APPENDICES ONLY

Go to main text

The impact of screening on future health-promoting behaviours and health beliefs: a systematic review

CR Bankhead
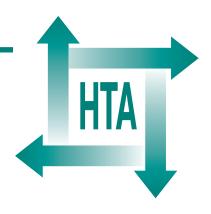J Brett
C Bukach
P Webster
S Stewart-Brown
M Munafo
J Austoker

**Health Technology Assessment
NHS R&D HTA Programme**

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Appendix 1

Literature search terms

MEDLINE: 1980 to 2000 (SilverPlatter ASCII 3.0)

1. explode "MAMMOGRAPHY"/without-subheadings, adverse-effects, economics, mortality, nursing, psychology, statistics-and-numerical-data, trends, utilization
2. explode "BREAST-NEOPLASMS"/without-subheadings, classification, diagnosis, economics, prevention-and-control, radiography
3. BREAST
4. SCREENING
5. BREAST SCREENING
6. MAMMOGRA*
7. #1 or #2 or #5 or #6
8. "HEALTH-PROMOTION"/without-subheadings, economics, organization-and-administration, supply-and-distribution, statistics-and-numerical-data, trends, utilization
9. explode "KNOWLEDGE,-ATTITUDES,-PRACTICE"/all subheadings
10. explode "HEALTH-BEHAVIOR"/without-subheadings, classification, economics, ethnology, mortality, nursing, psychology, statistics-and-numerical-data, trends, utilization
11. explode "ATTITUDE-TO-HEALTH"/without-subheadings, classification, economics, ethnology, mortality, nursing, psychology, statistics-and-numerical-data, trends, utilization
12. explode "PATIENT-PARTICIPATION"/without-subheadings, economics, psychology, statistics-and-numerical-data, trends, utilization
13. explode "PATIENT-ACCEPTANCE-OF-HEALTH-CARE"/without-subheadings, economics, ethnology, psychology, statistics-and-numerical-data, trends, utilization
14. explode "CONSUMER-PARTICIPATION"/without-subheadings, economics, psychology, statistics-and-numerical-data, trends, utilization
15. explode "CONSUMER-SATISFACTION"/without-subheadings, economics, ethnology, statistics-and-numerical-data
16. explode "HEALTH-STATUS"/without-subheadings, classification, statistics-and-numerical-data
17. explode "VAGINAL-SMEARS"/without-subheadings, classification, economics, mortality, nursing, psychology, statistics-and-numerical-data, trends, utilization
18. explode "TOBACCO-USE-CESSATION"/without-subheadings, economics, ethnology, psychology, statistics-and-numerical-data
19. explode "FOOD-HABITS"/without-subheadings, classification, ethnology, psychology
20. explode "DRINKING-BEHAVIOR"/without-subheadings, economics, ethnology, mortality, prevention-and-control, psychology, trends
21. explode "EXERCISE"/all subheadings
22. explode "BREAST-SELF-EXAMINATION"/without-subheadings, classification, economics, mortality, nursing, psychology, statistics-and-numerical-data, trends, utilization
23. explode "SEX-BEHAVIOR"/without-subheadings, classification, economics, ethnology, mortality, nursing, prevention-and-control, psychology, statistics-and-numerical-data, trends
24. explode "MAMMOGRAPHY"/without-subheadings, psychology, statistics-and-numerical-data, trends, utilization
25. explode "HYPERCHOLESTEROLEMIA"/without-subheadings, blood, diet-therapy, diagnosis, economics, prevention-and-control, psychology, therapy
26. "SICK-ROLE"
27. #8 or #9 or #10 or #11 or #12 or #13
28. #27 or #14 or #15 or #16 or #18 or #19
29. #28 or #20 or #21 or #22 or #23 or #25 or #26
30. HEALTH
31. BELIEFS
32. HEALTH BELIEFS
33. #29 or #32
34. uptake
35. attend*
36. reattend*
37. accept*

38. adher*
39. complian*
40. #17 and #34
41. #17 and #35
42. #17 and #36
43. #17 and #37
44. #17 and #38
45. #17 and #39
46. #40 or #41 or #42 or #43 or #44 or #45
47. #24 and #34
48. #24 and #35
49. #24 and #36
50. #24 and #37
51. #24 and #38
52. #24 and #39
53. #47 or #48 or #49 or #50 or #51 or #52
54. #33 or #46 or #53
55. #7 and #54
56. explode "VAGINAL-SMEARS"/without-subheadings, adverse-effects, economics, mortality, nursing, psychology, statistics-and-numerical-data, trends, utilization
57. "CERVIX-NEOPLASMS"/without-subheadings, classification, diagnosis, economics, prevention-and-control
58. CERVI*
59. SCREEN*
60. CERVI* SCREEN*
61. SMEAR
62. TEST*
63. SMEAR TEST*
64. CERVI*
65. SMEAR*
66. CERVI* SMEAR*
67. PAP
68. SMEAR*
69. PAP SMEAR*
70. VAGI*
71. SMEAR*
72. VAGI* SMEAR*
73. #56 or #57 or #60 or #63 or #66 or #69 or #72
74. #73 and #54
75. #74 or #55
76. explode "HYPERCHOLESTEROLEMIA"/without-subheadings, blood, classification, diagnosis, economics, ethnology, epidemiology, mortality, nursing, prevention-and-control
77. CHOLESTEROL
78. TEST*
79. CHOLESTEROL TEST*
80. LIPID
81. TEST*
82. LIPID TEST*
83. explode "POPULATION-SURVEILLANCE"/all subheadings

84. #83 and #77
85. HYPERCHOLEST*
86. #83 and #85
87. explode "MASS-SCREENING"/without-subheadings, adverse-effects, classification, economics, mortality, nursing, organization-and-administration, psychology, statistics-and-numerical-data, trends, utilization
88. #87 and #77
89. #87 and #85
90. #76 or #79 or #82 or #84 or #86 or #88 or #89
91. ANIMAL in TG
92. #90 not (ANIMAL in TG)
93. #92 and #54
94. #75 or #93

PsychInfo: 1977 to November 2000 (SilverPlatterASCII 3.0)

1. explode "Mammography"
2. explode "Breast-Neoplasms"
3. explode "Cancer-Screening"
4. explode "Screening-Tests"
5. breast
6. screening
7. breast screening
8. mammogra*
9. cervi*
10. screen*
11. cervi* screen*
12. smear
13. test*
14. smear test*
15. cervi*
16. smear*
17. cervi* smear*
18. Pap
19. smear*
20. Pap smear*
21. Vagi*
22. smear*
23. Vagi* smear*
24. explode "Metabolism-Disorders"
25. cholesterol
26. test*
27. cholesterol test*
28. lipid
29. test*
30. lipid test*
31. #1 or #2 or #7 or #8
32. #31 or #11 or #14 or #17 or #20 or #23
33. #32 or #27 or #30
34. #4 and #5
35. #4 and #9
36. #4 and #25

37. #24 and #25
38. #24 and #28
39. #33 or #34 or #35 or #36 or #37 or #38
40. #3 and #5
41. #3 and #9
42. #39 or #40 or #41
43. "Health-Attitudes" in DE
44. "Health-Behavior" in DE
45. "Health-Care-Seeking-Behavior" in DE
46. "Health-Care-Utilization" in DE
47. "Health-Promotion" in DE
48. explode "Health-Screening"
49. "Attitude-Change" in DE
50. "Alcohol-Drinking-Attitudes" in DE
51. explode "Attitudes"
52. "Attitudes-" in DE
53. "Client-Participation" in DE
54. explode "Consumer-Satisfaction"
55. "Health-" in DE
56. "Tobacco-Smoking" in DE
57. "Smoking-Cessation" in DE
58. explode "Food-Intake"
59. "Eating-Attitudes" in DE
60. explode "Drinking-Behavior"
61. explode "Exercise"
62. "Self-Examination-Medical" in DE
63. explode "Psychosexual-Behavior"
64. health
65. beliefs
66. health beliefs
67. #43 or #44 or #45 or #46 or #47 or #48
68. #67 or #49 or #50 or #51 or #52 or #53 or #54 or #55
69. #68 or #56 or #57 or #58 or #59 or #60 or #61 or #62
70. #69 or #63 or #66
71. #70 or #3 or #4
72. #42 and #71

EMBASE: 1980 to January 2001 (SilverPlatterASCII 3.0)

1. explode "mammography"/without-subheadings, complication, clinical-trial, diagnosis, epidemiology, etiology, prevention, side-effect
2. explode "breast-tumor"/without-subheadings, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention
3. breast
4. screening
5. breast screening
6. mammogra*
7. explode "vagina-smear"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, side-effect
8. "Papanicolaou-test"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, side-effect
9. "uterine-cervix-cytology"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, side-effect
10. explode "uterine-cervix-tumor"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, side-effect
11. cervi*
12. screen*
13. cervi* screen*
14. smear
15. test*
16. smear test*
17. cervi*
18. smear*
19. cervi* smear*
20. pap
21. smear*
22. pap smear*
23. vagi*
24. smear*
25. vagi* smear*
26. explode "hyperlipidemia"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, side-effect
27. cholesterol
28. test*
29. cholesterol test*
30. lipid
31. test*
32. lipid test*
33. "cancer-screening"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, side-effect
34. #33 and #3
35. #33 and #11
36. explode "screening"/without-subheadings, complication, clinical-trial, diagnosis, epidemiology, etiology, prevention, side-effect
37. #36 and #3
38. #36 and #11
39. #36 and #27
40. #1 or #2 or #5 or #6 or #7 or #8
41. #40 or #9 or #10 or #13 or #16 or #19
42. #41 or #22 or #25 or #26 or #29
43. #42 or #32 or #34 or #35 or #37 or #38 or #39
44. "attitude"/without-subheadings, complication, clinical-trial, diagnosis, disease-management,

83

epidemiology, etiology, prevention, rehabilitation, side-effect

45. explode "health-promotion"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

46. explode "health"/without-subheadings, complication, clinical-trial, diagnosis, epidemiology, etiology, prevention, rehabilitation, side-effect

47. explode "health-behavior"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

48. patient

49. participation

50. patient participation

51. consumer

52. participation

53. consumer participation

54. explode "patient-attitude"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

55. consumer

56. satisfaction

57. consumer satisfaction

58. explode "health-status"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

59. explode "smoking-cessation"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

60. explode "feeding-behavior"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation

61. explode "human"/all subheadings

62. #60 and #61

63. "drinking-behavior"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

64. explode "exercise"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

65. explode "self-examination"/without-subheadings, complication, clinical-trial, diagnosis, disease-management,

epidemiology, etiology, prevention, rehabilitation, side-effect

66. explode "sexual-behavior"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

67. "illness-behavior"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, rehabilitation, side-effect

68. explode "malingering"/without-subheadings, complication, clinical-trial, diagnosis, disease-management, epidemiology, etiology, prevention, rehabilitation, side-effect

69. #44 or #45 or #46 or #47 or #50

70. #69 or #53 or #54 or #57 or #58 or #59

71. #70 or #62 or #63 or #64 or #65 or #66 or #67 or #68

72. #43 and #71

CINAHL: 1982 to November 2000 (SilverPlatterASCII 3.0)

1. explode "Mammography"/adverse-effects, contraindications, economics, education, ethical-issues, mortality, nursing, psychosocial-factors, trends, utilization /without-subheadings, in-adulthood, in-old-age, in-pregnancy, in-middle-age

2. explode "Mammography"/all topical subheadings /without-subheadings, in-adulthood, in-old-age, in-pregnancy, in-middle-age

3. "Breast-Neoplasms"/all topical subheadings/without-subheadings, in-adulthood, in-old-age, in-pregnancy, in-middle-age

4. breast

5. screening

6. breast screening

7. mammogra*

8. "Cervical-Smears"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age

9. cervi*

10. screen*

11. cervi* screen*

12. "Cervix-Neoplasms"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age

13. smear

14. test*

15. smear test*

16. cervi*
17. smear*
18. cervi* smear*
19. pap
20. smear*
21. pap smear*
22. vagi*
23. smear
24. vagi* smear
25. explode "Hyperlipidemia"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
26. cholesterol
27. test*
28. cholesterol test*
29. lipid
30. test*
31. lipid test*
32. "Cancer-Screening"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
33. #32 and #4
34. #32 and #9
35. "Health-Screening"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
36. cancer
37. #35 and cancer
38. breast
39. cancer
40. #35 and breast cancer
41. cervical
42. cancer
43. #35 and cervical cancer
44. cholesterol
45. #35 and cholesterol
46. lipid
47. #35 and lipid
48. hyperchol*
49. #35 and hyperchol*
50. #2 or #3 or #6 or #7 or #8 or #11
51. #50 or #12 or #15 or #18 or #21 or #24
52. #51 or #25 or #28 or #31 or #33 or #34 or #40 or #43 or #45
53. #52 or #47 or #49
54. "Health-Promotion"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
55. "Health-Knowledge"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
56. explode "Health-Behavior"/all topical subheadings /all age subheadings
57. explode "Attitude-to-Health"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
58. "Consumer-Participation"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
59. "Patient-Satisfaction"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
60. explode "Health-Status"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
61. uptake
62. #8 and uptake
63. attend*
64. #8 and attend*
65. reattend*
66. #8 and reattend*
67. accept*
68. #8 and accept*
69. adher*
70. #8 and adher*
71. complian*
72. #8 and complian*
73. "Smoking-Cessation"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
74. "Food-Habits"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
75. explode "Drinking-Behavior"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
76. explode "Exercise"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
77. "Breast-Self-Examination"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
78. explode "Sexuality"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
79. uptake
80. #2 and uptake
81. attend*

82. #2 and attend*
83. reattend*
84. #2 and reattend*
85. accept*
86. #2 and accept*
87. adher*
88. #2 and adher*
89. complian*
90. #2 and complian*
91. explode "Hyperlipidemia"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
92. "Health-Beliefs"/all topical subheadings /all age subheadings
93. "Health-Beliefs"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age

94. "Sick-Role"/all topical subheadings /without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
95. "Patient-Attitudes"/all topical subheadings/without-subheadings, in-adolescence, in-adulthood, in-old-age, in-pregnancy, in-middle-age
96. #54 or #55 or #56 or #57 or #58 or #59 or #60
97. #96 or #62 or #64 or #66 or #68 or #70 or #72 or #73
98. #97 or #74 or #75 or #76 or #77 or #78 or #80 or #82
99. #98 or #84 or #86 or #88 or #90 or #91 or #93
100. #99 or #94 or #95
101. #53 and #100

Appendix 2

Data extraction form and quality assessment criteria

Data extraction form

Identification

Reviewer:	--
Study number/ Ref. Man. No.	--
Quality scoring:	

Study details

Title					
Authors					
Journal					
Year	Vol.	Pages	to	Country	
Study aims					
Study setting					
Study design	Cohort	Case–control	Qualitative (state type)	RCT	Cross-sectional	Other (state)
Domain of screening					
Participants/ages					
Sample size/power calculations		Follow-up % (if appropriate)			
Comparative groups					
Describe basic study method					

Outcomes = Health belief/Health behaviour

	Method of assessment:		*Observed or self-reported:*
Health behaviour			
Lifestyle change[a] (describe)			
Lifestyle confirmation[b] (describe)			
Uptake at screening			
Visits to GP or other health services (describe)			
Other (describe)			
Health beliefs			
Knowledge (describe)			
Attitudes (describe)			
Other (describe)			

[a] Lifestyle change, e.g. stop smoking, change diet, cut down on alcohol, more exercise.
[b] Lifestyle confirmation, e.g. continue smoking, maintain diet, maintain alcohol level, maintain exercise level.

Results

Health behaviour	
Lifestyle change[a] (describe)	
Lifestyle confirmation[b] (describe)	
Uptake at screening	
Visits to GP or other health services (describe)	
Other (describe)	

Health beliefs	
Knowledge (describe)	
Attitudes (describe)	
Other (describe)	

[a] Lifestyle change, e.g. stop smoking, change diet, cut down on alcohol, more exercise.

[b] Lifestyle confirmation, e.g. continue smoking, maintain diet, maintain alcohol level, maintain exercise level.

Summary of main findings

Quality assessment criteria

Quality checklist for qualitative studies

	Adequate 3	Partial 2	Inadequate/ not reported 1	NA
Are research methods appropriate to the question being asked?				
Is there a clear connection to an existing body of knowledge/wider theoretical framework?				
Are the criteria for/approach to sample selection, data collection and analysis clear and systematically applied?				
Is the relationship between the researcher and the researched considered and have the latter been fully informed?				
Is sufficient consideration given to how findings are derived from the data and how the validity of the findings were tested?				
Has evidence for and against the researchers interpretation been considered?				
Is the context for the research adequately described and accounted for?				
Are findings systematically reported and is sufficient original evidence reported to justify relationship between evidence and conclusions?				
Are the researchers clear about their own positions in relation to the research topic?				
External validity (relevance to different populations/size of study)				

Quality checklist for cohort studies

	Adequate 3	Partial 2	Inadequate/ not reported 1	NA
Is there sufficient description of the groups and the distribution of the prognostic factors?				
Are the groups assembled at a similar point in their screening progression?				
Is the exposure reliably ascertained?				
Were the groups comparable on all important confounding variables?				
Was there adequate adjustment for the effects of these confounding variables?				
Was a dose (e.g. severity of screening) relationship between exposure and outcome demonstrated?				
Was outcome assessment blind to exposure status? (if applicable)				
Was follow-up long enough for the outcomes to occur?				
What proportion of the cohort was followed up?				
Were dropout rates and reasons similar in exposed and unexposed groups?				
External validity (relevance to different populations/size of study)				

Case–control studies

	Adequate 3	Partial 2	Inadequate/ not reported 1	NA
Is the case definition explicit?				
Has the screening state of the cases been reliably assessed and validated?				
Were the controls randomly selected from the source of population of the cases?				
How comparable are the cases and controls with respect to potential confounding factors?				
Were interventions and other exposures assessed in the same way for cases and controls?				
What was the response rate defined as?				
Were the non-response rates and reasons the same in both groups?				
Is it possible that over-matching has occurred in that cases and controls were matched on factors related to exposure?				

Was an appropriate statistical analysis used (matched or unmatched)?				
External validity (relevance to different populations/size of study)				

Case series studies

	Adequate 3	Partial 2	Inadequate/ not reported 1	NA
Is the study based on a representative sample selected from a relevant population?				
Are the criteria for inclusion explicit?				
Did all individuals enter the survey at a similar point in their disease progression?				
Was follow-up long enough for important events to occur?				
Were outcomes assessed using objective criteria or was blinding used?				
If comparisons of subseries are being made, was there sufficient description of the series and the distribution of prognostic factors?				
External validity (relevance to different populations/size of study)				

Cross-sectional studies

	Adequate 3	Partial 2	Inadequate/ not reported 1	NA
Is there sufficient description of the groups and the distribution of the prognostic factors?				
Are the groups assembled at a similar point in their screening progression?				
Is the exposure reliably ascertained?				
Were the groups comparable on all important confounding variables?				
Was there adequate adjustment for the effects of these confounding variables?				
Was a dose (e.g. severity of screening) relationship between exposure and outcome demonstrated?				
Was outcome assessment blind to exposure status? (if applicable)				
External validity (relevance to different populations/size of study)				

Quality checklist for RCTs

	Adequate 3	Partial 2	Inadequate/ not reported 1	NA
Was the assignment to the intention/control groups really random?				
Was the intervention allocation concealed?				
Were the groups similar at baseline regarding prognostic factors?				
Were the eligibility criteria specified?				
Were outcome assessors blinded to the intervention/control allocation?				
Was the care provider blinded to the intervention/control allocation?				
Was the care provider blinded?				
Was the patient blinded?				
Were the point estimates and measure of variability presented for the primary outcome measure?				
Did the analysis include an intention-to-treat analysis?				
Transferability/limitations/comments				

Appendix 3

Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Aubin et al. (1998)[45] 1363 med Canada	RCT	Healthcare screening (two hospital-based family medical centres)	All patients 18–65 years in two family medical centres who did not know their cholesterol level	Those randomised to group 1 were informed of test results before completing the questionnaire. Control and Group 2 were informed of test results after completing questionnaires Cholesterol risk category[b]	3 months after screening	Dietary change (using Block Fat Screener) Cholesterol change Labelling (effects of knowing high cholesterol status) Baseline questionnaire with follow-up telephone interview
Baer (1993)[46] 1308 cin USA	Cohort	Worksite screening (nutritional education programme)	Invention group: mean age 44 ± 4 years, mean weight 86 ± 2.3 kg) Control group: mean age 35 ± 3 years, mean weight 85 ± 2.8 kg	Intervention group received screening and enhanced nutritional education programme with a telephone call to encourage adherence to diet Control group received screening without enhanced nutritional educational programme	1 year after screening	Dietary change (using survey-specific food types questionnaire) Exercise change (using increase in frequency of exercise) Weight change Cholesterol change Dietary records and interview with nutritionist
Baier et al. (1992)[47] 1890 emb USA	Cohort	Community screening	Study population: 71.3% women, 28.7% men; 33.2% 0–29 years, 35% 30–39 years, 19.4% 40–49 years, 8.9% 50–59 years, and 3.5% ≥ 60 years; 57.3% white	Cholesterol risk category	3 months and 6 months after screening. At 8 months retested	Dietary change (using survey-specific food types questionnaire) Exercise change (using increase in frequency of exercise) Weight change Adherence with referral to see doctor Smoking cessation (level of reduction in cigarettes smoked) Knowledge[c] (personal) Questionnaire survey

Appendix 3 cont'd   Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Barrere (1994)[48] 3663 med USA	Non randomised intervention study	Worksite screening (hospital employees)	29–78 years old, 70% married, 67% women, 94% white, 57% high school education	Those (non-randomly) assigned to traditional health education after receiving blood cholesterol results — Those (non-randomly) assigned to goal-orientated health education after receiving blood cholesterol results	3 months after screening	Dietary change (using Food Habits Questionnaire) Cholesterol change — Questionnaire survey
Barrere (1994)[48] 3663 med USA	Non randomised intervention study	Worksite screening (hospital employees)	29–78 years old, 70% married, 67% women, 94% white, 57% high school education	Those (non-randomly) assigned to traditional health education after receiving blood cholesterol results — Those (non-randomly) assigned to goal-orientated health education after receiving blood cholesterol results	3 months after screening	Dietary change (using Food Habits Questionnaire) Cholesterol change — Questionnaire survey
Beerman et al. (1991)[49] 5548 med USA	Cohort	Community screening (health fair)	Adults. Mean age 43.4 ± 14 years in whole sample and 39.7 ± 14) years in follow-up	None	3 months after screening	Dietary change (reported as dietary change/no change) Adherence with referral to see doctor Knowledge (personal) — Telephone interviews
Beerman et al. (1992)[50] 428 psy USA	Cohort	Community screening (health fair)	49% were male. Mean age 42 ± 16.9 years	<200 mg/dl, no prior cholesterol test <200 mg/dl, prior cholesterol test >200 mg/dl, no prior cholesterol test >200 mg/dl, prior cholesterol test	None	Dietary change (using increase in frequency of exercise) Exercise change Smoking cessation — Questionnaire survey

Appendix 3 cont'd   *Cholesterol screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Bell and Joseph (1990)[51] 5901 med USA	Cohort (prospective)	Community screening	Adults. 53% women; 95% white. Broad range of ages	None	4–6 months after screening	Dietary change (using mild, moderate or major changes to diet) Exercise change (change in proportion exercising regularly) Adherence with follow-up to see a doctor Adherence with drug treatment for those who previously had high cholesterol levels Telephone interviews
Bradford et al. (1990)[52] 6122 med USA	Cohort	Community screening	Adults. A majority were over the age of 40 years. The ratio of women to men was greater in the healthcare sites and the community sites. The ratio of men to women was greater in the worksite and the blood bank	Cholesterol risk category	Median of 2 months after screening	Dietary change (reported as dietary change/no change) Adherence with referral to see a doctor Telephone interviews
Brett (1991)[53] 5263 med USA	Case series	Healthcare screening	6 patients with hypercholesterolaemia: 40-year-old man, 37-year-old man, 33-year-old woman, 57-year-old woman, 71-year-old woman, 61-year-old woman	NA	NA	Dietary change Exercise change Adherence with drug treatment Cholesterol reduction Labelling (adverse psychological affects) Qualitative interviews

Appendix 3 cont'd   Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Brunt and Shields (1996)[54] 2406 med Canada	Cohort	Community screening (21 selected Hutterite colonies)	Participants from the 21 Hutterite colonies of two *leute* groups (Lehrerleut and Dariuslet): 56% men; 42% 19–75 years; 48% 19–34, 45% 35–64, 7% 65–75 years; 31% single, 66% married, 3% widowed	Cholesterol risk category Gender *Leute* group Age group (19–34, 35–64, 65–75 years)	16 months after screening	Dietary change (reported as dietary change/no change) Weight change Adherence with referral to see a doctor Questionnaire survey
Chambers (1992)[55] 1895 emb UK	Cohort	Healthcare screening (GPs and teachers screened and mailed a questionnaire at follow-up)	66% GPs, 88% teachers; 83% men	Cholesterol risk category	6 months and 24 months after screening	Dietary change (reported as dietary change/no change) Questionnaire survey
Clarke *et al.* (1997)[88] 745 cin Australia	Qualitative	Worksite screening (hospital pathology department and a worksite)	14 women, 16 men; aged 25–72 years	None	3 months after screening	Cholesterol change Acceptance of risk status Qualitative interviews

Appendix 3 cont'd   *Cholesterol screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Croyle et al. (1993)[95] part 1 4024 med USA	RCT	College screening (undergraduate students)	139 undergraduate students (62 men, 77 women). Mean age 20.2 years mainly Caucasian (69.1%) or Asian (21.6%). Eligible if they had not had cholesterol measured in previous 6 months	Those randomly assigned to receive desirable cholesterol results and those randomly assigned to receive borderline-high cholesterol results (irrespective of actual cholesterol results)	Immediate	Acceptance of risk – threat minimisation: Intention to modify lifestyle Intention to obtain more information re high cholesterol and have retest Cognitive appraisal: 'how serious a threat to health is high cholesterol?' (1–7) How accurate is cholesterol testing? (1–7) How prevalent is high cholesterol in the student population? Affective responses (mood) Questionnaire in clinic at baseline and follow-up
Croyle et al. (1993)[95] part 2 4024 med USA	Cohort	Community screening	227 adults, aged 18–83 years (127 men and 100 women). Mean age was 42.9 years mainly Caucasian (93%); 61.2% married; 22.5% never attended college; 11% retired; 56.8% employed in full-time jobs	Cholesterol risk category	Immediate	Acceptance of risk: Cognitive appraisal: 'how serious a threat to health is high cholesterol?'(0–100) Questionnaire in clinic at baseline and follow-up
Doring et al. (1989)[56] 6467 med Germany	Cohort	Unknown (men who had previous cholesterol test)	Men and women aged 25–64 years	Cholesterol risk category	Not reported	Dietary change (reported as dietary change/no change) Adherence with drug treatment Knowledge (personal) Interview survey

Appendix 3 cont'd   *Cholesterol screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Elton, et al. (1994)[89] 3805 med UK	RCT	Worksite screening (chemicals site)	Male and female workers aged 20–65 years who did not previously know their cholesterol level	Intervention group (were told cholesterol level) versus control group (were not told cholesterol level) in each of the cholesterol levels: desirable, borderline and high	13 weeks after screening	Change in cholesterol level Labelling (effects of knowing cholesterol risk) Interview survey
Fischer et al. (1990)[78] 5858 med USA	Cohort	Community screening (shopping mall)	Adults. Mean age 57.5 ± 13.5 years; 64% women	Cholesterol risk category	1 year after screening	Adherence with referral to see a doctor Labelling (absenteeism from work) Knowledge (personal) Questionnaire survey
Fitzgerald et al. (1991)[57] 1886 emb USA	RCT	Worksite screening	272 participants; mean aged 42.3 (19–75) years cholesterol level ≥ 200 mg/dl; 196/272 (72.1%) women	Invention group: mailed a reminder to see GP, information about their cholesterol level, and recommended lifestyle changes Control group: no reminder letter or enhanced information	1–2 months after screening	Dietary change (reported as dietary change/no change) Exercise change (increase in proportion of sample exercising regularly) Weight change Adherence with referral to see a doctor Smoking cessation (proportion stopped smoking at follow-up) Baseline questionnaire and follow-up interview

Appendix 3 cont'd *Cholesterol screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Gans et al. (1994)[58] 3445 med USA	RCT	Worksite and community screening (Rhode Island)	207 people were eligible Eligibility criteria: previously unknown cholesterol level >240 mg/dl or 200–239 mg/dl with two other CHD risk factors, participant had a personal doctor	Participant intervention (PT): within a month, written results, reminder to see a doctor, the specific participant-set goals and a fridge magnet were sent Doctor intervention (PH): written results were sent to participants' doctors stating that they had been recommended to attend, goals that participant set, plus a postcard reminder for referral that the doctor could send to the patient Both interventions (PTPH) Usual care (UC)	4 months after screening	Dietary change (Rate Your Plate, SCORE)
Gemson et al. (1990)[59] 6072 med USA	Cohort	Worksite screening	Average age 37 years; 57% men; 77% white, 12% black, 5% Hispanic	HFF and LFF groups within borderline-high group Cholesterol risk category	HFF: 2, 4 and 6 months after screening. LFF: 6 months after screening	Dietary change (using survey-specific food types questionnaire) Exercise change (increased frequency of exercise) Weight change Smoking cessation (change in frequency of cigarettes smoked) Cholesterol change Questionnaire at baseline and follow-up

Appendix 3 cont'd   Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Gordon et al. (1990)[60] 5974 med USA	Cohort	Community screening (supermarket)	Adults aged 20 years or over	Cholesterol risk category	3 months after screening	Dietary change (using survey-specific food types questionnaire) Exercise change (proportion who undertake exercise at least once a week) Adherence with referral to see a doctor Knowledge (personal and general) Questionnaire at baseline and follow-up
Guibert et al. (1999)[79] 546 emb Canada	Cohort	Worksite and community screening (Quebec)	59.4% men, mean age 47.5 ± 9.6 years. 28% college or university educated	Aware/unaware of cholesterol level before screening Gender	2–6 months after screening	Adherence with referral to see a doctor Telephone survey
Hahn (1993)[90] 4036 USA	Cohort	Healthcare screening (family practice)	Middle-class white residents of midwestern city. 56.9% male, mean age 38.1 years; 65% 18–39 years, 27% 40–64 years, 8% ≥ 65 years	Group 1: mailed diet advice Groups 2: diet counselling Group 3: diet and medication	1 year after screening. High cholesterol participants retested at 3–6-month intervals	Cholesterol change
Harris et al. (1989)[80] 6352 med USA	Cohort	Community screening	Adults; 89% white, 53% women; 41% 50–70 year olds; 55% college educated. More health conscious and smoke less than the general population	None	1 year after screening	Adherence with referral to see a doctor Cholesterol change Questionnaire survey

Appendix 3 cont'd   *Cholesterol screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Harris et al. (1989)[80] 6358 USA	Cohort	Community screening (Florida)	56% women; 76% over the age of 50 years; 27% college educated; 93% white; 50% never smoked, 15% current smokers	None	1 year after screening	Adherence with referral to see a doctor Cholesterol change Questionnaire survey
Havas et al. (1991)[96] 5213 med USA	Cohort	Community screening	Adults aged 20–88 years and classified as having high blood cholesterol at screening	Before/after measurement of health perceptions in participants No control group	2–4 months after screening	Labelling: Health perceptions including descriptor of current health (excellent to very poor), any concerns regarding health during past 2 months, health experience, expectation of heart attack, future health expectation and past sickness Questionnaire survey
Hyman et al. (1991)[61] 5212 med USA	Cohort	Community screening (California)	Adults aged 18–72 years	Pre- and post-test comparison Cholesterol risk category	3 months after screening	Dietary change (Burrette 21 dietary item questionnaire) Adherence with referral to see a doctor Acceptance of risk (enjoyment of food and other quality of life measures) Questionnaire in the clinic at baseline and follow-up
Irvine and Logan (1994)[98] 3824 med Canada	Cohort study within RCT	Worksite screening (motor-car assembly or steel-making plant)	Working men aged over 20 years	Deniers (deny they have high cholesterol levels) vs non-deniers	1 year after screening	Acceptance of risk: in denial of new risk status/not in denial (dietary change, cholesterol change and knowledge are reported in relation to denial status) Questionnaire survey

Appendix 3 cont'd Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
James R et al. (1989)[76] 6384 Australia	Cohort	Community and worksite screening	18–98 year olds	None	4–5 months after screening	Weight change Cholesterol change
Kass and Hickner (1991)[82] 5474 med USA	Cohort	Community screening (rural)	443 participants. Targeted people under 70 years old; mean age 53 (19–77) years; 65% women	None	29 months after screening	Adherence with referral to see a doctor Questionnaire survey
Kjellstrom et al. (1985)[77] 7340 med Sweden	Cohort	Healthcare screening (outpatient clinic)	209 hyperlipidaemic (cholesterol > 7.7 mmol/l or triglyceridaemia > 2.2) men born in the years 1927 and 1928	None	5 years after screening	Weight change Cholesterol change Triglycerides change
Klepp et al. (1993)[62] 1353 cin Norway	Cohort	Community screening (Bergen)	Mean age 51.4 (13–78) years; 52.5% male; 80.9% married; 31.0% college educated	Cholesterol risk category	1–2 weeks after screening and 1 year after screening	Dietary change Questionnaire at baseline and follow-up
Lansing et al. (1990)[83] 5722 med USA	Cohort	Community screening (state fair)	All ages with elevated cholesterol levels. About 5% of those with elevated cholesterol had prior heart problems	None	9–12 months after screening	Adherence with referral to see a doctor Adherence with drug treatment Acceptance of risk (concern regarding high cholesterol result) Telephone survey
Lefebvre et al. (1986)[91] 7213 med USA	Cohort	Community screening	Adults	None	6–8 weeks after screening	Cholesterol change

Appendix 3 cont'd   Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Lefebvre et al. (1991)[84] 2090 emb USA	RCT	Community screening	435 adults who had received two cholesterol measurements of 240 mg/dl or above (high cholesterol); median age 64.5 years, 66% married; 70% women	Randomly assigned to receive/not to receive a reminder letter to see a doctor	3 months after screening	Adherence with referral to see a doctor
Madejski and Madejski (1996)[63] 2458 med USA	Cohort	Community screening (pharmacy)	General population	None	1 month after screening	Dietary change (reported change in fat intake) Exercise change (reported increase in exercise/no increase in exercise) Weight change Adherence with referral to see a doctor Smoking cessation (stopped smoking at follow-up or not) Telephone interviews
Maiman et al. (1994)[64] 3762 med USA	Cohort	Community screening (supermarket)	Adults 20–65 years reporting a previous high cholesterol result, with elevated cholesterol at time of current screening	Adherence with referral recommendation vs non-adherence with referral	5 months and 1 year after screening	Dietary change (Sackett 10 dietary change questionnaire) Adherence with referral to see a doctor Cholesterol change Questionnaire survey at baseline; interview survey at follow-up
Mann et al. (1990)[92] 5806 med UK	Cohort	Healthcare screening (UK general practices)	Adults aged 25–59 years	Cholesterol risk category Short/medium/long follow-up	3 years after screening	Cholesterol change

Appendix 3 cont'd   Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Morris et al. (1990)[65] 5880 med USA	Cohort	Community screening	Adults over the age of 20 years	Participants who were previously aware of high cholesterol levels compared with those who were not previously aware of elevated cholesterol levels	5 months after screening	Dietary change (using survey-specific food types questionnaire) Adherence with referral to see a doctor Questionnaire survey
Muir et al. (1994)[93] 1708 emb UK	RCT	Community screening	Participants aged 35–64 years	Intervention group: patients receiving initial health check and scheduled to be rechecked Control group: patients receiving an initial health check	1 year after screening	Cholesterol change
Murdoch and Wilt (1997)[105] 1061 emb USA	Cohort	Mailed survey to patients who had received a cholesterol test at the Minneapolis Veterans' Affairs Medical Center	46% men (mean age 61.2 ± 14.7 years), 54% women (mean age (54.7 ± 19.7 years). Men reported fewer years of education and were more likely to be former smokers	None	Within 1 year after screening	Knowledge (personal) Mailed questionnaire survey
Nichol et al. (1993)[66] 1800 emb USA	Cohort	Healthcare screening (blood donors)	N = 490. 64% men, 93% high school graduates; mean age = 49 ± 13 years; 16.4% had a history of hypertension, 1% had a history of diabetes, 19.6% had a history of smoking, 16.6 had a history of premature heart disease	Cholesterol risk group	3–8 months after screening	Dietary changes (reported dietary change/no dietary change) Exercise change (reported increase in exercise/no increase in exercise) Adherence with referral to see a doctor Smoking cessation Knowledge (personal and effects of prior knowledge of cholesterol risk) Questionnaire survey at baseline; telephone interview at follow-up

Appendix 3 cont'd   Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Ovhed et al. (1991)[85] 5198 med Sweden	Cohort	Healthcare screening (one large general practice)	Participants who consulted their doctor aged 25–59 years were eligible for screening. Doctors decided who to invite for screening, and frequent consulters were selected more often. 47% men (mean age 45±8 years), 55% women (mean age 45±9 years)	Cholesterol risk group Age	2.25–3 years after screening	Adherence with follow-up to see a doctor
Qureshi et al. (2000)[87] 238 emb USA	Cross-sectional	Data from 1992 and 1993 Behavioural Risk Factor Surveillance System database in Ohio	Women aged 40–49 years; 81% (14,818) Caucasian, 10% (1799) African–American, 5% (876) Hispanic, 4% (736) other	Screening mammography within 2 years Not had a screening mammography within 2 years or never had mammography	NA	Cholesterol screening as predictors of breast screening use
Rastam et al. (1988)[75] 6692 med USA	Cohort	Community screening	Subjects aged 20–69 years who had two consecutive cholesterol tests of ≥ 265 mg/dl	None	6 months after screening	Dietary change (using survey-specific food types questionnaire) Exercise change (reported increase in exercise/no increase in exercise) Adherence with referral to see a doctor Knowledge (personal) Telephone interview
Rastam et al. (1991)[67] 5221 med Sweden	Cohort	Worksite screening (construction)	Men aged 20–59 years	Cholesterol risk group	1 year after screening	Labelling (recorded sick days from work in National Insurance data: total days/year and episodes/year in the year before screening compared with the year after screening)

Appendix 3 cont'd   Cholesterol screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Scheer et al. (1992)[68] 4732 med USA	Cohort	Students (fitness course students)	College students aged 17–25 years; 75% women, 25% men	Pre- and post-cholesterol screening Cholesterol risk group	6 weeks after screening	Dietary change (using survey-specific food types questionnaire) Exercise change (using survey-specific exercise change) Knowledge (personal and general) Questionnaire at baseline and follow-up
Steyn et al. (1988)[69] 6778 med S. Africa	Cohort	Worksite screening (transport)	Male managers or senior employees of transport services. Aged 25–64 years	None	3–4 months after screening	Dietary change (mild, moderate or major changes to diet) Exercise change (reported increase in exercise/no increase in exercise) Weight change Smoking cessation (stopped smoking at follow-up or not) Cholesterol change Interview with a nurse at baseline and follow-up
Stockbridge et al. (1989)[70] 6412 med USA	Cohort	Community screening (shopping malls)	Adults	None	1 month and 3–6 months after screening	Dietary change (survey specific: yes/no to specific food types) Exercise change (reported increase in exercise or not) Weight change Adherence with referral to see a doctor Smoking cessation (assessed reduction in number of cigarettes smoked) Knowledge (general) Questionnaire at 1 month; telephone interview at 3–6 months

Appendix 3 cont'd *Cholesterol screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Strychar et al. (1992)[71] 2032 emb Canada	Cohort	Worksite screening	Mean age 46.5 years; 63% (N = 218) women; over 90% had over 13 years of education	Study group: cholesterol screening and nutritional programme Control group: cholesterol screening with no nutritional programme	1 month after screening	Dietary change (using survey-specific food types questionnaire) Knowledge (general) Questionnaire survey
Strychar et al. (1993)[72] 3980 med Canada	Cohort	Community screening (supermarket)	18–24 year olds, predominantly female and French Canadian	Comparison between pre- and post-screening values	3 months after screening	Dietary change (using survey-specific food types questionnaire) Cholesterol change Adherence with referral to see a doctor Knowledge (general) Questionnaire at the clinic for baseline data; questionnaire mailed for follow-up data
Strychar et al. (1998)[73] 1336 med Canada	RCT	Worksite screening (maintenance workers in a hospital)	Mean age 50 (35–64) years; 38% overweight; 37% smokers; 77% drinkers; 36% not physically active	Those randomised to receive test results at initial screening and those randomised to receive results only at second screening (16–20 weeks later)	4–5 months after screening	Dietary change (Rate Your Plate, SCORE) Cholesterol change Interview at baseline and follow-up
Troein et al. (1997)[99] 986 emb Sweden	Qualitative taped counselling sessions	Healthcare screening (primary healthcare centre)	Men; 27.0% 35 years old, 30.2% 40 years old, 41.3% 45 years old; 60.3% smokers; 77.8% married or cohabiting	None	Men with a raised cholesterol level < 7.90 mmol/l were invited to be rescreened after 1 month. The interview took place immediately after the second screen	Acceptance of risk status (attitude to lifestyle changes in diet and exercise and attitude to information given) Qualitative interviews

Appendix 3 cont'd *Cholesterol screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes and outcome measures[a]
Van Beurden et al. (1990)[94] 483 psy Australia	Cohort	Community screening	Public screening: 59% female; mean age 54 years; 40% had elevated cholesterol Blood bank: 49% female; mean age 45 years; 34% had elevated cholesterol	Public screening participants vs controls (blood bank participants)	3 months after screening	Cholesterol change
Wang et al. (1999)[74] 987 med USA	Cohort	Worksite screening	Adults	Adhered with recommendation to see a doctor vs did not adhere with recommendation to see a doctor	6 months after screening	Dietary change (Foods Habit Questionnaire) Exercise change (reported increase in exercise/no increase in exercise) Weight change Smoking cessation (assessed reduction in number of cigarettes smoked) Questionnaire at baseline, telephone interview at follow-up
Wynder et al. (1989)[86] 6498 USA	Cohort	Community screening	Adults. 68% over the age of 50 years; 58% women; 42% men; 95% white; 12% smoked. Generally well educated and smoked less than the average American	None	1 year after screening	Adherence with referral to see a doctor Adherence with drug treatment Cholesterol change Previous screening Questionnaire survey

[a] Only outcomes specific to this review are stated.
[b] Most studies use the cholesterol risk categories of high, moderately high and desirable (see NCEP cut-offs in Introduction). Notes in the results tables indicate when these are not used.
[c] Knowledge (personal): knowledge of personal cholesterol risk; knowledge (general): knowledge of general cholesterol issues such as NCEP guidelines.
med: MEDLINE; emb: EMBASE; psy: PsychoInfo; cin: CINAHL; HFF: high-frequency follow-up; LFF: low-frequency follow-up.

