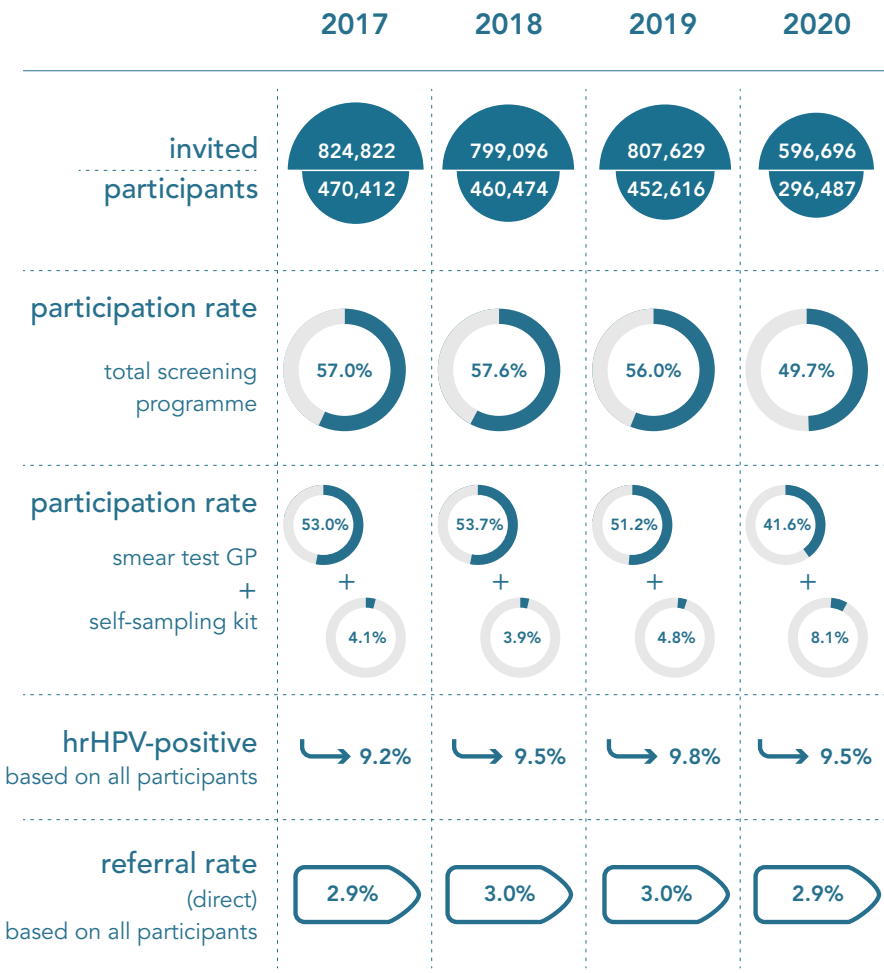
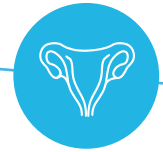


national monitoring of the cervical cancer screening programme in the Netherlands 2020



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

most important results 2020

Due to COVID-19, 25 percent less invitations were sent in 2020. In total **296,487** persons participated at the national screening programme.

The participation rate in 2020 was **49.7%**; **41.6%** participated by a smear test and **8.1%** participated by a self-sampling kit (SSK). The participation rate was lower than in earlier years, irrespective of the lower number of invitations. Of all participants **16.3%** used a SSK, which is more than in 2019 (**8.6%**).

In total, **9.5%** of the participants had a high risk Human Papilloma Virus (hrHPV).

The direct referral rate in 2020 was **2.9%** based on the total number of participants and **31.8%** based on all hrHPV-positive participants with cytology results. This corresponds with **8,702** participants who were directly referred to a gynaecologist.

Finally, **3,415** participants in total had a (pre)cancerous lesion of cervical cancer (CIN2+), which is **1.2%** of all participants.

COVID-19 pandemic

In 2020, due to the COVID-19 pandemic the screening programme was put on hold from March, 16 until July, 1st. From July 1st onwards the screening programme was slowly restarted. In the fall the invitation rate was upscaled to 120% and the SSK option for participation was emphasized in the invitation letter. Irrespective of the lower number of invitations sent, less persons participated in the national screening programme and in the follow up visits. For this reason some numbers can show broken trend lines. This is more pronounced in the absolute numbers. In addition, there is also a delay in the results after participation, like the control smear or referral, since many invitations were sent later in the year and less time than in earlier years was left for follow up visits.

- 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 re-newed screening programme will lead to broken trend lines in the data. More information can be found on the website: www.rivm.nl/en/cervical-cancer-screening-programme
- From 2018 onwards the data for the monitor are derived 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 also results in broken trend lines.

