

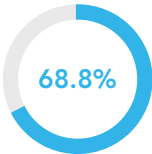
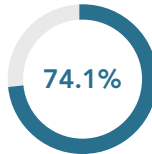
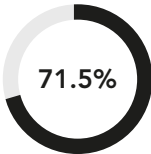
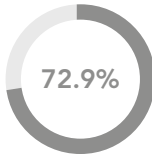


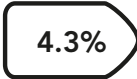




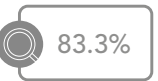










national monitoring of the colorectal cancer screening programme in the Netherlands 2019



			2019 total	2018 total
invited	1,078,183	1,114,875	2,193,058	2,186,108
participated	742,210	826,301	1,568,511	1,593,789
participation rate				
referral rate				
colonoscopy participation				
positive predictive value CRC and/or AAD				
detection rate CRC and/or AAD per 1,000 screened individuals				

most important results 2019

The participation rate in the colorectal cancer screening was **71.5%** in 2019. In total, more than **1.5 million** people participated.

Of these 1.5 million participants, **4.3%** had an unfavourable FIT result. This corresponds to more than **67,000** participants who were referred for a colonoscopy.

85.4% of these referred participants underwent a colonoscopy.

3,086 colorectal cancers and **18,054** advanced adenomas were detected. That is a total of **36.7%** of the participants who underwent a colonoscopy after an unfavourable FIT result. Per 1,000 participants who underwent a FIT, **13.5** participants had colorectal cancer or an advanced adenoma.

edition: October 2020

This monitor is available on www.iknl.nl/en/screening and on www.rivm.nl/en/national-monitoring-of-colorectal-cancer-screening-programme

introduction

The Dutch colorectal cancer screening programme might prevent colorectal cancer by detecting and removing advanced adenomas (large polyps). In addition, colorectal cancer might be detected at an early stage, resulting in a better prognosis. The colorectal cancer screening programme is coordinated by the National Institute for Public Health and the Environment (RIVM).

The RIVM commissioned the Netherlands Comprehensive Cancer Organisation (IKNL) to carry out an annual national monitoring of the colorectal cancer screening programme. Monitoring ensures the quality of the colorectal cancer screening programme and identifies bottlenecks. Monitoring is conducted using data from ScreenIT, the national information

system for the colorectal cancer screening programme. In addition, complications of the colonoscopy are gathered from the Dutch Registration of Complications in Endoscopy (DRCE) (reference date 30 June 2020), information on colorectal cancer mortality from Statistics Netherlands (CBS) and information on the incidence of colorectal cancer from the Netherlands Cancer Registry (NCR).

