years	348076 (8 RCTs)	???? MODERATE[a,b,c]	**RR 0.92** (0.83 to 1.02)	Low	
				480 per 100,000[d]	**38 fewer per 100,000** (82 fewer to 10 more)
Other cause mortality follow up: mean 10.8 years	290417 (6 RCTs)	???? VERY LOW[a,b,c,f]	**RR 1.04** (0.95 to 1.15)	Low	
				2,500 per 100,000[d]	**100 more per 100,000** (125 fewer to 375 more)
Breast cancer stage IIA or higher follow up: mean 13.6 years[g]	455283 (5 RCTs)	???? VERY LOW[b,c,h]	**RR 0.88** (0.78 to 0.99)	Low	
				380 per 100,000[d]	**46 fewer per 100,000** (84 fewer to 4 fewer)
Breast cancer stage III+ or tumour size ?40 mm follow up: mean 13.5 years[g]	274219 (4 RCTs)	???? LOW[a,b,c]	**RR 0.98** (0.74 to 1.29)	Low	
				90 per 100,000[d]	**2 fewer per 100,000** (23 fewer to 26 more)
Rate of mastectomies	250479 (5 RCTs)	???? LOW[a,b,i]	**RR 1.20** (1.11 to 1.30)[j]	Low	
				900 per 100,000[d]	**180 more per 100,000** (99 more to 270 more)
Provision of chemotherapy	100383 (2 RCTs)	???? VERY LOW[b,c,i,k,l]	**RR 0.86** (0.52 to 1.41)[j]	Low	
				400 per 100,000[d]	**56 fewer per 100,000** (192 fewer to 164 more)
Overdiagnosis (long case accrual)	0 (1 RCT)	???? MODERATE[b]	-	12.4% (95% CI 9.9%-14.9%)[m]	
Quality of life	0	????	-	Systematic review with 54 studies,	

Outcomes	? of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	**Anticipated absolute effects*** **(95% CI)**	
				Risk with no mammography screening	**Risk difference with organised mammography screening**
(inferred from psychological effects)[g]	(54 observational studies)	LOW[n]		no meta-analysis (Brett 2005). Mammographic screening does not appear to create anxiety in women who are given a clear result after a mammogram and subsequently placed on routine recall. Mixed results about anxiety in women recalled for further testing: several studies reported transient or long term (from 6 months to 1 year after recall) anxiety, while other studies reported no differences in anxiety levels. The nature and extent of further testing seem to determine the extent of anxiety.	
False-positive related adverse effects (psychological distress)[g]	0 (7 observational studies)	???? LOW	-	RR of psychological distress in women with a false-positive mammogram was compared to those with a normal mammogram 35 months after the last assessment (age of women was not specified). For women that needed further mammography: RR=1.28, 95%CI 0.82-2.00; For women placed in early recall: RR=1.82, 95%CI 1.22-2.72; For women that needed a fine needle puncture aspiration: RR=1.80, 95%CI 1.17-2.77; For women that needed a biopsy: RR=2.07, 95%CI 1.22-3.52. No differences in generic measures of general anxiety and depression were observed at 6 weeks after assessment and 3 months after screening Bond (2013).	
False-positive related adverse effects (biopsies and surgeries)[g]	0 (4 observational studies)	???? VERY LOW[o]	-	Results from literature review (4 studies, 390 000 women aged 50 to 69) show an, overall false-positive screening result of 19.7% in women undergoing 10 biennial screening tests (pooled risk estimate based on 3 studies; range 8 - 21%). This includes 2.9% pooled cumulative risk of an invasive procedure with benign outcome (range 1.8% to 6.3%; based on 2 studies) and 0.9% risk of undergoing surgical intervention with benign outcome (based on 1 study) (Hofvind 2012). Cross-sectional data from the EUNICE Project (women aged 50 to 69): 17 countries, 20 screening programmes, 1.7 million initial screens, 5.9 million subsequent screens; showed that 2.2% and 1.1% of all screening examinations resulted in needle biopsy among women without breast cancer (initial and subsequent screens,	

Outcomes	? of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	**Anticipated absolute effects*** **(95% CI)**	
				Risk with no mammography screening	**Risk difference with organised mammography screening**
				respectively). In addition, 0.19% and 0.07% of all screening examinations resulted in surgical interventions among women without breast cancer (initial and subsequent screens, respectively).	

1. Some studies did use methods that would not be accepted for random allocation today. One study had non-blinded assessment of 'cause of death'. The GDG felt that the CNBSS-1 possibly had issues with achieving prognostic balance. The GDG felt that lack of allocation concealment in this set of studies did not lead to high risk of bias. Given the lack of single trials driving the overall results and similarity in effect sizes (the test for subgroup differences - low vs high risk of bias trials - was non-significant) and overlapping confidence intervals (CIs), the risk of bias was rated as 'not serious'.
2. Trials were conducted more than 20 years ago. Currently, women have higher adherence to breast cancer screening and the quality control of screening and breast cancer care have improved. A large non-randomised study (Hellquist B 2011) showed a reduced risk for breast cancer deaths in women aged 40 to 49 years invited to screening, compared with women not invited (RR=0.74; 95%CI, 0.66-0.83) which is consistent with RCT results. The GDG did not rate downgrade for indirectness for breast cancer mortality but considered it serious for other outcomes.
3. 95% CI probably crosses the clinical decision threshold (as the CI is wide, a different clinical decision regarding the intervention may be taken depending on whether the lower or the higher limit is considered).
4. Median or mean of the control group of the included studies unless otherwise specified
5. Baseline risk calculated from the ITACAN database. http://itacan.ispo.toscana.it/italian/itacan.htm
6. Unexplained inconsistency with statistical heterogeneity (I^2 = 62%, P = 0.02).
7. Importance of the outcome was lowered from 'critical' to 'important' because the GDG members felt this outcome influenced neither the direction nor the strength of the recommendation.
8. Some studies were sub-optimally randomised and had non-blinded assessment of stage of disease. However, test for subgroup differences - low vs high risk of bias trials - was non-significant.
9. Population included women aged 40-74 years old. Therefore, a much broader age range than the 40-44 age group studied here. Observational studies do not confirm these results, instead they provide opposite results.
10. Due to lead time, there may be greater numbers of cancers to be treated in the screened group, during the period of observation, which may lead to an increased rate of chemotherapy and mastectomies in the screened group
11. Unexplained inconsistency with statistical heterogeneity (I^2 = 71%, P = 0.06).
12. Chemotherapy protocols and indications have significantly changed (e.g. node status was not determined in earlier studies).
13. The Independent UK Panel on Breast Cancer Screening (2012) calculated overdiagnosis from the CNBSS-1 trial, in which women in the control group were not offered mammography screening at the end of the trial. Excess cancers as a proportion of cancers diagnosed during follow-up in women invited for screening (population perspective).
14. Unexplained inconsistency for variability in anxiety in the group of women recalled for further testing.
15. Studies included women aged 50 to 69. Estimates for the 40 to 44 age stratum are likely to be higher.

Desirable effects

Eight trials of invitation to mammography screening provided breast cancer mortality data from 347 851 women <50 years (short case accrual). Mammography using short case accrual, compared to no screening, did not significantly reduce the risk of breast cancer mortality (Relative Risk (RR)= 0.89, 95% CI 0.79-1.01; Inconsistency (I2)=0%, p=0.48) (moderate quality evidence). This translates into an absolute effect, using 'short case accrual' with a mean follow-up of 16.8 years of 77 fewer breast cancer deaths per

100 000 (with a range from 7 more to 147 fewer deaths), and 44 fewer breast cancer deaths per 100 000 (with a range from 4 more to 84 fewer breast cancer deaths), using a 0.7% and 0.4% baseline risk, respectively.

Other methods for calculating absolute effects on breast cancer mortality may be used (more information can be found in the annex accompanying the evidence profile).

With regards to mammography using the 'longest case accrual' available, no reduction in breast cancer mortality was observed (RR=0.92, 95% CI 0.83-1.02; I2=6%, p=0.38) (moderate quality evidence). Mammography, compared to no screening, reduced the risk of stage IIA breast cancer or higher (RR=0.88 95% CI 0.78-0.99; I2=0%, p=0.54; 46 fewer cases of stage IIA breast cancer per 100 000 women during mean 13.6 years of follow up, from 4 to 84 fewer cases) (very low quality evidence). Furthermore, screening did not reduce the risk of all cause mortality (RR=1.01, 95% CI 0.94-1.08; I2=44%, p=0.10) (low quality evidence evidence), other cause mortality (RR=1.04, 95% CI 0.95-1.15; I2=62%, p=0.02) (very low quality evidence), stage III+ breast cancer cases or tumour size ? 40 mm (RR=0.98, 95% CI 0.74-1.29; I2=0%, p=0.56) (low quality evidence).

Undesirable effects

Although no specific information for this age stratum was identified, women aged 40 to 74 randomised to ‘invitation to screening’ were more likely to undergo mastectomy (RR=1.20, 95% CI 1.11-1.30; I2=0%, p=0.86; 180 more mastectomies per 100 000 women, from 99 to 270 more mastectomies) (low quality evidence). Estimates of overdiagnosis from one randomised clinical trial (RCT) (CNBSS-1) were 12.4% (95% CI 0.9.9%-14.9%) (moderate quality evidence) from a population perspective (long case accrual). From the perspective of a woman invited to screening, the proportion of overdiagnosed women was 22.7% (95% CI 18.4%-22.7%) (moderate quality evidence).

Mammography screening, compared with no screening, did not increase the number of women aged 43 to74 treated with chemotherapy (RR=0.86, 95% CI 0.52-1.41; I2=71%, p=0.06) (very low quality evidence).

A systematic review of observational studies (Brett 2005) reported that women who had further testing following their routine mammogram experienced significant short-term anxiety. A systematic review by Hofvind (2012), reported that the estimated cumulative risk of a false-positive screening result in women aged 50 to 69 undergoing 10 biennial screening tests was 19.7%. In addition, the EUNICE Project showed that 2.2% of women had a needle biopsy after an initial screening mammogram. False-positive mammograms are also associated with greater anxiety and distress about breast cancer (Salz 2010). Furthermore, the negative psychological consequences may last up to three years (Bond 2013) (low quality evidence).

Additional considerations

These studies used an 'intention-to-treat' analysis thus, a per protocol approach would lead to larger absolute effects.

GDG members mentioned that modelling studies describing quality and duration of ‘life gained’ should be considered.

Long case accrual may dilute the effect of the intervention as for some trials it will include cases diagnosed after closure of the trial when both arms are receiving the same intervention. Therefore, we performed a sensitivity analysis including only studies that reported long case accrual estimates and we observed a small although not significant diluting effect (RR 0.93; 95% CI 0.84 to 1.03).

GDG members agreed that the desirable health effects differ by age group and the age at first screening. For women in the 40 to 44 age group, the GDG agreed these women would have smaller anticipated beneficial health effects compared to older age groups.

Observational data provided supplementary evidence supporting the RCT evidence (see evidence profile).

Test accuracy is poorer in younger women, largely due to mammographic breast density. Digital mammography, which was not in use at the time of most of the studies reviewed here, may result in greater test accuracy in women aged 40 to 44.

In the Sweden Mammography Screening of Young Women (SCRY) cohort, which compared breast cancer mortality between women invited and not invited to screening; RRs of 0.82 (95% CI, 0.67-1.00) and 0.63(95% CI, 0.54-0.75) for the age groups of 40 to 44 and 45 to 49 years were respectively reported. The weighted RR for the 40 to 49 years did not differ from the unweighted estimate of 0.71 (95% CI, 0.62-0.80).

How substantial are the undesirable anticipated effects?

