Supplementary materials

Title of the article: Offering HPV self-sampling kits: an updated meta-analysis of the effectiveness of strategies to increase participation in cervical cancer screening.

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Supplementary materials

Table of Contents

1. Study protocol (including objectives, PICOS, bibliographic sources, literature search strings)
1.1. Objectives
1.1.1. Primary objectives
1.1.2. Secondary objectives
1.2. Clinical questions
1.3. PICOS components
1.3.1. Potential of strategies providing self-sampling to increase population coverage
1.4. Literature retrieval strings
1.4.1. Potential of strategies providing self-sampling to increase population coverage
2. PRISMA flow charts of study retrieval and selection
2.21. Meta-analysis on the response to the offer of self-sampling
4. Characteristics of the randomised trials comparing strategies including offering hrHPV self-sampling with control interventions
5. Assessment of risk of bias in randomised trials
6. Participation in the experimental and control groups of RCTs
7. Participation in the experimental groups: Opt-in vs. Mail-to-all
8. Specimen adequacy, test-positivity rate, follow-up adherence, detection of CIN2+
9. References

1. Study protocol (including objectives, PICOS, bibliographic sources, literature search strings)

1.1. Objectives

1.1.1. Primary objectives

- update and summarize the most recent evidence on cervical cancer screening participation when underor never-screened women are offered a self-sampling device for hrHPV testing;
- compare screening attendance when two different self-sampling invitation scenarios are used;

1.1.2. Secondary objectives

- summarize new evidence when the invitation scenario involves women getting offered an hrHPV selfsample kit upon a visit to the primary care provider.
- compare sample adequacy and test-positivity rate in self-sample versus conventional screening strategies;
- explore adherence to follow-up and detection rate of cervical precancer and cancer in screen-positive women.

1.2. Clinical questions

- 1) Is cervical cancer screening attendance higher when underscreened women are offered a self-sampling device for hrHPV-testing (experimental group) compared to routine invitations/reminders to contact a healthcare professional (HCP) for collection of a cervical specimen (control group).
- 2) How does attendance to screening vary when two different self-sampling invitation strategies are used.

1.3. PICOS components

1.3.1. Potential of strategies providing self-sampling to increase population coverage

<u>*Population*</u>: women who were irregularly screened, never screened or did not respond to one or more invitation/reminder letters recommending participation in conventional cervical cancer screening.

Intervention: providing a self-sampling device for collection of a vaginal sample, as a cervical screening method to be carried out by the women themselves.

I1: "Mail-to-All": an invitation to participate in the study accompanied by an hrHPV self-sampling kit was directly sent to the women at their home addresses;

I2: "Opt-In": offering women the possibility to obtain a self-sampling kit: women had to request the selfsampling kits to be received my mail or, alternatively, these could be collected from the local clinic/pharmacy; I3. "Community mobilization and outreach": community campaigns with outreach supported by mass media in which attending women were offered a self-sampling kit at the end of a sensibilization session as well as, an individualized self-sampling kit delivery approach in which community healthcare workers directly contacted women at their homes or work places

I4 "Direct offer at a healthcare service": women were offered a self-sample at the end of an individual appointment (when they contact a health service for whatever reason) and were given the choice to do it on site in a private room or to take it home.

<u>Control action:</u>

C: Women were offered the possibility to obtain screening according to current clinical practice either after an invitation/reminder to visit a HCP or as result from opportunistic screening upon woman's request or on HCP recommendation, without organized invitation

Outcomes:

O1: Response rate in experimental and control groups;

O2: Relative response rate (experimental /control groups); response difference (experimental /control groups);

O3: Relative response rate (opt-in /mail-to-all groups); response difference (opt-in /mail-to-all groups);

O4: proportion with inadequate sample test results among screened women;

O5: test-positivity rate among screened women with satisfactory sample;

O6: adherence to further follow-up among screen-test positive women;

O7: detection rate of CIN2+ among all women, screened women, screen-positive women who complied to follow-up.

<u>S</u>tudies:

Randomized controlled trials.

1.4. Literature retrieval strings

1.4.1. Potential of strategies providing self-sampling to increase population coverage

In Pubmed-Medline

(Cervix OR cervical) AND (HPV OR papillomavirus) AND (self-sampling OR self sampling OR self-collection OR self collection) AND (screening OR coverage OR participation OR knowledge OR acceptance)

2. PRISMA flow charts of study retrieval and selection

2.21. Meta-analysis on the response to the offer of self-sampling

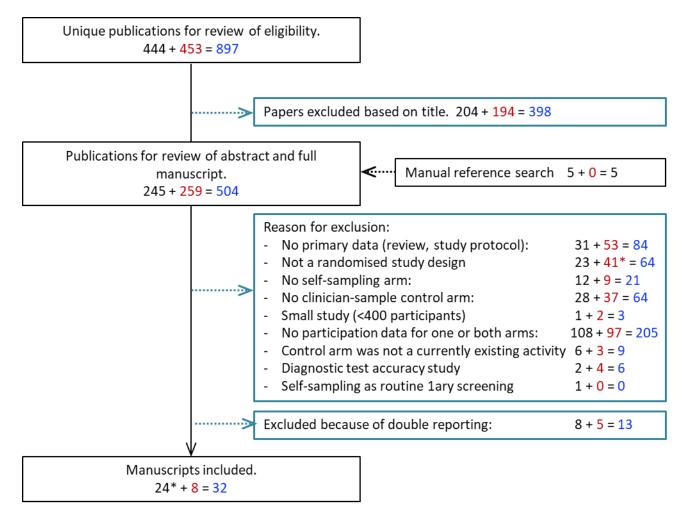


Figure S1. PRISMA flow chart summarizing the selection of eligible participation trials. Figures in black are those included in the search up to April 15, 2018¹, those in red are references retrieved up to March 31, 2022. References in blue are the sum of all searches. *One study (Zehbe et al, BMJ Open 2016)² included in the previous meta-analysis (Arbyn et al, BMJ 2018)¹ was excluded from the current update due to concerns raised with regards to the randomisation of women to the experimental and control intervention.

Throughout this Supplementary File, information regarding studies included in the previous meta-analysis of Arbyn et al. BMJ 20181 (retrieved until April 15, 2018) will be presented as black coloured text, whereas information on the studies newly included in this update (retrieved until March 31, 2022) will be presented in red coloured text.

4. Characteristics of the randomised trials comparing strategies including offering hrHPV selfsampling with control interventions

Table S1. Study characteristics of included RCTs fulfilling eligibility criteria.

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
1. Bais, 2007 ³ The Netherlands	Randomised. Women who did not respond to the invitation for conventional screening and the first reminder 6 months later. No data on response stratified by screening history.	Direct mailing of the self- sampling kit.*	Invitation for conventional cytology with an explanatory letter.*	Mail-to-all: 2,352	272	30-50
2. Gok, 2010 ⁴ The Netherlands	Randomised. Women who did not respond to the invitation for conventional screening and the first reminder 6 months later. Whole population: 1 st screen or screened 5 years ago. Subgroup: screened >7 years ago.	Direct mailing of the self- sampling kit, preceded by a notification. *	Invitation for conventional cytology, preceded by a notification.*	Mail-to-all: 26,886	277	30-60
3. Giorgi-Rossi, 2011 ⁵ Italy	Randomised. Women who did not respond to the invitation for conventional screening. No sufficient data on response stratified by screening history.	 Direct mailing of the self-sampling kit, preceded by a notification. Women were offered the opportunity to receive the self-sampler device (by mail or picking it up at the clinic). If interested, they had to call a free toll number. 	 Invitation for conventional cytology (prefixed date). Invitation for hrHPV testing at the clinic (sample collected by a clinician). 	Mail-to-all: 616 Opt-in: 622	- 619 - 616	35-65
4. Lazcano-Ponce, 2011 ⁶ Mexico	Randomised. Women in poverty-reduction programme, with limited access to health services. No data on response stratified by screening history.	Door-to-door recruitment. Nurses performed home visits, in which a self-sample was taken by the woman herself.	Door-to-door recruitment. Nurses performed home visits, and made an appointment for conventional cytology in the clinic.	Community mobilization and outreach: 9,371	1,2731	25-65

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
5. Piana, 2011 ⁷ France			Invitation for conventional cytology.	Mail-to-all: 4,400	4,934	35-69
6. Szarewski, 2011 ⁸ United Kingdom	Randomised. Women who did not respond to ≥2 invitations for conventional screening. No data on response stratified by screening history	Direct mailing of the self- sampling kit. [¥]	Invitation for conventional cytology. [¥]	Mail-to-all: 1,500	1,500	25-64
7. Virtanen, 2011 ⁹ Finland	Randomised. Women who did not respond to the invitation for conventional screening. No sufficient data on response stratified by screening history.	Direct mailing of the self- sampling kit, preceded by a notification (with an opt-out option).	Invitation for conventional cytology (pre-fixed appointment).	Mail-to-all: 2,397	6,302	30-60
8. Wikstrom, 2011 ¹⁰ Sweden	Randomised. Women who had not participated in screening for ≥6 years. No data on response stratified by screening history.	Direct mailing of the self- sampling kit, preceded by a notification. Afterwards an additional reminder to participate was sent.	Invitation for conventional cytology, within the framework of the organised screening programme.	Mail-to-all: 2,000	2,060	39-60
9. Gok, 2012 ¹¹ The Netherlands	Randomised. Women who did not respond to the invitation for conventional screening and the first reminder. No data on response stratified by screening history.	Direct mailing of the self- sampling kit, preceded by a notification.*	Invitation for conventional cytology, preceded by a notification.*	Mail-to-all: 25,561	261	30-60

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
10. Darlin, 2013 ¹² Sweden	Randomised. Women who had not had any cervical smears taken for >9y. No data on response stratified by screening history.	Direct mailing of the self- sampling kit. After one month, a reminder including another self-sampling kit was sent to non-responders.	Invitation for hrHPV testing at an outpatient clinic. The invitation included several alternative appointments. A reminder was sent to non-responders.	Mail-to-all: 1,000	500	32-65
11. Sancho- Garnier, 2013 ¹³ France	Randomised. Women who did not respond to the invitation for conventional screening and had not had a cervical smear in ≥2y. No data on response stratified by screening history.	Direct mailing of the self- sampling kit, preceded by a notification.	Invitation for conventional cytology at an outpatient clinic. The invitation included a list of centres performing the test.	Mail-to-all: 8,829	9,901	35-69
12. Broberg, 2014 ¹⁴ Sweden	Randomised. Women who did not respond to ≥ 4 invitations for conventional screening and did not have a registered Pap smear for $\geq 6y$ (30-53y), $\geq 7y$ (54y), or $\geq 8y$ (55-62y). Data on response stratified by screening history: screened ≤ 10 or $\geq 10y$ ago; never screened.	Women were offered the opportunity to receive a self- sampling kit (by mail). If interested, they had to return a coupon using a postage- free envelope. A reminder was sent if the kit was ordered but not returned, or after 10 weeks to women who did not respond.	No particular intervention was done. Women continued to receive annual invitations until a smear was registered.	Opt-in: 800	4,000	30-62
13. Haguenoer, 2014 ¹⁵ France	Randomised. Women who had not had a cervical smear in ≥3y, and did not respond to the invitation for conventional screening. No data on response stratified by screening history.	Direct mailing of the self- sampling kit.	 Invitation for conventional cytology. No intervention. 	Mail-to-all: 1,999	- 2,000 - 1,999	30-65

