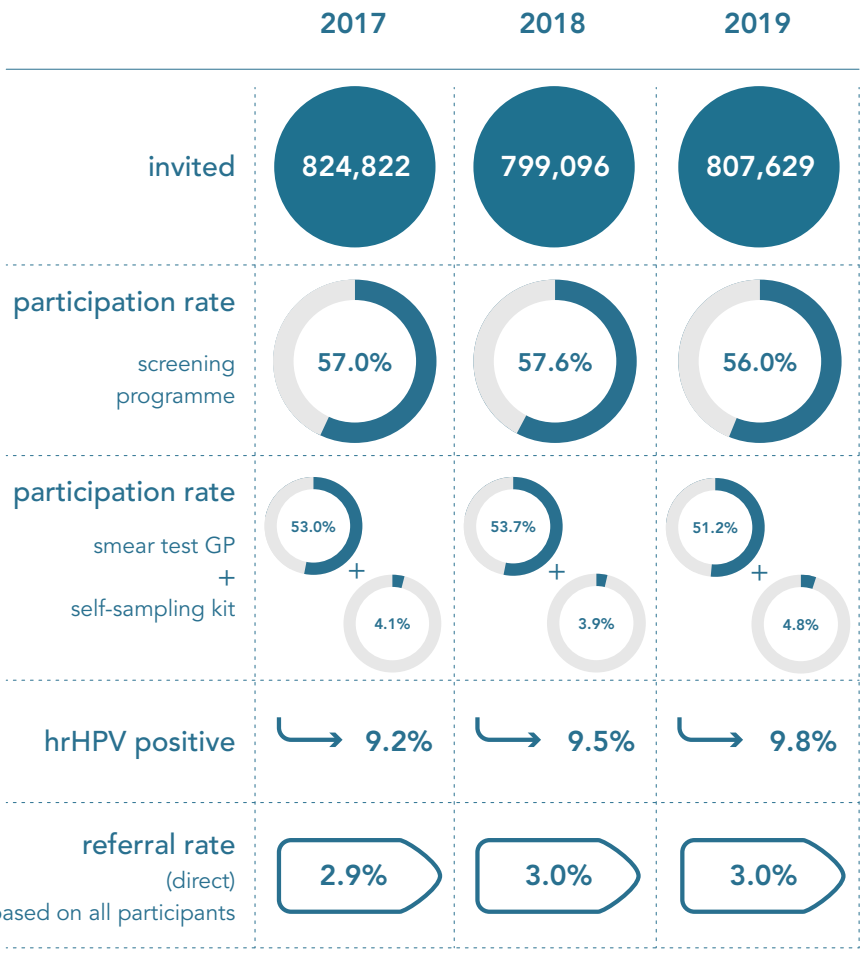
national monitoring of the **cervical cancer** screening programme in the Netherlands **2019**



Reference date of the participation rate, hrHPV positivity and referral rate is 15 months after the year started.

most important results 2019

The participation rate in 2019 was **56.0%**: **51.2%** participated by a smear test, **4.8%** participated via a self-sampling kit (SSK). The participation rate was thereby lower than in 2018 and 2017. Of all participants **8.6%** used a SSK, which is more than in 2018 (**6.8%**).

In total, **9.8%** of the participants had a high risk Human Papilloma Virus (hrHPV). The percentage of hrHPV positive results is highest in the youngest age group. The percentage of hrHPV positive participants increases slowly from 2017 onwards.

The referral rate in 2019 is **3.0%** based on the total number of participants and **31.0**% based on all hrHPV+ participants with cytology results.
This corresponds with more than **13,500** participants who were referred to a gynaecologist.

Finally, **4,982** participants had a precancerous lesion of cervical cancer (CIN2+), which is **1.1%** of all participants.

- From January 1st 2017 onwards, the renewed National Cervical Cancer Screening Programme based on primary hrHPV screening was implemented. HrHPV screening can be performed either by a GP or by using a self-sampling kit. The implementation of the renewed screening programme will lead to a trend breach in the data. This is explained in this monitor. More information can be found on the website: www.rivm.nl/en/cervical-cancer-screening-programme
- From 2018 onwards the data for the monitor come from a new data warehouse. Therefore, the sources of the data changed since 2017 and are different from the years before. In combination with the renewed screening programme, this results in trend breaches. This is explained in this monitor.