Appendix 4

Cholesterol screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Aubin et al. (1998)[45] 1363 med RCT (aware of cholesterol result/not aware of cholesterol result)	419/419 (100%) at baseline 391/419 (93.3%) at follow-up	Not available	**Dietary change**: at baseline patients aware of their results had a significantly higher intention to reduce their fat intake (4.1 vs 3.7, $F_{1,417} = 5.4$, $p = 0.02$) Intention rose with increasing cholesterol levels, but not significantly so, possibly due to sample size After 3 months mean $\pm$ SD reductions in fat intake were significantly greater for those with high cholesterol compared to normal. Normal 6.4 $\pm$ 26.0, slightly abnormal 15.3 $\pm$ 54.2, frankly abnormal 17.6 $\pm$ 23.8 ($F_{2,388} = 3.6$, $p = 0.03$) Mean dietary fat intake was 48.5 g at baseline and significantly reduced to 37.7 g 3 months later ($p < 0.00001$) **Cholesterol change**: in the subgroup of 81 patients with abnormal cholesterol levels after 3 months there was a significant decrease in total cholesterol (from 6.31 to 5.98 mmol/l, $p < 0.001$). Pearson's correlation between reduced dietary fat intake and decrease in cholesterol level was significant for 81 patients initially screened as abnormal ($R^2 = 0.5$, $p < 0.001$)	**Labelling**: knowledge of cholesterol risk status can be motivational to change lifestyles accordingly	Predominantly female, young (mean age 35 years) and well-educated sample	Knowledge of personal blood cholesterol level has an immediate and positive impact on intention to adopt a low-fat diet. By giving patients their cholesterol results, it can motivate them in the short term to adopt low-fat diets **Diet change (+)** **Cholesterol change (+)** **Labelling (+)**

Appendix 4   Cholesterol screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Baer (1993)[46] 1308 Cohort	70/80 (87.5%)	Study group 33/70 (47.1%) Control group 37/70 (52.9%)	The study group (screening and enhanced nutrition education) showed: **Cholesterol change**: significant reductions in total cholesterol from baseline to 12 months (6.15 ± 0.17 to 5.43 ± 0.16, $p < 0.05$) **Weight change**: significant weight loss from baseline to 12 months (86 ± 2.3 to 81 ± 3.5, $p < 0.05$) **Exercise change**: significant increase in exercise (days/week) seen from baseline to 12 months (2 ± 0.5 to 4 ± 1.2, $p < 0.05$) **Diet change**: significant increase in dietary fibre (g) intake (8 ± 2.3 to 23 ± 3.5); significant decrease in fat intake (% energy) (38 ± 3.4 to 31 ± 2.6); significant increase in carbohydrates (% energy) (38 ± 2.1 to 45 ± 2.5); and significant reduction in protein (% energy) (23 ± 3.5 to 20 ± 2.2) The control group (screening but no nutrition education) showed no significant differences in all outcomes		Study group were older and more educated than the control group, and had a more intensive follow-up (telephone call every month)	The study group showed a significant reduction in cholesterol, weight, fat intake and protein intake, and a significant increase in exercise, fibre intake and carbohydrate intake between baseline and 1 year. The control group did not demonstrate any significant changes in outcomes. **Diet change (+) study group, (–) in control group** **Exercise change (+) study group, (–) in control group** **Cholesterol change (+) study group, (–) in control group** **Weight change (+) study group, (–) in control group**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Baier *et al.* (1992)[47] 1890 emb Cohort	2244/8103 (28%)	Follow-up rates not stated, but cohort consists of: High: 278/2244 (12.4%) Borderline: 640/2244 (28.5%) Desirable: 1326/2244 (59.1%)	**Adherence with referral to see a doctor**: 129/423 (30.5%) with desirable levels had seen a doctor within 3 months; 59/165 (35.8%) borderline participants had seen a doctor; in the high group, 40/82 (48.8%) had seen a doctor. After 6 months, these figures were: 50% of the desirable participants, 48.1% of borderline participants and 67.4% of the high participants had seen a doctor. **Diet change**: a significant improvement in diet was observed ($p < 0.05$), but not reported by cholesterol group. **Weight change**: non-significant reduction in weight was reported. **Exercise change**: non-significant improvement in exercise was reported. **Smoking cessation**: non-significant reduction in smoking was reported. The changes were not reported by cholesterol group. **Cholesterol change**: desirable cholesterol group had a non-significant increase in cholesterol levels of 0.07 mmol/l; borderline cholesterol group significantly decreased cholesterol levels by 0.42 ± 0.07 mmol/l ($p < 0.0001$); high cholesterol group reduced cholesterol levels by 0.67 ± 0.1 mmol/l ($p < 0.0001$)	**Knowledge**: 445/681 (65.3%) recalled discussing cholesterol levels after 3 months (all groups combined). Recall of advice to see a doctor: 81.7% of high cholesterol subjects reported being advised to see a doctor; 8.5% of those with desirable levels also reported this, despite this advice not being given. Recall of cholesterol levels at 3 months: 215 (97.3%) of desirable cholesterol subjects reported their cholesterol level correctly, compared with 74 (88.1%) moderate and 47 (87.0%) high cholesterol subjects. 13% of high cholesterol participants reported that their cholesterol was lower than the actual levels. Recall of cholesterol levels at 6 months: 211 (95.6%) desirable cholesterol subjects reported their cholesterol level correctly, compared with 74 (88.1%) moderate and 49 (90.7) high cholesterol subjects. 9.3% of high cholesterol participants reported that their cholesterol was lower than the actual levels		Worksite cholesterol screening resulted in significant reductions in cholesterol levels for those with borderline or high cholesterol levels. Subjects with high cholesterol were more likely to have seen their doctor about their cholesterol levels at follow-up than desirable or borderline subjects. However, subjects with borderline or high cholesterol were more likely to forget their cholesterol level at 3 months and at 6 months. **Diet change (+) overall (not by cholesterol group) Exercise change (–) Weight change (–) Adherence with referral to see doctor (–) Cholesterol change (+) Smoking cessation (–) Knowledge (–) personal**

Appendix 4 cont'd   Cholesterol screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Barrere (1994)[48] 3663 med Non-randomised intervention study	79/100 (79%)	At follow-up only: Traditional health education = 40 Goal-orientated health education = 39	**Diet change**: there was no difference in mean Food Frequency Questionnaire scores at either time between the teaching methods. The mean scores at baseline were: 2.46 for traditional and 2.43 for goal setting (ns, $p = 0.75$) and 2.40 for traditional and 2.32 for goal setting (ns, $p = 0.42$) at 3 months There were no significant changes reported in dietary change in either the original cholesterol group or the health education group		Small study, convenience sample of highly motivated individuals who already had low-fat diets and many of whom underwent annual screening	There was no change in diet or cholesterol levels as a result of either diet, goal-orientated health education or traditional health education **Diet change (–)** **Cholesterol change (–)**
Beerman *et al.* (1991)[49] 5548 Cohort	22/35 (63%) follow-up rate for those with high cholesterol levels	None	**Adherence with referral to see a doctor**: 5/22 (23%) saw the doctor for follow-up. Their mean cholesterol level was 7.16 + 1.4 mmol/l **Dietary change**: 4/5 (80%) participants who consulted their doctor received dietary recommendations and decreased consumption of meat, fried foods, eggs, cheese, dairy products and fat **Non-adherence with referral to see a doctor**: 17/22 (77%) did not consult their doctor. Their mean cholesterol level was 6.21 + 0.89 mmol/l **Dietary change**: those who did not visit their doctor, reported eating less red meat, fewer eggs, less butter, whole milk, processed meat and fried foods. They also consumed more fibre, chicken, fish, fruit and vegetables. 3 reported no change in diet	**Knowledge**: 13/22 (60%) reported that the cholesterol value was higher than anticipated. All remembered being told their cholesterol level exceeded recommended levels when they received their test result. Only 3/22 (13%) did not remember the recommendation to see a doctor	Limited by small sample size	Compliance to recommendation to visit the doctor was poor. A majority made dietary changes whether they had been to see their GP or not. All remembered their elevated cholesterol status **Diet change (+)** **Adherence with referral to see a doctor (–)** **Knowledge (+) (personal)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Beerman *et al.* (1992)[50] 428 psy Cohort	171/200 (85.5%)	25% < 5.2 mmol/l no prior cholesterol test 19% < 5.2 mmol/l prior cholesterol test 20% > 5.2 mmol/l no prior cholesterol test 36% > 5.2 mmol/l prior cholesterol test	**Dietary change**: fat intake was lowest among participants who had prior cholesterol testing ($F = 3.58$, $p < 0.01$) **Smoking cessation and exercise change**: no significant differences found between groups for exercise and tobacco use			Participants with prior cholesterol testing were more likely to have a significantly lower dietary fat intake at follow-up than those with no prior cholesterol testing. There was no significant relationship between prior testing and exercise and smoking **Diet change (+)** **Exercise change (–)** **Smoking cessation (–)** **Previous screening (+)**
Bell and Joseph (1990)[51] 5901 med Cohort	120/208 (57.7%) of those with elevated cholesterol levels completed follow-up		**Diet change**: 118/120 (98%) reported an improvement in diet (33% a moderate improvement, 26% a major improvement) **Exercise change**: 106/120 (88%) reported an increase in exercise (28% a moderate improvement, 16% a major improvement) **Adherence with referral to see a doctor**: 70/120 (58%) consulted their doctor concerning high cholesterol levels **Adherence with drug treatment**: before screening 29% had previous high cholesterol levels. 7% of those who had high cholesterol were complying with drug treatment, whereas 4–6 months later 25% of the this group were complying with drug treatment for high cholesterol			After opportunistic screening, the vast majority of those with high cholesterol levels who were followed up altered their diet and exercise, but only just over half adhered to advice to see a doctor. Adherence to drug treatment had improved **Diet change (+)** **Exercise change (+)** **Adherence with referral to see a doctor (–)** **Adherence with drug treatment (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Bradford *et al.* (1990)[52] 6122 med Cohort	3531 had elevated cholesterol levels	1113/3531 (31%) of those with elevated cholesterol were randomly selected and followed up	**Diet change**: 92% of those whose doctor had recommended diet changes modified their diets compared with 80% of referrals who had not contacted their doctor **Adherence with referral to see a doctor**: 53% of those interviewed had seen the doctor (43%) or made an appointment (10%). 64% were from the high cholesterol group and 44% from the moderate group Highest doctor contact was reported where cholesterol levels were measured in a healthcare setting. More women (57%) than men (46%) made doctor contact		No actual numbers, just percentages	From this sample, over half recommended to see a doctor had done so. More women than men had visited their doctor, and more of those at high risk than at moderate risk had visited their doctor A very high proportion reported modifying diet regardless of whether they had seen a doctor or not, although a slightly higher percentage modified their diet as a result of their doctor's recommendation **Diet change (+) Adherence with referral to see doctor (–)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Brett (1991)[53] 5263 med Case series (qualitative)	6 (100%)		**Diet change**: patients 1, 2, 5 and 6 all reported improved diet after receipt of a high cholesterol result **Exercise change**: patient 2 reported decreasing levels of exercise after receipt of a high cholesterol result, due to concern about having a heart attack **Adherence to drug treatment**: patients 2 and 4 stopped their drug treatment for high cholesterol because of the side-effects. Patient 5 stopped treatment because it led to 'angina' symptoms	**Labelling**: Patient 1 no longer considers himself healthy Patient 3 was upset/unsettled at cholesterol levels still increasing despite diet improvement Patient 4 reported anxiety, frustration and confusion Patient 5 refused any further attempts to reduce cholesterol and reported feeling 'much better now it has been dropped from the agenda' Patient 6 'the issue (high cholesterol rate) is the source of considerable anxiety in her life'	Limited by small size	Positive dietary changes occurred after the diagnosis of hypercholesterolaemia in 4/6 participants, but labelling led to negative psychological effects, including feelings of unhealthiness, actual illness (hyperventilation), anxiety and confusion **Diet change (+) Exercise change (+ and –) Adherence with drug treatment (–) Labelling (–)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Brunt and Shields (1996)[54] 2406 med Cohort	534/846 (63.1%)	Data not given	**Diet change and weight loss**: 62% reported a reduction in dietary fat; 31% reported weight loss Women were more likely to report these changes than men. Reducing fat intake was significantly more likely to be reported by Dariusleuts, older participants and those with higher cholesterol levels **Adherence with referral to see a doctor**: overall, 34.5% had visited a doctor and had their cholesterol levels retested. There were no significant differences by gender or *leute* group. Likelihood of visiting a doctor increased significantly with increasing age ($\chi^2_{(2)} = 49.82, p < 0.001$) and increasing cholesterol level ($\chi^2_{(1)} = 37.44$, $p < 0.001$). 47.3% of those with cholesterol > 5.2 mmol/l were retested compared with 20.7% of those ≤ 5.2. In those retested, mean cholesterol was 5.81 mmol/l at baseline, compared with 5.13 of non-retesters ($p < 0.001$, adjusted for age) 81.6% of respondents reported that they had made some change in lifestyle. This was significantly higher in those with borderline to high cholesterol (85.1%) than in those with lower cholesterol levels (77.9%) ($\chi^2_{(1)} = 4.19, p < 0.04$)		The Hutterite community has beliefs specific to their community and therefore results are probably are not generalisable (although they are similar to other results)	Study provides evidence that community-based screening accompanied by counselling and referral by nurses can positively affect preventive behaviours in a small community Cholesterol levels at screening were strongly associated with subsequent surveillance, weight loss and dietary changes **Diet change (+)** **Weight change (+)** **Adherence with referral to see a doctor (–)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

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Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Chambers (1992)[55] 1895 emb Cohort	Unclear		**Diet change**: more subjects with raised cholesterol levels over 7.2 mmol/l found at the initial screen reported a reduced intake of fats at 6 months and at 24 months than those whose cholesterol levels were below this		Only one small aspect of the paper was relevant	Participants with very high cholesterol levels reduced their fat intake at 6 months and at 24 months **Diet change (+)**
Clarke, *et al*. (1997)[88] 745 cin Qualitative	27/28 (96%) responded	None	**Cholesterol change**: significant decline in cholesterol levels over a 3-month period ($t = 3.79$, df $= 26$, $p < 0.001$)	**Acceptance of risk**: 24/27 (89%) had come to terms with their risk status, but had initially found it difficult to come to terms with their new self-definition, having previously believed they were well 18/27 (67%) perceived the second result was not congruent with their efforts and results were seen as either undeservedly good or undeservedly bad Many were not prepared to sacrifice valued foods or pleasure when there was no guaranteed benefit. Some felt fate was outside their control, and therefore were not motivated to change behaviour		Cholesterol levels decreased significantly over the 3-month period Participants found it difficult to come to terms with their risk status and many perceived that at second screening the results were not congruent with their efforts Participants questioned the benefit of sacrificing pleasure to lower their cholesterol levels, and fatalism reduced their motivation to change behaviour **Cholesterol change (+)** **Acceptance of risk (–)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Croyle *et al.* (1993)[95] part 1

4024 med

RCT (aware of cholesterol result/not aware of cholesterol result | 139/139 (100%) | 100% in both randomisation groups | | **Labelling/acceptance of risk**: those randomised to receive borderline to high results were more likely to intend to modify lifestyle (77.9 vs 29.6%, $p < 0.001$), to have the intention of obtaining more information (80.9 vs 54.3%, $p < 0.001$) and to rate the cholesterol test as more accurate than those who were told their cholesterol levels were desirable (16.2 vs 5.6%, $p < 0.05$)

Those who believed they had borderline to high cholesterol levels rated high levels as a less serious threat (5.79 vs 6.17, $p < 0.01$), rated the test as less accurate (5.0 vs 5.82, $p < 0.001$) and overestimated the prevalence of high cholesterol levels (55.01 vs 30.86%, $p < 0.001$). Cholesterol level significantly affected responses on all of the mood items. Borderline/high subjects described themselves as more distressed, sad and surprised, and less elated, content and calm (all p-values < 0.001) than the desirable subjects | Study was not ethical (false results were given to students who had to participate to qualify for the course)

Responses were measured immediately after receipt of result | In a young population the receipt of a borderline-high cholesterol test was associated with increased intention to alter lifestyle, but reported more threat minimisation, with the perception that it is a less serious threat to health, viewing the test as less accurate, and believing that the prevalence of high cholesterol is higher compared with those with believed they had desirable levels

Labelling (+)
Acceptance of risk (–)
Previous screening (+) |

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Croyle *et al.* (1993)[95] part 2 4024 med Cohort	Not reported			**Acceptance of risk**: subjects with borderline or high cholesterol results reported that high cholesterol was less of a serious threat (borderline = 75.09, high = 76.79) than those who had a desirable level (desirable = 83.31) ($p < 0.01$) When this was examined by previous testing, the results were statistically different only in the group who had never been tested before (first time screenees) Subjects who had undergone previous testing were older and knew more about cholesterol. Adjustment for these factors and for having a previous high cholesterol result did not affect the results	Responses were measured immediately after receiving the screening results: it is unclear whether this effect would be sustained after the initial period	In a self-selected group for screening the receipt of a borderline or high cholesterol test was associated with the perception that it is a less serious threat to health. This was mainly due to the effect in participants who were first time screenees. The authors suggest that those who have repeat testing do not minimise. Threat minimisation is a common initial response to cholesterol screening results **Acceptance of risk (–)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Doring *et al.* (1989)[56] 6467 med Cohort	3776/5069 (74.5%) 3776/5312 (71%)	Not reported	**Diet change**: only 1% of men and 4% of women with cholesterol levels > 7.7 mmol/l reported following a diet regimen with lowered saturated fat and/or cholesterol, or increased polyunsaturated fat content. For those with cholesterol levels between 6.4 and 7.7 mmol/l, only 1% in both genders reported following the recommended diet regimen. No significant differences were found in risk status, age and gender **Adherence to drug treatment**: use of drugs in treatment of raised cholesterol levels was low. Lipid-lowering drugs were used by 2% of men and 1% of women. None of the participants in the 25–34 year age group consumed lipid-lowering drugs. Drug treatment was not used by 25–34-year-old men or 25–54-year-old women. The highest prevalence of drug treatment was 7% in the age group 55–64 years. No significant difference in drug treatment was found among different risk groups	**Knowledge**: no appreciable differences in groups in awareness of hypercholesterolaemia were reported, except for women aged 55–64 years with cholesterol levels > 7.7 mmol/l, who were significantly more aware than women with lower cholesterol levels and than men in the corresponding group. For men over the age of 45 years, those in the lower risk group (5.2–6.1 mmol/l) had significantly lower awareness than those with values > 6.2 mmol/l		Awareness of hypercholesterolaemia was low in younger people and did not increase with increasing risk level. The use of a dietary regimen was low and the prevalence of drug use was very low **Diet change (–) Adherence with drug treatment (–) Knowledge (–) (personal)**

Appendix 4 cont'd   Cholesterol screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Elton *et al.* (1994)[89] 3805 med RCT (aware of cholesterol levels/not aware of cholesterol levels)	469/495 (94.7%)	Intervention group: 229/239 (95.8%) Control group: 240/256 (93.8%)	**Cholesterol change**: the observed change in cholesterol levels between screen and follow-up in the high cholesterol intervention group was –0.29 mmol/l (95% CI –0.48 to –0.11) (baseline to final 7.13 to 6.84 mmol/l). This was compared with the high cholesterol control group, where the observed change in cholesterol levels between screen and follow-up was –0.01 mmol/l (95% CI –0.16 to 0.15) (baseline to final 7.12 to 7.12 mmol/l). The difference between the intervention group and the control group was significantly different, –0.28 mmol/l ($p = 0.024$, one-sided)	**Labelling**: knowledge of risk status encouraged individuals to reduce their cholesterol levels	Study tested one-sided hypotheses and therefore used one-sided p-values. Study was conducted over Christmas and studies have proven that cholesterol levels may rise in colder months	Informing people that they have high cholesterol leads to a reduction in cholesterol compared with if they are not told **Cholesterol change (+) Labelling (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Fischer *et al.* (1990)[78] 5858 med Cohort	1079 selected for follow-up. 672/1079 (62%) completed follow-up	433 were newly screened participants (on whom this paper reports), but no follow-up rate is given for this specific group	**Adherence with referral to see a doctor**: only 53.7% of those recommended follow-up had actually visited their doctor (68% of high cholesterol and 31% of borderline) There were no significant differences in absenteeism among the cholesterol risk groups. However, when individuals with very high absenteeism (> 50 days) were removed, there was an unexpected association between high cholesterol levels and decreased absenteeism	**Knowledge**: most participants were able to recall their cholesterol levels 1 year later (mean absolute reporting error 9 mg/dl). 91.5% of desirable, 58.7% of borderline and 74.4% of high subjects reported their cholesterol levels correctly **Association of high cholesterol with diseases**: 98% associated it with heart disease, 96% with strokes, 7% with emphysema and 20% with diabetes **Labelling**: well-being was reported as good among those diagnosed with high cholesterol levels, despite the initial distress reported		While poor adherence to see a doctor was reported overall, those with higher cholesterol levels were more likely to comply with follow-up. Recall of personal cholesterol levels was good, although awareness of personal cholesterol levels was highest in the desirable group and lowest in the borderline group Awareness of the association of high cholesterol with other diseases was high, and absenteeism actually decreased for those who had elevated cholesterol levels **Adherence with referral to see a doctor (–)** **Labelling (+)** **Knowledge (+) (personal and general)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Fitzgerald *et al.* (1991)[57] 1886 emb RCT (mailed follow-up information and reminder to see doctor/no follow-up information or reminder to see doctor)	272/313 (87%) of screenees with high cholesterol result consented to participate	Intervention group: 146/272 (53.7%) Control group: 126/272 (46.3%)	**Diet change**: overall, 141/167 (84.4%) reported improved diet. Dietary modifications were reported by 88% of the intervention group and 81% of the control group ($p = 0.37$) **Exercise change**: overall, 45/137 (32.8%) reported increasing their level of exercise. An increase in exercise was reported in 27% of the intervention group and 38% of the control group ($p = 0.41$) **Weight change**: overall, 42/156 (26.9%) reported a reduction in weight. Weight reduction was reported by 34% of the intervention group and 81% of the control group ($p = 0.17$) **Smoking cessation**: overall, 6/51 (11.8%) reported smoking cessation. Smoking cessation was reported in 19% of the intervention group and 7% of the control group ($p = 0.21$) **Adherence with referral to see a doctor**: 25% of the intervention group and 24% of the control group ($p = 0.31$) adhered to this advice No significant differences were reported between the control and intervention groups		Predominantly female participants	Overall health behavioural changes were reported, but not as a result of mailing supplementry information. A referral reminder was not effective at increasing adherence with referral to see a doctor **Diet change (+)** **Exercise change (+)** **Weight change (+)** **Adherence with referral to see a doctor (–)** **Smoking cessation (+)** **Overall (+), even if intervention is (–)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Gans *et al.* (1994)[58] 3445 med RCT (diet advice and reminder of doctor referral/ usual care)	173/207 (83%)	Data not given, but stated no difference in response by intervention group	**Diet change**: no significant difference was observed as a result of the intervention Statistically significant predictors of dietary compliance included age and total baseline cholesterol. People with baseline cholesterol ≥ 6.2 mmol/l were three times more likely to have complied with dietary recommendations than those with levels between 5.1 and 6.1 mmol/l (RR = 3.3, (1.4 to 7.3) No other supporting data			No change in diet was observed as a result of the intervention People with baseline cholesterol ≥ 240 mmol/l were three times more likely to have complied with dietary recommendations than those with levels between 200 and 239 mmol/l **Diet change (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			Summary
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	
Gemson *et al.* (1990)[59] 6072 med Cohort	232/411 (56%) of screenees with an elevated cholesterol result	Borderline-high 171/295 (58%) High 61/116 (52.6%)	**Diet change**: 24% of HFF participants reported changing their diet 'a lot' compared with 10.3% of LFF participants ($p = 0.05$) Specific diet change by HFF and LFF: less red meat 66.7 vs 45.6% ($p = 0.02$), less cheese 68.6 vs 50% ($p = 0.04$), less butter 68.6 vs 48.5% ($p = 0.03$), less fast food 58.8 vs 41.2% ($p = 0.05$) **Exercise change**: a significant increase in exercise in both risk groups was reported (1.3 vs 1.7%, $p < 0.01$, for borderline-high participants; 0.6 vs 1.3%, $p < 0.02$, for high participants). No differences reported by HFF/LFF group **Weight change**: a significant decrease in both risk groups was reported (77.3 to 75.5 kg in borderline, 78.6 to 75.4 kg in high, $p < 0.01$). No differences reported by HFF/LFF group **Smoking cessation**: a significant decrease in smoking was reported in both risk groups (12.9 to 11%, $p < 0.01$, in borderline; 27.9 to 24.5%, $p < 0.01$, in high). No differences reported by HFF/LFF group **Cholesterol change**: the mean cholesterol level declined by 0.4 mmol/l (7.3%) for those in the borderline-high category and by 0.8 mmol/l (11.6%) for those in the high cholesterol group. In total, cholesterol declined by 10% from 6 to 5.4 mmol/l ($p < 0.01$) There was a non-significant trend towards greater cholesterol in the HFF group			Cholesterol screening and counselling appear to have led to significant improvements in decreasing cholesterol, weight, smoking and increasing exercise, particularly in the high cholesterol group. A high proportion reported that they had made modifications to their diet. The management (HFF or LFF) made little difference in outcomes except in diet change **Diet change (+)** **Exercise change (+)** **Weight change (+)** **Smoking cessation (+)** **Cholesterol change (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Gordon *et al.* (1990)[60] 5974 med Cohort	338/375 (90%)	Not reported by cholesterol level	**Diet change**: the range of fat consumption stayed about the same, but the number of high-fat foods consumed decreased by an average of 2.16/week ($p < 0.001$). There was a statistically significant dose–response relationship observed, with the high cholesterol group making greater reductions (4.12/week) than the moderate level group (2.23/week), who made larger changes than those with desirable cholesterol levels (0.72/week) ($p < 0.001$) **Exercise change**: overall, the proportion who undertook exercise at least once a week increased during the study from 55 to 65% ($p < 0.001$) **Adherence with referral to see a doctor**: overall, 24% of the cohort made a doctor appointment to discuss cholesterol. This varied by cholesterol level: 7% in desirable, 22% in borderline, 50% in high ($p < 0.001$)	**Knowledge**: the proportion of participants who knew their own cholesterol level significantly increased from 33 to 72% ($p < 0.001$) More subjects knew the nationally recommended cholesterol cut-offs (NCEP threshold) after screening (increased from 31 to 63%, $p < 0.01$) Belief that a heart attack can be somewhat prevented remained the same, with 90% agreeing with the statement		Screening significantly increased participants' knowledge of own cholesterol, knowledge of the nationally recommended cholesterol cut-offs (NCEP threshold), and the proportion doing exercise at least once a week. It also led to a decrease in average fat consumption per week. Adherence with referral to see a doctor was poor There was a dose–response relationship between cholesterol levels and magnitude of dietary change and doctor contact. This relationship suggests that labelling individuals by cholesterol category communicates different degrees of motivation to change one's behaviour **Diet change (+)** **Exercise change (+)** **Adherence with referral to see a doctor (–)** **Knowledge (+) (personal and general)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Guibert et al. 1999[79] 546 emb Cohort	1143/1158 (98.7%) of participants with elevated cholesterol agreed to follow-up		**Adherence with referral to see a doctor**: in general, the higher the cholesterol level, the greater the adherence to see a doctor: 6.20–6.39 mmol/l, 244 (55.7%) compliant; 6.40–6.59 mmol/l, 210 (42.9%) compliant; 6.60–6.99 mmol/l, 286 (60.1%) compliant; > 7 mmol/l, 404 (69.1%) compliant ($p < 0.001$) Women were more likely than men to adhere to recommended follow-up (64 vs 55.9%) **Determinants of adherence to see a doctor**: total cholesterol 6.20–6.39 mmol/l, $OR_{adj} = 1.71$ (95% CI 1.156 to 3.690, $p = 0.007$); 6.60–6.99 mmol/l, $OR_{adj} = 1.91$ (95% CI 1.305 to 4.052, $p = 0.001$); > 7.0 mmol/l, $OR_{adj} = 1.86$ (95% CI 1.925 to 5.716, $p = 0.001$) **Previous screening**: compliance with recommendation for those who were previously aware of high cholesterol levels ($N = 365$): Total cholesterol 6.20–6.39 mmol/l, $OR_{adj} = 1.88$ ($p = 0.120$); 6.60–6.99 mmol/l, $OR_{adj} = 1.84$ ($p = 0.081$); > 7.0 mmol/l, $OR_{adj} = 1.86$ (95% CI 1.925 to 5.716, $p = 0.001$)			Determinants of adherence to see a doctor were cholesterol level at screening and prior knowledge of cholesterol level Adherence with referral to see a doctor was poor. However, the higher the cholesterol risk, the greater the adherence with referral to see a doctor **Adherence with referral to see a doctor (–) Previous screening (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Hahn (1993)[90] 4036 med Cohort	114/158 (72%)	65/114 (57%) mailed dietary advice 22/114 (19%) formal dietary counselling 27/114 (24%) diet and medication	**Cholesterol change**: total cholesterol change was –9.2% ($p < 0.0001$), compared with baseline, –7.3% (95% CI –4.0 to –10.5) for mailed (diet) advice, –9.7% (–3.5 to –15.9) for (diet) counselling, –13.3 (–8.9 to –17.6) for diet and medication		This paper reports the results of one aspect of a larger study	Participants may have been motivated to institute changes in dietary practices as a result of knowledge of high cholesterol status The greatest reduction was in those treated with a combination of diet and medication, intermediate for those who had formal dietary consultation, and least for those who received written instructions to follow a prudent diet **Cholesterol change (+)**
Harris *et al.* (1989)[81] 6352 med Cohort	Stratified sample of 10672 people who had undergone public screening ($N = 602$) 295/602 (49%) completed follow-up		**Adherence with referral to see a doctor**: 208/295 (70.5%) visited their doctor. 136/208 (65.4%) had their cholesterol levels checked by the doctor **Cholesterol change**: the average reduction of 0.9 mmol/l in cholesterol levels was reported after 6 months of care. The cholesterol reduction was greater if the participants had been treated with drugs		The percentage visiting their doctor were also presented by gender and age, but these figures did not agree with the overall percentages	A high proportion of those with elevated cholesterol followed the recommendation to visit their doctor. Cholesterol levels were reduced after 6 months of care irrespective of the treatment offered **Adherence with referral to see a doctor (+) Cholesterol change (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Harris *et al.* (1989)[80] 6358 med Cohort	240/304 (79%) responded	NA	**Adherence with referral to see a doctor**: 189/240 (78.8%) followed up the recommendation to have their cholesterol levels rechecked by the doctor. By age, 81% of those > 50 and 74% < 50 years adhered to follow-up. By gender, 83% of women, 71% of men adhered to follow-up **Cholesterol change**: overall, cholesterol reduction of 0.28 mmol/l (95% CI 0.10 to 0.46) was reported. This figure was lower in the non-drug group, where 0.23 mmol/l was observed. The figure was higher if participants were given drug therapy, where 0.38 mmol/l was observed. A dose–response relationship was shown, with greater decreases with higher initial cholesterol levels. Men showed greater absolute reductions		Methods and tables are unclear	A high proportion of those recommended to see a doctor did so (79%). A reduction of 0.28 mmol/l in cholesterol values was observed in those who were rechecked **Adherence with referral to see a doctor (+)** **Cholesterol change (+)**
Havas *et al.* (1991)[96] 5213 med Cohort	894/1093 (82%) Data available for 867/1093 (79%)	NA	Health behaviour changes not reported	**Labelling**: small positive changes in health perceptions were reported, but very few were statistically significant No significant negative changes in beliefs were reported	Many significance tests were conducted	Labelling participants with high cholesterol did not result in negative effects; overall, there was a small positive change in health beliefs. The authors suggest that this may be due to the positive nature of the counselling at screening **Labelling (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Hyman *et al.* (1991)[61] 5212 med Cohort	143/184 (77%)	Not reported by cholesterol level	**Diet change**: overall, there was a decrease in high cholesterol and high saturated fat foods after screening (2.10 to 1.75, $p < 0.001$). The study reports a decrease in consumption of red meat and cheese, and no improvement in consumption of added fats and oils Size of dietary change did not differ between high cholesterol and desirable groups **Adherence with referral to see a doctor**: 32% of the elevated cholesterol group saw a doctor, and 15% had their cholesterol level remeasured. However, 34% of those in the desirable group also visited their doctor about their cholesterol levels **Cholesterol change**: total cholesterol decreased from 5.60 to 5.43 mmol/l (95% CI for change = –0.47 to +0.12 mmol/l) ($p < 0.18$)	**Acceptance of risk status**: There was no adverse impact of men knowing they have a high cholesterol level. Participants did not change their enjoyment of food. The study also observed those who have had a very high cholesterol level, and those who have had a previous history of high cholesterol, but this had no adverse impact on these groups		Diet improved regardless of baseline cholesterol levels. There were no psychosocial effects in people who knew their elevated cholesterol levels. Only one-third of individuals adhered to advice to see a doctor. A similar proportion adhering was reported in the desirable cholesterol level group Therefore, public cholesterol screening did not have any adverse effects on high cholesterol individuals and may lead to beneficial changes in diet in people screened. **Diet change (+)** **Adherence with referral to see a doctor (–)** **Cholesterol reduction (–)** **Acceptance of risk status (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Irvine and Logan (1994)[98] 3824 med Cohort study within RCT	380/523 (72.7%)	Cohort comparisons: Deniers with elevated cholesterol 83/122 (68.0%) Non-deniers with elevated cholesterol 65/73 (89.0%)	**Cohort:** **Diet change**: deniers showed less change in all fat intake than those who accepted the result (all $p < 0.05$). Commitment to dietary change was significantly less in deniers than non-deniers at baseline and although both groups showed an improvement during the year, this trend was still evident, but not statistically significant **Cholesterol change**: observed cholesterol levels after 1 year: deniers had a smaller reduction in cholesterol level than non-deniers (2.7 vs 5.1%, ns)	**Cohort**: the deniers scored lower on physical symptoms, state anxiety and trait anger, and higher on life satisfaction, and therefore were happier The knowledge of CVD risk factors and cholesterol was significantly lower in deniers than in non-deniers ($p < 0.04$) **RCT**: knowing cholesterol status before screening and at 1 year: at baseline, 25% of men with raised cholesterol levels thought they had high cholesterol, at 1 year this figure was 50%. There was no difference between the high-risk groups and therefore no difference in labelling, but acceptance of the label was low	This was an RCT that showed no difference between groups, so then grouped together all hypercholes-terolaemics and conducted a 'nested cohort study' of deniers vs non-deniers Numerators in the cohort analysis are unclear	A high proportion of the men were in denial. Denial was a significant barrier to health behaviour change (non-deniers made significant changes to diet and reported a non-significant reduction in cholesterol levels). Denial may represent a maladaptive coping style that is associated with better mental health **Acceptance of risk (–)** Diet change, cholesterol change and knowledge are only reported in relation to denial status and therefore only reported as acceptance of risk
James *et al.* (1989)[76] 6384 Cohort	3164/5205 (60.8%)		**Weight change**: 65% reduced their weight. The mean BMI change was 0.51 (2% reduction) ($p < 0.001$) **Cholesterol change**: 72.5% had reduced their cholesterol levels. The mean cholesterol change was 0.65 mmol/l (10% reduction), ($p < 0.001$) 28.7% of moderate, 6.6% of high and 1.6% of very high cholesterol participants converted to desirable levels of cholesterol			Screening and a brief educational session for those with elevated cholesterol resulted in a large proportion of participants reducing both blood cholesterol and weight **Weight change (+)** **Cholesterol change (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Kass and Hickner (1991)[82] 5474 med Cohort	48/51 (94.1%) 30 had repeat cholesterol measures		**Adherence with referral to see a doctor**: 43/48 (89.6%) reported that they had contacted a doctor about their high cholesterol level. Of these, 32 visited the doctor and 11 had telephone contact. By gender, 30/33 (91%) women and 13/15 (86.6%) men contacted their doctor 30/48 (62.5%) had been retested within the 2 years, 26/33 (78.8%) women and 4/15 (26.6%) men		Very small study, predominantly female subjects	A high doctor follow-up rate was obtained, but fewer men received retesting (27% of men vs 75% of women) **Adherence with referral to see a doctor (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Kjellstrom et al. (1985)[77] 7340 Cohort	5 year follow-up: 153/209 (73.2%)		**Cholesterol change**: Change in triglycerides: isolated hypertriglycerides ($N = 83$): 3.20 ± 0.96 mmol/l (mean ±SD) at baseline, 2.26 ± 1.22 at 5 years (% reduction = 29.4); isolated hypercholesterol ($N = 28$): 1.46 ± 0.43 mmol/l at baseline, 1.33 ± 0.49 at 5 years (% reduction = 8.9); both hyper ($N = 34$): 3.31 ± 1.1 mmol/l at baseline, 1.97 ± 0.85 at 5 years (% reduction = 40.5) Change in cholesterol: isolated hypertriglycerides: 6.17 ± 0.88 mmol/l at baseline, 5.83 ± 0.87 at 5 years (% reduction = 5.5); isolated hypercholesterol: 8.21 ± 0.61 mmol/l at baseline, 6.90 ± 0.71 at 5 years (% reduction = 16.0); both hyper: 7.85 ± 0.79 mmol/l at baseline, 6.75 ± 0.83 at 5 years (% reduction = 14.0) **Weight change**: Isolated hypertriglycerides: 84.1 ± 11.2 mmol/l at baseline, 82.2 ± 11.2 at 5 years (% reduction = 2.3); isolated hypercholesterol: 75.7 ± 8.3 mmol/l at baseline, 74.8 ± 8.2 at 5 years (% reduction = 1.2); both hyper: 80.9 ± 11.4 mmol/l at baseline, 79.6 ± 11.6 at 5 years (% reduction = 1.6)			Reductions in cholesterol and triglycerides were still evident 5 years after systematic screening. No significant changes in weight were reported **Weight change (–)** **Cholesterol change (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Klepp et al. (1993)[62] 1353 cin Cohort	318/354 (89.9%) completed both questionnaires		**Diet change**: those with higher cholesterol values made more changes to their diets than those with low cholesterol levels ($F = 8.3$, $p < 0.0001$) Participants with highest cholesterol levels were much more motivated to change diet than those with low cholesterol levels (4.4 vs 2.7, $F = 18.2$, $p < 0.0001$) Barriers to diet compliance were cost and preparation time of healthy food		Paper focuses on gender differences	Participants with the highest cholesterol levels were motivated to make changes to dietary habits. They also reported significantly more dietary changes than those with lower cholesterol levels. Barriers to diet compliance were cost and preparation time of healthy food **Diet change (+)**
Lansing et al. (1990)[83] 5722 med Cohort	425/517 (82.2%)		**Adherence with referral to see a doctor**: 174/425 (41%) with elevated cholesterol levels complied with the recommendation to visit their doctor **Adherence to drug treatment**: 18/24 (75%) who were prescribed medication remained compliant for 6 months. 24/425 (5.6%) did not see doctor but self-prescribed a 'diet'	**Acceptance of risk**: 56/238 (24%) participants with very high cholesterol levels indicated a lack of concern, or disbelief	Reduction in cholesterol only measured in those with opportunistic retesting	A small proportion (41%) saw a doctor about their elevated cholesterol levels. Only 25% of those who had a follow-up test and knew the result had decreased their cholesterol levels. 24% of those at high risk showed a lack of concern or disbelief regarding their cholesterol level. Most of those who were prescribed drug treatment adhered to it **Adherence with referral to see a doctor (–)** **Adherence to drug treatment (+)** **Acceptance of risk (–)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Lefebvre *et al.* (1986)[91] 7213 med Cohort	1040/1439 (72.3%)		**Cholesterol change**: 58% reduced their cholesterol levels by an average of 0.76 mmol/l. 49% of these participants lowered their cholesterol to the point where they moved to a lower category of risk for CHD. 70% of those who showed an increase in cholesterol levels remained in their initial category of risk	94% remembered their cholesterol levels were high at both first and second visits 82% remembered being referred to a doctor		Cholesterol reduction was achieved, with almost half of the participants moving to a lower category of risk **Cholesterol change (+)** **Knowledge (??)**
Lefebvre *et al.* (1991)[84] 2090 emb RCT	386/435 (88.7%)	No. of participants: 198 in letter group; 188 in no-letter group Response rates not given	**Adherence with referral to see a doctor**: 60% of all participants had seen a doctor. By comparison group: 119/198 (60.1%) in the letter group and 112/188 (59.6%) in the no-letter group had seen a doctor Although there was no significant difference reported between the letter and the no-letter groups, those who received the follow-up letter were significantly more likely to state the primary reason for their visit was their high blood cholesterol levels than participants who did not receive a letter (44 vs 27%, χ^2=7.22, df = 1, $p < 0.001$)			A reminder letter confirming the high cholesterol level and prompting a doctor referral resulted in more participants specifically seeing their doctor about their cholesterol level **Adherence with referral to see a doctor (–)**

Appendix 4 cont'd   Cholesterol screening: summary of study results

| Author(s) (year) ID no. Study design | No. of participants and follow-up rate | | Main results | | | |
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Madejski and Madejski (1996)[63] 2458 med Cohort	359/420 (85%)	NA	**Diet change**: 246/359 (69%) decreased dietary fat intake following receipt of a high cholesterol result **Exercise change**: 133/359 (37%) increased exercise following receipt of a high cholesterol result **Weight change**: 69/359 (19%) lost weight following receipt of a high cholesterol result **Adherence with referral to see a doctor**: 169/359 (47%) with elevated cholesterol (>5.2 mmol/l) contacted their doctor. However, none of those under the age of 50 who had high cholesterol levels contacted their doctor **Smoking cessation**: 12/359 (3%) stopped smoking following receipt of a high cholesterol result There were no significant differences between men and women		Participants were telephoned and asked to visit the pharmacist, so were motivated individuals	Pharmacy-based cholesterol screening succeeded in convincing this group to make lifestyle changes. Less than half adhered with advice to see a doctor **Diet change (+)** **Exercise change (+)** **Weight change (+)** **Adherence with referral to see doctor (–)** **Smoking cessation (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

| Author(s) (year) ID no. Study design | No. of participants and follow-up rate | | Main results | | | |
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Maiman *et al.* (1994)[64] 3762 med Cohort	753/811 (93%)	559/753 (74%) adhered with referral advice 194/753 (26%) did not adhere with referral advice	**Diet change and adherence with referral to see a doctor**: those who adhered to referral advice were more likely than non-adherers to report increased consumption of fruit and vegetables (64.6 vs 57.3%, $p = 0.02$) and fish (61 vs 51.7%, $p = 0.06$), and did not eat red meat (7.4 vs 2.8%, $p = 0.03$), butter (65.5 vs 59.6%, $p = 0.02$), egg yolks (38.9 vs 30.9%, $p = 0.04$) and fried foods (26 vs 16.3%, $p = 0.01$). Likelihood of being on a low-fat, low-cholesterol diet was associated with seeking medical care after referral (92.5% of adherers and 83.6% of non-adherers, $p < 0.0001$) The high-risk group was more likely to be retested than the moderate group (64 vs 51%). Those at high risk were more likely to have sought medical attention (79 vs 66.7%, $p < 0.001$). **Cholesterol change**: 1 year after screening cholesterol levels were 4.5% (6.56 ± 0.28 to 6.28 ± 0.88 mmol/l) lower ($p = 0.001$) in those complying with referral ($N = 109$), but virtually unchanged in non-compliers (6.46 ± 0.27 to 6.46 ± 0.65, $N = 57$)			The screening programme's confirmation of high blood cholesterol levels combined with referral appeared to have a positive impact on previously diagnosed high cholesterol screenees, with greater consumption of healthy foods and lowering of cholesterol levels. Adherence with referral to see a doctor was good in the high cholesterol group **Diet change (+)** **Adherence with referral to see a doctor: high group (+), moderate group (–)** **Cholesterol change (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Mann *et al.* (1990)[92] 5806 med Cohort	801/878 (91.2%)		**Cholesterol change**: cholesterol levels had all decreased after screening and brief counselling intervention. Length of follow-up < 6 months, change = –13.7% (95% CI –11.5 to –15.9) ($p < 0.01$); 6–18 months, 13.3% (–11.5 to –15.2) ($p < 0.01$); ≥ 19 months, –10.8% (–9.3 to –12.4) ($p < 0.01$) Those with higher initial cholesterol levels decreased the most			It is possible to reduce cholesterol levels by screening and brief intervention. Most of the decrease occurred in the initial follow-up period (6 months), but was sustained up to 3 years later **Cholesterol change (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Morris *et al.* (1990)[65] 5880 med Cohort	1470/3078 (48%) of screenees with elevated cholesterol levels completed the follow-up questionnaire	703/1470 (49%) knew they had elevated cholesterol levels 749/1470 (51%) did not know they had elevated cholesterol levels (18 no answer)	**Adherence with referral to see a doctor**: overall, 65% visited a doctor, and the blood cholesterol levels were rechecked in 80% of this sample. 71% of those who had previous knowledge of elevated cholesterol levels and 62% of those who were not aware of their previous cholesterol levels had visited their doctor by the 5-month follow-up, which was significantly different at $p < 0.05$. Those who did not visit their doctor cited expense and procrastination at 5 months as the reasons for not consulting their doctor **Diet change**: in existing high cholesterol cases, 80% had no difficulties following recommendations to change diet, whereas 88% of the newly diagnosed had no difficulty making diet changes. This is significantly different ($p < 0.05$). The main reason cited for not following recommendations is 'due to expense' Of those who had not been to see their doctor: 90% of the newly diagnosed patients and 89% of those with previously diagnosed high cholesterol levels had made dietary changes			A higher proportion of those who previously knew their cholesterol levels visited the doctor compared with those who did not. In those that visited a doctor, and were given dietary advice, a higher proportion of newly diagnosed patients reported no difficulties in following dietary advice compared with previously diagnosed cases Procrastination and expense were cited as the primary reasons for failing to consult a doctor or not following dietary advice **Diet change (+) Adherence with referral to see a doctor (+)**