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
14. Arrossi, 2015 ¹⁶ Argentina	Cluster randomised. Women found at home. No data on response stratified by screening history.	Door-to-door recruitment. Community health workers performed home visits, in which a self-sample was taken by the woman herself.	Door-to-door recruitment. Community health workers performed home visits and advised women to go to a health centre for a clinician-collected sample for hrHPV testing.	Community mobilization and outreach: 3,049	4,018	≥30
15. Cadman, 2015 ¹⁷ United Kingdom	Randomised. Women who did not respond to the invitation for conventional screening and the first reminder. Data on response stratified by screening history: screened 0-3y, 3-5y, 5-10y and >10y ago; never screened.	Direct mailing of the self- sampling kit.	Invitation for conventional cytology.	Mail-to-all: 3,000	3,000	25-65
16. Giorgi-Rossi, 2015 ¹⁸ Italy	Randomised. Women who did not respond to the invitation for conventional screening. No data on response stratified by screening history.	 Direct mailing of the self- sampling kit, preceded by a notification. Women were invited by mail, to pick up a self- sampling device at the clinic. 	 Invitation for conventional cytology at the clinic. Invitation for hrHPV testing at the clinic (sample collected by a clinician). 	Mail-to-all: 4,516 Opt-in: 4,513	- 1,998 - 3,014	30-64
17. Moses, 2015 ¹⁹ Uganda	Randomised. Women who lived or worked in target city and had access to a mobile telephone. Door-to-door recruitment. No data on response stratified by screening history.	Women were provided a self-sampling kit at place of recruitment (home or workplace) and returned them to outreach workers.	Women were scheduled for VIA appointment and received a reminder call.	Community mobilization and outreach: 248	245	30-65

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
18. Enerly, 2016 ²⁰ Norway	Cohort study with random selection of women who did not have cytology, hrHPV or histology in ≥3 years. Targeted women attended information sessions. No data on response stratified by screening history.	Direct mailing of the self- sampling kit, preceded by a notification with an opt-out option.	Invitation (i.e., reminder) to complete liquid-based cytology sent to women not included in intervention group.	Mail-to-all: 800	2,593	26-69
19. Racey, 2016 ²¹	RCT.	Direct mailing of the self-	C1: Invitation letter to	Mail-to-all:	C1: 331	30–70
Canada	Women with current Ontario Health Insurance Program card and no cytology in ≥30 months. No data on response stratified by screening history.	sampling kit, preceded by a notification with choice to opt-out. Reminder phone call 1 month after kits were mailed.	schedule cytology appointment C2: No invitation (opportunistic screening)	335	C2: 152	
20. Sultana, 2016 ²²	RCT.	Direct mailing of the self-	Invitation (never-	Mail-to-all:	2,025	30-69
Australia	Never-screened or under-screened women (not screened in the previous 2.5 years). Data on response stratified by screening history: screened >2.5y ago; never screened.	sampling kit, preceded by a notification with an opt-out option.	screened) or reminder (underscreened) letters for cytology.	14,153 (7,075 un- screened; 7,078 under- screened)	(1,014 un- screened; 1,011 under- screened)	
21. Kitchener, 2017 ²³ United Kingdom	Cluster-randomised. Phase 2 of STRATEGIC trial. Women, due for their first invitation, who in phase 1 of STRATEGIC did not respond to invitation letters (with or without pre-leaflet or with/without online booking) to screening after 6 months.	 Direct mailing of unrequested self-sampling kits Direct mailing of requested self-sampling kits Offered women choice between nurse navigator and self-sampling kit (not considered for syst. rev & meta-analysis) 	No intervention beyond standard invitation.	Mail-to-all: 1,141 (32 GPs) Opt-in: 1,290 (66 GPs)	3,782 (101 GPs)	20 (Gramp- ian); 25 (Manch- ester)
22. Modibbo, 2017 ²⁴ Nigeria	RCT. Women living or working in target community not planning to move within 6 months. No data on response stratified by screening history.	Women attending a community event received a self-sampling kit to complete at home and to mail or drop off at collection sites.	Women attending a community event received a hospital hrHPV test appointment.	Community mobilization and outreach: 200	200	≥30

Author, year Country	Study design and nonvelotion	Scenario of invitation	Scenario of invitation	N (Self- sampling	N (Control	Age range
23. Kellen, 2018 ²⁵	Study design and population	in self-sampling arm	in control arm	arm) Mail-to-all:	arm) Reminder	(years) 30-64
Belgium	RCT. Population-based RCT with 2 experimental arms and 2 controls arms, including women without screening	-Reminder mailing with self-sampling kit (mail-to- all);	- Reminder mailing inviting women to have a cytology specimen taken	9,118.	letter: 8,830.	30-04
	record since 8 years. No data on response stratified by screening history.	- Reminder mailing with self-sampling to be ordered (opt-in).	by a clinician (=routine intervention). - No invitation.	Opt-in: 9,098.	No reminder: 8,849.	
24. Tranberg, 2018 ²⁶ Denmark	Population-based RCT with 1 control arm and 2 experimental arms (mail-to- all & opt-in) including women who did not reply to a 1 st invitation and were due to a 2 nd reminder. Nested in Danish screening programme. Response rates stratified for regularly screened, under-screened and never screened subgroups.	 Reminder mailing with self-sampling kit; Reminder mailing with self-sampling to be ordered (opt-in). Women were also offered the possibility to contact a GP for collection of cytology specimen. For both arms: reminder letter if response after 4m. 	Reminder mailing inviting women to have a cytology specimen taken by a clinician.	Mail-to-all: 3,265. Opt-in: 3,264.	3,262	30-64
25. Ivanus, 2018 ²⁷ Slovenia	Randomised. Women with no cytology results registered in the last 4 years and/or who had an hysterectomy. Response rates stratified for level of protection as medium and no/low protection.	 Direct mailing of the self- sampling kit Women were offered the opportunity to order a self- sampling kit All participants had free access to cytology screening with their GP during the study. 	No intervention beyond standard invitation.	Mail-to-all: 9,556 Opt-in: 14,400	2600	34 - 64

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
26. Elfström, 2019 ²⁸ Sweden	Randomised health services study. Women who did not have a screening test on record for at least 10 years, or who had been sent at least 10 annual renewed invitations and who were not blocked from invitations due to hysterectomy or screening program opt-out. No data on response stratified by screening history.	 Direct mailing of the self- sampling kit along with an invitation letter and instructions Women were offered the opportunity to order a self- sampling kit through an online application An invitation to call the region's coordinating midwife with potential questions and concerns regarding screening (not considered for syst. rev & meta- analysis) 	No intervention beyond standard invitation.	Mail-to-all: 2,000 Opt-in: 2,000	2,000	33 - 60
27. Gizaw, 2019 ²⁹ Ethiopia	Cluster Randomised. Women who had never been screened. No previous hysterectomy. No data on response stratified by screening history.	Invitation to the primary healthcare unit for self- sampling, after sensitization at community/cluster level.	Invitation to go to the hospital for VIA, after sensitization at community/cluster level.	Community mobilization and outreach: 1,213	1,143	30 - 49
28. Jalili, 2019³⁰ Canada	Randomised. Unscreened women: no Pap test in registry and who had been registered for 5+ years. Non-responders: women who had been sent an invitation letter to be screened, but who remained unscreened. No hysterectomy; or invasive gynaecologic cancer diagnosis in the registry. No data on response stratified by screening history.	Direct mailing of the self- sampling kit + reminder letter after 8w for non- responders	No intervention beyond standard invitation.	Mail-to-all: 529	523	30 - 65

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
29. Winer, 2019 ³¹ USA	Randomised. Women with health plan enrolment for 3 years and 5 months or longer, a primary care clinician, no Papanicolaou test within 3 years and 5 months, and no hysterectomy. No data on response stratified by screening history.	Usual care + direct mailing of the self-sampling kit. Participants, regardless of whether they chose to complete self-sampling, were advised to still receive Papanicolaou testing.	Usual care (annual patient reminders and ad hoc outreach from primary care clinics)	Mail-to-all: 9,960	9,891	30 - 64
30. Lilliecreutz, 2020 ³¹ Sweden	Randomised. Women who did not respond to the invitation for conventional screening and had not had a cervical smear in 6y (ages 30-49) and 8y (ages 50-64) No data on response stratified by screening history.	 Direct mailing of the self-sampling kit + annual invitation Annual screening invitation + telephone call with a midwife (within a month since invitation) offering the choice between a visit for a pap smear or an HPV self-sampling test (not considered for syst. rev & meta-analysis). 	No intervention beyond standard invitation	Mail-to-all: 3,068	3.538	30 - 64
31. MacDonald, 2021 ³³ New Zealand	Cluster randomised. Women who had not had a cervical smear in ≥4y. No data on response stratified by screening history.	Direct offer of the self- sampling kit when attending the intervention clinics. Participants randomised to receive the intervention could opt for a clinician taken HPV test or cervical smear.	Offering a cervical smear when attending the control clinics.	Direct offer at a healthcare service: 364	174	25 - 69

Author, year Country	Study design and population	Scenario of invitation in self-sampling arm	Scenario of invitation in control arm	N (Self- sampling arm)	N (Control arm)	Age range (years)
32. Brewer, 2021 ³⁴ New Zealand	Randomised. Never- and under-screened (no screening recorded for at least the last 5 years prior to enrolment) women from Maori, Pacific, and Asian ethnicities, registered at selected GP clinics.	 Direct mailing of the self- sampling kit, preceded by a notification Direct offer of the self- sampling kit at their usual general practice, preceded by a notification 	Invitation for conventional cytology (at a clinic, at an independent service providers, or with a study nurse), preceded by a notification	Mail-to-all: 1467 Opt-in: 1574	512	30 - 69
33. Veerus, 2021 ³⁵ Estonia†	Randomised. Never- and under-screened (no screening recorded from 2013-2019), women born between 1958-1983.	 Direct mailing of the self- sampling kit Women were offered the opportunity to order a self- sampling kit from a website 	/	Mail-to-all: 4000 Opt-in: 8000	/	37-62

* A telephone helpline and/or website with information was available throughout the study.

[¥] Study information was available in different languages as hard copy and on the internet.

Abbreviations: BHU: Basic Health Unit; GP: general practitioner; HPV: human papillomavirus; PG: personal gynaecologist; RCT: randomised controlled trial; SRH: sexual and reproductive health; SS: self-sampling; VIA: visual inspection with acetic acid.

† This study consisting of 2 experimental arms (different hrHPV self-sampling invitation scenarios) was not accounted for in the analysis comparing participation in self-sampling vs control groups.

Author, year	Tests	Self-sampling device	Time of response assessment (months after invitation)	Triage of test+	Follow-up
 Bais, 2007 Netherlands 	PCR (GP5+/6+)	Cervicovaginal brush	бm	No triage	• Cytology + colposcopy + colpo-directed biopsy, in case of positive screen-test
2. Gök,2010Netherlands	HC2	Lavage (Delphi screener)	12m	Self-arm: cytology + repeat HPV	 Colposcopy + colpo-directed biopsy, in case of ASC-US+ Repeat testing (Pap + hrHPV) in 1y, in case of normal cytology or no cytology performed
3. Giorgi- Rossi, 2011 Italy	HC2	Lavage	3m	No triage	 Colposcopy + colpo-directed biopsy, in case of screen test+ and positive colposcopy Colposcopy + cytology in 1y, in case of screen test+ and negative colposcopy
4. Lazcano- Ponce, 2011 Mexico	HC2	Cervicovaginal brush (Digene)	Not documented	No triage	• Colposcopy (free of charge) + colpo-directed biopsy, in case of screen test+
5. Piana, 2011 France	PCR	Not documented	Not documented	No triage	 Cytology and colposcopy + colpo-directed biopsy
6. Szarewski, 2011 United Kingdom	HC2	Swab	6m	Cytology	• Colposcopy + colpo-directed biopsy, in case of triage test+ (or triage test-, by choice) (self-sampling arm) or screening test+ (control arm).
7. Virtanen, 2011 Finland	HC2	Lavage (Delphi screener)	Not documented	- <40y: cytology + repeat HPV - ≥40y: no triage	 <40y: Colposcopy + colpo-directed biopsy, in case of at least one positive triage test. Repeat testing (cytology + hrHPV) in 1y, in case of normal triage test. ≥40y: colposcopy + colpo-directed biopsy, in case of a positive screen test
8. Wikström, 2011 Sweden	HC2	Swab	12m	No triage	 Self-arm: Colposcopy + biopsy; or cytology (with/without repeat hrHPV) Control arm: Colposcopy + biopsy, in case of HSIL+; repeat cytology in case of ASC-US or LSIL
9. Gök, 2012 Netherlands	HC2	Cervicovaginal brush	12m	Cytology	 Colposcopy + colpo-directed biopsy, in case of ASC-US+ Repeat testing (Pap + hrHPV) in 1y, in case of normal cytology

Table S2. Test, triage & follow-up characteristics of RCTs fulfilling eligibility criteria.

