

**EXTENSION OF CERVICAL SCREENING INTERVALS WITH PRIMARY HUMAN  
PAPILLOMAVIRUS TESTING: AN OBSERVATIONAL STUDY OF ENGLISH  
SCREENING PILOT DATA**

**SUPPLEMENTARY INFORMATION**

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**The characteristics of the women included in the analyses**

Table S1. Distribution of age and deciles of index of multiple deprivation, by screening round and screening test.

	First round		Second round	
	HPV test	Cytology	HPV test	Cytology
<b>Total</b>				
<b>Age group (years)</b>				
24-49	300,677 (74%)	706,820 (75%)	188,318 (88%)	260,266 (92%)
50-59	79,040 (20%)	175,973 (19%)	24,550 (12%)	22,195 (8%)
60-64	24,166 (6%)	54,908 (6%)	NR	NR
<b>IMD decile</b>				
1-5 (more deprived)	205,241 (51%)	555,030 (59%)	105,532 (50%)	165,039 (58%)
6-10 (less deprived)	198,642 (49%)	382,671 (41%)	107,336 (50%)	117,422 (42%)

Abbreviations. HPV: human papillomavirus. IMD: index of multiple deprivation. NR: not relevant (women were not eligible for a new invitation to primary screening).

## The characteristics of the women attending the pilot's second screening round

Roughly similar proportions of women screened negative with HPV testing vs. cytology in the pilot's first round attended the second round (Table S2). Among women aged 24-49, 76% of those who were tested for HPV in the pilot's first screening round also attended screening in the pilot's second round. Among women screened with cytology, this was 70%. At age 50-59 years, the proportions were 34% for HPV testing and 30% for cytology. More women screened with cytology were excluded from the analysis of the second screening round, as their screening test was changed to HPV. However, women who were screened with the same test in the second round had a very similar distribution of the IMD as all women who attended the second round (Table S3). This was observed in both age groups and for both screening tests. As an example, among women aged 24-49 screened with HPV testing in the first round, 50% of those attending the second round with any screening test were categorised as "less deprived"; among the subgroup who were screened with HPV testing in both rounds, this was also 50%. Among women aged 24-49 screened with cytology in the first round, 42% of those attending the second round with any screening test were categorised as "less deprived"; among the subgroup who were screened with cytology in both rounds (representing 56% of women screened in the second round, see Table S2), this was 41%.

Table S2. The proportions of women with negative screening tests attending any screening in the pilot's second round, and the subgroup who continued to be screened with the same type of a screening test.

Age group (years)	Were screened in the second round with any test		Were screened in the second round with the same test	
	HPV testing (%) <sup>a</sup>	Cytology (%) <sup>a</sup>	HPV testing (%) <sup>b</sup>	Cytology (%) <sup>b</sup>
24-49	194,209 (76%)	467,972 (70%)	188,318 (97%)	260,266 (56%)
50-59	25,082 (34%)	52,006 (30%)	24,550 (98%)	22,195 (43%)

Abbreviations. HPV: human papillomavirus.

<sup>a</sup> Of women with negative screening tests in the pilot's first round (not tabulated).

<sup>b</sup> Of women screened in the second round.

Table S3. IMD distribution among those who attended primary screening in the pilot's second screening round, by age group and screening test.

Type of screening test	Age group (years)	Screening test in the first round	IMD dummy	N attending in the second round	% of N attending in the second round	Screening test in the first round	IMD dummy	N attending in the second round	% of N attending in the second round
Any	24-49	HPV	More deprived	97,892		Cytology	More deprived	273,297	
			Less deprived	96,317	50%		Less deprived		
Same as the first round	24-49	HPV	More deprived	94,900		Cytology	More deprived	153,342	
			Less deprived	93,418	50%		Less deprived		
Any	50-59	HPV	More deprived	10,889		Cytology	More deprived	26,835	
			Less deprived	14,193	57%		Less deprived		
Same as the first round	50-59	HPV	More deprived	10,632		Cytology	More deprived	11,697	
			Less deprived	13,918	57%		Less deprived		

Note. IMD dummy: "more deprived" includes IMD deciles 1-5, whereas "less deprived" includes IMD deciles 6-10.

Example. Among women who were aged 24-49 years when they were screened with HPV testing in the pilot's first round, 194,209 (97,892+96,317) attended the second screening round. Among the latter, 96,317 (50%) were from the less deprived areas. Of the 194,209 women, 188,318 (94,900+93,418, or 97%, see also Table S2) were again screened with an HPV test. Among these 188,318 women, 93,418 (50%) were from the less deprived areas.

