Supplementary Table 1. Characteristics of the included quantitative studies, per type of cancer screening programme

➢ **Cervical cancer screening programme**

Reference	Study design	Number of participants (n)	Participants, collection period, region	Characteristics	Outcomes	I-Change model
(Gok, Heideman et al. 2012) Ref: 32	Retrospective observational cohort study	54,482 non-responders Group 1: 27,792 (self-sampling group 1) & 281 (recall/control group). Group 2: 26,145 (self-sampling group 2) & 264 (recall/control group).	Women, age 30-60. Between December 2006 to March 2008. North Holland and Flevoland. Non-responder= Women who had not responded to two invitations from the regular screening programme in 2005 & 2006. Self-sampling tool per group: 1: Delphi-Screener 2: VibaBrush	Age (group) Screening history Method invitation Country of birth Self-sampling: 29% Recall: 12% Group 1: 27% Group 2: 31%	Native Dutch non-attendees responded better than immigrants (32% vs. 22%, p<0.001) and those screened in previous round revealed higher response than underscreened or never screened. ≥ CINII rates were higher amongst responding native Dutch women than immigrants (p<0.001), and higher in under-/never- screened women than in women screened in the previous round (p<0.001). Self-sampling increases efficacy screening programme by targeting a substantial portion of non-attendees of all ethnic groups who have not regularly been screened and are at highest risk of ≥CIN II.	Predisposing factors Awareness factors
(Gok, Heideman et al. 2010)	Prospective observational cohort study	28,073 non-responders 27,792 were assigned to self-sampling group & 281 to the recall	Women, age 30-60. Between December 2006 to December 2007.	Age Screening history Self-sampling	Self-sampling responders who did not participate in the previous rounds of screening had an increased relative risk of ≥CIN II	Predisposing factors Information

Ref: 33		group/ control group.	North Holland and Flevoland. Non-responder = Women who had not responded to two invitations from the regular screening programme.	group 26.6% vs. 16.4% of the control group.	and ≥CIN III compared to self-sampling women who had been screened in the previous rounds. Self-sampling is a feasible and effective method for increasing coverage in a screening programme. Especially because of the higher risk in non-attenders.	factors
(Bais, Van Kemenade et al. 2007) Ref: 41	Interventional trial in addition to the regular population-based cervical cancer screening programme	2,830 non-responders 2,546 were assigned to the self-sampling group & 284 to the recall group/control group.	Women, age 30-50. Between January 2003 and April 2004. North Holland. Non-responder = Women who had not responded to two invitations from the regular screening programme. Control group received second re-invitation.	Age Screening history Self-sampling 34.2% vs. 17.6% of the control group.	hrHPV positive self-sampling responders were less likely to have a prior screening history than screening participants. Self-sampling is attractive adjunct to increase uptake, without markedly increased costs.	Information factors
(Bulkmans, Bulk et al. 2006) Ref: 42	Retrospective observational cohort study hrHPV testing was added to cervical	44,102	Women, age 30-60. Between 1999-2002. Amsterdam (North Holland).	Before: 58.7% and after: 61.4% implementation hrHPV testing.	hrHPV testing can be added to cervical screening by cytology without a decrease in participation rate.	Information factors

	screening in the POBASCAM-trial.					
(Van Leeuwen, De Nooijer et al. 2005) Ref: 31	Retrospective observational cohort study	251,446	Women, age 30-60. Between 1998 and 2001. South Holland & Zeeland.	Age SES Country of birth Overall: 55.7% Born in the Netherlands: 56.8% Other Western countries: 45.3% Moroccan: 35.9% Turkey: 48.0% Suriname: 51.3% Dutch Antilles: 46%	Although cervical screening is free of charge, participation rates differ greatly between ethnic groups and between women from different socio-economic strata. Abnormalities were found more often in women who were not born in The Netherlands and in women with lower socio-economic status. These groups show lower attendance at the screening programme.	Predisposing factors
(De Nooijer, De Waart et al. 2005) Ref: 37	Retrospective observational cohort study	237,719 37.1% by invitation of the GP and 62.9% by Municipal Health Service (GGD).	Women, age 30-60. Between 2000-2003. South Holland & Zeeland.	Age SES Country of birth Invitation Zip code After GP invitation 7.9% higher attendance than by GGD.	After invitation by a GP attendance rates were 7.9% higher for the entire population. This difference was even higher for women born in Morocco, Turkey, Suriname and the Dutch Antilles and for women with low-SES and living in a rural area.	Information factors
(Hermens, Tacken et al. 2000)	Cross-sectional observational study	5,548 Selection of 122 family	Women, age 35-60. Between September and November 1996.	Age Invitation strategy	A reminder from the family physician increased the attendance rate from 7 to 11%.	Information factors

