S2 Appendix 2. Characteristics of studies, Risk of bias assessment and reference list of studies included and excluded

Characteristics of included studies

Abdul Rashid, et al 2013

Methods	Design-RCT, computer generated number randomization into 1 of 4 groups, baseline comparability
Participants	Women aged 20-65 years, women who were due for repeat screening
Interventions	Personal letters (patient's identification card numbers, names and current addresses, the dates that they were supposed to repeat the screening, the list of clinics that they can go to and phone numbers that they can call to re-schedule appointment) were sent to eligible women through one of the following recall: Women in the personal letters group were sent a personal message through a postal letter Women in the registered letter group were sent same message through a registered letter Women in the SMS group were sent the same message through the SMS Women in the telephone group received the same message through a phone call
Outcomes	Percentage that had repeat Pap test
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization was done using computer-generated random numbers
Allocation concealment (selection bias)	Low risk	It is likely that allocation concealment was done since all the research participants were blinded to allocation to intervention or control

Blinding of participants and personnel (performance bias)	Low risk	All research participants were blinded
Blinding of outcome assessment (detection bias)	Low risk	Assessment of outcome was by documented evidence of repeat Pap smear, We judge that this objective outcome is unlikely to be influenced by blinding
Incomplete outcome data (attrition bias)	Unclear risk	No sufficient information to permit judgement
Selective reporting (reporting bias)	Low risk	All outcomes were reported
Other bias	Unclear risk	

Abdullah, et al 2013

Methods	Design-Cluster RCT, parallel group, unblinded, 1:1 randomization, baseline comparability between women in intervention and control groups
Participants	Female secondary school teachers who were either naive to Pap smear or had their last test more than 3 years prior to study Clusters were national secondary schools Kuala Lumpur, Malaysia
Interventions	Women in the intervention group received a call-recall program which includes a personal invitation letter with an information pamphlet of cervical cancer screening, and followed by a telephone reminder with counseling after four weeks performed for each participant. Women in the control group received usual care
Outcomes	Change in behavioral action in cervical cancer screening (uptake of Pap smear)
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computer generated simple randomization using SPSSv15 was used
Allocation concealment (selection bias)	Low risk	randomization was revealed after recruitment
Blinding of participants and personnel (performance bias)	Low risk	This was a cluster RCT and the nature of the primary outcome is unlikely to influence trial results

Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	lost to follow up was less than 2%
Selective reporting (reporting bias)	Low risk	All the outcomes were reported
Other bias	Unclear risk	

Batal, et al 2000

Methods	Design-RCT, prospectively randomized into intervention or usual care groups by randomization of days at the initiation of the study using a random number table, baseline comparability between groups
Participants	Women patient aged 18 to 70 years, presenting to the urgent care departments, Mondays through Fridays (8am-8pm) Acute care urban public hospital, Denver, Colorado, USA Women who presented to the gynecology clinic for self-scheduled annual examinations during the study period were used as a comparison group for Pap smear adequacy, Pap smear abnormality, and follow up rates
Interventions	Women in the intervention group had a Pap test performed as part of their pelvic examination in the urgent care clinic Women in the usual care group were referred to schedule an appointment at a later date in the gynecology clinic for Pap test screening
Outcomes	Pap tests performed
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization was done using a random number table
Allocation concealment (selection bias)	Unclear risk	No sufficient information for judgement
Blinding of participants and personnel (performance bias)	Low risk	The nature of the primary outcome is unlikely to be influenced by blinding
Blinding of outcome assessment (detection bias)	Unclear risk	The nature of the primary outcome is unlikely to be influenced by blinding
Incomplete outcome data (attrition bias)	Unclear risk	No sufficient information to permit judgement

Selective reporting (reporting bias)	Low risk	The study outcomes were reported
Other bias	Unclear risk	

Buehler, et al 1997

Methods	Design-RCT, randomized to either intervention or control group
Participants	Women aged 18-69 years who were listed as patients of the clinics but had not had Pap test within the 3 years before the start of the study.
Interventions	Women in the intervention group were sent an invitation asking them to seek a Pap test followed by a reminder letter 4 weeks later. Women in the control group were sent no letters.
Outcomes	Number of women who had a Pap test within 2 months and 6 months after the first letter was sent
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Women were randomly assigned to intervention or control groups using computer-generated numbers
Allocation concealment (selection bias)	Low risk	Final match of the intervention and control group lists with those of the cytology registry were made at the end of the study
Blinding of participants and personnel (performance bias)	Low risk	No sufficient information, but the nature of the primary outcome is unlikely to be influenced by blinding
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	The proportion that completed follow up was comparable in intervention and control groups
Selective reporting (reporting bias)	Low risk	The primary outcome data was reported
Other bias	Unclear risk	

Burack, et al 1998

Methods	Design-RCT, site specific, stratified randomization procedure, assigned to 1 of 4 intervention combinations