Appendix 4 cont'd   Cholesterol screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Muir *et al.* (1994)[93] 1708 emb RCT (receive initial health check and scheduled for recheck/ receive initial health check but not scheduled for recheck)	Unclear		**Cholesterol change**: the intervention group reported a mean score reduction in cholesterol of 6.16 ± 1.22 and the intervention group 5.96 ± 1.09; the difference in mean score reduction in cholesterol between the two groups was 0.20 (0.13–0.27) ($p < 0.05$) The difference in mean score reductions between the intervention group and the control group in the high cholesterol group only was 3.8 (2.6–5.1) ($p < 0.05$)		Unclear whether behavioural changes reported in this paper are due to cholesterol screening or blood pressure check, therefore only cholesterol change is reported	A significantly greater cholesterol reduction was reported in participants who had received the initial health check and were scheduled to be rechecked **Cholesterol change (+)**
Murdoch and Wilt (1997)[105] 1061 emb Cohort	207/250 (83%)	Men 95/125 (76%) Women 112/125 (90%)		**Knowledge**: 87/207 (42%) could not remember having their cholesterol levels checked, 142/207 (69%) did not know their cholesterol levels. 102/207 (50%) said their doctors did not tell them their results 'Were told cholesterol result by your doctor' and 'were recommended cholesterol-lowering diet' were significantly associated with knowing your cholesterol number (OR = 7.70, 2.04–29.00, $p < 0.01$; OR = 2.65, 1.15–6.07, $p < 0.04$). No other significant associations were found with awareness and health status	This paper was assessing compliance to NCEP's guidelines, and therefore not obviously relevant	Patients' awareness of their cholesterol status was poor, despite having had a cholesterol test **Knowledge (–) (personal)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Nichol *et al.* (1993)[66] 1800 emb Cohort	1039/3148 (33%) of donors participated	489/1039 (47%) followed up Desirable 176 Borderline 226 High 87	**Diet change**: desirable 22.7%, borderline 64.8%, high 82.8% ($p = 0.001$) **Exercise change**: desirable 15.0%, borderline 21%, high 28% ($p = 0.02$) **Adherence with referral to see a doctor**: desirable 8.5%, borderline 34.8%, high 51.7% ($p = 0.001$) **Smoking cessation**: desirable 1.0%, borderline 2.0%, high 2.0% ($p = 0.74$) **Effect of baseline characteristics on lifestyle change and doctor follow-up**: prior knowledge of cholesterol level, $OR_{adj} = 2.3$ (95% CI 1.8 to 2.9, $p = 0.0003$); screening cholesterol category, $OR_{adj} = 6.0$ (95% CI 4.8 to 7.6, $p < 0.0001$)	**Knowledge**: at the time of follow-up, 96.5% of respondents were aware of their cholesterol level. This percentage did not differ by cholesterol category, and represented a 52% increase over baseline ($p < 0.0001$)		Participants with high cholesterol levels were significantly more likely to see their doctor for follow-up and make lifestyle changes. Prior knowledge of cholesterol level and actual cholesterol level were independently associated with follow-up. There was a significant increase in awareness of cholesterol levels between baseline and follow-up among all participants **Diet change (+)** **Exercise change (+)** **Adherence with follow-up to see a doctor (–)** **Smoking cessation (–)** **Knowledge (+) (personal)** **Previous screening (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Ovhed *et al.* (1991)[85] 5198 med Retrospective cohort	100% follow-up; used general practice records to monitor (no patient response needed)		**Adherence with referral to see a doctor**: the authors state that older participants were statistically significantly more likely to have 'better' reattendance rates than the younger groups for moderate and low risk. The data show no difference in compliance in the younger and older age group 40/92 (43.5%) vs 113/255 (44.3%) ($p = 0.89$) This may be due to poor compliance generally in the high-risk group as they are expected to make many more visits than those in the other groups. The most obvious pattern is that compliance rates improve with decreasing cholesterol level, probably due to not having to reattend so many times		The categories of high, moderate and low risk are much higher than those recommended by NCEP	The most obvious pattern is that adherence rates improve with decreasing cholesterol level, probably due to not having to reattend so many times: it is easier to be compliant with one visit than with four or five visits. **Adherence with referral to see a doctor (–)**
Qureshi *et al.* (2000)[87] 238 emb Cross-sectional	Response rate to survey not given, but 18,245 women included in analysis	Response rates not given, but sample consists of: Had a mammography within preceding 2 years 11,509/18,245 (63%) Not had a mammography within preceding 2 years 6736/18,245 (37%)	**Association with breast screening**: Univariate analysis: Cholesterol screening (mammography < 2 years vs > 2 years): yes, 9913 (70.6%) vs 4164 (29.4%) ($p < 0.05$); no, 1495 (38.2%) vs 2458 (61.8%) Multivariate analysis: Cholesterol screening: ever, OR = 2.64 (2.3 to 3.0) ($p < 0.05$); never, OR = 1.00		Not sure whether temporal relationship between exposures and outcomes is correct One part of the analysis was incorrect	Women who had had mammography in the preceding 2 years were significantly more likely to have had cholesterol screening in the past 3 years compared with those who had not had a mammography in the preceding 2 years **Breast screening (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Rastam *et al.* (1988)[75] 6692 med Cohort	414/424 (97%)		**Diet change**: diet improvements are described as major 18%, moderate 50%, small 15%, no change 17% (*N* = 342) **Exercise change**: physical activity described as increased their level of exercise 32%, stayed the same 65%, decreased 3% (*N* = 414) **Adherence with referral to see a doctor**: 237/414 (57%) visited their doctor	**Knowledge**: 94% remembered their cholesterol levels were high at both first and second visits 82% remembered being referred to a doctor		After two elevated blood cholesterol measurements and recommendation to see their doctor, only 57% actually visited their doctor 83% made some form of dietary change, either self-initiated or as a result of seeing the doctor. 32% increased their level of exercise Knowledge of raised cholesterol levels was good at 6 month follow-up **Diet change (+) Exercise change (+) Adherence with referral to see a doctor (–) Knowledge (+) (personal)**
Rastam *et al.* (1991)[67] 5221 med Cohort	1594/1747 (91.2%)		**Labelling**: there was no difference in absenteeism between the high cholesterol group and the desirable cholesterol group: RR for increasing sick days (compared with same or less) = 0.92 (95% CI 0.75 to 1.14); RR for increasing episodes of sick leave = 1.01 (95% CI 0.93 to 1.10) In all men an increase in work absenteeism was seen in both days and episodes, although the authors suggest that this may have been due to ageing			Labelling men as hypercholesterolaemic did not increase the number of sick days or episodes in the following calendar year compared with men with desirable cholesterol levels. Overall, there was an increase in sickness, possibly due to ageing **Labelling (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

| Author(s) (year) ID no. Study design | No. of participants and follow-up rate | | Main results | | | |
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Scheer *et al.* (1992)[68] 4732 med Cohort	180/220 (82%)	Unknown by cholesterol level	**Diet change**: the high cholesterol group was significantly more likely to change their diet than the desirable cholesterol group ($\chi^2 = 23.97$, $p < 0.001$). **Exercise change**: significant exercise increase was dependent on cholesterol level ($\chi^2 = 7.217$, $p < 0.01$) (22% in desirable group, 48% in borderline-high)	**Knowledge**: knowledge of cholesterol screening value from baseline measurement was as follows: 137 (76%) remembered exactly, 22 (12%) remembered within 0.26 mmol/l, 8 were incorrect, 13 did not remember. This was not related to cholesterol group Importance of cholesterol values in terms of heart disease, atherosclerosis and other risk factors was as follows: 65 (36%) answered the question correctly, 42 (23%) were partially correct, and 73 (41%) were incorrect. Again, this was not related to cholesterol group Accuracy of the NCEP category range for high, borderline-high and desirable was as follows: 39 (22%) were correct, 10 (6%) wrote the correct categories, but the values were wrong; 113 (63%) were incorrect. This was not related to cholesterol group	Generalisability limited as subjects were part of a personal health and fitness class. Class dropout limited follow-up. Only 23 subjects in borderline/high category	6 weeks after cholesterol screening and receiving educational handouts and recommendations, 76% of subjects remembered their exact cholesterol value. Only 36% remembered why cholesterol is important, 22% remembered the NCEP categories and values and only 36% could fully identify their correct NCEP follow-up. More self-reported dietary and exercise changes were observed in those testing > 200 mg/dl than in those < 200mg/dl **Diet change (+)** **Exercise change (+)** **Knowledge of cholesterol: personal (+), general (–)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Steyn *et al.* (1988)[69] 6778 med Cohort	91/104 (87.5%) at follow-up		**Diet change**: 32/91 (35%) complied moderately and 13/91 (14%) complied strictly with the recommended diet. The strictly compliant group had significantly lower values ($p < 0.005$) **Cholesterol change**: a significant reduction in total cholesterol was observed after the counselling session (initially 6.54 ± 1.14 mmol/l, changed to 6.21 ± 0.97, paired *t*-test, $p = 0.0006$) **Exercise change, weight change and smoking cessation**: no significant differences in smoking, exercise or weight were reported		At follow-up, nursing sister found that many participants had unanswered questions about the diet or were inadvertently making mistakes	50% of this group made changes to their diet. This resulted in a significant reduction in cholesterol levels after 3–4 months. There was no change in other health behaviours (smoking, exercise, weight) **Diet change (+)** **Exercise change (–)** **Weight change (–)** **Cholesterol change (+)** **Smoking cessation (–)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Stockbridge et al. (1989)[70] 6412 med Cohort	1717/3844 (45%) of screenees had elevated cholesterol levels	652/1717 (38%) had borderline high levels 1065/1717 (62%) had high levels 507/1717 (29.5%) completed the mailed questionnaire 61/100 (61%) completed the telephone interview	**Diet change**: 76% of mailed survey, and 85% of telephone survey changed their diet owing to their high cholesterol level: 78% of mailed survey and 84% of telephone survey reduced high cholesterol food intake; 75% of mailed survey reduced their fat intake; 69% of mailed survey reduced their saturated fat intake; 62% of mailed survey increased their fibre intake **Exercise change**: 44% of mailed survey increased their level of exercise owing to their high cholesterol level. **Weight change**: 36% of mailed survey and 57% of telephone survey lost weight owing to their high cholesterol level **Adherence with referral to see a doctor**: 65% of mailed survey and 63% of telephone survey followed up with their doctor **Smoking cessation**: 7% of mailed survey and 43% of telephone survey had cut down or stopped smoking owing to their high cholesterol result	**Knowledge**: 54% of respondents to mailed survey said their motivation for going to screening was to recheck their cholesterol level, having been for screening before 94% believed that lowering their cholesterol decreased their risk of a heart attack 91% said that screening motivated them to decrease their cholesterol levels 95% said they had become more aware of cholesterol in the past 5 years		Receiving a moderate to high cholesterol result led to positive lifestyle changes in the majority of responders. Previous screening motivated 54% of participants to be screened again **Diet change (+) Exercise change (+) Weight change (+) Adherence with referral to see a doctor (+) Smoking cessation (+) Knowledge (+) (general) Previous screening (+)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Strychar et al. (1992)[71] 2032 emb Cohort	301/800 (37.6%)	Group 1: 58/301 (19%) Group 2: 234/602 (39%)	**Diet change**: the frequency of consumption of high-fat food decreased in those who attended the nutrition session compared with their pretest results ($t = 4.14$, $p = 0.0001$)	**Knowledge**: for those who attended the nutrition talk, the cholesterol knowledge mean scores were significantly higher than those who did not attend (4.67 vs 2.86, $p < 0.028$, where 5 = very important and 1 = not very important) Knowledge of nutrition and cholesterol increased significantly for those who chose to participate in the nutrition talk compared with the pretest responses ($t = -6.10$, $p = 0.0001$)	Low response rate and lacks comparison group. Also not sure which intervention influenced outcome (nutritional session, video, leaflet or knowledge of cholesterol level)	Knowledge of blood cholesterol level was associated with attendance at a nutrition session. Those who participated in the nutrition session significantly increased their knowledge about nutrition and cholesterol and reduced consumption of high-fat food **Diet change (fat intake) (+) Knowledge (+) (general)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Strychar *et al.* (1993)[72] 3980 med Cohort	1293/1989 (65%)		**Diet change**: 816/1293 (63%) of respondents reported that they had changed their eating habits following screening by decreasing their intake of fried foods and butter/margarine, and increasing their intake of fruit and vegetables Fat intake mean scores decreased from 2.57 ± 0.7 to 2.39 ± 0.6 ($t = 10.90$, $p < 0.001$). The Food Frequency Questionnaire mean scores decreased from 2.57 ± 0.7 to 2.39 ± 0.6) ($p < 0.0001$) The post-test food frequency scores were lower in those with high cholesterol ($R^2 = 42\%$, $F = 32.22$, $p < 0.0001$) 201 (16%) said they had seen a dietician following the Provigo programme, and in a majority of cases this was recommended by their doctors **Adherence with referral to see a doctor**: after screening, 683/1281 (53%) reported seeing their doctor to discuss blood cholesterol level or blood pressure. 437/1281 (34%) reported having another cholesterol test	**Knowledge**: knowledge of the role of fat in cardiovascular disease increased from 5.2 (1.6) to 5.5 (1.5), $p < 0.001$ (nine-item scale)		Following cholesterol screening significant improvements were observed in fat intake and food frequency, and a significant increase in knowledge of the role of fat in CVD. Just over half complied with the recommendation to see a doctor, and one-third had their cholesterol levels rechecked **Diet change (+)** **Adherence with referral to see a doctor (–)** **Knowledge (+) (general)**

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Strychar et al. (1998)[73] 1336 med RCT (aware of high cholesterol result at first screen/not aware of cholesterol result at first screen)	429/500 (86%) (authors state this as 93%)	Not reported	**Diet change**: overall, subjects improved their dietary intakes following the nutrition education. Employees significantly reduced their saturated fat intake by 7.4% from 12.2 to 11.3% of total calories ($p < 0.05$). Participants also decreased their frequency of consumption of high-fat foods by 7.6% ($p < 0.001$) By intervention group: there was no difference in dietary change between the groups (both decreased saturated fat by 0.9%) Participants with normal cholesterol levels but who did not receive their cholesterol level results at pretest had greater decreases in saturated fat intake than those who did **Cholesterol change**: overall, mean blood cholesterol levels decreased from pretest to post-test by 4.8% (5.21 to 4.96 mmol/l, $p < 0.001$)			The programme succeeded in improving dietary consumption patterns and cholesterol values. However, no differences were observed between the intervention groups (i.e. knowing one's cholesterol level did not affect the results) The authors noted that those with normal levels but who were not told so, reduced their fat consumption by a greater amount than those who knew that their blood cholesterol was fine. They suggest that this may be indicative of a false sense of security in the participants with normal cholesterol levels **Diet change (+) overall; intervention had no effect Cholesterol change (+)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Troein *et al.* (1997)[99] 986 emb Qualitative	63/63 (100%)		Preserving health was not regarded as the main interest in life: "In the evening or on days off you don't think so much about your body. You want to experience something else and you want to be free and maybe rest and then you don't want to spend your time with some sort of physical training or jogging or something like that" Changes of lifestyle were expected to threaten other important qualities of life: "There is quite a lot of fat in the food I eat during the weekends. How much will that shorten a life? It's not only a matter of living a long life. It's about quality of life as well" Changes require motivation and willpower, and earlier experiences, such as trying to quit smoking, have left some men with a feeling of poor self-control. Wholesome food was regarded as tasteless, expensive or not filling enough by several men The interviews also contained examples of men who had already started making lifestyle changes, who felt confident in undertaking changes and who were pleased to have support of their families and the nurse	**Understanding and accepting**: men expressed that the cue to understanding and taking action would be not feeling well: "I still don't think that you should worry too much [about the level] unless it is extremely high. If it's dangerous so you notice that this is getting dangerous and you feel bad, then you'll have to do something about it" There were expressions of scepticism about the diagnosis, since an elevated value at the initial test could turn out to be normal at the check-up **Attitudes to information**: information was regarded as unreliable and it often changed: 'There we are again, you get information from different sources and one says this and the other says that'		Many men expressed resistance to lifestyle changes as they felt the changes would impact on their quality of life. Many of the men did not perceive themselves as ill, which made it difficult for them to understand and accept their diagnosis and thus undertake the lifestyle changes **Acceptance of risk status** (–)

Appendix 4 cont'd   *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Van Beurden *et al*. (1990)[94] 483 psy Cohort	374/644 (58%)	Public screening 317/576 (55%) Blood bank control 57/68 (84%)	**Cholesterol change**: at retest the public screening participants showed a significant decrease in cholesterol of 2.9% (paired $t = 3.10$, $p = 0.002$) The control group (blood bank) showed a significant increase of 4.1% (paired $t = -2.16$, $p = 0.035$) The net difference between the control group and the public screening group was a 7% relative reduction in the public screening group ($t = 2.95$, $p = 0.003$)		Over Christmas period	The results indicate that cholesterol testing followed by a simple dietary message can effectively reduce cholesterol levels **Cholesterol change (+)**

Appendix 4 cont'd   Cholesterol screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Wang *et al.* (1999)[74] 987 med Cohort	1957 were followed up Follow-up rate was not reported for high cholesterol group, but overall 4473/4928, (90.8%) were followed up	692/1957 (35%) visited their doctor 1265/1957 (65%) did not visit their doctor	**Diet change**: fat consumption change: 273/362 (75%) of those visiting a doctor decreased fat intake, compared with 542/757 (72%) of those who did not see a doctor (adjusted OR = 1.32, 95% CI 0.97 to 1.81). Overall, 74% reduced their fat intake **Weight change**: 189/266 (71%) of those consulting their doctor reported weight loss compared with 245/361 (68%) of the non-consulters (OR = 1.34, 95% CI 0.91 to 1.98). Overall, 71% reported weight reduction **Exercise change**: 140/272 (52%) of those consulting their doctor reported an increase in exercise compared with 273/505 (54%) of the non-consulters (OR = 0.93, 95% CI 0.67 to 1.28). Overall, 53% reported an increase in exercise **Smoking cessation**: 47/115 (41%) of those consulting their doctor decreased smoking compared with 94/261 (36%) of the non-consulters (OR = 1.18, 95% CI 0.72 to 1.95). Overall, 38% reported decreased smoking			The study demonstrates that those with elevated cholesterol who consulted their doctor and received lifestyle advice were no more likely to modify their health behaviours than those who did not. However, the study demonstrated the high value of absolute changes in both groups. Therefore, participants did change their behaviour, but in response to screening, not to the doctor visit **Diet change: overall (+), visit (–)** **Weight change: overall (+), visit (–)** **Exercise change: overall (+), visit (–)** **Smoking change: overall (+), visit (–)**

Appendix 4 cont'd *Cholesterol screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Wynder *et al.* (1989)[86] 6498 Cohort	592/1287 (46%) response rate 117/278 (42%) were followed up by telephone and 499/1009 (50%) followed up by a mailed questionnaire	None	**Adherence with referral to see a doctor**: 415/592 (70.1%) followed up the recommendation to have their cholesterol levels rechecked by the doctor **Cholesterol reduction**: the average reduction for all 125 high cholesterol patients irrespective of treatment was 1.0 mmol/l (95% CI 0.82 to 1.23) **Adherence with drug treatment**: the average reduction in cholesterol over 1 year for those receiving drugs vs not was 1.33 vs 0.90 mmol/l ($p < 0.04$). The greatest reduction observed was > 1.54 mmol/l among drug-treated subjects with initial levels > 7.7 mmol/l		11% overall went for a cholesterol test because they had previously had a high cholesterol level	A high proportion of those recommended to see a doctor did so (70%). Significant reductions in cholesterol levels were observed, particularly in those who received treatment. **Adherence with referral to see a doctor (+) Adherence with drug treatment (+) Cholesterol change (+) Previous screening (+)**

OR: odds ratio; BMI: body mass index.

Appendix 5
Breast screening: description of studies

Papers marked with an asterisk (*) are also included in the cervical screening section.

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Allen *et al.* (1998)[124] 1235 med USA	Cross-sectional	Baseline survey of an RCT of workplace breast and cervical screening	Women aged ≥ 52 years, employed to work at least 15 hours/week and who were not adherent with mammography guidelines	Never users Previous user (had one or more mammograms, but not in past 2 years) Recent adopter (had a mammogram in past 2 years, but not before that)	NA	Intention to have a mammogram
Aro *et al.* (2000)[127] 147 med Finland	Cohort	Finnish breast screening programme	Women aged 50 years at their first screening; 80% married; 29% < 9 years of education, 33% 9–11 years, 38% > 12 years; 80% employed; 48% had a past mammogram	Normal findings (NF) False-positives (FP) Referents (REF)	2 months before screening 2 months after screening 12 months after screening	BSE practice Intention to reattend Importance of BSE Confidence in BSE Intrusive thinking about breast cancer Perception of healthy breasts Perceived breast cancer risk Breast symptoms Worry about breast cancer Depression

Appendix 5 cont'd *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Bakker et al. (1998)[193] 1544 med Canada	Cohort	One centre in the Ontario Breast Screening Program	Women immediately post-screening, aged ≥ 50 years without a history of breast malignancy or mammography during the 12 months before the study and no acute breast symptoms; mean age 61 (50–85) years; 71% married	None	3 weeks	Intention to reattend mammography Concerns over pain and radiation Sense of reassurance that you do not have breast cancer Feeling more relaxed Improved relationship with friends or relatives Feeling more able to meet home/work responsibilities Feeling more hopeful about the future Feeling less anxious about breast cancer Getting along better with those around you Been sleeping better Greater sense of well-being
Bastani et al. (1991)[174] 5422 med USA	Cross-sectional	Los Angeles County	Women aged ≥ 40 years; mean age 56.82 years; 68% white, 12% black, 10% Hispanic; 59% married or with partner; 62% had at least some college education (general population 35%); 71.2% had received a mammogram at some time	Ever having had a mammogram Never having had a mammogram	NA	Telephone-administered questionnaire Perceived susceptibility Perceived efficacy of mammography Perceived efficacy of early detection Concern about radiation Fear of finding cancer Knowledge of guidelines

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Beaulieu et al. (1996)[133] 2650 med Canada	Cohort	Asymptomatic breast screening ordered by prescription. The clinic served low socio-economic, white, French speakers	Women aged 50–69 years; given written prescription for screening mammogram, had not had one within 2 years and had never been treated for breast cancer	Women who accepted the offer of mammography Women who decided not to have the mammography	2 months after recommended screening (telephone questionnaire-based interview)	Health status and psychological well-being (Affect Balance Scale) Previous use of Pap smears and mammography Beliefs and attitudes re mammography Knowledge of screening recommendations and perceptions of other women's actions re breast screening
Bennett et al. (1994)[130] 1736 emb Australia	Cross-sectional	Royal Women's Hospital Breast Screening Clinic	Consecutive attenders for routine screening, aged 30–80 years, mean $\pm$ SD age = 57.7 $\pm$ 9.5 years	Experience of discomfort/pain: comfortable, uncomfortable but tolerable, very uncomfortable, intolerable	NA	Self-completion questionnaire Discomfort affects future mammography attendance
*Boer et al. (1993)[132] 382 psy Netherlands	Cohort	Breast screening programme	Women aged 50–70 years; reattenders mean age 56.6 years, non-reattenders mean age 57.6 years	Reattenders vs non-reattenders at second round screening	2 years Baseline T1: 1–10 days before participation (March 1989) T2: immediately after screening (March 1989) T3: reatten-dance/non-attendance from screening records, 2 years after first screen	Effect of previous Pap smear Effect of satisfaction of first breast screening on attendance at second breast screening

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Bull and Campbell (1991)[171] 5448 med UK	Cohort	Salisbury and Southampton Health Districts Mammography screening programme	Women aged 50–70 years	Group A: invitation to attend Group B: normal result, routine mammography (part of group A) Group C: normal after special assessment clinic (may or may not have been in group A) Group D: normal after surgical biopsy (may or may not have been in group A)	6 weeks	Self-administered questionnaires Some anxiety results (not included here) Frequency of BSE after screening compared with before Intensity of investigation and frequency of subsequent BSE Confidence in mammography
Burman et al. (1999)[152] 835 USA	Cohort	Breast cancer screening programme at Group Health Cooperative, a health maintenance organisation in Washington state	40 years of age or older with no history of breast cancer or breast surgery who had false-positive (N = 813) or true-negative (N = 4246) index screening mammograms between 1 August 1990 and 31 July 1992	True negatives and false positives	12 months	False-positive index mammogram and subsequent breast cancer screening
*Burton et al. (1998)[123] 1383 med UK	Cohort (retrospective)	RCT of annual mammography	Women aged 50–62 years randomised to receive mammography every year	Attenders (those who attended when first invited) Non-attenders Ambivalent attenders (those who delayed screening until 2nd year)	Not stated	Intention to reattend No. years since last cervical smear test Visits to GP Previous mammography Health-promoting behaviours Knowledge of mammography and smear test Found mammogram embarrassing Reassurance

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Calnan (1984)[144] 7500 med UK	Nested cohort within an RCT of BSE or mammography	Two health districts: in one district women were invited to attend a BSE class; in the other district women were invited to attend the breast screening clinic	Random sample of women aged between 45 and 64 years registered with a GP in the two districts	Breast screening attenders Breast screening non-attenders BSE class attenders BSE class non-attenders	Interviews conducted 1 month before receipt of invitations to BSE class or mammography Attendance status ascertained from RCT data	Questionnaire interview Ever had cervical smear Ever had previous breast screening (as predictors of attendance)
*Calnan (1985)[164] 7393 med UK	Cross-sectional	Part of a larger interview survey conducted in primary care in three cities on early detection of breast cancer	Women aged 45–64 years	Use/non-use of seven preventive health behaviours	NA	Interview survey Correlation between preventive behaviours (breast screening, cervical screening, dental check-up, dietary practice exercise, smoking behaviour, use of seatbelt)
Champion and Springston (1999)[175] 47 psy USA	Cross-sectional	Waiting room of a multiservice centre (women were waiting for food stamps or heating vouchers)	Convenience sample of 329 low-income African–American women, aged 45–64 years	Precontemplators (never had mammogram, not considering) Contemplators (never had mammogram, considering) Action (adherent with mammography guidelines) Relapse (had mammogram but not had one recently to be adherent with guidelines)	NA	Perceived susceptibility to breast cancer Barriers to mammography Benefits of mammography

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]

*Clark *et al.* (1998)[191]
 120 psy
 USA
	Cross-sectional	Telephone interviews with women from Rhode Island and Massachusetts	Women aged 50–74 years who made an appointment for any reason at Departments of Family Medicine, Internal Medicine or Obstetrics and Gynaecology	Least committed (never had mammogram or had mammogram, but no intention to have future mammograms)
				
				 Contemplators/inconsistent (never had, or had mammogram > 2 years ago, and planning to have a mammogram in the next 1–2 years)
				
				 Action (had a mammogram on yearly schedule and planning to have another one on schedule)
				
				 Maintenance (has had two or more mammograms on yearly schedule and is planning to have another one on schedule)
					NA	Telephone interviews
						
						 The following factors influence stages of adoption of mammography screening:
						
						  Pap smear within 2 years
						  Knowing the age-related
						    interval
						  Having no barriers to screening
						
						 Also reports demographic and provider–patient influence, but these are not relevant to this review

Clemow *et al.* (2000)[113]
 39 psy
 USA
	Cross-sectional	341 family medicine, internal medicine or general practice settings	Women aged 50–80 years; members of the Health Maintenance Organisation (provides free mammography)	Three categories of intention to have a mammogram:
				  not planning
				  thinking about
				  definitely planning
					NA	Telephone-administered questionnaire
						 Main outcome was intention to get a mammogram (not planning, thinking about, definitely planning); most of the data are not relevant on a temporal basis
						
						 Intention to obtain a mammogram based on prior utilisation of mammography services
						
						 Prior mammography use and intention for women not planning on having a mammogram in the next 1–2 years

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Cockburn et al. (1992)[131] 1972 emb Australia	Cohort	Melbourne pilot breast screening programme	Consecutive attenders, aged 50–69 years (23% 50–54 years, 32% 55–59 years, 20% 60–64 years, 24% 65–69 years); 19% had no lower secondary school education, 17% had further qualifications, 66% had lower secondary education, 15% had upper secondary education; 72% married	Severe, moderate, slight and no pain (but no comparative analysis)	3 months	Self-administered questionnaire after screening (pain data collection) Telephone interview after 3 months Experience of pain affecting intention to attend future screening
Cockburn et al. (1997)[148] 1656 med Australia	Cohort	Mobile breast screening unit in a rural area	Women aged 50–69 years who had not had a mammogram in the past 6 months	Attenders Non-attenders	Attendance at mobile screening unit during a 10-week period	Telephone interview 2 weeks before screening Previous mammography history (as predictor of current screening status)
*Cockburn et al. (1997)[153] 2105 med Australia	Cohort	Systematic breast screening programme	Women aged 50–69 years who lived in a defined geographical area and attended breast screening in the first round (data collected before first round)	Attenders at second round breast screening Non-attenders at second round screening	Approximately 2 years	Previous use of pap smears affecting reattendance for second round breast screening Previous diagnostic mammograms (before first round) Outcome of first round screening
Cole et al. (1997)[181] 1710 med USA	Cross-sectional	Seven counties (both rural and urban) in Kentucky	Women aged 40–90 years; mean age 58 years; 54% Caucasian, 46% African–American	Regular mammography users (adherent with American Cancer Society Guidelines)[b] Intermittent/non-users of mammography	NA. Interviewer completed questionnaire	Belief in the efficacy of early detection in improving breast cancer outcome Perceived risk Belief that mammography is dangerous Belief that mammography is painful

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Conlon et al. (1998)[186] 836 emb Canada	Cohort (retrospective)	North-eastern Ontario Breast Screening Program	Women aged ≥ 50 years; no history of breast cancer, had not had a mammogram within the past 12 months and asymptomatic, who participated in another study 73.4% aged 50–64 years; 71.7% married, 76.5% had high school or less education	Reattenders Non-reattenders	2 years after initial screen. Contacted 6 weeks before due for next biennial screening (to encourage attendance, not to collect data)	Questionnaire after initial screen Reattendance status ascertained from screening records Concern about radiation Pain from mammogram Emotional intensity of screening process (as predictors of current screening status)
Crump et al. (2000)[143] 124 med USA	Case-control	Urban hospital screening mammography department	African–American women, who spoke English; age ≥ 40 years; had a screening mammography appointment. Women were excluded if they had a history of breast cancer or if they had been referred for mammography because of signs or symptoms	Cases and controls Cases were defined as women who failed to keep their appointment Controls were defined as women who kept their appointment	NA	Telephone-administered questionnaire Knowledge, attitudes and beliefs surrounding breast cancer prevention and control Prior breast cancer screening practices
Dean et al. (1986)[170] 7224 med UK	Cohort (prospective)	Edinburgh Breast Screening Clinic	Women aged 45–65 years; had had mammography plus taught BSE 55% aged 45–54 years; 89% married; 60% employed; 52% middle-class by the Goldthorpe and Hope criteria	Before/after measures in screening sample vs community sample	6 months	Interviewed just before screening (at the clinic) and then contacted 6 months later Belief that breast screening is reassuring Belief that screening made them more anxious about screening Increased awareness of breast cancer Continued use of BSE

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
De Neef and Gandara (1991)[156] 5539 med USA	Cohort (retrospective)	Women who had screening mammography during a 7-month period	482 women who had had a screening mammogram; asymptomatic; no history of personal breast cancer or extensive breast intervention; at least 12 months since last mammogram; mean age 52.7 ± 13.1 years	Routine screening recommended Accelerated follow-up (early recall) Evaluate (further investigations)	Data collected 24–35 months after the index mammogram	Routine data sources Number with no further tests Number with unresolved follow-up Time taken to have further follow-up when recommended
Donato *et al.* (1991)[149] 5495 med Italy	Cohort	Mammography screening programme, northern Italy	Women aged 50–60 years, invited to screening	Attenders vs non-attenders	6 months	Reasons for non-attendance Past mammography Past Pap smear (for non-attenders) Very basic information in attenders (not collected specifically for study, but held at screening office)
Duijm *et al.* (1998)[201] 1252 med Netherlands	Cohort (prospective)	Physician-referred breast screening	Women aged > 30 years, referred for breast imaging and found to have non-palpable breast lesions (assuming this is screening) No other data given	None	7, 19 and 31 months	Routine attendance data and postal questionnaire to GPs of non-adherers 1 month after scheduled follow-up Adherence with mammographic follow-up of non-palpable lesions Reasons for non-adherence
Elkind and Eardley (1990)[194] 5986 med UK	Cohort	Trial phase of breast screening service in Manchester	Women aged 50–64 years from a practice in Manchester Health authority staff aged 50–64 years No other details given	None	Immediately after screening	Self-reported questionnaire Intention to attend Interest in 'preventive?' measures Reaction to receiving invitation

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Elwood et al. (1998)[187] 1400 med New Zealand	Cohort	Breast screening programme (Otago Southland)	Women aged 50–62 years	None	Telephone survey of non-attenders to 24-month routine screening at 27 months after the previous screen (i.e. 3 months after they should have reattended)	Influence of previous breast screening on decision not to reattend (pain, fear, concern of safety, fear of outcome, lack of acceptance of the benefits of screening)
*French et al. (1982)[158] 7716 med UK	Cohort	Edinburgh Breast Screening Clinic	Women aged 45–64 years, mean age 54 years; mostly married	Attenders Non-attenders (stratified by those who declined to attend, those who confirmed they would attend but then DNA, and those who DNA without contact)	3 months after invitation for mammography screening	Cervical smears Dental check-ups (as predictors of current screening status) Reasons for attending or not attending Fear
Friedman et al. (1996)[192] 228 psy USA	Cross-sectional	Health Information Extenders (community buildings such as church, shelters, drug treatment centres)	Adult women; mean age 38.62 ± 15.88 years; formal education averaged 11.68 ± 3.89 years; majority of subjects either African–American (43%) or Hispanic (37%)	Had a mammogram in the past year Not had a mammogram in the past year	NA	Knowledge of breast cancer and breast screening

Appendix 5 cont'd *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Fuller et al. (1992)[182] 4691 med USA	Cross-sectional	Mailed questionnaire to women in the State of Florida who had phoned up for information about a new breast screening programme	Women aged 31–83 years, mean age 57.5 years; 96% white; 29.1% yearly income of $20,000–$30,000; 73.5% were married; 64.3% high school education. No significant differences between the participants and the non-participants	Participants vs non-participants in mammography programme	NA	Mailed questionnaire on HBM outcomes: Barriers (fear, embarrassment, time, pain, radiation, exposure, safety) Perceived risk/susceptibility (lifetime risk, 5-year risk, general worry about the disease, family history risk) Perceived seriousness (serious disease, losing breast and self-image, losing breast and image held by others) Miscellaneous concerns (early detection: BSE, peace of mind, age as risk, family/friends' approval)
Glockner et al. (1992)[190] 4943 med USA	Cohort	Fee-for-service, university mammography clinic	Women aged ≥ 35 years currently undergoing breast screening; mean age 55.75 years; most had at least 1 year of college; 52% yearly income of < $20,000; 76% white	Previous mammography No previous mammography	None	Self-administered questionnaire Most of the results are not relevant for this study Previous use of mammography
*Gnanadesigan et al. (2000)[173] 1 psy USA	Cross-sectional	PEP programme	Women in PEP aged 60–84 years, average age 74 years; 43% of ethnic minorities; 76% widowed, divorced or single; 46% income at or below poverty level; 75% high school or further education	Ever had a mammogram Never had mammogram and Current mammogram (within 2 years) Not had a current mammogram	NA	Self-administered questionnaire Cervical screening Screening for colorectal cancer Immunisations for tetanus, pneumonia and influenza Calcium supplement use BSE HRT use Smoking Seatbelt use

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Gordon et al. (1991)[114] 5165 med Italy	Cross-sectional interview study	Two districts where a new breast screening programme was to be introduced	Random sample of women aged 50–70 years	Women who intend to participate in breast screening Women who do not know Women who do not intend to participate	NA	Previous mammogram Previous Pap smear (as predictors of intention)
Gram et al. (1990)[129] 5833 med Norway	Cohort	Systematic breast screening programme	Women aged ≥ 40 years	All eligible false positives (N = 179), all non-attenders (N = 670); a sample of negative-result women (N = 250), population sample (N = 250) This paper focuses primarily on interview data of false positives or all clear	Questionnaire after 6 months Interview after 18 months	Intention to reattend for mammography Visits to GP, outpatients department, physiotherapists Sense of well-being % Overall positive experience % Overall negative experience
Gram and Slenker (1992)[115] 5040 med Norway	Cohort	Free screening programme (part of a study)	Women aged > 40 years, median age 46 (range 40–61) years	All false positive (N = 160) Sample screen negative (N = 209) All non-attenders (N = 210) Sample not invited (population sample) (N = 164)	Postal questionnaire Period not specified	BSE behaviour Willingness for future mammograms Anxiety measures (not relevant for this review)
Helvie et al. (1991)[202] 5613 med USA	Cohort (retrospective)	Mammograms obtained in one institution (not sure whether purely screening or a mixture of screening and symptomatic)	2650 women aged 24–90 years Routine follow-up mammography after surgery and radiotherapy, second opinion films and those followed up after a negative FNA were excluded	None	12, 24 and 36 months	Routine data sources Proportion who underwent recommended repeat mammography after a low suspicion mammogram Proportion remaining adherent to repeated mammography at different periods

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Holm *et al.* (1999)[184] 927 med USA	Cross-sectional	Community setting	Women aged 35–84 years, mean age 53 years; predominantly married, white and Protestant (25 African–American, 72 white); 66% exceeded high school education	Had mammogram No mammogram	NA	HBM (susceptibility, seriousness, benefits, barriers, high motivation). Health Locus of Control (internal locus of control, powerful others locus of control and chance locus of control)
Johnson and Meischke (1994)[176] 1598 emb USA	Cross-sectional	Medium-sized mid-western city	Women aged 40–84 years, mean age 55 years; 89% Caucasian; 32% some college education, 30% high school education, 14% college degree, 15% postgraduate degree	Had mammogram No mammogram	NA	Telephone-administered questionnaire Ability to recognise changes in one's breasts Perceived vulnerability Perceived seriousness Health motivation
Johnson *et al.* (1996)[150] 2563 med Canada	Cohort	Breast screening programme	2253 women aged < 50 years (40.1% of cohort) and 3371 women aged ≥ 50 (59.9% of cohort) who were screened and did not have breast cancer	Annual adherers (within 18 months) Late adherers (18–36 months) Non-adherers at the next screening round	Questionnaire data collected at time of index screen, followed up for 3 years to assess rescreening status	Previous mammography (before index screen) (as predictor of rescreening behaviour) Result of index mammography (as predictor of rescreening behaviour)
*Kee *et al.* (1992)[116] 4667 med Northern Ireland	Cohort	National breast screening programme (cervical screening examined as a factor affecting uptake of breast screening)	600 women who had been invited at some time to attend for breast screening. Stratified (by attendance/non-attendance) random sample of 300 attenders and non-attenders, with replacement if interview was unsuccessful (766 addresses were visited to obtain 600 interviews); average age of respondents 58.7 years	300 breast screening attenders 300 breast screening non-attenders	Variable	Attendance status for breast screening (as predicted by cervical screening status) Intention to attend for breast screening when next invited

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Keemers *et al.* (2000)[195] 174 emb Netherlands	Cross-sectional	Breast screening programme	Consecutive attenders for routine breast screening, aged 50–75 years, Mean age 59.4 (49.7–75.7) years; 25.5% had low education level, 43% low–moderate, 18.9% moderate to high, 12.6% high education level; 77% married; 97% Dutch	No comparison	NA	Questionnaire after screening Pain deters from future mammography
Kessler *et al.* (1991)[203] 5555 med USA	Cohort (retrospective)	Worksite low-cost mammographic screening in 57 sites	3627 female employees or spouses of employees aged ≥ 35 years	None	Median follow-up 12 months	Routine data sources Proportion of women who were recommended to have a biopsy Proportion of those who had a biopsy
King *et al.* (1993)[183] 411 psy UK	Cohort	Annual breast cancer screening mammography programme (US Healthcare Check)	Non-attenders, women aged 65–74 years; all women offered a free mammogram but had not obtained one in the previous year; 53% married, 86% white, 61% had at least high school education, 80% not employed No significant differences between comparison groups No data on age presented	Never had a mammogram Ever had a mammogram	85 days (time from receiving invitation to not having had mammogram)	Telephone interviews Risk perception Beliefs (associated with previously ever/never having had a mammogram)

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Kruse and Philliips (1987)[168] 6976 med USA	Cohort	Two rural hospitals, Illinois	Women currently accepting breast screening, aged > 35 years, mean age 54.5 years (34% 35–49 years, 41% 50–64 years, 22.4% ≥ 65 years); 89% completed high school education, 17.4% college graduates; annual household income < $18,000 in 32.2%, > $30,000 in 30.1%; white women were more likely to attend screening than black (1% compared with 3.2% in the local population)	Had previous mammogram Have not had previous mammogram	No data on when previous mammogram was taken. No follow-up questionnaire	Questionnaire at time of current mammography Many predictors of this current episode of screening, only the following variable relevant: practise BSE
Lechner et al. (1997)[134] 1879 med Netherlands	Cohort	National breast screening programme	Women aged 50–69 years, average 59 years, who were invited to the first screening round; 75% married, 14% widowed, 11% single, 4% high level of education, 22% high school level	Participants and non-participants in the second screening round	Questionnaire 1 year after first screening round Observed uptake in second screening round, 2 years after first round	Intention to reattend Correlation between determinants (self-efficacy, screening behaviour in first round, screening characteristics), intention and behaviour Predictors of intention to participate Predictors of participation (all predicting participation in second screening round)
Lerman et al. (1991)[125] 5343 med USA	Cohort	Free screening through a US Healthcare check	Women aged 50–74 years who had recently undergone breast screening and were not diagnosed with cancer; mean age 58 ± 5.7 years; predominantly married and white	Women who received an immediate all clear (N) Women with 'low suspicion' abnormal mammograms (A2) Women with 'high suspicion' abnormal mammograms (A3)	3 months	Telephone questionnaire survey Psychological anxiety; not relevant to this review BSE frequency Intention to have a future mammogram

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Lipkus *et al.* (2000)[128] 61 emb USA	Cross-sectional	Routine breast screening (random telephone survey)	1047 women aged 40–55 years who did not have breast cancer and had had a mammography	Women who never had an abnormal mammogram Women who had an abnormal mammogram within past 2 years Women who had an abnormal mammogram > 2 years ago	Variable	Adherence to NCI mammography recommendations Whether women felt torn about going for their next routine screen (agree, disagree, undecided) Perceived absolute risk of developing cancer in next 10 years/lifetime: verbal responses (very unlikely, unlikely, 50/50 chance, likely, very likely) Numerical, 0 = certain not to happen to 100 = certain to happen Perceived comparative risk: compared with other women of your age, how likely are you to get breast cancer in next 10 years/lifetime (much below average, below average, average, above average, much above average) Worry about breast cancer Attitudes to screening based on agreement with 20 statements about breast screening Depression measured using Center for Epidemiology depression scale
McCarthy *et al.* (1996)[154] 2405 med USA	Cohort (retrospective)	Screening mammography in a medical group	1249 women with an abnormal screening result; majority aged under 50 years; married; Caucasian; with HMO insurance coverage	Women recommended for immediate follow-up (compare with other films, ultrasound, repeat mammography, biopsy) Women recommended for 6-month follow-up (repeat mammography in 6 months' time)	Not clear	Routine data sources Proportion with inadequate follow-up Relationship between inadequate follow-up and obtaining a previous mammogram

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Maclean *et al.* (1984)[159] 7493 med UK	Cohort	Edinburgh breast screening clinic	Random sample of women aged 45–64 years who declined to accept an invitation for breast screening	Non-attenders Attenders	Retrospective. Does not state how long after the screening appointment	Interviews (with precoded questions and some qualitative elements) Health-promoting behaviours Attitudes to breast screening Attitudes to BSE
McNoe *et al.* (1996)[117] 2434 med New Zealand	Cohort	First round of population-based screening programme	1 in 10 random sample of breast screening attenders with normal results ($N = 191$); 1 in 3 random sample of non-attending women ($N = 174$)	Attenders and recent non-attenders	Not stated	Telephone interview Reasons for attendance/non-attendance (not relevant to this review) Intention to attend when next invited
*Mandelblatt *et al.* (1993)[145] 4360 med USA	Cohort	Public hospital medical clinic	Black women aged ≥ 65 years, mean age 75 ± 6.4 years; low socio-economic status No differences between participants and non-participants except for number of chronic illnesses. No data presented	Participants ($N = 190$) completed all or part of the screening tests Non-participants ($N = 81$) refused screening	6 months	Questionnaire and record search Variables associated with participation in breast and cervical screening (not all relevant to this study) Past cervical screening Past mammography screening (to predict participation)
Marshall (1994)[165] 3662 med UK	Cohort	Nottingham breast screening programme	Previous attenders who were still eligible for second round breast screening at a screening unit in Nottingham. First round screening uptake 75%; 10% failed to reattend on second round screening	Sample of 200 reattenders All 200 non-reattenders	Retrospective. Data collected at time of second round screening (opportunity to reattend). Non-attenders were allowed 14 weeks to attend before being classified as non-attenders	Personal experience of the first breast screening visit Perception of personal risk of breast cancer Knowledge of breast cancer Ease of attending for breast screening For non-reattenders only, reasons for non-return

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Maxwell *et al.* (1996)[135] 647 cin USA	Cohort (longitudinal) (but originally from an RCT – analysed as a cohort of attenders and non-attenders)	Subjects recruited through random-digit dialling of telephone numbers from exchanges that serve Los Angeles County	English-speaking women aged ≥ 40 years who did not have cancer in the follow-up period; 71.5% white, 63.3% married, 90% high school or more education	Non-attenders vs attenders Attenders: one mammogram in 2 years, two or more mammograms in 2 years. (women had to make their own appointments; were not invited)	12 and 24 months	Telephone interviews Attendance to mammography
Mayer-Oakes *et al.* (1996)[160] 290 psy USA	Cross-sectional	Part of a large prospective randomised study (UCLA MSHPT). Participants enrolled through primary care physicians at the UCLA School of Medicine	Women aged 65–96 years, mean age 74.2 years, 87% Caucasian; 51% completed more than 12 years of education; 38% annual income > $30,000	Mammography users Non-users of mammography	NA	Telephone interviews Preventive behaviours and service use
Michels *et al.* (1995)[121] 297 psy USA	Cross-sectional	Army medical centre	Eligible women from military health centre (active duty, retired service members and family), mean age 65 (range 41–89) years; 72.4% white, 10.7% African–American, 15.9% Asian American; 22.6% less than high school education, 13.0% more than high school education; 19.6% low income	Regular users of mammography Non-regular users of mammography	NA	Mailed questionnaire Previous mammography use (as a predictor of current screening status) Knowledge and beliefs of women who are regular participants in breast screening Intention to have mammogram next year

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Montano and Taplin (1991)[122] 5523 med USA	Cohort	HMO BCSP	Women aged ≥ 40 years who responded to the BCSP risk factor questionnaire and were invited for their first screening	Breast screening attenders and non-attenders	Study questionnaires were sent within 2 weeks after the women were mailed a letter of invitation from the BCSP Screening attendance obtained after 6 months	Self-administered questionnaire TRA Pap tests in previous 4 years Mammography use in previous 5 years (habit)
*Mootz et al. (1991)[136] 5487 med USA	Cohort	Fee-for-service mobile breast screening unit in Dallas, Texas	Women from a large corporation aged ≥ 35 years; no history of breast cancer or breast problems; no significant differences in race, age or education between the groups	Adherent vs non-adherent Adherent: women who kept their appointments and completed the survey Non-adherent: women who did not keep their appointments for mammography	None	Questionnaire and 11% of non-adherers completed by telephone interview Health behaviours (previous mammography, Pap smears, CBE, BSE knowledge and practice, smoking status) Knowledge of breast cancer and beliefs Factors important in decision to undergo mammography

Appendix 5 cont'd *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Morrison (1996)[166] 289 USA	Cross-sectional	Recruited from those responding to advertisements and door-to-door contacts inviting them to participate in free breast cancer screening	Underinsured, low-income women, aged > 40 years; 80% black, 16% white; 82.5% high school or less; 49% household income < $10,000, 40% household income $10,000 – $24,999	Women who frequently conduct BSE Those who do not Women who believe they are proficient in BSE Women who do not believe they are proficient in BSE	NA	Telephone interview Previous cervical smear Previous mammography (to predict the breast screening outcome groups)
Nielsen (1990)[196] 5972 med USA	Cross-sectional	Breast screening at local community hospital, Connecticut	Women who had attended for mammography over a 3-month period; mean age 51 years; mean level of education 13 years; mean income level $41,000; 97% Caucasian	None	NA	Questionnaire Knowledge of risk in one's lifetime Perception of risk Cues or events Behaviours or events which reinforce Cost
Orton et al. (1991)[189] 5223 UK	Cohort	GP practices and breast screening programme in Aylesbury	Women aged 45–64 years	Attenders and non-attenders for mammography	Survey 3 years after previous screening (just before next routine screening). Attendance then observed	First breast screening was embarrassing, distressing, painful, reassuring or worthwhile Staff were unhelpful/unsupportive Vulnerability to breast cancer Screening is not always accurate Screening can detect problems at an early stage Screening can miss cancer Not important to be rescreened Screening can be harmful to health Influence of previous screening result (as predictor of current screening status)

Appendix 5 cont'd *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Pal et al. (1996)[157] 2494 med USA	Cohort (retrospective)	1 hospital conducting FNA	Women who had an FNA of a non-palpable lesion (therefore detected on screening?); mean age 55 (range 24–89) years	Continued mammographic surveillance after FNA Surgical biopsy after FNA	36 months	Routine data sources Patient adherence with recommendations for surgical biopsy or repeated mammography at 6, 12, 24 and 36 months after having a benign FNA examination
Pearlman et al. (1996)[161] 2359 med USA	Cross-sectional	National Health Interview Survey of Health Promotion and Disease Prevention	Subsample from a larger National Health Interview Survey of Health Promotion and Disease Prevention. Women aged 40–75 years who reported that their last mammogram was for routine purposes; 1320/8965 (14.7%) black, 482/8965 (5.4%) Hispanic, 7163/8965 (79.9%) white	Underuse of mammography Regular use Not intending to have a mammogram (excluding women who have been screened recently) within 1–3 years. Intending to have a mammogram	NA	Socio-demographic factors, health status and preventive orientation and health service use as predictors of underuse of mammography and lack of intention to obtain a mammogram. Examined these variables in relation to ethnic/racial group
Persky and Burack (1997)[137] 1054 emb USA	Cohort	University geriatric clinic	Women aged ≥ 55 years, mean age 76 years. Excluded women with breast disease and those who had mammogram after clinic visit and before interview. 90% white; 25% income < $10000; > 50% some college education	Women who had a mammogram < 1 year ago Women who had not had a mammogram < 1 year ago	Retrospective	Data obtained by review of computerised records and personal interviews Previous mammography use Other predictors of recent mammography use, including health indicators, health service utilisation, health beliefs, psychological factors and social influences (not relevant for this review)
Pisano et al. (1995)[155] 2730 med USA	Cohort (retrospective)	Mobile mammography service in North Carolina	Asymptomatic women with abnormal mammograms aged > 50 year; most self-referred; approx. 45% white, 55% black	Adherers: women with abnormal mammograms who received follow-up investigations Non-adherers: women who did not receive further investigations	Study conducted 9 months after the screening appointment	Previous mammography (as a predictor of adherence to follow-up recommendations) Results of mammography (as a predictor of adherence to follow-up recommendations)

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Pisano *et al.* (1998)[126] 1385 USA	Cohort (retrospective)	University of North Carolina Hospital and mobile mammography service	Study group: aged > 50 years, no family history of breast cancer, had had an abnormal mammogram. Control group: aged ≥ 50 years, no known history of breast cancer or benign breast biopsy	Study group: women who had an abnormal mammogram and underwent a surgical biopsy Control group 1: women who had a clear result after a mammogram Control group 2: women who had an abnormal result and were recommended to return for mammography in 6 months	Women screened between January 1989 and May 1991; survey carried out between January and August 1993	Adherence with recommendations for screening mammography Intention to undergo screening in the future Believe annual mammography was necessary Perceived barriers to undergoing mammography Perceived benefit of mammography Perceived negative effects of screening Perceived susceptibility to breast cancer Perceived severity of breast cancer Effect of biopsy on beliefs and fears of study patients
Pisano *et al.* (1998)[206] 1473 med USA	Cohort (retrospective)	University of North Carolina Hospital	Women aged ≥ 40 years in 1987 with an abnormal mammogram that was followed within 6 months by a breast biopsy with negative pathology. Women did not have a history of cancer or breast biopsies either before or after the 1987 mammogram 77% white; 73% married; mean age 50 years; 40% of participants aged > 50 years	None	Data collected about 5 years after false-positive mammogram	Telephone interview questionnaire Screening behaviour after false positive result Intention to be screened Effect of prior mammography behaviour Experience of false-positive result