Ref: 45		practices, representative of all family practices in The Netherlands. Approximately 40 practices per approach. Evaluation of three organizational approaches. Comparison between family practice-based, community-based, and a combination of the two.	The Netherlands.	Younger women (≤45): Family practice-based approach: 68% Combination approach: 62% Community-based approach 53% Older women (>45): Family practice-based approach: 58% Combination approach: 60% Community-based approach 47%	A family practice-based cervical screening approach appeared to be the most effective at a national level, achieving the highest attendance rate (also highest coverage and control rate).	
(Kreuger, van Oers et al. 1999) Ref: 29	Retrospective observational cohort study	70,621	Women, aged 35-54, between 1992 and 1994. In 53 neighbourhoods of Rotterdam (South Holland).	SES Marital status Nationality Range: 36-58%, depending on neighbourhood.	Risk groups are clustered in neighbourhoods and can be identified by SES, marital status and nationality. High-SES level of a neighbourhood, low-percentage migrants, single or divorced women correspond with high attendances.	Predisposing factors

> **Breast cancer screening programme**

Reference	Study design	Number of participants (n)	Participants, collection period, region	Characteristics	Outcomes	I-Change model
(Aarts, Voogd et al. 2011) Ref: 35	Retrospective observational cohort study	1,067,952	Women, age 50-75, from 1998 to 2006. Southern Netherlands Data combined with the Eindhoven Cancer Registry (ECR). As of 1998 women aged 70-75 were also invited within this screening programme. Before 1998 age boundaries were 50-70.	Age SES Year of invitation Low-SES: 79% Medium-SES: 85% High-SES: 87%	Women with low-SES had an unfavourable tumour-node-metastasis. Despite the absence of financial barriers for participation, SES inequalities in attendance rates exist.	Predisposing factors Barriers
(Vermeer and Van Den Muijsenbergh 2010) Ref: 28	Retrospective observational cohort study	977,961 (1997-1998) vs. 1,279,982 (2007-2008)	Women, 50-75 year. Comparison between attendance rates of 1997-1998 and 2007-2008. The Netherlands.	Country of birth Invitation period Screening region Attendance rates 1997-1998: Dutch: 81% Africa, Asia or Latin America: 56% Turkish: 50% Moroccan: 43%	The Western region, where most migrants live, had the lowest attendance rates in 1997-1998 and in 2007-2008. Attendance rates of migrant women increased over the past 10 years. However, specific efforts to increase the attendance rates are needed because current attendance rates are still far below the overall rates.	Predisposing factors Information factors

				Attendance rates 2007-2008: Dutch: 83% Africa, Asia or Latin America: 63% Turkish: 62% Moroccan: 54%		
(Visser, van Peppen et al. 2005) Ref: 34	Retrospective observational cohort study	824,916	Women, age 50-75 between 1995 and December 2002. North Holland & Flevoland. Data on invited and/ or screened women in a second or subsequent round. As of 1998 women aged 70-75 were also invited within this screening programme. Before 1998 age boundaries were 50-70.	Age Area of residence Country of birth Overall attendance: 76% Residents of Amsterdam: 68% Attendance rate per country of birth: Netherlands 79% Suriname 59% Turkey 44% Morocco 37%	Women born in non-Western countries attend breast cancer screening less frequently, but also have a low detection rate. This justifies a passive attitude towards the low attendance.	Predisposing factors

> *Colorectal cancer screening programme*

Reference	Study design	Number of participants (n)	Participants, collection period, region	Characteristics	Outcomes	I-Change model
(Toes-Zoutendijk, van Leerdam et al. 2017) Ref: 44	Retrospective observational cohort study Monitoring of the newly nationally enrolled cancer screening programme.	741,941	Target population 2014. Males and females reaching age of 63, 65, 57 or 75 years. The Netherlands.	Sex Age 71.3%	A few months into the program it appeared that participation and positive test results were higher than predicted. The positive predictive value was lower than predicted. To reduce the burden of unnecessary colonoscopies and improve colonoscopy capacity, the cut off level for a positive FIT was increased. Close monitoring of the implementation of the program allowed for rapid adjustment.	Information factors Motivational factors
(Deutekom, Rijn et al. 2009) Ref: 38	Prospective observational cohort study	10,054	Males and females, age 50-75. Between May 2006 and January 2007. Amsterdam (North Holland). Study was performed before the implementation of the national screening	Age Sex Country of birth Overall: 49%. Dutch: 52% Other Western: 46% Suriname and Antilles: 36%	Participation among ethnic minority groups was significantly lower than among ethnic Dutch. Studies are needed to explore whether groups are not reached or that lower uptake is determined by other causes.	Predisposing factors Information factors

			programme. Invitations by Comprehensive Cancer Centre Amsterdam (CCCA).	Asian: 38% Middle East and Central East: 21% African: 34%		