Author, year	Tests	Self-sampling device	Time of response assessment (months after invitation)	Triage of test+	Follow-up
10. Darlin, 2013	PCR (GP5+/6+)	Not documented	Not documented	No triage	• Colposcopy + colpo-directed biopsy and LBC, in case of hrHPV.
Sweden 11. Sancho- Garnier, 2013 France	Abbott RT PCR	Swab (Dacron)	Not documented	Cytology	Colposcopy + colpo-directed biopsy, in case of LSIL+
12. Broberg, 2014 Sweden	HC2	Plastic swab (QvinTip)	Not documented	No triage	• Colposcopy + colpo-directed biopsy, in case of hrHPV+ and/or abnormal cytology.
13. Haguenoer, 2014 France	INNO-LiPa	Dry nylon flocked swab.	9m 12m	Cytology	Colposcopy + colpo-directed biopsy in case of ASC-US+
14. Arrossi,2015Argentina	HC2	Cervical brush (Qiagen)	бт	Self arm: no triage Control arm: cytology	• Colposcopy + colpo-directed biopsy, in case of hrHPV+ (self-sampling arm) or in case of hrHPV+ and ASC-US+ (control arm).
15. Cadman, 2015 United Kingdom	HC2	Dacron Swab	3m	Cytology	• Colposcopy + colpo-directed biopsy, in case of abnormal cytology.
16. Giorgi- Rossi, 2015 Italy	HC2	Lavage (Delphi screener)	3m	Primary HPV: cytology (3/6 study centers), or no triage (3/6). Primary cytology: no triage.	 Colposcopy + colpo-directed biopsy in case of ASC-US+ (cytology triage, or primary cytology). Repeat HPV in case of normal cytology. Cytology, and colposcopy + colpo-directed biopsy in case of hrHPV+ (no triage). Repeat double testing in 3-6 months in case of normal colposcopy and HSIL, otherwise repeat testing in 1 year.
17. Moses, 2015 Uganda	Ecoli s.r.o real-time PCR test	Dacron swab	Not documented	VIA	 Self arm: cryotherapy at VIA appointment, or colposcopy with treatment when indicated. VIA arm: cryotherapy at the time of screening. Referral for colposcopy and treatment when lesions were not appropriate for cryotherapy or when VIA was unsatisfactory.

Author, year	Tests	Self-sampling device	Time of response assessment (months after invitation)	Triage of test+	Follow-up
18. Enerly, 2016 Norway	CLART HPV2 test, HC2	Lavage (Delphi screener) / Evalyn brush (randomised)	Not documented	Self arm: cytology or hrHPV testing Control arm: cytology	hrHPV+ on self-sample: scheduled appointment for collection of a cervical specimen that was co-tested (cytology &hr HPV).
19. Racey, 2016 Canada	NML Luminex (linear array)	Dacron swab	Not documented	Cytology	Standard of care
20. Sultana, 2016 Australia	Cobas 4800	Nylon-tipped flocked swab	6m	HPV 16/18: no triage (directly to colposcopy) HPV other types: cytology	Colposcopy with biopsy
21. Kitchener, 2017 United Kingdom	Cobas 4800	Lavage (Delphi Screener)/ Evalyn Brush	3m 6m 12m 18m	Cytology	Colposcopy if triage by cytology was positive. Usual triage as recommended in NHS programme if cytology positive in control arm. No triage results were presented.
22. Modibbo, 2017 Nigeria	GP5+/6+- EIA PCR with LMNX genotyping	Dry flocked swab	1m	Not documented	Treatment and follow-up
23. Kellen, 2018 Belgium	RIATOL qPCR	Qvintip	12m	Cytology	Not documented.
24. Tranberg, 2018 Denmark	Self arm: Cobas 4800. Control arm: cytology, Cobas 4800 if 60-64y	Evalyn Brush	6m	Self arm: cytology	Follow-up as defined in Danish programme: ASC-US/HPV+ & LSIL+ referred to colposcopy. If self HPV+ & NILM at 1 st triage: repeat cytology & HPV at 12m.

Author, year	Tests	Self-sampling device	Time of response assessment (months after invitation)	Triage of test+	Follow-up
25. Ivanus, 2018 Slovenia	HC2	Mail-to-all: Qvintip (Swab), HerSwab (Swab) and Delphi Screener (Lavage). Opt-in: Qvintip (Swab).	12m	No triage	Colposcopy + colpo-directed biopsy (if abnormal colposcopy result), in case of hrHPV+ and/or abnormal cytology.
26. Elfstrom,2019Sweden	Cobas 4800	Cobas PCR Swab	3m	Mail-to-all & opt-in group hrHPV positive: No triage In any arm: cytology	Mail-to-all & opt-in hrHPV+: pelvic exam, cytology + colposcopy + colpo-directed biopsy. Screen-positive women were managed in accordance with the program's standard guidelines and clinical presentation.
27. Gizaw, 2019 Ethiopia	PCR(GP5+/ GP6+)	Evalyn Brush	Not documented	hrHPV+: VIA	See&treat approach (cryotherapy)
28. Jalili, 2019 Canada	Cobas 4800	FLOQSwab	бm	No triage	Colposcopy, in case of hrHPV+ and/or abnormal cytology.
29. Winer, 2019 United States of America	Cobas 4800	Not documented	6m	Positive HPV-16 or 18: no triage Negative/unsatisfactory/hr HPV other than HPV-16 or 18: cytology	HPV-16 or 18: immediate colposcopy.
30. Lilliecreutz, 2020 Sweden	Cobas 4800	Cobas PCR Swab	6m	hrHPV+: no triage	Colposcopy + colpo-directed biopsy, in case of hrHPV+ and/or abnormal cytology.

Author, year	Tests	Self-sampling device	Time of response assessment (months after invitation)	Triage of test+	Follow-up
31.	Abbott	Nylon-tipped	Not	No triage	Colposcopy, in case of hrHPV+
MacDonald,	Real-time	flocked swab	documented		
2021	High-Risk	(Copan)			
New Zealand	HPV assay				
32. Brewer, 2021 New Zealand	Cobas 4800	FLOQSwab	3m	Positive HPV-16 or 18: no triage Negative/unsatisfactory/hr HPV other than HPV-16 or 18: cytology	Colposcopy, in case of hrHPV+ and/or abnormal cytology.
33. Veerus, 2021 Estonia†	Alinity m hrHPV Assay (Cobas 4800 on inadequate samples)	Qvintip and Evalynbrush	Not documented	hrHPV+: cytology	Colposcopy, in case of abnormal cytology

Abbreviations: ASC-US+: atypical squamous cells of undetermined significance or more severe results; EIA: enzyme immunoassay; HC2: Hybrid Capture 2; hrHPV: high-risk human papillomavirus; HSIL+: high-grade squamous intraepithelial lesions or more severe disease; LBC: Liquid-based cytology; LMNX: Luminex; LSIL+: low-grade squamous intraepithelial lesions or more severe disease; NHS: National Health Service; NILM: negative for intraepithelial lesion or malignancy; NML: Canadian National Microbiology Laboratory; RCT: randomised controlled trial; VIA: visual inspection with acetic acid.

[†] This study consisting of 2 experimental arms (different hrHPV self-sampling invitation scenarios) was not accounted for in the analysis comparing participation in self-sampling vs control groups.

5. Assessment of risk of bias in randomised trials

Table S3. Summary of the quality of included studies, according to the Cochrane Tool for Risk of Bias³⁶.

Risk of Bias	Select	ion	Attrition	Reporting		
	Random	Allocation	Incomplete	Reporting	Selective	
	sequence	concealment	outcome data	of timelines	reporting	
	generation					
Bais, 2007	Low	Medium	Low	Low	Low	
Gok, 2010	Low	Medium	Low	Low	Low	
Giorgi-Rossi, 2011	Low	Low	Low	Low	Low	
Lazcano-Ponce, 2011	Medium [*]	Low	Low	Medium	Medium [¥]	
Piana, 2011	Low	Medium	Low	Medium	High [¥] □	
Szarewski, 2011	Medium [∆]	Medium	Low	Low	Low	
Virtanen, 2011	Low	Medium	Low	Low	Low	
Wikstrom, 2011	Medium [∆]	Medium	Low	Low	Low	
Gok, 2012	Low	Medium	Low	Low	Medium [¥]	
Darlin, 2013	Medium [∆]	Medium	Low	Medium	Medium [¥]	
Sancho-Garnier, 2013	Medium [∆]	Medium	Low	Low	Medium [¥]	
Broberg, 2014	Medium [∆]	Medium	Low	Medium	Low	
Haguenoer, 2014	Low	Low	Low	Low	Low	
Arrossi, 2015	Medium*	Low	Low	Low	Low	
Cadman, 2015	Low	Low	Low	Low	Low	
Giorgi Rossi, 2015	Low	Low	Low	Low	Low	
Moses, 2015	Low	Low	Low	Medium	Low	
Enerly, 2016	$High^{\delta}$	High	Low	Low	Medium	
Racey, 2016	Low	Low	Low	Medium	Low	
Sultana, 2016	Low	Low	Low	Low	Medium	
Kitchener, 2017	Medium	Medium	Low	Low	Low	
Modibbo, 2017	High ^α	Medium	Low	Low	Medium [¥]	
Kellen, 2018	Low	High€	Low	Low	Medium [€]	
Tranberg, 2018	Low	Low	Low	Low	Low	
Ivanus, 2018	Low	Low	Low	Low	Low	
Elfstrom, 2019	Low	Low	Low	Low	Low	
Gizaw, 2019	Medium*	Low	Low	Medium	Medium [¥]	
Jalili, 2019	Medium [∆]	Low	Low	Low	Low	
Winer, 2019	Medium [∆]	Low	Low	Low	Low	
Lillicreutz, 2020	Low	Low	Low	Low	Low	
MacDonald, 2021	Medium*	Low	Low	Medium	Low	
Brewer, 2021	Low	Low	Low	Low	Medium [¥]	
Veerus, 2021 [†]	Low	Low	Low	Medium	Low	

High=high risk of bias, Low=low risk of bias, Medium=intermediate risk of bias.

* Non-random factor is included in design. Women assigned to the self-sampling arm who were found not at home, were reassigned to cytology.)

 $^{\Delta}$ Details of the randomisation process are not documented.

[¥] Intention-to-treat analysis was not reported. If there were women who went to the clinic for conventional screening, after being invited for self-sampling, it was not documented.

^D Women in the self-sampling arm could opt-out, and those who did were excluded from the analysis (possibly leading to an artificially high participation rate in the self-sampling arm).

* Cluster-randomisation of community health workers/ Health Units to self-sampling and control arm.

 $^{\Omega}$ Intention-to-treat analysis unclear (nbs < than per protocol analysis)

^δ Non-random factors in design. Investigators used randomisation to identify 800 screening non-attenders (300 each from age groups 26–34 and 35–49 years, and 200 from the age group 50–69 years). The remaining non-attenders in the study area screening programme were considered the control group.

 $^{\alpha}$ Randomisation occurred after enrolment.

 $^{\epsilon}$ Timing of invitation in experimental arms was different from invitation in the first control arm; compliance with cytology triage and detection rate of CIN2+ not reported.