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 (NCR). In this monitor the results of persons invited in 2020 are presented.

explanation of PALGA dataset

The FSB dataset consists of persons who are invited in 2020 and participated until April 1st 2021. Due to a delay in the invitations and a different selection method in the PALGA dataset, persons invited in the first quarter of 2021 are also included in the PALGA dataset. For this reason, the PALGA

dataset contains more participants than the FSB dataset and those participants had less time to follow up the referral. The percentage followed referral is therefore lower than expected.

collaboration

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

bevolkingsonderzoek



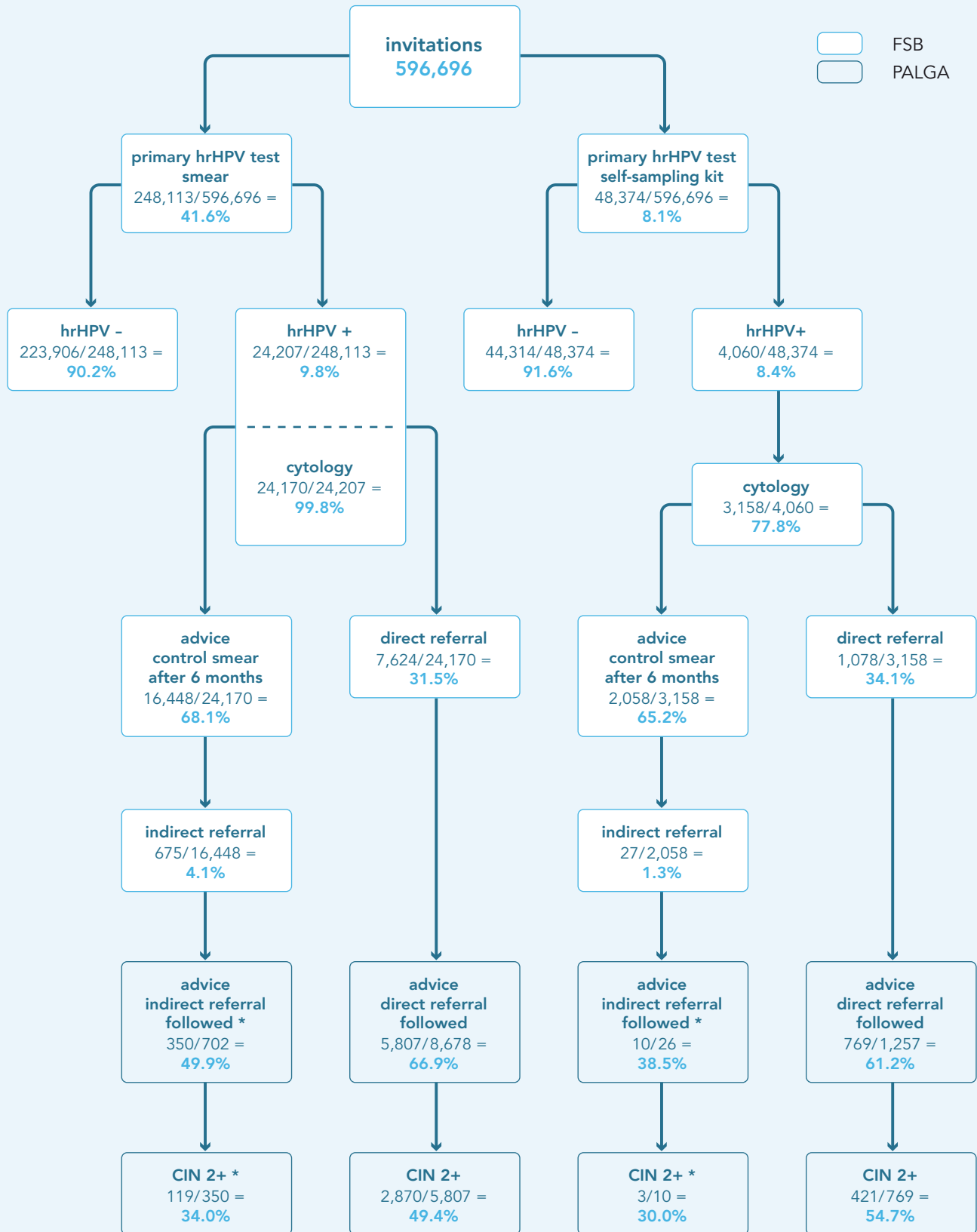
terminology

- **control smear** = smear which is performed after 6 months in hrHPV positive participants without cytological abnormalities in the primary test
- **coverage** = percentage of persons 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 rate** = percentage of participants in whom CIN2, 3 or a malignancy is detected
- **histological assessment** = examination of tissue obtained from colposcopic biopsy
- **initial target population** = persons that are based upon their year of birth eligible for the national screening programme
- **participation rate** = percentage of participants that in response to an invitation participated in the national screening programme. The reference date is always April 1st of the next year
- **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 rate** = percentage of participants that 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
total screening process in 2020

(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.