- ⊗ Large
- ○ Moderate
- ○ Small
- ○ Trivial
- ○ Varies
- ○ Don't know

Outcomes	? of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	**Anticipated absolute effects*** **(95% CI)**	
				Risk with no mammography screening	**Risk difference with organised mammography screening**
Breast cancer mortality (short case accrual) for women aged 40 to 44 follow up: mean 16.8 years	348306 (8 RCTs)	???? MODERATE[a,b,c]	**RR 0.89** (0.79 to 1.01)	Low	
				400 per 100,000[d]	**44 fewer per 100,000** (84 fewer to 4 more)
				High	
				700 per 100,000[e]	**77 fewer per 100,000** (147 fewer to 7 more)
Breast cancer mortality (longest case accrual available) for women for women aged 40 to 44 follow up: mean 15.2 years	348076 (8 RCTs)	???? MODERATE[a,b,c]	**RR 0.92** (0.83 to 1.02)	Low	
				480 per 100,000[d]	**38 fewer per 100,000** (82 fewer to 10 more)
Other cause mortality follow up: mean 10.8 years	290417 (6 RCTs)	???? VERY LOW[a,b,c,f]	**RR 1.04** (0.95 to 1.15)	Low	
				2,500 per 100,000[d]	**100 more per 100,000** (125 fewer to 375 more)
Breast cancer stage IIA or higher follow up: mean 13.6 years[g]	455283 (5 RCTs)	???? VERY LOW[b,c,h]	**RR 0.88** (0.78 to 0.99)	Low	
				380 per 100,000[d]	**46 fewer per 100,000** (84 fewer to 4 fewer)
Breast cancer stage III+ or tumour size ?40 mm follow up: mean 13.5 years[g]	274219 (4 RCTs)	???? LOW[a,b,c]	**RR 0.98** (0.74 to 1.29)	Low	
				90 per 100,000[d]	**2 fewer per 100,000** (23 fewer to 26 more)
Rate of mastectomies	250479 (5 RCTs)	???? LOW[a,b,i]	**RR 1.20** (1.11 to 1.30)[j]	Low	
				900 per 100,000[d]	**180 more per 100,000** (99 more to 270 more)
Provision of chemotherapy	100383 (2 RCTs)	???? VERY LOW[b,c,i,k,l]	**RR 0.86** (0.52 to 1.41)[j]	Low	
				400 per 100,000[d]	**56 fewer per 100,000** (192 fewer to 164 more)
Overdiagnosis (long case accrual)	0 (1 RCT)	???? MODERATE[b]	-	12.4% (95% CI 9.9%-14.9%)[m]	
Quality of life	0	????	-	Systematic review with 54 studies,	

Outcomes	? of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	**Anticipated absolute effects*** **(95% CI)**	
				Risk with no mammography screening	**Risk difference with organised mammography screening**
(inferred from psychological effects)[g]	(54 observational studies)	LOW[n]		no meta-analysis (Brett 2005). Mammographic screening does not appear to create anxiety in women who are given a clear result after a mammogram and subsequently placed on routine recall. Mixed results about anxiety in women recalled for further testing: several studies reported transient or long term (from 6 months to 1 year after recall) anxiety, while other studies reported no differences in anxiety levels. The nature and extent of further testing seem to determine the extent of anxiety.	
False-positive related adverse effects (psychological distress)[g]	0 (7 observational studies)	???? LOW	-	RR of psychological distress in women with a false-positive mammogram was compared to those with a normal mammogram 35 months after the last assessment (age of women was not specified). For women that needed further mammography: RR=1.28, 95%CI 0.82-2.00; For women placed in early recall: RR=1.82, 95%CI 1.22-2.72; For women that needed a fine needle puncture aspiration: RR=1.80, 95%CI 1.17-2.77; For women that needed a biopsy: RR=2.07, 95%CI 1.22-3.52. No differences in generic measures of general anxiety and depression were observed at 6 weeks after assessment and 3 months after screening Bond (2013).	
False-positive related adverse effects (biopsies and surgeries)[g]	0 (4 observational studies)	???? VERY LOW[o]	-	Results from literature review (4 studies, 390 000 women aged 50 to 69) show an, overall false-positive screening result of 19.7% in women undergoing 10 biennial screening tests (pooled risk estimate based on 3 studies; range 8 - 21%). This includes 2.9% pooled cumulative risk of an invasive procedure with benign outcome (range 1.8% to 6.3%; based on 2 studies) and 0.9% risk of undergoing surgical intervention with benign outcome (based on 1 study) (Hofvind 2012). Cross-sectional data from the EUNICE Project (women aged 50 to 69): 17 countries, 20 screening programmes, 1.7 million initial screens, 5.9 million subsequent screens; showed that 2.2% and 1.1% of all screening examinations resulted in needle biopsy among women without breast cancer (initial and subsequent screens,	

Outcomes	? of participants (studies) Follow up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	**Anticipated absolute effects*** **(95% CI)**	
				Risk with no mammography screening	**Risk difference with organised mammography screening**
				respectively). In addition, 0.19% and 0.07% of all screening examinations resulted in surgical interventions among women without breast cancer (initial and subsequent screens, respectively).	

1. Some studies did use methods that would not be accepted for random allocation today. One study had non-blinded assessment of 'cause of death'. The GDG felt that the CNBSS-1 possibly had issues with achieving prognostic balance. The GDG felt that lack of allocation concealment in this set of studies did not lead to high risk of bias. Given the lack of single trials driving the overall results and similarity in effect sizes (the test for subgroup differences - low vs high risk of bias trials - was non-significant) and overlapping confidence intervals (CIs), the risk of bias was rated as 'not serious'.
2. Trials were conducted more than 20 years ago. Currently, women have higher adherence to breast cancer screening and the quality control of screening and breast cancer care have improved. A large non-randomised study (Hellquist B 2011) showed a reduced risk for breast cancer deaths in women aged 40 to 49 years invited to screening, compared with women not invited (RR=0.74; 95%CI, 0.66-0.83) which is consistent with RCT results. The GDG did not rate downgrade for indirectness for breast cancer mortality but considered it serious for other outcomes.
3. 95% CI probably crosses the clinical decision threshold (as the CI is wide, a different clinical decision regarding the intervention may be taken depending on whether the lower or the higher limit is considered).
4. Median or mean of the control group of the included studies unless otherwise specified
5. Baseline risk calculated from the ITACAN database. http://itacan.ispo.toscana.it/italian/itacan.htm
6. Unexplained inconsistency with statistical heterogeneity (I^2 = 62%, P = 0.02).
7. Importance of the outcome was lowered from 'critical' to 'important' because the GDG members felt this outcome influenced neither the direction nor the strength of the recommendation.
8. Some studies were sub-optimally randomised and had non-blinded assessment of stage of disease. However, test for subgroup differences - low vs high risk of bias trials - was non-significant.
9. Population included women aged 40-74 years old. Therefore, a much broader age range than the 40-44 age group studied here. Observational studies do not confirm these results, instead they provide opposite results.
10. Due to lead time, there may be greater numbers of cancers to be treated in the screened group, during the period of observation, which may lead to an increased rate of chemotherapy and mastectomies in the screened group
11. Unexplained inconsistency with statistical heterogeneity (I^2 = 71%, P = 0.06).
12. Chemotherapy protocols and indications have significantly changed (e.g. node status was not determined in earlier studies).
13. The Independent UK Panel on Breast Cancer Screening (2012) calculated overdiagnosis from the CNBSS-1 trial, in which women in the control group were not offered mammography screening at the end of the trial. Excess cancers as a proportion of cancers diagnosed during follow-up in women invited for screening (population perspective).
14. Unexplained inconsistency for variability in anxiety in the group of women recalled for further testing.
15. Studies included women aged 50 to 69. Estimates for the 40 to 44 age stratum are likely to be higher.

Desirable effects

Eight trials of invitation to mammography screening provided breast cancer mortality data from 347 851 women <50 years (short case accrual). Mammography using short case accrual, compared to no screening, did not significantly reduce the risk of breast cancer mortality (Relative Risk (RR)= 0.89, 95% CI 0.79-1.01; Inconsistency (I2)=0%, p=0.48) (moderate quality evidence). This translates into an absolute effect, using 'short case accrual' with a mean follow-up of 16.8 years of 77 fewer breast cancer deaths per

100 000 (with a range from 7 more to 147 fewer deaths), and 44 fewer breast cancer deaths per 100 000 (with a range from 4 more to 84 fewer breast cancer deaths), using a 0.7% and 0.4% baseline risk, respectively.

Other methods for calculating absolute effects on breast cancer mortality may be used (more information can be found in the annex accompanying the evidence profile).

With regards to mammography using the 'longest case accrual' available, no reduction in breast cancer mortality was observed (RR=0.92, 95% CI 0.83-1.02; I2=6%, p=0.38) (moderate quality evidence). Mammography, compared to no screening, reduced the risk of stage IIA breast cancer or higher (RR=0.88 95% CI 0.78-0.99; I2=0%, p=0.54; 46 fewer cases of stage IIA breast cancer per 100 000 women during mean 13.6 years of follow up, from 4 to 84 fewer cases) (very low quality evidence). Furthermore, screening did not reduce the risk of all cause mortality (RR=1.01, 95% CI 0.94-1.08; I2=44%, p=0.10) (low quality evidence evidence), other cause mortality (RR=1.04, 95% CI 0.95-1.15; I2=62%, p=0.02) (very low quality evidence), stage III+ breast cancer cases or tumour size ? 40 mm (RR=0.98, 95% CI 0.74-1.29; I2=0%, p=0.56) (low quality evidence).

Undesirable effects

Although no specific information for this age stratum was identified, women aged 40 to 74 randomised to ‘invitation to screening’ were more likely to undergo mastectomy (RR=1.20, 95% CI 1.11-1.30; I2=0%, p=0.86; 180 more mastectomies per 100 000 women, from 99 to 270 more mastectomies) (low quality evidence). Estimates of overdiagnosis from one randomised clinical trial (RCT) (CNBSS-1) were 12.4% (95% CI 0.9.9%-14.9%) (moderate quality evidence) from a population perspective (long case accrual). From the perspective of a woman invited to screening, the proportion of overdiagnosed women was 22.7% (95% CI 18.4%-22.7%) (moderate quality evidence).

Mammography screening, compared with no screening, did not increase the number of women aged 43 to74 treated with chemotherapy (RR=0.86, 95% CI 0.52-1.41; I2=71%, p=0.06) (very low quality evidence).

A systematic review of observational studies (Brett 2005) reported that women who had further testing following their routine mammogram experienced significant short-term anxiety. A systematic review by Hofvind (2012), reported that the estimated cumulative risk of a false-positive screening result in women aged 50 to 69 undergoing 10 biennial screening tests was 19.7%. In addition, the EUNICE Project showed that 2.2% of women had a needle biopsy after an initial screening mammogram. False-positive mammograms are also associated with greater anxiety and distress about breast cancer (Salz 2010). Furthermore, the negative psychological consequences may last up to three years (Bond 2013) (low quality evidence).

Additional considerations

Overdiagnosis and its magnitude are not greatly influenced by age at first screening.

Overdiagnosis estimates from both CNBSS1 and CNBSS2 may have been overestimated by subsequent screening in the population (both organised and opportunistic) after screening ceased in the CNBSS in 1988. Thus, while at 25 years of follow-up a non-statistically significant excess of all breast cancers was observed in the intervention arm of CNBSS trials (difference 2.6; 95%CI -0.8 to 5.9), the excess rate of in-situ/invasive breast cancers actually increased over the first-years post-screening in the CNBSS1, and dramatically decreased after the 10 years post-screening in the CNBSS2.

Due to lead time (diagnosis time being brought forward with screening), there may be greater numbers of cancers to be treated in the screened group, during the period of observation, which may lead to an increased rate of chemotherapy and mastectomies in the screened group.

False-positive rates have been observed to be higher in women under age 50 than in women aged 50 to 69.

The number of false-positives will depend on the age of first screening. The GDG considered this effect to be large. Radiation risk is higher in younger women.

The radiation exposure and associated risk is dependent on the screening method and frequency that, in turn, will influence the balance of benefits and harms.

What is the overall certainty of the evidence of effects?

- ◯ Very low
- ◯ Low
- ⊗ Moderate
- ◯ High
- ◯ No included studies

The overall certainty (i.e. quality) of the evidence was considered moderate, as this was the lowest quality among the critical outcomes—namely, breast cancer mortality and overdiagnosis.

Is there important uncertainty about or variability in how much people value the main outcomes?

- ◯ Important uncertainty or variability
- ⊗ Possibly important uncertainty or variability
- ◯ Probably no important uncertainty or variability
- ◯ No important uncertainty or variability
- ◯ No known undesirable outcomes

A systematic review shows that participants place a low value on the psychosocial and physical effects of false-positive results and overdiagnosis (JRC Technical Report PICO 10-11, contract FWC443094012015; available upon request). Women generally consider these undesirable effects acceptable (low confidence in evidence). However, these findings are of limited value mainly given the significant concerns regarding the adequacy of the information provided to women, in order to make an informed decision about participation. Also, acceptability of false positive results is based on studies of participants who have already received a false positive result. Their preferences may differ from the general population. Another finding is that breast cancer screening represents a significant burden for some participants due to the associated psychological distress and inconvenience (moderate confidence in evidence).