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Qureshi et al. (2000)[87] 238 emb USA	Cross-sectional	Data from 1992 and 1993 Behavioural Risk Factor Surveillance System database in Ohio	Women aged 40–49 years; 14,818 (81%) Caucasian, 1799 (10%) African–American, 876 (5%) Hispanic, 736 (4%) other	Screening mammography within 2 years Never had a screening mammography or >2 years ago	NA	Cholesterol screening Pap smear Seatbelt use Heavy alcohol use Alcohol use Current smoker (as predictors of mammography use)
*Rakowski et al. (1993)[118] 4128 med USA	Cross-sectional	Data from NHIS-HPDP	Women aged 40–75 years	Had mammogram 1–2 years ago Ever had mammogram Never had mammogram	NA	Intention to have mammography Smoking Drinking Exercise Knowledge of BSE Prior Pap test (associated with mammography status)
*Rakowski et al. (1995)[162] 3140 med USA	Cross-sectional	Data from the 1990 NHIS-HPDP of 40, 104 women aged ≥ 18 years	Subsample of women aged 40–75 years; income < $20,000 and > $30,000; some college education. No other data given on this sample or compared to full sample	Mammography attendance in low resource participants 1390/3014 (46.1%) high resource participants 1624/3014 (53.9%)	NA	Pap test CBE BSE Smoking Exercise
Reynolds et al. (1997)[204] 2179 med USA	Cohort (retrospective)	Fixed-facility free worksite screening	Women aged over 40 years; employees, retirees or dependants of these groups; mean age 53 years	None	Not stated	Routine data sources Proportion of those who undergo a biopsy when recommended to do so
Richardson et al. (1994)[197] 3839 New Zealand	Cohort	Pilot breast screening programme in Otago-Southland	Women aged 50–64 years; 156 urban women, 286 rural women. Rural women had more trade or vocational education, less university education and lower incomes than the urban women	None relevant (urban vs rural)	Women sent questionnaire after screening	Intention to reattend Pain and discomfort in relation to reattendance Cost as a barrier to screening

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Rimer et al. (1989)[167] 6456 USA	Cross-sectional	Health maintenance programme in Pennsylvania and New Jersey	Women aged > 40 years who were eligible for a health check. 299 (50%) 40–49 years, 127 (21%) 50–64 years, 175 (29%) ≥ 65 years; 86% white; 70% married; 23% above high school education, 50% high school education	Women who underwent mammography (adherers) Women who did not have a mammogram (non-adherers)	NA	Know how to do BSE Reported BSE practice Believe that breast cancer can be cured if found early Attitudes: Mammography not necessary unless symptomatic I'd be embarrassed It's too much trouble (to have mammography) I'd rather not think about it Worried about radiation Too expensive Inconvenient Would be painful
Rimer et al. (1988)[172] 6707 USA	Cross-sectional	Health maintenance programme in Pennsylvania and New Jersey	Women aged > 40 years who were eligible for a health check; a majority between 40–49 years, who were high school graduates; however, the adherers were more likely to be aged > 60 years	Adherers: women who completed a breast risk assessment form Non-adherers: Women who did not complete a breast risk assessment form	NA	Ever had a mammogram (as an exposure that may influence completion of the breast risk assessment form)
Rimer et al. (1989)[146] 6437 med USA	Cohort	US Healthcheck breast screening programme	Women aged ≥ 40 years; 25% less than high school education, 50% high school, 25% more than high school education; adherers more likely to be white than non-adherers (90% vs 79%); adherers also more likely to be married than non-adherers (72% vs 60%)	Adherers Non-adherers	4–6 months	Telephone survey Ever had a mammogram Cigarette smoking status BSE practice/knowledge Perceived risk of breast cancer Attitudes Prior mammography

Appendix 5 cont'd Breast screening: description of studies

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Rodriguez et al. (1995)[147] 3139 med Spain	Two cohorts	Breast cancer screening programme	Majority of women were aged 50–54 years old; invited for screening by letter; relatives of current employees or retirees from Barcelona municipality	Women enrolled for first screening in 1989 Women who declined to enrol (enrolment study) Women who attended second screening in 1988/89 Women who did not (adherence study)	NA (retrospective)	Telephone interview Periodic use of cervical screening Previous mammography BSE behaviours Smoking Visits to gynaecologist Knowledge and attitudes
Roworth et al. (1993)[198] 4300 med UK	Cross-sectional	National Breast Screening Programme	Consecutive attenders for routine breast screening, aged 50–65+ (only 3% were aged > 65 years)	No relevant comparison Mobile vs static units	NA	Questionnaire Satisfaction about the screening process; not relevant for this review Intention to reattend in 3 years
Rutledge et al. (1988)[177] 6701 med USA	Cross-sectional	Department of radiology at a university	Women aged over > 40 years employed at the university and medical centre during the time a workplace programme was offered; 382/1700 (22.5%) underwent screening Mean age 49.1 ± 7.3 years; mean education 14.7 ± 2.7 years; 60% married	G1A: participants (received mammogram) G1B: non-participants who had received recent mammogram (< 3 years ago) G2: non-participants	NA	Postal questionnaire after screening programme completed Knowledge of mammography Value of mammography Barriers Perceived susceptibility Knowledge of breast cancer
Rutter et al. (1992)[199] 4786 med UK	Cohort	Breast screening programme in London	Breast screening attenders, aged 50–64 years	None	Interviews conducted immediately after mammography	Majority of paper not relevant to this review Intention to reattend for mammography Correlation between discomfort and intention to return Correlation between satisfaction and intention to return

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Rutter et al. (1997)[138] 1090 emb UK	Cohort	Breast screening programme in the South East Regional Health Authority. Three sites: one rural, one provincial, and one inner city	Women aged 50–64 years who were invited routinely	Reattenders to routine screening non-reattenders to routine screening	3 years	Reattendance Satisfaction of previous mammography Pain and discomfort experienced at previous mammography Previous Pap smear
Salazar and Carter (1993)[169] 400 psy USA	Qualitative Phase 1 Cross-sectional Phase 2	Four federal agencies in the US Public Health Service Region	Working women; performers of BSE: mean age 45.88 years; 93% white, average education 12.67 years; non-performers: mean age 43.31 years; 75.7% white; average education 13.47 years. Majority married, no differences in marital status between the two groups	Performers of BSE vs non-performers of BSE	None (not reported)	Phase 1: interviews used to derive survey instrument (data not presented in this paper) Phase 2: interview-administered survey; other health examination
*Savage and Clarke (1996)[119] 249 psy Australia	Cross-sectional	Two suburbs in a provincial city in Victoria, Australia (one low socio-economic status, one high)	Women aged 50–70 years: 28% 50–54 years, 27% 55–59 years, 24% 60–64 years, 21% 65–70 years; mean education 10.7 ± 2.7 (range 5–21) years; 78% not employed	Those with intention to have mammogram Those without intention to have mammogram Those intending to conduct BSE Those not intending to conduct BSE	NA	Telephone survey Correlates of intention to have a mammogram Correlates of BSE intention
Scaf et al. (1995)[139] 2814 med Netherlands	Cohort (prospective)	Nijmegen experimental breast screening programme	Women aged 50–63 years at the start of the study (1975)	Adherers/non-adherers at previous round Age False positives/all others at previous round	17 years	Attendance/reattendance

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Schwartz et al. (2000)[188] 176 med USA	Cross-sectional survey	Random selection of women from telephone directories and admin records	Age 18–39 years, 120/479 (25%), 40–49 years, 153/479 (32%), 50–69 years, 158/479 (33%), ≥ 70 years, 48/479 (10%)	None	NA	Postal survey Belief that mammography could not harm a women who turned out not to have breast cancer Would take into account false-positives when deciding on screening Number of false positives tolerated per life saved
Simoes et al. (1999)[163] 712 med USA	Two cross-sectional studies	Data from two probability studies: 1994 Missouri Behavioural Risk Factors Surveillance system (BRFSS) and the 1994 Missouri Enhanced Survey (ES). Both random-digit dialled studies	Combined sample: 59.1% aged < 50 years; 84.7% white; 83.2% high school graduates	Had previous mammography Not had previous mammography	NA	Had cervical screening Not had cervical screening
Skinner et al. (1997)[185] 180 psy USA	Cross-sectional	University medical centre	Female employees of university medical centre; aged 40–77 years, mean age 48.66 ± 6.77 years; 85% white, 10% African–American, 5% Asian, native American or other; Education: 16% high school, 24% some college, 12% college degree, 39% at least some graduate work, 7% technical or business school	Precontemplators: no prior mammography and not thought of having one in next 6 months Contemplators: no prior mammogram, but thinking about having one in next 6 months Action/Maintenance: one or more mammograms Relapse: One or more mammograms, but overdue for a mammogram	NA	Self-administered questionnaires Knowledge of breast cancer issues Barriers to breast screening Benefits of breast screening

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Smith *et al.* (1991)[205] 5274 med UK	Cohort	Routine breast screening service, one centre	Women recalled for further investigation in 11 clinics, but subsequently found not to have cancer ($N = 91$)	None	Not explicitly stated. After clear result following further assessment	Intention to reattend for next routine breast screening appointment
Song and Fletcher (1998)[140] 149 psy USA	Cohort	Breast and Cervical Health Program offering free breast and cervical screening for low-income women, particularly 'coloured' women	Women aged ≥ 40 years; low income; not insured to have breast or cervical screening; 2888 women who had received a breast cancer evaluation (CBE, mammography or both). Approx. 50% aged < 50 years; > 50% non-white	Women who have had a prior mammogram Women who have not had a prior mammogram	27 months	Attendance for breast rescreening (could be by CBE, mammogram or both) as predicted by previous mammography status
Speedy and Hase (2000)[141] 47 cin Australia	Cohort	Screening programme	Attenders: women aged >40 years who presented at the screening unit over a 6-month period; non-attenders: women aged > 40 years, approached at shopping centres, churches and social clubs Non-attenders were older than attenders; 66% married; 56% retired	Attenders at breast screening ($N = 127$) Non-attenders at breast screening ($N = 185$)	None	Self-administered questionnaires Previous mammography use Health belief variables (not relevant for this review for temporal reasons)

Appendix 5 cont'd   *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Sutton et al. (1994)[151] 3804 med UK	Cohort	Three neighbouring health districts in inner south-east London	Women aged 50–64 years who were due to be called for first round breast screening; 37% had an educational qualification; 48% classified as non-manual social class; 66% married or living with a partner; 75% white ethnic group, 13% black ethnic group The two groups were similar except that postal questionnaire responders were less likely to hold an educational qualification (27 vs 45%, $\chi^2_{(1)} = 43.3, p < 0.001$)	Attended for breast screening Did not attend for breast screening	Data collected 4 months before screening Attendance data obtained from screening records, 4 months later	Postal questionnaires or interviews Previous smear tests Previous mammography (as predictors of attendance)
Swinker et al. (1993)[142] 4287 med USA	Case–control	University-based family practice centre	Women aged ≥ 50 years; mean age of adherers 68 ± 12.5 years and of refusers 69 ± 13.5; mean education level 12 years for both groups	Cases: women who refused to schedule breast screening when prompted by doctor Controls: adherers Women age matched and completed mammography	NA	Telephone survey Knowledge of cancer Attitudes to cancer Belief that early diagnosis is beneficial Knowledge of mammography Concern about radiation Number of past mammograms (as predictor of current mammogram) Mean time since last mammogram
Taylor et al. (1980)[200] 7993 UK	Cross-sectional	Edinburgh breast screening clinic	Women aged 40–59 years attending for mammography	None	Women completed a questionnaire after breast screening and after an informative session about other cancer (e.g. gastrointestinal, lung)	Attitudes to breast screening Attitudes to other forms of cancer screening

Appendix 5 cont'd *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Taylor et al. (1995)[178] 3040 med USA	Cross-sectional	Random population sample	Women aged 50–75 years	Non-users vs one-time users Repeat users vs one-time users	NA	Telephone interviews Perceived lifetime risk Perceived personal risk relative to others Belief that mammography involves asymptomatic disease detection Belief that mammography is more effective than CBE or BSE
*Vaile et al. (1993)[120] 4368 med UK	Cohort	Routine breast screening service. Three areas including a mobile and static unit	Women aged 50–64 years who were eligible for breast screening	Attenders for breast screening Non-attenders for breast screening	Not explicitly stated, but first questionnaire sent before invitation, second questionnaire sent after results	Previous smear to predict attendance for mammography Previous mammogram to predict attendance Intention to reattend for mammography in 3 years' time (current attendees only who received an all-clear result)
Vernon et al. (1993)[179] 3961 US	Cohort	American Cancer Society Texas Breast Screening Project	Women aged 35–39 years, asymptomatic, no prior mammogram, women aged ≥ 39 years, no mammogram in the past 12 months, no prior history of breast cancer	Women who rated themselves on their risk of getting breast cancer as high or very high Women who rated themselves on their risk of getting breast cancer as moderate or low	Retrospective	Self-reported questionnaire Factors associated with perceived risk of ever getting breast cancer (only one relevant outcome) Prior mammography and perceived risk

Appendix 5 cont'd *Breast screening: description of studies*

Author(s) (year), ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Wolosin (1989)[180] 6360 med USA	Cross-sectional	Mobile and established breast screening clinics throughout a small mid-western city	Women who have just had a screening mammogram; aged 21–87 years, median age 53 years; 55% having first mammogram	First time mammography Repeat mammography	Questions completed immediately after mammography	Attitudes to mammography (looked forward to it, dreaded it, less painful than expected, more painful, worried about breasts, influenced by things heard, feared results, wanted reassurance, perceived risk of breast cancer)

[a] All outcomes are self- reported unless it is stated that the outcome was observed/measured.
[b] Regular users: 1: women aged 40–50 years, without a family history of breast cancer, who reported a mammography every other year; 2: women aged 40–50 years, with a family history of breast cancer who reported mammography every year; 3: women over 50 years, who reported mammography screening every year.
BCSP: breast cancer screening programme; HMO: Health Maintenance Organization; DNA: did not attend; NF: normal findings; FP: false positives; REF: referents.
NCI: National Cancer Institute; PEP: Prevention for Elderly Persons; TRA: Theory of Reasoned Action; NHIS-HPDP: National Health Survey of Health Promotion and Disease Prevention.

Appendix 6

Breast screening: summary of study results

Papers marked with an asterisk (*) are also included in the cervical screening section.

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Allen *et al.* (1998)[124] 1235 med Cross-sectional	Response to survey was 72%, resulted in 194 underutilisers	Not known	**Intention to reattend**: intention to have a mammogram was statistically significantly higher in recent adopters than in previous users or never users: recent adopters 43/64 (67%), previous users 48/88 (55%), never users 6/42 (14%), ($p = 0.001$)			Among women who are underusers of mammography, women who have recently adopted mammography are statistically more likely to intend to have another mammogram in the next 1–2 years. Women who have never had a mammography are least likely to intend to be screened despite ease of access (provided in the workplace) **Intention to reattend (+)**
Aro *et al.* (2000)[127] 147 med Cohort	Target population for screening $N = 16,886$ NF $N = 1407$ FP $N = 492$ REF $N = 1718$	54–65% for prescreening 73–87% at 2 months 73–87% at 12 months	**False-positive result associated with BSE behaviour**: At 2 months post-screening FP reported most often active to excess practice of BSE ($\chi^2_{(6)} = 71.54, p < 0.001$) At 12 months post-screening the FP group was most active in BSE ($\chi^2_{(6)} = 13.13, p < 0.05$) **Intention to reattend**: NF group 98.2%, FP group 98.7%	**2 months post-screening**: No significant differences in any of the distress scales **Intrusive thinking, perception of healthy breasts, susceptibility to cancer and BSE**: FP reported most often intrusive thinking ($\chi^2_{(4)} = 36.62, p < 0.001$), worry about breast cancer ($\chi^2_{(4)} = 39.38, p < 0.001$). FP also reported less confidence in BSE ($\chi^2_{(4)} = 9.96, p < 0.050$), perceived their breast to be less healthy ($\chi^2_{(1)} = 59.88, p < 0.001$) and had more breast symptoms ($\chi^2_{(2)} = 10.90, p < 0.004$) than those with normal findings	Moderate response rate 2 months prescreening	The false-positive group showed an increased breast cancer specific distress, and reported more intrusive thinking and worry about breast cancer, and increased frequency of BSE as well as a heightened perceived risk and more breast symptoms at both 2 months and 12 months In the multivariate analysis at 2 months, intrusive thinking and worry about breast cancer were higher in the false-positive group. At 12 months, distress was no longer statistically significant

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				There were non-significant differences between all groups at 2 months and 12 months post-screening regarding confidence in breast cancer prevention **12 months post-screening**: The NF group was more afraid of illness than the referents and the FPs had more often intrusive thinking ($\chi^2_{(4)} = 26.47, p < 0.001$) and worry about breast cancer ($\chi^2_{(4)} = 16.96, p < 0.001$). They perceived breast cancer risk to be high ($\chi^2_{(6)} = 24.32, p < 0.001$) and perceived their breast to be not healthy ($\chi^2_{(2)} = 21.98, p < 0.0001$) more often than women with normal findings **Changes over time**: For the normal screening findings group, worry about illness decreased from prescreening at 2 months ($p < 0.001$) and 12 months post-screening ($p < 0.001$); depression decreased from prescreening levels at 2 months ($p = 0.002$), and then rose back almost to prescreening levels at 12 months ($p = 0.049$); concern about pain/bodily preoccupation decreased from prescreening levels at 2 months ($p = 0.013$); health habits increased from prescreening levels at 2		**False-positive results associated with: BSE behaviour (+) Intrusive thinking (–) Lowered perception of healthy breasts (–) Increased perception of susceptibility to cancer (–) Intention to reattend (ns) Importance of BSE (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				months ($p = 0.043$)		
				Among the FPs, perceived breast cancer severity increased from prescreening levels at 12 months ($p = 0.035$).		
				Among the referents, concern about pain/bodily preoccupation decreased from prescreening levels at 2 months ($p = 0.033$); depression decreased from prescreening levels at 12 months ($p = 0.018$); anxiety first increased from prescreening levels at 2 months ($p = 0.019$) and then decreased at 12 months ($p = 0.003$); worry about illness decreased from prescreening levels at 2 months ($p < 0.001$) and remained at that level at 12 months ($p < 0.001$)		

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Bakker *et al.* (1998)[193] 1544 med Cohort	315 completed a questionnaire immediately after screening (95% of those approached); 256 completed a telephone interview 3 weeks after screening (81% of cohort, 77 of all eligible)	None	**Intention to reattend**: 89% of the cohort intended to reattend mammography in the future Breast screening had very little impact on the following health behaviours (percentage is the proportion of women who reported that breast screening had no effect on these outcomes): 76% reported no impact on improved relationships with friends or relatives, 78% reported no effect on ability to meet home/work responsibilities, 80% experienced no impact on getting along better with those around you, 79% reported no improvement in sleep	**Radiation concerns**: concerns over pain and radiation: 40% of the women reported that mammography hurt, only 15% had concerns over the radiation risks of breast screening **Reassurance**: 84% reported quite a bit, or a great deal of reassurance after breast screening that you do not have breast cancer, and 62% felt quite a bit or a great deal more relaxed after screening. Screening seemed to have little effect on feeling more hopeful about the future (53% reported being a little bit, quite a bit or a great deal more hopeful), feeling less anxious about breast cancer (50% felt quite a bit or a great deal less anxious, a further 18% felt a little bit less anxious with 32% having no change) **Improved sense of well-being**: quite a bit or a great deal of greater sense of well-being was experienced by 51% of the women, with only 25% feeling no improved sense of well-being	No statistics, purely descriptive	The majority of women were highly satisfied, and intended to return in the future for screening. Many women found the mammogram painful, yet the vast majority intended to return. The results suggested that screening had relatively little impact on social or physical dimensions; however, half the women reported that screening did affect emotions, such as providing a sense of reassurance and well-being **No comparisons Intention to reattend (+) Reassurance (+) Radiation concerns (ns) Improved sense of well-being (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Bastani et al. (1991)[174] 5422 med Cross-sectional	10,007 households called 79% of households did not meet eligibility criteria Calculated response rate 77.6% (given terminated interviews, etc.) $N = 802$ completed interviews		**Perception of susceptibility to cancer, efficacy of mammography and efficacy of early detection**: women who had had at least one mammogram, compared with those who had never had a mammogram, were more likely to perceive themselves as more susceptible ($\chi^2 = 10.15$, $p < 0.05$), believe in the efficacy of mammography ($\chi^2 = 8.25$, $p < 0.05$), and know the recommended guidelines ($\chi^2 = 17.91$, $p < 0.05$). Perceived efficacy of early detection was not significant ($\chi^2 = 0.48$). **Radiation concerns**: women who had never had a mammogram were more likely to say that concern about radiation would prevent them from having a mammogram ($\chi^2 = 32.87$, $p < 0.05$, regression $\beta = -0.87$, OR = 0.42, CI 0.26 to 0.67)		Participants more educated than the general population	Women who had at least one mammogram had significantly greater perceived susceptibility, and were more likely to believe in the efficacy of mammography and have greater knowledge of guidelines about breast screening. Women who had not had a mammogram expressed more concern about radiation and fear of finding cancer **Increased perception of susceptibility to cancer (–) Efficacy of mammography (+) Fewer radiation concerns (+) Knowledge of screening guidelines (+) Efficacy of early detection (ns)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Beaulieu et al. (1996)[133] 2650 med Cohort	149/171 (87.1%)	Attenders 105/113 (92.9%) Non-attenders 44/58 (75.9%)	**Smoking status**: health status and psychological well-being (Affect Balance Scale): only data seem to be regarding smoking. Non-smokers were significantly less likely to be non-attenders (OR_{adj} = 0.43, 95% CI 0.22 to 0.86, p = 0.02) (adjusted for HBM scales, previous use of healthcare services and preventive practices) **Reattendance**: previous use of Pap smears and mammography:14/44 (31.8%) non-attenders had had a Pap test within 3 years, compared with 66/105 (62.9%) attenders (RR = 0.52, 95% CI 0.32 to 0.800). When this was adjusted for HBM scales and other health practices, OR = 0.65 (95% CI 0.39 to 1.08, p = 0.10) The variable in the regression model that was the strongest predictor of adherence was previous mammography. In the adjusted model the OR for non-attendance was 0.11 (95% CI 0.02 to 0.51, p = 0.005)	**Fear of cancer and radiation concerns**: beliefs and attitudes re mammography: the only variables that were significant in the logistic regression were the fear variables and time constraints variables from the HBM. Women who expressed fear were more likely to be non-adherent (OR_{adj} = 2.09, 95% CI 1.08 to 4.02) **Knowledge of screening guidelines**: knowledge of screening recommendations and perceptions of other women's actions re breast screening: no data	The variables from the HBM are very difficult to deal with. One cannot tell whether it is an innate characteristic that leads to the screening behaviour or whether the HBM scales are as a result of previous screening or even this most recent invitation	Women who had previously undergone mammography were significantly less likely to be non-adherers for mammography than women who had never undergone one before. Likewise, the same pattern was observed for previous cervical smears, although significance was not reached in the multiple logistic regression (adjusted for previous mammography use and other factors) There was an association between fear of X-rays and the results and non-adherence, but it was not possible to assess the temporal relationship within this association **Smoking behaviour (+) Fewer radiation concerns (+) Less fear of cancer (+) Reattendance (+) Knowledge of screening guidelines (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Bennett *et al.* (1994)[130] 1736 emb Cross-sectional	1000/1022 (97.8%)	Not stated, but sample consists of: comfortable 642/1000 (64.2%), uncomfortable but tolerable 345/1000 (34.5%), very uncomfortable 11/1000 (1.1%), intolerable 2/1000 (0.2%)	**Effect of pain on intention to reattend**: 984/1000 (98.4) said they would return for future mammography No significant difference was found between groups ($p < 0.86$): comfortable: 633/642 (98%) said they would return for mammography; uncomfortable but tolerable: 338/345 (98%) said they would return for mammography; very uncomfortable: 11/11 (100%) said they would return for mammography; intolerable: 2/2 (100%) said they would return for mammography		Small number of women in the uncomfortable and intolerable categories	Discomfort/pain was not a deterrent for future mammography **Pain had no effect on intention to reattend (ns)**
*Boer *et al.* (1993)[132] 382 psy Cohort	T1: 261/386 (68%) completed a questionnaire before mammography screening T2: 372/386 (96%) were screened and filled out a second questionnaire T3: 386/386 (100%) screening status ascertained	Cohort consists of: reattenders in second round mammography screening 263/372 (71%), non-reattenders in second round screening 75/372 (20%), not invited (too old or missing from database) 34/372 (9%)	263/338 (78%) who had participated in the first round and were reinvited had screening in the second round **Effect of experiences on reattendance**: experiences during their first breast screen did not affect participation adherence. There was no significant difference in pain experienced by reattenders and non-reattenders ($\chi^2 = 0.5$, df $= 1$, $p > 0.05$). There were no other significant differences between reattenders and non-reattenders in the experiences of being screened (time taken, travelling to unit, unsuitable location, manner of staff)			22% who participated in the first breast screening round did not attend second round screening. However, there were no differences between reattenders and non-reattenders in satisfaction with first breast screen, including pain **Experiences did not affect reattendance (ns) (pain, etc., last time)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Bull and Campbell (1991)[171] 5448 med Cohort	1125/1478 (76%)	Group A 541/750 (72.1%) Group B 331/417 (79.4%) [229/331 (69%) of this group had completed questionnaire before screening] Group C 204/240 (85.0%) Group D 49/68 (72.1%)	**BSE behaviours**: frequency of BSE after screening compared with before: in comparing women in groups B, C and D, women in groups C and D now examine their breasts more often, with mean scores of 2.0, 2.3 and 2.4, respectively (Kruskal–Wallis $\chi^2_{(2)} = 28.6$, $p < 0.001$) Association between increasing intensity of the investigation and increasing frequency of subsequent BSE: within groups B, C and D there was a significant correlation (Spearman's $r = 0.24$, $p < 0.001$) between increasing intensity of investigation and increasing frequency of subsequent BSE Of 226 women who answered the question in groups A and B, 64 women increased BSE and 26 decreased BSE ($\chi^2_{(1)} = 15.2$, $p < 0.001$)	**Efficacy of screening**: Increasing confidence in the sensitivity of the screening process was reported with degree of investigation ($\chi^2_{(3)} = 48.3$, $p < 0.001$), with 96% of group D believing that the screening programme was 'very likely' or 'would always' detect a malignancy, compared with 81% of group A 21 women were less confident after screening than before and 49 more confident No significant difference between groups regarding the knowledge question "Do you think a woman has a good chance of being cured from breast cancer?" 97.8% of women said "only if caught early enough"	Very little description of the participants other than by age Prospective: looks at changes in scores before and after screening	Women who had further investigations following screening tended to perform BSE more frequently than before screening. Women who experienced increasing degrees of investigation tended to perform BSE with increasing frequency. Confidence in the screening programme increased with degree of investigation **False-positive investigations associated with BSE behaviours (+) Efficacy of screening (+)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Burman *et al.* (1999)[152] 835 Cohort	3700/5059 (73%)	False-positive 602/813 (74%) True negative 3098/4246 (73%)	**False positives associated with reattendance**: false-positive index mammogram and subsequent breast cancer screening (OR_{adj} = 1.21, 95% CI 1.01 to 1.45); false-positive index mammogram with no previous mammogram and subsequent breast screening (*N* = 1264) (OR_{adj} = 1.66, 95% CI 1.26 to 2.17) For women with one or more mammograms before the index mammogram neither history of a false-positive mammogram before the index mammogram (*N* = 610) (OR = 1.01, 95% CI 0.8 to 1.27) nor the occurrence of two sequential false-positive mammograms (*N* = 102) (OR = 0.90, 95% CI 0.56 to 1.46) was predictive of adherence to the next screening recommendation Number of mammograms before index mammogram and subsequent breast cancer screening (OR_{adj} = 1.87, 95% CI 1.71 to 2.05)			Women who had a false-positive mammogram were more likely to obtain their next recommended screening mammogram than women who had a true negative mammogram. Women with no previous mammography history before this study seemed to be influenced by a false-positive mammogram more strongly than other women **False-positive results associated with: Reattendance (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Burton *et al.* (1998)[123] 1383 med Cohort (retrospective)	No definite figures were given for totals approached, just proportions willing to participate	80 attenders were interviewed (75% of those approached), 28 non-attenders (10%), 39 ambivalent attenders (20%) [Psychological measures were collected using a questionnaire (90%, 89% and 82% response rates, respectively)]	**Intention to reattend**: majority said they would attend again for screening (no data given) **Use of GP/health services**: there was a significant difference in the proportions across the three groups who had visited a GP within the past month, with the lowest proportion being observed in the screening non-attenders: 51/79 (65%) attenders, 16/28 (57%) non-attenders, 30/39 (77%) ambivalent attenders ($p = 0.007$). See notes **Reattendance**: there was no difference in previous mammography behaviours between the three groups, with 24/80 (30%) attenders having previously had a mammogram, compared with 4/28 (14%) non-attenders and 7/39 (18%) ambivalent attenders ($p > 0.01$). (These previous attendance rates are low) **Other preventive health behaviours**: there were no significant differences in other health-promoting behaviours between the three groups; 93% overall wore seatbelts, 86% tried to eat healthy foods, 67% took some exercise, 60% were non-smokers and 25% had tried to stop smoking	**Knowledge of mammography**: there was a highly significant difference in the proportions of women who correctly identified what a mammogram is, with non-attenders having the worst knowledge. 79/80 (99%) attenders knew what a mammogram was compared with 37/39 (95%) ambivalent attenders and only 20/29 (69%) non-attenders ($p < 0.0001$) **Knowledge of cervical screening**: there was no difference in knowledge of smear tests, due to the vast majority knowing what there are: 79/80 (99%) attenders, 28/28 (100%) non-attenders and 37/39 (95%) non-attenders ($p > 0.01$) **Worry**: there was no difference in reported worry about screening between the three groups ($p = 0.041$) There was a significant difference between the groups regarding being pleased to be invited for screening. A much higher proportion of non-attenders was displeased to be invited for screening than the other groups: 18/28 (64%) non-attenders, 16/39 (41%) ambivalent attenders and only 9/80 (11%) attenders ($p < 0.0001$)	Vastly different response rates in the three comparison groups Proportions visiting GPs: only seemed to be two options (within the past month or more than 1 year ago) Percentages added to 100% within the screening groups, but it seems a little unlikely that no-one saw a GP between 1 and 12 months previously Significance levels are set at 0.01 for this study	Mammography screening did not influence other health-related behaviours such as seatbelt use Previous mammography use was low across all groups and was not related to the current screening status of the women Knowledge of mammography was better in women who had attended (including ambivalent attenders) Knowledge of cervical smears was high, with no observed differences in the three groups **Use of GP/health services (+)** **Knowledge of mammography (+)** **Intention to reattend (high: no data)** **Other preventive health behaviours (ns)** **Cervical screening (ns)** **Reattendance (ns)** **Knowledge of cervical screening (ns)** **Worry (ns)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Calnan (1984)[144] 7500 med Nested cohort	BSE district $N = 825$ Breast screening district $N = 854$	BSE district Interview rate 678/825 (82.2%) Attendance rate 305/678 (45.0%) Small difference in participation rates in the interview study between attenders and non-attenders (no detail presented) Breast screening district Interview rate 654/854 (76.6%) Attendance rate 471/654 (72.0%) Attenders interviewed 84% Non-attenders interviewed 64%	**Cervical screening**: attenders at breast screening were more likely to have ever had a cervical smear ($\chi^2_{(3)} = 22.5, p < 0.001$) than non-attenders **Reattendance**: attenders were not more likely to have had previous breast screening ($\chi^2_{(2)} = 1.1$) than the non-attenders (possibly due to non-availability of a mammography screening programme) Those who attended the BSE class were more likely to have ever had a cervical smear ($\chi^2_{(3)} = 25.7, p < 0.001$) than non-attenders. However, attenders were not more likely to have had previous breast screening ($\chi^2_{(2)} = 0.8$) than the non-attenders (as above)			Attenders at breast screening and the BSE class were more likely to have had cervical screening but not breast screening than non-attenders Breast screening was not previously routinely available at this time, so may contribute to the non-significant association between mammography and attendance in this study **Cervical screening (+) Reattendance (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Calnan (1985)[164] 7393 med Cross-sectional	Response rate 2084/2524 (82.6%)		**Preventive behaviour**: breast screening showed an association with cervical screening ($r = 0.20$, $p < 0.001$), dental check-up ($r = 0.11$, $p < 0.001$), dietary practice ($r = 0.06$, $p < 0.01$), exercise ($r = 0.11$, $p < 0.001$), smoking behaviour ($r = 0.07$, $p < 0.01$) and use of seatbelts ($r = 0.08$, $p < 0.001$)		Temporal nature of the association is unclear Interviews carried out in 1980, which was 8 years before the breast screening programme was introduced. The cervical screening programme was running, but it was chaotic	There were moderately positive associations between various preventive health behaviours **Cervical screening (+) Other preventive health behaviours (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Champion and Springston (1999)[175] 47 psy Cross-sectional	Response rate 329/402 (82%)	Not given by comparison groups 62% were adherent to guidelines, 28% were relapsers. The minority (3%) were pre-contemplators and 8% were contemplators		**Perceived susceptibility to breast cancer**: precontemplators had significantly lower scores than the other three groups ($p < 0.01$) **Barriers to mammography**: women who had never had a mammogram (precontemplators and contemplators) had significantly higher scores for perceived barriers than women who had a mammogram ($p < 0.01$) **Benefits of mammography**: Precontemplators and relapsers had significantly lower scores of benefits than contemplators and action people ($p < 0.05$)		Women who were precontemplators perceived themselves at significantly lower risk of developing breast cancer than the other groups Women who had never had a mammogram had significantly greater barrier scores than women who had had a mammogram Benefit scores were lowest for precontemplators, possibly because they had not considered the benefits or otherwise of mammography **Increased perceived susceptibility to breast cancer (–) Fewer barriers to mammography (+) Benefits of mammography (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
*Clark *et al.* (1998)[191] 120 psy Cross-sectional	$N = 1323$ Response rate 73.5% Least committed $N = 120$ Contemplator/ inconsistent $N = 212$ Action $N = 238$ Maintenance $N = 754$			**Knowledge and barriers to mammography as indicators within stages of adoption of breast screening**: Least committed: knowing the age-related breast screening interval ($\beta = 0.30$, $t = 3.98$, $p < 0.001$); having no barriers to breast screening ($\beta = 0.36$, $t = 4.70$, $p < 0.001$) Contemplation: knowing age-associated screening ($\beta = 0.22$, $t = 3.51$, $p < 0.001$); having no barriers to screening ($\beta = 0.31$, $t = 4.98$, $p < 0.001$) Action: knowing age-related barriers to screening ($\beta = 0.13$, $t = 2.14$, $p < 0.05$); having no barriers ($\beta = 0.32$, $t = 5.19$, $p < 0.001$) Maintenance: knowing age-related barriers to screening ($\beta = 0.15$, $t = 4.41$, $p < 0.001$); having no barriers ($\beta = 0.25$, $t = 7.24$, $p < 0.001$)	The temporal relationship is unclear for breast screening	Knowing the age-related interval and having no barriers to screening were significantly associated with positive decisional balance adoption indicators of screening in all stages of adoption groups Temporal relationship unclear **Knowledge (?) Fewer barriers to mammography (?)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Clemow *et al.* (2000)[113] 39 psy Cross-sectional	4005 underusers of mammography 2507/2981 (84.1%) met criteria and agreed to participate	Response rates not given, but sample consists of: not planning $N = 333$, thinking about group $N = 419$, definitely planning $N = 1671$	**Intention to reattend/attend**: intention to obtain a mammogram based on prior utilisation of mammography services showed highly significant differences ($p < 0.001$): Of those not planning to obtain a mammogram ($N = 333$), 3.5% ($N = 11$) had a recent mammogram, 27.3% ($N = 86$) had a mammogram more than 24 months ago, 69.2% ($N = 218$) had never had a mammogram Of those thinking about obtaining a mammogram ($N = 419$), 12.8% ($N = 52$) had a recent mammogram, 41.0% ($N = 167$) had a mammogram more than 24 months ago, 46.2% ($N = 188$) had never had a mammogram Of those definitely planning to obtain a mammogram ($N = 1671$), 45.8% ($N = 683$) had a recent mammogram, 45.1% ($N = 672$) had a mammogram more than 24 months ago, 9.1% ($N = 135$) had never had a mammogram Regression analysis of factors associated with intention to obtain a mammogram: Those who had never had a mammogram were less likely to be thinking about having a mammogram than former users ($OR = 0.43$, 95% CI 0.19 to 1.01)		How long has HMO provided free mammography? Discrepancy between table 1 and figure re numbers of women in each group. Numbers presented in table appear to have been used in calculations	Those never having had a mammogram or not having a recent mammogram were less likely to be definitely planning a mammogram. Most women who had not thought about having a mammogram in the next 2 years had never had a mammogram. Of those women who decided not to have a mammogram, a significant number had a mammogram more than 2 years ago and very few had a recent mammogram. Of those women who were undecided a significant number had a mammogram > 2 years ago and very few had a recent mammogram **Intention to reattend/attend (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
			and never users (OR = 0.27, 95% CI 0.12 to 0.61, *p* < 0.05). Those who had never had a mammogram and those who had not had one recently were significantly less likely to be planning a mammogram than former users (OR = 0.39, 95% CI 0.27 to 0.56, *p* < 0.05) and never users (OR = 0.10, 95% CI 0.06 to 0.15, *p* < 0.05)			
			Prior mammography use and intention for women not planning on having a mammogram in the next 1–2 years (*p* < 0.001):			
			Of those women who never considered having a mammogram in the next 2 years (*N* = 105), 2.9% had a recent mammogram, 8.7% had a mammogram > 2 years ago and 88.4% had never had a mammogram			
			Of those who decided not to have a mammogram in the next 2 years (*N* = 110), 0.0% had a recent mammogram, 31.7% had a mammogram > 2 years ago, and 68.3% had never had a mammogram			
			Of those undecided about whether to have a mammogram in the next 2 years (*N* = 85), 4.8% had a recent mammogram, 30.1% had a mammogram > 2 years ago and 65.1% had never had a mammogram			

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Cockburn *et al.* (1992)[131] 1972 emb Cohort	96/101 (95%) completed questionnaire 94 provided data on pain/ discomfort 88/101 (87%) interviewed at 3 months	Not stated, but cohort consisted of: no discomfort 28/94 (30%), mild discomfort 34/94 (36%), moderate discomfort 22/94 (23%), severe discomfort 4/94 (4%), moderate pain 5/94 (5%), severe pain 1/94 (1%)	**Effect of pain on intention to reattend**: no women said that their level of discomfort would stop them from attending future screening. However, 3% of women said it might stop them. 2 (2%) reported having experienced severe pain, and 1 (1%) had reported moderate discomfort			A very small minority of the sample said that pain and discomfort might deter them from attending for breast screening again **No comparative analysis Pain had no effect on intention to reattend (ns)**
Cockburn *et al.* (1997)[148] 1656 med Cohort	60% consent rate *N* = 219 Of these, 180 were eligible	Attenders 90/180 (50%) Non-attenders 90/180 (50%)	**Reattendance**: previous mammography history: 91 participants had not been screened previously and 60% attended screening 72 participants had a previous mammogram and only 35% attended screening (OR = 0.38, 95% CI 0.17 to 0.83, *p* = 0.01)		17.8% of women contacted had had a mammogram in the past 6 months but were ineligible for this study. Relatively low consent rate	Participants who had previously been screened were less likely than those who had not been screened to attend the mobile unit **Re-attendance (–)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Cockburn et al. (1997)[153] 2105 med Cohort	668 women interviewed before 1st round of screening. 315 attended 1st round of screening	Not stated	**Reattendance**: outcome of first round screening: no significant relationship between being recalled at first visit and reattendance during the second round (data not shown)			There was no association between outcome of first round screening and subsequent attendance, and no association with having regular routine Pap smears (data not shown) **False-positive results had no association with: Reattendance (ns)**
Cole et al. (1997)[181] 1710 med Cross-sectional	391/450 (87%)	Not given		**Efficacy of early detection**: 192/220 (87%) regular users and 129/171 (75%) intermittent users believed that early detection improves the outcome of breast cancer (OR = 2.31, 95% CI 1.36 to 3.94). OR_{adj} for all variables = 2.98 (95% CI 1.62 to 5.47) **Perceived susceptibility to breast cancer**: 22/220 (10%) regular users and 31/171 (18%) intermittent users believed that they were more likely to get breast cancer than other women (OR = 0.49, 95% CI 0.27 to 0.88). (OR_{adj} for all variables = 0.49 (95% CI 0.26 to 0.94) **Barriers to mammography**: there was no difference in the belief that mammography is painful or dangerous	"no information on the determinants of the beliefs ascertained, for example, why women believed themselves at increased risk of breast cancer, or that mammography is dangerous. Such information would be particularly helpful in explanation of the findings"	Women who are regular users of mammography are more likely to believe that early detection improves breast cancer outcomes. Regular users were also less likely to believe that they were at increased risk. The beliefs that mammography is painful and mammography is dangerous are inconclusive (due to lack of statistical power) **Efficacy of early detection (+) Lower perceived susceptibility to breast cancer (+) Barriers to mammography (ns)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Conlon *et al.* (1998)[186] 836 emb Cohort	293/315 (93%)	Participation rates were not given, just numbers Reattenders *N* = 238 Non-reattenders *N* = 55		There were no significant results, indicating that there was no effect of screening on attendance **Radiation concerns**: 37/238 (15.5%) reattenders were concerned; 8/55 (14.5%) non-reattenders were concerned **Barriers to mammography**: (pain from mammogram): 95/238 (39.9%) reattenders reported pain; 20/55 (36.4%) non-reattenders reported pain ($p = 0.647$) **Intensity of screening process**: 98/238 (41.1%) of reattenders intense process; 26/55 (47.3%) non-reattenders intense process ($p = 0.454$)	Self-selected group of women from a previous study	Concern about radiation, pain from mammography and intensity of screening process were not significantly correlated with reattendance for screening **Radiation concerns (ns)** **Barriers to mammography (ns)** **Intense process (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Crump *et al.* (2000)[143] 124 med Case–control	1248 women were initially contacted by telephone 574/634 final sample size from the interviews conducted	239 cases 335 controls	**Reattendance**: 64% of cases (non-attenders) were adherent with ACS recommendations, compared with a slightly higher figure of 72.8% of controls (attenders) ($p = 0.07$)	**Knowledge of screening tests**: there were no significant differences between the cases and controls in terms of naming breast cancer screening tests (BSE 45.6 vs 43.9% $p = 0.68$; CBE 54.4 vs 57.9%, $p = 0.40$; mammography 78.2 vs 82.1%, $p = 0.25$. For cases and controls, respectively: **Efficacy of mammography**: 6.3 vs 3.0% ($p = 0.06$) believe that breast cancer cannot be found early **Barriers to mammography**: 8.4 vs 5.5% ($p = 0.18$) believe that mammography is not safe **Embarrassment**: 7.9 vs 2.7% ($p = 0.004$) believe that having a mammogram is embarrassing **Fear of cancer**: 11.8 vs 12.0% ($p = 0.93$) are scared that mammogram will detect breast cancer **Need mammography even though not sick**: 12.7 vs 5.7% ($p = 0.004$) believe that there is no reason for a women to have a mammogram if she is not sick	Unsure of temporal relationship of health beliefs data	Slight (ns) trend towards non-attenders being less adherent with recommended breast screening guidelines **Knowledge of screening tests (ns)** **Less embarrassment (+)** **Efficacy of mammography (ns)** **Barriers to mammography (ns)** **Fear of cancer (ns)** **Need mammography even though not sick (+)** **Reattendance (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Dean *et al.* (1986)[170] 7224 med Cohort	271/303 (89%) Attenders were interviewed, community sample were sent questionnaire	132/145 (91%) of attenders 139/158 (88%) of community sample	**BSE behaviour**: of the 132 women interviewed, 88 (67%) said they were still practising self-examination 6 months later. Only 31 (23.5%) were carrying it out at monthly intervals, and 38 (29%) more often, 27 (20.5%) of them once or more a week	**Anxiety measures**: not relevant for this review **Reassurance**: 86% found breast screening reassuring. 12 (9%) did not feel reassured. 6/12 had high anxiety (General Health Questionnaire scores before and after screening) **Perceived susceptibility to breast cancer**: 10 (7.6%) thought screening made them more anxious about developing breast cancer **Worry about breast cancer**: 40% of interviewed group said they sometimes worried about breast cancer before screening. 39% reported this after screening (ns) **Awareness of breast cancer**: 38% said it increased their awareness of breast cancer, and 93% of these thought increased awareness was a good thing	Main focus of paper was psychiatric morbidity and anxiety	Having been taught BSE as part of breast screening, a majority were still practising it 6 months after screening. A majority of the sample found breast screening reassuring. Just over one-third thought screening made them more aware of breast cancer, and a majority of these people thought this was a good thing **Main comparison was before/after BSE behaviours: continued conducting Reassurance (+) Worry about breast cancer (ns) Increased awareness of breast cancer (+) Perceived susceptibility to breast cancer (small proportion reported increase anxiety about getting breast cancer)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
De Neef and Gandara (1991)[156] 5539 med Cohort (retrospective)	482 eligible screened women, routine data obtained for 100%	100%	**Adherence to follow-up**: 482 women had a screening mammography; 346 were recommended to have routine screening after a clear index mammography 105 were recommended to have accelerated follow-up (additional mammography within 6 months). 22/105 (21.0%) of these had no further screening conducted. The remaining 83 (79.0%) had further screens, although 10 of these were still unresolved 31 were recommended to have immediate evaluation conducted. 6/31 (19.4%) of these had no further tests, a further 3 (10%) opted to have additional mammography and the subject was unresolved. (Reviewers calculated this difference as not significant, but underpowered) In the accelerated follow-up group, 83 had received additional tests. However, only 22/83 (26.5%) had the extra mammography within the recommended 6 months. Using the denominator of all those recommended this management option, only 22/105 (21%) received the follow-up in the desirable time interval			One-fifth of women who were advised to have early recall did not attend for further mammography. Of those who did, only 21% had the repeated mammography within the recommended period **Positive result associated with:** **Adherence to follow-up recommendations (–)** A similar proportion of women who needed immediate evaluation also failed to attend **Repeat mammography vs immediate further investigations** **Adherence to follow-up recommendations (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Donato *et al.* (1991)[149] 5495 med Cohort	612 non-attenders 1032 attenders eligible	429/612 (70.1%) eligible non-attenders 477/1032 (46.2%) attenders sampled. No response rates as used routine data	**Reattendance**: the proportion of non-attenders who had ever had a mammogram was higher than in the attenders. Non-attenders: 25% had had a mammogram, 12.1% had had at least one in the past 2 years, and 5.1% had more than one mammography Attenders: 19.1% had had a mammogram, and 9.4% had at least one in the past 2 years Past Pap smears: data only available for non-attenders. 55.9% had at least one Pap smear in their life, and 36% had at least one in the past 3 years The proportion of non-attenders who had undergone a recent Pap test (36%) was three times higher than the proportion of non-attenders who had undergone recent mammography (12%), indicating that non-attenders for breast screening are selective in which health prevention procedures they undergo		Data on non-atttenders and attenders collected differently. Data on non-attenders were collected specifically for the project, but only basic routine data available for attenders, hence lack of comparison between attenders and non-attenders in crucial outcomes. Non-concurrent comparison groups	The proportion of non-attenders who had a previous mammogram was higher than in attenders Non-attenders are more likely to undergo cervical screening than breast screening **Re-attendance (–)**