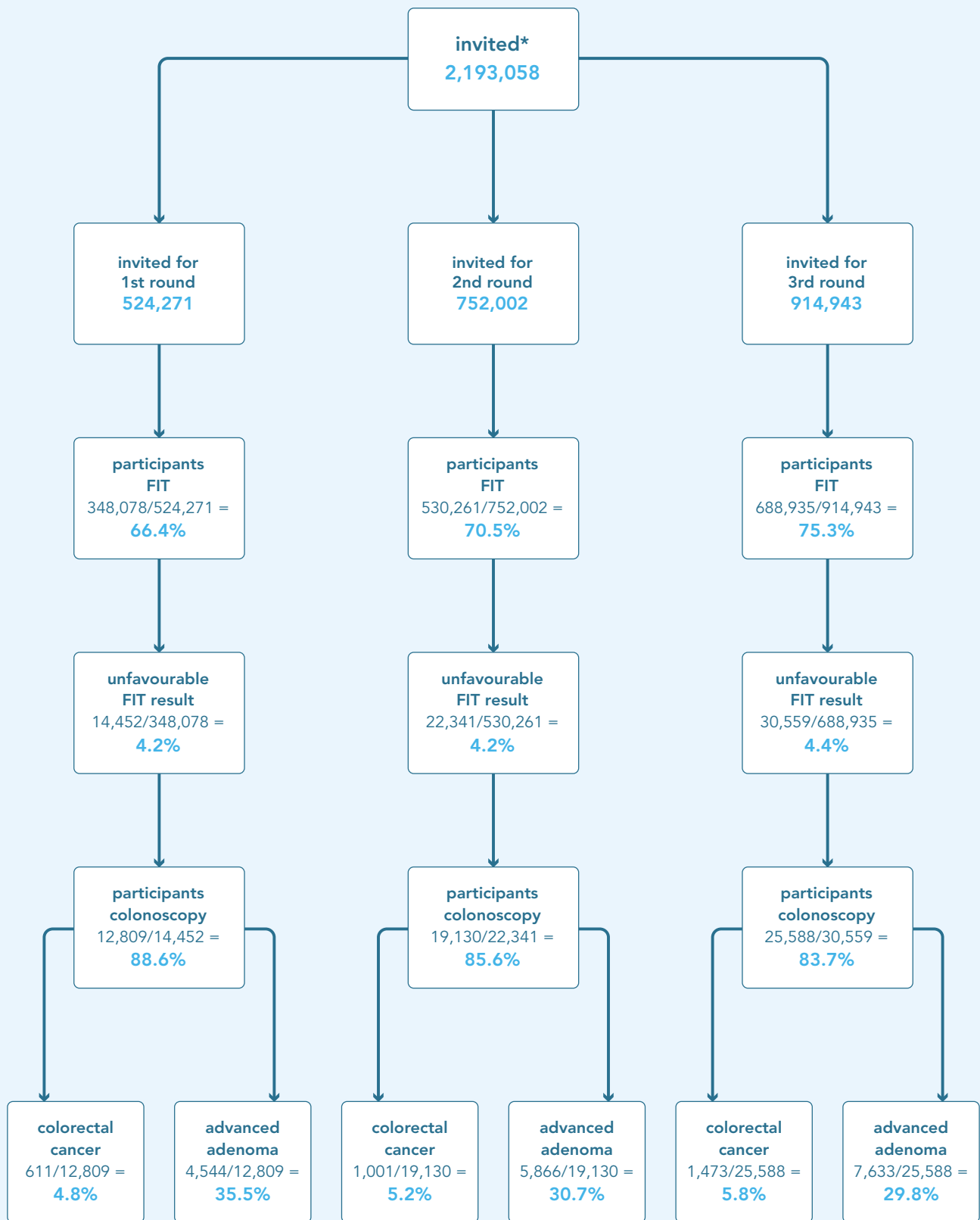
The current monitoring report presents the results of the individuals who were invited for the national colorectal screening programme in 2019; this can be an invitation for a first round as well as for a subsequent round. Due to the small numbers, the results of the fourth screening round are not shown separately, but are included in the total numbers.

terminology

- **advanced adenomas (AAD)** = large polyps
- **colonoscopy** = endoscopic examination of the large bowel
- **CRC** = colorectal cancer
- **detection rate** = number of subjects with colorectal cancer and/or advanced adenoma per 1,000 screened individuals
- **faecal immunochemical test (FIT)** = primary test used in the colorectal cancer screening programme to detect blood in the stool
- **interval cancers** = colorectal cancer diagnosed in screened participants during the interval between two screening rounds and where diagnosis did not follow from the screening examination
- **non-participants** = invited individuals who actively opt out of screening

- **non-responders** = invited individuals who did not respond
- **positive predictive value (PPV)** = number of participants with colorectal cancer and/or advanced adenomas divided by the total number of participants who underwent a colonoscopy
- **referral rate** = proportion of participants with an unfavourable FIT result in relation to the total number of participants
- **sensitivity** = the proportion participants with a screen-detected colorectal cancer of all participants detected with colorectal cancer
- **specificity** = the proportion participants with a correct favourable FIT results of all participants in whom no colorectal cancer is detected

flowchart
total screening process in 2019



* This includes the invitations for the 4th round. Due to the small numbers, this round is not described here.