Participants	Women 18-40 years who have visited a health maintenance organization, serving a minority population eligible for Medicaid in Detroit, USA
Interventions	The computer-based reminder system generated Pap smear reminders for both patients and physicians. The patient reminder letter was mailed to patients, and the physician reminder was placed in medical records by the research team. Both the patient reminder and the physician reminder were triggered by the patient's Pap smear due date. The 5,801 eligible women were randomly assigned to: Group 1 received both patient and physician reminder Group 2 received physician reminder only Group 3 received patient reminder only Group 4 received no reminders (control)
Outcomes	Pap smear completion
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A two–stage randomization procedure was used to assign women first to physician reminder intervention and then to patient reminder intervention. site specific, stratefication was also made to reduce risk of bias
Allocation concealment (selection bias)	Unclear risk	No sufficient information to permit judgement
Blinding of participants and personnel (performance bias)	Low risk	The objective nature of the primary outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	The objective nature of the primary outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	Intent-to-treat analyses was done in the evaluation of outcomesNo sufficient information to permit judgement
Selective reporting (reporting bias)	Low risk	All the outcomes were reported
Other bias	Unclear risk	

Byrd et al 2013

Methods	Design-RCT, 1 of 4 groups randomization with baseline comparability
Participants	Mexican women, aged 21 years and above with no previous history of cancer, no cervical cancer screening within the past 3 years Country-US-Mexico border, Hispanic population
Interventions	Full AMIGAS received video and flip chart education AMIGAS with flip chart only received educational intervention by flip chart without video AMIGAS with video only received educational intervention by video without flip chart Control group receive usual care with no promotora education, but may have received education about cervical cancer screening delivered by clinics and media.
Outcomes	cervical cancer screening rate
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	computer generated randomization scheme was used to randomize eligible study participants to 1 of 4 study arms
Allocation concealment (selection bias)	Unclear risk	No sufficient information to permit judgement
Blinding of participants and personnel (performance bias)	Low risk	The objective nature of the primary outcome which was validated through medical records review is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	The objective nature of the primary outcome which was validated through medical records review is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	loss to follow up was about 16%; intention-to-treat and per-protocol analyses were done, assumption of missingness at random was used in analysis of missing data
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	Unclear risk	

Chumworathayi, et al 2007

Methods	Design-Quasi-randomized trial, baseline comparability except for income between the groups
Participants	Women aged between 35 and 65 years, not screened for at least 5 years Samliem inner-city community, Khon Kaen, Northeast Thailand
Interventions	Baeline interviews were performed in both groups by one of the researchers, who also provided culturally-sensitive health education that emphasized the need for screening. Women in the intervention group were sent appointment letters with a specified date for screening. Women in the control group did not receive appointment letters for screening.
Outcomes	Uptake of cervical cancer screening
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Women were subdivided into intervention or control group according to age
Allocation concealment (selection bias)	High risk	Unlikely, given the nature of the design
Blinding of participants and personnel (performance bias)	Low risk	The nature of the primary outcome is unlikely to be affected by blinding
Blinding of outcome assessment (detection bias)	Low risk	The nature of the primary outcome is unlikely to be affected by blinding
Incomplete outcome data (attrition bias)	Unclear risk	No sufficient information to permit judgment
Selective reporting (reporting bias)	Low risk	The primary outcome was reported
Other bias	Unclear risk	

de Jonge, et al 2008

Methods	Design-Quasi-randomized trial,
Participants	Women aged 25-64 years, who have not had Pap test in the past 30 months Limburg Province, Belgium
Interventions	Women in the intervention group received Invitation letters to have a Pap smear done by their physician of choice. The letter included a brief description of the test and its purpose.

	Women in the control group were followed for the next 12 months without invitation letters. All women studied, both in the baseline and the intervention period, had equal follow up for 12 months.
Outcomes	Pap smear participation rate
Notes	Women who received invitation letters were blinded to the study

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	study cohorts were defined and selected in a non-random fashion
Allocation concealment (selection bias)	High risk	Base on the design of the study, it is unlikely that allocation concealment was done
Blinding of participants and personnel (performance bias)	Low risk	Participants were blinded to the study intervention
Blinding of outcome assessment (detection bias)	Low risk	Giving the nature of the primary outcome, it is unlikely that unblinding will influence assessment of outcome
Incomplete outcome data (attrition bias)	Low risk	Analysis was by the intention-to-treat
Selective reporting (reporting bias)	Low risk	All outcomes were reported
Other bias	Unclear risk	

