National monitoring **of the colorectal cancer screening programme** in the Netherlands **2018**

SUMMARY

In the fifth year of the colorectal cancer screening programme the participation remained high, including among participants who were invited for a third time. In line with the five-year implementation plan, 99% of the target population was invited at least once at the end of 2018. A total of 1,589,322 (73%) individuals participated in the colorectal cancer screening programme. Of these individuals, 71,118 (4.5%) had an unfavourable FIT result.

The proportion of participants who were referred for colonoscopy, as well as the proportion of participants with a relevant finding (colorectal cancer and/or advanced adenoma) decreased in 2018 compared with previous years. A total of 3,733 (6%) colorectal cancers and 20,805 (36%) advanced adenomas were detected in 2018.

			2018 total	2017 total
Invited	1,080,445	1,105,741	2,186,186	1,939,980
Participated	757,775	831,547	1,589,322	1,415,025
Participation rate	70%	75%	73%	73%
Participation rate without reminder	57%	64%	61%	62%
Referral rate	5.5%	3.6%	4.5%	5.1%
Colonoscopy participation	83%	82%	82%	84%
Positive predictive value CRC and/or AAD	45%	37%	42%	46%
Detection rate* per 1,000 screened individuals*	20.3	11.0	15.4	19.4

Glossary

• **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 number of cancers detected by screening in a specific round divided by the sum of the number interval cancers and the number of cancers detected by screening in the same round

Edition: October 2019

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

The colorectal cancer screening programme is coordinated by the National Institute for Public Health and the Environment (RIVM).

INTRODUCTION

The Dutch colorectal cancer screening programme might prevent colorectal cancer by detecting and removing advanced adenomas (large polyps). In addition, colorectal cancer will be detected at an early stage (such as stages I and II), 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) and information on the incidence of colorectal cancer from the Netherlands Cancer Registry (NCR). The current monitoring report presents the results of the national colorectal screening programme for 2018, the fifth year of the programme.

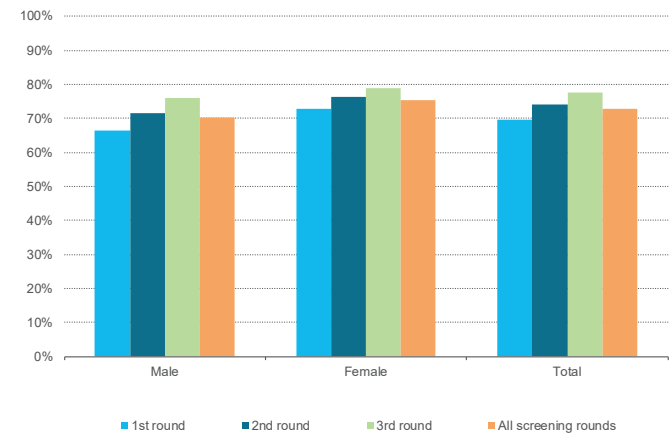
TARGET POPULATION

The colorectal cancer screening programme's target population consists of men and women aged 55 to 75, who once every two years are invited to do a self-test that measures blood in the stool (faecal immunochemical test, FIT). In case of an unfavourable FIT result, i.e. when the amount of blood in the stool samples exceeds the cut-off value, the participant is invited for a colonoscopy intake interview. The target population in 2018 existed of individuals who received an invitation for the population screening programme for the first time (birth cohorts 1943, 1959, 1961 and 1963) and individuals who were eligible for a subsequent (second or third) screening round in 2018.

1. TOTAL SCREENING PROCESS 2018

	TARGET GROUP 2,348,534					
Invited	963,881		836,365		385,940	
Participants	671,751 (69.7%)		618,331 (73.9%)		299,240 (77.5%)	
Unfavourable FIT result	33,023 (4.9%)		25,631 (4.1%)		12,464 (4.2%)	
Intake colonoscopy	29,497 (89.3%)		23,145 (90.3%)		11,087 (88.9%)	
Advice colonoscopy	27,949 (94.8%)		21,601 (93.3%)		10,342 (94.1%)	
Colonoscopy	27,389 (98.0%)		21,154 (97.9%)		10,084 (97.5%)	
	CRC **1,920** (7.0%)	AAD **10,796** (39.3%)	CRC **1,162** (5.5%)	AAD **6,813** (32.2%)	CRC **651** (6.5%)	AAD **3,196** (31.7%)
	1st ROUND		2nd ROUND		3rd ROUND	