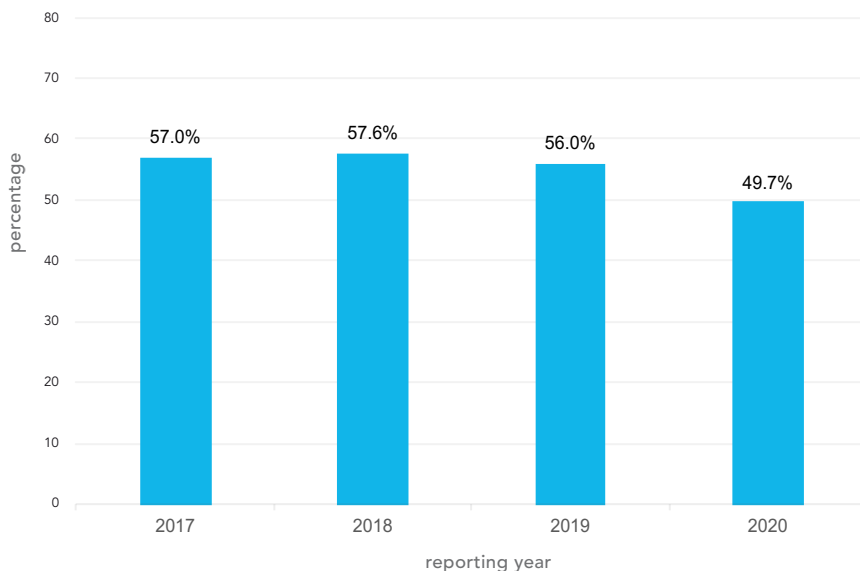
table 1 invitation and participation rate

by year, reference date April 1st of the next year (source: FSB)

	2017	2018	2019	2020
invitations sent	824,808	799,084	807,609	596,696
participation rate primary test	470,412	460,474	452,616	296,487

figure 1 participation rate

by year, reference date April 1st of the next year (source: 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 reference date for the participation rate is always April 1st of the next year. The participation rate in 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 COVID-19 pandemic and therefore 2019 and 2020 have an incomplete reference period. On July 1st the screening programme restarted slowly.

figure 2a participation rate primary test total

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

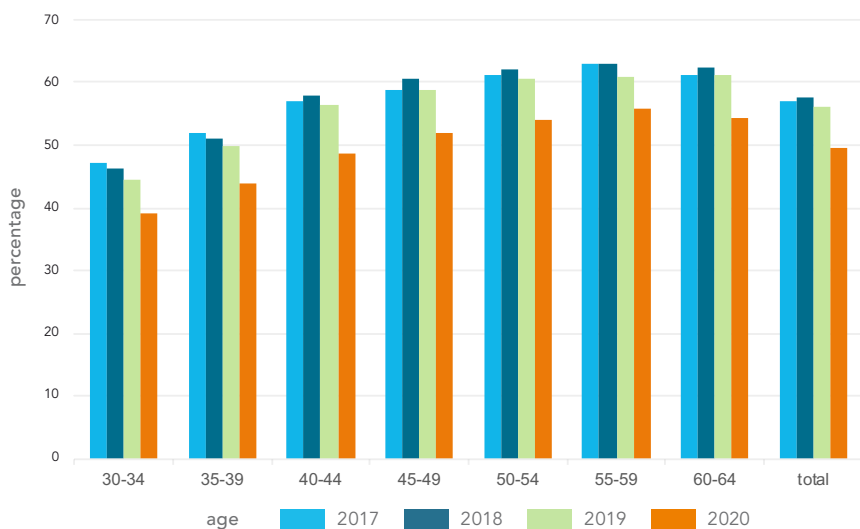


figure 2b participation rate primary test smear by age and year, based on total number of invited persons (source: FSB)