Regarding breast cancer diagnosis, very limited data is available addressing people's views. One of the main themes identified in the literature is that people disvalue highly the anxiety caused by delays in receiving diagnostic results, or by a lack of understanding of the tests due to suboptimal communication with physicians (moderate confidence in evidence). Also, people have a higher overall preference towards more comfortable, brief diagnostic procedures (moderate confidence in evidence). (JRC Technical Report PICO 10-11, contract FWC443094012015; available upon request)

Does the balance between desirable and undesirable effects favor the intervention or the comparison?

- ◯ Favors the comparison
- ⊗ Probably favors the comparison
- ◯ Does not favor either the intervention or the comparison
- ◯ Probably favors the intervention
- ◯ Favors the intervention
- ◯ Varies
- ◯ Don't know

Additional considerations

GDG members agreed that the balance of desirable and undesirable health effects for starting screening at age 40 probably favours the comparison (no screening), as the intervention has large undesirable effects and small desirable effects.

How large are the resource requirements (costs)?

- ◯ Large costs
- ⊗ Moderate costs
- ◯ Negligible costs and savings
- ◯ Moderate savings
- ◯ Large savings
- ◯ Varies
- ◯ Don't know

Differences in required resources for mammography screening versus no screening in women aged 40 to 49 in the studies analysed may be related to the inclusion or not of costs related to the screening process, diagnostic techniques, treatment and follow-up of diagnosed women (Madan, 2010 and Sankatsing, 2015).

Based on the results of Sankatsing et al. (2015), the total cost of breast cancer diagnosis, treatment and death in the absence of screening was estimated to be €1 161 008 per 1 000 women, followed over their lifetime. The total cost of extended biennial screening in women aged 40 to 49 would increase to €306 590 per 1 000 women (using a 3.5% discount rate).

Additional considerations

Varies by screening interval and by country and by the presence of opportunistic screening.

GDG members judged the cost to be at least moderate.

However, substantial differences could be observed in European countries without population-based screening programmes or in those programmes with different screening policies.

Estimates refer to organised screening programmes.

Local/regional/country level resource/cost analyses exist or are required to estimate the cost for each setting.

What is the certainty of the evidence of resource requirements (costs)?

- ◯ Very low
- ⊗ Low
- ◯ Moderate
- ◯ High
- ◯ No included studies

The certainty of the evidence of resource requirements is low due to the study design of the included study (Sankatsing 2015). This was a modelling study based on observational data from a biennial screening programme using digital mammography. Based on this data, total cost per round of biennial screening in the Netherlands would be €61.3 (value of 2014).

The formal assessment of the certainty in the evidence for cost and resources used was made using GRADE criteria and reported in the Evidence Profile (JRC Technical Report PICO 14-15, contract FWC443094012015; available upon request).

Additional considerations

The study assessed the extension (i.e. starting at age 40 as compared to age 50) of a current population-based screening programme. As previously stated, substantial differences could be observed in European countries without population-based screening programmes or in those programmes with different screening policies.

Does the cost-effectiveness of the intervention favor the intervention or the comparison?

- ◯ Favors the comparison
- ◯ Probably favors the comparison
- ◯ Does not favor either the intervention or the comparison
- ◯ Probably favors the intervention
- ◯ Favors the intervention
- ⊗ Varies
- ◯ No included studies

Based on the evidence provided by Sankatsing et al. (2015), the extension of biennial mammography screening starting at age 40 appears to be cost-effective at a 'willingness-to-pay' of €20 000 per Life Year Gained (LYG) with an Incremental Cost-Effectiveness Ratio (ICER) of €10 826 per LYG starting at age 40 instead of age 45.

Additional considerations

GDG members agreed that cost-effectiveness is likely to vary across European countries, in particular with respect to countries without population-based screening programmes or across programmes with different screening policies.

What would be the impact on health equity?

- ◯ Reduced
- ◯ Probably reduced
- ◯ Probably no impact
- ◯ Probably increased
- ◯ Increased
- ◯ Varies
- ⊗ Don't know

Additional considerations

A systematic review on this topic has not been conducted. However, the utilisation of cancer screening services may largely depend on the availability of national public screening programmes; although European findings highlight that inequalities are larger in countries without population-based screening programmes (Palència, 2010).

Is the intervention acceptable to key stakeholders?

- ◯ No
- ◯ Probably no
- ◯ Probably yes
- ⊗ Yes
- ◯ Varies
- ◯ Don't know

A systematic review (JRC Technical Report PICO 16-17, contract FWC443094032016; available upon request) found the following barriers associated with breast cancer screening: (*a*) lack of knowledge and misperceptions regarding preventive medicine and breast health (high confidence in evidence), (*b*) poor communication skills of healthcare providers (high confidence in evidence), (*c*) poor accessibility to breast screening, especially among women with disabilities (high confidence in evidence), (*d*) fear and stress related to the procedure and the possibility of cancer diagnosis (high confidence in evidence), (*e*) pain and discomfort during the procedure (moderate confidence in evidence), (*f*) embarrassment and shyness during the procedure (moderate confidence in evidence), (*g*) lack of support and encouragement from family members, caregivers and social network (moderate confidence in evidence), (*h*) lack of information regarding the available resources (low confidence in evidence) and (*i*) low prioritisation of breast cancer screening (low confidence in evidence).

Additional considerations

Some GDG members described some professional groups may find a screening programme not acceptable due to their financial interests.

Is the intervention feasible to implement?

- ◯ No
- ◯ Probably no
- ⊗ Probably yes
- ◯ Yes
- ◯ Varies
- ◯ Don't know

Additional considerations

A systematic review on this topic has not been conducted. Some countries do not have screening programmes mainly due to lack of resources and/or infrastructure. Given that this recommendation would be additive to screening in older age groups (45 to 69), it was judged as being probably feasible to implement.

European Commission

CONCLUSIONS

If you are aged 40 to 44, should you attend an organised mammography screening programme?

TYPE OF RECOMMENDATION	Strong recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	Conditional recommendation for the intervention	Strong recommendation for the intervention
	○	⊗	○	○	○

RECOMMENDATION	The ECIBC's Guidelines Development Group suggests that women between 40 and 44 years old, who are not at high risk of breast cancer and do not have symptoms, should not have mammography screening.
JUSTIFICATION	
SUBGROUP CONSIDERATIONS	This recommendation does not apply to high-risk women (see recommendations for women with high breast density).
IMPLEMENTATION CONSIDERATIONS	GDG members agreed on the need for additional imaging techniques in this age group, as well as the need for shared decision making.
MONITORING AND EVALUATION	Future monitoring and evaluation of screening services should consider benefits and risks in the context of evolving treatment and management protocols. Monitoring and evaluation criteria are being developed within the ECIBC initiative.
RESEARCH PRIORITIES	1. Carry out evaluations of the efficacy of the intervention, time intervals, risk factors and stratification of women, as well as context specific cost-effectiveness in this age group. 2. Carry out studies addressing the role of other screening modalities (e.g. MRI) in this population.

European Commission

BIBLIOGRAPHY

Evidence of effects

- Alexander FE, Anderson TJ, Brown HK, Forrest AP, Hepburn W, Kirkpatrick AE, Muir BB, Prescott RJ, Smith A. 14 years of follow-up from the Edinburgh randomised trial of breast-cancer screening. Lancet. 1999;353(9168):1903-8.
- Andersson I, Aspegren K, Janzon L, Landberg T, Lindholm K, Linell F, et al. Mammographic screening and mortality from breast cancer: the Malmo mammographic screening trial. BMJ 1988;297(6654):943–8.
- Armaroli P, Villain P, Suonio E, Almonte M, Anttila A, Atkin WS, et al. European Code against Cancer, 4th Edition: Cancer screening. Cancer epidemiology. 2015;39 Suppl 1:S139-52.
- Autier P, Héry C, Haukka J, Boniol M, Byrnes G. Advanced breast cancer and breast cancer mortality in randomized controlled trials on mammography screening.J Clin Oncol. 2009 Dec 10;27(35):5919-23.
- Baena-Canada JM, Rosado-Varela P, Exposito-Alvarez I, Gonzalez-Guerrero M, Nieto-Vera J, Benitez-Rodriguez E: Women's perceptions of breast cancer screening. Spanish screening programme survey. Breast (Edinburgh, Scotland) 2014, 23(6):883-888.
- Benjamin DJ. The efficacy of surgical treatment of breast cancer. Medical Hypotheses 1996;47(5):389–97.
- Bjurstam N, Bjorneld L, Duffy SW, et al. The Gothenburg breast screening trial: first results on mortality, incidence, and mode of detection for women ages 39-49 years at randomization. Cancer. 1997;80(11): 2091-9.
- Bjurstam N, Bjorneld L, Warwick J, et al. The Gothenburg Breast Screening Trial. Cancer. 2003;97(10): 2387-96.
- Bjurstam NG, Björneld LM, Duffy SW.Updated results of the Gothenburg Trial of Mammographic Screening. Cancer. 2016 Apr 8. doi: 10.1002/cncr.29975. [Epub ahead of print]
- Blue Cross Blue Shield Association; Kaiser Permanente. Special report: screening asymptomatic women with dense breasts and normal mammograms for breast cancer. Technol Eval Cent Assess Program Exec Summ. 2014 Apr;28(15):1-2.
- Bolejko A, Hagell P, Wann-Hansson C, Zackrisson S: Prevalence, Long-term Development, and Predictors of Psychosocial Consequences of False-Positive Mammography among Women Attending Population-Based Screening. Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology 2015, 24(9):1388-1397.
- Bolejko A, Zackrisson S, Hagell P, Wann-Hansson C: A roller coaster of emotions and sense--coping with the perceived psychosocial consequences of a false-positive screening mammography. Journal of clinical nursing 2014, 23(13-14):2053-2062.
- Bond M, Garside R, Hyde C: Improving screening recall services for women with false-positive mammograms: a comparison of qualitative evidence with UK guidelines. BMJ open 2015, 5(1):e005855.
- Bond M, Pavey T, Welch K, Cooper C, Garside R, Dean S, Hyde CJ. Psychological consequences of false-positive screening mammograms in the UK. Evid Based Med. 2013 Apr;18(2):54-61.
- Braithwaite D, Walter LC, Izano M, Kerlikowske K. Benefits and Harms of Screening Mammography by Comorbidity and Age: A Qualitative Synthesis of Observational Studies and Decision Analyses. J Gen Intern Med. 2016 Jan 29. doi: 10.1007/s11606-015-3580-3.
- Brandon CJ, Mullan PB: Patients' perception of care during image-guided breast biopsy in a rural community breast center: communication matters. Journal of cancer education : the official journal of the American Association for Cancer Education 2011, 26(1):156-160.
- Brett J, Bankhead C, Henderson B, et al. The psychological impact of mammographic screening. A systematic review. Psychooncology. 2005;14(11): 917-38.
- Broeders M, Moss S, Nyström L, et al. The impact of mammographic screening on breast cancer mortality in Europe: a review of observational studies. J Med Screen. 2012;19 Suppl 1: 14-25.
- Buseman S, Mouchawar J, Calonge N, et al. Mammography screening matters for young women with breast carcinoma: evidence of downstaging among 42-49-year-old women with a history of previous mammography screening. Cancer. 2003;97(2): 352-8.
- Carter CL, Allen C, Henson DE. Relation of tumor size, lymph node status, and survival in 24, 740 breast cancer cases. Cancer 1989; 63(1):181–7.