Appendix 6 cont'd   *Breast screening: summary of study results*

| Author(s) (year) ID no. Study design | No. of participants and follow-up rate | | Main results | | | |
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Duijm *et al.* (1998)[201] 1252 med Cohort (prospective)	163/167 (97.6%)		**Adherence to follow-up recommendation**: the recommended follow-up was mammography after 6 months, then two more annual mammograms. The authors defined total adherence as completion of all three follow-up visits. This was achieved in 110/163 women (67.5%) and the remaining 32.5% had incomplete follow-up. Only 29.4% of all women underwent all three follow-ups without reminders GPs more frequently reported that they were responsible for the patient not being followed up, principally due to an insufficient retrieval system	Fear of radiation and fear of cancer detection did not appear to be important patient-related barriers (although reported by GPs) The lack of breast symptoms was an important barrier to patient adherence, although again reported by GPs	This study asked GPs why women did not attend for follow-up. It would appear that the GPs are the gatekeepers to breast screening services in this population	Approximately one-third of women did not complete all three recommended follow-up appointments after a suspicious mammogram GPs reported that the most frequent barriers were GP related, not patient related **No comparison Adherence to follow-up recommendations (–)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Elkind and Eardley (1990)[194] 5986 med Cohort	230	GP practice invited women: 198/304 (65%) questionnaires returned; 146/195 (75%) attended screening Health authority staff: 84/224 (37%) returned questionnaire	**Intention to reattend**: future attendance is very likely: 62% of practice attenders, 43% staff attenders; future attendance is likely: 38% of practice attenders, 56% staff attenders One member of each group thought it unlikely they would reattend Interest in 'preventive?' measures: women expressed interest in what they could do themselves to detect breast cancer. Some women regarded screening as protective against cancer (breast screening unit staff comments – no statistics given)	**Reaction to receiving invitation**: only results for practice attenders presented: 64% made a positive comment such as being 'pleased' or 'glad of opportunity'; 12% negative comment such as shock, fear or nervousness, although nearly half of these women also had some positive feelings	Very little information given about participants	Almost all women who attended screening intended to return for future screening if invited. Women expressed an interest in what they could do to detect breast cancer themselves before the next screening; however, some women regarded mammography as protective against cancer Although 64% of those receiving an invitation felt positive about it, 12% of respondents had negative feelings **No comparisons Intention to reattend (+) Reaction to being invited (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Elwood *et al.* (1998)[187] 1400 Cohort	167/200 eligible for this study 121/167 (72%) responded to the telephone survey	None		**Effect of pain on reattendance**: reasons given for not reattending were ($N = 79$): 45.6% because of previous painful mammogram; 7.6% because they thought mammograms were dangerous; 7.6% were concerned about some aspect of the programme; 5.1% were uncomfortable with mammography; and 1.3% did not think mammograms were effective When comparing women who declined a second screen with a sample of all women who had received a first screen, non-attenders were significantly more likely to report mammography as "very painful" and to have "concerns about staff at the screening unit" (14 vs 1%, $p < 0.0001$), and less likely to "recommend screening to other eligible women" (65 vs 99%, $p < 0.0001$). The attenders were significantly more likely to report mammography as "a little uncomfortable" (45 vs 22%, $p < 0.0003$) and to report mammography as causing "a little bruising" (7 vs 27%, $p < 0.0002$) **Perceived barriers** to undergoing a second screen ($N = 77$) were: fear of procedure (41.6% major, 11.7% minor), concern about safety of mammogram (19.5% major,	Significant differences were calculated by the reviewers	Women's past experience of mammography discouraged them from attending again. The major factor affecting non-participation with further screening was a previous painful mammogram **No comparisons** **Reattendance (–) if painful first time** **Fear of mammography (–)** **Safety of mammography (–)** **Fear of cancer (–)** **Other barriers (–)**

Appendix 6 cont'd   Breast screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				18.2% minor), fear of possible outcome (5.2% major, 10.4% minor), mammogram provides no benefit (6.5% major, 9.1% major), embarrassment (2.6% major, 9.1% minor), concern about some aspect of the programme (3.9% minor), and concern about privacy of information (2.6 major)		
*French *et al.* (1982)[158] 7716 med Cohort	115/200 (57.5%)	Attenders 61/90 (67.8%) Non-attenders 54/110 (49.1%)	**Cervical screening**: more attenders than non-attenders had cervical smears (84 vs 65%, $\chi^2_{(1)} = 5.36$, $p = 0.021$); more attenders had smears at their own request (20 vs 9% ns) **Other preventive health behaviours**: attenders were more likely to have regular dental check-ups (33 vs 15%, $\chi^2_{(1)} = 5.02$, $p = 0.025$)	**Reasons for attending** ($N = 176$): Wishing to know: "Make sure nothing wrong, to find out, put mind at rest, better to face things" (24%) Prevention: "Be on the safe side, preventive measure, a good opportunity" (16%) Importance of early treatment: "early treatment cures, gives better chances, catch it in time, postponing treatment means poor outlook" (15%) Awareness and vulnerability: "right age group, symptoms, breast awareness, family history, possibility of cancer, aware of cancer" (15%) Miscellaneous: "only fair on family, screening better than self-examination, etc." (7%) **Reasons for not attending**: Not interested/irrelevance of screening: "had enough of check-ups and hospitals, been tested before, too old, can't be bothered, feel quite well" (24%)		Attenders for mammography were more like to have had cervical smear tests. They were also more likely to have regular dental check-ups Attenders and non-attenders were similar with respect to beliefs about early treatment being beneficial, and lump as a symptom of breast cancer, but significantly fewer attenders thought that pain could be a symptom of breast cancer Non-attenders were more likely to believe that that you should not go looking for trouble and to fear that cancer would be found on screening **Cervical screening (+) Other preventive health behaviours (+) Less fear of cancer (+) Need mammography even though not sick (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				Fear: "Can't face it, distrust of medicine, negative influence of others" (17%) Other: "not enough explanation in letter, screening dangerous" (12%) **Fear of cancer**: more non-attenders felt that one should not go looking for trouble than attenders (58 vs 11%, $\chi^2_{(1)} = 27.31$, $p < 0.0001$) More non-attenders feared that cancer would be found than did attenders (79 vs 36% $\chi^2_{(1)} = 22.12$, $p < 0.0001$) **Knowledge of mammography and breast cancer**: attenders and non-attenders were broadly similar in knowledge and beliefs: 85% of attenders and 77% of non-attenders believed that early treatment usually or always made a difference to survival, that breast lumps had a 50/50 or greater likelihood of being malignant (90% and 91%, respectively) and that lumps were a symptom of breast cancer (91% and 81%). These differences were not significant. There was a significant difference in that fewer attenders thought that pain was a symptom of breast cancer (11 vs 48% in non-attenders) ($p < 0.001$)		**Knowledge of breast cancer (ns)** **Efficacy of early detection (ns)** **Knowledge of mammography (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

| Author(s) (year) ID no. Study design | No. of participants and follow-up rate | | Main results | | | |
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Friedman et al. (1996)[192] 228 psy Cross-sectional	301 (all ages)	54 women aged > 50 years	**Knowledge of breast cancer**: women aged > 50 years who had had a mammogram in the past year were significantly more likely to be more knowledgeable about breast cancer than women > 50 years who had not had a mammogram in the past year The logistic coefficient for this variable was 0.43 ($p < 0.05$), which indicated that odds of a woman over the age of 50 having had a mammogram in the past 12 months increases by a factor of about 1.5 per 1 unit change in knowledge score			Women aged > 50 years who have had a mammogram in the past year are significantly more knowledgeable about breast cancer than those aged > 50 who have not had a mammogram **Knowledge of breast cancer (+)**
Fuller et al. (1992)[182] 4691 med Cross-sectional	556/1000 (55.6%)	Response rates not known, but sample consists of 459/556 (82.5%) participants (had mammography), 97/556 (17.5%) non-participants (not had mammography)		**Barriers to mammography, and susceptibility and seriousness of breast cancer**: participants and non-participants did not differ significantly with respect to health beliefs examined. However, in factor analysis for participants 32.2% of total variance was yielded by three factors alone: barriers, susceptibility and seriousness. For non-participants, 34.8% of the variance was yielded by three factors: barriers, susceptibility and miscellaneous concerns For the whole group the factor analysis was the same as for participants, but this is not surprising considering 82% of the sample were participants	Not sure about the temporal relationship	No significant differences in health beliefs were reported between those who had had mammography and those who had not **Perceived susceptibility to breast cancer (ns)** **Barriers to mammography (ns)** **Perceived severity of breast cancer (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Glockner *et al.* (1992)[190] 4943 med Cohort	381/469 participants met eligibility criteria	None	**Efficacy of mammography**: women who had previous mammograms were less likely to believe that mammography was an unnecessary screening procedure than women who had not had previous mammograms ($p < 0.001$). Fear of medical intervention was not found to be significant		Fee-for-service screening. No comparison group	Deterrents were less prominent in women who had attended mammography screening previously than those who had not previously attended. **Efficacy of mammography (+)**
*Gnanadesigan *et al.* (2000)[173] 1 psy Cross-sectional	Response rates not given $N = 610$	Response rates not given Sample consisted of 525/610 (86.1%) who ever had a mammogram and 375/610 (61.5%) who were current users of mammography	**Preventive health behaviours**: unadjusted ORs: smoking, regular exercise, seatbelt use, aspirin use and current HRT use were not associated with either ever or current mammography use and were not included in the multivariate analysis In the adjusted analyses, significant associations ($p < 0.05$) were reported between ever having a mammogram and: tetanus shot (ever) (OR = 2.13, 95% CI 1.10 to 4.09), tetanus shot (within 10 years) (OR = 7.43, 95% CI 1.72 to 32.05), Pap smear (ever) (OR = 16.00, 95% CI 4.32 to 59.20), Pap smear (every 3 years until age 65) (OR = 2.57, 95% CI 1.10 to 6.01), sigmoidoscope/colonoscope screening (OR = 6.74, 95% CI 3.08 to 14.76), stool for occult blood (OR = 4.51, 95% CI 1.71 to 11.89)		Unclear temporal relationship	The strongest association with mammography use (ever and current) was ever having had a Pap smear. Faecal occult blood testing (ever) was also associated with both ever and current mammography use. Current mammography use was also associated with flu jabs, calcium use and BSE. Ever mammography use was associated with tetanus jabs (both ever and within 10 years), Pap smears (every 3 years until the age of 65) and sigmoidoscope/colonoscope screening The authors conclude that "preventive services that require a clinician's intervention and no ongoing involvement (e.g. tetanus, colorectal screening) were associated with having ever had a mammogram but not with being current in its use. Preventive

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
			No significant association was found between ever having a mammogram and flu shots (ever or current), pneumonia vaccine, calcium use, HRT use or BSE behaviours			services that are patient-initiated or require patients to take a more active role (e.g. current use of calcium supplementation, BSE, stool for occult blood) were associated with being current on mammography use"
			Significant associations were reported between current mammography use and: flu jab (ever) (OR = 2.28, 95% CI 1.13 to 4.60), calcium use (OR = 2.24, 95% CI 1.16 to 4.35), Pap smear (ever) (OR = 6.11, 95% CI 1.03 to 36.23), stool for occult blood (OR = 2.93, 95% CI 1.31 to 6.54), BSE (OR = 3.17, 95% CI 1.60 to 6.32)			**Some preventive health behaviours (+)**
			No significant associations were observed for current flu shots, pneumonia vaccine, tetanus shots (ever or within 10 years), HRT use, Pap smears or sigmoidoscope/colonoscope screening			

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Gordon et al. (1991)[114] 5165 med Cross-sectional	143/200 (72%) participated	Not known	**Intention to attend**: in the 'no' group, 43% of women had never had a pap smear compared with 5% in the 'yes' group ($p = 0.001$). In the no group, 85% had never had a mammogram, compared with 40% ($p = 0.001$)		Had to extract (guess) figures from a graph	There were differences between the women who intended to attend for mammography screening and those who did not intend to attend. Having had a Pap smear or mammogram was associated with increased intention to attend for mammography **Intention to attend (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Gram *et al.* (1990)[129] 5833 med Cohort	Questionnaire (6 months) 793/1349 (58.8%) Interview (18 months): 278/429 (64.8%)	**Questionnaire** (6 months): 160/179 (89.4%) FP, 209/250 (83.6%) all clear (AC), 259/670 (38.7%) DNA, 165/250 (66.0%) pop. sample **Interview** (18 months): 126/179 (70.4%) FP, 152/250 (60.8%) AC	**Intention to reattend for mammography**: overall, only 3/278 women would not go again if it was free. No breakdown by FP/AC **Use of GP/other health services** (visits to GP, outpatients department, physiotherapist): at the time of screening, the mean ± SD number of GP visits was 1.6 ± 0.2 in FP and 1.6 ± 0.1 in AC; outpatient visits were 0.6 ± 0.1 in FP and 0.5 ± 0.1 in AC; physiotherapist visits were 1.8 ± 0.5 in FP and 2.1 ± 0.5 in AC **Worry/sleeplessness/BSE behaviour**: no changes in health visits were reported in either group. There were no differences between FP and AC for being easily worried, sleeplessness or frequency of BSE (results not given) **Sense of well-being**: at the time of interview both groups had the same level of sense of well-being	**Comparison with other stressful events**: proportion that rate headache, gastric flu, rain on holiday and sprained ankle as more stressful than further investigation following screening (reported after 18 months) <table><tr><td></td><td>FP (biopsy)</td><td>FP (no biopsy)</td><td>AC</td></tr><tr><td>*n*</td><td>29</td><td>94</td><td>152</td></tr><tr><td>Headache</td><td>24%</td><td>60%</td><td>83%</td></tr><tr><td>Gastric flu</td><td>38%</td><td>69%</td><td>95%</td></tr><tr><td>Rain on holiday</td><td>38%</td><td>74%</td><td>97%</td></tr><tr><td>Sprained ankle</td><td>41%</td><td>72%</td><td>98%</td></tr></table> In all of the above figures, a smaller proportion of FP group rated these events more stressful than screening compared with the AC group (AC group found these events more stressful than screening): dose–response relationship 54/123 (44%) of FPs thought it was a positive experience vs 81/152 (53%) of AC group (ns) An overall negative experience was reported by only 3/123 (3%) of the FP women		After 18 months, there was no difference in the mean number of visits to health professionals, or sense of well-being, between the FP and AC women. There was a significantly higher prevalence of breast cancer worry in the FP group than in the AC group When asked how it compared with other 'stressful events', a smaller proportion of FP group rated these events (headache, gastric flu, rain on holiday, sprained ankle) as more stressful than screening compared with the AC group (AC group found these events more stressful than screening). A greater proportion of those who underwent a biopsy rated the breast screening as more stressful than the other FPs; a dose–response relationship **False-positive results associated with:** **More stressful than other life events (–)** **Use of GP/health services (ns)** **Sense of well-being (ns)** **Overall intention to re-attend (+)** **BSE behaviours (ns)** **Worry/sleeplessness (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Gram and Slenker (1992)[115] 5040 med Cohort	Uptake of mammography: 3653/4323 (85%) Overall follow-up rate: 60.5%	160/179 (89.4%) FP, 209/250 (83.6%) random sample of screen negative, 210/550 (38.2%) non-attenders, 164/250 (65.6%) random sample of women not invited (live in nearby city)	**BSE behaviour**: non-attenders were less likely to practise BSE than the population sample ($p < 0.05$) (data not given) **Intention to reattend**: 92% of non-attenders reported that they would be willing to have a free mammogram in the future, compared with 99% of attenders and women not invited (RR 0.93, 95% CI 0.89 to 0.97). Non-attenders were significantly less likely to be willing to attend mammography in the future	Anxiety measures were collected (but not relevant for the review); screen-negative and non-attenders had significantly lower anxiety than the population sample. The FPs had levels slightly higher than the population sample (ns)		Non-attenders were less likely to practise BSE than the population sample. Non-attenders were significantly less likely to be willing to attend for a future mammogram than all other women **Intention to reattend (+)** **BSE behaviour (+)**

Appendix 6 cont'd   Breast screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Helvie *et al.* (1991)[202] 5613 med Cohort	144 women who were recommended for repeated mammography. The paper states that they know, for all women, whether they returned or not, but then states that 10 'were lost to further mammographic and clinical follow-up at our institution'		**Adherence to follow-up recommendations**: 144 women were recommended to have repeated mammography at 4, 12, 24 and 36 months Adherence rate for 4-month follow-up was not given, but 5 women had a biopsy or the condition had resolved at this time and therefore were no longer eligible to be followed up by mammography. 139 remained eligible. 99/139 (71%) were followed up at 1 year; 3 became ineligible. 82/136 (60%) received follow-up at 20 months or after (2 years); 2 became ineligible. 63/134 (47%) had repeat mammography at about 30 months (3 years). 18/144 (12.5%) never had any follow-up. The authors report that many women returned for some, but not all, of their follow-up examinations. However, the data are unclear		Unsure about the follow-up data: it appears that the authors have complete data, but they state that they do not	Adherence rates with repeated mammography as a further investigation declined with each subsequent screen so that only just under half of the women had repeated mammography 3 years after the index mammogram 12.5% of women with suspicious mammograms did not receive any follow-up Many women had some, but not all, of the recommended follow-up **No comparison Adherence to follow-up recommendations (–)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Holm *et al.* (1999)[184] 927 med Cross-sectional	Response rate 97/150 (65%)	Response rate not given by comparison groups, but sample consisted of 65 women who had a mammogram (68.2% of sample) and 31 who had not had a mammogram (32.3% of sample) One subject missing data	**HBM benefits/motivation scale:** significant positive correlations were observed between frequency of mammograms and the HBM benefits scale ($\rho = 0.225$, $p < 0.05$) and the HBM motivation scale ($\rho = 0.386$, $p < 0.01$). This indicates that increased frequency is associated with increased scores on these scales. A significant negative correlation was observed between frequency and the HBM barriers scale ($\rho = -0.204$, $p < 0.05$), indicating that increased barriers are associated with reduced frequency of screening There were no other significant correlations with frequency Significant negative correlations were observed between time since last mammogram and the HBM benefits scale ($\rho = -0.257$, $p < 0.05$) and the HBM motivation scale ($\rho = -0.260$, $p < 0.05$), indicating that increased scores on these scales are associated with shorter durations between screens	**Efficacy of mammography:** women who had participated in mammography were significantly more likely to perceive greater benefits: had mammography mean $\pm$ SD 26.7 $\pm$ 3.7, no mammography 25 $\pm$ 3.4 ($t = 2.16$, df = 94, $p = 0.033$) **Barriers to mammography:** women who had participated in mammography were significantly more likely to perceive fewer barriers: had mammography, mean $\pm$ SD 9.8 $\pm$ 2.8, no mammography, 12.4 $\pm$ 3.5 ($t = 3.83$, df = 94, $p = 0.001$) **Health motivation:** women who had participated in mammography were significantly more likely to report greater health motivation: had mammogram 29.5 $\pm$ 3.6, no mammogram 27.6 $\pm$ 5.5 ($t = 1.99$, df = 94, $p = 0.050$) No other significant differences were reported regarding HBM susceptibility or seriousness scales, or any of the HLC scales	Uncertainty over temporal relationship There were significant differences between the comparison groups with regard to education, marital status and income	Those who have attended for mammography perceived significantly greater benefits and significantly fewer barriers to mammography, and had significantly higher health motivation than those who did not attend for mammography Increased frequency of mammography was associated with increased scores on the HBM benefits and motivations scales, as was shorter duration between screens **Efficacy of mammography (+)** **Fewer barriers to mammography (+)** **Health motivation (+)** **HBM benefits scale (+)** **HBM motivation scale (+)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Johnson and Meischke (1994)[176] 1598 emb Cross-sectional	N = 395 36% of households refused before it was ascertained whether there were eligible respondents. 21% of eligible respondents refused to participate	Had mammography 321/395 (81.3%) No mammography 58/395 (14.7%)		**Confidence in breast awareness**: women who had had mammography were significantly less confident in recognising changes in their breasts than women who had not had a mammogram: had mammogram mean $\pm$ SD 6.38 $\pm$ 2.70, no mammogram 7.71 $\pm$ 2.37 ($p < 0.05$) **Perceived susceptibility and severity of breast cancer and health consciousness**: women who had mammography were significantly more likely to perceive themselves as more vulnerable to breast cancer: had mammogram mean $\pm$ SD 5.28 $\pm$ 2.46, no mammogram 3.65 $\pm$ 2.68 ($p < 0.05$); perceive breast cancer as more serious: had mammogram 4.05 $\pm$ 2.29, no mammogram 3.65 $\pm$ 2.68 ($p < 0.05$); and be more health conscious: had mammogram 7.41 $\pm$ 2.68, no mammogram 6.61 $\pm$ 3.11 ($p = 0.10$) than women who have not had mammography	Not clear whether outcomes were a result of screening or previously held beliefs and attitudes	Women who had mammography were less confident in their ability to recognise changes in their own breasts, had a greater perceived vulnerability to breast cancer and perceived breast cancer as more serious than women who had not had mammography However, women who had mammography were more health conscious than those who were not screened **Less confidence in breast awareness (–)** **Increased perceived susceptibility to breast cancer (–)** **Increased perception of severity of breast cancer (–)** **More health conscious (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Johnson *et al.* (1996)[150] 2563 med Cohort	Questionnaire response rate not stated Analysis based on 5624 women	The questionnaire response rate is not stated Analysis based on 2609 adherers, 872 late adherers and 2143 non-adherers	**Reattendance**: women aged < 50 years: annual adherers 1033/2253 (45.8%), late adherers 406/2253 (18.0%), non-adherers 814/2253 (36.1%); women aged ≥ 50 years: annual adherers 1576/3371 (46.8%), late adherers 466/3371 (13.8%), non-adherers 1329/3371 (39.4%) Of the women who had a previous mammography (before index screen), 37.8% were annual adherers (and 62.2% were not), compared with 52% of women who had not had a mammogram. (OR for non-annual adherence = 1.79, 95% CI 1.55 to 2.06) Of the women who had an abnormal index mammogram only 26.9% were classed as annual adherers (73.1% were not) compared with 48.6% of women with an normal index mammogram (OR for non-annual adherence = 2.57, 95% CI 1.96 to 3.36)			Prior mammography and an abnormal initial screening result were both associated with non-adherence to rescreening within the programme. This applied to both age groups (data not shown for under 50s), for both annual adherers vs late or non-adherers and late adherers vs non-adherers **Re-attendance (–)** **False-positive results also associated with: Reattendance (–)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
*Kee *et al.* (1992)[116] 4667 med Cohort	600/766 = (78.3%)	Breast screening attenders 300/325 (92.3%) Breast screening non-attenders 300/441 (68.0%)	Attendance status for breast screening (as predicted by cervical screening status in women without hysterectomies): 153/223 (68.6%) attenders had a smear in previous 5 years compared with 85/183 (46.4%) non-attenders (CRB RR = 1.48, 95% CI 1.23 to 1.77, $p < 0.00001$) **Intention to reattend**: intention to attend for breast screening when next invited: 285/300 (95.0%) attenders were very or fairly likely to be rescreened compared with 156/300 (52%) of non-attenders (CRB calc RR = 1.83, 95% CI 1.63 to 2.04, $p < 0.00001$)			Women who had undergone a cervical smear test in the previous 5 years were 50% more likely to attend for mammography than those who did not have a smear Mammography attenders were significantly more likely to express intention to attend breast screening when next invited **Intention to reattend (+)**
Keemers *et al.* (2000)[195] 174 emb Cross-sectional	954/1200 (79.5%) 9 excluded because no data on pain 945/1200 (78.8%)	Not given, but sample consisted of: no pain 256/945 (27.1%), little pain 397/945 (42%), moderate pain 204/945 (21.6%), severe pain 88/945 (9.3%)	**Effect of pain on intention to reattend**: in response to the question of whether the respondent would attend for future screening mammography when invited, 25 (2.6%) answered that pain might deter them. 1 woman (0.1%) indicated to be sure not to attend further mammography because of severe pain. 6 women (0.6%) indicated that they probably would not attend because of other reasons			Only a minority of women said pain might deter them from attending for mammography again **No comparison groups Pain had no effect on intention to reattend (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Kessler *et al.* (1991)[203] 5555 med Cohort	3627 women screened. Follow-up obtained from routine data; follow-up rate not stated		**Adherence to follow-up recommendations**: 63/3627 (1.7%) were recommended to have a biopsy following a suspicious mammogram 57/63 (90%) biopsies were performed 4/6 of the women who did not have a biopsy opted for repeated mammography; a definitive result has not been obtained, despite a median follow-up of 12 months. The remaining 2 women did not have a biopsy and were subsequently lost to follow-up		Biopsy rate was lower than the national average at this time (3%)	6/63 (10%) who were advised to have a biopsy after a suspicious mammogram did not do so. 4 of these opted for repeated mammography **No comparison Adherence to follow-up recommendations (–)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
King *et al.* (1993)[183] 411 psy Cohort	*N* = 1001 548/696 (78.7%) interviews completed with eligible women	Never had a mammogram Ever had a mammogram		**Perceived susceptibility to breast cancer**: there were no significant differences between women who had ever vs never had a mammogram in risk perceptions **Efficacy of mammography**: women who never had a mammogram were significantly more likely to believe that a woman does not need a mammogram unless she has symptoms (41 vs 18%, $p < 0.001$) **Barriers to mammography**: 40% of the women who had never had a mammogram agreed 'a lot' that the thought of having a mammogram made them nervous vs 19% of those who had ever had a mammogram. 60% of women who had ever had a mammogram were not at all nervous about having a mammogram vs 35% of women who had never had a mammogram ($p < 0.001$) **Concern about radiation**: 24% of the women who had never had a mammogram were quite concerned about radiation vs 15% of those who had ever had a mammogram. 62% of women who had ever had a mammogram were not at all concerned about radiation vs 56% of women who had never had a mammogram ($p < 0.032$)	Very unclear temporal relationship	There were significant differences between those who had ever had a mammogram and those who had never had a mammogram It is not known whether the experience of mammography itself influences women's attitudes about mammography and allays their anxiety **Perceived susceptibility to breast cancer (ns) Efficacy of mammography (+) Fewer barriers to mammography (+) Fewer radiation concerns (+) Need mammography even though not sick (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				Looking for trouble: 33% of the women who had never had a mammogram thought 'a lot' that having a mammogram was looking for trouble vs 11% of those who had ever had a mammogram. 74% of women who had ever had a mammogram thought 'not at all' that having a mammogram was looking for trouble vs 47% of women who had never had a mammogram ($p < 0.001$)		
				Been healthy no need to worry: 26% of the women who had never had a mammogram thought 'a lot' that since they had been healthy all their life, they did not need to worry about breast cancer vs 17% of those who had ever had a mammogram. 66% of women who had ever had a mammogram thought 'not at all' that since they had been healthy all their life, they did not need to worry about breast cancer vs 54% of women who had never had a mammogram ($p = 0.008$)		

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Kruse et al. (1987)[168] 6976 med Cohort	735/739 (99.5%)	38.8% (N = 285?) had had previous mammography 61.2% (N = 450?) had not had previous mammography	**BSE behaviour**: women who had previously had mammograms were more likely to perform BSE than women who had not had a previous mammogram (59.0 vs 45.6%, $p < 0.001$)		All current attenders for breast screening Sample not generalisable for the population in the area	Women who had attended screening, before this screening episode were more likely to perform BSE. **BSE behaviour (+)**
Lechner et al. (1997)[134] 1879 med Cohort	395/798 (49.5%) of original sample were analysed Majority of losses were due to not obtaining screening data from the second round	Not stated by second round screening attendance	**Reattendance**: screening behaviour at the second round showed the highest correlations with past screening behaviour (0.56) and the intention (0.56) to participate at the second round. These were significant at $p < 0.01$ Participation in second screening round: 74% of participants in the second round participated in the first screening round. Of those who did not participate in the second screening round only 13% had participated in the first round ($\chi^2 = 126.5$, df = 1, $p < 0.0001$) Actual participation in the second round was strongly influenced by intention to attend (OR = 2.23, 95% CI 1.48 to 3.35) and past behaviour (OR = 8.17, 95% CI 4.06 to 20.09) when adjusted for all other variables		Quite difficult to follow the numbers used to derive response rates; the authors state that the response rate was 58%	Two significant predictors of second round participation were intention to participate (incorrect temporal relationship) and past behaviour **Reattendance (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Lerman *et al.* (1991)[125] 5343 med Cohort	308 women 85% response rate, non-response evenly distributed	Response rates not stated: 120 Normal (N) 120 low suspicion abnormal (A2) 68 high suspicion abnormal (A3)	**BSE behaviour**: there was no significant relationship between categorical frequencies of BSE behaviour (never, 1–2 years etc.) and the three screening outcomes, or the average score of BSE behaviour, where M(N) = 3.79 ± 0.16 (SEM), M(A2) = 3.86 ± 0.16, M(A3) = 3.68 ± 0.22 **Intention to reattend**: intention to have a future mammogram: there was no significant relationship between categorical frequencies of intentions to have a future mammogram and the three screening outcomes (72% of Ns extremely likely intention, 83% of A2s, 85% of A3s). However, when the average scores are examined there is a significant relationship, with women with highly suspicious mammograms (A3) being more likely to report stronger intentions to have another mammogram: M(N) = 3.51 ± 0.08, M(A2) = 3.72 ± 0.07, M(A3) = 3.77 ± 0.07 (p = 0.02)	Psychological anxiety: not relevant to this review		Screening outcome (normal, low suspicion abnormal or high suspicion abnormal) was not related with reported BSE frequency, but did appear to be associated with stronger intentions to have a future mammogram, with a dose–response relationship of women increasingly reporting likelihood of having mammography again with severity of screening result **False-positive results associated with: Intention to reattend (+) BSE behaviour (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Lipkus et al. (2000)[128] 61 emb Cross-sectional	$N = 1047$ (reported response rate = 76%)	Response rates not reported, but 772 women had never had an abnormal mammogram, 87 had had an abnormal mammogram within the past 2 years, 188 had had an abnormal mammogram over 2 years ago	**Reattendance**: women with a previous abnormal result were significantly more likely to be on schedule for mammograms: 239/275 (87%) compared with 625/772 (81%) of previous normals ($p = 0.01$). There was no difference with respect to CBE When looked at by length of time since abnormal result, those with a recent abnormal result ($N = 87$) were more likely to be on schedule for mammograms (87/87, 100%) than the normals (81%) and 'distant' abnormals (152/188, 81%) ($p = 0.001$). The same pattern was found for CBE	**Perceived susceptibility to breast cancer**: perceived absolute risk of developing cancer in next 10 years/lifetime: verbal responses (very unlikely, unlikely, 50/50 chance, likely, very likely) Numerical (0 = certain not to happen to 100 = certain to happen) Perceived risk (mean scores 1–5 scale): 10 year: normal 2.3 ± 0.9, abnormal 2.5 ± 0.9 ($p < 0.01$), recent abnormal 2.4 ± 0.9, past abnormal 2.5 ± 0.9 ($p = 0.001$) Lifetime: normal 2.4 ± 0.9, abnormal 2.7 ± 1.0 ($p < 0.01$), recent abnormal 2.5 ± 1.0, past abnormal 2.7 ± 0.9 ($p = 0.001$) **Perceived comparative risk**: compared with other women your age, how likely are you to get breast cancer in next 10 years/lifetime (much below average, below average, average, above average, much above average). No between-group differences **Worry and depression**: worry about breast cancer (mean $\pm$ SD scores): 10 year: normal 1.9 ± 0.8, abnormal 2.2 ± 0.9 ($p < 0.01$), recent abnormal 2.1 ± 1.0, past abnormal 2.2 ± 0.9 ($p = 0.001$) (significant difference from normal, but not each other) Lifetime: normal 2.1 ± 0.9,	Not a representative sample. These women were well educated and predominantly Caucasian. Most were married and in paid work. The majority also perceived their health as excellent	Women with an abnormal mammogram perceived that they were at greater risk of breast cancer than women who had never had an abnormal result. Women with previous abnormal results were substantially more worried about developing breast cancer whether the result was recent or not (worry persisted). They were also more likely to be adherent to the mammography screening guidelines, but only those women who had a recent abnormal result – women with an abnormal result more than 2 years previously were similar to the normal group. Women who had experienced an abnormal result reported more benefits of mammography than those with normal results, but again this effect was only seen for recent abnormal results. **False-positive results associated with: Reattendance (ns) Increased perceived susceptibility to breast cancer (–) Worry and depression (–) Benefits of mammography (+)**

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
				abnormal 2.3 ± 1.0 ($p < 0.0$) recent abnormal 2.3 ± 1.1, past abnormal 2.3 ± 0.9, ($p = 0.002$) (significant difference from normal, but not each other)		
				Benefits of mammography: attitudes to screening based on agreement with 20 statements about breast screening:		
				Decisional balance pro-score: normal 9.6 ± 2.2, abnormal 9.9 ±1.5 ($p < 0.01$), recent abnormal 10.0 ± 1.7, past abnormal 9.9 ±1.4, ($p = 0.088$) (significant difference from normal, but not each other) Felt torn about getting mammogram: normal 5, abnormal 2, ($p < 0.02$)		
				Depression measured using Center for Epidemiology depression scale: no difference across the three groups		

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Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
McCarthy *et al.* (1996)[154] 2405 med Cohort	1249 women	100%	**Adherence to follow-up recommendations**: in women recommended for immediate follow-up the adjusted RR of inadequate follow-up was 1.5 in women who had not had a previous mammogram (95% CI 0.8 to 2.8) In women recommended for 6-month recall, the adjusted RR of inadequate follow-up was 1.6 (95% CI 1.1 to 2.3) in women who had not previously had a mammogram 7.2% of 790 women recommended to have immediate follow-up received inadequate follow-up, compared with 36.8% of 459 women who were advised to have a further mammography in 6 months' time (reviewers calculated $p < 0.0001$)			Women who had a previous mammogram were significantly less likely to be non-adherent with 6-month early recall than women who had never had a mammogram. The same pattern was observed in women recommended for immediate follow-up, but this did not reach significance **Positive result associated with: Adherence to follow-up recommendations (+?)** The proportion of women who received inadequate follow-up was significantly higher in those who waited 6 months than in those followed up immediately **6-month recall (vs immediate follow-up) associated with: Adherence to follow-up recommendations (–)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**	**Notes**	**Summary**
Maclean *et al.* (1984)[159] 7493 med Cohort	*N* = 150 response rate (90%)	21 attenders, 125 non-attenders (this adds up to 146, not 150)	**Preventive health behaviours**: use of 'health foods': 33% of non-attenders vs 48% of attenders ($p > 0.10$); do not use specifically 'healthy' products: 67% of non-attenders vs 38% of attenders ($p < 0.02$); regular exercise: 40% of non-attenders vs 52% of attenders ($p > 0.20$); never smoked: 28% of non-attenders vs 28% of attenders ($p > 0.95$); regular dental checks-ups: 26% of non-attenders vs 53% of attenders ($p < 0.05$); dental attendance only for problems: 63% of non-attenders vs 42% of attenders ($p < 0.01$); no GP surgery attendance in previous year: 39% of non-attenders vs 24% of attenders ($p > 0.10$); 1–2 attendances in previous year: 34% of non-attenders vs 48% of attenders ($p > 0.20$); hospital outpatient attendance in previous 5 years: 44% of non-attenders vs 62% of attenders ($p > 0.10$); cervical smear test: 41% of non-attenders vs 71% of attenders ($p < 0.01$); invariable seatbelt use: 30% of non-attenders vs 60% of attenders ($p < 0.01$); children immunised: 89% of non-attenders vs 95% of attenders ($p > 0.30$)	**Reasons for non-attendance**: 39.2% expressed fear, 38.4% believe that screening is not necessary, 23.2% believe that you should not go looking for trouble "Some women had reacted with great alarm because they fancied that the original letter of invitation, endorsed by their doctor, must mean that he or she considered they had cancer" **Mammography even though not sick**: nearly 40% did not understand the idea of screening: "They felt themselves to be perfectly well at the time and were emphatic that they would go for medical attention for breast trouble if they thought they needed it. Screening might be all right for others, they implied but the notion that they themselves should look for trouble seemed not merely pointless but positively foolhardy" "20% were explicit that one ought not to tempt fate or that it was best to leave well enough alone. To them the entire philosophy of screening was foreign and they could see no point in searching for hidden invisible ills within their bodies. On the contrary, they seemed to fear, irrationally, that the very enterprise might bring sickness into being, not	Small sample size limits generalisability Attenders were those who were incorrectly on screening files as non-attenders. Not deliberately sampled Cannot assess temporal relationship	Non-attenders appeared to use fewer preventive services than did attenders, particularly dental services, smear tests and regular use of seatbelts. Reasons for non-attendance included fear, belief that screening is unnecessary and that "you shouldn't go looking for trouble". BSE was viewed more negatively by the non-attenders than by the attenders **Some preventive health behaviours (+) Cervical screening (+) Need mammography even though not sick (+) Importance of BSE (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				simply into sight, and they would prefer to have nothing whatsoever to do with such unnecessary and, they believed, potentially threatening activities"		
				The statement, "You shouldn't go looking for health problems – you'll know soon enough if anything is really wrong" was agreed with by 78% of non-attenders and 43% of attenders		
				Importance of BSE: good practice: 29.6% of non-attenders vs 81.0% of attenders; quite good practice: 31.2% of non-attenders vs 0% of attenders; not good practice: 12.8% of non-attenders vs 4.8% of attenders; bad practice: 22.4% of non-attenders vs 0% of attenders; unsure/no opinion: 4.0% of non-attenders vs 14.3% of attenders ($p < 0.01$)		

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
McNoe *et al.* (1996)[117] 2434 med Cohort	365/398 (91.7%) cleaned list	191/194 (98.5%) of 'cleaned' attenders list; 174/204 (85.3%) of 'cleaned' non-attenders	**Intention to reattend**: 172/191 (90.1%) attenders said they intend to reattend; only 75/174 (43.1%) non-attenders said they would attend next time (reviewers calculated RR = 2.09, 95% CI 1.75 to 2.49; $p < 0.00001$) There was a difference in reported intention among non-attenders according to the reasons that were given for the recent non-attendance: practical difficulties 28/35 (80.0%) would attend, likely to be ineligible 5/12 (41.5%), no reason given 33/93 (35.5%), negative opinion 9/34 (26.5%)	**Reasons for non-attendance**: fear of procedure 22/174 (12.6%), fear of possible outcome 14/174 (8.0%), negative opinion of screening 34/174 (19.5%) **Reasons for attendance**: reassurance 131/191 (68.6%), to detect breast cancer early 125/191 (65.4%) **Worry upon receiving invitation**: attenders: not worried 75.0%, bit worried 19.7%, quite/very worried 5.3%; non-attenders: not worried 78.9%, bit worried 14.5%, quite/very worried 6.6% ($\chi^2_{(2)} = 1.8, p = 0.40$)	If the response rates are calculated from uncleaned list (including those with no telephone numbers) then the response rates are: 191/243 (78.6%) in attenders and 174/497 (35.0%) in non-attenders	Women who had recently attended for screening were significantly more likely to express intention to attend again than non-attenders. However, among the non-attending women, those women who reported practical difficulties in getting to the screening appointment, 80% of them said they would go next time, which is not statistically different from the intention rate in the attenders. The lowest intention was observed in those women with a negative opinion of screening (26.5%) **Intention to reattend (+) Worry on receipt of invitation (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Mandelblatt et al. (1993)[145] 4360 med Cohort	N = 647 N = 476 women included in study 445/476 (93.5%) consented to interview Final study group 271/445 (60.9%) women offered screening	Participants 190/271 (70.1%) Non-participants 81/271 (29.9%)	Past breast and cervical screening data were collected but not presented in paper **Reattendance**: there were no significant differences between participants and non-participants with respect to prior use of screening or health beliefs (knowledge, perceived susceptibility to breast or cervical cancer, perceived benefit of early detection) (no data presented) Stated intent was a significant independent predictor of participation. Those who intended to have a mammogram and/or Pap test were 2.7 times more likely (95% CI 1.4 to 4.9, $p = 0.01$) to participate than women who did not intend to participate Having a history of a recent Pap smear ($\leq$ 4 years) or recent mammogram ($\leq$ 2 years) was not significantly related to participation		Participants were elderly, black, low socio-economic status women They had to attend the clinic to be offered mammography	Previous use of cervical screening and mammography screening were not significantly related to participation in future cervical and/or breast screening **Reattendance (ns)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Marshall (1994)[165] 3662 med Cohort	338 included in the analysis (400 originally sent a questionnaire). Some women were excluded from DNA denominator as not strictly non-attenders (under investigation, etc.)	Reattenders completed 200/200 (100%) questionnaires Non-reattenders completed 138/179 (77%) questionnaires	**BSE behaviour**: there was no significant difference between the reattenders and the non-reattenders in the frequency of BSE ($p = 0.70113$)	**Barriers to mammography**: the non-reattenders were significantly more likely to have found their previous screening more uncomfortable ($p < 0.00028$), very painful ($p < 0.00001$), stressful ($p < 0.00001$), embarrassing ($p < 0.03927$), worse than expected ($p < 0.00001$), not very reassuring ($p < 0.00001$), overall not satisfactory ($p < 0.00001$) 50% of non-attenders attributed their failure to attend to their first visit experience: 41% implicated pain, 6% stress, 3% embarrassment **Knowledge of breast cancer**: reattenders were more likely to know which age groups were most at risk from breast cancer ($p < 0.00002$), to believe that screening is effective in detecting breast cancer ($p < 0.00001$), and to believe that breast screening increases the cure rate from breast cancer ($p < 0.00027$). However, although there were significant differences for the latter knowledge questions, both groups were ill-informed **Perceived susceptibility to breast cancer**: There was no significant difference between the reattenders and the non-reattenders in the perceived risk of breast cancer ($p < 0.40908$)	Data were analysed using 5×2 χ^2 tests. Did not calculate RRs or CIs	10% of previously screened women failed to reattend and half of those attributed this to their first breast screening appointment Reattenders were more likely to have positive health beliefs regarding breast screening than non-reattenders, although both groups were ill-informed BSE practices did not differ between the two groups Reattendance associated with: Fewer barriers to mammography (+) Less embarrassment (+) Reassurance (+) Knowledge of breast cancer (+) Efficacy of mammography (+) BSE behaviour (ns) Perceived susceptibility to breast cancer (ns)

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Maxwell *et al.* (1996)[135] 647 cin Cohort	485/802 (61%) completed all three interviews	No follow-up rates presented by comparison groups, but the sample was constructed of: no screening in 2-year period: 149/485 (31%); one mammogram in 2 years: 164/485 (34%); two or more mammograms in 2 years: 172/485 (35%)	Having had a recent breast screening (in past 2 years) was the strongest predictor of interval screening. Logistic regression: OR = 2.960 (95% CI 1.55 to 5.65) **Reattendance**: there was a linear relationship between past screening and future attendance and reattendance. Only 33% of women who did not undergo screening had a prior mammogram, whereas 63% of women who had one further mammogram had previously had screening and 85% of women who had two mammograms had further screening			Recent screening was the strongest predictor of future screening; dose–response relationship **Reattendance (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Mayer-Oakes et al. (1996)[160] 290 psy Cross-sectional	1050 women from the larger study	None	**Preventive behaviours and service use**: 58% of users wear seatbelts vs 43% of non-users ($p < 0.001$), 53% of users regularly exercise vs 39% of non-users ($p < 0.001$), 6% of users read to learn about health vs 4% of non-users, 80% of users use dental services vs 61% of non-users ($p < 0.001$), 51% of users received influenza immunisation vs 38% of non-users ($p < 0.001$), 77% of users have a Pap smear vs 38% of non-users ($p < 0.001$) **Cervical screening**: women who had a Pap smear in the previous 2 years were 4 times more likely to have had mammography than those who did not have a Pap smear (OR = 4.33, 95% CI 3.02 to 6.20)		Users and non-user of mammography are not defined. 'Current' in mammography use is defined as having a mammogram in the past 2 years. Not clear whether the non-users include people who have had screening but are currently 'non-users'	Mammography use was significantly higher in women who had recently had a Pap smear. Women who used preventive services or practice preventive behaviours were more likely to have had a mammogram There was an association between the use of mammography and other preventive measures, but the temporal relationship cannot be assessed **Some preventive health behaviours (+)** **Cervical screening (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Michels *et al.* (1995)[121] 297 psy Cross-sectional	Crude response rate 309/500 (61.8%) Adjusted response rate 309/440 (70.2%)	Not given	**Intention to have mammogram next year**: women who are regular participants in mammography screening are more likely to intend to have a mammogram in the next year (OR = 7.41, 95% CI 2.22 to 24.77, $p < 0.0002$) Significant correlation between intention to have a mammogram and participation in other preventive services ($r = 0.13$, $p < 0.05$) and prior regular participation in mammography ($r = 0.39$, $p \leq 0.01$) was found	Knowledge and beliefs of women who are regular participants in breast screening: Women who are regularly screened were more likely to find the following acceptable as a consequence of mammography: embarrassment (OR = 2.94, 95% CI 1.11 to 7.82, $p < 0.025$), fear of cancer (OR = 1.26, 95% CI 1.18 to 1.34, $p < 0.002$), radiation concerns (OR = 3.08, 95% CI 1.36 to 6.97, $p < 0.005$), intrusive thinking about cancer (OR = 4.20, 95% CI 1.96 to 9.02, $p < 0.0001$)	Only ~39/309 (12.6%) of the women were classified as adherent with NCI guidelines	Women who were regular users of mammography were more likely to intend to have a mammogram. They were also more likely to accept embarrassment and radiation from mammography, as well as to be more likely to accept finding asymptomatic cancer and thinking about cancer as consequences of screening **Intention to reattend (+) Less embarrassment (+) Less fear of cancer (+) Fewer radiation concerns (+) Less intrusive thinking (+)**
*Montano and Taplin (1991)[122] 5523 med Cohort	N = 946 (939 valid addresses)	683/939 (72.7%)	**Reattendance and intention to reattend**: mammography use in previous 5 years (habit) had no association with behaviour ($r = -0.01$, ns) or behavioural intention ($r = 0.03$, ns) Correlation between participant and habit/intention interaction was negative ($r = -0.10$), indicating that the greater the number of mammograms the lower the correlation between behavioural intention and participation		Authors note that only 26% of the sample had ever had a mammogram, so few women had developed a habit	There was a significant interaction between habit and intention, with individuals with more mammography experience having lower intention/behaviour correspondence than individuals with less mammography experience **Reattendance (ns) Intention to attend (ns) (poor correlation between intention and behaviour)**