Table S4. Unadjusted OR and HR from Tables 2 and 4 in the main text, comparing the detection of CIN3+ and cervical cancer after primary screening with HPV testing with primary screening with cytology, by age group.

	24-49 years		50-59 years		60-64 years	
	Unadjusted estimate (95% CI)	Adjusted estimate (95% CI)	Unadjusted estimate (95% CI)	Adjusted estimate (95% CI)	Unadjusted estimate (95% CI)	Adjusted estimate (95% CI)
<b>First round</b>						
<i>After a non-negative screen</i>						
CIN3+ (OR)	1.53 (1.47-1.58)	1.55 (1.50-1.61)	1.47 (1.24-1.74)	1.56 (1.31-1.85)	1.70 (1.22-2.36)	1.69 (1.21-2.37)
Cervical cancer (OR)	1.38 (1.18-1.61)	1.38 (1.18-1.61)	1.33 (0.85-2.07)	1.41 (0.90-2.21)	0.89 (0.41-1.92)	--
<i>After a negative screen<sup>b</sup></i>						
Cervical cancer (HR)	0.45 (0.23-0.85)	0.44 (0.23-0.84)	0.26 (0.06-1.15)	--	0.39 (0.05-3.20)	--
<b>Second round<sup>c</sup></b>						
<i>After a non-negative screen</i>						
CIN3+ (OR)	0.27 (0.23-0.31)	0.26 (0.23-0.30)	0.63 (0.32-1.25)	--	NR	NR
Cervical cancer (OR)	0.03 (0.00-0.18)	0.02 (0.00-0.17)	0.45 (0.04-4.98)	--	NR	NR

Abbreviations. CI: confidence interval. CIN: cervical intraepithelial neoplasia. HPV: high-risk human papillomavirus. HR: hazard ratio. NR: not relevant (women were not invited for the second round due to their age). OR: odds ratio.

Note. Estimates in red were reported in Tables 2 and 4. "--" means that the observed numbers of cases did not suffice for regression models with adjustments.

Table S5. Unadjusted OR and HR from Table 3 in the main text, comparing the detection of CIN3+ and cervical cancer with specific HPV assays, for women aged 24-59 years.

	<b>APTIMA vs. cobas</b>		<b>RealTime vs. cobas</b>		<b>APTIMA vs. RealTime</b>		<b>APTIMA vs. RealTime and cobas combined</b>	
	<b>Unadjusted estimate (95% CI)</b>	<b>Adjusted estimate (95% CI)</b>	<b>Unadjusted estimate (95% CI)</b>	<b>Adjusted estimate (95% CI)</b>	<b>Unadjusted estimate (95% CI)</b>	<b>Adjusted estimate (95% CI)</b>	<b>Unadjusted estimate (95% CI)</b>	<b>Adjusted estimate (95% CI)</b>
<b>First round</b>								
<i>After a non-negative screen</i>								
CIN3+ (OR)	1.06 (0.98-1.15)	1.03 (0.95-1.12)	0.92 (0.86-0.98)	1.06 (0.99-1.13)	1.15 (1.06-1.25)	1.00 (0.92-1.09)	1.11 (1.03-1.19)	1.04 (0.96-1.12)
Cervical cancer (OR)	1.14 (0.78-1.68)	1.15 (0.78-1.70)	1.33 (1.01-1.75)	1.44 (1.10-1.90)	0.86 (0.60-1.24)	0.80 (0.60-1.24)	0.97 (0.69-1.38)	0.95 (0.67-1.34)
<i>After a negative screen<sup>b</sup></i>								
Cervical cancer (HR)	0.35 (0.04-2.84)	--	0.40 (0.12-1.33)	--	0.73 (0.08-6.21)	--	0.51 (0.07-3.91)	--
<b>Second round<sup>c</sup></b>								
<i>After a non-negative screen</i>								
CIN3+ (OR)	1.46 (0.97-2.21)	1.38 (0.91-2.08)	1.47 (1.09-1.98)	1.65 (1.22-2.23)	1.00 (0.68-1.45)	0.86 (0.59-1.25)	1.16 (0.81-1.66)	1.05 (0.73-1.50)
Cervical cancer (OR)	--	--	0.78 (0.05-12.41)	--	--	--	--	--

Abbreviations. CI: confidence interval. CIN: cervical intraepithelial neoplasia. HPV: high-risk human papillomavirus. HR: hazard ratio. OR: odds ratio.

Note: estimates in red were reported in Table 3. "--" means that the observed numbers of cases did not suffice for regression models (with or without adjustments, as relevant).