 μ Monthly-alternation as randomisation method was used to allocate women to the experimental or control arm. † This study consisting of 2 experimental arms (different hrHPV self-sampling invitation scenarios) is only included for the secondary analysis and was not accounted for in the main analysis.

Mail-to-all	
Bais, 2007	■ 31.3 (29.5, 33.2)
Gok, 2010	27.5 (27.0, 28.1)
Giorgi-Rossi, 2011	■ 16.7 (14.0, 19.9)
Piana, 2011	■ 26.4 (25.0, 27.9)
Szarewski, 2011	■ 6.4 (5.3, 7.8)
Virtanen, 2011	■ 27.7 (25.9, 29.5)
Wikstrom, 2011	34.0 (31.9, 36.1)
Gok, 2012	■ 30.8 (30.2, 31.4)
Darlin, 2013	■ 14.7 (12.6, 17.0)
Sancho-Garnier, 2013	18.3 (17.5, 19.1)
Haguenoer, 2014	■ 16.0 (14.5, 17.7)
Cadman, 2015	8.9 (7.9, 10.0)
Giorgi-Rossi, 2015	■ 19.6 (18.4, 20.8)
Enerly, 2016	■ 21.1 (18.4, 24.1)
Racey, 2016	- 20.9 (16.9, 25.6)
Sultana, 2016	11.5 (11.0, 12.1)
Kitchener, 2017	7.4 (6.1, 9.1)
Ivanus, 2018	■ 28.1 (27.2, 29.0)
Kellen, 2018	■ 18.7 (17.9, 19.5)
Tranberg, 2018	■ 19.4 (18.1, 20.8)
Elfstrom, 2019	17.6 (16.0, 19.3)
Jalili, 2019	9.6 (7.4, 12.5)
Winer, 2019	■ 12.1 (11.5, 12.8)
Lilliecreutz, 2020	■ 25.7 (24.2, 27.3)
Brewer, 2021	14.0 (12.3, 15.8)
Subtotal (I^2 = 99.5%, p = <0.0001)	• 18.8 (15.7, 22.0)
Opt-in	
Giorgi-Rossi, 2011	■ 5.8 (4.2, 7.9)
Broberg, 2014	12.0 (9.9, 14.4)
Giorgi-Rossi, 2015	10.5 (9.7, 11.5)
Kitchener, 2017	■ 1.5 (0.9, 2.3)
Ivanus, 2018	17.5 (16.9, 18.2)
Kellen, 2018	■ 10.6 (10.0, 11.3)
Tranberg, 2018	8.3 (7.4, 9.3)
Elfstrom, 2019	8.2 (7.0, 9.4)
Brewer, 2021	6.4 (5.3, 7.7)
Subtotal (I^2 = 99.0%, p = <0.0001)	Q 8.5 (5.6, 11.8)
Community mobilization & outreach	
Lazcano-Ponce, 2011	98.2 (97.9, 98.4)
Arrossi, 2015	79.8 (78.4, 81.2)
Moses, 2015	99.2 (97.1, 99.8)
Modibbo, 2017	92.5 (88.0, 95.4)
Gizaw, 2019	■ 84.1 (81.9, 86.0)
Subtotal (I^2 = 99.7%, p = <0.0001)	92.5 (80.3, 99.1)
Offer at Healthcare Service	
MacDonald, 2021	42.0 (38.5, 45.6)
	0 25 50 75 100

6. Participation in the experimental and control groups of RCTs

Figure S2. Participation rate in the experimental groups of randomised trials: per-protocol (PP) analysis. Only hrHPV tests on self-samples were accounted for.