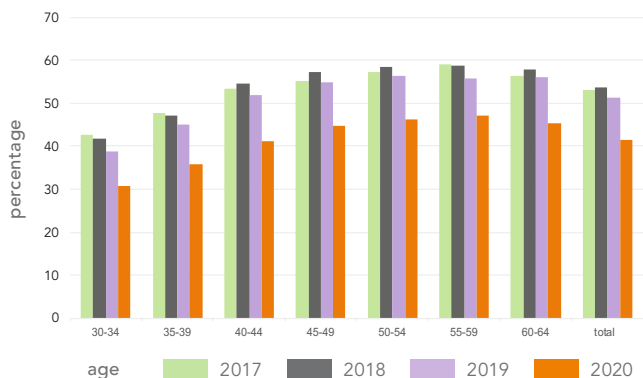
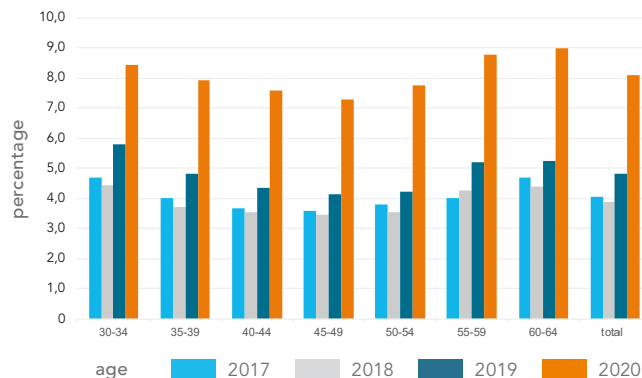


figure 2c participation rate primary test SSK by age and year, based on total number of invited persons (source: FSB)



- In 2020, 49.7% of the invited persons participated in the screening programme, compared to 56.0% in 2019. The decreased participation is seen in all age groups.
- The percentage of participants who underwent a smear test by their GP was 41.6% in 2020 compared to 51.2% in 2019.

- For using the SSK this was 8.1% and 4.8% respectively.
- The total participation rate was lower among younger participants than among older participants.
- Use of the SSK was highest among the youngest and oldest participants and is higher in all age groups compared to earlier years.

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

	2017	2018	2019	2019	2020
reference period (months)	51	39	27	15	15
age					
30 - 34 years	92%	92%	91%	82%	80%
35 - 39 years	89%	89%	89%	79%	80%
40 - 44 years	91%	91%	86%	76%	79%
45 - 49 years	92%	90%	86%	79%	76%
50 - 54 years	86%	87%	89%	82%	80%
55 - 59 years	88%	87%	85%	76%	76%
60 - 64 years	86%	87%	85%	77%	80%
total	90%	90%	88%	79%	79%

table 3 participation rate after invitation for control smear after 6 months by age and year (source: FSB) *

	2017	2018	2019	2019	2020
reference period (months)	51	39	27	15	15
age					
30 - 34 years	76%	77%	74%	57%	55%
35 - 39 years	78%	79%	76%	58%	54%
40 - 44 years	83%	85%	81%	62%	60%
45 - 49 years	85%	87%	84%	65%	59%
50 - 54 years	87%	88%	84%	66%	60%
55 - 59 years	90%	90%	87%	71%	65%
60 - 64 years	90%	91%	87%	71%	66%
total	82%	84%	80%	63%	59%

* Reference date for all results is April 1st, 2021. Therefore, the reference period for 2019, for example, is 12 months longer than for 2020 (27 months and 15 months, respectively), which makes the years incomparable. For that reason an extra column of 2019 with a reference period of 15 months is added for comparison. The numbers of the reference period of 15 months are preliminary and printed in italic.

- The participation rate for taking a cervical smear after a hrHPV-positive SSK was on average 79% in 2020 (preliminary result). In 2019, with a 15 months reference period, this was 79%, which increased to 88% at 27 months.
- The participation rate for control smears (after hrHPV-positive + Pap 1) was on average 59% in 2020 (preliminary

- result). Many invitations were sent later in the year, which resulted in less time for control smears than in earlier years. In 2019, with a 15 months reference period, this was 63%, which increased to 80% at 27 months.
- The participation rate for control smears increased with higher age.

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

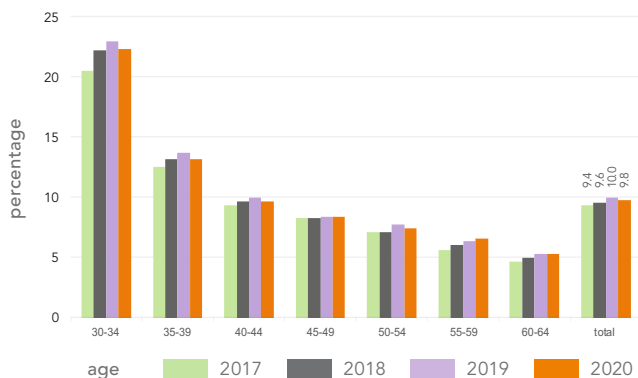
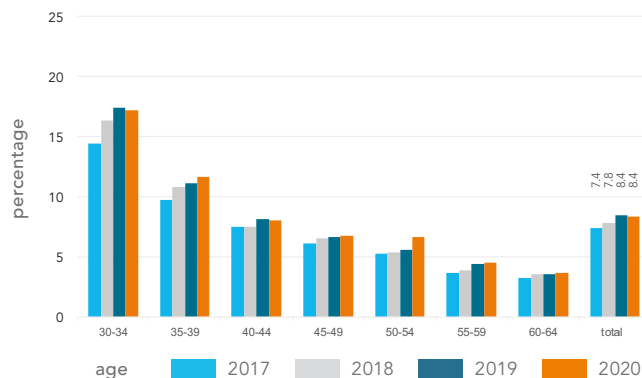


figure 3b hrHPV-positive participants for SSK by age and year (source: FSB)