edition: October 2020

This monitor is available on **www.iknl.nl/en/screening**
and on **www.rivm.nl/en/cervical-cancer-screening-programme**

introduction

By using the National Cervical Cancer Screening Programme, cervical cancer can be prevented by detecting and treating pre-cancerous lesions. In addition, sometimes early staged cervical cancer is detected which gives a better prognosis. The Dutch National Cervical Cancer Screening Programme is coordinated by the National Institute for Public Health and the Environment (RIVM). The RIVM has commissioned Netherlands Comprehensive Cancer Organization (IKNL) to carry out the annual monitoring of the national cervical cancer screening programme. Monitoring helps to ensure the quality of the screening programme and identifies trends. Monitoring is conducted using data from Facility Screening Programme Cooperation (FSB) and the nationwide network and registry of histo- and cytopathology in the Netherlands (PALGA). Furthermore, incidence data is collected from the Netherlands Cancer Registry (NKR). In this monitor the results of persons invited in 2019 are presented.

collaboration

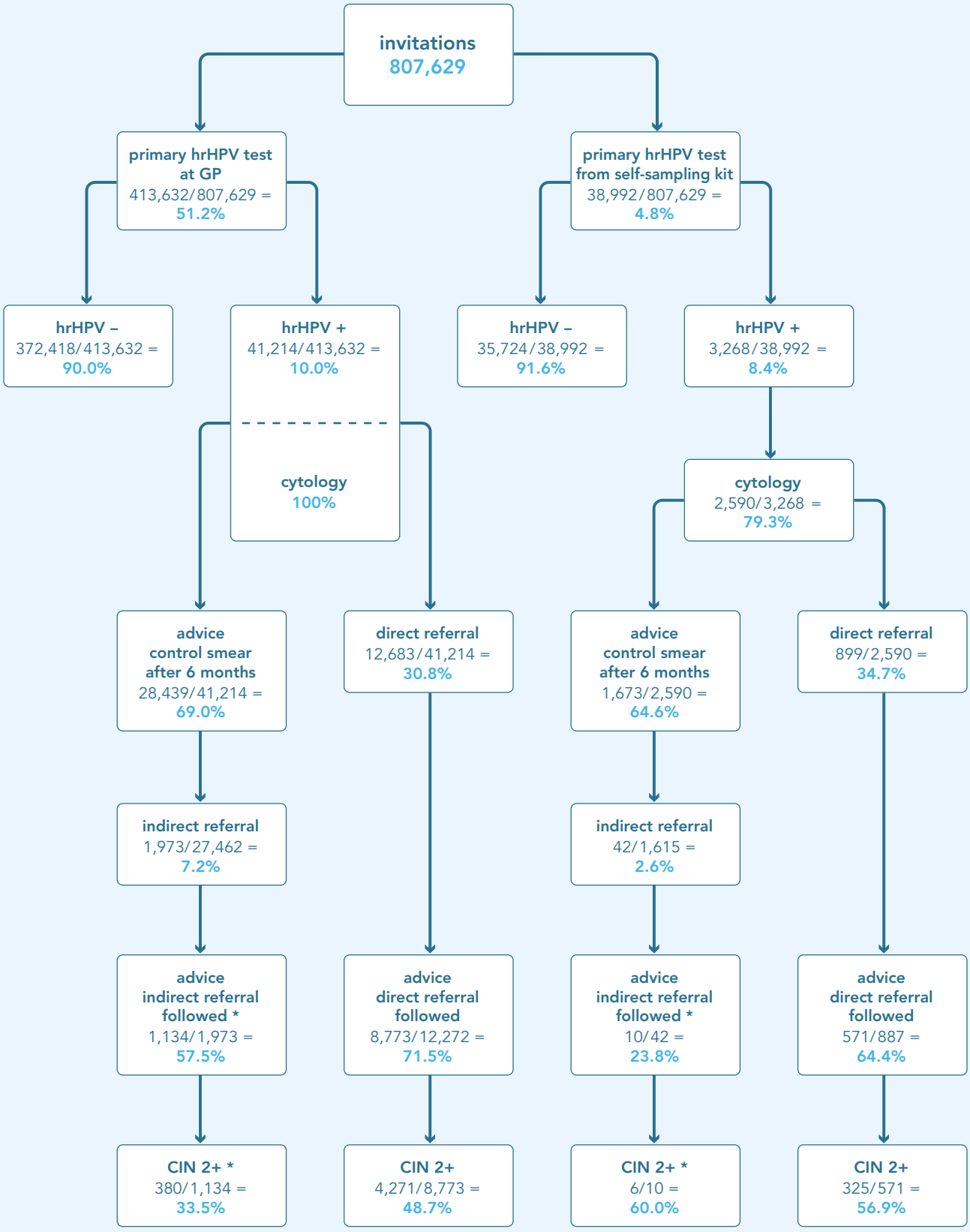
The screening programme cervical cancer is carried out in collaboration with the following parties:

terminology

• **control smear** = smear which is performed after 6 months in hrHPV positive participants without cytological abnormalities in the primary test • **coverage** = percentage of persons at risk (persons whose cervix is not removed) within the range of the screening age group that took at least one cervical smear or hrHPV test in the five years before the reference date • **cytological assessment** = examination of cells taken from cervical smear • **detection** = participants in whom CIN2, 3 or a malignancy is detected • **histological assessment** = examination of tissue obtained from colposcopic biopsy • **poor quality smear** = specimen that cannot be assessed • **primary test** = hrHPV test and, when a hrHPV positive result, cytological assessment, after being invited for the screening programme. A hrHPV test can be taken by having a smear taken by the GP or by using the self-sampling kit • **referral** = participants are referred to the gynaecologist. Participants can be referred after the primary test or after the control smear • **Positive Predictive Value (PPV)** = participants who are referred to the gynaecologist and where CIN 2+ was detected histologically • **repeat smear test** = smear is repeated due to poor quality • **return to screening** = no further follow up is needed. Participant can await the next screening invitation • **screening programme** = national cervical cancer screening programme • **SSK** = self-sampling kit

flowchart

referral and advice in 2019 in the renewed national cervical cancer screening programme* (source: FSB and PALGA)



* Numbers of indirect referral are preliminary because not all participants have had an invitation for the control smear at the reference date.

table 1 **invitation and participation rate**

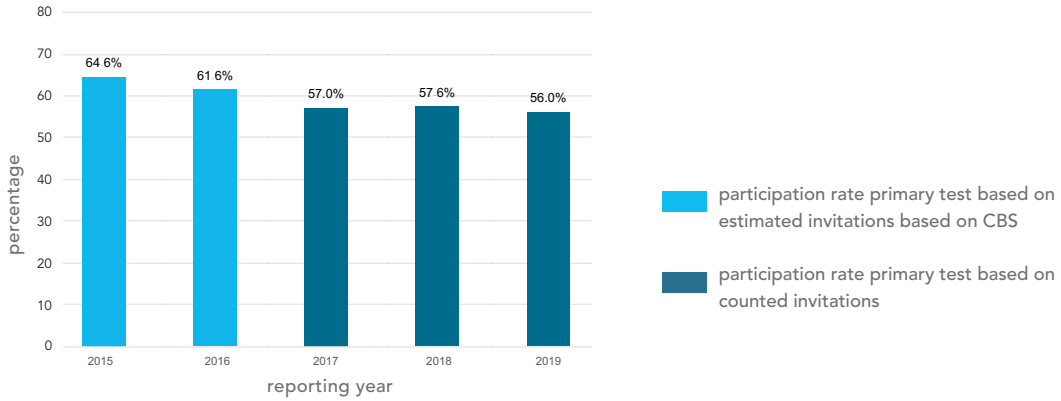
by year, reference date April 1st the next year (source: PALGA and FSB) *

	2015	2016	2017	2018	2019
invitations sent	750,685	749,282	824,822	799,096	807,629
participation rate primary test	485,015	461,749	470,417	460,481	452,624

* In the past, the number of invitations as well as the number of participants were calculated in a different way than now, cohort year 2017, 2018 and 2019 are calculated using a new method. See frame 'explanation for participation rate'.

figure 1 **participation rate**

by year, based on total number of invited persons (source: PALGA and FSB)



explanation for participation rate

The participation rate is calculated by dividing the total number of participants by the total number of invited persons. The total amount of sent invitations used to be estimated based on data from CBS. From 2018 onwards the real number of sent invitations is used. In retrospect this was done from 2017 onwards. The real number of invitations seems to be higher than estimated in the earlier years. The participation rate reference date is always April 1st in the next year.

The participation rate in 2016 and 2017 is based on a shorter period because of the implementation of the renewed screening programme. In 2020 the screening programme was put on hold due to the corona pandemic and therefore 2019 has an incomplete reference period, the participation rate would probably be more than 57%.

figure 2a **participation rate primary test smear** by age and year, based on total number of invited persons (source: FSB)