- Carter JL, Coletti RJ, Harris RP. Quantifying and monitoring overdiagnosis in cancer screening: a systematic review of methods. BMJ 2015;350:g7773.
- Chicken DW, Sivanadarajah N, Keshtgar MRS: Patients' view on intraoperative diagnosis of sentinel nodes in breast cancer: is it an automatic choice? International journal of surgery (London, England) 2007, 5(2):76-80.
- Chu KC, Smart CR, Tarone RE. Analysis of breast cancer mortality and stage distribution by age for the Health Insurance Plan clinical trial. J Natl Cancer Inst. 1988;80(14): 1125-32.
- Collette HJ, Day NE, Rombach JJ, de Waard F. Evaluation of screening for breast cancer in a non-randomised study (the DOM project) by means of a case-control study. Lancet 1984;1(8388): 1224–6.
- Collette HJ, de Waard F, Rombach JJ, Collette C, Day NE. Further evidence of benefits of a (non-randomised) breast cancer screening programme: the DOM project. J Epidemiol Commun Health 1992; 46(4): 382–6.
- de Gelder R, Draisma G, Heijnsdijk EA, de Koning HJ. Population-based mammography screening below age 50: balancing radiation-induced vs prevented breast cancer deaths. Br J Cancer 2011;104(7):1214-20.
- de Gelder R, Heijnsdijk EA, Fracheboud J, et al. The effects of population-based mammography screening starting between age 40 and 50 in the presence of adjuvant systemic therapy. Int J Cancer 2015; 137:165–72.
- de Koning HJ, Boer R, Warmerdam PG, Beemsterboer PM, van der Maas PJ. Quantitative interpretation of age-specific mortality reductions from the Swedish breast cancer screening trials. J Natl Cancer Inst 1995;87(16):1217–23.
- Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray, F. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr, accessed on day/month/year.
- Fiszer C, Dolbeault S, Sultan S, Bredart A: Prevalence, intensity, and predictors of the supportive care needs of women diagnosed with breast cancer: a systematic review. Psycho-oncology 2014, 23(4):361-374.
- Frisell J, Glas U, Hellstrom L, Somell A. Randomized mammographic screening for breast cancer in Stockholm. Design, first round results and comparisons. Breast Cancer Research and Treatment 1986;8(1):45–54.
- Frisell J, Lidbrink E, Hellstrom L, et al. Followup after 11 years--update of mortality results in the Stockholm mammographic screening trial. Breast Cancer Res Treat. 1997;45(3): 263-70.
- Ganott MA, Sumkin JH, King JL, Klym AH, Catullo VJ, Cohen CS, Gur D: Screening mammography: do women prefer a higher recall rate given the possibility of earlier detection of cancer? Radiology 2006, 238(3):793-800.
- Garcia Fernández A, Chabrera C, Garcia Font M, et al. Mortality and recurrence patterns of breast cancer patients diagnosed under a screening programme versus comparable non-screened breast cancer patients from the same population: analytical survey from 2002 to 2012. Tumour Biol. 2014;35(3): 1945-53.
- Gotzsche PC, Jorgensen KJ. Screening for breast cancer with mammography. Cochrane Database Syst Rev. 2013;6.
- Guyatt GH, Oxman AD, Schünemann HJ, Tugwell P, Knottnerus A. GRADE guidelines: a new series of articles in the Journal of Clinical Epidemiology. J Clin Epidemiol 2011 Apr;64(4):380-2.
- Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, Schünemann HJ; GRADE Working Group. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. BMJ 2008; 336(7650):924-6.
- Habbema JD, van Oortmarssen GJ, van Putten DJ, et al. Age-specific reduction in breast cancer mortality by screening: an analysis of the results of the Health Insurance Plan of Greater New York study. J Natl Cancer Inst. 1986;77(2): 317-20.
- Health Council of the Netherlands. Population screening for breast cancer: expectations and developments. The Hague: Health Council of the Netherlands, 2014; publication no. 2014/01E.
- Hellquist BN, Duffy SW, Abdsaleh S, 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.Hendrick RE. Radiation doses and cancer risks from breast imaging studies. Radiology. 2010;257(1): 246-53.
- Hersch J, Jansen J, Barratt A, Irwig L, Houssami N, Howard K, Dhillon H, McCaffery K: Women's views on overdiagnosis in breast cancer screening: a qualitative study. BMJ (Clinical research ed) 2013, 346:f158.
- Higgins JPT, Altman DG, Sterne JAC. Chapter 8: assessing risk of bias in included studies. In: Higgins JPT, Green S, editors. Cochrane handbook for systematic reviews of interventions version 5.1.0 (updated March 2011). The Cochrane Collaboration. 2011.
- Hobbs MM, Taylor DB, Buzynski S, Peake RE: Contrast-enhanced spectral mammography (CESM) and contrast

enhanced MRI (CEMRI): Patient preferences and tolerance. Journal of medical imaging and radiation oncology 2015, 59(3):300-305.
- Hofvind S, Ponti A, Patnick J, et al. False-positive results in mammographic screening for breast cancer in Europe: a literature review and survey of service screening programmes. J Med Screen 2012; 19: Suppl 1: 57-66.
- Independent UKPoBCS. The benefits and harms of breast cancer screening: an independent review. Lancet. 2012;380(9855): 1778-86.
- Institute for Clinical and Economic Review (ICER). Appropriate imaging for breast cancer screening in special populations. Boston: Institute for Clinical and Economic Review (ICER). 2014. Available from http://www.hca.wa.gov/hta/Pages/breast_imaging.aspx
- Jensen AR, Garne JP, Storm HH, et al. Stage and survival in breast cancer patients in screened and non-screened Danish and Swedish populations. Acta Oncol. 2003;42(7): 701-9.
- Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. Syst Rev. 2012 Feb 10;1:10.
- Lauby-Secretan B, Scoccianti C, Loomis D, Benbrahim-Tallaa L, Bouvard V, Bianchini F, Straif K; International Agency for Research on Cancer Handbook Working Group.Breast-cancer screening--viewpoint of the IARC Working Group. N Engl J Med. 2015 Jun 11;372(24):2353-8.
- Lewin S, Glenton C, Munthe-Kaas H, Carlsen B, Colvin CJ, Gülmezoglu M, et al. Using qualitative evidence in decision making for health and social interventions: an approach to assess confidence in findings from qualitative evidence syntheses (GRADE-CERQual). PLoS Med. 2015 Oct 27;12(10):e1001895.
- Løberg M, Lousdal ML, Bretthauer M, Kalager M. Benefits and harms of mammography screening. Breast Cancer Res. 2015 May 1;17:63. doi: 10.1186/s13058-015-0525-z.
- Marmot et al. Independent UK Panel on Breast Cancer Screening. The benefits and harms of breast cancer screening: an independent review. Lancet 2012; 380: 1778-86.
- Michaelson JS, Silverstein M, Wyatt J, et al. Predicting the survival of patients with breast carcinoma using tumor size. Cancer 2002; 95(4): 713–23.
- Michaelson JS, Silverstein M, Sgroi D, et al. The effect of tumor size and lymph node status on breast carcinoma lethality. Cancer 2003; 98(10): 2133–43.
- Miller LS, Shelby RA, Balmadrid MH, Yoon S, Baker JA, Wildermann L, Soo MS: Patient anxiety before and immediately after imaging-guided breast biopsy procedures: impact of radiologist-patient communication. Journal of the American College of Radiology : JACR 2013, 10(6):423-431.
- Miller AB, To T, Baines CJ, Wall C. Canadian National Breast Screening Study-2: 13-year results of a randomized trial in women aged 50–59 years. J Natl Cancer Inst 2000; 92: 1490–99.
- 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.
- Miller AB, Wall C, Baines CJ, et al. Twenty five year follow-up for breast cancer incidence and mortality of the Canadian National Breast Screening Study: randomised screening trial. BMJ. 2014;348: g366.
- Moberg J, Alonso-Coello P, Oxman AD. GRADE Evidence to Decision (EtD) Frameworks Guidance. Version 1.1 [updated May 2015], The GRADE Working Group, 2015. Available from: https://ietd.epistemonikos.org/#/help/guidance
- Moss S, Waller M, Anderson TJ, Cuckle H; Trial Management Group. Randomised controlled trial of mammographic screening in women from age 40: predicted mortality based on surrogate outcome measures. Br J Cancer. 2005 Mar 14;92(5):955-60.
- Moss SM, Cuckle H, Evans A, 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: 2053–60.
- Moss SM, Wale C, Smith R, Evans A, Cuckle H, Duffy SW. Effect of mammographic screening from age 40 years on breast cancer mortality in the UK Age trial at 17 years' follow-up: a randomised controlled trial. Lancet Oncol. 2015;16(9):1123-32.
- Myers ER, Moorman P, Gierisch JM, Havrilesky LJ, Grimm LJ, Ghate S, et al. Benefits and Harms of Breast Cancer Screening: A Systematic Review. JAMA. 2015;314(15):1615-34.
- NETB (National Evaluation Team for Breast cancer screening). National evaluation of breast cancer screening in the Netherlands – eleventh evaluation report. Rotterdam: Department of Public Health, Erasmus MC; 2005.
- NICE (National Institute for Health and Clinical Excellence). The guidelines manual: appendix G. NICE

methodology checklist for economic evaluations. 2012. Available in: publications.nice.org.uk/the-guidelines-manual-appendices-bi-pmg6b/appendix-g-methodology-checklist-economic-evaluations#checklist-5b.

- Nelson HD, Cantor A, Humphrey L, Fu R, Pappas M, Daeges M, et al. U.S. Preventive Services Task Force Evidence Syntheses, formerly Systematic Evidence Reviews. Screening for Breast Cancer: A Systematic Review to Update the 2009 US Preventive Services Task Force Recommendation. Rockville (MD): Agency for Healthcare Research and Quality (US); 2016.
- Nelson HD, Fu R, Cantor A, Pappas M, Daeges M, Humphrey L. Effectiveness of Breast Cancer Screening: Systematic Review and Meta-analysis to Update the 2009 U.S. Preventive Services Task Force Recommendation. Annals of internal medicine. 2016;164(4):244-55.
- Nelson HD, Pappas M, Cantor A, Griffin J, Daeges M, Humphrey L. Harms of Breast Cancer Screening: Systematic Review to Update the 2009 U.S. Preventive Services Task Force Recommendation. Annals of internal medicine. 2016;164(4):256-67.
- No authors listed. Correction to Lancet Oncol 2015; 16: 1127. Lancet Oncol. 2015 Sep;16(9):e427. doi: 10.1016/S1470-2045(15)00240-5.
- Nyström L, Andersson I, Bjurstam N, et al. Long-term effects of mammography screening: updated overview of the Swedish randomised trials. Lancet. 2002;359(9310): 909-19.
- Olivotto IA, Mates D, Kan L, et al. Prognosis, treatment, and recurrence of breast cancer for women attending or not attending the Screening Mammography Program of British Columbia. Breast Cancer Res Treat. 1999;54(1): 73-81.
- Olsson A, Garne JP, Tengrup I, et al. Overweight in relation to tumour size and axillary lymph node involvement in postmenopausal breast cancer patients-differences between women invited to vs. not invited to mammography in a randomized screening trial. Cancer Epidemiol. 2009;33(1): 9-15.
- Presutti R, D'Alimonte L, McGuffin M, Chen H, Chow E, Pignol J-P, Di Prospero L, Doherty M, Kiss A, Wong J et al: Decisional support throughout the cancer journey for older women diagnosed with early stage breast cancer: a single institutional study. Journal of cancer education : the official journal of the American Association for Cancer Education 2014, 29(1):129-135.
- Puliti D, Duffy SW, Miccinesi G, et al. Overdiagnosis in mammographic screening for breast cancer in Europe: a literature review. J Med Screen 2012; 19: Suppl 1: 42-56.
- Roberts MM, Alexander FE, Anderson TJ, Chetty U, Donnan PT, Forrest P, Hepburn W, Huggins A, Kirkpatrick AE, Lamb J, et al. Edinburgh trial of screening for breast cancer: mortality at seven years. Lancet. 1990;335(8684):241-6.
- Salz T, Richman AR, Brewer NT. Meta-analyses of the effect of false-positive mammograms on generic and specific psychosocial outcomes.Psychooncology. 2010;19(10):1026-34.
- Sant M, Allemani C, Capocaccia R, et al. Stage at diagnosis is a key explanation of differences in breast cancer survival across Europe. Int J Cancer 2003; 106(3): 416–22.
- Sepucha KR, Borkhoff CM, Lally J, Levin CA, Matlock DD, Ng CJ, et al. Establishing the effectiveness of patient decision aids: key constructs and measurement instruments. BMC: Medical Informatics and Decision Making 2013;Nov:1-12.
- Schünemann H, Bro?ek J, Guyatt G, Oxman A, editors. GRADE handbook for grading quality of evidence and strength of recommendations. Updated October 2013. The GRADE Working Group, 2013. Available from www.guidelinedevelopment.org/handbook.
- Shapiro S, Strax P, Venet L, Venet W. Changes in 5-year breast cancer mortality in a breast cancer screening program. Proc Natl Cancer Conf. 1972;7:663-78.
- Stout NK, Rosenberg MA, Trentham-Dietz A, Smith MA, Robinson SM, Fryback DG: Retrospective cost-effectiveness analysis of screening mammography. J Natl Cancer Inst 2006, 98(11):774-782.
- Tabár L, Fagerberg G, Duffy SW, et al. The Swedish two county trial of mammographic screening for breast cancer: recent results and calculation of benefit. J Epidemiol Community Health. 1989;43(2):107-14.
- Tabár L, Fagerberg G, Chen HH, et al. Efficacy of breast cancer screening by age. New results from the Swedish Two-County Trial. Cancer. 1995;75(10): 2507-17.
- Tabar L, Chen HH, Duffy SW, Krusemo UB. Primary and adjuvant therapy, prognostic factors and survival in 1053 breast cancers diagnosed in a trial of mammography screening. Japanese Journal of Clinical Oncology 1999;29 (12):608–16.
- Tabár L, Vitak B, Chen HH, 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.