figure 1 participation rate FIT

by screening round and age group

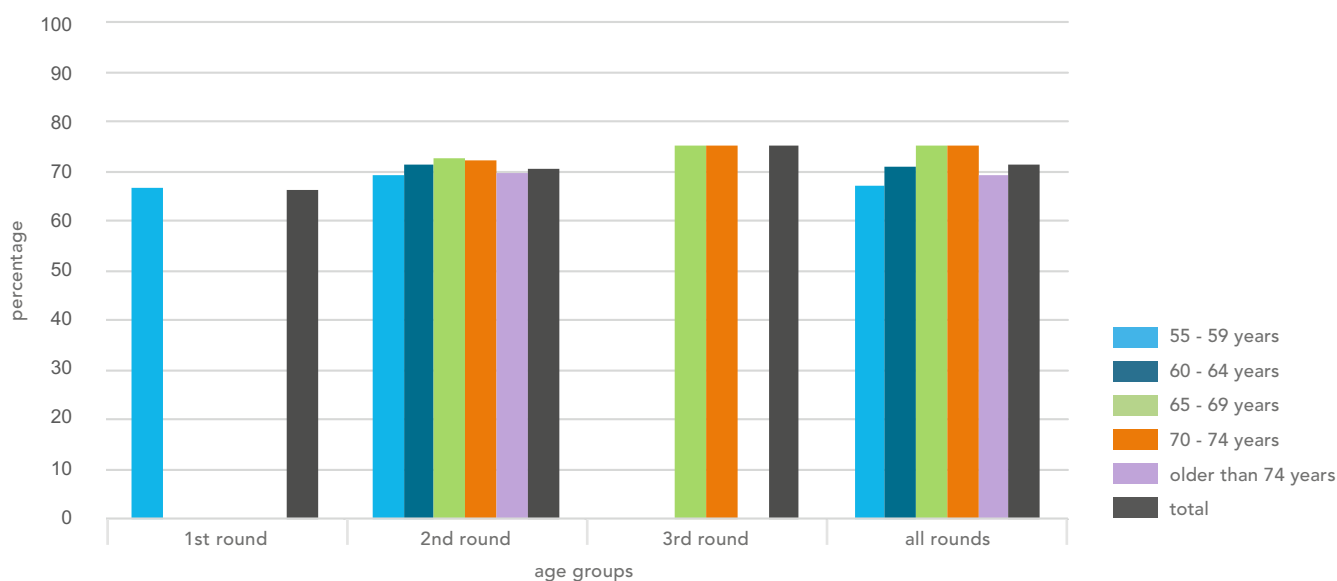


table 1 participation rate FIT

by screening round and age group

	1st round	2nd round	3rd round	all rounds
55 - 59 years	342,832 (66.6%)	144,444 (69.3%)	-	487,276 (67.4%)
60 - 64 years	*	287,805 (71.3%)	*	290,645 (71.1%)
65 - 69 years	*	8,200 (72.8%)	402,732 (75.3%)	411,924 (75.1%)
70 - 74 years	*	6,752 (72.3%)	286,201 (75.3%)	294,249 (75.1%)
older than 74 years	1,357 (63.2%)	83,060 (69.6%)	-	84,417 (69.5%)
total	348,078 (66.4%)	530,261 (70.5%)	688,935 (75.3%)	1,568,511 (71.5%)

- No participants in this age group in this round.

* These numbers are not shown due to small numbers. The participants from these age groups and screening rounds are included in the total numbers and participation rates for all screening rounds.

- In 2019, 72% of the invited persons participated in the colorectal cancer screening programme. The participation rate in the second round increased with increasing age, except for the participants older than 74 years.
- Within the age group 55 – 59 years the participation rate increased from the first to the second round; within the age group 65 – 69 years and the age group 70 – 74 years the participation rate increased from the second to the third round.
- In all screening rounds the participation rate was higher among women compared to men. The participation rate for men was respectively 62%, 68% and 74% for the first, second and third round. For women, these percentages were respectively 71%, 73% and 77%.
- Among the invited individuals, a total of 79,256 (3.6%) individuals opted out (non-participant).
- The re-attendance rate was high. Of those that had participated in a previous round, 1,139,939 (92%) individuals participated again in a subsequent round in 2019.