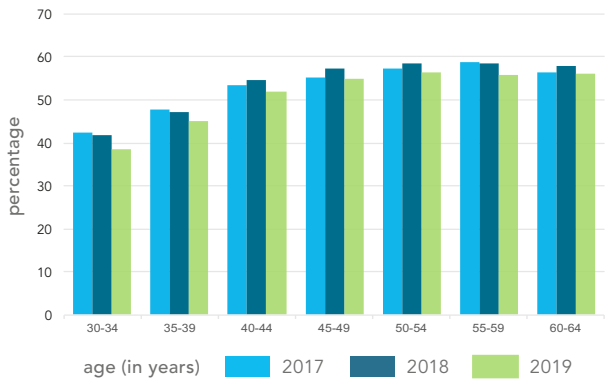
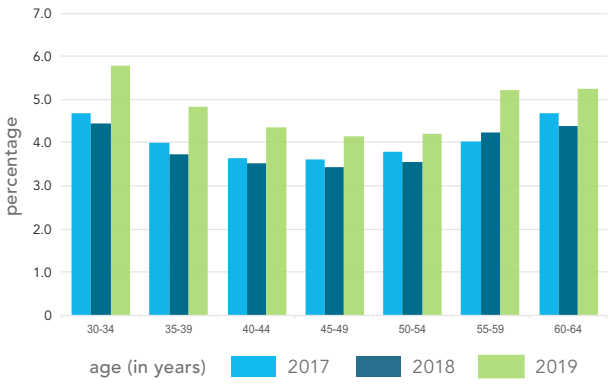


figure 2b **participation rate primary test SSK** by age and year, based on total number of invited persons (source: FSB)



- In 2019, 56.0% of the invited persons participated in the screening programme, compared to 57.6% in 2018.
- The percentage of participants that had a smear test by their GP was 51.2% in 2019 compared to 53.7% in 2018.
- For using the SSK this was 4.8% and 3.9% respectively.
- The total participation rate was lower among young participants than among older participants.
- Use of the SSK was highest among the youngest and oldest participants.
- The increase in the use of the SSK is probably partly explained by cancelling the waiting time.

table 2 **participation rate smear after hrHPV-positive self-sampling kit** by year (source: FSB) *

	2017	2018	2019
reference period (months)	39	27	*15*
age			
30 - 34 years	92%	92%	*82%*
35 - 39 years	89%	89%	*79%*
40 - 44 years	91%	91%	*76%*
45 - 49 years	92%	90%	*79%*
50 - 54 years	86%	87%	*82%*
55 - 59 years	86%	87%	*76%*
60 - 64 years	86%	87%	*77%*
total	**90%**	**90%**	***79%***

table 3 **participation rate after invitation for a control**

by year (source: FSB) *

	2017	2018	2019
reference period (months)	39	27	*15*
age			
30 - 34 years	76%	77%	*57%*
35 - 39 years	78%	80%	*58%*
40 - 44 years	83%	85%	*62%*
45 - 49 years	85%	87%	*65%*
50 - 54 years	87%	88%	*66%*
55 - 59 years	90%	90%	*71%*
60 - 64 years	90%	91%	*71%*
total	**82%**	**84%**	***63%***

* Reference date for all results is April 1st, 2020. Therefore, the reference period for 2018, for example, is 12 months longer than for 2019 (27 and 15 months respectively) which makes the years incomparable. Due to the shorter reference period the 2019 numbers are preliminary and printed in italic.

- The participation rate for taking a cervical smear after a hrHPV-positive SSK was on average 79% in 2019 (preliminary result). In 2018 this was 78% with a 15 months reference period and increased to 90% at 27 months.
- The participation rate for control smears (after hrHPV-positive + Pap1) was on average 63% in 2019 (preliminary result). The participation rate for control smears increased with higher age. In 2018 with a 15 months reference period this was 65% which increased to 84% after 27 months.

PART 2 results, advice and referral

figure 3a **hrHPV-positive participants for SSK** by age and year (source: FSB)

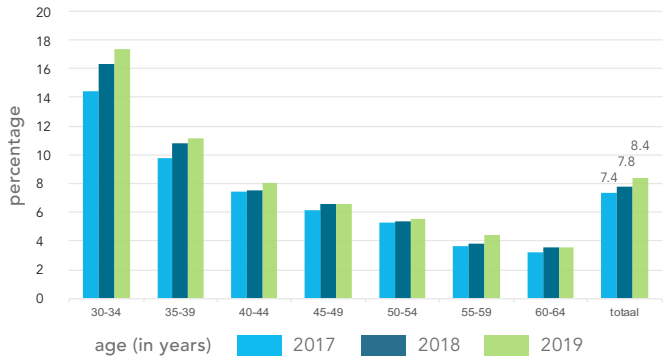
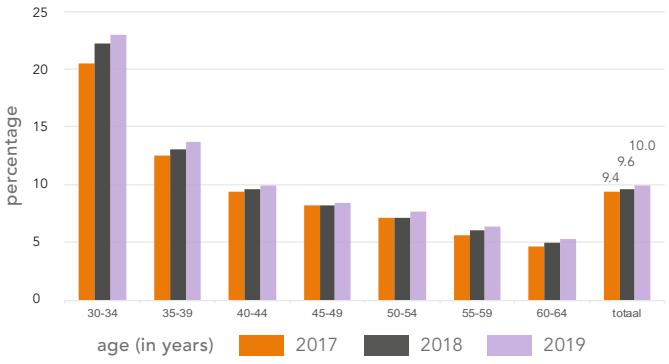


figure 3b **hrHPV-positive participants for cervical smear** by age and year (source: FSB)