- Tabár L, Vitak B, Chen TH-H, et al. Swedish two-county trial: impact of mammographic screening on breast cancer mortality during 3 decades. Radiology. 2011;260(3): 658-63.
- Thomson MD, Siminoff LA: Perspectives on mammography after receipt of secondary screening owing to a false positive. Women's health issues : official publication of the Jacobs Institute of Women's Health 2015, 25(2):128-133.
- Tosteson ANA, Fryback DG, Hammond CS, Hanna LG, Grove MR, Brown M, Wang Q, Lindfors K, Pisano ED: Consequences of false-positive screening mammograms. JAMA internal medicine 2014, 174(6):954-961.
- Tricco AC, Antony J, Zarin W, Strifler L, Ghassemi M, Ivory J, Perrier L, Hutton B, Moher D, Straus SE. A scoping review of rapid review methods. BMC Med. 2015;13:224.
- Tsilidis KK, Papadimitriou N, Capothanassi D et al. Burden of Cancer in a Large Consortium of Prospective Cohorts in Europe. J Natl Cancer Inst. 2016 May 6;108(10). pii: djw127. doi: 10.1093/jnci/djw127.
- van Oortmarssen GJ, Habbema JD, van der Maas PJ, et al. A model for breast cancer screening. Cancer 1990; 66(7): 1601–12.
- Van den Bruel A, Jones C, Yang Y, Oke J, Hewitson P: People's willingness to accept overdetection in cancer screening: population survey. BMJ (Clinical research ed) 2015, 350:h980.
- Verbeek AL, Hendriks JH, Holland R, Mravunac M, Sturmans F, Day NE. Reduction of breast cancer mortality through mass screening with modern mammography. First results of the Nijmegen.
- Vilaprinyo E, Rue M, Marcos-Gragera R, Martinez-Alonso M: Estimation of age- and stage-specific Catalan breast cancer survival functions using US and Catalan survival data. BMC Cancer 2009, 9:98.
- Waller J, Douglas E, Whitaker KL, Wardle J: Women's responses to information about overdiagnosis in the UK breast cancer screening programme: a qualitative study. BMJ open 2013, 3(4).
- Waller J, Whitaker KL, Winstanley K, Power E, Wardle J: A survey study of women's responses to information about overdiagnosis in breast cancer screening in Britain. British journal of cancer 2014, 111(9):1831-1835.
- Wockel A, Janni W, Porzsolt F, Schmutzler R. Benefits and risks of breast cancer screening. Oncology research and treatment. 2014;37 Suppl 3:21-8.
- World Health Organization. WHO handbook for guideline development – 2nd ed. Available in http://www.who.int/kms/handbook_2nd_ed.pdf
- WHO Position Paper on Mammography Screening. Geneva: World Health Organization; 2014.
- Yaffe MJ, Mainprize JG. Risk of radiation-induced breast cancer from mammographic screening.[Erratum appears in Radiology. 2012 Jul;264(1):306]. Radiology. 2011;258(1): 98-105.
- Zackrisson S, Andersson I, Janzon L, Manjer J, Garne JP. Rate of overdiagnosis of breast cancer 15 years after end of Malmo mammographic screening trial: follow-up study. BMJ 2006; 332: 689–92.
- Zoetelief J, Veldkamp WJ, Thijssen MA, Jansen JT. Glandularity and mean glandular dose determined for individual women at four regional breast cancer screening units in the Netherlands. Phys Med Biol 2006; 51(7):1807– 1817.

Acceptability

- Ackerson, K. and S. D. Preston (2009). "A decision theory perspective on why women do or do not decide to have cancer screening: systematic review." J Adv Nurs 65(6): 1130-1140.
- Ahmed, N. U., K. Winter, A. N. Albatineh and G. Haber (2012). "Clustering very low-income, insured women's mammography screening barriers into potentially functional subgroups." Womens Health Issues 22(3): e259-266.
- Alexandraki, I. and A. D. Mooradian (2010). "Barriers related to mammography use for breast cancer screening among minority women." J Natl Med Assoc 102(3): 206-218.
- Amy, N. K., A. Aalborg, P. Lyons and L. Keranen (2006). "Barriers to routine gynecological cancer screening for White and African-American obese women." Int J Obes (Lond) 30(1): 147-155.
- Andreeva, V. A. and P. Pokhrel. (2013). "Breast cancer screening utilization among Eastern European immigrant women worldwide: A systematic literature review and a focus on psychosocial barriers." 12. Retrieved (Andreeva) UREN, University of Paris, 74 rue Marcel Cachin, Bobigny 93017, France, 22, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed11&NEWS=N&AN=2013781745.
- Angus, J., L. Seto, N. Barry, N. Cechetto, S. Chandani, J. Devaney, S. Fernando, L. Muraca and F. Odette (2012). "Access to cancer screening for women with mobility disabilities." J Cancer Educ 27(1): 75-82.
- Azami-Aghdash, S., M. Ghojazadeh, S. G. Sheyklo, A. Daemi, K. Kolahdouzan, M. Mohseni and A. Moosavi

(2015). "Breast Cancer Screening Barriers from the Womans Perspective: a Meta-synthesis." Asian Pac J Cancer Prev 16(8): 3463-3471.

- Baron, R. C., B. K. Rimer, R. A. Breslow, R. J. Coates, J. Kerner, S. Melillo, N. Habarta, G. P. Kalra, S. Chattopadhyay, K. M. Wilson, N. C. Lee, P. D. Mullen, S. S. Coughlin and P. A. Briss. (2008). "Client-Directed Interventions to Increase Community Demand for Breast, Cervical, and Colorectal Cancer Screening. A Systematic Review." 1 SUPPL. Retrieved (Baron, Melillo, Habarta, Kalra, Chattopadhyay, Briss) Community Guide Branch, National Center for Health Marketing, CDC, Atlanta, GA, United States, 35, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=2008272738.
- Barr, J. K., T. E. Giannotti, T. J. Van Hoof, J. Mongoven and M. Curry (2008). "Understanding barriers to participation in mammography by women with disabilities." Am J Health Promot 22(6): 381-385.
- Barreau, B., A. Hubert, M. H. Dilhuydy, B. Seradour and J. M. Dilhuydy. (2008). "Qualitative study of motivational and biocultural factors for participation in breast cancer screening." 1. Retrieved (Barreau) Axular Radiologie, Centre Futura, 62, avenue de Bayonne, 64600 Anglet, France, 2, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=2008273530.
- Berens, E. M., Y. Yilmaz-Aslan, J. Spallek and O. Razum (2016). "Determinants of mammography screening participation among Turkish immigrant women in Germany - a qualitative study reflecting key informants' and women's perspectives." Eur J Cancer Care (Engl) 25(1): 38-48.
- Betancourt, H., P. M. Flynn, M. Riggs and C. Garberoglio (2010). "A cultural research approach to instrument development: the case of breast and cervical cancer screening among Latino and Anglo women." Health Educ Res 25(6): 991-1007.
- Bowen, S. A., E. M. Williams, C. M. Stoneberg-Cooper, S. H. Glover, M. S. Williams and M. D. Byrd (2013). "Effects of social injustice on breast health-seeking behaviors of low-income women." Am J Health Promot 27(4): 222-230.
- Brown, S. L., T. M. Gibney and R. Tarling (2013). "Busy lifestyles and mammography screening: time pressure and women's reattendance likelihood." Psychol Health 28(8): 928-938.
- Castellanos, M. R., J. Conte, D. A. Fadel, C. Raia, F. Forte, K. Ahern, M. Smith, D. Elsayeh and S. Buchbinder (2008). "Improving access to breast health services with an interdisciplinary model of care." Breast J 14(4): 353-356.
- Chen, J. Y., H. Eborall and N. Armstrong. (2014). "Stakeholders' positions in the breast screening debate, and media coverage of the debate: a qualitative study." 1. Retrieved (Chen) Department of Medical and Social Care Education, University of Leicester Medical School, Leicester, United Kingdom, 24, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed12&NEWS=N&AN=2014046897.
- Cohen, E. L., B. R. Wilson, R. C. Vanderpool and T. Collins (2016). "Identifying Sociocultural Barriers to Mammography Adherence Among Appalachian Kentucky Women." Health Commun 31(1): 72-82.
- Consedine, N. S., C. Magai, Y. S. Krivoshekova, L. Ryzewicz and A. I. Neugut. (2004). "Fear, anxiety, worry, and breast cancer screening behavior: A critical review." 4. Retrieved (Consedine, Magai) Psychology Department, Long Island University, Brooklyn, NY, United States, 13, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed6&NEWS=N&AN=2004247329.
- Corcoran, J., M. Crowley, H. Bell, A. Murray and L. Grindle (2012). "U.S. Latinas' knowledge and attitudes toward mammography: Meta-synthesis." 22(American Cancer Society. (2006). Cancer facts and figures for Hispanics/Latinos 2006-2008. Retrieved from http://www.cancer.org/downloads/STT/CAFF2006HispPWSecured.pdf.): 671-689.
- Davis, T. C., C. L. Arnold, A. Rademaker, S. C. Bailey, D. J. Platt, C. Reynolds, J. Esparza, D. Liu and M. S. Wolf. (2012). "Differences in barriers to mammography between rural and urban women." 7. Retrieved (Davis, Arnold, Platt, Reynolds, Esparza) Department of Medicine and Pediatrics, Louisiana State University, Health Sciences Center, 1501 Kings Highway, Shreveport, LA 71130, United States, 21, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed10&NEWS=N&AN=2012397811.
- Domati, F., E. Travlos, C. Cirilli, G. Rossi, P. Benatti, M. Marino, G. Ponti, M. Vandelli, S. Valmori, A. Oursana, A. Pezzi and M. Ponz De Leon. (2009). "Attitude of the Italian general population towards prevention and screening of the most common tumors, with special emphasis on colorectal malignancies." 3. Retrieved (Domati, Travlos, Rossi, Benatti, Marino, Ponti, Vandelli, Valmori, Oursana, Pezzi, Ponz De Leon) Dipartimento di Medicina Interna, Universita di Modena e Reggio Emilia, Modena, Italy, 4, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed9&NEWS=N&AN=18807148.
- Engelman, K. K., A. M. Cizik, E. F. Ellerbeck and V. F. Rempusheski (2012). "Perceptions of the screening