Mail-to-all Bais, 2007 Gok, 2010 (Giorgl-Rossi, 2011) Piana, 2011 Szarewski, 2011 Wikstom, 2011 Sarewski, 2011 Wikstom, 2011 Gok, 2012 Darlin, 2013 Sancho-Garnier, 2013 Haguencer, 2014 Cadman, 2015 Enerly, 2016 Brewr, 2016 Kitchener, 2017 Itiliacrate, 2018 Elfstrom, 2018 Ciorgl-Rossi, 2015 Elfstrom, 2018 Ciorgl-Rossi, 2015 Elfstrom, 2018 Ciorgl-Rossi, 2015 Elfstrom, 2018 Ciorgl-Rossi, 2015 Elfstrom, 2018 Ciorgl-Rossi, 2016 Brewer, 2021 $34.3 (32.4, 36.2) (32.4, $	Study	AP (95% CI)
Gok, 2010 27.7 (27.2, 28.3) Giorgi-Rossi, 2011 19.6 (16.7, 23.0) Yirtanen, 2011 10.2 (8.8, 11.8) Yirtanen, 2011 39.0 (36.8, 41.1) Gok, 2012 30.8 (30.2, 31.4) Darlin, 2013 14.7 (12.6, 17.0) Sarawski, 2011 30.9 (36.8, 41.1) Gok, 2012 30.8 (30.2, 31.4) Darlin, 2013 14.7 (12.6, 17.0) Sarawski, 2014 24.6 (22.8, 26.5) Cadman, 2015 14.7 (13.5, 16.1) Giorgi-Rossi, 2016 33.4 (30.2, 36.7) Sutana, 2016 33.4 (30.2, 36.7) Kitchener, 2017 21.6 (20.4, 22.8) Ivanus, 2018 5.9 (15.3, 16.5) Kellen, 2018 5.8 (25.0, 26.7) Tranberg, 2018 8.8.0 (36.4, 39.7) Subtotal (h*2 = 99.3%, p = <0.0001)	Mail-to-all	
Giorgi-Rossi, 2011 • 19.6 (16.7, 23.0) Piana, 2011 26.4 (25.0, 27.9) Szarewski, 2011 • 31.5 (29.7, 33.4) Wikstom, 2011 • 30.0 (36.8, 41.1) Gok, 2012 • 30.8 (30.2, 31.4) Darlin, 2013 • 14.7 (12.6, 17.0) Sancho-Garnier, 2014 • 24.6 (22.8, 26.5) Cadman, 2015 • 14.7 (13.5, 16.1) Giorgi-Rossi, 2015 • 31.9 (27.2, 37.1) Sultana, 2016 • 31.9 (27.2, 37.1) Sultana, 2018 • 31.9 (27.2, 37.1) Natana, 2018 • 31.9 (27.2, 37.1) Natana, 2018 • 31.9 (27.2, 37.1) Natana, 2018 • 31.9 (27.2, 37.1) Values, 2018 • 31.9 (27.2, 37.1) Subtotal (I^2 = 99.3%, p = <0.0001)	Bais, 2007	34.3 (32.4, 36.2)
Piran, 2011 26.4 (25.0, 27.9) Szarewski, 2011 10.2 (8.8, 11.8) Virtaren, 2011 30.6 (36.8, 41.1) Wikstrom, 2013 30.6 (36.8, 41.1) Darlin, 2013 30.8 (30.2, 31.4) Darlin, 2013 14.7 (12.6, 17.0) Sancho-Garnier, 2013 14.7 (12.6, 17.0) Haguenoer, 2014 24.6 (22.8, 26.5) Cadman, 2015 14.7 (13.5, 16.1) Giorgi-Rossi, 2015 14.7 (13.5, 16.5) Enerly, 2016 33.4 (30.2, 36.7) Racey, 2016 33.4 (30.2, 36.7) Subtana, 2015 21.6 (20.4, 22.8) Enerly, 2016 33.4 (30.2, 36.7) Racey, 2016 33.4 (30.2, 36.7) Subtana, 2016 15.9 (15.3, 16.5) Kellen, 2018 25.8 (25.0, 26.7) Tranberg, 2018 25.8 (25.0, 26.7) Subtotal (h^2 = 99.3%, p = <0.0001)	Gok, 2010	27.7 (27.2, 28.3)
Szarewski, 2011 Virtanen, 2011 Virtanen, 2011 Virtanen, 2011 Gok, 2012 Darlin, 2013 Sancho-Garnier, 2013 Haguenoer, 2014 Cadman, 2015 Enerly, 2016 Racey, 2016 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Brewer, 2021 Subtotal (l*2 = 99.6%, p = <0.0001) Offer at Healthcare Service MacDonald, 2021 0 25 50 75 100 Virtane, 2017 Virtane, 2018 Subtotal (l*2 = 99.6%, p = <0.0001) Offer at Healthcare Service MacDonald, 2021 0 25 50 75 100 Virtane, 2017 Virtane, 2018 Subtotal (l*2 = 99.6%, p = <0.0001) Offer at Healthcare Service MacDonald, 2021 0 25 50 75 100 Virtane, 2017 Virtane, 2018 Subtotal (l*2 = 99.6%, p = <0.0001) Offer at Healthcare Service MacDonald, 2021 0 25 50 75 100	Giorgi-Rossi, 2011	– 19.6 (16.7, 23.0)
Virtanen, 2011 31.5 (29.7, 33.4) Wikstrom, 2011 30.8 (30.2, 31.4) Gok, 2012 30.8 (30.2, 31.4) Darlin, 2013 14.7 (12.6, 17.0) Sancho-Garnier, 2013 18.3 (17.5, 19.1) Haguenoer, 2014 24.6 (22.8, 26.5) Cadman, 2015 14.7 (13.5, 16.1) Giorgi-Rossi, 2015 21.6 (20.4, 22.8) Enerly, 2016 31.9 (27.2, 37.1) Sultana, 2016 31.9 (27.2, 37.1) Kitchener, 2017 21.3 (19.0, 23.8) Ivanus, 2018 25.8 (25.0, 26.7) Franberg, 2018 38.0 (36.4, 39.7) Elfstrom, 2019 18.7 (17.1, 20.5) Juilier, 2020 34.1 (32.5, 35.8) Brewer, 2021 34.0 (36.4, 39.7) Subtotal (h*2 = 99.3%, p = <0.0001)	Piana, 2011	26.4 (25.0, 27.9)
Wikstrom. 2011 39.0 (36.8, 41.1) Gok, 2012 30.8 (30.2, 31.4) Darlin, 2013 14.7 (12.6, 17.0) Sancho-Garnier, 2013 14.7 (12.6, 17.0) Haguenoer, 2014 24.6 (22.8, 26.5) Cadman, 2015 14.7 (13.5, 16.1) Giorgi-Rossi, 2015 14.7 (13.5, 16.1) Enerly, 2016 33.4 (30.2, 36.7) Racey, 2016 33.4 (30.2, 36.7) Kitchener, 2017 13.9 (27.2, 37.1) Ivanus, 2018 15.9 (15.3, 16.5) Tranberg, 2018 33.8 (30.2, 36.7) Ifstrom, 2019 33.4 (30.2, 36.7) Jailli, 2019 13.9 (27.2, 37.1) Winer, 2018 37.7 (36.7, 38.6) Brower, 2021 38.0 (36.4, 39.7) Subtotal (I^2 = 99.3%, p = <0.0001)	Szarewski, 2011	10.2 (8.8, 11.8)
Gok, 2012 30.8 (30.2, 31.4) Darlin, 2013 30.8 (30.2, 31.4) Sancho-Garnier, 2013 4.7 (12.6, 17.0) Haguencer, 2014 24.6 (22.8, 26.5) Cadman, 2015 14.7 (13.5, 16.1) Giorgi-Rossi, 2016 33.4 (30.2, 36.7) Sultana, 2016 33.4 (30.2, 36.7) Kitchener, 2017 31.9 (27.2, 37.1) Ivanus, 2018 37.7 (36.7, 38.6) Kellen, 2018 38.0 (36.4, 39.7) Elfstrom, 2019 18.7 (17.1, 20.5) Jalili, 2019 18.7 (17.1, 20.5) Viner, 2021 34.1 (32.5, 35.8) Brewer, 2021 34.1 (32.5, 35.8) Subtotal (I^2 = 99.3%, p = <0.0001)	Virtanen, 2011	31.5 (29.7, 33.4)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Wikstrom, 2011	39.0 (36.8, 41.1)
Sancho-Garnier, 2013 Haguenoer, 2014 Cadman, 2015 Enerly, 2016 Enerly, 2017 Ivanus, 2018 Elfstrom, 2019 Lilliecreutz, 2020 Brewer, 2021 Subtotal (I^2 = 99.3%, p = <0.0001) Optin Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Elfstrom, 2019 Lilliecreutz, 2020 Brewer, 2021 Subtotal (I^2 = 99.5%, p = <0.0001) Community mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Modibo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001) Offer at Healthcare Service MacDonald, 2021 0 2 0 2 0 2 1 0 2 1 0 2 1 1 1 1 1 1 1 1	Gok, 2012	30.8 (30.2, 31.4)
Haguencer, 2014 24.6 (22.8, 26.5) Cadman, 2015 14.7 (13.5, 16.1) Giorgi-Rossi, 2016 33.4 (30.2, 36.7) Racey, 2016 33.4 (30.2, 36.7) Kitchener, 2017 21.3 (19.0, 23.8) Ivanus, 2018 38.0 (36.4, 39.7) Elfstrom, 2019 10.8 (8.4, 13.7) Jalili, 2019 10.8 (8.4, 13.7) Winer, 2019 10.8 (8.4, 13.7) Jalili, 2019 10.8 (8.4, 13.7) Brewer, 2021 34.1 (32.5, 35.8) Subtotal (I^2 = 99.3%, p = <0.0001)	Darlin, 2013	14.7 (12.6, 17.0)
Cadman, 2015 14.7 (13.5, 16.1) Giorgi-Rossi, 2015 14.7 (13.5, 16.1) Enerty, 2016 33.4 (30.2, 36.7) Racey, 2016 31.9 (27.2, 37.1) Sultana, 2016 15.9 (15.3, 16.5) Kitchener, 2017 21.3 (19.0, 23.8) Ivanus, 2018 37.7 (36.7, 38.6) Kellen, 2018 38.0 (36.4, 39.7) Elfstrom, 2019 38.0 (36.4, 39.7) Jailli, 2019 8.7 (17.1, 20.5) Winer, 2019 10.8 (84, 13.7) Uilicereutz, 2020 9.3 (4, 132.5, 35.8) Brewer, 2021 26.6 (25.7, 27.4) Subtotal (1^2 = 99.3%, p = <0.0001)	Sancho-Garnier, 2013	18.3 (17.5, 19.1)
Giorgi-Rossi, 201521.6 $(20.4, 22.8)$ Enerly, 2016•33.4 $(30.2, 36.7)$ Racey, 2016•33.4 $(30.2, 26.7)$ Sultana, 2016•15.9 $(15.3, 16.5)$ Kitchener, 2017•21.3 $(19.0, 23.8)$ Ivanus, 2018•38.0 $(36.4, 39.7)$ Elfstrom, 2019•38.0 $(36.4, 39.7)$ Jalili, 2019•10.8 $(8.4, 13.7)$ Winer, 2019•10.8 $(8.4, 13.7)$ Jalili, 2019•10.8 $(8.4, 13.7)$ Winer, 2019•26.6 $(25.7, 27.4)$ Lilliecreutz, 2020•34.1 $(32.5, 35.8)$ Brewer, 2021•14.0 $(12.3, 15.8)$ Subtotal (I^2 = 99.3%, p = <0.0001)	Haguenoer, 2014	24.6 (22.8, 26.5)
Enerly, 2016 Racey, 2016 Sultana, 2016 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Jalili, 2019 Winer, 2019 Lilliecreutz, 2020 Brewer, 2021 Subtotal (I^2 = 99.3%, p = <0.0001) Optin Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Elfstrom, 2019 Elfstrom, 2019 Elfstrom, 2019 Elfstrom, 2019 Subtotal (I^2 = 99.6%, p = <0.0001) $Omunity mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Modibbo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001) Offer at Healthcare ServiceMacDonald, 202100255075100025507510033.4 (30.2, 36.7) 31.9 (27.2, 37.1) 31.9 (27.2, 37.1)31.9 (27.2, 37.1)31.9 (27.2, 37.1)31.9 (27.2, 37.1)21.3 (19.0, 23.8)3.3.7 (36.5) 21.3 (19.0, 23.8)3.8 (36.4, 39.7)10.8 (84.13.7)10.8 (84.13.7)24.3 (21.5, 27.3)024.3 (21.5, 27.3)024.3 (21.5, 27.3)010.6 (9.4, 12.1)099.2 (97.9, 98.4)84.1 (81.9, 86.0)99.2 (97.9, 98.4)84.1 (81.9, 86.0)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (97.1, 99.8)99.2 (92.3, 99.0)0092.9 (82.3, 99.0)0092.9 (82.3, 99.0)0010.7 (46.1, 53.3)$	Cadman, 2015	14.7 (13.5, 16.1)
Racey, 2016 $31.9(27.2, 37.1)$ Suitana, 2016 $15.9(15.3, 16.5)$ Kitchener, 2017 $21.3(19.0, 23.8)$ Ivanus, 2018 $25.8(25.0, 26.7)$ Tranberg, 2019 $38.0(36.4, 39.7)$ Elfstrom, 2019 $10.8(8.4, 13.7)$ Viner, 2019 $10.8(8.4, 13.7)$ Lilliecreutz, 2020 $34.1(32.5, 35.6)$ Brewer, 2021 $34.1(32.5, 35.6)$ Subtotal (I^2 = 99.3%, p = <0.0001)	Giorgi-Rossi, 2015	21.6 (20.4, 22.8)
Sultana, 201615.9 (15.3, 16.5)Kitchener, 201721.3 (19.0, 23.8)Ivanus, 201838.0 (36.4, 39.7)Elfstrom, 20198.7 (17.1, 20.5)Jalili, 201918.7 (17.1, 20.5)Viner, 201918.7 (17.1, 20.5)Jalili, 201926.6 (25.7, 27.4)Lilliecreutz, 20204.4 (12.3, 15.8)Brewer, 20214.4 (12.3, 15.8)Subtotal ($1^2 = 99.3\%$, p = <0.0001)	Enerly, 2016	33.4 (30.2, 36.7)
Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2013 Elfstrom, 2019 Jalili, 2019 Winer, 2019 Lilliecreutz, 2020 Brewer, 2021 Subtotal ($l^2 = 99.3\%$, p = <0.0001) $25.8 (25.0, 26.7)$ $= 38.0 (36.4, 39.7)$ $= 18.7 (17.1, 20.5)$ $= 38.0 (36.4, 39.7)$ $= 26.6 (25.7, 27.4)$ $= 20.5 (17.8, 23.4)$ $= 20.5 (17.1, 2)$ $= 99.2 (97.1, 99.8)$ $= 90.2 (97.1, 99.8)$ $= 90.2 (97.1, 99.8)$ $= 92.2 (97.9, 98.4)$ $= 92.2 (97.1, 99.8)$ $= 92.2 (97.9, 98.4)$ $= 92.9 (82.3, 99.0)$ $= 10.6 (9.4, 1, 53.3)$ $= 10.6 (9.4, 1, 53.3)$ $= 10.6 (9.4, 1, 53.3)$ <b< td=""><td>Racey, 2016</td><td>➡ 31.9 (27.2, 37.1)</td></b<>	Racey, 2016	➡ 31.9 (27.2, 37.1)
Ivanus, 2018 Kellen, 2018 $37.7 (36.7, 38.6)$ Tranberg, 2018 Elfstrom, 2019 Jalili, 2019 $38.0 (36.4, 39.7)$ Jalili, 2019 Uilliecrutz, 2020 Brewer, 2021 $18.7 (17.1, 20.5)$ Brewer, 2021 Subtotal (I^2 = 99.3%, p = <0.0001)	Sultana, 2016	15.9 (15.3, 16.5)
Kellen, 2018 25.8 (25.0, 26.7) Tranberg, 2018 38.0 (36.4, 39.7) Elfstrom, 2019 18.7 (17.1, 20.5) Jailil, 2019 26.6 (25.7, 27.4) Winer, 2020 34.1 (32.5, 35.8) Brewer, 2021 34.1 (32.5, 35.8) Subtotal (l*2 = 99.3%, p = <0.0001)	Kitchener, 2017	21.3 (19.0, 23.8)
Tranberg, 2018 $38.0 (36.4, 39.7)$ Elfstrom, 2019 $18.7 (17.1, 20.5)$ Jailii, 2019 $10.8 (8.4, 13.7)$ Winer, 2019 $26.6 (25.7, 27.4)$ Lilliecreutz, 2020 $34.1 (32.5, 35.8)$ Brewer, 2021 $34.1 (32.5, 35.8)$ Subtotal (I^2 = 99.3%, p = <0.0001)	Ivanus, 2018	
Elfstrom, 2019 $18.7 (17.1, 20.5)$ Jalili, 2019 $10.8 (8.4, 13.7)$ Winer, 2019 $26.6 (25.7, 27.4)$ Lilliecreutz, 2020 $34.1 (32.5, 35.8)$ Brewer, 2021 $34.1 (32.5, 35.8)$ Subtotal (1^2 = 99.3%, p = <0.0001)	Kellen, 2018	25.8 (25.0, 26.7)
Jalili, 201910.8 (8.4, 13.7)Winer, 201926.6 (25.7, 27.4)Lilliecreutz, 2020 $34.1 (32.5, 35.8)$ Brewer, 2021 $34.1 (32.5, 35.8)$ Subtotal (I^2 = 99.3%, p = <0.0001)	Tranberg, 2018	38.0 (36.4, 39.7)
Winer, 2019 Lilliecreutz, 2020 Brewer, 2021 Subtotal (I^2 = 99.3%, p = <0.0001) $26.6 (25.7, 27.4)$ $34.1 (32.5, 35.8)$ $14.0 (12.3, 15.8)$ $24.3 (21.5, 27.3)$ Opt-in Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001) $8.7 (6.7, 11.2)$ $12.0 (11.1, 12.9)$ $10.6 (9.4, 12.1)$ $10.6 (9.4, 12.1)$ $10.6 (9.4, 12.1)$ Community mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Modibo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001) $98.2 (97.9, 98.4)$ $83.0 (81.6, 84.2)$ $99.2 (97.1, 99.8)$ $99.2 (97.1, 99.8)$ $99.2 (97.1, 99.8)$ $99.2 (97.1, 99.8)$ Offer at Healthcare Service MacDonald, 2021 $49.7 (46.1, 53.3)$	Elfstrom, 2019	18.7 (17.1, 20.5)
Lilliecreutz, 2020 Brewer, 2021 Subtotal (I^2 = 99.3%, p = <0.0001) Opt-in Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001) Ommunity mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Modibbo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001) Offer at Healthcare Service MacDonald, 2021 0 0 25 50 75 106 10.6 (14, 153.3) 10.6 (9.4, 12.1) 98.2 (97.9, 98.4) 84.1 (81.9, 86.0) 92.9 (82.3, 99.0)	Jalili, 2019	10.8 (8.4, 13.7)
Brewer, 2021 Subtotal (I^2 = 99.3%, p = <0.0001) Opt-in Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001) Community mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Modibbo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001) Offer at Healthcare Service MacDonald, 2021 0 25 50 75 100 14.0 (12.3, 15.8) 24.3 (21.5, 27.3) 14.0 (12.3, 15.8) 24.3 (21.5, 27.3) 24.3 (21.5, 27.3) 8.7 (6.7, 11.2) 8.7 (6.7, 11.2) 14.0 (12.3, 15.8) 24.3 (21.5, 27.3) 12.0 (11.1, 12.9) 12.0 (11.1, 12.9) 16.2 (14.3, 18.3) 18.7 (18.0, 19.6) 10.6 (9.4, 12.1) 98.2 (97.9, 98.4) 83.0 (81.6, 84.2) 99.2 (97.9, 98.4) 84.1 (81.9, 86.0) 92.9 (82.3, 99.0)	Winer, 2019	
Subtotal ($l^2 = 99.3\%$, $p = <0.0001$) 24.3 (21.5, 27.3) 24.3 (21.5, 27.3) Opt-in Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal ($l^2 = 99.6\%$, $p = <0.0001$) 8.7 (6.7 , 11.2) 20.5 (17.8 , 23.4) 12.0 (11.1 , 12.9) 16.2 (14.3 , 18.3) 18.7 (18.0 , 19.6) 18.7 (18.0 , 19.6) 18.7 (18.0 , 19.6) 10.6 (9.4 , 12.1) Brewer, 2021 Subtotal ($l^2 = 99.6\%$, $p = <0.0001$) Community mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Moses, 2015 Modibbo, 2017 Gizaw, 2019 Subtotal ($l^2 = 99.6\%$, $p = <0.0001$) 98.2 (97.9 , 98.4) 84.1 (81.9 , 86.0) 92.9 (82.3 , 99.0) Offer at Healthcare Service MacDonald, 2021 49.7 ($46.1, 53.3$)		
Opt-in Giorgi-Rossi, 2011 8.7 (6.7, 11.2) Broberg, 2014 20.5 (17.8, 23.4) Giorgi-Rossi, 2015 12.0 (11.1, 12.9) Kitchener, 2017 16.2 (14.3, 18.3) Ivanus, 2018 34.0 (33.2, 34.8) Kellen, 2018 18.7 (18.0, 19.6) Tranberg, 2018 18.7 (18.0, 19.6) Elfstrom, 2019 10.6 (9.4, 12.1) Brewer, 2021 0.4 (5.3, 7.7) Subtotal (I^2 = 99.6%, p = <0.0001)		
Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (h^2 = 99.6%, p = <0.0001)	Subtotal (I^2 = 99.3%, p = <0.0001)	9 24.3 (21.5, 27.3)
Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001) $20.5 (17.8, 23.4)$ 12.0 (11.1, 12.9) 16.2 (14.3, 18.3) 34.0 (33.2, 34.8) 18.7 (18.0, 19.6) 18.7 (18.0, 19.6) 18.7 (18.0, 19.6) 19.9 (29.4, 32.5) Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001) $20.5 (17.8, 23.4)$ 16.2 (14.3, 18.3) 18.7 (18.0, 19.6) 10.6 (9.4, 12.1) 6.4 (5.3, 7.7) 10.6 (9.4, 12.1) 6.4 (5.3, 7.7) 10.6 (9.4, 12.1) 6.4 (5.3, 7.7) 10.6 (9.4, 12.1) 6.4 (5.3, 7.7) 10.6 (9.4, 12.1) 9.9 (97.9, 98.4) 9.9 (97.9, 98.4) 9.9 (97.1, 99.8) 9.9 (
Giorgi-Rossi, 2015 Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (l^2 = 99.6%, p = <0.0001)		
Kitchener, 2017 Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001)16.2 (14.3, 18.3) $34.0 (33.2, 34.8)$ $18.7 (18.0, 19.6)$ $30.9 (29.4, 32.5)$ $10.6 (9.4, 12.1)$ $6.4 (5.3, 7.7)$ $16.7 (10.5, 23.9)$ Community mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Moses, 2015 Modibbo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001)98.2 (97.9, 98.4) $99.2 (97.1, 99.8)$ $99.2 (97.1, 99.8)$ $92.9 (82.3, 99.0)$ Offer at Healthcare Service MacDonald, 202149.7 (46.1, 53.3)0255075		
Ivanus, 2018 Kellen, 2018 Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001)		
Kellen, 2018 18.7 (18.0, 19.6) Tranberg, 2018 $30.9 (29.4, 32.5)$ Elfstrom, 2019 $10.6 (9.4, 12.1)$ Brewer, 2021 $6.4 (5.3, 7.7)$ Subtotal (I^2 = 99.6%, p = <0.0001)	-	
Tranberg, 2018 Elfstrom, 2019 Brewer, 2021 Subtotal (I^2 = 99.6%, p = <0.0001) $30.9 (29.4, 32.5)$ $10.6 (9.4, 12.1)$ $6.4 (5.3, 7.7)$ $16.7 (10.5, 23.9)$ Community mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Moses, 2015 Modibbo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001)		
Elfstrom, 2019 10.6 (9.4, 12.1) Brewer, 2021 $6.4 (5.3, 7.7)$ Subtotal (I^2 = 99.6%, p = <0.0001)		
Brewer, 2021 $6.4 (5.3, 7.7)$ Subtotal (I^2 = 99.6%, p = <0.0001)		
Subtotal (I^2 = 99.6%, p = <0.0001)		
Community mobilization & outreach Lazcano-Ponce, 2011 Arrossi, 2015 Moses, 2015 Modibbo, 2017 Gizaw, 2019 Subtotal (I^2 = 99.6%, p = <0.0001)	,	
Lazcano-Ponce, 2011 98.2 (97.9, 98.4) Arrossi, 2015 83.0 (81.6, 84.2) Moses, 2015 99.2 (97.1, 99.8) Modibbo, 2017 92.5 (88.0, 95.4) Gizaw, 2019 84.1 (81.9, 86.0) Subtotal (I^2 = 99.6%, p = <0.0001)	Subtotal $(1^2 = 99.6\%, p = <0.0001)$	16.7 (10.5, 23.9)
Lazcano-Ponce, 2011 98.2 (97.9, 98.4) Arrossi, 2015 83.0 (81.6, 84.2) Moses, 2015 99.2 (97.1, 99.8) Modibbo, 2017 92.5 (88.0, 95.4) Gizaw, 2019 84.1 (81.9, 86.0) Subtotal (I^2 = 99.6%, p = <0.0001)	Community mobilization & outreach	
Anossi, 2013 $=$ 33.0 (81.0, 84.2) Moses, 2015 $=$ 99.2 (97.1, 99.8) Modibbo, 2017 $=$ 92.5 (88.0, 95.4) Gizaw, 2019 $=$ 84.1 (81.9, 86.0) Subtotal (I^2 = 99.6%, p = <0.0001)	Lazcano-Ponce, 2011	98.2 (97.9, 98.4)
Modibbo, 2017 \bullet 92.5 (88.0, 95.4) Gizaw, 2019 84.1 (81.9, 86.0) Subtotal (I^2 = 99.6%, p = <0.0001)	Arrossi, 2015	83.0 (81.6, 84.2)
Gizaw, 2019 84.1 (81.9, 86.0) Subtotal (I^2 = 99.6%, p = <0.0001)		99.2 (97.1, 99.8)
Subtotal (I^2 = 99.6%, p = <0.0001)	Modibbo, 2017	92.5 (88.0, 95.4)
Offer at Healthcare Service + 49.7 (46.1, 53.3) MacDonald, 2021 - 1		84.1 (81.9, 86.0)
MacDonald, 2021 49.7 (46.1, 53.3)	Subtotal (I^2 = 99.6%, p = <0.0001)	92.9 (82.3, 99.0)
0 25 50 75 100		
	MacDonald, 2021	49.7 (46.1, 53.3)
Participation (%)		0 25 50 75 100
	Part	ticipation (%)