- HrHPV was found in 9.8% of all participants. Most hrHPV positive results were found in young participants.
- The percentage of hrHPV positive results increased over the years. In 2019 10.0% of participants who had made a smear test were hrHPV positive, compared to 9.6% in 2018 and 9.4% in 2017. For the SSK this was 8.4% compared to 7.8% in 2018 and 7.4% in 2017.
- For participants that used the SSK the percentage of hrHPV positivity was lower (8.4%) than for participants that had made a smear test (10.0%).

table 4a **cytology in the screening programme** by year (source: FSB)

	2017	2018	2019
results cytology in the screening programme			
normal smear (Pap 1)	66.6%	67.2%	68.7%
ASC-US (Pap 2)	12.0%	12.8%	13.2%
LSIL (Pap 3A1)	9.2%	8.7%	8.6%
HSIL (Pap 3A2 - Pap 4)	11.9%	10.9%	9.1%
invasive carcinoma (Pap 5)	0.02%	0.03%	0.02%
indication for referral to gynaecologist (ASC-US - invasive carcinoma)	33.2%	32.5%	31.0%

- Compared to 2017 and 2018 there seems to be a decrease in HSIL results in hrHPV-positive participants.
- Participants that use the SSK and are hrHPV positive seem to have a higher HSIL result than participants who take a cervical smear at the GP.
- In 2019, 31.0% of the hrHPV positive participants were referred to a gynaecologist (ASC-US – invasive carcinoma), which were 13,582 persons. In 2018 this was 32.5%.

table 4b **cytology in the screening programme** by year and kind of primary test (source: FSB)

	2017	2018	2019
results cytology in the screening programme smear			
normal smear (Pap 1)	67.0%	67.3%	68.9%
ASC-US (Pap 2)	12.0%	12.9%	13.2%
LSIL (Pap 3A1)	9.2%	8.8%	8.6%
HSIL (Pap 3A2 - Pap 4)	11.6%	10.8%	8.9%
invasive carcinoma (Pap 5)	0.02%	0.02%	0.51%
indication for referral to gynaecologist (ASC-US - invasive carcinoma)	32.8%	32.4%	31.2%

	2017	2018	2019
results cytology in the screening programme SSK			
normal smear (Pap 1)	62.1%	65.6%	64.6%
ASC-US (Pap 2)	12.0%	12.0%	12.9%
LSIL (Pap 3A1)	9.8%	8.6%	9.0%
HSIL (Pap 3A2 - Pap 4)	15.8%	13.3%	12.8%
invasive carcinoma (Pap 5)	0.03%	0.09%	0.04%
indication for referral to gynaecologist (ASC-US - invasive carcinoma)	37.7%	34.0%	34.7%

table 5 **advice based on primary tests**

by year (source: FSB and PALGA)*

	2015	2016	2017	2018	2019
reference period (months)	63	51	39	27	*15*
direct referral	0.93%	0.92%	3.56%	3.46%	*3.00%*
repeat smear due to smear material that cannot be assessed (Pap 0) or hrHPV could not be determined (no follow up)	1.6%	1.8%	0.20%	0.23%	*0.31%*
- due to ineligible smear hrHPV	-	-	0.04%	0.03%	*0.07%*
- due to ineligible SSK hrHPV	-	-	0.11%	0.14%	*0.12%*
- due to ineligible smear cytology	-	-	0.05%	0.06%	*0.12%*
control smear after 6 months	3.8%	3.8%	7.2%	7.2%	*6.7%*
return to screening programme	93.6%	93.5%	89.0%	89.1%	*89.9%*
cytology after positive SSK (no follow up)	-	-	0.05%	0.05%	*0.15%*

* Reference date for all results is April 1st, 2020. Therefore, the reference period for 2018, for example, is 12 months longer than for 2019 (27 months and 15 months respectively), which makes the years incomparable. Due to the shorter reference period the 2019 numbers are preliminary and printed in italic.