mammography experience by Hispanic and non-Hispanic White women." Womens Health Issues 22(4): e395-401.
- Ferrante, J. M., D. C. Fyffe, M. L. Vega, A. K. Piasecki, P. A. Ohman-Strickland and B. F. Crabtree (2010). "Family physicians' barriers to cancer screening in extremely obese patients." Obesity (Silver Spring) 18(6): 1153-1159.
- Ferrat, E., J. Le Breton, M. Djassibel, K. Veerabudun, Z. Brixi, C. Attali and V. Renard (2013). "Understanding barriers to organized breast cancer screening in France: women's perceptions, attitudes, and knowledge." Fam Pract 30(4): 445-451.
- Friedman, A. M., J. R. Hemler, E. Rossetti, L. P. Clemow and J. M. Ferrante (2012). "Obese women's barriers to mammography and pap smear: the possible role of personality." Obesity (Silver Spring) 20(8): 1611-1617.
- Genoff, M. C., A. Zaballa, F. Gany, J. Gonzalez, J. Ramirez, S. T. Jewell and L. C. Diamond. (2016). "Navigating Language Barriers: A Systematic Review of Patient Navigators' Impact on Cancer Screening for Limited English Proficient Patients." 4. Retrieved (Genoff, Gany, Gonzalez, Ramirez, Diamond) Department of Psychiatry and Behavioral Sciences, Immigrant Health and Cancer Disparities Service, Memorial Sloan-Kettering Cancer Center, New York City, NY, United States, 31, from http://www.springerlink.com/content/120414/
- Greenwood, N. W., D. Dreyfus and J. Wilkinson (2014). "More than just a mammogram: breast cancer screening perspectives of relatives of women with intellectual disability." Intellect Dev Disabil 52(6): 444-455.
- Grube, B. J. (2006). "Barriers to diagnosis and treatment of breast cancer in the older woman." 3. Retrieved (Grube) Department of Surgery, Surgical Breast Health Program, University of Texas Medical Branch, Galveston, TX, United States, 202, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed7&NEWS=N&AN=2006115834.
- Hanson, K., P. Montgomery, D. Bakker and M. Conlon (2009). "Factors influencing mammography participation in Canada: an integrative review of the literature." Curr Oncol 16(5): 65-75.
- Hay, J. L., K. D. McCaul and R. E. Magnan. (2006). "Does worry about breast cancer predict screening behaviors? A meta-analysis of the prospective evidence." 6. Retrieved (Hay) Department of Psychiatry and Behavioral Sciences, Memorial Sloan-Kettering Cancer Center, 641 Lexington Avenue, New York, NY 10022, United States, 42, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed7&NEWS=N&AN=2006376914.
- Jerome-D'Emilia, B. (2015). "A Systematic Review of Barriers and Facilitators to Mammography in Hispanic Women." Journal of Transcultural Nursing 26(1): 73-82 10p.
- Kahn, L., C. H. Fox, J. Krause-Kelly, D. E. Berdine and R. B. Cadzow. (2006). "Identifying barriers and facilitating factors to improve screening mammography rates in women diagnosed with mental illness and substance use disorders." 3. Retrieved (Kahn, Fox, Krause-Kelly, Berdine, Cadzow) Department of Family Medicine, State University of New York, Buffalo School of Medicine and Biomedical Sciences, 462 Grider Street, Buffalo, NY 14215, United States, 42, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed7&NEWS=N&AN=2006320730.
- Kaltsa, A., A. Holloway and K. Cox (2013). "Factors that influence mammography screening behaviour: a qualitative study of Greek women's experiences." Eur J Oncol Nurs 17(3): 292-301.
- Koitsalu, M., M. A. G. Sprangers, M. Eklund, K. Czene, P. Hall, H. Gronberg and Y. Brandberg. (2016). "Public interest in and acceptability of the prospect of risk-stratified screening for breast and prostate cancer." 1. Retrieved (Koitsalu, Brandberg) Karolinska Institutet, Department of Oncology-Pathology, Karolinska University Hospital, Stockholm 171 76, Sweden, 55, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed13&NEWS=N&AN=20151060984.
- Llewellyn, G., S. Balandin, A. Poulos and L. McCarthy (2011). "Disability and mammography screening: intangible barriers to participation." Disabil Rehabil 33(19-20): 1755-1767.
- Makuc, D. M., N. Breen, H. I. Meissner, S. W. Vernon and A. Cohen. (2007). "Financial barriers to mammography: Who pays out-of-pocket?" 3. Retrieved (Makuc, Cohen) Office of Analysis and Epidemiology, National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, MD, United States, 16, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=2007211721.
- McAlearney, A. S., K. W. Reeves, C. Tatum and E. D. Paskett (2007). "Cost as a barrier to screening mammography among underserved women." Ethn Health 12(2): 189-203.
- McIlfatrick, S., L. Taggart and M. Truesdale-Kennedy (2011). "Supporting women with intellectual disabilities to access breast cancer screening: a healthcare professional perspective." Eur J Cancer Care (Engl) 20(3): 412-420.

- Mosavel, M., C. Rafie, D. L. Cadet and A. Ayers (2012). "Opportunities to reduce cancer barriers: community town halls and provider focus groups." J Cancer Educ 27(4): 641-648.
- Parkington, S. R., N. Faine, M. C. Nguyen, M. T. Lowry and P. A. Virginkar (2009). "Barriers to breast cancer screening in a managed care population." Manag Care 18(4): 34-45.
- Peipins, L. A., A. Soman, Z. Berkowitz and M. C. White (2012). "The lack of paid sick leave as a barrier to cancer screening and medical care-seeking: results from the National Health Interview Survey." BMC Public Health 12: 520.
- Peters, K. and A. Cotton (2015). "Barriers to breast cancer screening in Australia: experiences of women with physical disabilities." J Clin Nurs 24(3-4): 563-572.
- Pons-Vigues, M., R. Puigpinos-Riera, D. Rodriguez, M. J. Fernandez de Sanmamed, M. I. Pasarin, G. Perez, C. Borrell, M. Casamitjana and J. Benet (2012). "Country of origin and prevention of breast cancer: beliefs, knowledge and barriers." Health Place 18(6): 1270-1281.
- Robinson-White, S., B. Conroy, K. H. Slavish and M. Rosenzweig. (2010). "Patient navigation in breast cancer: A systematic review." 2. Retrieved (Robinson-White) University of Pittsburgh School of Medicine, 33, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed9&NEWS=N&AN=2010151758.
- Sabatino, S. A., N. Habarta, R. C. Baron, R. J. Coates, B. K. Rimer, J. Kerner, S. S. Coughlin, G. P. Kalra and S. Chattopadhyay. (2008). "Interventions to Increase Recommendation and Delivery of Screening for Breast, Cervical, and Colorectal Cancers by Healthcare Providers. Systematic Reviews of Provider Assessment and Feedback and Provider Incentives." 1 SUPPL. Retrieved (Habarta, Baron, Kalra, Chattopadhyay) CDC Community Guide Branch, National Center for Health Marketing, Atlanta, GA, United States, 35, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=2008272744.
- Sabih, W. K., J. A. Taher, C. El Jabari, C. Hajat, S. M. Adib and O. Harrison (2012). "Barriers to breast cancer screening and treatment among women in Emirate of Abu Dhabi." Ethn Dis 22(2): 148-154.
- Sarma, E. A. (2015). "Barriers to screening mammography." Health Psychol Rev 9(1): 42-62.
- Schueler, K. M., P. W. Chu and R. Smith-Bindman. (2008). "Factors associated with mammography utilization: A systematic quantitative review of the literature." 9. Retrieved (Schueler, Smith-Bindman) Department of Radiology, Santa Clara Valley Medical Center, San Jose, CA, United States, 17, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=2008542871.
- Sinicrope, P. S., C. A. Patten, S. M. Bonnema, J. R. Almquist, C. M. Smith, T. J. Beebe, S. J. Jacobsen and C. M. Vachon (2009). "Healthy women's motivators and barriers to participation in a breast cancer cohort study: a qualitative study." Ann Epidemiol 19(7): 484-493.
- Suzuki, R., G. Krahn, E. Small and J. Peterson-Besse (2013). "Multi-level Barriers to Obtaining Mammograms for Women with Mobility Limitations: Post Workshop Evaluation." American Journal of Health Behavior 37(5): 711-718 718p.
- Swaine, J. G., S. Dababnah, S. L. Parish and K. Luken (2013). "Family caregivers' perspectives on barriers and facilitators of cervical and breast cancer screening for women with intellectual disability." Intellect Dev Disabil 51(1): 62-73.
- Todd, A. and A. Stuifbergen (2011). "Barriers and Facilitators to Breast Cancer Screening: A Qualitative Study of Women with Multiple Sclerosis." Int J MS Care 13(2): 49-56.
- Trigoni, M., F. Griffiths, D. Tsiftsis, E. Koumantakis, E. Green and C. Lionis (2008). "Mammography screening: views from women and primary care physicians in Crete." BMC Womens Health 8: 20.
- Vedel, I., M. T. E. Puts, M. Monette, J. Monette and H. Bergman. (2011). "Barriers and facilitators to breast and colorectal cancer screening of older adults in primary care: A systematic review." 2. Retrieved (Vedel, Puts, Monette, Monette, Bergman) Solidage, McGill University - Univ. de Montreal Research Group on Frailty and Ageing, Department of Epidemiology Pav H-485. 3755, Ch. Cote Ste Catherine Montreal, Quebec H3T 1E2, Canada, 2, from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed10&NEWS=N&AN=2011147121.
- Vernon, S. W. (1999). "Risk perception and risk communication for cancer screening behaviors: a review." J Natl Cancer Inst Monogr(25): 101-119.
- Watson-Johnson, L. C., A. DeGroff, C. B. Steele, M. Revels, J. L. Smith, E. Justen, R. Barron-Simpson, L. Sanders and L. C. Richardson (2011). "Mammography adherence: a qualitative study." J Womens Health (Larchmt) 20(12): 1887-1894.
- Weinstein, L. C., M. LaNoue, K. Hurley, R. Sifri and R. Myers (2015). "Using Concept Mapping to Explore Barriers and Facilitators to Breast Cancer Screening in Formerly Homeless Women with Serious Mental Illness."

J Health Care Poor Underserved 26(3): 908-925.
- Wong, C. J. (2009). "A study on the effects of language discordance and limited English proficiency in cancer screening." 3-B. 70, from http://gateway.proquest.com/openurl?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&res_dat=xri:pqdiss&rft_dat=xri:pqdiss:3351889

Economic Evidence

- Brunetti M1, Shemilt I, Pregno S, Vale L, Oxman AD, Lord J, et al. GRADE guidelines: 10. Considering resource use and rating the quality of economic evidence. J Clin Epidemiol. 2013 Feb; 66(2): 140-50.
- Carles M, Vilaprinyo E, Cots F, Gregori A, Pla R, Román R, Sala M, Macià F, Castells X, Rue M. Cost-effectiveness of early detection of breast cancer in Catalonia (Spain). BMC Cancer. 2011 May 23; 11: 192.
- Curtis L. Unit costs of Health and Social Care. Canterbury: University of Kent at Canterbury, Personal Social Services Research Unit, 2008.
- de Gelder R, Bulliard JL, de Wolf C, Fracheboud J, Draisma G, Schopper D, de Koning HJ. Cost-effectiveness of opportunistic versus organised mammography screening in Switzerland. Eur J Cancer. 2009 Jan; 45(1): 127-38.
- Gocgun Y, Banjevic D, Taghipour S, Montgomery N, Harvey BJ, Jardine AK, Miller AB. Cost-effectiveness of breast cancer screening policies using simulation. Breast. 2015 Aug; 24(4):440-8.
- Higgins JP, Altman DG, Gøtzsche PC, Jüni P, Moher D, Oxman AD, Savovic J, Schulz KF, Weeks L, Sterne JA; Cochrane Bias Methods Group; Cochrane Statistical Methods Group. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. BMJ. 2011 Oct 18; 343: d5928.
- Madan J, Rawdin A, Stevenson M, Tappenden P. A Rapid Response Economic Evaluation of the UK NHS Cancer Reform Strategy Breast Cancer Screening Program Extension via a Plausible Bounds Approach. Value Health. 2010, 13(2):215-21.
- Melnikow J, Tancredi DJ, Yang Z, Ritley D, Jiang Y, Slee C, Popova S, Rylett P, Knutson K, Smalley S. Program-specific cost-effectiveness analysis: breast cancer screening policies for a safety-net program. Value Health. 2013 Sep-Oct; 16(6):932-41.
- Mittmann N, Stout NK, Lee P, Tosteson AN, Trentham-Dietz A, Alagoz O, Yaffe MJ. Total cost-effectiveness of mammography screening strategies. Health Rep. 2015 Dec; 26(12):16-25.
- Moher D, Liberati A, Tetzlaff J, Altman DG; PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ. 2009 Jul 21; 339: b2535.
- Pharoah PD, Sewell B, Fitzsimmons D, Bennett HS, Pashayan N. Cost effectiveness of the NHS breast screening programme: life table model. BMJ. 2013 May 9; 346: f2618.
- Rashidian A, Barfar E, Hosseini H, Nosratnejad S, Barooti E. Cost effectiveness of breast cancer screening using mammography; a systematic review. Iran J Public Health. 2013 Apr 1; 42 (4):347-57. Print 2013.
- Rojnik K, Naversnik K, Mateovi?-Rojnik T, Primiczakelj M. Probabilistic cost-effectiveness modeling of different breast cancer screening policies in Slovenia. Value Health. 2008 Mar-Apr; 11(2): 139-48.
- Saadatmand S, Tilanus-Linthorst MM, Rutgers EJ, et al. Cost-effectiveness of screening women with familial risk for breast cancer with magnetic resonance imaging. J Natl Cancer Inst 2013;105: 1314–21.
- Sankatsing VD, Heijnsdijk EA, van Luijt PA, van Ravesteyn NT, Fracheboud J, de Koning HJ. Cost-effectiveness of digital mammography screening before the age of 50 in The Netherlands. Int J Cancer. 2015 Oct 15; 137(8):1990-9

Values and preferences

- Abbey CK, Eckstein MP, Boone JM: An equivalent relative utility metric for evaluating screening mammography. Medical decision making : an international journal of the Society for Medical Decision Making 2010, 30(1):113-122.
- Ackerson K, Preston SD: A decision theory perspective on why women do or do not decide to have cancer screening: systematic review. Journal of advanced nursing 2009, 65(6):1130-1140.
- Ahmadian M, Samah AA, Redzuan Mr, Emby Z: The influence of psycho-social factors on participation levels in community-based breast cancer prevention programs in Tehran, Iran. Global journal of health science 2012, 4(1):42-56.
- Al Dasoqi K, Zeilani R, Abdalrahim M, Evans C: Screening for breast cancer among young Jordanian women: ambiguity and apprehension. International nursing review 2013, 60(3):351-357.