- In 2020, hrHPV was found in 9.5% of all participants. Most hrHPV positive results were found in young participants.
- In 2020 9.8% of participants who underwent a smear test were hrHPV positive, compared to 10.0% in 2019 and 9.6% in 2018. For the SSK this was 8.4% compared to 8.4% in

- 2019, 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 who underwent a smear test (9.8%). This was also observed in earlier years.

table 4a cytology primary test total

by year (source: FSB)

	2017	2018	2019	2020
normal smear (Pap 1)	66.6%	67.1%	68.3%	67.7%
ASC-US (Pap 2)	12.0%	12.8%	13.1%	12.7%
LSIL (Pap 3A1)	9.2%	8.8%	8.7%	8.9%
HSIL (Pap 3A2 - Pap 4)	11.9%	11.0%	9.6%	10.3%
invasive carcinoma (Pap 5)	0.02%	0.03%	0.02%	0.01%
indication for referral to gynaecologist (ASC-US-invasive carcinoma)	33.2%	32.6%	31.4%	31.8%

table 4b cytology primary test cervical smear

by year (source: FSB)

	2017	2018	2019	2020
normal smear (Pap 1)	66.9%	67.3%	68.7%	68.1%
ASC-US (Pap 2)	12.0%	12.8%	13.2%	12.9%
LSIL (Pap 3A1)	9.2%	8.8%	8.7%	8.8%
HSIL (Pap 3A2 - Pap 4)	11.6%	10.8%	9.2%	9.8%
invasive carcinoma (Pap 5)	0.02%	0.02%	0.02%	0.01%
indication for referral to gynaecologist (ASC-US-invasive carcinoma)	32.9%	32.5%	31.7%	31.5%

table 4c cytology primary test SSK

by year (source: FSB)

	2017	2018	2019	2020
normal smear (Pap 1)	62.1%	65.1%	64.5%	65.2%
ASC-US (Pap 2)	12.0%	12.0%	12.2%	10.7%
LSIL (Pap 3A1)	9.7%	8.5%	9.1%	9.9%
HSIL (Pap 3A2 - Pap 4)	16.0%	14.1%	13.8%	13.4%
invasive carcinoma (Pap 5)	0.03%	0.08%	0.03%	0.03%
indication for referral to gynaecologist (ASC-US-invasive carcinoma)	37.6%	34.6%	35.1%	34.1%

- Participants that use the SSK and are hrHPV positive seem to have a higher HSIL result than participants who underwent a cervical smear at the GP.
- In 2020, 31.8% of the hrHPV positive participants were referred to a gynaecologist (ASC-US – invasive carcinoma),

which were 8,702 persons. This absolute number is lower than in earlier years because the screening programme was temporarily stopped. In 2019 this was 31.4%, in 2018 32.6%, and in 2017 33.2%.

table 5 advice based on primary test

by year (source: FSB) *

	2017	2018	2019	2020
reference period (months)	51	39	27	15
direct referral	3.0%	3.1%	3.0%	2.9%
repeat smear due to smear material that cannot be assessed (Pap 0) or hrHPV could not be determined (no follow up)	0.20%	0.23%	0.31%	0.26%
control smear after 6 months	6.2%	6.3%	6.7%	6.2%
return to screening programme	89.0%	89.1%	89.9%	90.5%
cytology after positive SSK (no follow up)	0.05%	0.05%	0.08%	0.29%

* Reference date for all results is April 1st, 2021. Therefore, the reference period for 2019, for example, is 12 months longer than for 2020 (27 months and 15 months, respectively), which makes the years incomparable. Due to the shorter reference period the 2020 numbers are preliminary and printed in italic.