Figure S1. Completeness of data in the study, by age group and calendar year of the primary screening test in the first round.

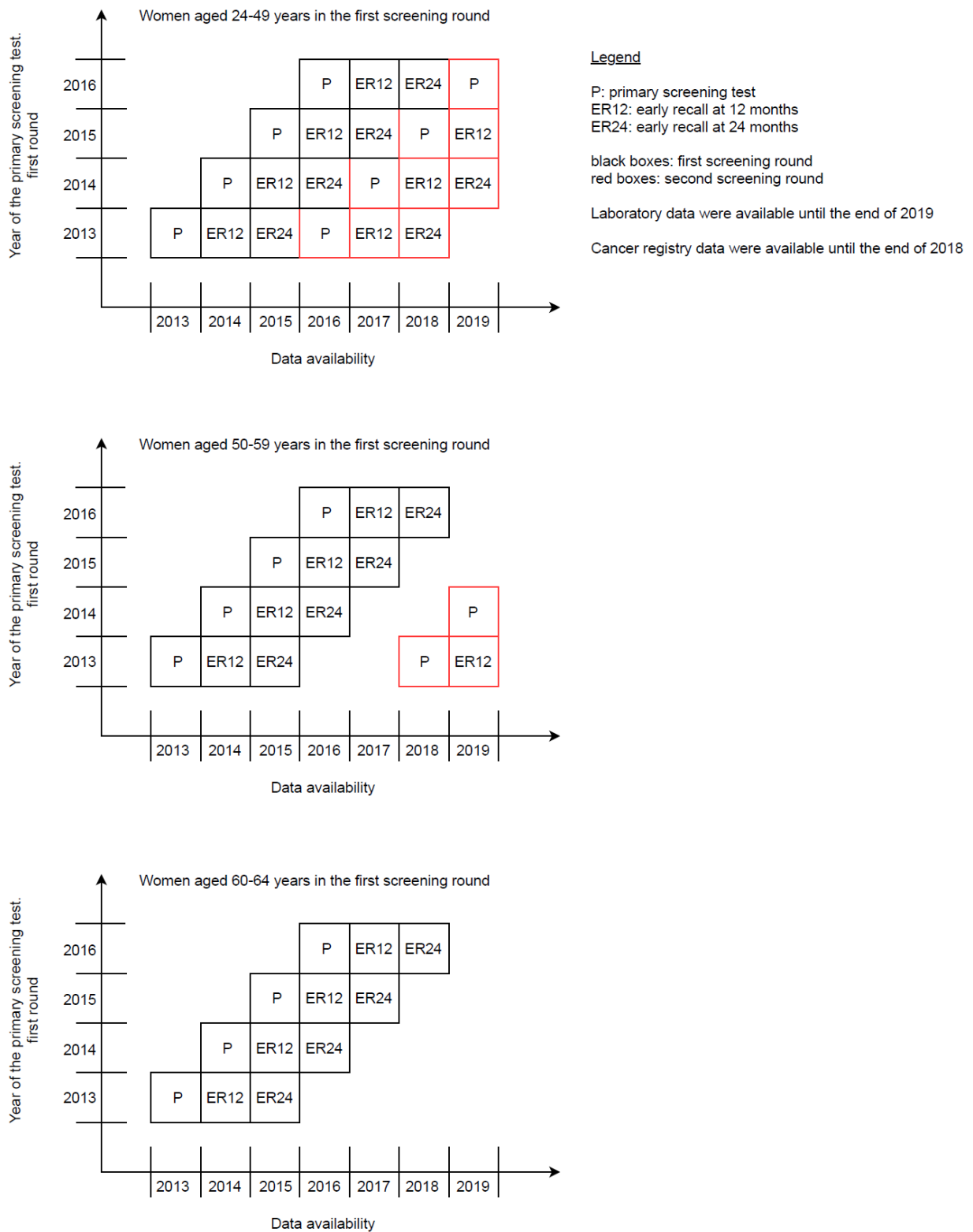
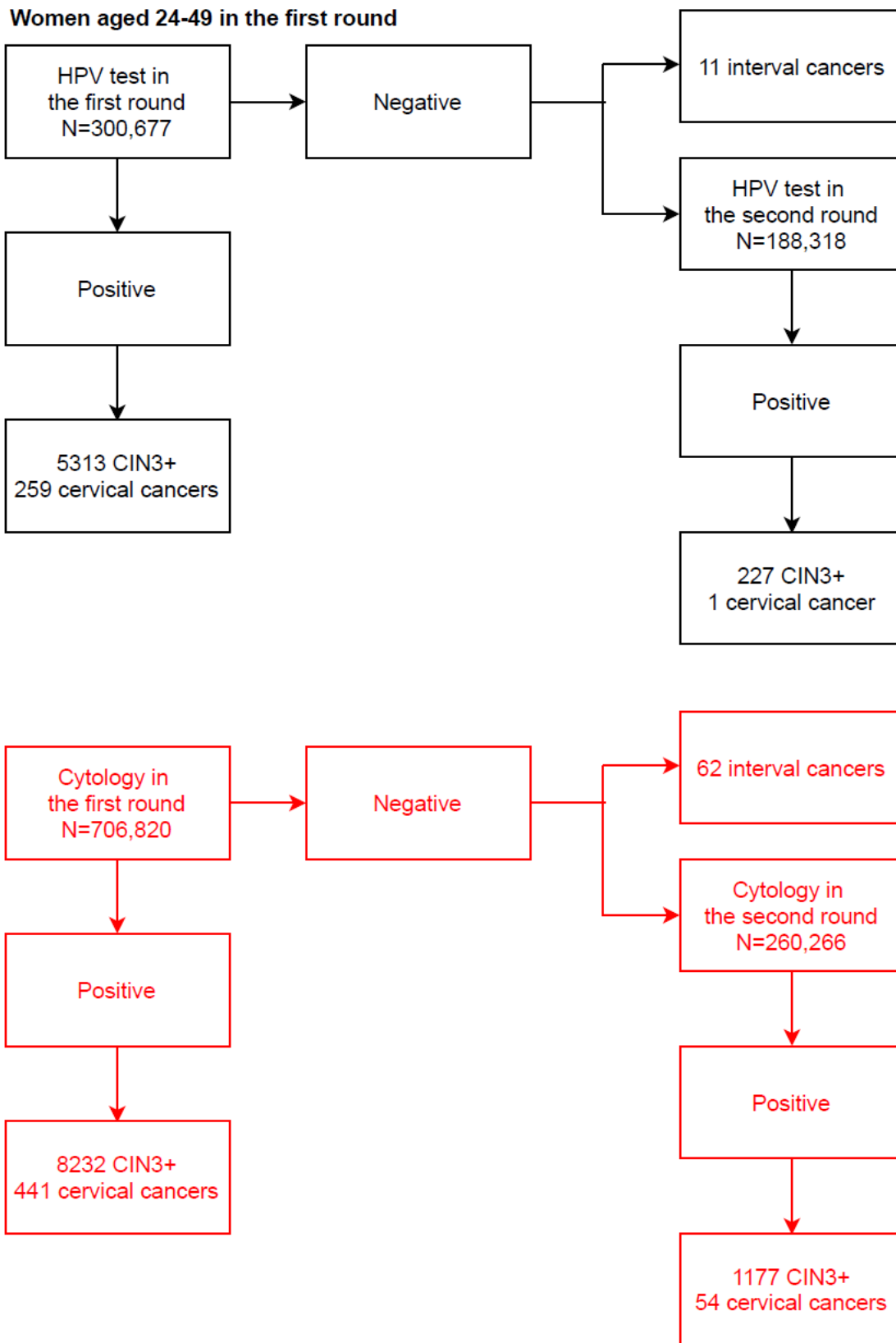