Decker, et al 2013

Methods	Design-Cluster RCT, each cluster had a unique postal codes that starts with the same three characters
Participants	Manitoba women, unscreened, 30-69 years, no history of invasive cervical cancer Country-Canada
Interventions	Women in the intervention group were mailed an invitation letter and a brochure. The invitation letter was personally addressed in English and French and stated that the woman had not had a Pap test in at least 5 years, described the benefits of screening, and provided Pap test locations. Screening availability in all the locations were confirmed to ensure access to screening by women Women in the control group were not mailed an invitation letter but given an index date of screening that matched the invitation date
Outcomes	Pap test that occur during the 6-months intervention

Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization units were identified clusters, individual participants in the randomized clusters may differ by certain characteristics such as minority status, education, household income, opportunity to screen
Allocation concealment (selection bias)	High risk	Based on study design, it is unlikely that concealment occurred
Blinding of participants and personnel (performance bias)	Low risk	The nature of the primary outcome is unlikely to be influenced by blinding
Blinding of outcome assessment (detection bias)	Low risk	The nature of the primary outcome is unlikely to be influenced by blinding
Incomplete outcome data (attrition bias)	Low risk	All statistical analyses for the primary outcome was on an intention-to-treat basis
Selective reporting (reporting bias)	Low risk	All outcomes were reported
Other bias	Unclear risk	

Duke et al 2015

Methods	Community Randomized Controlled Trial Baseline comparability in catchment population, age, income, employment rate and baseline Pap smear rates Participants were followed up for 2 years to assess change in screening rates
Participants	Country-Canada Setting-3 comparable communities in Newfoundland 6,057 women inclusion criteria- aged 30-69 years
Interventions	Women in intervention Community A received option of HPV self-collection for screening in addition to regular Pap test screening. Cervical cancer education with intense educational and promotional campaign about HPV, self-collection and cervical cancer screening in addition to regular provincial education campaigns was given to both communities A and B. This raised

	awareness about the prevalence and preventability of cervical cancer, and the importance of regular screening. Women in Communities B and C had continued availability of Pap smears for cervical screening. The focus of the intervention in Community B was on the importance of Pap smears. Women in Community C received no intervention beyond the normal public education initiatives conducted by the provincial cervical screening program.
Outcomes	Change in Cervical cancer screening rates following intervention
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Although the intervention and control communities were comparable, individual participants in the communities may differ in certain characteristics
Allocation concealment (selection bias)	High risk	As above
Blinding of participants and personnel (performance bias)	Low risk	Blinding was not feasible, but the nature of the primary outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	High risk	low response rate of 20.1%
Selective reporting (reporting bias)	Low risk	The primary outcome was reported
Other bias	Unclear risk	

Eaker, et al 2004

Methods	Design-RCT, sequential randomization in three successive interventions, baseline comparability between groups
Participants	Women aged 25-59 years, not had Pap smear during the previous 3 years in an organized cervical cancer screening program Uppsala Country, Sweden
Interventions	a. Modified invitation letter versus standard invitation letter group; b. reminder letter to women who did not attend after first intervention versus no reminder letter; and c. phone reminder to

	women who did not attend after the reminder letter versus no phone reminder. The modified invitation letter consisted of sending an additional information brochure with the standard invitation. The standard invitation letter, contained a brief description of the purpose of Pap smear, whom it is for, how it is taken, how to schedule an appointment, and that test results are classified and conveyed by mail. The reminder letter was identical to the standard invitation letter, except that it included the information that this was a reminder. Women who received a phone reminder were called up by one of two professional female research assistants who gave short description of the Pap smear and offered to schedule an appointment for the women. Women who were not randomized to receive the respective intervention composed the comparison group for the respective intervention groups
Outcomes	proportions of women attending Pap smear screening following the interventions
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Each woman due for an invitation was on a weekly basis assigned a random number, which allowed for random allocation to either the intervention or control groups
Allocation concealment (selection bias)	Low risk	As above
Blinding of participants and personnel (performance bias)	Low risk	Collaborators were blinded to the women's group assignment, and also, the nature of the primary outcome is unlikely to be influenced by binding
Blinding of outcome assessment (detection bias)	Low risk	The midwives performing the Pap smears were blinded to group assignment
Incomplete outcome data (attrition bias)	Low risk	Analyses of outcome data were performed according to the intention-to-treat principle
Selective reporting (reporting bias)	Low risk	The primary outcomes were reported
Other bias	Unclear risk	

Enerly, et al 2016

Methods	Design-RCT with electronic randomization to either self-sampling or a second reminder letter for Pap screening
Participants	Women aged 25-69 years, non-attenders due to receive a second reminder for CCS at the Norwegian Cervical Cancer Screening Programme (NCCSP), Norway
Interventions	Women in the intervention group were sent an information letter, inviting them to participate in the Self-Sampling (SESAM) study and were given self-sampling devices Women in the control group were sent a 2nd reminder letter according to the NCCSP guidelines
Outcomes	Cervical cancer screening by Pap cytology or HPV DNA testing
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Electronic randomization was used to identify non-attenders from the registry who were then allocated to the intervention and control
Allocation concealment (selection bias)	Low risk	As above
Blinding of participants and personnel (performance bias)	Low risk	Blinding of participants and personnel was not feasible, but we feel that the outcome will not be significantly influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	Blinding of participants and personnel was not feasible, but we feel that the outcome will not be significantly influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	The proportion who completed follow up was comparable in both groups
Selective reporting (reporting bias)	Low risk	The primary outcome were reported
Other bias	Unclear risk	