- In the renewed screening programme, participants with hrHPV+ and ASC-US or higher result are directly referred to a gynaecologist.
- In the renewed screening programme, participants are advised to take a control smear after a hrHPV+ and normal smear.
- In 2020, the percentage of participants with direct referral (of the total participants) was 2.9%, compared to 3.0% in 2019 with a longer reference period.
- In 2020, the percentage of participants that was invited for a control smear after 6 months was 6.2%, compared to 6.7% in 2019 with a longer reference period.

figure 4a referral (direct and indirect) based on the total number of participants by year (source: FSB) *

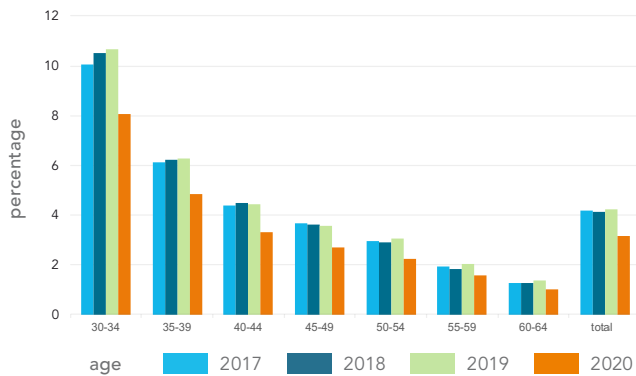


figure 4b referral (direct and indirect) based on the total number of hrHPV-positive participants with cervical smear by year (source: FSB) *

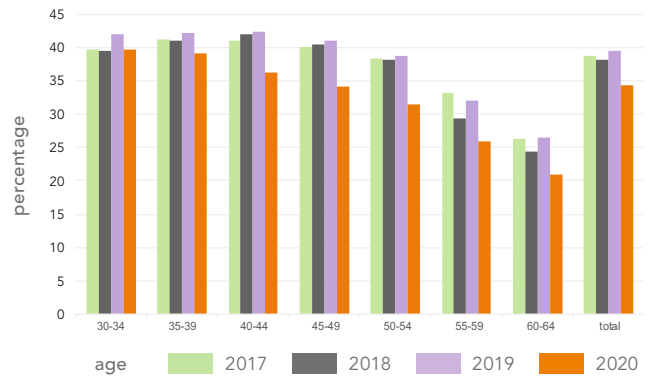
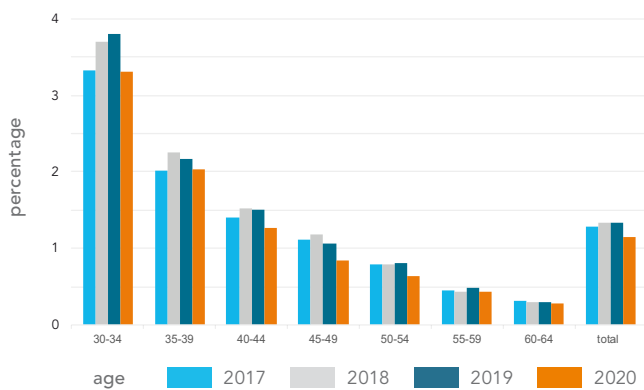


figure 4c detection (direct and indirect) based on the total number of participants by year (source: FSB and PALGA) *



* Reference date for all results is April 1st, 2021. Therefore, the reference period for 2019, for example, is 12 months longer than for 2020 (27 months and 15 months, respectively), which makes the years incomparable. Due to the shorter reference period the 2020 numbers are preliminary.

table 6 detection after direct referral

in 2020, within 150 days after the primary test (source: PALGA)

	primary test cervical smear	primary test SSK	total
only cytology	0.00%	1.17%	0.14%
benign	17.5%	14.3%	17.2%
CIN 1	28.9%	26.3%	28.6%
CIN 2	23.0%	21.2%	22.8%
CIN 3	25.2%	32.1%	26.0%
malignant, primary cervix carcinoma	1.2%	1.3%	1.2%
malignant, other	0.02%	0.13%	0.03%
poor quality	2.2%	0.65%	2.1%
subtotal	98.2%	97.1%	98.0%
unknown	1.8%	2.9%	2.0%
total	100%	100%	100%

figure 5 detection after direct referral

in 2020, by age (source: PALGA)

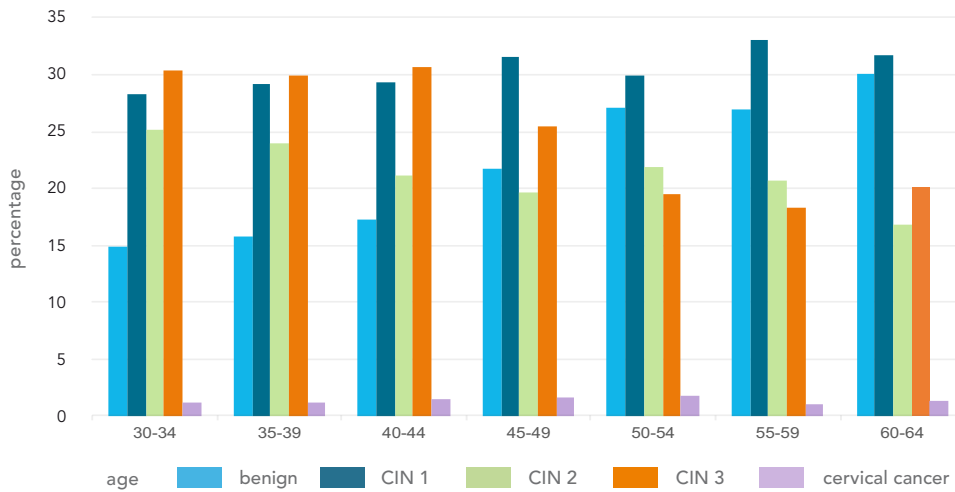


table 7 detection rate, followed referrals, detection and positive predictive value (PPV)