figure 2 referral rate

by screening round and age group

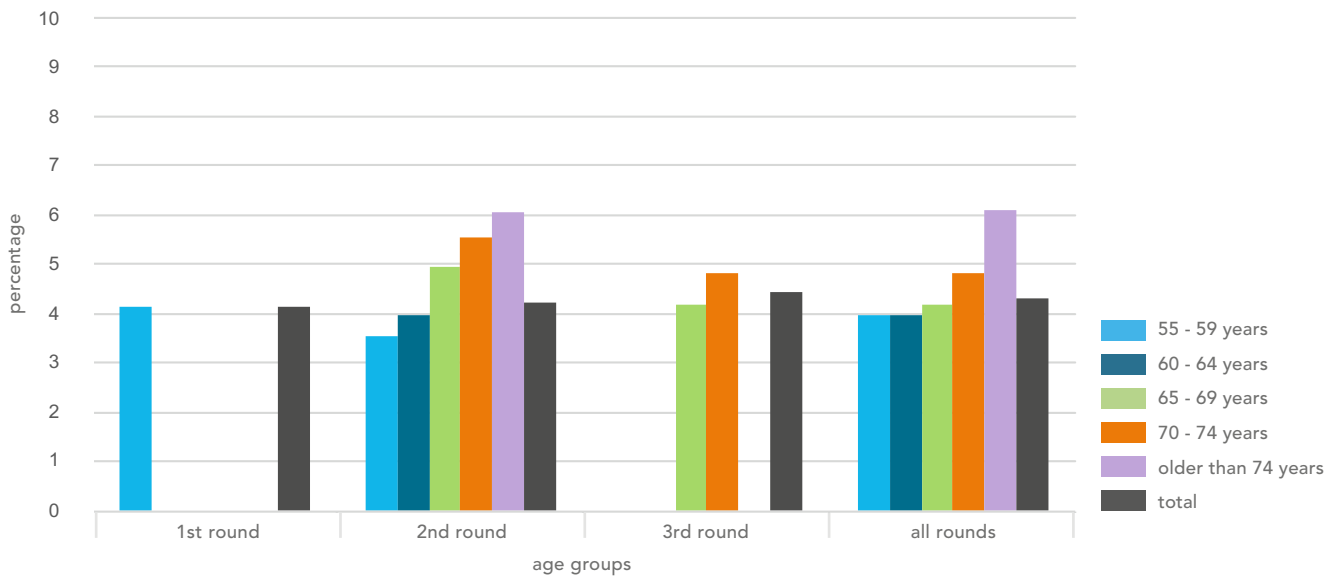


table 2 referral rate

by screening round and age group

	1st round	2nd round	3rd round	all rounds
55 - 59 years	14,104 (4.1%)	5,113 (3.5%)	-	19,217 (3.9%)
60 - 64 years	*	11,426 (4.0%)	*	11,587 (4.0%)
65 - 69 years	*	407 (5.0%)	16,770 (4.2%)	17,212 (4.2%)
70 - 74 years	*	373 (5.5%)	13,789 (4.8%)	14,221 (4.8%)
older than 74 years	*	5,022 (6.1%)	-	5,154 (6.1%)
total	14,452 (4.2%)	22,341 (4.2%)	30,559 (4.4%)	67,391 (4.3%)

- No participants in this age group in this round.

* These numbers are not shown due to small numbers. The participants from these age groups and screening rounds are included in the total numbers and referral rates for all screening rounds.

- In total, 4.3% of the individuals had an unfavourable FIT result. Both in the second and third round, the referral rate increased with increasing age.
- The referral rate was higher among men compared to women. A total of 38,391 men were referred for colonoscopy.

The referral rate was respectively 5.1%, 5.1% and 5.3% in the first, second and third round. Among women, a total of 29,000 were referred for colonoscopy. The referral rate was respectively 3.4%, 3.5% and 3.6% in the first, second and third round.