Fujiwara, et al 2015

Methods	Design-RCT, blocks of random permutations stratified by age into 1 of 3 groups, baseline comparability between groups
Participants	Japanese women, aged 20-39 years, who had not participated in screening Country-Japan
Interventions	Intervention group A received a printed reminder with information on the possible benefits of screening

	Intervention group B received a printed reminder with information on the possible benefits and risk of screening Control group received a printed reminder with simple information
Outcomes	cervical cancer screening rate
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Block permutation sequence used in randomization
Allocation concealment (selection bias)	Low risk	As above
Blinding of participants and personnel (performance bias)	Low risk	It is unlikely that blinding of participants and personnel was done, but we judge that the nature of the outcome is such that unblinding is not likely to affect the results
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	proportion of participants who completed follow up was comparable
Selective reporting (reporting bias)	Low risk	The primary study outcomes were reported
Other bias	Unclear risk	

Haguenoer, et al 2014

Methods	Design-RCT, a three-parallel group randomized in 1:1:1
Participants	Unscreened women aged 30-65 years, women who had not responded to an initial invitation to have a Pap smear, Cancer Screening Department of the University Hospital of Tours, France
Interventions	Women in group 1 ("no intervention group") Women in group 2 ("recall") received a letter to visit a general practitioner, gynecologist or midwife to have a Pap smear Women in group 3 ("self-sampling") received a vaginal self-sampling kit
Outcomes	Cervical cancer screening participation
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization and random sequence generation was handled by an independent computer programmer
Allocation concealment (selection bias)	Low risk	The allocation method was concealed to the study coordinator
Blinding of participants and personnel (performance bias)	Low risk	The randomization was generated by a computer programmer who was not involved in the study. The allocation method was concealed to the study coordinator. Women involved in the study were blinded to the trial
Blinding of outcome assessment (detection bias)	Low risk	Outcome were assessed by the Cancer Screening Department from routinely collected screening data' the objective nature of these outcomes is unlikely to be influenced by blinding
Incomplete outcome data (attrition bias)	Low risk	Analyses of outcome followed the principle of intent-to-screen
Selective reporting (reporting bias)	Low risk	All study outcomes were reported
Other bias	Unclear risk	

Heranney, et al 2011

Methods	Design-RCT, randomized into 1 of 2 groups
Participants	Women aged between 25 and 65 years, who have had no smear within the previous 3 years Country-France
Interventions	Eligible women who had home telephone were randomized to either receive a telephone call or receive a letter Women in the telephone group received a call from an independent company (Teleperformance) specializing in telemarketing. The purpose of the call was to remind women that screening smears were necessary and they were due for screening. Women in the letter reminder group received a mailed letter.
Outcomes	uptake of Pap smear following the intervention
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Although randomization was done on eligible women who were identified to have a telephone at home, no sufficient information was provided on how randomization was done to allocate women to intervention or control groups
Allocation concealment (selection bias)	Unclear risk	As above
Blinding of participants and personnel (performance bias)	Low risk	The nature of the primary outcome is unlikely to be influenced by blinding
Blinding of outcome assessment (detection bias)	Low risk	The nature of the primary outcome is unlikely to be influenced by blinding
Incomplete outcome data (attrition bias)	Unclear risk	No sufficient information to permit judgement
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	Unclear risk	

Hou, et al 2002

Methods	Design-RCT, even and odd numbered randomization, no evidence of baseline comparability in demographic characteristics
Participants	Chinese women aged 30 years who have not had Pap test in the previous 12 months Country-Taiwan
Interventions	The women in the intervention group received a three-month education program utilizing direct mail communication as well as a phone-counseling component. They also received educational brochures with theory and evidence-based messages. Women in the control group received a monthly newsletter with health information in general from the Hospital.
Outcomes	Pap smear obtained during the study period
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement

Random sequence generation (selection bias)	High risk	use of even and odd numbered sequence is prone to selection bias
Allocation concealment (selection bias)	High risk	As in random sequence generation above
Blinding of participants and personnel (performance bias)	Low risk	Although it is likely that participants and personnel were not blinded, the outcome is not likely to be influenced by this factors
Blinding of outcome assessment (detection bias)	Low risk	As mentioned above
Incomplete outcome data (attrition bias)	High risk	About 40% were lost to follow up
Selective reporting (reporting bias)	Low risk	The primary outcome was reported
Other bias	Unclear risk	