Figure S3. Participation rate in the experimental groups of randomised trials: intention-to-treat (ITT) analysis. Both, hrHPV tests on self-samples and Pap smears were accounted.

Study Te	st control arm		AP (95% CI)
Mail-to-all			
Bais, 2007	Cyto	-	17.6 (13.6, 22.6
Gok, 2010	Cyto	-	16.6 (12.7, 21.4
Giorgi-Rossi, 2011	Cyto	-	13.9 (11.4, 16.8
Piana, 2011	Cyto		
Szarewski, 2011			7.2 (6.5, 8.0) 4.5 (3.6, 5.7)
	Cyto		
Virtanen, 2011	Cyto		25.9 (24.8, 27.0
Wikstrom, 2011	Cyto		9.1 (8.0, 10.4)
Gok, 2012	Cyto	L -	6.5 (4.1, 10.2)
Sancho-Garnier, 2013	Cyto	P	2.0 (1.7, 2.3)
Haguenoer, 2014	Cyto	•	13.8 (12.4, 15.4
Cadman, 2015	Cyto	■	6.1 (5.3, 7.0)
Giorgi-Rossi, 2015	Cyto		11.8 (10.4, 13.2
Enerly, 2016	Cyto		23.2 (21.6, 24.8
Racey, 2016		.	15.4 (11.9, 19.7
	Cyto		
Sultana, 2016	Cyto	-	6.2 (5.2, 7.3)
Kitchener, 2017	Cyto		16.2 (15.0, 17.4
Ivanus, 2018	Cyto	•	18.4 (16.9, 19.9
Kellen, 2018 [no letter]	Cyto	1 •	8.0 (7.5, 8.6)
Kellen, 2018 [recall letter]	Cyto		10.5 (9.9, 11.2)
Tranberg, 2018	Cyto		25.2 (23.8, 26.7
Elfstrom, 2019	Cyto		1.7 (1.2, 2.4)
Jalili, 2019			2.5 (1.5, 4.2)
	Cyto		
Winer, 2019	Cyto		17.4 (16.6, 18.1
Lilliecreutz, 2020	Cyto	1 -	7.1 (6.3, 8.0)
Giorgi-Rossi, 2011	HPV	-	14.9 (12.3, 18.0
Giorgi-Rossi, 2015	HPV	■	12.0 (10.9, 13.3
Darlin, 2013	Cyto/HPV	•	4.2 (2.8, 6.3)
Brewer, 2021	Cyto/HPV		2.7 (1.6, 4.5)
Subtotal (I^2 = 99.4%, p =		•	10.4 (7.8, 13.4)
<u>Opt-in</u> Giorgi-Rossi, 2011 Broberg, 2014 Giorgi-Rossi, 2015 Kitchener, 2017	Cyto Cyto Cyto Cyto		13.9 (11.4, 16.8 10.6 (9.6, 11.5) 11.8 (10.4, 13.2 16.2 (15.0, 17.4
Ivanus, 2018			
	Cyto		18.4 (16.9, 19.9
Kellen, 2018 [no letter]	Cyto		8.0 (7.5, 8.6)
Kellen, 2018 [recall letter]	Cyto	• _	10.5 (9.9, 11.2)
Tranberg, 2018	Cyto		25.2 (23.8, 26.7
Elfstrom, 2019	Cyto	P	1.7 (1.2, 2.4)
Giorgi-Rossi, 2011	HPV	•	14.9 (12.3, 18.0
Giorgi-Rossi, 2015	HPV		12.0 (10.9, 13.3
Brewer, 2021	Cyto/HPV		2.7 (1.6, 4.5)
Subtotal (I^2 = 99.1%, p =		0	11.3 (8.2, 14.9)
oubtotal (1 2 = 55.170, p =	-0.0001	-	11.0 (0.2, 14.0)
Community mobilization &	outreach		
Lazcano-Ponce, 2011	Cyto		86.8 (86.2, 87.4
Arrossi, 2015	ΗΡ̈́ν		19.2 (17.9, 20.7
Modibbo, 2017	HPV		56.5 (49.6, 63.2
Moses, 2015	VIA	-∎ -	48.4 (42.3, 54.6
Gizaw, 2019	VIA	-	50.3 (47.4, 53.2
			50.0 (41.4, 00.2
Subtotal (I^2 = 99.9%, p =	<0.000T)		52.7 (16.7, 87.1
Offer at Healthcare Service	•		
MacDonald, 2021	Cyto	-	21.6 (18.9, 24.6
		+ $ -$	
		0 25 50	75 100

Figure S4. Participation in the control group according to the invitation scenario applied in the experimental groups.