- In the renewed screening programme more participants are referred to a gynaecologist. In the renewed screening programme, participants with hrHPV+ and ASC-US and higher result are directly referred to a gynaecologist. In the old screening programme, participants were referred after a HSIL result.
- In the renewed screening programme, participants are more often advised to take a control smear: in the renewed screening programme, participants are advised to take a control smear after a hrHPV+ and normal smear. In the old screening programme this was after an ASC-US or LSIL.
- In 2019, the percentage of participants with direct referral (of the total participants) was 3.0%, compared to 3.5% in 2018 with a longer reference period.
- In 2019, the percentage of participants that was invited for a control smear after 6 months was 6.7%, compared to 7.2% in 2018 with a longer reference period.

figure 4a **referral (direct and indirect)**

based on the total number of participants, by year (source: FSB and PALGA) *

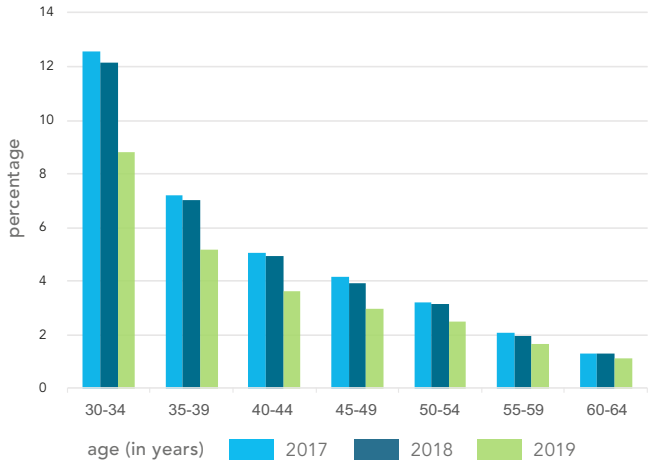
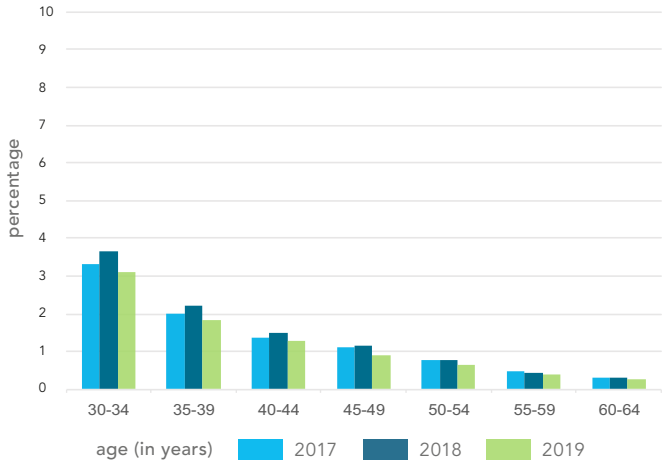


figure 4b **detection (direct and indirect)**

based on the total number of participants, by year (source: FSB and PALGA) *



* Reference date for all results is April 1st, 2020. Therefore, the reference period for 2018, for example, is 12 months longer than for 2019 (27 months and 15 months, respectively), which makes the years incomparable. Due to the shorter reference period the 2019 numbers are preliminary.

table 6 **detection after direct referral 2019**

(within 150 days after the primary test) (source: PALGA)

	primary test GP	primary test SSK	total
no histology assessed	0.00%	0.88%	**0.10%**
benign	18.7%	16.3%	**18.6%**
CIN 1	29.0%	23.5%	**28.6%**
CIN 2	22.0%	20.3%	**21.9%**
CIN 3	25.4%	34.7%	**26.0%**
malignant, primary cervix carcinoma	1.3%	1.9%	**1.3%**
malignant, other	0.02%	0.00%	**0.00%**
poor quality	2.0%	0.88%	**2.0%**
subtotal	**98.4%**	**98.4%**	**98.4%**
unknown	1.6%	1.6%	**1.6%**
total	**100%**	**100%**	**100%**

figure 5 **detection 2019** after direct referral, by age (source: PALGA)