Mishara, et al 2009

Methods	Design-Community RCT, randomly assigned 2 geographic districts to intervention or control (Samoan churches in each study location), baseline comparability between study groups except for differences in mean age groups
Participants	Samoan women aged 20 years or older, no self-reported history of Pap smear within 2 years to the study, no history of cervical cancer US territory of American Samoa
Interventions	Educational intervention guided by the Health Belief Framework Women in the intervention group received specially developed English and Samoan language cervical cancer education booklets; skill building and behavioral exercises; and interactive group discussion sessions. The education booklets were developed to address limitations (readability, comprehension, acceptability, and cultural appropriateness of standard cervical cancer education materials) previously identified through focus groups conducted among Samoans. Women in the control group received the cervical cancer education booklets after the posttest surveys.
Outcomes	Pap smear rates
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement

Random sequence generation (selection bias)	Unclear risk	Community RCT with randomization of the study locations and the study sites in which the Samoan churches were the study sites in each of the study locations. The eastern and western districts were respectively randomized as the control and intervention locations
Allocation concealment (selection bias)	High risk	As described above, it is unlikely that allocation concealment was done
Blinding of participants and personnel (performance bias)	Low risk	The objective nature of the primary outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	The objective nature of the primary outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	4% loss to follow up (18 /416)
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	Unclear risk	

Morrell, et al 2004

Methods	Design-RCT, randomized into either reminder letter or no-reminder letter groups in a 2 to 1 ratio
Participants	Women aged 20-69 years whose last Pap test occurred 48 months ago or longer New South Wales, Australia
Interventions	Intervention group were mailed letters written in English. The letter was written to remind the woman that she is overdue for her Pap test and also highlighted the benefits of regular screening. The control group received no letter.
Outcomes	Pap smear screening rates
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	No sufficient information to judge if randomization followed a random sequence

Allocation concealment (selection bias)	Unclear risk	No sufficient information for judgement
Blinding of participants and personnel (performance bias)	Low risk	The nature of the primary outcome is such that blinding is unlikely to influence trial results
Blinding of outcome assessment (detection bias)	Low risk	The nature of the primary outcome is such that blinding is unlikely to influence trial results
Incomplete outcome data (attrition bias)	Unclear risk	No sufficient information for judgement
Selective reporting (reporting bias)	Low risk	All outcomes including subgroup analyses were reported
Other bias	Unclear risk	

Murphy, et al 2016

Methods	Design-an RCT to test effectiveness of an intervention of self-sampling as an intervention to promote cervical cancer screening, baseline comparability between intervention and control groups
Participants	HIV infected women older than 18 years attending a US mid-Atlantic inner city HIV clinic whose last cervical cancer screening was 18 months or more prior to randomization
Interventions	Women in the intervention arm were given a HPV test kit and a soft cytobrush and instructions for self-collection of cervicovaginal sample for subsequent testing for high-risk HPV DNA Women in the control arm (information-only) were reminded to make their appointment for cervical screening
Outcomes	completion of cervical cytology testing within 6 months following intervention
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomization assignment was done using a computer-generated random list of assignments from Research Randomizer.
Allocation concealment (selection bias)	Low risk	As above
Blinding of participants and personnel (performance bias)	Low risk	Although the intervention was not blinded, we judge that giving the objective nature of the

		primary outcome, the results will not be significantly influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	follow up was comparable in the two groups
Selective reporting (reporting bias)	Low risk	The primary outcome was reported in both groups
Other bias	Unclear risk	

Nuno, et al 2011

Methods	RCT, randomized in 1:1 ratio, baseline comparability between the intervention and control groups except for mean age
Participants	country-US-Mexico Border, Yuma County located in southwestern corner of Arizona. Hispanic Women
Interventions	Theory-based cervical cancer education guided by the social cognitive theory. The use of a promotora-administered intervention utilized existing social networks within the community to model and deliver educational materials to study participants. The educational intervention consisted of a 2-hour group session presented by a trained promotora and included description and explanation of cancer screening and community resources for health care and screening. The usual care group received no educational intervention. All were mailed a reminder and received a telephone call reminder about scheduling a screening visit.
Outcomes	Proportion of Pap smear during the study period
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Although randomization was done, we judged that the process is subject to high bias since allocation was based on "Even" and "Odd" numbers randomization
Allocation concealment (selection bias)	High risk	Base on the randomization method above, it is unlikely that allocation concealment was done
Blinding of participants and personnel (performance bias)	Low risk	It is unlikely that blinding occurred, but based on the objective nature of the primary outcome, we

		feel that the results are unlikely to influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	It is unlikely that blinding occurred, but based on the objective nature of the primary outcome, we feel that the results are unlikely to influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	Less than 3% loss to follow up (7/190 in intervention and 3/191 in the control group). Also, the analyses was based on intent-to-treat principles
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	High risk	Although Pap smear assessments were done through medical records documentation, reliance on self-report on assessment of Pap screening may limit reliability of results.