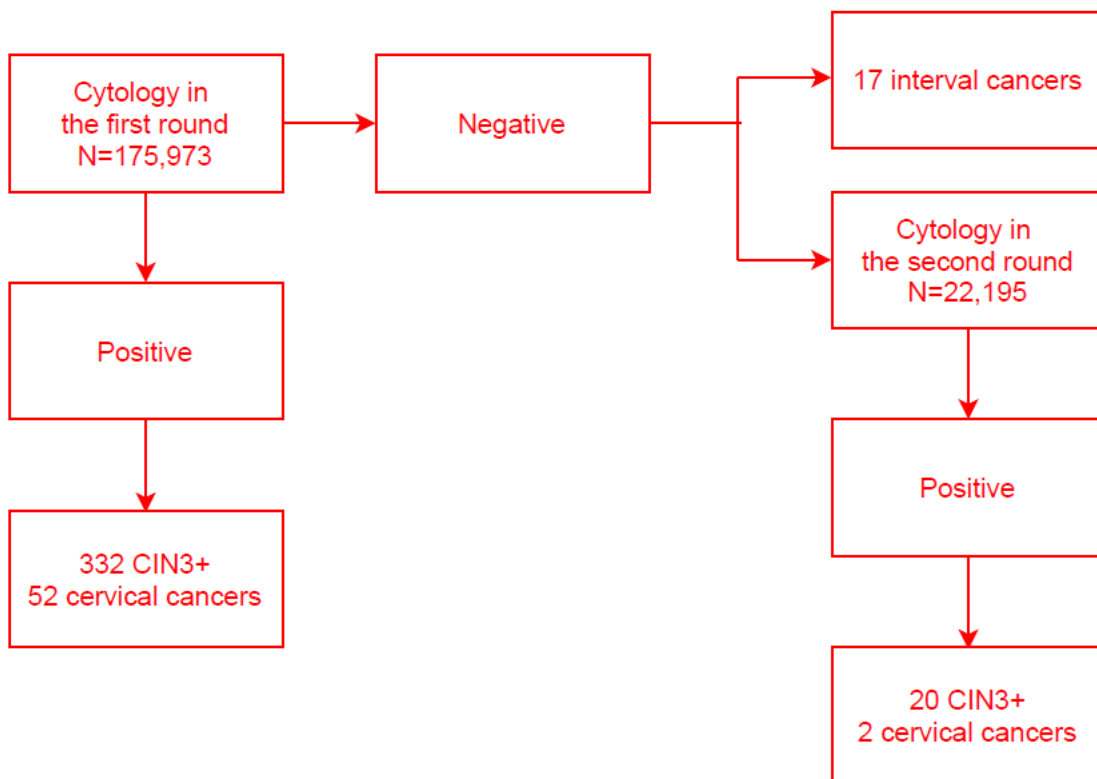
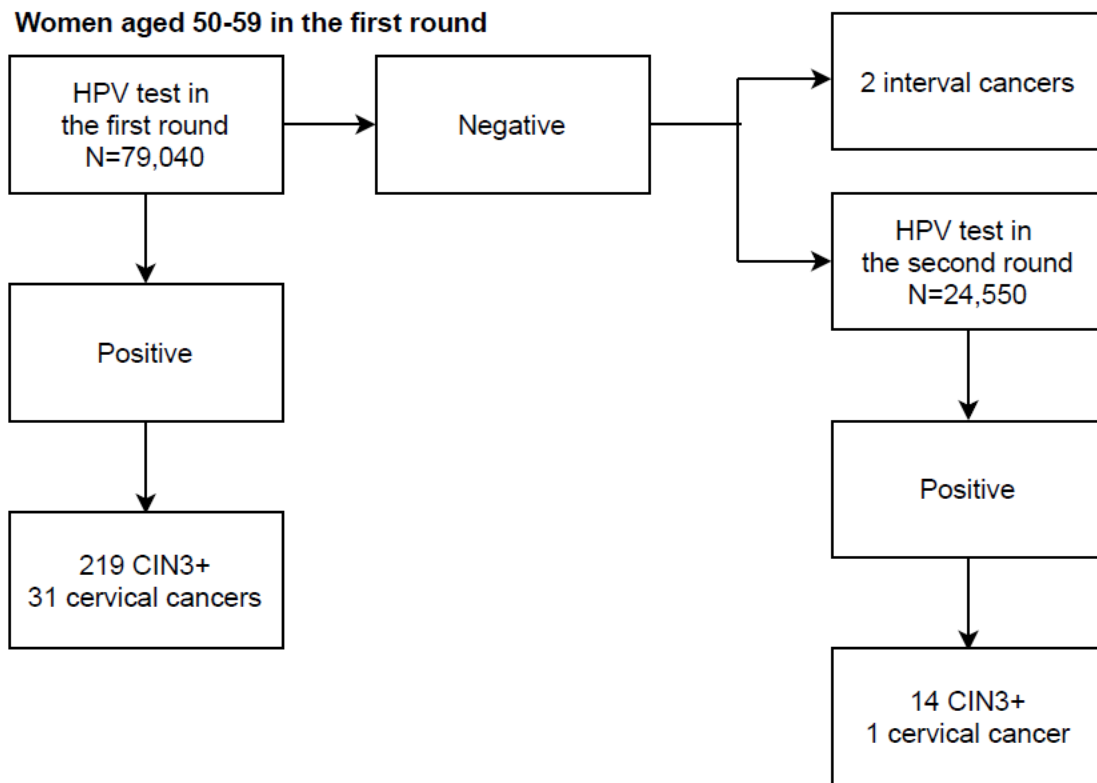


Figure S2. Flow chart.

Note that the flowchart does not include women who were not included in the analyses e.g., those with inadequate test results or those who defaulted from the recommended follow-up with early recall or colposcopy.



**Women aged 50-59 in the first round**





**Women aged 60-64 in the first round**