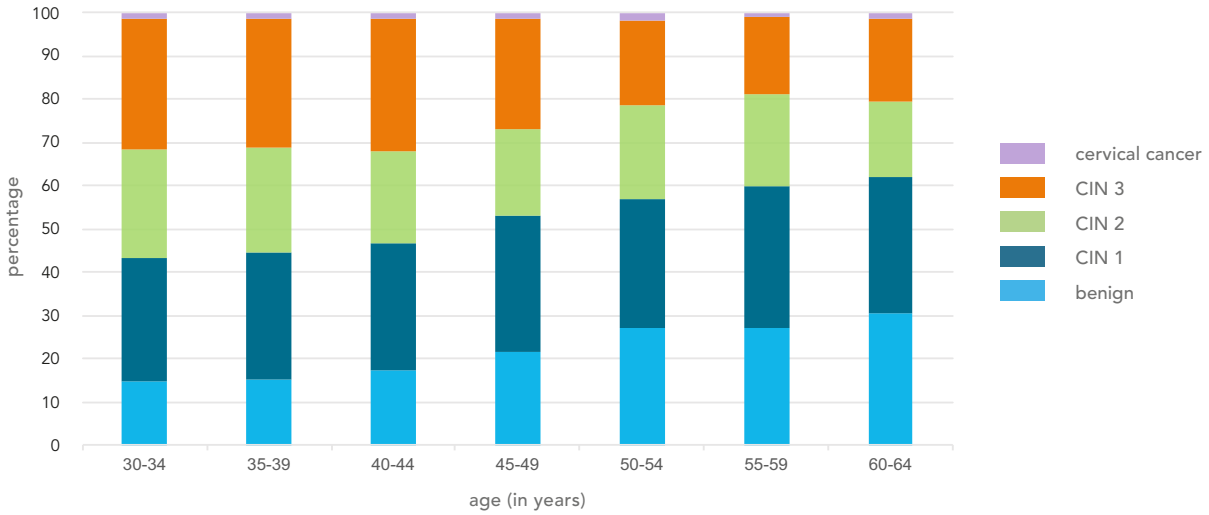


table 7 **detection rate, followed referrals, detection and positive predictive value (PPV)**

by year (source: FSB and PALGA) *

	2015	2016	2017	2018	2019
reference period (months)	63	51	39	27	*15*
referral rate total	2.0%	1.9%	4.9%	4.6%	*3.5%*
referral rate direct	0.93%	0.92%	3.56%	3.46%	*3.00%*
referral rate indirect	0.88%	0.82%	1.34%	1.11%	*0.45%*
followed referral total	92%	93%	75%	74%	*69%*
followed referral direct	92%	90%	77%	75%	*71%*
followed referral indirect	78%	80%	69%	70%	*56%*
detection total	1.01%	1.00%	1.28%	1.32%	*1.10%*
detection direct	0.66%	0.66%	1.00%	1.08%	*1.02%*
detection indirect	0.31%	0.29%	0.28%	0.24%	*0.09%*
PVV total	55.5%	56.9%	35.1%	34.5%	*32.7%*
PVV direct	70.6%	71.4%	38.3%	37.8%	*34.9%*
PVV indirect	8.1%	7.8%	5.1%	4.0%	*1.3%*

* Reference date for all results is April 1st, 2020. Therefore, the reference period for 2018, for example, is 12 months longer than for 2019 (27 months and 15 months respectively), which makes the years incomparable. Due to the shorter reference period the 2019 numbers are preliminary and printed in italic.

explanation for histology

In table 6 and 7 the percentage of participants in which a cytological or histological sample (cervical smear or biopsy) was taken due to referral, was used as proxy for compliance, instead of the number of consultations. From 2017 onwards hrHPV positive participants with ASC-US and higher are referred to the gynaecologist, instead of participants with HSIL. Probably, cell or tissue material is therefore taken less often and the histological positive predictive value for colposcopy is lower (see also table 8).

- Younger participants are more often referred to the gynaecologist, which was also true in 2017 and 2018.
- The percentage participants with CIN3 is higher among participants using the SSK than among participants going to the GP.
- The total referral rate, the percentage of participants that was referred to a gynaecologist, is 3.5% for 2019 and 3.4% for 2018 at a reference period of 15 months. At a longer reference period the total referral rate for 2018 is 4.6%, while for 2015 this is 2.0%.
- The percentage of participants that followed the referral advice for 2019 is around 70%, while for 2015 this was over 90%. The numerator is the number of participants from whom cells or tissue was taken, not the number of consultations. See also 'explanation for histology'.
- The total detection rate, the percentage of participants with a screen-detected (pre-)malignancy (CIN 2+) was 1.1% in 2019 (preliminary data). In 2018 this was 1.32% with a reference period of 27 months. In 2017 this was 1.28% with a reference period of 39 months. In 2015-2016 this was around 1.00%.
- Due to the short reference period, the indirect detection rate is preliminary and the (total) detection rate might therefore increase over time.
- The positive predictive value of the screening programme, the chance that a person is correctly referred to the gynaecologist for further examination, is 33% and for the time being lower than in 2018 and 2017, and significantly lower than in earlier years.

table 8 **histological test** by year (source: PALGA) *

	2015	2016	2017	2018	2019
percentage of persons with histological sample	88.9%	90.5%	73.4%	72.6%	67.4%
positive predictive value of histology at colposcopy	68.1%	69.8%	51.0%	49.2%	47.5%

* Reference date for all results is April 1st, 2020. Therefore, the reference period for 2018, for example, is 12 months longer than for 2019 (27 months and 15 months respectively), which makes the years incomparable.