Peitzmeier, et al 2016

Methods	Design- RCT, computer generated randomization to the intervention groups and control, baseline comparability
Participants	Women aged 21-65 years, who were overdue for Pap testing, in a community health center in Boston, USA
Interventions	Eligible women were randomized into one of outreach intervention groups (letter, email, telephone, or multimodal-letter/email/telephone) and the control group received usual care. 1. Letter group received a standard letter from their provider indicating that women were overdue for a Pap and inviting them for screening. The letter also included some educational flyers on cervical cancer 2. The email group received a standard email from the provider's email sent to the email address documented in the patient's electronic medical record. The email had similar content to that of the letter group 3. The telephone outreach group were read a script with information similar to the letter group 4. The multimodal outreach receive sequential attempts with letter, then email and lastly the telephone as outlined above 5. The control group received usual care, providers offering Pap tests as needed
Outcomes	cervical cancer screening rates, and time to screening after outreach intervention
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	electronic randomization was done
Allocation concealment (selection bias)	Low risk	It is likely that this was done since there was electronic randomization with baseline comparability between the groups
Blinding of participants and personnel (performance bias)	Low risk	There was no blinding of participants or personnel, but since the nature of the outcome is actual performance of screening, our judgement is that the lack of blinding is unlikely to influence the study results
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	The proportion of participants lost to follow up was comparable in both groups
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	Unclear risk	

Racey, et al 2015

Methods	Design-RCT, simple randomization with random number generator, 1:1 into 2 intervention groups and a control group, baseline comparability between groups
Participants	Women age between 30 and 70 years, who are overdue for cervical cancer screening Southwestern Ontario, Canada Overdue for screening was defined as not having had a Pap test recorded in the preceding 30 months
Interventions	Women in intervention group 1 received a study information letter from the health clinic 2 weeks before receiving the at-home self-collected HPV kit. The letter informed women about the study and provided them the option to opt-out. A reminder phone call was placed to nonresponders 1 month after distribution of self-collected HPV kits. Women in intervention group 2 were sent an invitation letter for Pap testing that asked women to call their doctor’s office to book an appointment. They also received information on HPV and cervical cancer screening. Women who had not responded after a

	minimum of 1 month from the invitation were contacted by phone for follow up and appointment of possible. Women in the control group were not contacted during the study period. The receive the standard of care in the clinic
Outcomes	uptake of cervical cancer screening
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Simple randomization was done using computer-generated random numbers
Allocation concealment (selection bias)	Low risk	Allocation was blinded using a 1:1 ratio for intervention arms of the study; the control arm consisted of the remaining eligible women not assigned to the intervention arms
Blinding of participants and personnel (performance bias)	Low risk	The objective nature of the outcome is such that blinding is unlikely to influence trial results
Blinding of outcome assessment (detection bias)	Low risk	The objective nature of the outcome is such that blinding is unlikely to influence trial results
Incomplete outcome data (attrition bias)	Low risk	All analyses of outcomes were done by the intention-to-treat principle
Selective reporting (reporting bias)	Low risk	All study outcomes were reported
Other bias	Unclear risk	

Radde, et al 2016

Methods	Design-an RCT, randomization was stratified by age group, baseline comparability was achieved
Participants	Women 30-65 years living in Mainz communities, Germany selected via population registries
Interventions	Women in intervention arm A received a letter with a study information sheet, study identification card to show when visiting the office-based gynecologist and a response card with pre-paid postage for the woman to give information to the study team concerning last participation in CCS among others Women in intervention arm B received the same material as for arm A, with an additional eight-page color brochure including

	information on cervical cancer and its precursor lesions, HPV infection, the process of Pap smear screening and simple explanations of relevant medical terminology Women in the control arm C did not receive an invitation to CCS, but were contacted to provide information on their participation in CCS during the study period
Outcomes	3-year cervical cancer screening participation
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Although randomization was stratified by age group, there was baseline comparability between the intervention and control groups
Allocation concealment (selection bias)	Low risk	As above
Blinding of participants and personnel (performance bias)	Low risk	Blinding of participants and personnel was not feasible, but we feel that the nature of the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	Follow up rate was comparable between intervention and control groups
Selective reporting (reporting bias)	Low risk	All outcomes were reported
Other bias	Unclear risk	