figure 3 colonoscopy participation

by screening round and age group

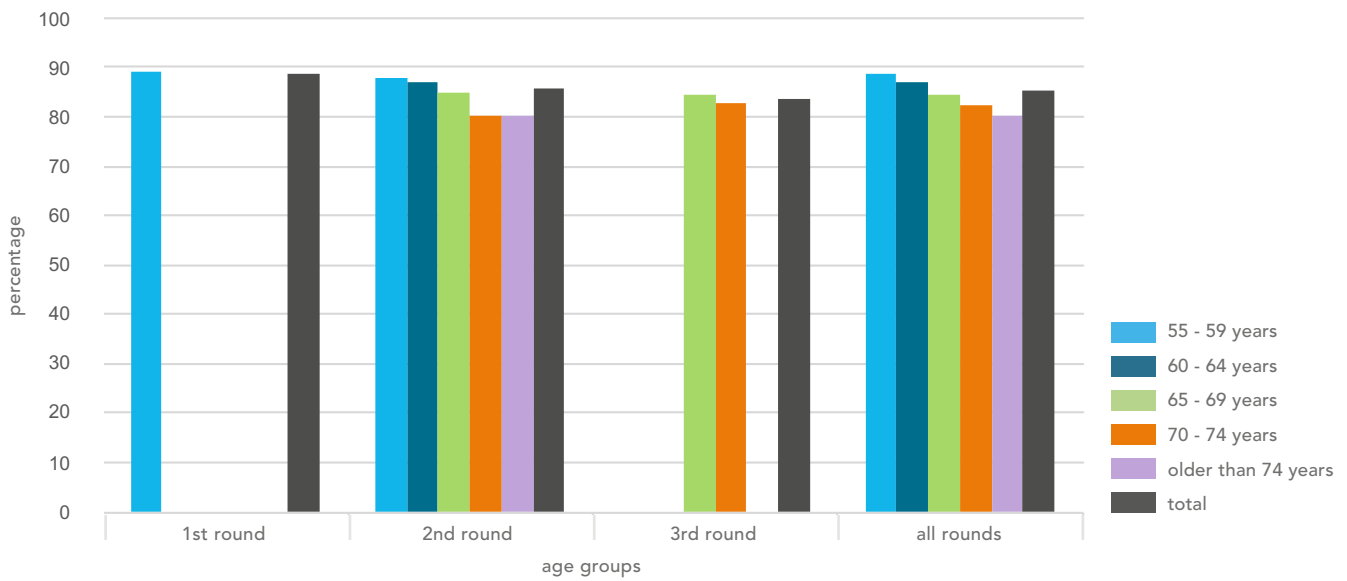


table 3 colonoscopy participation

by screening round and age group

	1st round	2nd round	3rd round	all rounds
55 - 59 years	12,552 (89.0%)	4,483 (87.7%)	-	17,035 (88.6%)
60 - 64 years	*	9,964 (87.2%)	-	10,089 (87.1%)
65 - 69 years	*	346 (85.0%)	14,195 (84.6%)	14,565 (84.6%)
70 - 74 years	*	299 (80.2%)	11,393 (82.6%)	11,737 (82.5%)
older than 74 years	*	4,038 (80.4%)	-	4,132 (80.2%)
total	12,809 (88.6%)	19,130 (85.6%)	25,588 (83.7%)	57,558 (85.4%)

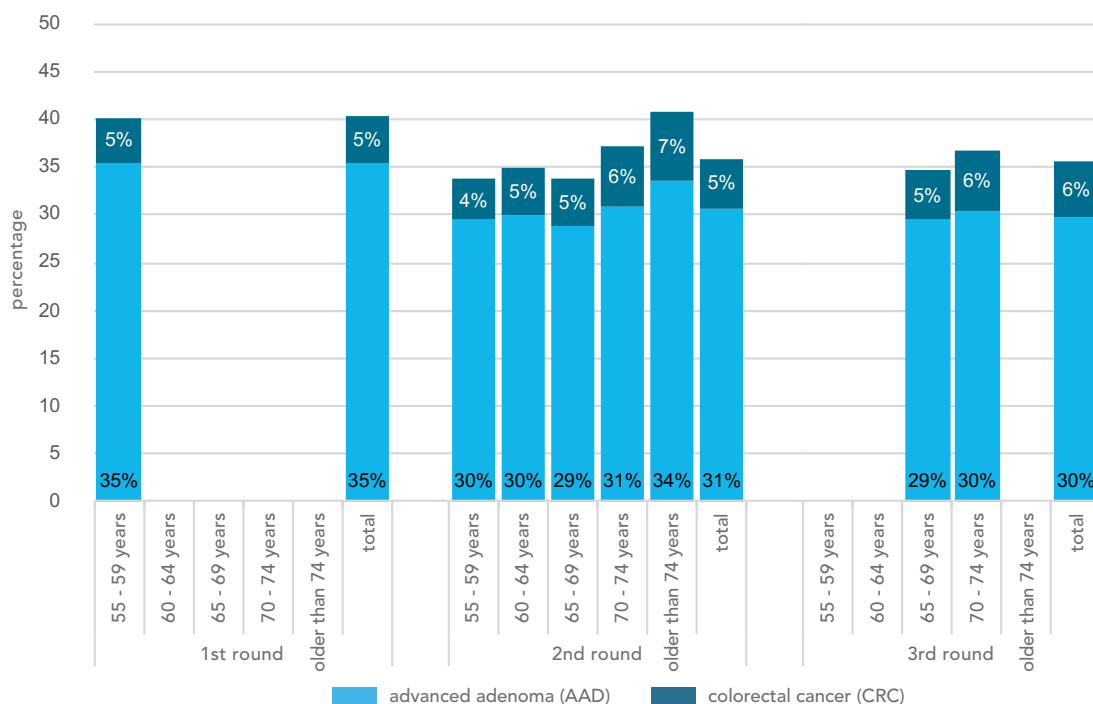
- No participants in this age group in this round.