by year (source: FSB and PALGA) *

	2017	2018	2019	2019	2020
reference period (months)	51	39	27	15	15
referral rate total	4.2%	4.1%	4.2%	3.5%	3.2%
referral rate direct	3.0%	3.1%	3.0%	3.0%	2.9%
referral rate indirect	1.2%	1.1%	1.2%	0.5%	0.24%
followed referral total	75%	74%	73%	69%	65%
followed referral direct	77%	75%	75%	71%	66%
followed referral indirect	69%	70%	67%	56%	49%
detection total	1.3%	1.3%	1.3%	1.1%	1.2%
detection direct	1.0%	1.1%	1.1%	1.0%	1.1%
detection indirect	0.29%	0.26%	0.26%	0.09%	0.04%
PPV total	35%	35%	33%	33%	32%
PPV direct	38%	38%	37%	34%	33%
PPV indirect	5.3%	4.3%	4.0%	1.3%	0.58%

* Reference date for all results is April 1st, 2021. Therefore, the reference period for 2019, for example, is 12 months longer than for 2020 (27 months and 15 months, respectively), which makes the years incomparable. For that reason an extra column of 2019 with a reference period of 15 months is added for comparison. The numbers of the reference period of 15 months 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.

- In 2020, younger participants are more often referred to the gynaecologist, which was also true in 2017, 2018, and 2019.
- The percentage of participants with CIN3 is higher among participants using SSK than among participants going to the GP.
- The total referral rate, the percentage of participants that was referred to a gynaecologist, is 3.2% for 2020 and 3.5% for 2019 at a reference period of 15 months. At a longer reference period the total referral rate for 2019 is 4.2%.
- The percentage of participants that followed the referral advice for 2020 is 65% while for 2019 this was 69% (same reference period). 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 lower percentage of followed referral advice could also be caused by COVID-19. In addition, the PALGA dataset included also participants that were invited in the first quarter of 2021. These participants had less time to follow the possible referral advice. Therefore, the percentage followed referral advice is lower than expected. See also the introduction.
- The total detection rate, the percentage of participants with a screen-detected (pre-)malignancy (CIN 2+) was 1.2% in 2020 (preliminary date). In 2019, 2018 and 2017 this was all three years 1.3% with a reference period of 27, 39, and 51 months, respectively.
- Due to the short follow-up time, 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 32% and, for the time being, lower than in 2019, 2018, and 2017.

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

	2017	2018	2019	2019	2020
reference period (months)	51	39	27	15	15
percentage of persons with histological sample	73.5%	72.8%	71.4%	67.4%	63.5%
positive predictive value of histology at colposcopy	52.3%	51.6%	48.4%	47.5%	49.4%

* Reference date for all results is April 1st, 2021. Therefore, the reference period for 2019, for example, is 12 months longer than for 2020 (27 months and 15 months, respectively), which makes the years incomparable. For that reason an extra column of 2019 with a reference period of 15 months is added for comparison. The numbers of the reference period of 15 months are preliminary and printed in italic.

- 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 histological sample was taken decreased to 64% in 2020. In 2019, 2018, and 2017, looking at a longer reference period, this percentage is higher (73%).
- The PALGA dataset included also participants that were invited in the first quarter of 2021. These participants had less time to follow the possible referral advice. Therefore, the percentage of persons with a histological sample is lower than expected. See also the introduction.
- The positive predictive value of taking a histological sample (the number of persons diagnosed with CIN 2+) is 49%.

PART 3 coverage

explanation for coverage

Coverage or the 5-year coverage rate is the percentage of persons 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 2014-2018.

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

	2015	2016	2017	2018	2019	2020
age						
30 - 34 years	68.9%	68.8%	65.4%	65.2%	64.9%	61.7%
35 - 39 years	75.9%	75.3%	72.2%	71.0%	70.8%	67.4%
40 - 44 years	75.1%	75.2%	73.2%	73.7%	73.8%	70.8%
45 - 49 years	81.0%	80.0%	76.9%	75.0%	73.3%	69.2%
50 - 54 years	82.4%	81.3%	78.1%	77.4%	77.5%	73.1%
55 - 59 years	81.9%	82.1%	79.6%	78.5%	77.7%	72.7%
60 - 64 years	78.6%	79.6%	76.5%	76.4%	76.7%	71.5%
total	77.8%	77.6%	74.7%	73.9%	73.5%	69.5%
primary tests (screening programme)	69.4%	69.4%	66.3%	65.6%	65.2%	60.7%
other *	8.6%	8.3%	8.5%	8.4%	8.4%	8.9%

* Opportunistic, indicative and secondary smears.