Appendix 6 cont'd *Breast screening: summary of study results*

| Author(s) (year) ID no. Study design | No. of participants and follow-up rate | | Main results | | | |
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Mootz et al. (1991)[136] 5487 med Cohort	Not given	213/347 (61.4%) in non-adherent group answered questionnaire Response rate for adherent women not given. 275 were randomly selected and completed questionnaire	**Reattendance**: 83.9% of adherent women vs 75.3% of non-adherent women (χ^2 35.19, $p < 0.001$) underwent previous mammography Non-significant results were obtained for adherent vs non-adherent participants: **BSE behaviour and knowledge**: knows BSE (91.0 vs 89.8%), practises BSE regularly (78.8 vs 80.3%), had a CBE within last year (52.5 vs 58.1%) **Cervical screening**: Pap smear within last year (64.4 vs 66.4%) **Smoking**: smokes cigarettes (18.6 vs 20.0%)	Non-significant results were obtained for adherent vs non-adherent participants in the following areas: **Knowledge and efficacy of breast screening**: able to define mammography (99.2 vs 98.4%), believe breast cancer can be detected with mammography before it is felt (96.6 vs 97.8%), believe breast cancer can be cured (90.7 vs 97.8%), believe that there is no or only slight risk involved with mammography (94.3 vs 91.9%) **Fear of breast cancer**: for 54.9% of adherent participants and 42.3% of non-adherent participants ($p < 0.01$) fear of breast cancer was an important factor in the decision to undergo mammography	73% of non-adherent women had previously been screened There were differences in occupation, with the adherent group reporting more skilled or professional jobs (χ^2 6.70, $p < 0.05$), and income levels, with adherent women reporting higher income levels (χ^2 15.91, $p < 0.005$)	Those who were screened were significantly more likely to have had previous mammography (but not Pap testing) and to have a significantly greater fear of breast cancer than non-adherers No significant differences were reported between the comparison groups with regard to knowledge and practice of BSE, CBE experience, Pap smear use in last year, smoking, or health beliefs regarding breast cancer and mammography **Re-attendance (+) BSE behaviour (ns) Knowledge of BSE (ns) Cervical screening (ns) Smoking (ns) Knowledge of screening (ns) Efficacy of mammography (ns) Fear of breast cancer (–)**
*Morrison (1996)[166] 289 Cross-sectional	204/206 (99%)	Not given	**BSE behaviour**: previous mammograms were not related to BSE behaviours (data not given)			Previous Pap smear and previous mammography were not related to BSE behaviours **BSE (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Nielsen (1990)[196] 5972 med Cross-sectional	359 No other data on sample size			**Perception of susceptibility to breast cancer**: 67% of women correctly estimated the 1 in 10 risk of a woman developing breast cancer within her lifetime. Only 4% underestimated the risk and 27% overestimated their risk. These results suggest that the group of women perceived themselves to be at moderate to high risk of breast cancer **Feelings reported following mammography**: 178 (50%) of women felt relief, 150 (42.1%) no change, and 28 (7.9%) felt increased anxiety	Women who attended mammography over a 3-month period at a community hospital. No other data presented on how women came to be screened	The authors report that this sample of women, who had attended for breast screening, perceived themselves to be at moderate to high risk of breast cancer Most women felt relief or reported no change in feelings following mammography **No comparisons Increased perception of susceptibility to breast cancer (–)**

Appendix 6 cont'd   Breast screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Orton *et al.* (1991)[189] 5223 Cohort	765/832 (92.0%)	Reattenders: 641/657 (97.6%) Non reattenders: 124/175 (70.9%)		**Experience of previous breast screening**: embarrassing: attenders 602 (5.3%), non-attenders 120 (13.3%) ($p < 0.01$); distressing: attenders 602 (4.8%), non-attenders 120 (14.2%) ($p < 0.001$); reassuring: attenders 600 (96.3%), non-attenders 118 (87.3%) ($p < 0.001$); worthwhile: attenders 603 (97.7%), non-attenders 120 (87.5%) ($p < 0.001$); found staff unhelpful: attenders 601 (3.3%), non-attenders 119 (7.6%) ($p < 0.05$) **Knowledge of breast screening**: believe that family history makes women vulnerable to breast cancer: attenders: 624 (25.2%), non-attenders 121 (14%) ($p < 0.05$); believe that screening can detect problems at an early stage: attenders 635 (97.8%), non-attenders 123 (87.8%) ($p <0.001$); believe it is not important to be rescreened: attenders 630 (9.8%), non-attenders 121 (11.6%) ($p < 0.001$) No other significant differences were found between attenders and non-attenders for previous experiences or beliefs about breast screening	Based in three centres in one town, and therefore the generalisability is questionable	Attenders had been more satisfied with their previous breast screening experience and had a more positive attitude to breast screening than non-attenders **Less embarrassment (+)** **Reassurance (+)** **Benefits of mammography (+)** **Efficacy of mammography (+)** **Importance of rescreening (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Pal *et al.* (1996)[157] 2494 med Cohort	395 non-palpable lesions in 359 patients 306 required further follow-up Follow-up data obtained from all these women, although 98/517 (19%) had already been excluded owing to missing notes	Not stated	**Adherence to follow-up recommendation**: 165 lesions were recommended to be followed up by repeat mammography following FNA. 84 of these lesions were completely followed up (50.9%). Of the remaining 81 lesions, 24 did not attend, 35 were followed up elsewhere, 17 people were lost to follow-up by their physician and 5 women were lost to follow-up for other reasons. Excluding the losses to follow-up from the denominator and the numerator, and including the 35 lesions that were followed up elsewhere, one can estimate that (84+35)/143 (83.2%) received follow-up mammography after FNA and approximately 16.8% did not receive follow-up 141 were recommended for surgical biopsy based on the FNA result. 122 of these were removed (86.5%). Of the remaining 19, 10 were not followed up at this hospital, 1 underwent further mammography, 5 had non-surgical or no follow-up at the request of referring physician, 2 were lost to follow-up and 1 died (Reviewers: the proportions of women not receiving follow-up in the two regimens is not significantly different)		Analysed using the denominator of number of lesions, not number of women. However, the study is looking at the adherence of individuals, so the individual woman would be a more appropriate unit of analysis	After receiving an FNA result, 16.8% of women who were recommended to undergo repeated mammographic surveillance did not attend 13.5% of women recommended to have a biopsy did not undergo the procedure **Positive result associated with: Adherence to follow-up recommendations (–)** **Repeat mammography vs biopsy: Adherence to follow-up recommendations (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Pearlman *et al.* (1996)[161] 2359 med Cross-sectional	8965 women aged 40–75 years from a large national survey of 40,104 adults 8965/9219 (97.2%) could have mammogram usage status assessed	6521 were classified as non-users or underusers of mammography (72.7% of sample) 2444 were adherent Intention $N = 4481$ (49.9% of sample)	Logistic regression model for not screened routinely ($N = 8849$): the following covariates are associated with not being routinely screened: **Smoking** ($\beta = 0.30$, OR = 1.35, 95% CI 1.15 to 1.59, $p \leq 0.01$) **Not exercising** ($\beta = 0.29$, OR = 1.34, 95% CI 1.19 to 1.52, $p \leq 0.01$) **CBE and Pap test**: one test ≤ 1 year and other test ≥ 2 years ago ($\beta = 0.56$, OR = 1.76, 95% CI 1.46 to 2.11, $p \leq 0.01$) **BSE behaviour**: performs BSE less than monthly ($\beta = 0.22$, OR = 1.25, 95% CI 1.10 to 1.42, $p \leq 0.01$) Does not know or do BSE ($\beta = 0.64$, OR = 1.89, 95% CI 1.53 to 2.34, $p \leq 0.01$) Had both tests **CBE and pap test** ≥ 2 years ago ($\beta = 2.26$, OR = 9.57, 95% CI 7.72 to 11.86, $p \leq 0.01$) Logistic regression model for not intending to be screened routinely ($N = 4437$), due to the temporal relationship, the only variable applicable to this review is: CBE and Pap test: one test ≤ 1 year and other test ≥ 2 years ago ($\beta = -0.04$, OR = 0.96, 95% CI 0.71 to 1.31, $p > 0.05$) Had both tests CBE and pap test ≥ 2 years ago ($\beta = 0.58$, OR = 1.78, 95% CI 1.43 to 2.23, $p \leq 0.01$)		Study only includes women who had a previous mammogram for routine purposes; however, it is not clear whether cost of mammogram would have been a factor	Less frequent users of mammography were more likely to smoke, not exercise, perform BSE less than monthly, not know or do BSE, have had their last CBE and/or Pap test < 1 year ago and the other > 2 years ago, and had their last CBE and Pap test both > 2 years ago Women not intending to be screened were more likely to have had both their last CBE and Pap test > 2 years ago **Smoking (+) Some preventive behaviours (+) BSE behaviour (+) Other cancer screening (cervical and/or CBE) (+)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Persky and Burack (1997)[137] 1054 emb Cohort	N = 781 308 exclusions (dementia, mammogram before interview, moved, etc.)	242/373 (64.9%)	**Attendance/reattendance**: previous mammography use: of 61 women with a history of no prior mammography use, 15% received a mammogram in the past year; of 89 women with a history of 1–2 previous mammograms, 34% received a mammogram in the past year; of 87 women with a history of ≥ 3 previous mammograms, 63% received a mammogram in the past year ($p < 0.01$) In the logistic regression analysis, historical mammography use $OR_{adj} = 1.42$ (95% CI 1.12 to 1.79)			Past mammography use was significantly associated with recent mammography use. There appeared to be a dose–response relationship, with increased number of past mammograms being associated with an increased use of mammography **Reattendance (+)**
Pisano et al. (1995)[155] 2730 med Cohort (retrospective)	1005 women with abnormal mammograms. Women who had no record of receiving further investigations were attempted to be contacted to see whether they had been followed up. Women who did not respond to this contact were assumed to be non-adherent	No information available on 187/1005 women. These were assumed to be non-adherent	**Adherence to further investigations**: previous mammography (as a predictor of adherence to further investigations): women who had previous mammograms were statistically more likely to receive further investigations than women who had not had a previous mammogram (53% vs 39%, $p < 0.0001$) Results of current mammography (as predictor of adherence to further investigations): 62% of women with malignant or probably malignant findings were adherent, compared with 57% with indeterminate findings and 44% with normal or benign findings ($p < 0.0001$)			Women who had had previous mammograms were more likely to comply with recommendation for further investigations than women with no previous history of mammography **Adherence to further investigations (+)** Adherers also tended to have more suspicious mammography results (this screening episode) **Severity of mammographic finding associated with: Adherence to further investigations (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Pisano *et al.* (1998)[126] 1385 Cohort (retrospective)	216/281 (77%)	Study group (SG): 43/50 (86%) Control group (CG): 173/231 (75%)	**Reattendance**: there was high adherence to mammography between all three groups, with no significant differences between them	**Believe annual mammography was necessary**: SG 39/41 (95%), CG1 46/50 (92%), CG2 66/75 (88%) ($p = 0.421$) **Perceived barriers to undergoing mammography**: SG 9/43 (21%), CG1 19/53 (36%), CG2 30/82 (37%) ($p = 0.173$) **Perceived benefit of mammography**: SG 31/41 (76%), CG1 26/48 (54%), CG2 46/77 (60%) ($p = 0.098$) **Perceived negative effects of mammography**: SG 13/33 (39%), CG1 14/34 (41%), CG2 31/61 (51%) ($p = 0.485$) **Perceived susceptibility to breast cancer**: SG 5/40 (13%), CG1 1/50 (2%), CG2 2/72 (3%) ($p = 0.039$) **Perceived severity of breast cancer**: SG 23/38 (61%), CG1 31/46 (67%), CG2 44/66 (67%) ($p = 0.769$) **Intend to undergo mammography every year**: SG 41/42 (98%), CG1 44/49 (90%), CG2 63/77 (82%) ($p = 0.036$) **Effect of biopsy on beliefs and fears of study patients**: 57% did not experience increased awareness of their future risk of breast cancer, 84% did not fear needing another biopsy, 93% did not worry about undergoing another mammographic examination	Small numbers in the study group compared with the control group, although may be unavoidable. Only numbers, percentages and *p*-values are presented (no CIs)	A false-positive mammogram with a subsequent surgical biopsy did not hinder most women from undergoing subsequent mammographic screening and it seemed to increase intentions to undergo regular screening. Women in the study group had significantly higher intentions to undergo mammography every year and they had a significantly higher perceived susceptibility to breast cancer than women in the control groups **False-positive results associated with:** **Reattendance (ns)** **Intention to reattend (+)** **Barriers to mammography (+)** **Benefits of mammography (+)** **Efficacy of mammography (+)** **Increased perceived susceptibility to breast cancer (–)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Pisano *et al.* (1998)[206] 1473 med Cohort	39 eligible women 30/39 (77%) of women consented		**Reattendance**: screening behaviour after false-positive (1987): 22/30 (73%) of women reported having their next mammogram within 2 years of 1987, with 68% of these women having the mammogram within 1 year; 4/30 (13%) of women reported never having another mammogram after 1987. None of these 4 women reported having regular mammography before 1987; only 60% reported at least 3 mammograms in the intervening 5 years. **Intention to be rescreened**: 25/30 (83%) of women indicated an intention to having another mammogram; 5/30 (17%) of women did not indicate an intention to have another mammogram Women who met the guidelines for their next mammogram following the biopsy, as well as those who continued to meet the guidelines over the 5 years since the biopsy, were much more likely to intend to have a mammogram in the future ($p = 0.0004$ for next mammogram; $p = 0.0056$ for 5 years) **Effect of prior mammography behaviour**: women with prior regular mammography were more	**Experience of false positive on interval between biopsy and next mammogram**: 77% of women indicated that they were more likely to have a mammogram as a result of their biopsy experience. 1 woman indicated that she was less likely. 10 women reported being more aware of their susceptibility to the disease, and 8 women said they were more confident about the utility of the procedure. 2 others reported being less confident about the utility and efficacy of the procedure. 1 woman continued to fear she would have to have another biopsy	Limited by small sample size and recall bias. Pilot study	83% of women who had a false-positive mammogram and subsequent negative biopsy were intending to undergo future mammography screening. Those who had prior mammograms were more likely than those who had not However, only 60% of the women received regular mammography following the false-positive mammogram (3 in 5 years) **False-positive results associated with: High intention to be rescreened (especially if screened before) (+) Reattendance (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
			likely to continue during the next 5 years than women who did not have a prior mammography (90 vs 45%, $p = 0.02$)			
			Those with prior screening were also more likely to intend to undergo screening (100 vs 75%, $p = 0.14$)			

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Qureshi et al. (2000)[87] 238 emb Cross-sectional	Response rate to survey not given, but 18,245 women included in analysis	Response rates not given, but sample consists of 11509/18245 (63%) who had a mammography within preceding 2 years; and 6736/18245 (37%) who had not had a mammography within preceding 2 years	**Univariate analysis** (all results presented as mammograph <2 years, mammography >2 years) **Smoking**: yes 2148 (51.4%), 2022 (48.6%); no 9327 (66.7%), 4702 (33.3%) ($p < 0.05$) **Alcohol**: yes 5724 (67.3), 2789 (32.7); no 5775 (59.8), 3947 (40.2) ($p < 0.05$) **Heavy alcohol use**: yes 521 (59.9%), 362 (40.1); no 10,978 (63.5), 6374 (36.5) ($p = 0.146$) (although STATA gives a p-value of 0.01) **Cervical screening**: < 3 years 11,063 (71%), 4596 (29%); > 3 years/never 412 (16.2%), 2077 (83.8%) ($p < 0.05$) **Cholesterol screening**: yes 9913 (70.6%), 4164 (29.4%); no 1495 (38.2%), 2458 (61.8%) ($p < 0.05$) **Multivariate analysis** **Cervical screening**: within 3 years OR = 8.99 (95% CI 7.6 to 10.7); never/over 3 years OR = 1.00 ($p < 0.05$) **Cholesterol screening**: ever OR = 2.64 (95% CI 2.3 to 3.0); never OR = 1.00 ($p < 0.05$) **Seatbelt use**: yes OR = 1.47 (95% CI 1.3 to 1.7); no OR = 1.00 ($p < 0.05$) **Current smoker**: yes OR = 0.71 (95% CI 0.6 to 0.8); no OR = 1.00 ($p < 0.056$)		Temporal relationship issues One part of the analysis was incorrect	Women who had had a mammography in the preceding 2 years were significantly more likely to have had cholesterol screening and a Pap smear in the past 3 years compared with those who had not had a mammography in the preceding 2 years Women who had had mammography in the preceding 2 years were also significantly more likely to be seatbelt users and non-smokers, and not to be heavy alcohol drinkers **Mammography usage associated with:** **Cervical screening (+)** **Cholesterol screening (+)** **Other preventive health behaviours (+)** **Smoking (+)** **Drinking (+)**

Appendix 6 cont'd   Breast screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Rakowski *et al.* (1993)[118] 4128 med Cross-sectional	Total sample N = 10,950 After exclusions for symptomatic mammography N = 9396 Data for bivariate and multivariate analysis N = 9107 9107/10,950 (83%)		**Intention to reattend**: Women aged 40–50 years: of those who had a previous mammogram, 12.7% did not intend to have another (vs 48.9% of women without prior mammography), 18% would have one when a physician recommended it (23.4% of non-users), 26% intended to be screened in 1–3 years (4.5% of non-users) and 43.2% within the coming year (23.2% of non-users) Women aged 51–75 years: of those who had a previous mammogram, 15.9% did not intend to have another (vs 66.8% of women without prior mammography), 19.6% would have one when a physician recommended it (20.6% of non-users), 17.7% intended to be screened in 1–3 years (1.2% of non-users) and 46.8% within the coming year (11.4% of non-users) **Multivariate analysis** Ever had vs never had a mammogram: smokers ($OR_{adj} = 0.62$, 95% CI 0.53 to 0.71), those reporting no exercise ($OR_{adj} = 0.80$, 0.71 to 0.91), not knowing BSE ($OR_{adj} = 0.64$, 0.52 to 0.80), and less recent Pap test (bivariate data) 1–2 years ($OR_{adj} = 0.36$, 0.31 to 0.42) and $\geq$ 3 years, never		Could not conduct statistics on the intention data as raw figures were not provided	Women with previous mammography were more likely to intend to have a future mammogram than those without a prior mammogram. They were also more likely to decide themselves when they intended to go. These results were more dramatic in the older women (ingrained habit) Less recent Pap test, being a smoker, reporting no regular exercise and not knowing BSE were related to less likelihood of having ever had a mammogram compared with never having a mammogram Mammogram in previous 2 years vs all others: results were very similar to ever vs never Screened and plans to continue vs all others: results were very similar to ever vs never Screened and intends to continue vs no intention: these groups are at the extreme stages of mammography adoption. Being a smoker, not exercising regularly, not knowing BSE and not having had a recent Pap test were related to less likelihood of being regularly screened

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
			or don't know (OR_{adj} = 0.13, 0.12 to 0.15) were less likely to have ever had a mammogram			Screened and intends to continue vs risk of lapsing: among these women who had all recently been screened, the likelihood of intending to continue was lower for those reporting no exercise and not having had a recent Pap test
			Mammogram in previous 2 years vs all others: results very similar to ever vs never			
			Screened and plans to continue vs all others: results very similar to ever vs never			**Intention (+)** **Smoking (+)** **Drinking (+)** **Exercise (+)** **Knowledge of BSE (+)** **Prior Pap test (+)**
			Screened and intends to continue vs risk of lapsing: smokers (OR_{adj} = 0.87, 95% CI 0.70 to 1.08), those reporting no exercise (OR_{adj} = 0.74, 0.63 to 0.87), not knowing BSE (OR_{adj} = 0.81, 0.60 to 1.10), and less recent Pap test (bivariate data) 1–2 years (OR_{adj} = 0.71, 0.54 to 0.93) and ≥ 3 years, never or don't know (OR_{adj} = 0.75, 0.59 to 0.95) were less likely to intend to be screened			
			Attendance: smokers (OR_{adj} = 0.52, 95% CI 0.42 to 0.65), those reporting no exercise (OR_{adj} = 0.57, 0.46 to 0.69), not knowing BSE (OR_{adj} = 0.51, 0.48 to 0.54), and less recent Pap test (bivariate data) 1–2 years (OR_{adj} =0.18, 0.14 to 0.23) and ≥ 3 years, never or don't know (OR_{adj} = 0.05, 0.04 to 0.06) were less likely to be regularly screened			

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Rakowski *et al.* (1995)[162] 3140 med Cross-sectional	Original data set was 40,104 people, aged ≥ 18 years This study uses a subsample of 3014	No response rates, but sample consisted of: Low resource group 1390/3014 (46.1%) High resource group 1624/3014 (53.9%)	**Attendance for mammography in the past 2 years (influence of cervical screening and BSE behaviour):** Low resource women: Multivariate analysis indicated strong associations with breast screening in the past 2 years for recency of a Pap test and recency of CBE. A Pap test in the past year was associated with a higher likelihood of screening. The rate of screening then decreased notably for the periods of 1–2 years and ≥ 3 years since having had a Pap test (OR$_{adj}$ = 0.50 and 0.40, respectively). CBE was associated with screening when it occurred < 3 years ago vs ≥ 3 years ago (OR$_{adj}$ = 0.04 with a 2.2% screening rate). Practising BSE monthly or more often (OR$_{adj}$ = 1.82) was associated with screening. Smoking and exercise status showed an association in the bivariate analysis but did not factor in the multivariate analysis High resource women: Multivariate analysis indicated strong associations with recency of Pap test and recency of CBE. Having had either test 1–2 years before was associated with notably lower rates of screening compared with those who had the			Recency of Pap test and recency of CBE were strong correlates of screening mammography for both low and high resource women, along with regularity of BSE. For low resource women regularity of BSE was a strong correlate of regularly receiving and intending to receive a mammogram **Cervical screening (+) BSE behaviour (+)**

Appendix 6 cont'd   Breast screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
			tests in the past year (OR_{adj} = 0.39 and 0.51, respectively). Those reporting practising BSE monthly or more often (OR_{adj} = 1.40) were also associated with increased screening. Smoking and exercise status showed an association in the bivariate analysis but did not factor in the multivariate analysis **Mammogram on schedule (both past behaviours and intention)**: Low resource women: Multivariate analysis indicated strong associations with past screening and intention and recency of CBE. CBE showed the strongest association with screening. The rate of screening decreased for CBE within 1–2 years ago and $\geq$ 3 years ago (OR_{adj} = 0.38 and 0.03). Those who reported doing BSE monthly or more often (OR_{adj} = 2.05) were associated with screening Pap testing was not associated with past screening and future intention High resource women: Multivariate analysis indicated strong associations of screening rates with recency of Pap test and recency of CBE. Having had either			

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
			test 1–2 years before was associated with notably lower rates of screening compared with those who had the tests in the past year ($OR_{adj} = 0.38$ and 0.51, respectively). Not exercising ($OR_{adj} = 0.72$) showed an association with lower rates of screening			
Reynolds *et al*. (1997)[204] 2179 med Cohort	449 mammograms that needed additional work-up. 20 (4.5%) were lost to follow-up, but not all data discussed in this paper		**Adherence to follow-up recommendations**: In total, 62 biopsies were recommended, 60 were conducted (96.8%) The reason that 2 women did not have a biopsy was that their surgeon chose alternative follow-up			Adherence to recommendation for biopsy was very high. Where a biopsy was not performed this was the surgeon's choice, not the woman's **No comparison Adherence to follow-up recommendations (+)**

Appendix 6 cont'd   Breast screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Richardson et al. (1994)[197] 3839 Cohort	442/474 (93%) response rate	Urban 156/168 (93%) Rural 286/306 (93%)	**Intention to reattend**: 94% of the whole sample said they would reattend for mammography in the future, but only 75% of those who found mammography painful, 53 (12%) very painful, 82 (19%) painful 35% of women said that one of their reasons for attending was because the screening service was free. 86 (20%) said they would not attend again if they had to pay for screening; 180 (42%) said they would attend again if the cost of screening was under $20, 135 (32%) said they would attend again if the cost of screening was $20–50, 25 (6%) said they would attend again if the cost of screening was > $50			Previous screening did not appear to affect women's intention to reattend, although pain due to mammography and cost of a mammogram could be barriers to reattendance **No comparisons Intention to reattend was high (+) Fewer who experienced pain were intending to be rescreened (–)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Rimer *et al*. (1989)[167] 6456 Cross-sectional	601/631 (95%) participated in mammography		**BSE behaviour**: know how to do BSE: adherers more likely to know how (*p* = 0.008); reported BSE practice: no difference between adherers and non-adherers	**Efficacy of early detection**: believe that breast cancer can be cured if found early: adherers more likely to believe this (*p* = 0.04) **Mammography not necessary unless symptomatic**: non-adherers more likely to agree (*p* = 0.0001) I'd be embarrassed (ns) It's too much trouble (to have mammography): non-adherers more likely to agree (*p* = 0.0001) I'd rather not think about it: non-adherers more likely to report this (*p* = 0.004) **Radiation concerns**: non-adherers more worried (*p* = 0.04) Too expensive (ns) (maybe because they were free in the trial) Inconvenient: non-adherers reported this more frequently (*p* < 0.0001) Would be painful (ns)	No data provided, only *p*-values	Women who had a mammogram as part of healthcheck had more positive beliefs about mammography than those who did not. Attenders were more likely to know how to undertake BSE, but there was no difference in reported behaviour **Importance of BSE (+)** **BSE behaviour (ns)** **Efficacy of early detection (+)** **Need mammography even though not sick (+)** **Embarrassment (ns)** **Fewer radiation concerns (+)**
Rimer *et al*. (1988)[172] 6707 Cross-sectional	502/527 (95%) completed the form		**Preventive health behaviour**: women who performed the health behaviour (completed the breast risk assessment form) were more likely to have ever had a mammogram in the past than non-adherers (54 vs 37%, *p* = 0.0002)		Only one small aspect of this paper was relevant	Women who had previously had a mammogram were more likely to complete the breast risk assessment form as part of the US healthcheck programme **Preventive health behaviour (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Rimer et al. (1989)[146] 6437 med Cohort	N = 600 95% of women completed the interview Asymptomatic respondents 484/600 (80.7%)	Adherers N = 328 Non-adherers N = 156	**Attendance**: 100% of adherers had ever had a mammogram vs 24% of non-adherers ($p < 0.001$) **Smoking status**: 22% of adherers vs 32% of non-adherers are current cigarette smokers ($p = 0.02$) **BSE behaviour**: 13% of adherers and 16% of non-adherers never perform or do not know how to perform BSE (ns) In the multivariate analysis, prior mammography did not discriminate between adherers and non-adherers (no data presented)	**Perceived susceptibility to breast cancer**: no significant difference was observed between adherers and non-adherers in perceived risk of breast cancer in a woman's lifetime **Mammography not necessary unless symptomatic**: fewer adherers than non-adherers agreed with the statement, 'I have no symptoms, so I don't need a mammogram' ($p < 0.001$) **Barriers to mammography**: fewer adherers than non-adherers agreed with the statement, 'It is too much trouble. I don't have the time for one' ($p < 0.001$) Fewer adherers than non-adherers agreed with the statement, 'Getting a mammogram would be inconvenient' ($p < 0.001$) **Denial**: fewer adherers than non-adherers agreed with the statement, 'I'd rather not think about it' ($p < 0.01$) **Radiation concerns**: fewer adherers than non-adherers agreed with the statement, 'I'm worried about radiation' ($p < 0.05$) **Embarrassment**: there was no significant difference between adherers and non-adherers to the statement, 'I'd be embarrassed about getting a mammogram' There was no significant difference between adherers and non-adherers to the statement, 'Getting a mammogram would be painful'	Not clear whether people held beliefs, etc., before being screened or not screened	All of the adherers had had a previous mammogram, whereas in the non-adherers only 24% had had a previous breast screen (this was significant). However, in the multivariate analysis, this variable failed to distinguish between adherers and non-adherers Overall, adherers had fewer barriers to breast screening than non-adherers. There was a significantly smaller proportion of adherers who smoked compared with non-adherers, but no difference between the two groups in BSE knowledge/practice, embarrassment and belief that mammography would be painful **Reattandance (ns in multivariate analysis) Smoking status (+) BSE behaviours (ns) Need mammography even though not sick (+) Fewer barriers to mammography (+) Less denial (+) Fewer radiation concerns (+) Embarrassment (ns) Susceptibility to breast cancer (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
*Rodriguez *et al.* (1995)[147] 3139med Cohort	**Enrolment study**: All women invited to first screening during 1989 Response rate = 93%, resulting in *N* = 256 **Adherence study**: Attenders at second round Response rate 82%, resulting in *N* = 490 Random sample of non-attenders at second round *N* = 150		**Enrolment study**: in the bivariate analysis, having cervical smears periodically was associated with increased enrolment (OR = 2.03, 95% CI 1.16 to 3.55), as was having a prior mammography (OR = 6.93, 95% CI 3.71 to 13.0) In the multivariate analysis, only the effect of mammography remained significant (OR = 6.45, 95% CI 3.35 to 12.42) **Adherence study**: bivariate analysis showed that having cervical smears periodically (OR = 0.21, 95% CI 0.13 to 0.33) and visiting the gynaecologist periodically (OR = 1.01, 95% CI 0.65 to 1.57) were not strongly associated with adherence to breast screening Multivariate analysis indicated that having a 'best opinion of the programme' (OR = 3.15, 95% CI 0.99 to 9.98), knowing the preventive role of mammography (OR = 2.27, 95% CI 1.77 to 2.91) and doing regular BSE (OR = 1.99, 95% CI 1.23 to 3.23) were independently associated with adherence, and the effects of previous cervical screening and prior mammography were no longer significant	**Reasons for non-attendance**: 9/123 (7.3%) women stated that screening was not necessary; 1/123 (0.8%) stated that 'one should not go looking for trouble' **Knowledge in adherence group**: knew the preventive role of breast screening (OR = 2.83, 95% CI 0.97 to 8.10); knew the preventive role of mammography (OR = 2.95, 95% CI 1.38 to 6.27) **Attitudes in adherence group**: had an interest in health information (OR = 0.81, 95% CI 0.45 to 1.17); felt the risk of cancer can be reduced (OR = 1.25, 95% CI 0.65 to 2.37); best opinion about programme (OR = 6.46, 95% CI 2.34 to 18.1)		Previous cervical screening and mammography were associated with an increased likelihood of enrolment in a breast screening programme in the bivariate analysis. However, when an adjusted analysis was conducted only the effect of previous mammography remained The multivariate analysis of the effect of breast and cervical screening on adherence to breast screening showed no effect **Enrolment in a programme (+) Reattendance (ns) Knowledge of mammography (+) Health consciousness (ns) Benefits of mammography (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Roworth *et al.* (1993)[198] 4300 med Cross-sectional	Response rate 2586/3000 (86.2%)	Not stated	**Intention to reattend**: 88.5% (95% CI 87.3 to 89.7%) reported that they intended to reattend for breast screening when next invited		Most of the study was not relevant to the review (looked at pain, waiting times etc.). No relevant comparison groups	A high proportion of women reported that they intended to reattend next time. No analysis by pain experienced **No comparison groups Intention to re-attend was high (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Rutledge *et al.* (1988)[177] 6701 med Cross-sectional	882/1683 (52%) responded. Of these, 62 had not heard of the programme and were excluded. 820 in analysis	G1A: 278/383 (72.6%) received mammogram and responded to questionnaire G1B: non-participants in mammography who have had a recent mammogram, 125/~1300 G2: non-participants, 417/~1300		Of the non-attenders for screening 14/293 (4.8%) gave the following reason for non-attendance: bad feelings about past mammograms **Perceived susceptibility to breast cancer and benefits of mammography**: one-way analyses of variance showed that perceived susceptibility to breast cancer ($F_{2,718} = 4.1$, $p = 0.02$) and perceived benefits of mammography ($F_{2,740} = 52.9$, $p = 0.001$) differed significantly across the three groups Post hoc Student–Newman–Keuls tests: G1B perceived themselves to be significantly more susceptible to breast cancer than G2 women; G1A perceived the most benefits from mammography and G2 women perceived the least benefit from mammography **Knowledge of breast cancer**: there was a significant difference in the mean scores for knowledge of breast cancer ($F_{2,814} = 3.7$, $p = 0.03$), with G2 women having lower scores than G1A women	First time participants not separated from previous participants Very poor response rate in non-attenders Significant differences in comparison groups in job classification and years of education. G1A was comprised of more university faculty and fewer non-professional patent care workers ($\chi^2_{(2)} = 27.7$, $p = 0.002$) than G1B and G2. G2 had significantly fewer years of education ($F_{2,805} = 18.1$, $p < 0.001$) than G1A and G1B. Temporal relationship unclear	High levels of perceived susceptibility to breast cancer and high levels of perceived benefits of mammography were associated with increased participation in breast screening Of the non-participants, a few did not attend owing to bad feelings regarding past mammograms **Increased perceived susceptibility to breast cancer (–) Benefits of mammography (+) Knowledge of breast cancer (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Rutter *et al.* (1992)[199] 4786 med Cohort	597/617 (97%) of women attending screening		**Intention to reattend**: 552/597 (92%) said they would reattend. Correlation between discomfort and intention to return in 3 years was –0.15 (*p* < 0.001); correlation between satisfaction and intention to return was 0.83 (*p* < 0.001)		Intention to reattend was high, but elicited by an interviewer at the screening office. Would be interesting to look at actual reattendance or intention to reattend reported away from the screening unit	The majority of screenees reported that they intend to return for screening next time. However, intention to reattend was inversely correlated with discomfort and positively correlated with satisfaction with the service **No comparison** **Intention high overall (+)** **Negative correlation with pain (–)** **Positive correlation with satisfaction (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
*Rutter *et al*. (1997)[138] 1090 emb Cohort	1555/2239 (69.5%) had responded to the initial questionnaire (baseline prescreening)	1335 of these attended first screening; 1196/1335 (90%) completed the questionnaire about attenders' responses to screening Telephone interview with non-attenders (2–4 weeks after second routine screening 3 years on): 184/362 (51%)	**Reattendance**: there was a highly significant association between attending round 2 and attending round 1 when attendance/absence in round 2 was examined in relation to attendance/absence in round 1 (χ^2 455.8, df = 1, $p < 0.001$) Previous mammogram (before first round) was significantly associated with attendance at second screening (yes 95% attended, no/unsure 78.0% attended, $\chi^2 = 43.3, p < 0.001$) Previous (before first round) cervical smear was also significantly associated with attendance at second screen (yes 92.6, no or unsure 60.7, $\chi^2 = 225.4$, df = 1, $p < 0.001$) When attendance at the second screen was analysed using logistic regression, previous smear test was significant ($p < 0.01$) but previous mammography was no longer significant Satisfaction with first screen was also a predictor of second screen (significant difference between attenders and non-attenders, $t = 2.3, p < 0.05$) The interviews of the non-attenders reported that 14 of those who did not attend second screen stated that discomfort and pain from their previous screening put them off, and 12 were afraid of the possible result		The interviews with non-attenders were conducted retrospectively. They were asked to think back to the first round of screening 3 years previously to rate discomfort and pain	Women who attended in the first screening round were extremely likely to reattend in the second round Previous screening (cervical smear and mammography) was a predictor of second round screening in the univariate analysis, but only cervical screening was a significant predictor in the multivariate analysis Satisfaction with previous breast screening appeared to be the main factor influencing reattendance Discomfort and pain was a major factor influencing non-attendance, and lack of discomfort and pain was a major factor influencing reattendance **Reattendance (+) (only in univariate analysis)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Salazar and Carter (1993)[169] 400 psy Qualitative and cross-sectional	19 in Phase 1. 52/150 (34.7%) surveyed in Phase 2 preliminary interview, 52 in Phase 2	Response rates not given by BSE performers and non-performers Sample consisted of 15/52 (28.85%) performers of BSE and 37/52 (71.15%) non-performers of BSE	**BSE behaviours**: 60% of performers had had a mammogram vs 29.7% of non-performers ($p < 0.05$)			Performers of BSE were significantly more likely than non-performers to have had a mammogram in the past. **BSE behaviours (+)**
*Savage and Clarke (1996)[119] 249 psy Cross-sectional	170/250 (68.0%) (although authors state 71%)	None	**Intention to re-attend**: multiple regression analysis to identify correlates of intentions to obtain a mammogram accounted for 47% (adj) of the variability in mammography intentions ($p < 0.001$). The variables included previous mammography ($\beta = 0.21$) and Pap test history ($\beta = 0.20$) **BSE behaviour**: correlates of BSE intention did not include previous mammography or Pap test history			Previous mammography and Pap test history were significant predictors of mammography intention, but did not predict BSE intention **Intention to reattend (+)** **BSE behaviour (ns)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Scaf *et al.* (1995)[139] 2814 med Cohort	6898 followed up using registered data of women who were eligible for every screening round. Those with 'obvious reasons' for non-attendance were left out (death, moved, diagnosed with breast cancer) 100%?		**Reattendance**: age is significantly related to attendance in all nine screening rounds (biennially) observed (ORs range from 0.82 in round 9 to 0.98 in round 2) so that attendance decreases with increasing age Numbers of false-positive results were small and consistently reduced over the years (53, 21, 18, 15, 14, 4, 12, 6). A false-positive result had a strong negative impact of attendance at the next round (OR = 0.23, 95% CI 0.13 to 0.40; OR = 0.15, 95% CI 0.06 to 0.36; OR = 0.29, 95% CI 0.11 to 0.76; OR = 0.08, 95% CI 0.03 to 0.26; OR = 0.32, 95% CI 0.11 to 0.97; OR = 0.41, 95% CI 0.04 to 1.01; OR = 0.15, 95% CI 0.06 to 0.36; OR = 0.35, 95% CI 0.06 to 2.14). The authors correctly state that this may be due to continuing clinical follow-up The strongest predictor of attendance was non-attendance in the previous round (OR = 0.04, 95% CI 0.03 to 0.04; OR = 0.05, 95% CI 0.04 to 0.06; OR = 0.05, 95% CI 0.05 to 0.06; OR = 0.04, 95% CI 0.03 to 0.05; OR = 0.03, 95% CI 0.03 to 0.04; OR = 0.03, 95% CI 0.02 to 0.03; OR = 0.04, 95% CI 0.01 to 0.28; OR = 0.06, 95% CI 0.05 to 0.07)		50–53 years: attendance rate at entry was high (88%), decreased over the course of the programme, but remained well over 60% until round 8; 39% completed nine rounds and 24% completed eight rounds. 7% never attended. Attendance rates of older women were somewhat lower at entry (87–82%) and declined more strongly. Regular adherence was also lower	The strongest predictor of attendance or non-attendance was non-attendance at the previous round. The OR for attendance in recent non-attenders was extremely low, indicating that non-attendance is very highly influential on future non-attendance Women who received a false-positive result were also significantly less likely to attend than women who did not have a false-positive result. This may be due to continuing clinical care **Reattendance (+)** **but** **False-positive result was associated with:** **Reattendance (–)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Schwartz *et al.* (2000)[188] 176 med Cross-sectional	479/767 (62.5%) women aged 18–97 years without a history of breast cancer	76/479 (16%) had a false-positive mammogram		**Barriers to mammography**: 71/76 (93%) women who had a false-positive result believed that mammography could not harm a women who turned out not to have breast cancer (total sample, including FPs 92%) 27/76 (36%) wanted to take into account FPs when deciding on screening (total sample 38%) 54/76 (71%) would tolerate 500 or more FPs per life saved (total sample 63%) and 30/76 (39%) would tolerate 10,000 or more (total sample 37%)	Main results of the paper not reported in terms of those who had been for screening and those who have not been screened Higher income households are over-represented, as are higher levels of education	Most women who had a false-positive result did not believe that it was harmful and had a high acceptance for the number of false-positives tolerated per life saved. One-third of women wanted to take false-positives into account in deciding on screening **No comparison Minimal barriers to mammography (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Simoes *et al.* (1999)[163] 712 med Two cross-sectional studies	Response rate to one survey 63.3% Response rate to other survey 69% *N* = 1609	Response rates not given, but cohort consisted of 50.1% with no mammography or > 5 years and 49.9% with recent mammography Only data given on cervical smear attendance: Never/> 1 year ago 36.8% ≤ 1 year 63.2%	**Attendance for cervical screening**: having had mammography in the previous 5 years was associated with a substantial reduction in the odds of non-adherence to cervical screening: recent mammogram OR = 0.5 (95% CI 0.4 to 0.7) Women who had a recent mammogram were more likely to report that their Pap smear was for screening purposes (as opposed to diagnostic reasons) than women who had not had a recent mammogram: recent mammogram OR = 3.2 (95% CI 1.8 to 5.6)			Previous mammography was associated with adherence to cervical screening Women with recent mammographies were more likely to have had cervical screening for screening, not diagnostic purposes **Attendance for cervical screening (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Skinner *et al.* (1997)[185] 180 psy Cross-sectional	Response rate in eligible women 51% $N = 1093$	Data not given by comparative group, but sample consists of: 78% action/ maintenance, 3% precontemplators, 6% contemplators, 13% relapsers (142/1093)	**Benefits and knowledge of mammography**: precontemplators and contemplators were less likely than action/maintainers to agree that having mammograms would help to find breast lumps early (OR = 0.25, 95% CI 0.10 to 0.62, $p < 0.0024$; OR = 0.36, 95% CI 0.17 to 0.75, $p < 0.0067$, respectively) There was no significant difference between the relapse group and action/maintenance group (OR = 1.25, 95% CI 0.55 to 2.80, $p < 0.6101$) Precontemplators and contemplators were less likely to agree that having a mammogram would decrease the chances of dying from breast cancer (OR = 0.25, 95% CI 0.12 to 0.50, $p < 0.0001$; OR = 0.57, 95% CI 0.32 to 1.02, $p < 0.0601$) There was no significant difference between the relapse group and action/maintenance group (OR = 0.75, 95% CI 0.49 to 1.16, $p < 0.1936$) Precontemplators and contemplators were less likely to believe that a mammogram can find a lump before it can be felt by themselves or a health professional (OR = 0.21, 95% CI	**Barriers to mammography**: precontemplators and contemplators were less likely to believe that having a mammogram is painful than the action/maintenance group (OR = 0.23, CI 0.09 to 0.62, $p < 0.0033$; OR = 0.52, CI 0.30 to 0.93, $p < 0.0271$). There was no significant difference between the relapse group and the action/maintenance group (OR = 0.76, CI 0.75 to 1.11, $p < 0.1527$). (Note: precontemplators and contemplators had never been screened) The relapse group and the contemplator group were more likely to believe that having a mammogram is embarrassing than the action/maintenance group (OR = 1.62, CI 1.05 to 2.51, $p < 0.0300$; OR = 2.06, CI 1.17 to 3.63, $p < 0.0128$). There was no significant difference between the precontemplators group and the action/maintenance group (OR = 1.76, CI 0.78 to 3.95, $p < 0.1707$)		Those who attended for mammography had more accurate knowledge of the benefits of breast screening than those who had not attended **Benefits of mammography (+) Knowledge of mammography (+) Fewer barriers to mammography (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
			0.01 to 0.46, $p < 0.0001$; OR = 0.49, 95% CI 0.25 to 0.96, $p < 0.0375$) There was no significant difference between the relapse group and action/maintenance group (OR = 0.62, 95% CI 0.37 to 1.03, $p < 0.0643$)			
Smith *et al.* (1991)[205] 5274 med Cohort	79/91 (86.8%)	NA	**Intention to reattend next time**: 75/78 (96%) said they would reattend (95% CI 89.2 to 99.2%) The 3 that would not return cited the reason that the mammogram is unpleasant		Most of the measures in the study were not relevant to this review	A high proportion of women undergoing further investigation after mammography (and then receiving the all clear) would reattend **No comparison; false-positive results associated with: Intention to reattend (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Song and Fletcher (1998)[140] 149 psy Survival analysis of cohort data	2888 participants. 100% inclusion as using routinely collected data		**Reattendance**: attendance for breast rescreening (could be by CBE, mammogram or both) as predicted by previous mammography status: 1467/2888 (50.8%) women had a history of previous mammography, 955/2888 (33.1) had never had a mammogram, 466/2888 (16.1%) were unknown After 15 months, 30% of women with previous mammograph had been rescreened compared with 19.7% of those with no previous mammography (23.3% of those with unknown prior mammography status). This is highly statistically significant ($p < 0.00001$). Reviewers ever vs never RR = 1.52 (95% CI 1.31 to 1.77) At 27 months 47.9% of women previously screened had been rescreened and 33.4% of those not screened before. Reviewers ever vs never RR = 1.43 (95% CI 1.29 to 1.59, $p < 0.00001$) A Cox proportional regression model produced hazard ratios of 1.68 ($p < 0.0001$) for ever vs never had mammography over a follow-up period of 9–27 months. Once adjusted for other variables this remained highly significant at 1.64			Women who had previously had a mammogram were about 50% more likely to reattend for breast screening (CBE, mammography or both) than women who had not had a mammogram before the index screening (CBE, mammography or both) appointment **Reattendance (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Speedy and Hase (2000)[141] 47 cin Cohort	312/400 (78%)	Attenders 127/200 (63.5%) Non-attenders 185/200 (92.5%)	**Reattendance**: Attenders at screening were more likely to have been screened before ($\chi^2_{(5)} = 52.55$, $p < 0.001$) than non-attenders		Lacked socio-demographic details for the two groups	Attenders for mammography screening were more likely to have had past mammography screening than non-attenders **Reattendance (+)**
*Sutton et al. (1994)[151] 3804 med Cohort	3291 women due for first round breast screening 1301 final sample	No data given by attendance status 731/977 (74.8%) interview sample interviewed 570/1600 (35.6%) returned questionnaires	**Attendance/reattendance**: Interview group: Overall, 646/731 (88.4%) had a previous smear test and 566/731 (78%) had not had a mammogram Women who had not had a previous mammography were more likely to attend for breast screening than those who had. 72% of women who had not had previous mammography attended for breast screening compared with 55% of women who had had a prior Breast screen (LR χ^2 $p = 0.00008$, OR = 2.08, 95% CI 1.45 to 2.98) This effect was increased in the adjusted analysis, resulting in OR$_{adj}$ = 9.71 (95% CI 5.28 to 17.87, $p < 0.00005$) Postal questionnaire group: 64% of women who had not had previous mammography attended compared with 57% of those who had (LR χ^2 $p = 0.00001$, OR = 2.58, 95% CI 1.70 to 3.91); OR$_{adj}$ = 4.25 (95% CI 2.52 to 7.17, $p < 0.00005$)		Crude OR are presented, which overestimate the crude RR	Women who had had a previous smear test were more likely to attend for breast screening, whereas women who had not had a previous mammography were more likely to attend. The authors state this is due to the high proportion of women who had not received breast screening previously **Reattendance (–)**

Appendix 6 cont'd *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Swinker et al. (1993)[142] 4287 med Case–control	44 women 100% response rate, although 2 cases were deleted (plus matched controls) as they could not be contacted; not sure whether they are in the 44	Cases: 22 women	**Reattendance**: there were significant differences between the adherers and refusers in terms of the number of past mammograms obtained (95 vs 50%, $p < 0.01$), with adherers having had at least one mammogram. Mean time since last mammography was 1.1 year for adherers and 4.75 years for refusers ($p < 0.05$)	No significant differences between the cases and controls in terms of knowledge and attitudes toward cancer, belief that early diagnosis is beneficial, knowledge of mammography, or concern about radiation cost or pain	Very small study Unclear whether statistics relevant for matched case–control studies were used	There were no significant differences between adherers and refusers, except in terms of the number of past mammograms obtained and the length of time since the last mammogram **Reattendance (+)**
Taylor et al. (1980)[200] 7993 Cross-sectional	500/520 (96%)	NA		**Reassurance**: 89.9% considered attendance at the screening unit was reassuring, 4.6% who had initially been worried were reassured, 5.8% had continual worry (all clear of cancer) **Belief that cancer screening should be expanded**: having attended for screening, 96.4% believed screening should be extended to other forms of screening. Only 12 women said it should not be extended to other cancers, and 9/12 of these women had not found screening reassuring. Conversely, 23/29 women who had continual worry as a result of attending the screening clinic still believed that screening should be extended	The informative session may have biased women's views about screening Quality score = 59%	Following breast screening women were enthusiastic about breast screening and for its extension to other forms of cancer screening **No comparisons Reassurance (+) Believed cancer screening should be expanded (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Taylor *et al.* (1995)[178] 3040 med Cross-sectional	Initial response 1528/2122 (72%) 200 excluded after interview. Sample 1357/2122 (64%)	No response rates by comparison group Breakdown of participants: 425 (31%) had no mammography, 373 (28%) had one mammography, and 559 (41%) had been screened at least twice in past 5 years		**Perceived susceptibility to breast cancer**: belief that risk is high relative to other women: 0 mammograms 30 (7%), 1 mammogram 27 (8%), ≥ 2 mammograms 76 (14%). Significant difference between women reporting 1 mammogram, and women reporting ≥ 2 mammograms ($p < 0.05$) Belief that lifetime risk is equal or greater than 10%: 0 mammograms 228 (54%), 1 mammogram 183 (49%), ≥ 2 mammograms 376 (67%). Significant difference between women reporting having had 1 mammogram and women reporting ≥ 2 mammograms ($p < 0.001$) **Knowledge of screening**: belief that mammogram involves asymptomatic disease detection: 0 mammograms 343 (81%), 1 mammogram 337 (90%), ≥ 2 mammograms 534 (96%). Significant difference between women reporting 1 mammogram and women reporting ≥ 2 mammograms ($p < 0.05$), and between women reporting 0 mammograms and women reporting 1 mammogram ($p < 0.001$)	Uncertainty over temporal relationship	Women who reported repeat mammography (2 or more) had a greater perceived vulnerability and greater perceived personal risk, and were significantly more likely to believe that mammography involves asymptomatic detection, and to believe that mammography is more effective than CBE or BSE **Increased perceived susceptibility to breast cancer (–)** **Knowledge of screening (+)** **Efficacy of mammography (+)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				Efficacy of mammography: belief that mammography is more effective than CBE: 0 mammograms 337 (80%), 1 mammogram 339 (92%), $\geq$ 2 mammograms 535 (96%).		
				Significant difference between women reporting 1 mammogram and women reporting $\geq$ 2 mammograms ($p < 0.05$), and between women reporting 0 mammograms and women reporting $\geq$ 2 mammograms ($p < 0.001$)		
				Belief that mammography is more effective than BSE: 0 mammograms 344 (82%), 1 mammogram 344 (93%), $\geq$ 2 mammograms 541 (97%)		
				In multivariate analysis, adjusting for county of residence and all other variables, significant differences were observed between 1 mammogram vs 0 mammograms for lifetime risk $\geq$ 10% (OR = 0.69, 95% CI 0.49 to 0.97, $p < 0.05$) and mammography more effective than BSE (OR = 2.29, 95% CI 1.15 to 4.57, $p < 0.05$) No significant differences were observed for perception of high personal relative risk (OR = 0.85, 95% CI 0.45 to 1.62), belief that mammography detects		

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				asymptomatic disease (OR = 1.73, 95% CI 0.94 to 3.20) or belief that mammography is more effective than CBE (OR = 1.82, 95% CI 0.94 to 3.54)		
				For the multivariate analysis for repeat vs one-time mammography, significant differences were observed for lifetime risk ≥ 10% (OR = 1.99, 95% CI 1.47 to 2.71, $p < 0.001$) and perception of high personal relative risk (OR = 1.89, 95% CI 1.11 to 3.21, $p < 0.05$). No significant differences were observed for belief that mammography detects asymptomatic disease (OR = 1.44, 95% CI 0.69 to 2.98), mammography more effective than BSE (OR = 2.39, 95% CI 0.95 to 6.04) or belief that mammography is more effective than CBE (OR = 0.65, 95% CI 0.29 to 1.46)		

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Vaile et al. (1993)[120] 4368 med Cohort	Numbers in the paper are not consistent Approximately 65% to baseline questionnaire and 88% to second questionnaire		**Reattendance**: women who had undergone previous mammography were less likely to attend for the current mammography (authors say it was due to having a recent mammogram): 538 women had a previous mammogram, 1521 had not 402/538 (74.7%) who had a previous mammogram attended for mammography, compared with 1325/1521 (87.1%) who had not. Reviewers calculated RR = 0.8577429 (95% CI 0.81 to 0.90, $p < 0.001$) **Intention to reattend** for mammography in 3 years' time (current attendees only who received an all-clear result): 95% of current attenders reported that they would reattend next time. No analysis conducted by screening outcome or previous smear tests		This paper looked at predictors of attendance for mammography. Many of the temporal relationships were incorrect for the review	Women were less likely to attend if they had had a mammogram (authors state that this was due to having a recent mammogram) A majority of those who went for screening said they intended to return for screening **Reattendance (–) – recency? Intention to reattend (+)**

Appendix 6 cont'd   Breast screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Vernon *et al.* (1993)[179] 3961 Cohort	36000/64000 (56.3%) completed mammography and questionnaire	Not reported	**Perceived susceptibility to breast cancer**: in the bivariate analysis, women who had prior mammography were almost twice as likely to perceive their risk as high than those who did not report prior mammography. There was a positive association between the number of mammograms and perceived risk (*p* < 0.001) In the multivariate analysis (adjusting for age and other factors), prior mammography was still associated with perceived risk (OR = 1.616, 95% CI 1.48 to 1.77); however, the number of prior mammograms was not associated when other factors were controlled for			Prior mammography usage is associated with perceived risk of breast cancer. The number of previous mammograms was not found to be significant in multivariate analysis **Increased perceived susceptibility to breast cancer (–)**

Appendix 6 cont'd   *Breast screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Wolosin (1989)[180] 6360 med Cross-sectional	985 women (which we are told represented a 72% response rate)			Significant differences were observed between first time screenees and those who were going for repeat screening with respect to the following variables: **Perceived susceptibility to breast cancer**: am likely to get breast cancer: 54/542 (10%) first timers agreed vs 89/443 (20%) repeat screenees ($p = 0.001$) **Barriers to mammography**: less painful than expected: 352/542 (65%) first screenees vs 199/443 (45%) or repeaters ($p = 0.001$); influenced by things heard: 108/542 (20%) first timers vs 53/443 (12%) repeaters ($p = 0.001$); feared results: 54/542 (10%) first time screenees vs 31/443 (7%) ($p = 0.003$); 31% of first time screenees dreaded the appointment vs 18% of those who had been before ($p = 0.001$) No differences were observed for these variables: looking forward to mammography, more painful than expected, worry about breasts, need for reassurance	One site was different to the other sites with respect to marital status	Repeat screenees had a more positive attitude to mammography. They were less likely to dread the mammogram, find it less painful than expected, be influenced by things they heard, and fear results. They were more likely to believe they were going to get cancer **Fewer barriers to mammography (+) Increased perceived susceptibility to breast cancer (–)**
AC: all clear.						