- Al-Azri M, Al-Awisi H, Al-Rasbi S, El-Shafie K, Al-Hinai M, Al-Habsi H, Al-Moundhri M: Psychosocial impact of breast cancer diagnosis among omani women. Oman medical journal 2014, 29(6):437-444.
- Alcazar-Bejerano IL: Health Behaviors, Disparities and Deterring Factors for Breast Cancer Screening of Immigrant Women - A Challenge to Health Care Professionals. Journal of lifestyle medicine 2014, 4(1):55-63.
- Alexandraki I, Mooradian AD: Barriers related to mammography use for breast cancer screening among minority women. Journal of the National Medical Association 2010, 102(3):206-218.
- Andrews J, Guyatt G, Oxman AD, Alderson P, Dahm P, Falck-Ytter Y, Nasser M, Meerpohl J, Post PN, Kunz R et al: GRADE guidelines: 14. Going from evidence to recommendations: the significance and presentation of recommendations. J Clin Epidemiol 2013, 66(7):719-725.
- Andrews JC, Schunemann HJ, Oxman AD, Pottie K, Meerpohl JJ, Coello PA, Rind D, Montori VM, Brito JP, Norris S et al: GRADE guidelines: 15. Going from evidence to recommendation-determinants of a recommendation's direction and strength. J Clin Epidemiol 2013, 66(7):726-735.
- Anton S, Tomanovic K, Mrdenovic S, Katinic K, Gugic D, Topic J: Influence of psychical trauma through transgenerational transfer on the development of traumatic reactions in women with diagnosed breast cancer. Collegium antropologicum 2011, 35(3):673-680.
- Azami-Aghdash S, Ghojazadeh M, Sheyklo SG, Daemi A, Kolahdouzan K, Mohseni M, Moosavi A: Breast Cancer Screening Barriers from the Womans Perspective: a Meta-synthesis. Asian Pacific journal of cancer prevention : APJCP 2015, 16(8):3463-3471.
- Baena-Canada JM, Rosado-Varela P, Exposito-Alvarez I, Gonzalez-Guerrero M, Nieto-Vera J, Benitez-Rodriguez E: Women's perceptions of breast cancer screening. Spanish screening programme survey. Breast (Edinburgh, Scotland) 2014, 23(6):883-888.
- Baker P, Beesley H, Dinwoodie R, Fletcher I, Ablett J, Holcombe C, Salmon P: 'You're putting thoughts into my head': a qualitative study of the readiness of patients with breast, lung or prostate cancer to address emotional needs through the first 18 months after diagnosis. Psycho-oncology 2013, 22(6):1402-1410.
- Bennett P, Parsons E, Brain K, Hood K, reTrace Study T: Long-term cohort study of women at intermediate risk of familial breast cancer: experiences of living at risk. Psycho-oncology 2010, 19(4):390-398.
- Bolejko A, Brodersen J, Zackrisson S, Wann-Hansson C, Hagell P: Psychometric properties of a Swedish version of the Consequences of Screening--Breast Cancer questionnaire. Journal of advanced nursing 2014, 70(10):2373-2388.
- Bolejko A, Hagell P, Wann-Hansson C, Zackrisson S: Prevalence, Long-term Development, and Predictors of Psychosocial Consequences of False-Positive Mammography among Women Attending Population-Based Screening. Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology 2015, 24(9):1388-1397.
- Bolejko A, Zackrisson S, Hagell P, Wann-Hansson C: A roller coaster of emotions and sense--coping with the perceived psychosocial consequences of a false-positive screening mammography. Journal of clinical nursing 2014, 23(13-14):2053-2062.
- Bonomi AE, Boudreau DM, Fishman PA, Ludman E, Mohelnitzky A, Cannon EA, Seger D: Quality of life valuations of mammography screening. Quality of life research : an international journal of quality of life aspects of treatment, care and rehabilitation 2008, 17(5):801-814.
- Bond M, Garside R, Hyde C: Improving screening recall services for women with false-positive mammograms: a comparison of qualitative evidence with UK guidelines. BMJ open 2015, 5(1):e005855.
- Brandon CJ, Mullan PB: Patients' perception of care during image-guided breast biopsy in a rural community breast center: communication matters. Journal of cancer education : the official journal of the American Association for Cancer Education 2011, 26(1):156-160.
- Brodersen J, Siersma VD: Long-term psychosocial consequences of false-positive screening mammography. Annals of family medicine 2013, 11(2):106-115.
- Carney P, O'Neill S, O'Neill C: Determinants of breast cancer screening uptake in women, evidence from the British Household Panel Survey. Social science & medicine (1982) 2013, 82:108-114.
- Carney PA, Yi JP, Abraham LA, Miglioretti DL, Aiello EJ, Gerrity MS, Reisch L, Berns EA, Sickles EA, Elmore JG: Reactions to uncertainty and the accuracy of diagnostic mammography. Journal of general internal medicine 2007, 22(2):234-241.
- Chicken DW, Sivanadarajah N, Keshtgar MRS: Patients' view on intraoperative diagnosis of sentinel nodes in breast cancer: is it an automatic choice? International journal of surgery (London, England) 2007, 5(2):76-80.
- Critical Appraisal Skills Programme (CASP). (2015). Critical Appraisal Skills Programme (CASP). [online]

Available at: http://www.casp-uk.net/#!casp-tools-checklists/c18f8 [Accessed 14 Feb. 2016].
- Davidson AS, Liao X, Magee BD: Attitudes of women in their forties toward the 2009 USPSTF mammogram guidelines: a randomized trial on the effects of media exposure. American journal of obstetrics and gynecology 2011, 205(1):30.e31-37.
- Davidson JA, Cromwell I, Ellard SL, Lohrisch C, Gelmon KA, Shenkier T, Villa D, Lim H, Sun S, Taylor S et al: A prospective clinical utility and pharmacoeconomic study of the impact of the 21-gene Recurrence Score assay in oestrogen receptor positive node negative breast cancer. European journal of cancer (Oxford, England : 1990) 2013, 49(11):2469-2475.
- Dowling EC, Klabunde C, Patnick J, Ballard-Barbash R, International Cancer Screening N: Breast and cervical cancer screening programme implementation in 16 countries. Journal of medical screening 2010, 17(3):139-146.
- Dreier M, Borutta B, Toppich J, Bitzer EM, Walter U: [Mammography and cervical cancer screening--a systematic review about women's knowledge, attitudes and participation in Germany]. Fruherkennung von Brust- und Gebarmutterhalskrebs--ein systematischer Review zu Wissen, Einstellungen und Inanspruchnahmeverhalten der Frauen in Deutschland 2012, 74(11):722-735.
- Ersin F, Gozukara F, Polat P, Ercetin G, Bozkurt ME: Determining the health beliefs and breast cancer fear levels of women regarding mammography. Turkish journal of medical sciences 2015, 45(4):775-781.
- Fiszer C, Dolbeault S, Sultan S, Bredart A: Prevalence, intensity, and predictors of the supportive care needs of women diagnosed with breast cancer: a systematic review. Psycho-oncology 2014, 23(4):361-374.
- Fowler BA: Social processes used by African American women in making decisions about mammography screening. Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing / Sigma Theta Tau 2006, 38(3):247-254.
- Fowler BA: Claiming health: mammography screening decision making of African American women. Oncology nursing forum 2006, 33(5):969-975.
- Ganott MA, Sumkin JH, King JL, Klym AH, Catullo VJ, Cohen CS, Gur D: Screening mammography: do women prefer a higher recall rate given the possibility of earlier detection of cancer? Radiology 2006, 238(3):793-800.
- Greco KE, Nail LM, Kendall J, Cartwright J, Messecar DC: Mammography decision making in older women with a breast cancer family history. Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing / Sigma Theta Tau 2010, 42(3):348-356.
- Green LE, Dinh TA, Hinds DA, Walser BL, Allman R: Economic evaluation of using a genetic test to direct breast cancer chemoprevention in white women with a previous breast biopsy. Applied health economics and health policy 2014, 12(2):203-217.
- Gupta S, Vij A, Cafiero E, Bloom D, Agarwal S, Donelan K, Kopans D, Saini S: Retail venue based screening mammography: assessment of women's preferences. Academic radiology 2012, 19(10):1268-1272.
- Gurmankin Levy A, Micco E, Putt M, Armstrong K: Value for the future and breast cancer-preventive health behavior. Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology 2006, 15(5):955-960.
- Guyatt GH, Oxman AD, Schunemann HJ, Tugwell P, Knottnerus A: GRADE guidelines: a new series of articles in the Journal of Clinical Epidemiology. J Clin Epidemiol 2011, 64(4):380-382.
- Halkett GKB, Arbon P, Scutter SD, Borg M: The phenomenon of making decisions during the experience of early breast cancer. European journal of cancer care 2007, 16(4):322-330.
- Harding V, Afshar M, Krell J, Ramaswami R, Twelves CJ, Stebbing J: 'Being there' for women with metastatic breast cancer: a pan-European patient survey. British journal of cancer 2013, 109(6):1543-1548.
- Henderson BJ, Tyndel S, Brain K, Clements A, Bankhead C, Austoker J, Watson E, Group PSM, Duffy S, Evans G et al: Factors associated with breast cancer-specific distress in younger women participating in a family history mammography screening programme. Psycho-oncology 2008, 17(1):74-82.
- Hersch J, Jansen J, Barratt A, Irwig L, Houssami N, Howard K, Dhillon H, McCaffery K: Women's views on overdiagnosis in breast cancer screening: a qualitative study. BMJ (Clinical research ed) 2013, 346:f158.
- Hersch J, Jansen J, Barratt A, Irwig L, Houssami N, Jacklyn G, Thornton H, Dhillon H, McCaffery K: Overdetection in breast cancer screening: development and preliminary evaluation of a decision aid. BMJ open 2014, 4(9):e006016.
- Higgins J, Green S: Cochrane Handbook for Systematic Reviews of Interventions; 2011.
- Hobbs MM, Taylor DB, Buzynski S, Peake RE: Contrast-enhanced spectral mammography (CESM) and contrast enhanced MRI (CEMRI): Patient preferences and tolerance. Journal of medical imaging and radiation oncology 2015, 59(3):300-305.