Rosser, et al 2015

Methods	Design- RCT, blocked randomization, baseline comparability with no significant differences between groups
Participants	Rural health facilities in Suba and Mbita in rural Kenya, eligible for cervical screening, are aged at least 23 years with no prior screening
Interventions	The intervention consisted of a 30-minute interactive talk about cervical cancer. The talk reviewed basic health facts about cervical cancer, risk factors, how screening is performed, what screening results mean, and treatment options. Included in the talk

	was guided discussion on barriers to screening and fears or stigma associated with screening. The control group receive the usual standard of care without the educational intervention.
Outcomes	knowledge scores and cervical cancer screening rates
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	computer-generated block of eight for randomization
Allocation concealment (selection bias)	Low risk	No sufficient information, but likely to be concealed giving the type of randomization described above
Blinding of participants and personnel (performance bias)	Low risk	No sufficient information provided, but the nature of the primary outcome is not likely to be affected by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	High risk	high loss to follow up in excess of 20% (46/207 in the intervention arm, 45/212 in control arm)
Selective reporting (reporting bias)	Low risk	All the outcomes were reported
Other bias	High risk	

Rossi, et al 2015

Methods	Design-RCT, randomized to 1 of 2 intervention groups and a control group
Participants	Women aged 30-64 years who had been invited by the screening programme in the previous months and had failed to respond were eligible. Organized cervical screening programmes in six Italian local health authorities, Northern Italy.
Interventions	Women in intervention group 1 received the self-sampler by mail directly at home. This was preceded by an explanatory letter sent 1 week earlier. women in intervention group 2 was offered the opportunity to pick the self-sampling device up at an area pharmacy

	Women in the control group received a standard invitation letter to perform either a Pap test or an HPV test at the clinic according to that center's routine screening
Outcomes	Screening participation rate
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The random sampling and study arm assignment were performed centrally by the coordinating center using a statistical software
Allocation concealment (selection bias)	Low risk	As above
Blinding of participants and personnel (performance bias)	Low risk	Although no sufficient information on blinding, we judged that the nature of the primary outcome is such that unblinding is not likely to influence trial results
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	All randomized participants were included in primary outcome assessment
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	Unclear risk	

Sultana, et al 2016

Methods	Design-RCT, 7:1 ratio (self-sampling vs reminder for Pap test) in a cervical cancer screening programme in Australia
Participants	Women who have never screened or under-screened (not screened in the past 5 years) and were between 30-69 years, not pregnant and no prior hysterectomy.
Interventions	Women in the intervention arm received a preinvitation letter informing them that they will sent a self-sampling kit. The intervention package included an information brochure on HPV and cervical cancer, a nylon-tipped flocked swab enclosed in a dry plastic tube (Copan Italia, Brescia, Italy) within a resealable plastic bag, an instruction sheet for sample collection, an information form and a postage paid envelope for returning the swab and the form. Women in the Pap test (comparison) arm received a single

	invitation letter (never-screened) or a standard reminder letter (under-screened) to have a Pap test. Included in the letter was a Pap test brochure, a similar information form and a postage paid envelope to return the form.
Outcomes	participation in cervical cancer screening at 3 and 6 months (return of a self-sample or having a Pap test); proportion of women with a positive HPV test undergoing appropriate follow-up clinical investigation
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random sequence was generated and implemented in blocks by a computer programmer
Allocation concealment (selection bias)	Low risk	Allocation was done in blocks with low risk of selection bias
Blinding of participants and personnel (performance bias)	Low risk	Although blinding was not feasible, the nature of the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	As above
Incomplete outcome data (attrition bias)	Low risk	Data was analyzed as intention-to-treat, and sensitivity analyses for sub-groups were done
Selective reporting (reporting bias)	Low risk	All study outcomes were reported
Other bias	Unclear risk	

Taylor, et al 2002

Methods	Design-RCT, randomized into 1 of 2 intervention groups or control
Participants	Chinese women, underutilizers of Pap smear testing, 20-69 years Country-US and Canada (Seattle and Vancouver communities)
Interventions	Women in the outreach worker intervention group initially received Chinese and English versions of an introductory letter. Within 3 weeks, they were visited at home by one of four bicultural, trilingual Chinese female outreach workers. The outreach worker provided tailored responses to each woman's individual barriers to cervical cancer screening.

	Women in the direct mail intervention group were mailed a packet that included Chinese and English versions of a cover letter, the education-entertainment video, educational brochure and fact sheet. Women in the control group received their usual care at local clinics and doctors' offices.
Outcomes	Pap smear rates
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computer program was used to randomly allocate each woman to one of the 3 study arms
Allocation concealment (selection bias)	Low risk	it is likely that allocation concealment was done
Blinding of participants and personnel (performance bias)	Low risk	Although this information is not provided, we judged that the objective nature of the outcome is unlikely to be influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	Although this information is not provided, we judged that the objective nature of the outcome is unlikely to be influenced by lack of blinding
Incomplete outcome data (attrition bias)	Low risk	The analyses used both Pap testing self-report and medical record data, and the intent-to-treat analysis principle was used
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	Unclear risk	