- The 5-year coverage rate decreased in the period 2015 to 2020. The largest decrease is in the last year. In 2020 the screening programme was temporarily put on hold and therefore less persons were invited and less persons participated. The coverage rate, however, includes the initial target population and not the actually invited persons. This distorts the 2020 coverage rate.
- The PALGA dataset included also participants that were invited in the first quarter of 2021. These participants had less time to follow up the invitation. Therefore, the coverage rate is lower than expected. See also the introduction.

figure 6 incidence and mortality

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

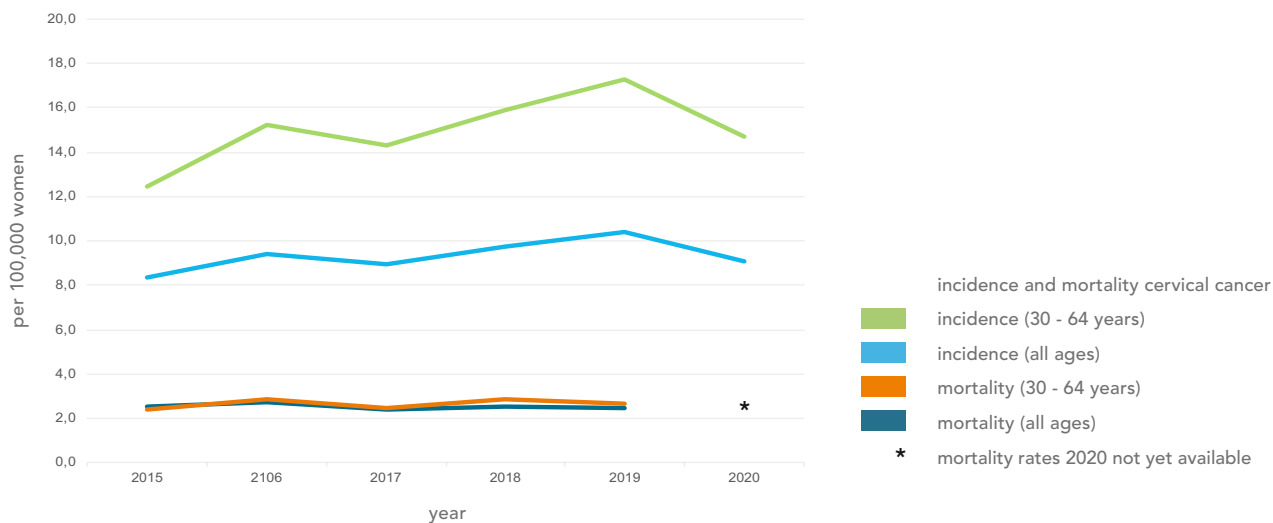


table 10 incidence and mortality

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

	2015	2016	2017	2018	2019	2020
incidence cervical cancer/100,000 women 30 - 64 years						
squamous cell carcinoma	9.3	11.2	10.9	11.9	12.6	11.0
adenocarcinoma	2.5	3.2	2.8	3.3	3.6	3.0
other	0.7	0.8	0.6	0.8	1.1	0.8
total	12.5	15.2	14.3	15.9	17.3	14.7
incidence cervical cancer/100,000 women all ages						
squamous cell carcinoma	6.2	6.9	6.8	7.1	7.7	6.7
adenocarcinoma	1.6	2.0	1.7	2.0	2.0	1.8
other	0.5	0.5	0.5	0.6	0.7	0.6
total	8.3	9.4	9.0	9.7	10.4	9.1
mortality cervical cancer/100,000 women 30 - 64 years						
total	2.4	2.9	2.4	2.9	2.7	*
mortality cervical cancer/100,000 women all ages						
total	2.5	2.7	2.4	2.5	2.5	*

Incidence and mortality are standardized for the Dutch population. 2020 are preliminary results and therefore in italic.

* Not yet available.

- The nationwide incidence of cervical cancer varies from 8.3 to 10.4 per 100,000 women.
- This incidence varies from 12.5 to 17.3 per 100,000 women in the group of persons within the screening age.
- The nationwide mortality varies from 2.4 to 2.9 per 100,000 women within the screening age.

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

Disclaimer: the information in this monitor has been carefully compiled. The results of previous years have been updated with recent data. Therefore, these may differ from previously reported results.