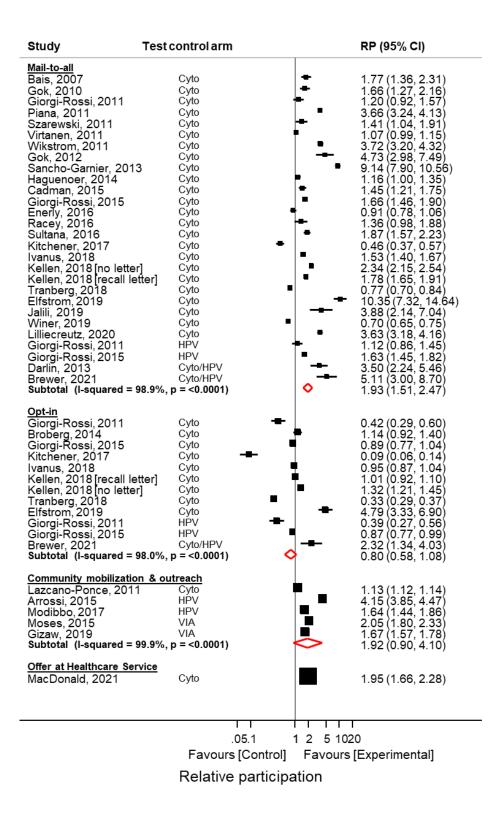
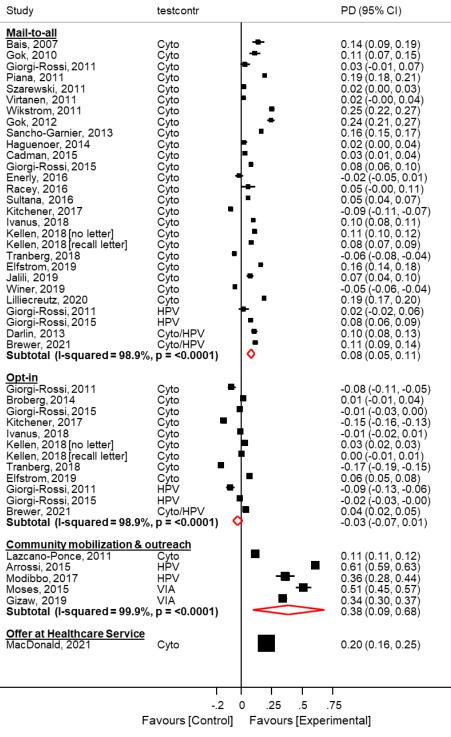


Figure S5. Relative participation (RP) in the experimental vs. the control groups of randomised trials: perprotocol (PP) analysis. Only hrHPV tests on self-samples were accounted for.

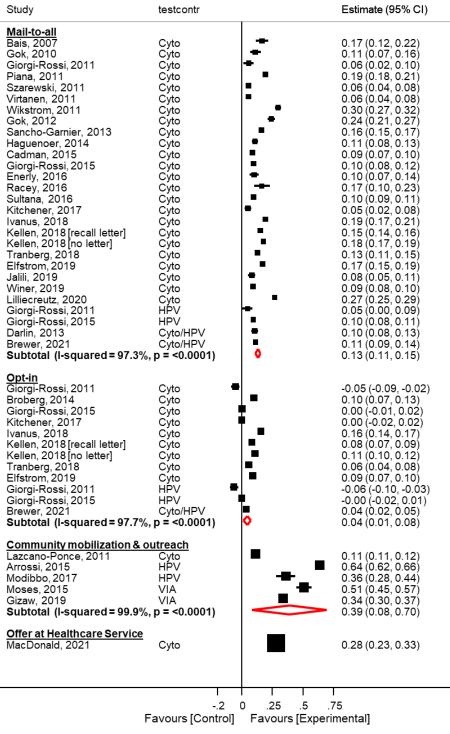
Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto		$\begin{array}{c} 1.94 \left(1.49, 2.53 \right) \\ 1.67 \left(1.28, 2.18 \right) \\ 1.41 \left(1.10, 1.82 \right) \\ 3.66 \left(3.24, 4.13 \right) \\ 2.25 \left(1.71, 2.97 \right) \\ 1.22 \left(1.13, 1.31 \right) \\ 4.27 \left(3.68, 4.94 \right) \\ 4.73 \left(2.98, 7.49 \right) \\ 9.14 \left(7.90, 10.56 \right) \\ 1.78 \left(1.56, 2.04 \right) \\ 2.42 \left(2.05, 2.85 \right) \\ 1.80 \right) \end{array}$
Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto	-	1.67 (1.28, 2.18) 1.41 (1.10, 1.82) 3.66 (3.24, 4.13) 2.25 (1.71, 2.97) 1.22 (1.13, 1.31) 4.27 (3.68, 4.94) 4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto	-	1.67 (1.28, 2.18) 1.41 (1.10, 1.82) 3.66 (3.24, 4.13) 2.25 (1.71, 2.97) 1.22 (1.13, 1.31) 4.27 (3.68, 4.94) 4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto	-	1.41 (1.10, 1.82) 3.66 (3.24, 4.13) 2.25 (1.71, 2.97) 1.22 (1.13, 1.31) 4.27 (3.68, 4.94) 4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto	-	3.66 (3.24, 4.13) 2.25 (1.71, 2.97) 1.22 (1.13, 1.31) 4.27 (3.68, 4.94) 4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto	-	2.25 (1.71, 2.97) 1.22 (1.13, 1.31) 4.27 (3.68, 4.94) 4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto	-	1.22 (1.13, 1.31) 4.27 (3.68, 4.94) 4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto Cyto Cyto	-	4.27 (3.68, 4.94) 4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto Cyto		4.73 (2.98, 7.49) 9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto Cyto		9.14 (7.90, 10.56) 1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto Cyto		1.78 (1.56, 2.04) 2.42 (2.05, 2.85)
Cyto Cyto Cyto		2.42 (2.05, 2.85)
Cyto Cyto		
Cyto		1 0 2 / 1 6 1 7 0 0 1
•		1.83 (1.61, 2.09)
CVIO		1.44 (1.28, 1.62)
		2.07 (1.54, 2.79)
Cyto		2.57 (2.16, 3.06)
Cyto		1.32 (1.15, 1.50)
Cyto	-	2.05 (1.88, 2.23)
		3.22 (2.98, 3.49)
,		2.45 (2.28, 2.63)
Cyto		1.51 (1.40, 1.62)
Cyto		11.00 (7.79, 15.54)
Cyto		4.33 (2.40, 7.82)
Cyto		1.53 (1.45, 1.61)
Cyto		4.83 (4.24, 5.50)
HPV		1.32 (1.03, 1.68)
HPV		1.79 (1.60, 2.00)
Cvto/HPV		3.50 (2.24, 5.46)
		5.11 (3.00, 8.70)
	0	2.50 (2.08, 3.01)
,	-	,
C: to		0.00 (0.45.0.00)
		0.62 (0.45, 0.86)
	_	1.94 (1.65, 2.29)
	I	1.02 (0.88, 1.17)
•		1.00 (0.87, 1.16)
•		1.85 (1.70, 2.01)
		1.78 (1.65, 1.91)
		2.34 (2.15, 2.54)
•	–	1.23 (1.13, 1.32)
		6.26 (4.39, 8.95)
HPV	►⊥	0.58 (0.42, 0.80)
HPV	•	0.99 (0.88, 1.13)
Cyto/HPV		2.32 (1.34, 4.03)
<0.0001)	\diamond	1.45 (1.16, 1.81)
ach		
Cyto	■ _	1.13 (1.12, 1.14)
HPV	_ ■	4.31 (4.01, 4.64)
HPV		1.64 (1.44, 1.86)
VIA		2.05 (1.80, 2.33)
VIA		1.67 (1.57, 1.78)
	\diamond	1.94 (0.89, 4.24)
	<u> </u>	
Cyto		2.30 (1.98, 2.67)
Г 1		Г 20
• •		
-		vhenmenral
	Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto/HPV Cyto/HPV Cyto/HPV Cyto/HPV Cyto	Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto Cyto/HPV Cyto/HPV Cyto/HPV Cyto/HPV Cyto/HPV Cyto

Figure S6. Relative participation (RP) in the experimental vs. the control groups of randomised trials: intention-to-treat (ITT) analysis. Both, hrHPV tests on self-samples and Pap smears were accounted.



Participation difference

Figure S7. Participation difference (PD) in the experimental vs. the control groups of randomised trials: perprotocol (PP) analysis. Only hrHPV tests on self-samples were accounted for.



Participation difference

Figure S8. Participation difference (PD) in the experimental vs. the control groups of randomised trials: intention-to-treat (ITT) analysis. Both, hrHPV tests on self-samples and Pap smears were accounted for.

Table S4. Absolute proportion in self-sampling and control arm, and relative participation and participation difference in the self-sampling versus control arm, by scenario of invitation.

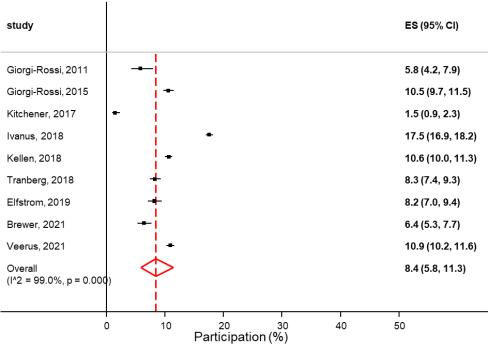
		Absolute pa Self-sampling	articipation Control	Relative participation	Participation difference
Scenario of invitation	#	%(95% CI)	%(95% CI)	(95% CI)	%(95% CI)
Per-protocol					
Mail-to-all	25/28†	18.8 (15.7, 22.0)	10.4 (7.8, 13.4)	1.93 (1.51, 2.47)	7.8 (4.7, 10.9)
Opt-in	9/12†	8.5 (5.6, 11.8)	11.3 (8.2, 14.9)	0.80 (0.58, 1.08)	-3.2 (-7.2, 0.9)
Community mobilization & outreach	5	92.5 (80.3, 99.1)	52.7 (16.7, 87.1)	1.92 (0.90, 4.10)	38.5 (9.3, 67.7)
Offer at healthcare service	1	42.0 (38.5, 45.6)	21.6 (18.9, 24.6)	1.95 (1.66, 2.28)	20.4 (15.9, 25.0)
Intention-to-treat*					
Mail-to-all	25/28†	24.3 (21.5, 27.3)	10.4 (7.8, 13.4)	2.50 (2.08, 3.01)	13.2 (11.0, 15.3)
Opt-in	9/12†	16.7 (10.5, 23.9)	11.3 (8.2, 14.9)	1.45 (1.16, 1.81)	4.4 (1.2, 7.6)
Community mobilization & outreach	5	92.9 (82.3, 99.0)	52.7 (16.7, 87.1)	1.94 (0.89, 4.24)	39.1 (8.4, 69.9)
Offer at healthcare service	1	49.7 (46.1, 53.3)	21.6 (18.9, 24.6)	2.30 (1.98, 2.67)	28.1 (23.5, 32.7)

*Certain studies reported that certain women, allocated to the self-sampling arm, had a Pap smear taken. The sum of self-samples taken + Pap smears taken, were counted in the ITT analyses. In studies, where no such cases were reported, the number of events in the PP and ITT analyses were considered as equal. * Number of studies. †Giorgi-Rossi, 2011 & Giorgi-Rossi, 2015 had 2 control groups (one in which Pap smear was taken by a clinician and another in which a sample for hrHPV testing was taken by a clinician). Kellen, 2018 also had 2 control arms (one with recall letters and another without recall letters. **Table S5.** Test for publication bias (small sample effects) in the relative participation (experimental vs control groups).

Scenario	Analysis	Harbord's p-value
/lail-to-all	Per-protocol	0.588
	Intention-to-treat	0.588
pt-in	Per-protocol	0.859
	Intention-to-treat	0.393

7. Participation in the experimental groups: Opt-in vs. Mail-to-all

Participation Opt-in (PP)



Participation (%) Figure S9. Participation rate in Opt-in invitation scenario of randomised trials with two experimental groups:

per-protocol (PP) analysis. Only hrHPV tests on self-samples were accounted for.