* These numbers are not shown due to small numbers. The participants from these age groups and screening rounds are included in the total numbers and colonoscopy participation rates for all screening rounds.

- In total, 85% of the individuals with an unfavourable FIT result underwent a colonoscopy. Colonoscopy participation decreased with increasing age and was similar for men and women.
- Of the individuals with an unfavourable FIT result whom during the intake interview were advised to undergo a colonoscopy, 99% underwent a colonoscopy.

figure 4 positive predictive value

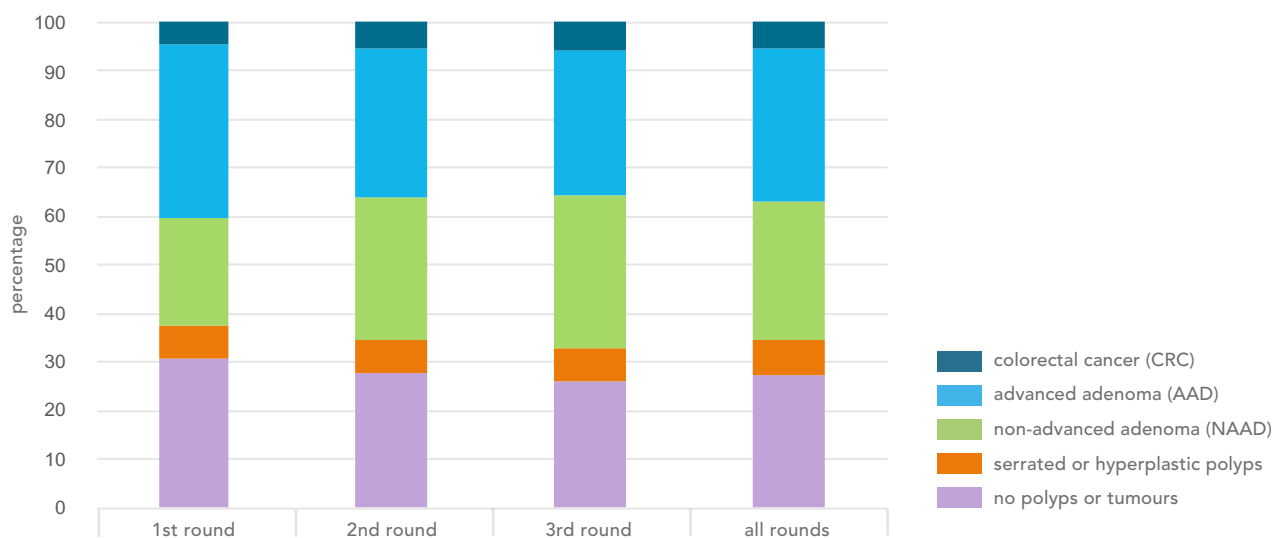
by screening round and age group



- In total, the positive predictive value for colorectal cancer and advanced adenomas was 36.7%. In both the second and third round, the positive predictive value increased with age.