- The positive predictive value of histology at colposcopy is determined as the proportion of persons for whom the histology was justified.
- The percentage of persons from whom a sample was taken decreased to 67% in 2019. In 2018 and 2017, looking at a longer reference period, this percentage is higher (73%). In the earlier years (old screening programme) this is on average 89% and much higher. See also 'explanation for histology'.
- The positive predictive value of taking a histological sample (the number of persons diagnosed with CIN 2+) is 48%, which is much lower than in the old screening programme.

PART 3 coverage

explanation for coverage

Coverage or the 5-year coverage rate is the percentage of persons at risk (persons whose cervix is not removed) within the range of the screening age group that took at least one cervical smear or hrHPV test in the five years before the reference date (in or out of the screening programme). To calculate the 5-year coverage rate, we analysed the data for periods of five consecutive years. The outcomes of a particular year are based on the five-year period up to, and including that year. For example: the 5-year coverage rate of 2018 is based on tests performed during the period 2013-2018.

table 9 **coverage (5-year coverage rate in percentage)** by year (source: PALGA)

	2013	2014	2015	2016	2017	2018	2019
age							
30 - 34 years	69.3%	69.5%	68.8%	68.7%	65.3%	65.1%	64.8%
35 - 39 years	74.8%	74.9%	75.5%	74.8%	71.8%	70.6%	70.7%
40 - 44 years	76.4%	75.1%	74.6%	74.7%	72.6%	73.2%	73.3%
45 - 49 years	80.7%	81.1%	80.4%	79.4%	76.3%	74.5%	72.9%
50 - 54 years	82.7%	82.4%	81.7%	80.6%	77.4%	76.8%	76.9%
55 - 59 years	81.0%	81.5%	81.3%	81.5%	79.0%	77.9%	77.1%
60 - 64 years	77.3%	77.4%	78.2%	79.1%	76.1%	76.0%	76.2%
total	**77.6%**	**77.5%**	**77.5%**	**77.1%**	**74.2%**	**73.5%**	**73.1%**
primary tests (screening programme)	68.9%	68.9%	68.9%	68.9%	65.8%	65.2%	64.9%
other *	8.8%	8.7%	8.7%	8.3%	8.4%	8.4%	8.3%

* Opportunistic, indicative en secondary smears.

- The 5-year coverage rate decreased with 4% on average in the period 2013 to 2019.

table 10 **incidence and mortality**

by year (source: NCR (incidence) and CBS (mortality))

	2014		2015		2016		2017		2018		2019*	
incidence cervical cancer / 100.000 (ESR)												
age (in years)	30-64	all	30-64	all	30-64	all	30-64	all	30-64	all	*30-64*	*all*
squamous cell carcinoma	10.0	6.5	9.4	6.4	11.2	7.0	11.0	7.0	11.8	7.1	*11.2*	*6.9*
adenocarcinoma	3.0	1.8	2.5	1.8	3.3	2.2	2.9	1.7	3.2	1.9	*3.1*	*1.7*
other	0.7	0.7	0.7	0.7	0.9	0.8	0.6	0.7	0.9	0.9	*1.1*	*0.9*
total	**13.7**	**8.9**	**12.7**	**8.7**	**15.4**	**9.8**	**14.6**	**9.2**	**15.9**	**9.8**	***15.4***	***9.4***
mortality cervical cancer / 100.000 (ESR)												
age (in years)	30-64	all	30-64	all	30-64	all	30-64	all	30-64	all	*30-64*	*all*
total	**2.4**	**2.3**	**2.4**	**2.4**	**2.8**	**2.6**	**2.4**	**2.4**	**2.9**	**2.4**	**	**

ESR= European Standardized rate, incidence/mortality are standardized for the European population.

* Preliminary results (and therefore in italic).

** Not yet available.

- The nationwide incidence varies from 8.7 to 9.8 per 100,000 women.
- This incidence varies from 12.7 to 15.9 per 100,000 women in the group of persons within the screening age.
- The nationwide mortality varies from 2.3 to 2.6 per 100,000 women.

Disclaimer: the information in this monitor has been carefully compiled. Last year a new way of data processing started. This could possibly lead to minor corrections in the results in the future.