Appendix 7

Breast screening: summary of key papers published since 2000

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes
Barton *et al* 2001[222] 1 new USA	Cohort	Large HMO	Women aged 40–69 years without breast cancer who were enrolled in the HMO	496 women with a false-positive mammogram and 496 women with a normal mammogram (matched for year of mammogram and location)	Retrospective	Medical notes review Documentation in clinician's notes about breast concerns expressed by women in the year before and after the index mammogram Number of ambulatory care visits (breast related and non-breast related) in the year before and after the index mammogram

Appendix 7 cont'd *Breast screening: summary of key papers published since 2000*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Barton et al. (2001)[222] 1 new Cohort	992 women. 100% data collection due to inclusion criteria (continuous enrolment in HMO)	496 women with false-positive mammograms 496 women with normal mammograms	Number of ambulatory visits before and after the index mammogram Patient-initiated breast-related healthcare visits were 4 times more frequent in women with false-positive results than in women with normal results (adjusted incidence ratio = 4.03, 95% CI 2.97 to 5.47). For non-breast-related visits, the incidence ratio was 1.18 (95% CI 1.09 to 1.28), showing that women with false-positive results made significantly more non-breast consultations than women who were given the 'all clear'	In the year preceding the index mammogram the proportion of women who had documented breast concerns was 0.5% in those who subsequently had a FP mammogram compared with 0.3% in women who then had a normal mammogram ($p = 0.5$). During the year after the index mammogram the respective rates were 50/496 (10%) and 1/496 (0.2%) ($p = 0.001$) The frequency of documented concern increased with increasing intensity of further investigations, with 4.69% of women needing additional views having documented evidence of breast concerns, 5.77% of women recommended to have 6-month follow-up mammography, 10.99% of women investigated using ultrasound and 15.94% of women who underwent a biopsy ($p = 0.009$)	Data extraction was blinded to mammography outcome and whether it was before or after the index mammogram. However, the women with false-positive results were significantly younger than the women with normal results	The frequency with which breast concerns were documented was significantly higher in women who had a false-positive mammogram following breast screening There appeared to be a dose–response relationship between increasing severity of false-positive results and increasing documentation of concern Women with false-positive mammograms made significantly more ambulatory care visits than women with normal results. This was observed for both breast-related visits and non-breast-related visits (adjusted for previous healthcare use) **False-positive results associated with: Increased perception of susceptibility to cancer (–) Use of GP/health services (+)**

Appendix 7 cont'd *Breast screening: summary of key papers published since 2000*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes
Brett and Austoker (2001)[223] 2 new UK	Cohort	National Breast Screening Programme	505 women without breast cancer, who had undergone breast screening 3 years previously and had participated in the previous data collection periods of this prospective cohort (1 month, 5 months and 11 months after previous screening)	Women who had received a false-positive mammogram (including the full range of management options: additional clinical examinations; FNA; early recall and breast biopsy) Those with a normal result	3 years	Postal questionnaire and attendance records Psychological effects (not relevant to this review) Reattendance at next breast screening Health beliefs towards screening Cervical screening Dental check-ups

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Brett and Austoker (2001)[223] 2 new Cohort	387/505 (77%)	288/375 (77%) of false-positive group 99/130 (76%) of normal results group	56/375 (15%) false-positive women did not attend for their next routine breast screening appointment compared with 10/130 (8%) women who received a clear result ($p = 0.035$) Attendance at cervical screening and having regular dental check-ups were both significantly positively correlated with the likelihood of reattending for breast screening ($p < 0.001$)	Women tended to have positive health beliefs about breast screening and other checks (no data shown)		Women who received false-positive results were significantly less likely to reattend for routine screening than those with a normal result Having cervical screening and regular dental check-ups was positively correlated with likelihood of reattendance **Cervical screening (+)** **Other preventive health behaviours (+)** **Screening beliefs (+)** **False-positive results associated with:** **Reattendance (–)**

Appendix 7 cont'd   Breast screening: summary of key papers published since 2000

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes
Drossaert et al. (2001)[224] 3 new Netherlands	Cohort	Breast cancer screening programme	Women aged 50–69 years, invited for their first screening mammogram (and attended the appointment)	Before (10 days before) and after (6 weeks) screening comparison (N = 223) Another comparison group of women after screening (N = 293)	6 weeks after breast screening	Questionnaires before and after screening Intention to reattend (both periods) Perceptions of susceptibility to breast cancer Perceptions of severity of breast cancer Knowledge of breast screening (results) False reassurance after negative result

Appendix 7 cont'd *Breast screening: summary of key papers published since 2000*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Drossaert et al. (2001)[224] 3 new Cohort			Intention to reattend was high before and after the screening process (mean score 1.8 at both times, scale ranged from –2 to 2)	There was no change in perceived susceptibility after screening. The mean score was 2.9 (from a range of 1 to 4) at both times, indicating that perceived susceptibility was high at both times Perception of severity of breast cancer was high at both times (mean score 3.7 before and 3.6 after, from a range of 1 to 4), with no difference in perception before or after screening The screening experience did not affect women's knowledge about the interpretation of the test results. Knowledge levels were high at both times, with over three-quarters of women correctly interpreting the results of screening The screening experience did not lead to false reassurance and most women knew that having breast screening does not prevent breast cancer in the future. Over 75% of the women reported that they would see their GP within 1 week if they developed a breast lump: there was no significant difference between the periods	Actually measures the effect of screening: has a baseline measure and monitors the changes observed after screening	The screening experience did not lead to any changes in behaviour or beliefs measured **Intention to reattend (ns) Perceived susceptibility to breast cancer (ns) Perceived severity of breast cancer (ns) Knowledge about breast screening (ns) Reassurance (false) (ns)**

Appendix 7 cont'd *Breast screening: summary of key papers published since 2000*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes
Lemon *et al.* (2001)[227] 4 new USA	Cross-sectional	Telephone survey of random population sample	Men and women aged ≥ 50 years with no history of prostate or breast cancer	Current mammography users (screened within the last year) Non-current mammography users (women only)	NA	Telephone survey Screening for colorectal cancer by faecal occult blood test, flexible sigmoidoscopy, colonoscopy or barium enema tests

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Lemon *et al.* (2001)[227] 4 new Cross-sectional	540 women included in the survey Overall response rate to the survey 64%	Not stated	Women who had a mammography within the last year were 4 times as likely to be current for colorectal screening (OR = 4.01, 95% CI 2.26 to 7.12)			Women who undergo breast screening are more likely to have also undergone colorectal screening **Other screening behaviours**

Appendix 7 cont'd   *Breast screening: summary of key papers published since 2000*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes
O'Sullivan et al. (2001)[225] 5 new UK	Cohort	One Breast screening centre	Women who had been invited for breast screening in 1997 and had previously undergone routine breast screening in the NHSBSP	Women with a previous false-positive result Women with a normal result Women with different follow-up regimens after a false-positive result	Retrospective, but at least 3 years between index screen and screening in 1997	Database record review Reattendance

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
O'Sullivan et al. (2001)[225] 5 new Cohort	5649 women Response rate NA as study design is a note review	248 women with previous false-positive result (162 given further assessment and 86 on early recall) 5401 women with a normal breast screening result	3841/5401 (71%) women with normal results reattended when next invited. 175/248 (70.5%) false-positive results attended (ns) 119/162 (73.5%) who received immediate assessment after a positive mammogram reattended compared with 56/86 (65%) who were put on early recall after a suspicious mammogram. This difference is not significant, but the comparison is underpowered		Conducted in one screening programme in an area of very low uptake, such that the women who initially attended are 'self-selected'	Reattendance rates did not differ between women who received a false-positive result and women who had normal mammograms There was an indication of decreasing reattendance in those women placed on early recall **False-positive results associated with: Reattendance (ns)**

Appendix 7 cont'd   *Breast screening: summary of key papers published since 2000*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes
Stidley et al. (2001)[226] 6 new USA	Cohort	Healthcare claims database	21,552 women aged ≥ 40 years	Women who had breast screening and no biopsy Women who had an incisional biopsy Women who had an excisional biopsy (none of them had breast cancer)	NA (retrospective)	Database record review Reattendance

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Stidley et al. (2001)[226] 6 new Cohort	21,552 women Response rate NA as study design is a note review	20,540 women with normal mammograms 693 women who had an incisional biopsy 289 women who had an excisional biopsy	Over 10% of women with benign breast biopsies failed to return for another mammogram within 25 months after the index breast screen However, women who had undergone either type of benign biopsy returned for mammography in a shorter interval than women who had an original normal result (adjusted for recommendation for more frequent mammography)			Non-reattendance rates were quite high in women who had a benign biopsy However, women who had undergone a benign biopsy returned for mammography sooner than women who had a normal breast screening **False-positive results associated with: Reattendance (?)**

Appendix 8

Cervical screening: description of studies

Papers marked with an asterisk (*) are also included in the breast screening section.

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Ali-Abarghoui et al. (1998)[248] 395 cin USA	Cross-sectional	Population random sample Medically underserved population from a health promotion programme	Population survey: 91% health coverage; 19% college education or more, 22% less than high school. Medically underserved: 45.5% of sample in the age range 40–49 years, only 12% in the ≥ 65 category; 11% health coverage; 3.7% college education or more, 41.7% less than high school	Mammography No mammography	NA	Telephone surveys Cervical screening predicting mammography Pap smear never Pap smear > 1 year ago Pap smear ≤ 1 year ago
*Beaulieu et al. (1996)[133] 2650 med Canada	Cohort	Asymptomatic breast screening ordered by prescription. The clinic served low socio-economic, white, French speakers	Women aged 50–69 years; given written prescription for screening mammogram, had not had one within 2 years and had never been treated for breast cancer	Women who accepted the offer of mammography Women who decided not to have the mammography	2 months after recommended screening	Telephone interviews Health status and psychological well-being (Affect Balance Scale) Previous use of Pap smears and mammography Beliefs and attitudes regarding mammography Knowledge of screening recommendations and perceptions of other women's actions regarding breast screening

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Boer et al. (1993)[132] 382 psy Netherlands	Cohort	Breast screening programme	Women aged 50–70 years; reattenders mean age 56.6 years, non-reattenders mean age 57.6 years	Reattenders vs non-reattenders (at second round screening)	2 years Baseline T1: 1–10 days before participation (March 1989) T2: immediately after screening (March 1989) T3: Reattendance/ non-attendance from screening records, 2 years after first screen	Questionnaire and attendance data Effect of previous Pap smear Effect of satisfaction of first breast screening on attendance at second breast screen
*Burton et al. (1998)[123] 1383 med UK	Cohort (retrospective)	RCT of annual mammography	Women aged 50–62 years randomised to receive mammography every year	Attenders (those who attended when first invited) Non-attenders Ambivalent attenders (those who delayed screening until 2nd year)	Not stated	Interview Intention to reattend Years since last cervical smear test Visits to GP Previous mammography Health-promoting behaviours Knowledge of mammography and smear test Found mammogram embarrassing Reassurance

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Calnan (1984)[144] 7500 med UK	Nested cohort within an RCT of BSE or mammography	Two health districts: in one district women were invited to attend a BSE class; in the other district women were invited to attend the breast screening clinic	Random sample of women aged between 45 and 64 years registered with a GP in the two districts	Breast screening attenders Breast screening non-attenders BSE class attenders BSE class non-attenders	Interviews conducted 1 month before receipt of invitations to BSE class or mammography Attendance status ascertained from RCT data	Questionnaire interviews Ever had cervical smear Ever had previous breast screening (as predictors of attendance)
*Calnan (1985)[164] 7393 med UK	Cross-sectional	Part of a larger interview survey conducted in primary care in three cities on early detection of breast cancer	Women aged 45–64 years	Use/non-use of seven preventive health behaviours	NA	Interview surveys Correlation between preventive behaviours (breast screening, cervical screening, dental check-up, dietary practice, exercise, smoking behaviour, use of seatbelt)

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Carney et al. (1992)[246] 4829 med USA	Cohort	Cervical cancer screening programme in New Hampshire and health education session designed to provide services to women at high risk. Education session was on the importance of obtaining regular subsequent cancer screening services	Women aged > 21 years **Participants**: mean age 50.6 years; 37.4% completed high school education; 64.2% married; 96.2% Caucasian; 76.2% household income of >$12,000 **Comparison group**: mean age 48.1 years; 38.2% completed high school education; 65.4% married, 96.2% Caucasian; 82.4% household income of >$12,000	Participants of cervical screening (2 years previously) Comparison group who did not participate in cervical screening 2 years ago	2 years	Postal questionnaires Preventive healthcare services: Pap test Regular BSE CBE Mammography (aged > 50 years) Regular healthcare provider
*Clark et al. (1998)[191] 120 psy USA	Cross-sectional	Telephone interviews with women from Rhode Island and Massachusetts	Women aged 50–74 years who made an appointment for any reason at Departments of Family Medicine, Internal Medicine or Obstetrics and Gynaecology	Least committed (never had mammogram or had mammogram, but no intention to have future mammograms) Contemplators/inconsistent (never had, or had mammogram > 2 years ago, and planning to have a mammogram in the next 1–2 years) Action (had a mammogram on yearly schedule and planning to have another one on schedule) Maintenance (has had two or more mammograms on yearly schedule and is planning to have another one on schedule)	NA	Telephone interviews The following factors influence stage of adoption of mammography screening: Pap smear within 2 years Knowing the age-related interval Having no barriers to screening Also reports demographic and provider–patient influence, but these are not relevant to this review

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Cockburn et al. (1997)[153] 2105 med Australia	Cohort	Systematic breast screening programme (free)	Women aged 50–69 years who lived in a defined geographical area and attended breast screening in the first round (data collected before first round)	Attenders at second round breast screening Non-attenders at second round screening	Approximately 2 years	Interviews Previous use of Pap smears affecting reattendance for second round breast screening Previous diagnostic mammograms (before first round) Outcome of first round screening
Cummings et al. (2000)[253] 36 emb USA	Cross-sectional (data from other studies)	Household survey in rural eastern Carolina (REACH Survey)	Women aged > 50 years; 47% aged 50–64 years; 53 ≥ 65 years; 52% white, 48% African–American	None	NA	Interviews Uptake of mammography
Eger and Peipert (1996)[243] 2366 med USA	Case–control (retrospective)	Colposcopy clinic	Women referred for colposcopy; aged 13–88 years, median age 24.5 years; 57.5% white, 87.7% non-married, 17.1% no medical insurance No significant differences between adherent and non-adherent groups	Adherent: kept at least two appointments (controls) Non-adherent: kept one appointment and missed one or more; or kept two appointments and then refused further treatment (cases) Lesion grade: Normal to low High	NA	Medical record review Adherence with follow-up
*French et al. (1982)[158] 7716 med UK	Cohort	Edinburgh Breast Screening Clinic	Women aged 45–64 years, mean age 54 years; mostly married	Attenders Non-attenders (stratified by those who declined to attend, those who confirmed they would attend but then DNA and those who DNA without contact)	3 months after invitation for mammography screening	Interview Cervical smears Dental check-ups (as predictors of current screening status) Reasons for attending or not attending Fear

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Funke and Nicholson (1993)[245] 4169 med USA	Cohort	Large north-eastern university health service and two north-eastern family planning organisations	Women aged ≥ 18 years; diagnosed with an abnormal Pap smear 2–18 months before start of study	Non-adherent: failed to adhere with any of the medical recommendations for follow-up Adherent: completed all follow-up recommendations	2–18 months	Questionnaires Adherence with follow-up Perceived susceptibility Perceived benefits Perceived barriers
*Gnanadesigan et al. (2000)[173] 1 psy USA	Cross-sectional	PEP programme	Women in PEP aged 60–84 years, average age 74 years; 43% of ethnic minorities; 76% widowed, divorced or single; 46% income at or below poverty level; 75% high school or further education	Ever had a mammogram Never had mammogram and Current mammogram (within 2 years) Not had a current mammogram	NA	Self-administered questionnaires Cervical screening Screening for colorectal cancer Immunisations for tetanus, pneumonia and influenza Calcium supplement use BSE HRT use Smoking Seatbelt use
*Gordon et al. (1991)[114] 5165 med Italy	Cross-sectional interview study	Two districts where a new breast screening programme was to be introduced	Random sample of women aged 50–70 years	Women who intend to participate in breast screening Women who are uncertain about participating Women who do not intend to participate	NA	Semistructured interviews Previous mammogram Previous Pap smear (as predictors of intention)
Hernandez-Hernandez et al. (1998)[232] 732 emb Mexico	Cross-sectional	Questionnaire study to representative sample of women in Tlalpan, south-western area of the Mexico City Federal District	Women aged 18–74 years, median age 35 years; 72.6% married; 42.7% ≤ 6 years of schooling; 73% housewives	Non-users of Pap test Misusers (not regular) of Pap test Adequate users of Pap test	NA	Interviews Knowledge Reasons for non-attendance Understanding benefits of Pap test Number of visits to medical centre

Appendix 8 cont'd   Cervical screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Hobbs et al. (1980)[250] 8066 med UK	Cohort (retrospective)	Women in two GP practices invited for breast screening, self-referred women	Women aged 50–79 years. Accepters were significantly younger than rejectors of screening. Self-referred women were significantly younger than both the other groups	Random sample of: 100 attenders 100 decliners 50 self-referred women	NA	Interviews Previous Pap smears (as a predictor of mammography behaviour)
*Kee et al. (1992)[116] 4667 med UK	Cohort	National breast screening programme	600 women who had been invited at some time to attend for breast screening. Stratified (by attendance/non-attendance) random sample of 300 attenders and non-attenders, with replacement if interview was unsuccessful (766 addresses were visited to obtain 600 interviews); average age of respondents 58.7 years	300 breast screening attenders 300 breast screening non-attenders	Variable	Interviews Attendance status for breast screening (as predicted by cervical screening status) Intention to attend for breast screening when next invited
Lagerlund et al. (2000)[249] 193 med Sweden	Cohort	Population-based mammography screening programme	Sample of women who had been invited for breast screening between 1988 and 30 June 1997	Breast screening non-attenders (on at least two occasions) Breast screening attenders (those who had been invited at least twice and attended at least once)	Variable	Outcome was attendance or non-attendance for breast screening, predicted by previous smear status (never or ever)

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Lancaster and Elton (1992)[247] 4652 med UK	Randomised intervention trial	Northern Hospital in Manchester and mobile breast screening unit	Women aged 50–64 years invited for breast screening; mean age of both group 1 and group 2 56 years	Random allocation to: Group 1: women invited in advance for cervical screening with their breast screening invitation Group 2: women invited for breast screening only and then offered a smear test upon arrival for breast screening	8 weeks after breast screening appointment	Uptake of cervical screening Effect of receiving invitation for cervical screening along with invitation for breast screening on breast screening uptake Previous cervical screening in women attending breast screening
Larsen and Olesen (1996)[233] 2322 med Denmark	Case–control	Cervical screening programme, Aarhus County	Women aged 32–60 years **Passive attenders**: 60.8% married, 27.7% never married, 11.5% divorced/widowed; 62.6% basic education, 37.4% secondary education or commercial college **Active attenders**: 55.1% married, 30.9% never married, 14.0% divorced/widowed; 60.8% basic education, 39.2% secondary education or commercial college **Non-attenders (never)**: 27.8% married, 63.9% never married, 8.3% divorced/widowed; 47.7% basic education, 52.3% secondary education or commercial college **Non-attenders (ever)**: 54.3% married, 31.3% never married, 14.4% divorced/widowed; 61.4% basic education, 38.6% secondary education or commercial college	Attenders (controls): had at least one test in the previous 42 months Active attenders: women who on their own or on their doctor's initiative had a smear test because of symptoms/signs and women who had a smear because they or the GP had suggested it (opportunistic) Passive attenders: had a smear test because of the specific invitation to organised screening programme Non-attenders (cases): had not had a smear during the previous 42 months Never attenders: women who had never been registered as having a smear test Ever attenders: women who had not had a smear test during the previous 42 months but had previously had at least one smear test	None	Postal questionnaires Number of medical consultations in past year Smoking status

Appendix 8 cont'd   Cervical screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Lerman et al. (1990)[235] 6003 med USA	Cross-sectional	University hospital, North Philadelphia	Lower income primary care patients; women aged ≥ 20 years in the general internal medicine practices, 45% aged 20–34 years, 25% aged 35–49, 30% aged ≥ 50; 86% black, 9% white; 37% married; 29% high school education, 29% some college, 15% college graduate or more	Cervical screening <3 years ago Cervical screening >3 years ago	None	Self-administered baseline questionnaires before medical visit Perceived risk for cervical cancer Perceived effectiveness of screening Reassurance (worth it to make sure nothing is wrong) Worry/fear of finding cancer Embarrassment
Lerman et al. (1991)[244] 5371 med USA	Cohort	Family planning clinic and colposcopy clinic	Lower income women aged 15–58 years, average age 26 years, 63% aged 15–24, 30% aged 25–34; 84% black; 11% married; 72% high school education	Women with negative smear test result Women with positive smear test result	3 months	Telephone surveys Previous Pap smear Impairment of daily activities Worry Tension Mood Sleep patterns
McKee et al. (1999)[241] 967 med USA	Cross-sectional	Urban community health centre	Women with abnormal smear result referred for colposcopy; mean age 30.3 ± 10.2 (range 14–78) years; Hispanic 52.8%, black 34.7%, white 8.3%, Asian 4.1%; no insurance 5.5%, Medicaid 79.8%; less than high school education 42%, high school 24%, more than high school 34%	Attenders Non-attenders (for colposcopy) and Low-grade lesions High-grade lesions	Ranges from 17 to 47 months from Pap smear to interview	Telephone-administered questionnaires Chart review for attendance at colposcopy Attendance at colposcopy Attendance by grade of lesion Knowledge of result Report results incorrectly Staying healthy is matter of luck Fear of cancer Belief in early detection Need follow-up only if sick Pelvic examinations are embarrassing

Appendix 8 cont'd   Cervical screening: description of studies

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Mandelblatt et al. (1993)[145] 4360 med USA	Cohort (prospective)	Public hospital medical clinic	Black women aged ≥ 65 years, mean age 75 ± 6.4); low socio-economic status No differences between participants and non-participants except for number of chronic illnesses. No data presented	Participants completed all or part of the screening tests (breast and cervical screening) Non-participants refused screening	6 months	Questionnaires and record search Variables associated with participation in breast and cervical screening (not all relevant to this study) Past cervical screening Past mammography screening (to predict participation)
Melnikow et al. (1999)[242] 579 med USA	Cohort (retrospective)	Three northern California family planning clinics	Women requiring follow-up (colposcopy or repeat Pap smear) for an abnormal smear; aged 15–66 years, mean age 25.9 years; 90% covered by various medical insurance assistance programmes	Women referred for colposcopy Women referred for repeat Pap smear Women with atypical squamous cells of undetermined significance (ASCUS) Women with low-grade squamous intraepithelial lesions (LGSIL) or high-grade squamous intraepithelial lesions (HGSIL)	Length of time between referral and measurement of adherence status is not clearly stated	Medical record review Adherence with recommended repeat Pap smear Adherence with recommended colposcopy Adherence based on grade of lesion
*Montano and Taplin (1991)[122] 5523 med USA	Cohort	HMO BCSP	Women aged ≥ 40 years who responded to the BCSP risk factor questionnaire and were invited for their first screening	Breast screening attenders and non-attenders	Study questionnaires were sent within 2 weeks after the women were mailed a letter of invitation from the BCSP Screening attendance obtained after 6 months	Self-administered questionnaires Theory of Reasoned Action Pap tests in previous 4 years Mammography use in previous 5 years (habit)

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Mootz et al. (1991)[136] 5487 med USA	Cohort	Fee-for-service mobile breast screening unit in Dallas, Texas	Women from a large corporation aged ≥ 35 years; no history of breast cancer or breast problems No significant differences in race, age or education between the groups	Adherent vs non-adherent Adherent: women who kept their appointments and completed the survey Non-adherent: women who did not keep their appointments for mammography	None	Questionnaires and 11% of non-adherers completed by telephone interviews Health behaviours (previous mammography, Pap smears, CBE, BSE knowledge and practice, smoking status) Knowledge of breast cancer and beliefs Factors important in decision to undergo mammography
*Morrison (1996)[166] 289 psy USA	Cross-sectional	Recruited from those responding to advertisements and door-to-door contacts inviting them to participate in free breast cancer screening	Underinsured, low-income women, aged >40 years; 80% black, 16% white; 82.5% high school or less; 49% household income < $10,000, 40% household income $10,000–$24,999	Women who frequently conduct BSE Those who do not frequently conduct BSE Women who believe they are proficient in BSE Women who do not believe they are proficient in BSE	NA	Telephone interviews Previous cervical smear Previous mammography (to predict the breast screening outcome groups)
Nicoll et al. (1991)[236] 5339 med UK	Cross-sectional	GP practice in Scotland (list size 19,600)	Women aged 20–64 years registered with a GP; stratified random sample of each group Non-attenders were more likely to be single and childless, whereas defaulters were less likely to be from social class I and II and more likely to have completed education by the age of 16	Attenders: had smear test in past 5 years Defaulters: had smear test > 5 years ago Non-attenders: never had a smear test	None	Postal questionnaires Intention to have cervical screening Knowledge of cervical screening

Appendix 8 cont'd *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Nugent and Tamlyn-Leaman (1992)[237] 1452 cin Canada	Cross-sectional	Three colposcopy clinics at two teaching hospitals in New Brunswick	Women who had a first time abnormal Pap smear and were referred for colposcopy; aged 15–70 years, mean age 29.2 ± 10.92 years; 41.6% single, 40.3% married	None	None	Questionnaires (completed before colposcopy ~5 weeks after learning of Pap smear result) Knowledge of location of cervix Knowledge of Pap test Knowledge of Pap test result Knowledge of colposcopy
Orbell et al. (1995)[234] 2989 med UK	Case–control	Cervical screening programme	Women aged 20–60 years **Screened**: ages not reported; 66% married, 23% single, 11% widowed or divorced **Non-screened**: 42% aged 20–34 years, 44% aged > 50 years; 53% single, 35% married, 12% divorced/widowed/separated Aged matched sample	Screened women (in past 3 years) Non-screened women (not screened in past 3 years)	None	Semistructured interviews Smoking status Risk perception Embarrassment Perceived expectation of a positive test result Perceived efficacy Perceived benefit Influences on intention to attend
Pearlman et al. (1996)[161] 2359 med USA	Cross-sectional	NHIS-HPDP	Subsample from a larger NHIS-HPDP. Women aged 40–75 years who reported that their last mammogram was for routine purposes; 1320/8965 (14.7%) black, 482/8965 (5.4%) Hispanic, 7163/8965 (79.9%) white	Underuse of mammography Regular use Not intending to have a mammogram (excluding women who have been screened recently) within 1–3 years. Intending to have a mammogram		Sociodemographic factors, health status, preventive orientation and health service use as predictors of underuse of mammography and lack of intention to obtain a mammogram. Examined these variables in relation to ethnic/racial group

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Qureshi et al. (2000)[87] 238 emb USA	Cross-sectional	Data from 1992 and 1993 Behavioural Risk Factor Surveillance System database in Ohio	Women aged 40–49 years; 14,818 (81%) Caucasian, 1799 (10%) African–American, 876 (5%) Hispanic, 736 (4%) other	Screening mammography within 2 years Never had a screening mammography or > 2 years ago	NA	Telephone interview survey Cholesterol screening Pap smear Seatbelt use Heavy alcohol use Alcohol use Current smoker (as predictors of mammography use)
Rajaram et al. (1997)[230] 759 cin USA	Qualitative	Colposcopy clinic	Opportunistic sample of women aged 19–54 years who had abnormal Pap smears and underwent colposcopy	NA	NA	Interviews Perceived seriousness Fear of cancer Search for knowledge (Anxiety, symbolic significance of diagnosis, effect on relationships, etc., not relevant for this review)
*Rakowski et al. (1993)[118] 4128 med USA	Cross-sectional	Data from the NHIS-HPDP	Women aged 40–75 years	Had mammogram 1–2 years ago Ever had mammogram Never had mammogram	NA	Intention to have mammography Smoking Drinking Exercise Knowledge of BSE Prior Pap test (associated with mammography status)
*Rakowski et al. (1995)[162] 3140 med USA	Cross-sectional	Data from the 1990 NHIS-HPDP of 40,104 women aged ≥ 18 years	Subsample of women aged 40–75 years; income < $20,000 and > $30,000; some college education. No other data given on this sample or compared to full sample	Mammography attendance in low resource participants high resource participants	NA	Interview Pap test CBE BSE Smoking Exercise

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Ravaioli et al. (1993)[238] 4202 med Italy	Cross-sectional	Sanitary Unit in Rimini area (prevention clinic)	Volunteers from women who spontaneously presented themselves for a Pap test 30.7% aged 40–49 years; 81% married; 5% graduates, 32% high school, 58% finished basic primary school	None	NA	Self-administered questionnaires Previous Pap test Frequency of Pap testing Acceptance/decliners of breast screening Reasons for not having Pap test
*Rodriguez et al. (1995)[147] 3139 med Spain	Two cohort studies (retrospective)	Breast cancer screening programme	Majority of women aged 50–54 years; were invited for screening by letter; relatives of current employees or retirees from Barcelona municipality	Enrolment study Women enrolled for first screening in 1989 Women who declined to enrol Adherence study Women who attended second screening in 1988/89 Women who did not attend	NA	Telephone interviews Periodic use of cervical screening Previous mammography BSE behaviours Smoking Visits to gynaecologist Knowledge and attitudes
Ronco et al. (1994)[231] 3347 med Italy	Cross-sectional	Pilot cervical screening programme	Random sample of women aged 25–64 years registered in two general practices in Turin	Attenders Non-attenders	NA	Questionnaire-based interviews Previous Pap smear Anxiety caused by this invitation
*Rutter et al. (1997)[138] 1090 emb UK	Cohort	Breast screening programme in the South East Regional Health Authority. Three sites: one rural, one provincial and one inner city	Women aged 50–64 years who were invited routinely	Reattenders to routine screening Non-reattenders to routine screening	3 years	Reattendance Satisfaction of previous mammography Pain and discomfort experienced at previous mammography Previous Pap smear

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Savage and Clarke (1996)[119] 249 psy Australia	Cross-sectional	Two suburbs in a provincial city in Victoria, Australia (one low socio-economic status, one high)	Women aged 50–70 years: 28% aged 50–54 years, 27% aged 55–59 years, 24% aged 60–64 years, 21% aged 65–70 years, Education 10.7 ± 2.7 range 5–21 years; 78% not employed	Those with intention to have mammogram Those without intention to have mammogram Those intending to conduct BSE Those not intending to conduct BSE	None	Telephone survey Correlates of intention to have a mammogram Correlates of BSE intention
Seow et al. (1995)[239] 3141 med Singapore	Cross-sectional	Household interviews with randomly selected women	Women aged 21–65 years, 10.4% aged 21–29 years, 41.8% aged 30–39 years, 29.4% aged 40–49 years, 16.1% aged 50–59 years, 2.3% aged 60–65 years; 72.5% Chinese, 20.1% Malay; 56.7% no education or primary level only, 33.8% secondary level education	Ever had cervical screening Never had cervical cancer screening	None	Interviewer-administered questionnaire Future intention to have a cervical smear associated with: Perceived severity: 'Cancer is a serious disease' 'Cancer affects family' 'Cancer would affect work/social life' Perceived susceptibility: 'Cancer is avoidable' 'I worry about cancer' 'As likely to contract as others' Perceived benefits of action: 'Medical help is needed for diagnosis' 'Cancer can be cured' 'Pap smear effective' Perceived barriers to action: 'Fear of positive result' 'Safety of test' 'Discomfort' 'Embarrassment'

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
Seow *et al.* (1997)[251] 1829 med Singapore	Cohort (retrospective)	Mammography Centre at the Singapore General Hospital	Women aged 50–64 years, mean age 56 years; 83% of attenders and 70% of non-attenders Chinese; 91% of attenders and 81% of non-attenders married; 56% of attenders and 53% of non-attenders had no formal education	Attenders at mammography screening Non-attenders at mammography screening	NA Data collected at time of screening for attenders (1–2 months after receiving invitation). Non-attenders interviewed in home (no timeframe provided)	Interviewer-administered questionnaires Previous screening behaviour: Pap smear Previous mammography Reasons for non-attendance (after having been invited): Screening is unnecessary Psychological or emotional barriers Health beliefs: "Breast cancer is a disease that all women our age should be worried about" "There is nothing we can do to prevent ourselves from getting breast cancer" "If I really did have breast cancer, I would prefer to know about it"
Slater (2000)[240] 18 med UK	Cross-sectional	Colposcopy clinic	300 consecutive women referred and attending for colposcopy for the first time following an abnormal Pap smear No further data presented	None	None	Multiple choice questionnaires (before colposcopy) Knowledge of purpose of smear test Knowledge of what a result with abnormal cells means

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
*Sutton et al. (1994)[151] 3804 med UK	Cohort	Three neighbouring health districts in inner south-east London	Women aged 50–64 years who were due to be called for first round breast screening; 37% had an educational qualification; 48% classified as non-manual social class; 66% married or living with a partner; 75% white ethnic group, 13% black ethnic group The two groups were similar except that postal questionnaire responders were less likely to hold an educational qualification (27 vs 45%, $\chi^2_{(1)} = 43.3$, $p < 0.001$)	Attended for breast screening Did not attend for breast screening	Data collected 4 months before screening Attendance data obtained from screening records, 4 months later	Postal questionnaires or interviews Previous smear tests Previous mammography (as predictors of attendance)
*Vaile et. al. (1993)[120] 4368 med UK	Cohort	Routine breast screening service. Three areas including a mobile and static unit	Women aged 50–64 years who were eligible for breast screening	Attenders for breast screening Non-attenders for breast screening	Not explicitly stated, but first questionnaire sent before invitation, second questionnaire sent after results	Previous smear to predict attendance for mammography Previous mammogram to predict attendance Intention to reattend for mammography in 3 years' time (current attendees only who received an all-clear result)
Vogel et al. (1993)[252] 4376 med USA	Cross-sectional	Fee-for-service, media advertised mammography screening project	Participants were women, who during the media promotion had a mammogram; 62% aged < 55 years; 58% some college or higher education; 90% white; median income $33,000	None	None	Self-administered questionnaires Survey of users of the screening project (mostly not relevant) Time since previous Pap smear test for mammography users

Appendix 8 cont'd   *Cervical screening: description of studies*

Author(s) (year) ID no. Country of study	Study design	Study setting	Characteristics of participants	Comparison groups	Length of follow-up	Main outcomes[a]
White (1995)[229] 3143 med New Zealand	Qualitative	Women selected by their GPs. Interviews took place at participants' homes	Women aged 45–70 years, 3 women aged 45–55 years, 5 women aged 56–70 years; women had delayed, declined or had a recent smear after a period of over 10 years	NA	All participants had a cervical smear, the median interval being around 15 years. 3 of the women had a recent cervical smear after intervals ranging from 30 to 10 years	Interviews Knowledge of cervical screening and cervical cancer Perceptions about cervical cancer Fears of getting cervical cancer Significance of health checks in general Perceptions concerning cervical smear The importance of having regular smears Personal experience and concerns

[a] All outcomes are self-reported unless it is stated that the outcome was observed/measured.
ASCUS: atypical squamous cells of undetermined significance; LGSIL: low-grade squamous intraepithelial lesions; HGSIL: high-grade squamous intraepithelial lesions.

Appendix 9

Cervical screening: summary of study results

Papers marked with an asterisk (*) are also included in the breast screening section.