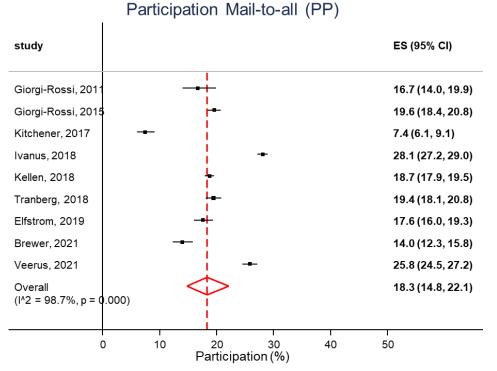
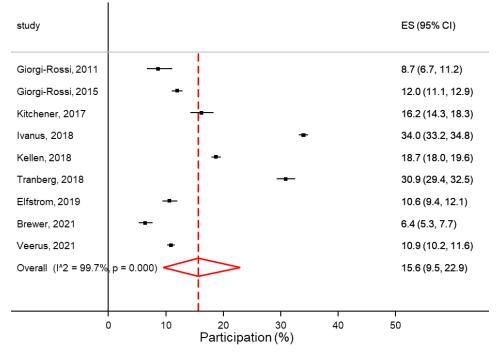
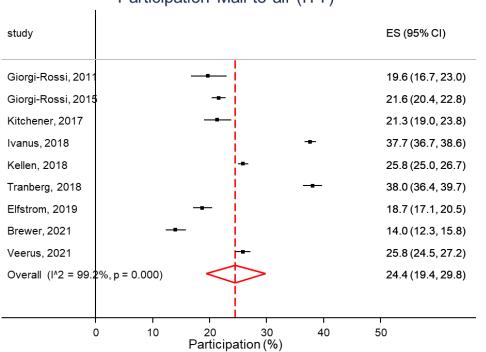


Figure S10. Participation rate in Mail-to-all invitation scenario of randomised trials with two experimental groups: per-protocol (PP) analysis. Only hrHPV tests on self-samples were accounted for.



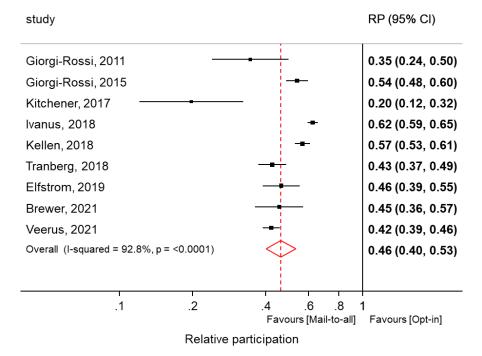
Participation Opt-in (ITT)

Figure S11. Participation rate in Opt-in invitation scenario of randomised trials with two experimental groups: intention-to-treat (ITT) analysis. Both, hrHPV tests on self-samples and Pap smears were accounted.



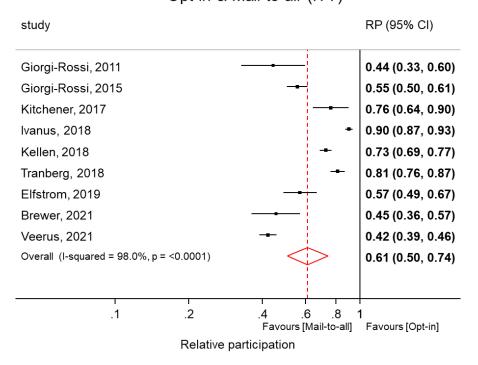
Participation Mail-to-all (ITT)

Figure S12. Participation rate in Mail-to-all invitation scenario of randomised trials with two experimental groups: intention-to-treat (ITT) analysis. Both, hrHPV tests on self-samples and Pap smears were accounted.



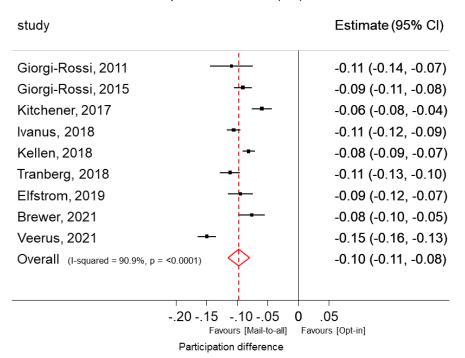
Opt-in & Mail-to-all (PP)

Figure S13. Relative participation (RP) in the Opt-in vs. Mail-to-all experimental groups of randomised trials: per-protocol (PP) analysis. Only hrHPV tests on self-samples were accounted for.



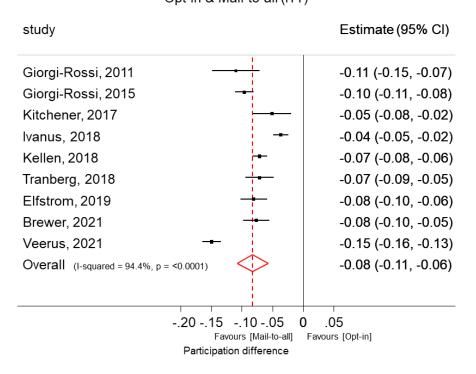
Opt-in & Mail-to-all (ITT)

Figure S14. Relative participation (RP) in the Opt-in vs. Mail-to-all experimental groups of randomised trials: intention-to-treat (ITT) analysis. Both, hrHPV tests on self-samples and Pap smears were accounted for.



Opt-in & Mail-to-all (PP)

Figure S15. Participation difference (PD) in the Opt-in vs. Mail-to-all experimental groups of randomised trials: per-protocol (PP) analysis. Only hrHPV tests on self-samples were accounted for.



Opt-in & Mail-to-all (ITT)

Figure S16. Participation difference (PD) in the Opt-in vs. Mail-to-all experimental groups of randomised trials: intention-to-treat (ITT) analysis. Both, hrHPV tests on self-samples and Pap smears were accounted for.

Table S6. Absolute proportion in self-sampling arm, and relative proportion and difference in the Opt-in vs. Mail-to-all self-sampling invitation scenarios.

		Absolute par	ticipation	Relative	Participation
		Opt-in	Mail-to-all	participation	difference
Analysis	#	%(95% CI)	%(95% CI)	(95% CI)	%(95% CI)
Per-protocol	9	8.4 (5.8, 11.3)	18.3 (14.8, 22.1)	0.46 (0.40, 0.53)	-9.7 (-11.5, -8.0)
Intention-to-treat*	9	15.6 (9.5, 22.9)	24.4 (19.4, 29.8)	0.61 (0.50, 0.74)	-8.2 (-10.8, -5.7)

*Certain studies reported that certain women, allocated to the self-sampling arm, had a Pap smear taken. The sum of self-samples taken + Pap smears taken, were counted in the ITT analyses. In studies, where no such cases were reported, the number of events in the PP and ITT analyses were considered as equal.

8. Specimen adequacy, test-positivity rate, follow-up adherence, detection of CIN2+

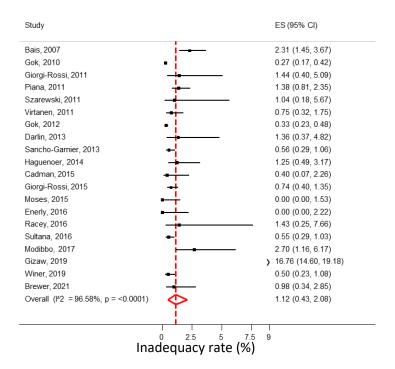


Figure S17. Proportion of self-samples that was inadequate for hrHPV-testing.

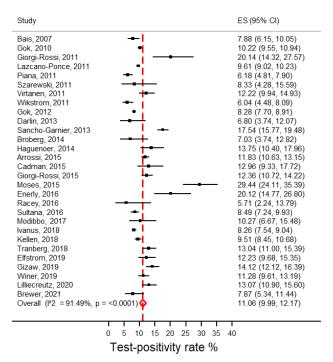


Figure S18. hrHPV test-positivity in self-samples (experimental arm).

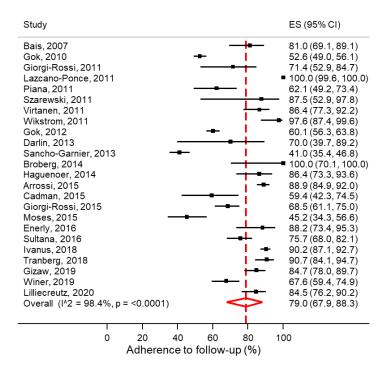


Figure S19. Follow-up adherence among women with a positive test result on their hrHPV self-sample (in the self-sampling arm).

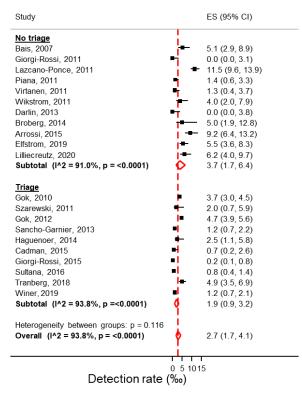


Figure S20. Detection of CIN2+ per 1000 invited women in the self-sampling arm, stratified by triage policy.

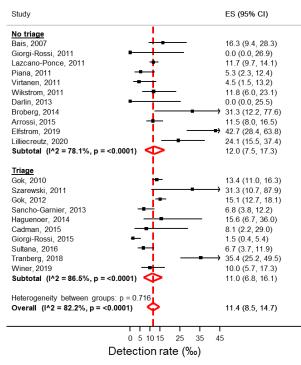


Figure S21. Detection of CIN2+ per 1000 screened women in the self-sampling arm, stratified by triage policy.

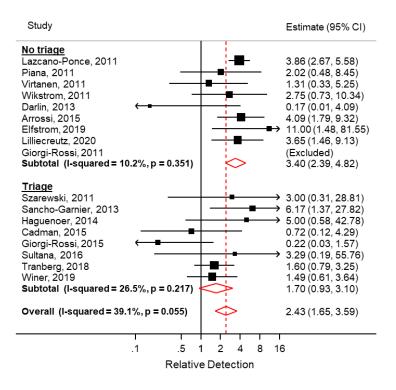


Figure S22. Relative detection of CIN2+ in the self- compared to the control arm among invited women, by triage policy in the self-sampling arm.

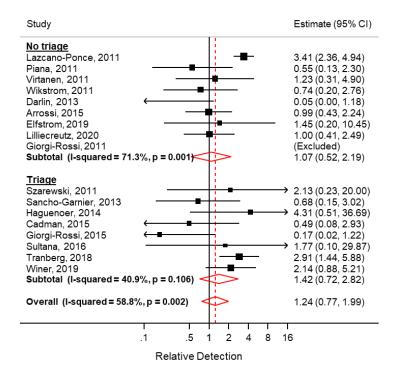


Figure S23. Relative detection of CIN2+ in the self-sampling compared to the control arm among screened women, by triage policy in the self-sampling arm.

		Absolute proportion self-sampling arm		Relative proportion	Proportion Difference
Parameter	#	(95% CI)	#	(95% CI)	(95% CI)
Inadequate sample	20	1.1% (0.4, 2.1%)	-	-	-
Test-positivity*	29	11.1% (10.0, 12.2%)	-	-	-
Compliance to follow-up	24	79.0% (67.9, 88.3%)	11	0.93 (0.84, 1.04)	-6.7% (-17.4, 4.0%)
CIN2+/1000 invited	21	2.7‰ (1.7, 3.2‰)	17	2.43 (1.65, 3.59)	1.8‰ (0.6, 3.1‰)
CIN2+/1000 screened	21	11.4‰ (8.5, 14.7‰)	17	1.24 (0.77, 1.99)	3.3‰ (-0.4, 7.1‰)

Table S7. Absolute proportion in self-sampling arm, and relative proportion and difference in the self-sampling arm vs. control arm (cytology) for four parameters.

* Test-positivity of hrHPV-test in the self-sampling arm (per-protocol). # Number of studies.

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