figure 5 colonoscopy findings

by screening round



- In 2019, colorectal cancer was found in 3,086 (5%) individuals with an unfavourable FIT result who underwent a colonoscopy. In 18,054 (31%) of these individuals an advanced adenoma was found.
- During colonoscopy in the first round, in 611 (5%) participants colorectal cancer was detected and in 4,544 (35%) advanced adenoma was detected. The percentage advanced adenoma decreased to respectively 31% and 30% in the second and third round. The percentage colorectal cancer remained stable.
- In all screening rounds, the proportion individuals with serrated or hyperplastic polyps was similar, namely 7%. The proportion individuals with non-advanced adenomas increased from 22% in the first round to 32% in the third round.
- In total, in 15,868 (28%) individuals with an unfavourable FIT result who underwent a colonoscopy no polyps or tumours were detected. This proportion decreased from 31% in the first round to 26% in the third round.

table 4 **detection rate**

by age group

	advanced adenomas		colorectal cancer	
	number	detection rate *	number	detection rate *
55 - 59 years	5,771	11.8	776	1.6
60 - 64 years	3,027	10.4	497	1.7
65 - 69 years	4,287	10.4	771	1.9
70 - 74 years	3,562	12.1	742	2.5
older than 74 years	1,407	16.7	300	3.6
total	18,054	11.5	3,086	2.0

* Per 1,000 screened individuals.

- Advanced adenomas were found in 18,054 participants. This corresponds to a detection rate of 11.5 per 1,000 screened individuals.
- Colorectal cancer was found in 3,086 individuals. This corresponds to a detection rate of 2.0 per 1,000 screened individuals.

table 5 **complications during or after colonoscopy**

by type en severity of the complications

	mild		moderate		severe	
	number	percentage *	number	percentage *	number	percentage *
perforation	20	0.034%	1	0.002%	11	0.019%
bleeding	103	0.175%	117	0.199%	6	0.010%
other	50	0.085%	8	0.014%	3	0.005%
total	173	0.294%	126	0.214%	20	0.034%

* The proportion of complications is based on the total number of colonoscopies that were performed. In 2019 a total of 58,397 colonoscopies were performed. An individual may have undergone more than one colonoscopy. Data source: complication registration (DCRE).

- In total, the following complications were registered in 2019: 173 (0.294%) individuals with a mild complication (i.e. hospitalization <4 days), 126 (0.214%) individuals with a moderate complication (i.e. hospitalization 4-10 days) and 20 (0.034%) individuals with a severe complication (i.e. hospitalization >10 days).
- No fatal complications were reported in 2019.
- Compared with 2018, the mild, moderate and fatal complication rates decreased. The severe complication rate was similar compared to 2018.

table 6 **interval cancers**

by year

	2015	2016
number of interval cancers	867	1,010
proportion of interval cancers after a favourable FIT result	0.11%	0.10%
sensitivity	84.4%	81.8%
specificity	94.1%	94.7%

- The proportion interval cancers in individuals with a favourable FIT result in 2016 was similar to 2015.
- The sensitivity slightly decreased and the specificity remained stable.

table 7 indicators 2019 compared to previous years

	2014	2015	2016	2017	2018	2019
target population						
target population	864,562	1,305,742	1,542,768	2,039,947	2,208,353	2,224,923
number of invited individuals	740,825	1,170,608	1,456,980	1,939,913	2,186,108	2,193,058
coverage rate invitations	85.7%	89.7%	94.4%	95.1%	99.0%	98.6%
response						
non-participants	9.6%	8.8%	8.4%	7.2%	5.5%	3.6%
non-respondents	18.7%	18.2%	18.5%	19.8%	21.6%	24.9%
participation FIT						
participation rate total	71.7%	73.0%	73.2%	73.0%	72.9%	71.5%
participation rate initial invitations	62.5%	63.3%	62.9%	62.0%	60.7%	59.9%
participation rate reminder	9.2%	9.7%	10.3%	11.0%	12.2%	11.6%
participation rate 1st round	71.7%	73.1%	72.0%	70.6%	70.0%	66.4%
participation rate 2nd round			76.1%	75.3%	74.1%	70.5%
participation rate 3rd round					77.7%	75.3%
re-attendance		91.7%	93.5%	93.3%	93.2%	91.9%
age participants (in years)						
average age 1st round	68.0	66.1	64.8	63.3	60.3	56.2
average age 2nd round			67.1	67.1	65.3	63.4
average age 3rd round					69.1	69.1
colonoscopy						
colonoscopy participation after unfavourable FIT result	81.1%	82.4%	83.7%	84.2%	83.3%	85.4%
travel distance and time intervals						
travel distance to intake interview location < 40 km	96.4%	90.3%	97.0%	98.5%	98.1%	99.8%
waiting time intake interview < 15 working days	59.9%	37.5%	65.0%	76.2%	73.7%	94.7%
waiting time colonoscopy (after intake) < 15 working days	88.2%	78.4%	81.0%	83.2%	84.8%	80.4%