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Ali-Abarghoui *et al.* (1998)[248] 395 cin Cross-sectional	Population survey 1089 Eligible sample 915 Medically underserved 6784		**Breast screening**: population survey, women aged ≥ 40 years (Pap smear N = 590): of women who had never had a cervical smear, 25.7% had a mammogram. Of those who had a cervical smear > 1 year ago, 54.8% had a mammogram (OR_{adj} = 4.2, 95% CI 1.4 to 12.6). Of those who had cervical screening ≤ 1 year ago, 85.8% had a mammogram (OR_{adj} = 33.0, 95% CI 7.3 to 71.9). Medically underserved survey women aged ≥ 40 years (Pap smear N = 4559): Only crude ORs available. Of women who had never had a cervical smear, 25.1% had a mammogram. Of those women who had a cervical smear > 1 year ago, 57.2% had a mammogram (OR = 4.0, 95% CI 3.1 to 5.1). Of women who had a cervical smear ≤ 1 year ago, 66.8% had a mammogram (OR=6.0, 95% CI 4.5 to 8.1) Population survey, women aged ≥ 50 years (Pap smear N = 397): Of women who had never had a cervical smear, 12.7% had a mammogram. Of those who had a cervical smear > 1 year ago,			Women with prior cervical screening are more likely to attend mammography screening. Women with more recent Pap test are even more likely to have mammography screening **Breast screening (+)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
			22.5% had a mammogram (OR_{adj} = 1.7, 95% CI 0.5 to 6.6). Of those who had cervical screening $\leq$ 1 year ago, 77.0% had a mammogram (OR_{adj} = 23.8, 95% CI 6.0 to 95.0)			
			Medically underserved survey, women aged $\geq$ 50 years (Pap smear N = 2260): Only crude ORs available. Of women who had never had a cervical smear, 7.7% had a mammogram. Of those women who had a cervical smear > 1 year ago, 9.0% had a mammogram (OR = 1.2, 95% CI 0.1 to 2.1). Of women who had a cervical smear $\leq$ 1 year ago, 36.6% had a mammogram (OR=36.6, 95% CI 3.9 to 12.3)			
*Beaulieu et al. (1996)[133] 2650 med Cohort	149/171 (87.1%)	Attenders 105/113 (92.9%) Non-attenders 44/58 (75.9%)	**Breast screening**: previous use of Pap smears and mammography: 14/44 (31.8%) non-attenders had had a Pap test within 3 years, compared with 66/105 (62.9%) attenders (RR = 0.52, 95% CI 0.32 to 0.800). When this was adjusted for HBM scales and other health practices, this OR = 0.65 (95% CI 0.39 to 1.08, p = 0.10)		The variables from the HBM are very difficult to deal with. One cannot tell whether it is an innate characteristic that leads to the screening behaviour or whether the HBM scales are as a result of previous screening or even this most recent invitation	Women who had previously undergone cervical smears were significantly less likely to be non-attenders for mammography than women who had never undergone one before, although significance was not reached in the multiple logistic regression (adjusted for previous mammography use and other factors) **Breast screening (ns)**

Appendix 9 cont'd Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Boer *et al.* (1993)[132] 382 psy Cohort	T1: 261/386 (68%) completed a questionnaire before mammography screening T2: 372/386 (96%) were screened and filled out a second questionnaire T3: 386/386 (100%) screening status ascertained	Cohort consists of: reattenders in second round mammography screening 263/372 (71%), non-reattenders in second round screening 75/372 (20%); not invited (too old or missing from database) 34/372 (9%)	**Breast screening**: 210 (80%) reattenders had a previous Pap smear compared with 47 (63%) non-reattenders ($\chi^2 = 5.7$, $p = 0.02$)			Those who had a previous Pap smear were significantly more likely to attend second round screening **Breast screening (+)**
*Burton *et al.* (1998)[123] 1383 med Cohort (retrospective)	No definite figures were given for totals approached, just proportions willing to participate	80 attenders were interviewed (75% of those approached), 28 non-attenders (10%), 39 ambivalent attenders (20%) [Psychological measures were collected using a questionnaire (90%, 89% and 82% response rates respectively)]	**Breast screening**: non-attenders at mammography had the longest interval since last smear test, with a mean ± SD of 7.17 ± 1.34 years, attenders of 5.49 ± 0.77 years and ambivalent attenders of 3.67 ± 1.09 years. These differences were not significant at $p < 0.01$	**Knowledge of cervical screening**: there was no difference in knowledge of smear tests, due to the vast majority knowing what there are: 79/80 (99%) attenders, 28/28 (100%) non-attenders and 37/39 (95%) ambivalent ($p > 0.01$)	Vastly different response rates in the three comparison groups. Proportions visiting GPs: only seemed to be two options (within the past month or more than 1 year ago). Percentages added to 100% within the screening groups, but it seems a little unlikely that no-one saw a GP between 1 and 12 months previously Significance levels are set at 0.01 for this study	Women who did not attend for mammography had the longest duration since last cervical smear (although not significant) Knowledge of cervical smears was high, with no observed differences in the three groups **Breast screening (ns) Knowledge of cervical screening (ns)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Calnan (1984)[144] 7500 med Nested cohort	BSE district $N = 825$ Breast screening district $N = 854$	BSE district Interview rate 678/825 (82.2%) Attendance rate 305/678 (45.0%) Small difference in participation rates in the interview study between attenders and non-attenders (no detail presented) Breast screening district Interview rate 654/854 (76.6%) Attendance rate 471/654 (72.0%) Attenders interviewed 84% Non-attenders interviewed 64%	**Breast screening**: attenders at breast screening were more likely to have ever had a cervical smear ($\chi^2_{(3)} = 22.5, p < 0.001$) than non-attenders **Attendance at BSE class**: those who attended the BSE class were more likely to have ever had a cervical smear ($\chi^2_{(3)} = 25.7, p < 0.001$) than non-attenders			Attenders at breast screening and the BSE class were more likely to have had cervical screening than non-attenders **Breast screening (+) Attendance at BSE class (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Calnan (1985)[164] 7393 med Cross-sectional	Response rate 2084/2524 (82.6%)		**Breast screening**: Breast screening showed an association with cervical screening ($r = 0.20$, $p < 0.001$) **Preventive behaviour**: cervical screening showed an association with dental check-ups ($r = 0.18$, $p < 0.001$), dietary practice ($r = 0.13$, $p < 0.001$), exercise ($r = 0.12$, $p < 0.001$), smoking behaviour ($r = 0.07$, $p < 0.01$) and use of seatbelts ($r = 0.10$, $p < 0.001$)		Temporal nature of the association is unclear Interviews carried out in 1980, which was 8 years before the breast screening programme was introduced. The cervical screening programme was running, but it was chaotic	There were moderately positive associations between various preventive health behaviours **Breast screening (+)** **Other preventive health behaviours (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Carney *et al.* (1992)[246] 4829 med Cohort	718/1085 (66%)	Participants: 471/750 (63%) Comparison group: 247/335 (74%)	Health behaviours of participants before and after the programme: 		Before	After
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Pap test	40.2%	60.3%
Regular BSE	52.0%	61.9%
Regular healthcare provider	63.5%	77.8%	 (All significantly different at $p < 0.001$) Health behaviours of participants vs comparisons within the past 2 years: 		Participants	Comparison
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Pap test	60.3%	75.6%
BSE	61.9%	63.5%
CBE	71.5%	84.5%
Mammography (aged $\geq$ 50, within the past year)	48.5%	54.6%
Regular healthcare provider	77.8%	88.2%	 Pap smear and regular healthcare provider data were significantly different ($p < 0.001$), and CBE was significantly different ($p < 0.01$)		Impossible to determine whether outcomes are related to cervical screening or the education session or a combination	Results indicate that women who participated in the original project received significantly more preventive healthcare services (Pap smear, BSE, use of regular healthcare provider) after the programme than before. At the time of follow-up, the comparison group was significantly more likely to obtain a Pap smear, see their regular healthcare provider and have a CBE than the participants. The authors suggest that this may be because the participants had received the Pap test 2 years before. There was no significant difference with respect to BSE and mammography behaviour The authors conclude that having a regular healthcare provider was the most significant characteristic associated with obtaining indicated preventive services **Reattendance (+)** **BSE (+)** **Regular healthcare provider (+)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**	**Notes**	**Summary**
*Clark *et al.* (1998)[191] 120 psy Cross-sectional	$N = 1323$ Response rate 73.5% Least committed $N = 120$ Contemplator/ inconsistent $N = 212$ Action $N = 238$ Maintenance $N = 754$		Positive behavioural indicators within stages of adoption of breast screening: Least committed (precontemplation, relapse, relapse risk) group: Pap smear within 2 years ($\beta = 0.17$, $t = 2.24$, $p < 0.05$)		No socio-demographic data presented on participants	Pap smear use within the previous 2 years was associated with adoption indicators for screening in the least committed breast screening group **Breast screening (+) (subgroup only)**
*Cockburn *et al.* (1997)[153] 2105 med Cohort	668 women interviewed before first round of screening. 315 attended first round of screening	Not stated	**Breast screening**: effect of previous use of Pap smears on reattendance for second round breast screening: an up-to-date Pap history was not associated with reattendance (data not shown)			Pap test history was not significantly related to reattendance at breast screening (data not shown) **Breast screening (ns)**
Cummings *et al.* (2000)[253] 36 emb Cross-sectional	2500 households surveyed 843 women eligible		**Breast screening**: Association between Pap smear and completed mammography: had Pap smear: 78.9% completed mammography; not had Pap smear: 21.4% completed mammography ($p < 0.001$, χ^2 test); logistic regression: OR = 2.56 (95% CI 1.50 to 4.37, $p < 0.001$)		Reported association with age, race, education, health insurance and physician	Data obtained from other studies Having a Pap smear is a significant predictor of breast screening **No comparison** **Breast screening (+)**

Appendix 9 cont'd Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Eger and Peipert (1996)[243] 2366 med Case–control	179/200 (89.5%) For 21 women adherence status could not be ascertained	Adherent N = 93 Non-adherent N = 86	**Adherence to follow-up (severity of lesion)**: women who were non-adherent with follow-up colposcopy were less likely to have high-grade lesions than women who were adherent (OR = 0.34, 95% CI 0.13 to 0.85, p = 0.01) **Adherence to follow-up (test result)**: based on review of 80 charts, baseline non-adherence was 23%			Women who adhered with follow-up recommendation were more likely to have high-grade lesions 77% of women were adherent with follow-up **No comparison** **Positive test result associated with:** **Adherence with follow-up (–)** **Comparative** **Severity of lesion associated with adherence:** **High grade lesions (+)**
*French et al. (1982)[158] 7716 med Cohort	115/200 (57.5%)	Attenders 61/90 (67.8%) Non-attenders 54/110 (49.1%)	**Breast screening**: more attenders than non-attenders at mammographic screening had cervical smears (84 vs 65%); more attenders at breast screening had smears at their own request (20 vs 9%) (Reviewer calculated $\chi^2_{(1)} = 5.36$, p = 0.021)			Attenders for mammography were more likely to have had cervical smear tests **Breast screening (+)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Funke and Nicholson (1993)[245] 4169 med Cohort	2050 women considered eligible 272/292 (93.2%) attended clinic during study period and complete questionnaire (13% of total eligible women)	29/272 (11%) non-adherent with follow-up recommenda-tions		No significant differences related to perceived susceptibility, perceived benefits or perceived barriers with two exceptions. **Uncertainty about test result**: women who agreed with the statement, "The uncertainty about my Pap test makes me nervous" were more than 4 times more likely to adhere with recommendations than women who disagreed with the statement (logistic regression $t = -2.104$, $p < 0.0418$) **Being able to cope**: women who agreed with the statement, "I have not been able to cope with my abnormal Pap test" were approximately 3 times as likely not to adhere than women who disagreed with the statement (logistic regression $t = 2.122$, $p < 0.0401$)	No description of participants. Small non-adherent group	There were no significant differences between the adherers and non-adherers with two exceptions: uncertainty about the test increased compliance and not being able to cope decreased compliance **Adherence with follow-up:** **Uncertainty about test result (+)** **Being able to cope (+)** **Perceived susceptibility (ns)** **Perceived benefits (ns)** **Perceived barriers (ns)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**	**Notes**	**Summary**
*Gnanadesigan et al. (2000)[173] 1 psy Cross-sectional	Response rates not given *N* = 610	Response rates not given Sample consisted of 525/610 (86.1%) who had ever had a mammogram and 375/610 (61.5%) who were current users of mammography	**Breast screening**: in the adjusted analyses, significant associations ($p < 0.05$) were reported between ever having a mammogram and: Pap smear (ever) OR = 16.00 (95% CI 4.32 to 59.20); Pap smear (every 3 years until age 65) OR = 2.57 (95% CI 1.10 to 6.01) Significant associations were reported between current mammography use and: Pap smear (ever) OR = 6.11 (95% CI 1.03 to 36.23) No significant association was observed between current mammography use and Pap smears use		Unclear temporal relationship	The strongest association with mammography use (ever and current) was ever having had a Pap smear Ever mammography use was associated with Pap smears (every 3 years until the age of 65), but was not associated with current mammography use **Breast screening (+)**
*Gordon et al. (1991)[114] 5165 med Cross-sectional	143/200 (72%) participated	Not known	**Intention to attend breast screening**: in the 'No' group (women who did not intend to participate in breast screening), 43% of women had never had a Pap smear compared with 5% in the 'Yes' group (women who intended to participate in breast screening) ($p = 0.001$)		Had to extract (guess) figures from a graph	Having had a Pap smear was associated with increased intention to attend the mammography programme **Breast screening intention (+)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Hernandez-Hernandez et al. (1998)[232] 732 emb Cross-sectional	N = 1215 Non-response rate 2.7%	Non-users 273/1215 (22.5%) Misusers 511/1215 (42.1%) Adequate users 431/1215 (35.5%)	The length of time since last Pap test was significantly different between adequate users and misusers: having a Pap test $\leq$ 3 years ago, adequate users vs misusers (98.6 vs 34.1%), Pap test 4–5 years ago (1.4 vs 39.7%) and 5 years ago (0 vs 26.2%) (χ^2 = 421, $p < 0.001$) (This would be true by definition) **Use of GP services**: in comparing non-users and misusers of Pap testing in terms of number of visits to medical centres per year, the fewer the number of visits per year the less likely Pap testing was (0–1 visits, OR 1.4, 95% CI 0.9 to 2.0). Non-users compared with adequate users had the same trend (0–1 visits, OR 2.0, 95% CI 1.3 to 3.0)	**Knowledge of cervical screening**: among the 942 women who had had a previous Pap smear, 97.2% women knew of the Pap test, while 57.1% of non-users knew of it (OR = 18.9, 95% CI 11.5 to 31.1) **Benefits of cervical screening**: there was no significant difference between the misuse and adequate groups in understanding the benefits of the Pap test (96.7 vs 97.7%, χ^2 = 1.3, $p = 0.2$) **Reasons for not having a Pap smear**: Indifferent attitude 37.7% Fear 13.9% Ignorance about test 42.9%	Mainly reports social, reproductive and health service factors associated with non-use of Pap test Temporal relationship is unclear	Women who had had a smear test were more knowledgeable about the test than those who had not had a smear test. There were no significant differences between the misuse and adequate groups in their understanding the benefits of Pap testing. Fewer visits to medical centres were associated with non-use of Pap testing **Use of GP services (+)** **Benefits of cervical screening (ns)** **Knowledge of cervical screening (+)**
Hobbs et al. (1980)[250] 8066 med Cohort (retrospective)	250/276 (90.6%)	Attenders: 100/100 (100%) Non-attenders: 100/126 (79.4%) Self-referred: 50/50 (100%)	**Breast screening**: 77/100 (77%) rejectors of the breast screening invitation had never had a Pap smear, compared with only 5/50 (10%) of the self-referred group and 59/100 (59%) accepters			Women who refused the offer of screening mammography were significantly less likely to have had a previous Pap smear compared with attenders. The proportion who have had a Pap smear was significantly higher in women who self-referred for mammography **Breast screening (+)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Kee *et al.* (1992)[116] 4667 med Cohort	600/766 (78.3%)	Breast screening attenders 300/325 (92.3%) Breast screening non-attenders 300/441 (68.0%)	**Breast screening**: attendance status for breast screening (as predicted by cervical screening status in women without hysterectomies): 153/223 (68.6%) attenders had a smear in previous 5 years compared with 85/183 (46.4%) non-attenders (reviewer RR = 1.48, 95% CI 1.23 to 1.77, *p* < 0.00001)			Women who had undergone a cervical smear test in the previous 5 years were 50% more likely to attend for mammography than those who did not have a smear **Breast screening (+)**
Lagerlund *et al.* (2000)[249] 193 med Cohort	949/1199 (79.1%)	515/581 (88.6%) breast screening attendees 434/618 (70.2%) non-attenders for breast screening	**Breast screening**: never versus ever had a smear test to predict non-attendance for breast screening: 8/507 (1.6%) breast screening attendees had never had a cervical smear compared with 38/392 (9.7%) of breast screening non-attenders. The OR for non-attendance (adjusted for age) was 5.57 (95% CI 2.53 to 12.25) When this was adjusted for all other variables that were significant in the univariate analysis this OR became 3.89 (95% CI 1.65 to 9.18)		The main aspect of the paper was examining factors predictive of having a mammogram. Only one variable (previous smear test) was relevant for the purposes of this review	Women who had never had a cervical smear were significantly more likely to be non-attenders for breast screening **Breast screening (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Lancaster and Elton (1992)[247] 4652 med Randomised intervention trial	Women invited for breast screening $N = 2131$ Uptake rate 1025/1912 (54%)	No follow-up rate Cohort consisted of: Group 1: attended breast screening 506/965 (52.4%) Group 2: Attended breast screening 519/947 (55%)	**Breast screening**: there were no significant differences in attendance at breast screening compared with whether or not women had received an invitation for cervical screening with their invitation for breast screening Previous cervical screening in women attending breast screening: of the women attending breast screening ($N = 957$), 690 (72%) had a smear test in the previous 5 years, 69 (7%) had a smear test 5–10 years ago, 29 (3%) > 10 years ago, and 169 (18%) had no cervical smear record Attendance at cervical screening for women who attended breast screening: 131 (26%) women in group 1 who were sent a cervical screening invitation letter in advance had a cervical smear, whereas only 62 (12%) of those in group 2 who were not invited in advance attended the clinic ($\chi^2 = 31.64$, $p < 0.001$) Of the women who had cervical screening 85/193 (44%) had not had cervical screening in the past 5 years		Poor uptake rates. Lacking information on characteristics of participants	There was a significant positive increase in the uptake of cervical screening in the women who received an invitation for cervical screening with their breast screening invitation. Of the women who did accept the invitation to have cervical screening, slightly less than half of them had not had a cervical screen in the past 5 years **Breast screening (+)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**	**Notes**	**Summary**
Larsen and Olesen (1996)[233] 2322 med Case–control	Cohort of 133,500 women aged 23–60 years 1984/2902 (68%) of the invited women returned a questionnaire Non-attenders 1502 randomly selected and age-matched to 1400 attenders Response rates: Attenders 81% (80% active attenders, 80% passive attenders) Non-attenders 53% (43% never attenders, 53% ever attenders)	Active attenders $N = 567$ Passive attenders $N = 551$ Never attenders $N = 111$ Ever attenders $N = 578$ Response rate 53%	**Use of GP services**: passive attenders compared with active attenders had fewer consultations in the previous year and were less likely to smoke (both ns) **Smoking**: never attenders compared with ever attenders had fewer consultations in the previous year ($p < 0.001$) and were less likely to smoke (ns)		Not reported whether matched analysis was used	There were no significant differences between passive and active attenders at cervical screening in terms of number of consultations and smoking status. Never attenders were less likely to consult their GP than ever attenders **Smoking (ns) Use of GP services (+)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Lerman *et al.* (1990)[235] 6003 med Cross-sectional	$N = 141$ < 5% refusal rate	Screened < 3 years ago 120/141 (85%) Screened > 3 years ago 21/141 (15%)		**Efficacy of cervical screening/ reassurance**: women who had been screened in the past 3 years, compared with > 3 years ago, believed that screening is effective ($\chi^2 = 6.1$, $p < 0.01$) and that it was "worth it to make sure that nothing is wrong" ($\chi^2 = 9.9$, $p < 0.002$) **Perceived susceptibility to cervical cancer**: there was no significant statistical difference between women who had been screened in the past 3 years, compared with > 3 years ago, in terms of greater perceived risk for cervical cancer ($\chi^2 = 2.7$, $p > 0.1$) Women who were worried about finding cervical cancer were significantly less likely to have had a Pap test within the past 3 years ($\chi^2 = 6.2$, $p < 0.01$) Significant variables for the number of Pap tests ever had: **Fear of cancer and embarrassment**: women who were worried about finding cervical cancer ($r = -0.31$, $p < 0.006$) and those who thought that Pap tests are embarrassing ($r = -0.30$, $p < 0.003$) had significantly fewer tests than those who did not hold these beliefs **Efficacy of cervical screening**: women who believed that Pap tests are effective had a significantly greater number of Pap tests than other women ($r = 0.25$, $p < 0.04$)	Small sample of women screened > 3 years ago Recruitment of women not described	Belief in the efficacy of Pap tests and the benefits of screening are positively associated with cervical screening. Fear of finding cancer and belief that Pap tests are embarrassing were negatively associated with screening. Perceived susceptibility to cervical cancer was non-significant **Efficacy of cervical screening (+)** **Reassurance (+)** **Less fear of cancer (+)** **Less embarrassment (+)** **Perceived susceptibility to cervical cancer (ns)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
Lerman *et al.* (1991)[244] 5371 med Cohort	70% response rate *N* = 224 Negative cervical test *N* = 106 Positive cervical test *N* = 118 (65% complied with referral to colposcopy)		Most women had previous smear tests. There was no difference between the groups	Women with positive results were more likely to: report impairment of daily activities (8.3 vs 2.8%, *p* = 0.02), report impairment in sexual interest (50.0 vs 31.4%, *p* = 0.01), report sleep disturbance (40.5 vs 25.7%, *p* = 0.04) and worry about cervical cancer (29.8 vs 14.1%, *p* = 0.002) Tension: there were no significant differences between the women in terms of tension (29.8 vs 23.5%, ns) Mood: women with positive results were more likely to report their mood as bad (23.5 vs 5.7%, *p* = 0.01) When the results were adjusted, women with positive results who did not comply for referral to colposcopy were worse than the women with negative results for worries, impairment of daily activities, mood, sexual interest and sleeping. Women with positive results who complied with referral to colposcopy were only worse than women with negative results in terms of impairment of daily activities and sleep	Participants not generalisable	Women with positive smear results had heightened worries about cervical cancer and worsened moods compared with women with negative results. However, women who had been for colposcopy did not exhibit heightened worry or disturbance of sleep or sexual interest compared with women with negative results. Women who did not comply with follow-up had more negative psychological responses. Completion of follow-up may reduce the uncertainty and uncontrollability surrounding positive diagnosis **Positive test results associated with: Impairment of daily activities (–) Impairment of sexual interest (–) Sleep disturbance (–) Worry (–) Mood (–) Tension (ns) Non-adherence with follow-up for positive test results associated with: Impairment of daily activities (–) Impairment of sexual interest (–) Sleep disturbance (–) Increased worry (–) Worse mood (–) Adherence with follow-up for positive test result associated with: Impairment of daily activities (–) Sleep disturbance (–)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
McKee *et al.* (1999)[241] 967 med Cross-sectional	202/279 (72.4%)		**Adherence with follow-up**: attendance at colposcopy 151/202 (74.8%) **Adherence with follow-up (severity of lesion)**: Attendance at colposcopy by grade of lesion: 152 women with low-grade lesions attended (72% adherence rate); 38 women with high-grade lesions attended (87%) ($p = 0.06$) (note: underpowered to detect difference owing to small sample size)	**Knowledge of result**: women who reported not knowing the result of their Pap test (14% of respondents) were less likely to attend the colposcopy appointment than women who knew the result of their Pap test (36 vs 81%, $p = 0.001$) Report results incorrectly or correctly: women who reported their results correctly as abnormal smears were more likely to have had colposcopy (83 vs 59%, $p = 0.02$) than women who incorrectly reported that they had normal results **Other health beliefs**: there were no statistically significant associations between women attending or not attending colposcopy who believed or did not believe the following concepts: Staying healthy is matter of luck Fear of cancer Belief in early detection Need follow-up only if sick Pelvic examinations are embarrassing	Non-participants were similar in severity of Pap smear result Possible recall bias in that there was a range of 17–47 months from Pap smear to interview Temporal relationship not clear for knowledge of the result outcome	25% of women did not attend for colposcopy. Women who did not know or did not understand the result of their Pap test were very likely not to attend colposcopy. There did not appear to be any association with attitudes or beliefs Women with high-grade lesions were more likely to attend for colposcopy (only approached significance) **No comparison Adherence with follow-up colposcopy (–)** **Comparative Severity of lesion associated with adherence: Grade of lesion (+)** **Positive test result associated with: Knowledge of result (+) Other health beliefs (ns)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Mandelblatt et al. (1993)[145] 4360 med Cohort	N = 647 N = 476 women included in study 445/476 (93.5%) consented to interview Final study group 271/445 (60.9%) women offered screening	Participants 190/271 (70.1%) Non-participants 81/271 (29.9%)	**Reattendance (breast and cervical screening)**: there were no significant differences between participants and non-participants with respect to prior use of screening (no data presented) **Intention (breast and cervical screening)**: stated intent was a significant independent predictor of participation. Those who intended to have a mammogram and/or Pap test were 2.7 times more likely (95% CI 1.4 to 4.9, $p = 0.01$) to participate than women who did not intend to participate Having a history of a recent Pap smear ($\leq$ 4 years) or recent mammogram ($\leq$ 2 years) was not significantly related to participation	**Knowledge/perceived susceptibility/perceived benefits**: there were no significant differences between participants and non-participants with respect to health beliefs (knowledge, perceived susceptibility to breast or cervical cancer, perceived benefit of early detection) (no data presented)	Participants were elderly, black, low socio-economic status women They had to attend the clinic to be offered mammography Data on some of the outcomes of interest not presented	Recent use of cervical screening and mammography screening were not significantly related to participation. Intention was a significant predictor of participation. There were no significant differences in terms of prior use of screening or health beliefs between the participants and non-participants **Reattendance (ns) Breast screening (ns) Intention (breast and cervical screening) (+) Knowledge (ns) Perceived susceptibility (ns) Perceived benefits of early diagnosis (ns)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Melnikow *et al.* (1999)[242] 579 med Cohort (retrospective)	243/352 (69.0%) medical records reviewed	Follow-up rates not given. Sample consists of: Women referred for repeat smear 153, ASCUS 129 (84.3%), LGSIL 19 (12.4%), HGSIL 0 Women referred for colposcopy 90, ASCUS 25 (27.8%), LGSIL 54 (60.0%), HGSIL 10 (11.1%)	**Overall adherence to recommended follow-up**: repeated Pap smear 81/153 (52.9%), colposcopy 55/90 (61.1%) (OR = 1.4, 95% CI 0.80 to 2.46, $p = 0.22$) **Adherence to recommended follow-up (severity of result)**: women with ASCUS were more likely to comply with colposcopy (20/25, 80%) than repeated Pap smear (64/129, 49.6%) (OR = 4.06, 95% CI 1.44 to 11.48) (hazard ratio = 2.67, 95% CI 1.22 to 5.86) Women with LGSIL or HGSIL were less likely to comply with colposcopy (35/64, 54.7%) than repeated Pap test (14/19, 73.7%) (OR = 0.43, 95% CI 0.14 to 1.34) (hazard ratio = 0.37, 95% CI 0.14 to 0.99) Women with LGSIL or HGSIL were more like to attend any appointment than ASCUS (hazard ratio = 3.59, 95% CI 1.40 to 9.25)		Unsure whether this was the first abnormal result for these women Relatively small sample sizes Authors note that women with ASCUS may have already had a repeat smear and therefore may represent a more adherent group of women	Adherence for repeated Pap smear was 53% and for colposcopy was 61% Women with more serious abnormalities on their smear test were less likely to attend for colposcopy than for a repeated smear Women with ASCUS were more likely to attend for colposcopy than for a repeated Pap smear Women with high-grade lesions were more likely to attend any appointment than women with ASCUS **Positive test result associated with: Overall adherence with either type of follow-up (–) Overall adherence for more severe result (+) Adherence with either type of follow-up based on severity of result (–)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	**By comparison groups**	**Health behaviours**	**Health beliefs**		
*Montano and Taplin (1991)[122] 5523 med Cohort	N = 946 (939 valid addresses)	683/939 (72.7%)	**Breast screening**: the number of Pap tests in the previous 4 years had a significant correlation with participating in screening ($r = 0.14$, $p < 0.001$); however, Pap tests did not appear in multiple regression of participation on TRA and other variables as they did not add anything to the TRA model (i.e. difference in Pap use is explained by the TRA variables)		Authors note that only 26% of the sample had ever had a mammogram, so few women had developed a habit	Previous Pap tests had a significant correlation with participation in breast screening, however, Pap tests do not appear in multiple regression of participation on TRA and other variables, as they did not add anything to the TRA model (i.e. difference in Pap use is explained by the TRA variables) **Breast screening (ns)**
*Mootz et al. (1991)[136] 5487 med Cohort	Not given	213/347 (61.4%) of non-adherent group answered questionnaire Response rate for adherent women not given. 275 were randomly selected and completed questionnaire	**Breast screening**: non-significant results were obtained for attenders vs non-attenders for mammography screening for Pap smear use within the past year (64.4 vs 66.4%)		73% of non-attenders women had previously been screened There were differences in occupation, with the attenders reporting more skilled or professional jobs ($\chi^2 = 6.70$, $p < 0.05$), and income levels, with attenders reporting higher income levels ($\chi^2 = 15.91$, $p < 0.005$)	There was no significant difference between attenders and non-attenders in terms of having had a Pap smear in the past year **Breast screening (ns)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Morrison (1996)[166] 289 psy Cross-sectional	204/206 (99%)	Not given	**BSE behaviour**: previous Pap smear behaviour and previous mammogram were not related to BSE behaviours (data not given)			Previous Pap smear and previous mammography were not related to BSE behaviours **BSE (ns)**
Nicoll *et al.* (1991)[236] 5339 med Cross-sectional	Stratified random sample of 1416 women was sent a questionnaire	Participant rate not given Sample consists of: Attenders 381/1416 (27%) Defaulters 492/1416 (35%) Non-attenders 543/1416 (38%)		**Intention to have cervical screening**: 99% of attenders, 92% of defaulters and 76% of non-attenders were willing to have a test in the future (reviewer calculation $\chi^2_{(2)} = 122.34, p < 0.0001$) **Knowledge of cervical screening**: 47% of attenders, 26% of defaulters and 31% of non-attenders had good knowledge of the smear test ($p < 0.001$) (based on Likert scale of good, fair and poor knowledge)	Do not know whether the knowledge was gained during attendance, or whether good knowledge led to attendance. Surprising that the defaulters had a poorer knowledge rating than the non-attenders. If knowledge was gained as part of screening, they would be expected to have greater knowledge than the non-attenders, unless they were given poor information as part of screening	Women who had previously attended were more likely to intend to go for cervical screening again than those who had not had cervical screening Significant differences in the level of knowledge of the smear test exist, with more attenders having good knowledge. Overall, the level of knowledge was low, only 47% of attenders knowing that the smear test was a preventive measure (therefore need for improved health education) **Intention to reattend (+) Knowledge of cervical screening (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Nugent and Tamlyn-Leaman (1992)[237] 1452 cin Cross-sectional	*N* = 149 Response rate not stated			**Knowledge**: 39.6% of women did not know the location of the cervix 44.3% did not know the site of sample procurement for a Pap test 51.7% had some understanding of an abnormal Pap result; 38.9% did not have a clear understanding of an abnormal result 84.6% had no understanding of the relationship between an abnormal Pap result and disease of the cervix or vagina 32.4% had no knowledge of the main reason for colposcopy, 40.5% had some knowledge and 27% had good knowledge	Not sure whether the questionnaire was validated	Many women who were attending colposcopy did not have good knowledge about Pap smears, abnormal results or colposcopy **No comparison Positive test result associated with: Knowledge (–)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Orbell *et al.* (1995)[234] 2989 med Case–control	Non-screened women N = 475 (uncleaned N = 660) Screened women N = 376 (uncleaned N = 417) Overall response rate 72% (different from paper)	Non-screened women interviewed 307 (65%, different from paper) Screened women 307 (82%)	**Smoking**: there was no association between screening status and smoking status	**Perceived risk**: non-screened women were less likely to believe that they were at risk of cervical cancer or that they needed a test ($\chi^2 = 224.7$, $p < 0.01$) **Embarrassment**: non-screened women were more likely to anticipate embarrassment during a future test ($\chi^2 = 106.9$, $p < 0.01$) **Likelihood of positive result/belief that problems will be cured**: there was no significant difference between screened and non-screened women regarding the likelihood of a positive result (both 21%), or the belief that problems will be cured (80 vs 74%) **Peace of mind**: screened women were more likely to feel that the test would be beneficial in giving them peace of mind compared with non-screened women (96 vs 67%, $\chi^2 = 83.42$, $p < 0.01$) **Intention to attend**: non-screened women were significantly more likely to believe that embarrassment (43 vs 3%), anxiety (42 vs 3%) and discovery of early changes (26 vs 1%) would influence their intention to attend screening in a negative manner ($p < 0.01$)		There were significant differences between screened and non-screened women in embarrassment, perceived benefit and risk perception. There were no significant associations with likelihood of a positive result or belief that problems can be cured. Smoking was not associated with screening status **Smoking (ns)** **Perceived risk (–)** **Less embarrassment (+)** **Peace of mind (+)** **Likelihood of positive result (ns)** **Belief that problems will be cured (ns)** **Intention to attend (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Pearlman *et al.* (1996)[161] 2359 med Cross-sectional	8965 women aged 40–75 from a large national survey of 40,104 adults 8965/9219 (97.2%) could have mammogram usage status assessed	6521 were classified as non-users or under users of mammography (72.7% of sample) 2444 were adherent Intention N = 4481 (49.9% of sample)	Logistic regression model for not mammography screened routinely (N = 8849): the following covariates are associated with not being routinely screened: CBE and Pap test: one test ≤ 1 year and other test ≥ 2 years ago (β = 0.56, OR = 1.76, 95% CI 1.46 to 2.11, $p \leq 0.01$) Had both tests CBE and Pap test ≥ 2 years ago (β = 2.26, OR = 9.57, 95% CI 7.72 to 11.86, $p \leq 0.01$) Logistic regression model for not intending to be mammography screened routinely (N = 4437): owing to the temporal relationship, the only variable applicable to this review is: CBE and Pap test: one test ≤ 1 year and other test ≥ 2 years ago (β = –0.04, OR = 0.96, 95% CI 0.71 to 1.31, $p > 0.05$) Had both tests CBE and Pap test ≥ 2 years ago (β = 0.58, OR = 1.78, 95% CI 1.43 to 2.23, $p \leq 0.01$)		Study only includes women who had a previous mammogram for routine purposes; however, it is not clear whether cost of mammogram would have been a factor	Less frequent users of mammography were more likely to have had their last CBE and/or Pap test < 1 year and the other > 2 years ago, and had both their last CBE and Pap test > 2 years ago Women not intending to be screened were more likely to have had both their last CBE and Pap test > 2 years ago **Breast screening (+) Breast screening intention (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Qureshi et al. (2000)[87] 238 emb Cross-sectional	Response rate to survey not given, but 18,245 women included in analysis	Response rates not given, but sample consists of: 11,509/18,245 (63%) who had a mammography within preceding 2 years and 6736/18,245 (37%) who had not had a mammography within preceding 2 years	**Breast screening**: **Univariate analysis** (results presented as mammography < 2 years, mammography > 2 years) Pap smear < 3 years 11063 (71%), 4596 (29%); Pap smear > 3 years 412 (16.2%), 2077 (83.8%) ($p < 0.05$) **Multivariate analysis**: Pap smear within 3 years OR = 8.99 (95% CI 7.6 to 10.7); Pap smear never/> 3 years OR = 1.00 ($p < 0.05$)		Temporal relationship issues One part of the analysis was incorrect	Women who had had a mammography in the preceding 2 years were significantly more likely to have had a Pap smear in the past 3 years compared with those who had not had a mammography in the preceding 2 years **Breast screening (+)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Rajaram *et al.* (1997)[230] 759 cin Qualitative	13 women			**Ability to distinguish between precancerous and cancerous state** and belief about prognosis: "I don't want to go through a colposcopy done one, two or more times a year … if it just keeps coming back and they can't exactly explain where it comes from or why or how … if I go back in four months and it comes back abnormal again and I have to go through all this again …" Process of contextualising and integrating the diagnosis by becoming more knowledgeable about their condition: "And then I kind of did a little bit of research on my own and found an article in the paper, in a magazine, and that actually made me feel more comfortable. It didn't explain the procedure, but it detailed some of the abnormalities and what they mean. And what can cause it …. It put me a little bit more at ease. It explained the abnormal cells and the different things" A 19-year-old woman diagnosed with severe dysplasia, explained the potential seriousness of her		Women who had had an abnormal smear test and been for colposcopy were dealing with issues of perceived seriousness of their diagnosis, fear of cancer and searching for knowledge on their condition **No comparison** **Positive test result associated with:** **Faith in medicine** **Understanding precancerous and cancerous state** **Fear of cancer**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
				condition and her **fear of cancer**: "I get the test results back and then it's like abnormal. So then I was kind of freaking out like, oh gosh, you know, and I thought, oh gosh, I'm going to die or, you know, something like that. I've got cancer, I'm going to die. But then they told me that it wasn't that bad, but it wasn't that good" **Putting faith in medicine**: a 36-year old said: "He explained three different procedures that could be done to get rid of the dysplasia and what he recommended would be best for me, and so I followed his advice. I was told that was what was wrong with me and I believed them. I mean because you believe doctors" Another woman was disappointed that medicine was not able to provide her with definite answers about the cause of her abnormal Pap, but believed that, "doctors would catch it in time and do what they would have to do"		

Appendix 9 cont'd   *Cervical screening: summary of study results*

| Author(s) (year) ID no. Study design | No. of participants and follow-up rate | | Main results | | | |
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
*Rakowski et al. (1993)[118] 4128 med Cross-sectional	Total sample N = 10,950 After exclusions N = 9396 Data for bivariate and multivariate analysis N = 9107 9107/10,950 (83%)		**Breast screening**: Multivariate analysis: Ever had versus never had a mammogram: less recent Pap test (bivariate data) between 1 and 2 years (OR_{adj} = 0.36, 95% CI 0.31 to 0.42) and ≥ 3 years, never or don't know (OR_{adj} =0.13, 0.12 to 0.15) were less likely to have ever had a mammogram Mammogram in previous 2 years vs all others: results very similar to ever vs never Screened and plans to continue vs all others: results very similar to ever vs never No intention vs screened and will continue: less recent Pap test (bivariate data) between 1 and 2 years (OR_{adj} =0.18, 95% CI 0.14 to 0.23) and 3 ≥ years, never or don't know (OR_{adj} =0.05, 0.04 to 0.06) were less likely to be regularly screened Screened and intends to continue vs risk of lapsing: less recent Pap test (bivariate data) between 1 and 2 years (OR_{adj} =0.71, 95% CI 0.54 to 0.93) and ≥ 3 year, never, don't know (OR_{adj} =0.75, 0.59 to 0.95) were less likely to intend to be screened			Women with more recent Pap tests were more likely to undergo regular mammography screening **Breast screening (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Rakowski et al. (1995)[162] 3140 med Cross-sectional	Original data set was 40,104 people, aged ≥ 18 years This study uses a subsample of 3014	No response rates, but sample consisted of: Low resource group 1390/3014 (46.1%) High resource group 1624/3014 (53.9%)	**Breast screening**: **Mammography in the past 2 years**: Low resource women: Multivariate analysis indicated strong associations with breast screening in the past 2 years for recency of a Pap test and recency of CBE. A Pap test in the past year was associated with a higher likelihood of screening. The rate of screening then decreased notably for the periods of 1–2 years and ≥ 3 years since having had a Pap test ($OR_{adj} = 0.50$ and 0.40, respectively) High resource women: Multivariate analysis indicated strong associations with recency of Pap test and recency of CBE. Having had either test 1–2 years before was associated with notably lower rates of screening compared with those who had the tests in the past year ($OR_{adj} = 0.39$ and 0.51, respectively) **Mammogram on schedule (both past behaviours and intention)**: Low resource women: Pap testing was not associated with past screening and future intention High resource women: Multivariate analysis indicated strong associations of screening rates with recency of Pap test and recency of CBE. Having had either test 1–2 years before was associated with notably lower rates of screening compared with those who had the tests in the past year ($OR_{adj} = 0.38$ and 0.51, respectively)			Recency of Pap test is a strong correlate of screening mammography for both low- and high resource women **Breast screening (+)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results			
	Total	By comparison groups	Health behaviours	Health beliefs	Notes	Summary
Ravaioli *et al.* (1993)[238] 4202 med Cross-sectional	*N* = 1543		**Reattendance**: Previous Pap tests: 86% had previous Pap tests, 12% did not have a previous Pap test Frequency of Pap test: 57% every year, 23% every 2–3 years, 14% every 5–10 years, 6% did not respond **Breast screening**: 60% accepted further breast examinations/mammography 25% of the women informed of breast screening did not ask for screening	Reasons for not having had a Pap test: Fear of outcome 27% Neglect 26% Lack of symptoms 15%	Participants were women who spontaneously presented for Pap test. Unsure of response rate	Most of the women had had previous Pap tests and most had Pap test within 3 years from the last test. Many women who were offered breast screening accepted the offer; however, one-quarter of the women did not **No comparison Reattendance (+) Breast screening (+)**
Rodriguez et al. (1995)[147] 3139 med Cohort	**Enrolment study**: All women invited to first screening during 1989; response rate 93%, resulting in *N* = 256 **Adherence study**: Attenders at second round; response rate 82%, resulting in *N* = 490 Random sample of non-attenders at second round *N* = 150		**Enrolment in breast screening**: In the bivariate analysis, having cervical smears periodically was associated with increased enrolment (OR = 2.03, 95% CI 1.16 to 3.55) In the multivariate analysis, only the effect of mammography remained significant (OR = 6.45, 95% CI 3.35 to 12.42) **Breast screening**: bivariate analysis showed that having cervical smears periodically (OR = 0.21, 95% CI 0.13 to 0.33) was not strongly associated with adherence to breast screening. Multivariate analysis indicated that the effect of previous cervical screening was no longer significant			Previous cervical screening was associated with an increased likelihood of enrolment in a breast screening programme in the bivariate analysis. However, when an adjusted analysis was conducted the effect of cervical screening was not significant The multivariate analysis of the effect of cervical screening on adherence to breast screening showed no effect **Enrolment in a breast screening programme (ns) Breast screening (ns)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Ronco et al. (1994)[231] 3347 med Cross-sectional		99.5% (372/374) in attenders 77.6% (398/513) in non-attenders	**Reattendance**: previous Pap smear. No significant difference between women who had ever or never been screened before with respect to attendance in the pilot (OR = 1.19, 95% CI 0.86 to 1.65) However, women who had previously been screened, but > 3 years ago, were significantly more likely to attend for screening than women who had never been screened before (OR = 2.52, 95% CI 1.51 to 2.47). This OR decreased as the time since last smear decreased	**Reassurance**: women who reported that they felt anxious upon receiving the invitation to be screened were less likely to attend for screening than women who were reassured by screening. There was a dose–response relationship, with more anxious women being less likely to attend (OR = 0.05, 95% CI 0.01 to 0.23 for the most anxious group, and for mildly anxious OR = 0.85, 95% CI 0.57 to 1.27)	Temporal relationship difficult to assess	Overall previous Pap smear history was not related to attendance in this pilot scheme. However, women who had previously been screened, but some time ago, were significantly likely to be screened, whereas women who had been screened more recently (up to < 3 months ago) were increasingly less likely to attend for cervical screening when invited. *(This is probably due to perceiving that there is no need to repeat smears too often)* **Re-attendance (+)** **Reassurance (+)**
*Rutter et al. (1997)[138] 1090 emb Cohort	1555/2239 (69.5%) had responded to the initial questionnaire (baseline prescreening)	1335 of these attended first screening; 1196/1335 (90%) completed the questionnaire about attenders' responses to screening. Telephone interview with non-attenders (2–4 weeks after second routine screening 3 years later): 184/362 (51%)	**Breast screening**: previous (before first round) cervical smear was also significantly associated with attendance at second breast screen (yes 92.6, no or unsure 60.7, $\chi^2_{(1)} = 225.4, p < 0.001$) When attendance at the second breast screen was analysed using logistic regression, previous smear test was significant ($p < 0.01$) but previous mammography was no longer significant		The interviews with non-attenders were conducted retrospectively. They were asked to think back to the first round of screening 3 years previously to rate discomfort and pain	Previous screening (cervical smear and mammography) was a predictor of second round screening in univariate analysis, but only cervical screening was a significant predictor in the multivariate analysis **Breast screening (+)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Savage and Clarke (1996)[119] 249 psy Cross-sectional	170/250 (68.0%) (although authors state 71%)	None	**Intention to attend breast screening**: multiple regression analysis to identify correlates of intentions to obtain a mammogram accounted for 47% (adj) of the variability in mammography intentions ($p < 0.001$). The variables included previous mammography ($\beta = 0.21$) and Pap test history ($\beta = 0.20$) **BSE behaviour**: correlates of BSE intention did not include previous mammography or Pap test history			Previous mammography and Pap test history were significant predictors of mammography intention, but did not predict BSE intention **Breast screening intention to reattend (+) BSE behaviour (ns)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Seow et al. (1995)[239] 3141 med Cross-sectional	Overall response rate 528/640 (82.5%) 385/527 (73%) had ever had the test or had heard of the test Questionnaire administered to 385/385 (100%) women Women with a history of at least one Pap smear 296/385 (76.9%) Women who had never had a smear test 89/385 (23.1%)		**Intention to reattend**: future intention to attend cervical screening was associated with respondent's past smear history (prevalence RR = 1.71, 95% CI 1.20 to 2.42 for those women who had had a previous smear vs those who had not had one)	**Perceived susceptibility**: "I worry about cancer" (RR = 2.27, 95% CI 1.20 to 4.30) and "As likely to contract as others" (RR = 2.76, 95% CI 1.57 to 4.83) were significantly associated with future intent for those who had never had cervical screening. "Cancer is avoidable" (RR = 1.18, 95% CI 1.07 to 1.30) was significantly associated with future intent for those who had ever been for cervical screening **Perceived barriers to action**: "Belief in safety of procedure" (RR = 1.30, 95% CI 1.11 to 1.51) "Discomfort" (RR = 1.13, 95% CI 1.01 to 1.25) and "Embarrassment" (RR = 1.19, 95% CI 1.01 to 1.33) showed a weak, significant association with future intent for those who had ever been for cervical screening **Perceived benefits of action**: "Pap smear is effective" was significantly associated with future intent for those who had never had cervical screening (RR = 2.53, 95% CI 1.34 to 4.75) and for those who had ever had cervical screening (RR = 1.75, 95% CI 1.47 to 2.09) No other significant results were reported	Temporal relationship not clear for the health beliefs	Future intention to attend cervical screening was associated with respondent's past smear history for those women who had had a previous smear compared with those who had not had one **Intention to reattend (+)**

Appendix 9 cont'd   Cervical screening: summary of study results

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
Seow *et al.* (1997)[251] 1829 med Cohort (retrospective)	560/848 (66%)	Attenders 300/300 (100%) approached to take part in study Non-attenders 260/548 (47%)	**Breast screening**: ORs for attendance at mammography by preventive health behaviour and attitudes: Pap smear > 3 years ago OR = 3.6 (95% CI 2.3 to 5.6), Pap smear < 3 years ago OR = 3.9 (95% CI 2.5 to 6.2); never had mammography OR = 1.0, ever had mammography OR = 1.4 (95% CI 0.7 to 2.5) In the multivariate analysis of the likelihood for attendance, having had a Pap smear > 3 years ago had an OR_{adj} = 2.7 (95% CI 1.5 to 4.9), and having had a Pap smear < 3 years ago had an OR_{adj} = 4.7 (95% CI 2.6 to 8.7)			Having had a previous Pap smear was significantly associated with attendance for mammography. However, attendance for mammography was not associated with having had a previous mammogram **Breast screening (+)**

Slater (2000)[240]
 	
18 med
 	
Cross-sectional
	N = 300
	
	Response rate 83%
	
	Do not know whether 300 is the resultant or initial study size
				Knowledge:
				Main reason for a smear test:
				    prevent development of cervical cancer by finding early treatable abnormalities (96%)
				    detect cervical cancer (4%)
				
				If a test shows abnormal cells do you believe that the woman:
				    must have cervical precancer or cancer (3%)
				    may but not necessarily have cervical precancer or cancer (94%)
				    don't know (3%)
					No numerator/denominator data shown	Women with a positive Pap smear showed good knowledge of the purpose of the smear test and what abnormal cells mean
						
						No comparison
						Positive test result associated with:
						Knowledge (+)

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Sutton et al. (1994)[151] 3804 med Cohort	3291 women due for first round breast screening 1301 final sample	No data given by attendance status 731/977 (74.8%) interview sample interviewed 570/1600 (35.6%) returned questionnaires	**Breast screening**: Interview group: Overall, 646/731 (88.4%) women had a previous smear test and 566/731 (78%) had not had a mammogram Women with a previous smear were more likely to attend for breast screening than those without a smear. In the univariate analysis, 70% of women with a previous smear attended breast screening compared with 50% of those who had not had a previous smear (LR χ^2 $p = 0.0003$, OR = 2.36, 95% CI 1.49 to 3.75) ($N = 84/731$) In the multivariate analysis having a previous smear had an $OR_{adj} = 2.55$ (95% CI 1.06 to 6.13, $p = 0.0370$) Postal questionnaire group: In the univariate analysis, 78% of women with a previous smear test attended breast screening compared with 43% of those without (LR χ^2 $p < 0.000005$, OR = 4.70, 95% CI 2.82 to 7.83) In the multivariate analysis having a previous smear had an $OR_{adj} = 3.14$ (95% CI 1.52 to 6.49, $p = 0.0020$)		Crude OR are presented which overestimate the crude RR	Women who had had a previous smear test were more like to attend for breast screening **Breast screening (+)**

Appendix 9 cont'd   *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
*Vaile *et.al*. (1993)[120] 4368 med Cohort	Numbers in the paper are not consistent Approximately 65% to baseline questionnaire and 88% to second questionnaire		**Breast screening**: women with a previous smear history were more likely to attend for mammography: 1818 women had a previous smear and 241 had not 1553/1818 (85.4%) who had a smear attended for mammography, compared with 175/241 (72.6%) who had not. (Reviewer calculated RR = 1.18, 95% CI 1.09 to 1.27, $\chi^2 < 0.001$)		This paper looked at predictors of attendance for mammography. Many of the temporal relationships were incorrect for the review	Women were more likely to attend if they had previously had a smear test, but less likely if they had had a mammogram (authors state that this was due to having a recent mammogram) **Breast screening (+)**
Vogel *et al*. (1993)[252] 4376 med Cross-sectional	36,361/64,459 (56.4%)		**Breast screening**: time since previous Pap smear test for mammography users: <1 year 19083 (53.7%), 1–2 years 8606 (24.2%), >2 years 7497 (21.1%), never 340 (1.0%)		Low response rate. Participants were young and educated, responded to a media promotion and paid for the mammogram	99% of mammography users had a previous Pap smear test, with over half having had one in the past year **No comparison Breast screening (+)**

Appendix 9 cont'd *Cervical screening: summary of study results*

Author(s) (year) ID no. Study design	No. of participants and follow-up rate		Main results		Notes	Summary
	Total	By comparison groups	Health behaviours	Health beliefs		
White (1995)[229] 3143 med Qualitative	9/16 (56%)			**Knowledge**: all presumed that a cervical smear was to detect cancer "It's an early warning system … for cancer of the cervix" 3/9 believed cervical cancer could be detected before it developed 2/9 stated that cervical cancer was serious Most believed by the time cancer was found it was terminal		Small study that highlights cognitive, emotional and ego integrity barriers to regular cervical smears in older women
				Risk/cause of cervical cancer: uncertainty about risk among participants, but hypotheses were divided into two groups: Hereditary predisposition "I suppose there is a predisposition to cancer, or it might be hereditary" An active sexual life "could be sexually transmitted". Believed could be an allergic reaction to the mixture of different seminal fluids, belief that nuns and Jewish women were less likely to develop cervical cancer due to celibacy in the former and male circumcision in the latter		**No comparison** **Knowledge of reason for smear** **Knowledge of early detection** **Risk** **Cause of cervical cancer** **Delay** **Faith in medicine** **Age**
				Smoking was also mentioned as a potential trigger		
				Mostly women stated they did not know what caused cervical cancer, although a few hypothesised that it was already present in the body and that something aggravated it		
				Delay: all participants thought it was very important, but especially for younger women (because they have families). Comments as to why they had delayed included, "It's not going to happen to me" and "I haven't worried about it"		
				Other concerns: check-ups for skin cancer were seen as important as this was easy to treat Loss of faith in the medical profession Ageing: 'Is it worth it' attitude		

Feedback

The HTA Programme and the authors would like to know your views about this report.

The Correspondence Page on the HTA website (http://www.ncchta.org) is a convenient way to publish your comments. If you prefer, you can send your comments to the address below, telling us whether you would like us to transfer them to the website.

We look forward to hearing from you.