- Ives A, Musiello T, Saunders C: The experience of pregnancy and early motherhood in women diagnosed with gestational breast cancer. Psycho-oncology 2012, 21(7):754-761.
- Jimbo M, Rana GK, Hawley S, Holmes-Rovner M, Kelly-Blake K, Nease DE, Jr., Ruffin MTt: What is lacking in current decision aids on cancer screening? CA: a cancer journal for clinicians 2013, 63(3):193-214.
- Jones B: BresDex: helping women make breast cancer surgery choices. Journal of visual communication in medicine 2012, 35(2):59-64.
- Jones SL, Hadjistavropoulos HD, Gullickson K: Understanding health anxiety following breast cancer diagnosis. Psychology, health & medicine 2014, 19(5):525-535.
- Kang D-H, Park N-J, McArdle T: Cancer-specific stress and mood disturbance: implications for symptom perception, quality of life, and immune response in women shortly after diagnosis of breast cancer. ISRN nursing 2012, 2012:608039.
- Khan MA, Shafique S, Khan MT, Shahzad MF, Iqbal S: Presentation delay in breast cancer patients, identifying the barriers in North Pakistan. Asian Pacific journal of cancer prevention : APJCP 2015, 16(1):377-380.
- Kim S, Ko YH, Jun EY: The impact of breast cancer on mother-child relationships in Korea. Psycho-oncology 2012, 21(6):640-646.
- Lally RM, Hydeman JA, Schwert KT, Edge SB: Unsupportive social interactions in the weeks immediately following breast cancer diagnosis. Journal of psychosocial oncology 2013, 31(4):468-488.
- Leonard RC, Barrett-Lee PJ, Gosney MA, Willett AM, Reed MW, Hammond PJ: Effect of patient age on management decisions in breast cancer: consensus from a national consultation. The oncologist 2010, 15(7):657-664.
- Leung GM, Woo PPS, Cowling BJ, Tsang CSH, Cheung ANY, Ngan HYS, Galbraith K, Lam T-H: Who receives, benefits from and is harmed by cervical and breast cancer screening among Hong Kong Chinese? Journal of public health (Oxford, England) 2008, 30(3):282-292.
- Lewin S, Glenton C, Munthe-Kaas H, Carlsen B, Colvin CJ, Gulmezoglu M, Noyes J, Booth A, Garside R, Rashidian A: Using qualitative evidence in decision making for health and social interventions: an approach to assess confidence in findings from qualitative evidence syntheses (GRADE-CERQual). PLoS Med 2015, 12(10):e1001895.
- Mackenzie CR: 'It is hard for mums to put themselves first': how mothers diagnosed with breast cancer manage the sociological boundaries between paid work, family and caring for the self. Social science & medicine (1982) 2014, 117:96-106.
- Mandelblatt JS, Sheppard VB, Hurria A, Kimmick G, Isaacs C, Taylor KL, Kornblith AB, Noone A-M, Luta G, Tallarico M et al: Breast cancer adjuvant chemotherapy decisions in older women: the role of patient preference and interactions with physicians. Journal of clinical oncology : official journal of the American Society of Clinical Oncology 2010, 28(19):3146-3153.
- Marcus EN, Drummond D, Dietz N: Urban women's preferences for learning of their mammogram result: a qualitative study. Journal of cancer education : the official journal of the American Association for Cancer Education 2012, 27(1):156-164.
- McCann L, Illingworth N, Wengstrom Y, Hubbard G, Kearney N: Transitional experiences of women with breast cancer within the first year following diagnosis. Journal of clinical nursing 2010, 19(13-14):1969-1976.
- McCorry NK, Dempster M, Quinn J, Hogg A, Newell J, Moore M, Kelly S, Kirk SJ: Illness perception clusters at diagnosis predict psychological distress among women with breast cancer at 6 months post diagnosis. Psycho-oncology 2013, 22(3):692-698.
- Metcalfe KA, Quan M-L, Eisen A, Cil T, Sun P, Narod SA: The impact of having a sister diagnosed with breast cancer on cancer-related distress and breast cancer risk perception. Cancer 2013, 119(9):1722-1728.
- Miller LS, Shelby RA, Balmadrid MH, Yoon S, Baker JA, Wildermann L, Soo MS: Patient anxiety before and immediately after imaging-guided breast biopsy procedures: impact of radiologist-patient communication. Journal of the American College of Radiology : JACR 2013, 10(6):423-431.
- Moher D, Liberati A, Tetzlaff J, Altman DG: Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ 2009, 339:b2535.
- Molina Y, Beresford SAA, Espinoza N, Thompson B: Psychological distress, social withdrawal, and coping following receipt of an abnormal mammogram among different ethnicities: a mediation model. Oncology nursing forum 2014, 41(5):523-532.
- Muhlbacher AC, Juhnke C: Patient preferences versus physicians' judgement: does it make a difference in healthcare decision making? Appl Health Econ Health Policy 2013, 11(3):163-180.

- Nekhlyudov L, Li R, Fletcher SW: Informed decision making before initiating screening mammography: does it occur and does it make a difference? Health expectations : an international journal of public participation in health care and health policy 2008, 11(4):366-375.
- Obeidat R, Khrais HI: Information needs and disclosure preferences among Jordanian women diagnosed with breast cancer. Journal of cancer education : the official journal of the American Association for Cancer Education 2015, 30(1):94-99.
- Obeidat RF, Dickerson SS, Homish GG, Alqaissi NM, Lally RM: Controlling fear: Jordanian women's perceptions of the diagnosis and surgical treatment of early-stage breast cancer. Cancer nursing 2013, 36(6):484-492.
- Obeidat R, Finnell DS, Lally RM: Decision aids for surgical treatment of early stage breast cancer: a narrative review of the literature. Patient education and counseling 2011, 85(3):e311-321.
- Oh D-Y, Crawford B, Kim S-B, Chung H-C, McDonald J, Lee SY, Ko S-K, Ro J: Evaluation of the willingness-to-pay for cancer treatment in Korean metastatic breast cancer patients: a multicenter, cross-sectional study. Asia-Pacific journal of clinical oncology 2012, 8(3):282-291.
- Ollivier L, Apiou F, Leclere J, Sevellec M, Asselain B, Bredart A, Neuenschwander S: Patient experiences and preferences: development of practice guidelines in a cancer imaging department. Cancer imaging : the official publication of the International Cancer Imaging Society 2009, 9 Spec No A:S92-97.
- Osterlie W, Solbjor M, Skolbekken JA, Hofvind S, Saetnan AR, Forsmo S: Challenges of informed choice in organised screening. Journal of medical ethics 2008, 34(9):e5.
- Pasternack I, Saalasti-Koskinen U, Makela M: Decision aid for women considering breast cancer screening. International journal of technology assessment in health care 2011, 27(4):357-362.
- Peate M, Meiser B, Cheah BC, Saunders C, Butow P, Thewes B, Hart R, Phillips KA, Hickey M, Friedlander M: Making hard choices easier: a prospective, multicentre study to assess the efficacy of a fertility-related decision aid in young women with early-stage breast cancer. British journal of cancer 2012, 106(6):1053-1061.
- Peate M, Meiser B, Friedlander M, Saunders C, Martinello R, Wakefield CE, Hickey M: Development and pilot testing of a fertility decision aid for young women diagnosed with early breast cancer. The breast journal 2011, 17(1):112-114.
- Pivot X, Eisinger F, Blay J-Y, Coscas Y, Calazel-Benque A, Viguier J, Roussel C, Morere J-F: Mammography utilization in women aged 40-49 years: the French EDIFICE survey. European journal of cancer prevention : the official journal of the European Cancer Prevention Organisation (ECP) 2011, 20 Suppl 1:S16-19.
- Presutti R, D'Alimonte L, McGuffin M, Chen H, Chow E, Pignol J-P, Di Prospero L, Doherty M, Kiss A, Wong J et al: Decisional support throughout the cancer journey for older women diagnosed with early stage breast cancer: a single institutional study. Journal of cancer education : the official journal of the American Association for Cancer Education 2014, 29(1):129-135.
- Rottmann N, Helmes AW, Vogel BA: Patients' needs and experiences at breast cancer diagnosis: how perceived threat influences the physician-patient interaction. Journal of psychosocial oncology 2010, 28(2):157-172.
- Schonberg MA, Birdwell RL, Bychkovsky BL, Hintz L, Fein-Zachary V, Wertheimer MD, Silliman RA: Older women's experience with breast cancer treatment decisions. Breast cancer research and treatment 2014, 145(1):211-223.
- Schonberg MA, McCarthy EP, York M, Davis RB, Marcantonio ER: Factors influencing elderly women's mammography screening decisions: implications for counseling. BMC geriatrics 2007, 7:26.
- Schonberg MA, Ramanan RA, McCarthy EP, Marcantonio ER: Decision making and counseling around mammography screening for women aged 80 or older. Journal of general internal medicine 2006, 21(9):979-985.
- Schonberg MA, Silliman RA, Ngo LH, Birdwell RL, Fein-Zachary V, Donato J, Marcantonio ER: Older women's experience with a benign breast biopsy-a mixed methods study. Journal of general internal medicine 2014, 29(12):1631-1640.
- Shaffer VA, Tomek S, Hulsey L: The effect of narrative information in a publicly available patient decision aid for early-stage breast cancer. Health communication 2014, 29(1):64-73.
- Singh-Carlson S, Nguyen SKA, Wong F: Perceptions of survivorship care among South Asian female breast cancer survivors. Current oncology (Toronto, Ont) 2013, 20(2):e80-89.
- Spittler CA, Pallikathayil L, Bott M: Exploration of how women make treatment decisions after a breast cancer diagnosis. Oncology nursing forum 2012, 39(5):E425-433.
- Swainston K, Campbell C, van Wersch A, Durning P: Treatment decision making in breast cancer: a longitudinal exploration of women's experiences. British journal of health psychology 2012, 17(1):155-170.
- Swan JS, Ying J, Stahl J, Kong CY, Moy B, Roy J, Halpern E: Initial development of the Temporary Utilities

Index: a multiattribute system for classifying the functional health impact of diagnostic testing. Quality of life research : an international journal of quality of life aspects of treatment, care and rehabilitation 2010, 19(3):401-412.
- Taguchi R, Yamazaki Y, Nakayama K: [Eliciting preferences for mammography: using a discrete choice experiment approach]. [Nihon koshu eisei zasshi] Japanese journal of public health 2010, 57(2):83-94.
- Tobiasz-Adamczyk B, Zawisza K, Florek M, Hodorowicz-Zaniewska D: [Preoperative quality of life in women with pathological alteration in breast]. Jakosc ycia kobiet ze zmianami patologicznymi piersi w okresie przygotowawczym do zabiegu chirurgicznego 2013, 70(4):180-186.
- Thompson J, Coleman R, Colwell B, Freeman J, Greenfield D, Holmes K, Mathers N, Reed M: Levels of distress in breast cancer survivors approaching discharge from routine hospital follow-up. Psycho-oncology 2013, 22(8):1866-1871.
- Thomson MD, Siminoff LA: Perspectives on mammography after receipt of secondary screening owing to a false positive. Women's health issues : official publication of the Jacobs Institute of Women's Health 2015, 25(2):128-133.
- Tosteson ANA, Fryback DG, Hammond CS, Hanna LG, Grove MR, Brown M, Wang Q, Lindfors K, Pisano ED: Consequences of false-positive screening mammograms. JAMA internal medicine 2014, 174(6):954-961.
- Tyndel S, Austoker J, Henderson BJ, Brain K, Bankhead C, Clements A, Watson EK: What is the psychological impact of mammographic screening on younger women with a family history of breast cancer? Findings from a prospective cohort study by the PIMMS Management Group. Journal of clinical oncology : official journal of the American Society of Clinical Oncology 2007, 25(25):3823-3830.
- Van den Bruel A, Jones C, Yang Y, Oke J, Hewitson P: People's willingness to accept overdetection in cancer screening: population survey. BMJ (Clinical research ed) 2015, 350:h980.
- Vernon SW: Risk perception and risk communication for cancer screening behaviors: a review. Journal of the National Cancer Institute Monographs 1999(25):101-119.
- Waller J, Douglas E, Whitaker KL, Wardle J: Women's responses to information about overdiagnosis in the UK breast cancer screening programme: a qualitative study. BMJ open 2013, 3(4).
- Waller J, Whitaker KL, Winstanley K, Power E, Wardle J: A survey study of women's responses to information about overdiagnosis in breast cancer screening in Britain. British journal of cancer 2014, 111(9):1831-1835.
- Watson-Johnson LC, DeGroff A, Steele CB, Revels M, Smith JL, Justen E, Barron-Simpson R, Sanders L, Richardson LC: Mammography adherence: a qualitative study. Journal of women's health (2002) 2011, 20(12):1887-1894.
- Wevers MR, Ausems MGEM, Verhoef S, Bleiker EMA, Hahn DEE, Hogervorst FBL, van der Luijt RB, Valdimarsdottir HB, van Hillegersberg R, Rutgers EJTH et al: Behavioral and psychosocial effects of rapid genetic counseling and testing in newly diagnosed breast cancer patients: design of a multicenter randomized clinical trial. BMC cancer 2011, 11:6.
- Willis K: "I come because I am called": recruitment and participation in mammography screening in Uppsala, Sweden. Health care for women international 2008, 29(2):135-150.
- Wood RY, Della-Monica NR: Psychosocial factors influencing breast cancer risk appraisal among older women. Qualitative health research 2011, 21(6):783-795.
- Yasunaga H, Ide H, Imamura T, Ohe K: Women's anxieties caused by false positives in mammography screening: a contingent valuation survey. Breast cancer research and treatment 2007, 101(1):59-64.