- The target population comprised in 2019 more than 2.2 million people. Almost 99% of the target population was invited. The proportion individuals per screening round differed over time. This affects the results.
- In 2019, 742,210 men and 826,301 women participated in the colorectal cancer screening programme. The participation rate of 72% was slightly lower compared to previous years. This is partly because the target population is younger and the participation rate is lower for younger individuals.
- The participation rate after a reminder was 12% in 2019.
- The waiting time for a colonoscopy intake interview was less than 15 working days in 95% of the participants. This is a large increase compared to 2018.

table 8 test characteristics compared to previous years

by year and screening round

	2014	2015	2016	2017	2018	2019
referral rate						
1st round	8.3%	6.8%	6.5%	6.0%	4.9%	4.2%
2nd round			4.9%	4.8%	4.2%	4.2%
3rd round					4.2%	4.4%
all rounds	8.3%	6.8%	6.0%	5.4%	4.5%	4.3%
detection rate CRC*						
1st round	5.6	4.6	4.1	3.9	2.9	1.8
2nd round			2.5	2.3	1.9	1.9
3rd round					2.2	2.1
all rounds	5.6	4.6	3.7	3.1	2.4	2.0
detection rate CRC and/or AAD*						
1st round	34.7	29.9	27.0	24.6	19.1	14.8
2nd round			15.9	15.6	13.0	13.0
3rd round					13.2	13.2
all rounds	34.7	29.9	23.7	19.8	15.6	13.5
PPV CRC						
1st round	8.9%	8.8%	8.2%	8.0%	7.0%	4.8%
2nd round			6.6%	6.1%	5.5%	5.2%
3rd round					6.5%	5.8%
all rounds	8.9%	8.8%	7.8%	7.1%	6.4%	5.4%
PPV CRC and/or AAD						
1st round	55.5%	57.5%	53.2%	50.9%	46.3%	40.2%
2nd round			42.4%	41.2%	37.7%	35.9%
3rd round					38.2%	35.6%
all rounds	55.5%	57.5%	50.6%	46.4%	41.8%	36.7%

* Per 1,000 screened individuals.

- The referral rate, detection rate and positive predictive value decreased over time.
- As expected, the referral rate, detection rate and positive predictive value all decreased in the second and third

round compared with the first round. Fewer abnormalities are found during colonoscopy, because the prevalence of colorectal cancer and advanced adenoma decreased after a first round of screening.

table 9 incidence and mortality rate

by year

	2013	2014	2015	2016	2017	2018	2019
incidence rate colorectal cancer / 100,000 (ESR)¹							
total	54.7	62.0	64.5	61.6	56.3	53.7	47.1*
55 - 74 years	174.3	196.9	231.1	220.2	193.0	171.5	152.2*
mortality rate colorectal cancer / 100,000 (ESR)²							
total	19.3	18.6	19.1	18.8	17.9	17.5	**
55 - 74 years	52.9	50.2	51.2	50.5	47.1	45.9	**

ESR: European Standardized Rate, incidence and mortality rate adjusted for the European standard population.

* Preliminary data.

** Not yet available.

¹ Data source: Netherlands Cancer Registry. ² Data source: Statistics Netherlands.

- The incidence of colorectal cancer decreased since 2016. The incidence rate in 2019 was 47.1 per 100,000 individuals. This is lower than the incidence in 2013, before the introduction of the colorectal cancer screening programme.
- This trend is also seen in the group of individuals within the screening age.
- Colorectal cancer mortality has decreased slightly over the years. The mortality rate for 2019 was not yet available.

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.