Virtanen, et al 2011

Methods	Design-RCT, pseudo-random number generator used to randomized eligible participants to either self-sampling or to reminder letter arm
Participants	Women age between 30 and 60 years Espoo municipalities, Finland Women who have not attended a screening after an invitation to screen (non-attenders)
Interventions	Women in the self-sampling arm received by mail a self-sampling kit, an information letter on the study, an informed consent

	document and a data sheet on HPV infections and cervical cancer screening. Women in the reminder letter arm received a new invitation letter with a new appointment for screening. They also received the same questionnaire as the self-sampling arm.
Outcomes	screening participation rate, screening coverage
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	A computer-generator random number was used
Allocation concealment (selection bias)	Unclear risk	No sufficient information to permit judgement
Blinding of participants and personnel (performance bias)	Low risk	The objective nature of the primary outcome is unlikely to the influenced by lack of blinding
Blinding of outcome assessment (detection bias)	Low risk	The objective nature of the primary outcome is unlikely to the influenced by lack of blinding
Incomplete outcome data (attrition bias)	Unclear risk	No sufficient information to permit judgement
Selective reporting (reporting bias)	Low risk	All the study outcomes were reported
Other bias	Unclear risk	

Footnotes

Characteristics of excluded studies

Abiodun, et al 2014

Reason for exclusion	Not an RCT

Acera, et al 2014

Reason for exclusion	wrong population

Bebis, et al 2012

Reason for exclusion	No evidence of Randomization, wrong outcome

Brownstein, et al 1992

Reason for exclusion	Not an RCT

Bulkmans, et al 2006

Reason for exclusion	wrong intervention

Burger, et al 2014

Reason for exclusion	wrong intervention, wrong outcome

Byles, et al 1994

Reason for exclusion	Not RCT, intervention and outcome too broad for comparison

Byles, et al 1996

Reason for exclusion	Not an RCT

Campbell, et al 1997

Reason for exclusion	wrong intervention

Carrasquillo, et al 2014

Reason for exclusion	Study protocol (not report)

Chalapati, et al 2007

Reason for exclusion	Randomization not clear

Choi, et al 2013

Reason for exclusion	Not an RCT

Choma, et al 2015

Reason for exclusion	wrong study population, not an RCT

Chou, et al 2015

Reason for exclusion	Wrong outcome

de Bie, et al 2011

Reason for exclusion	wrong outcome

Dehdari, et al 2014

Reason for exclusion	wrong design, wrong outcome

Del Mar, et al 1998

Reason for exclusion	Wrong outcome

Dietrich, et al 2006

Reason for exclusion	wrong study population, different outcomes

Dietrich, et al 2007

Reason for exclusion	wrong intervention

Dignan, et al 1990

Reason for exclusion	Not an RCT

Dignan, et al 1996

Reason for exclusion	wrong intervention, wrong outcome

Dignan, et al 1998

Reason for exclusion	wrong intervention, wrong outcome

Duggan, et al 2012

Reason for exclusion	Study protocol (not report)

Engelstad, et al 2005

Reason for exclusion	wrong intervention

Fang, et al 2007

Reason for exclusion	Not an RCT

Fernandez-Esquer, et al 2003

Reason for exclusion	Wrong outcome

Ghahremani, et al 2015

Reason for exclusion	Wrong design, wrong study population

Interis, et al 2016

Reason for exclusion	Wrong design, cross-sectional study, wrong outcome

Jenkins, et al 1999

Reason for exclusion	Wrong study design

Jensen, et al 2009

Reason for exclusion	Wrong outcome

Karjalainen, et al 2016

Reason for exclusion	Wrong outcome, feasibility of sample collection methods

Lantz, et al 1995

Reason for exclusion	No evidence of randomization, multiple outcomes (cervical cancer screening and mammography)

Love, et al 2012

Reason for exclusion	wrong design, wrong outcome

Margolis, et al 1998

Reason for exclusion	Wrong intervention

Michielutte, et al 1994

Reason for exclusion	evaluation report, not an RCT

Pierce, et al 1989

Reason for exclusion	No evidence of randomization, No CONSORT flow chart

Racey, et al 2016

Reason for exclusion	Multiple report, published twice in the same journal

Segnan, et al 1998

Reason for exclusion	intervention not specific to target population, wrong outcome

Sosauer, et al 2014

Reason for exclusion	Wrong outcome

Sung, et al 1997

Reason for exclusion	Wrong outcome

Thompson, et al 2013

Reason for exclusion	Not an RCT

Torres-Mejia, et al 2000

Reason for exclusion	outcome measure not suitable

Valanis, et al 2002

Reason for exclusion	wrong intervention, wrong outcome

Virtanen, etal 2011

Reason for exclusion	Multiple reports

Wikstrom, et al 2011

Reason for exclusion	wrong design, wrong outcome

Footnotes

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