Supplementary Table 2. Characteristics of the included qualitative studies, per type of cancer screening programme

➢ **Cervical cancer screening programme**

Reference	Study design	Number of participants (n)	Participants, collection period, region	Characteristics	Outcomes	I-Change model
(Bosgraaf, Ketelaars et al. 2014) Ref: 36	Questionnaire study	30,130 (non-responders). Analysis of 9,484 with self-sampling device and 682 without.	Women, aged 30-60. Between October 2011 to December 2012. North Holland, Flevoland, Utrecht & Gelderland.	Non-attendance: forgot to schedule an appointment. The main reason to use the self-sampling device: own time-setting. Convenience and self-control. 30.9% who did not use self-sampling device preferred after all to have a cervical smear taken instead.	Organisational barriers are the main reason for non-attendance of regular cervical screening. Self-sampling might be a solution for non-attenders because of convenience and self-control.	Information factors Barriers
(Knops-Dullens, de Vries et al. 2007) Ref: 39	A computer-assisted telephone survey	165 100 attendees and 65 non-attendees. Random sample of 300 attendees and 600 non-attendees. Drawn from a total of 20,000 women.	Women, age 30-60. Between January and July 2001. Limburg.	Attendees perceived more positive social influence, more positive role models, talked more often with others and perceived a more positive norm. Non-attendees experienced more affective disadvantages, were more insecure and afraid of smear taking, experienced more feelings of shame and were more insecure and anxious about the result.	In order to motivate Dutch women to participate in the screening programme they need to be convinced that the advantages outweigh the disadvantages.	Information factors Awareness factors Barriers
(Tacken,	Questionnaire	Analyses on 1392	Women, age	Women aged 40-50 years who felt a	To improve uptake: focus	Predisposing

| Braspenning et al. 2007) Ref: 30 | study | women (968 screened and 424 unscreened). 2,224 (1204 screened, 1020 unscreened). | 30-60. Between December 2000 and February 2001. The Netherlands. | high personal moral obligation, who had only ever had one sexual partner, and who were invited and reminded by their own general practice had the greatest likelihood of screening uptake. Women's beliefs are the best predictors of uptake. Non-responders (mainly unscreened) thought they had less risk of cervical cancer, were less motivated, less often intended to take part in future screening, and were more convinced that cervical cancer cannot be cured. | on moral obligation of eligible women, beliefs about the risk of cervical cancer, and available cures. Invitations and reminders within general practices enhance the uptake rate. | factors Information factors Motivational factors |

➢ **Colorectal cancer screening programme**

Reference	Study design	Number of participants (n)	Participants, collection period, region	Characteristics	Outcomes	I-Change model
(Woudstra, Dekker et al. 2016) Ref: 43	Qualitative interviews (purposive sampling)	30	First-generation immigrants age 48-74. (born in Turkey, Morocco and Suriname). Between February-July 2014. Amsterdam (North Holland)	All respondents felt susceptible to CRC. Knowledge about screening harm and self-efficacy to participate was low. Adult children acted as important mediators. The language and low literacy formed	To ensure equal opportunities for informed participation in screening, target strategies should be developed, such as oral and visual, and face-to-face communication in the mother tongue. This will help minority groups in informed decision making in CRC screening.	Information factors Awareness factors Ability factors

				serious barriers to informed participation.		
(Hummel, Steuten et al. 2013) Ref: 46	Web-based questionnaire	167	Target population screening programme, age 55-75. April 2011. Choice between: iFOBT, colonoscopy, sigmoidoscopy and CT colonography. The Netherlands.	Most preferred was CT colonography. Screening test with highest intention to attend was the iFOBT.	While respondents may recognize the importance of diagnostic effectiveness in the long term, their short-term decision to attend the screening tests may be less driven by this consideration. Inconvenience, safety and frequency of tests are the strongest technique-related determinants of the respondents' intention to participate in colorectal screening programs.	Awareness factors Barriers
(Van Rijn, Van Rossum et al. 2008) Ref: 40	Standardized telephone interviews	312 non-participants analysed. Random selection of 500 people out of the non-responders of a cohort of 20,623 people who received an invitation for faecal occult blood test.	Non-participants of the faecal occult blood test, age 50-75. Between November 2006 to May 2007. The Netherlands.	Most reported reasons for non-participation were: time- or priority-related. Other reasons were health-related issues.	Main reasons not to participate reflect low priority. This was associated with a lack of knowledge. Adding extra instructions and information and addressing specific concerns should be considered in order to improve informed decision making about participation.	Information factors Awareness factors Barriers