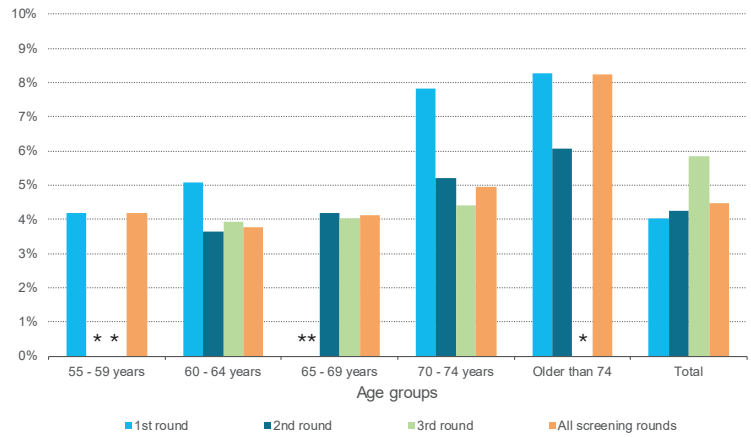
2. PARTICIPATION RATE



	1st round	2nd round	3rd round	all screening rounds
Male	319,331	294,002	144,442	757,775
Female	352,420	324,329	154,798	831,547
Total	**671,751**	**618,331**	**299,240**	**1,589,322**

- For the first time individuals were eligible for a third round in 2018. Participation remained high in the third round, namely 78%. The participation rate increased with every subsequent round.
- Participation was higher in all screening rounds among women compared with men. The participation rate for men was respectively 67%, 72% and 76% for the first, second and third round. For women, these percentages were 73%, 76% and 79%.
- In the first invitation round, participation was highest (70%) among individuals aged 55 to 59 and 70 to 74 years.
- In both the second and third round, participation was highest among individuals aged 65 to 74 years. These percentages were 75% and 78% respectively.
- Among the invited individuals, a total of 119,768 (5%) individuals opted out (non-participant).
- Of those that had participated in a previous round, 854,287 (93%) individuals participated again in a subsequent round.

3. REFERRAL RATE

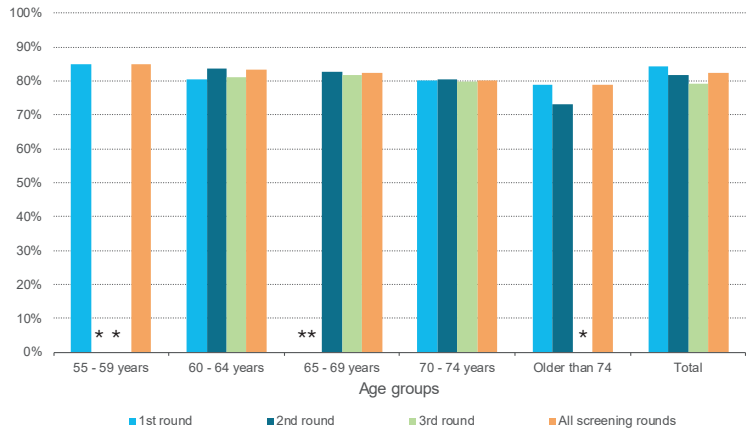


- The referral rate increased with age and is higher among men compared with women.
- A total of 41,283 men were referred for a colonoscopy. The referral rate was 6.1%, 5.0% and 4.9% for the first, second and third round. Among women, a total of 29,835 were referred for a colonoscopy. The referral rate was respectively 3.8%, 3.3% and 3.5% for the first, second and third round.
- The referral rate decreased after the first invitation round. Similar referral rates were found in the second and third round.

	1st round	2nd round	3rd round	all screening rounds
55 - 59 years	22,069	*	*	22,069
60 - 64 years	1,355	11,120	537	13,012
65 - 69 years	45	7,446	6,725	14,171
70 - 74 years	857	6,912	5,202	12,971
Older than 74	8,697	153	*	8,850
Male	19,369	14,802	7,112	41,283
Female	13,654	10,829	5,352	29,835
Total	**33,023**	**25,631**	**12,464**	**71,118**

* No participants in this age group in this round; ** Age group 65-69 years is not shown due to low numbers (n=45) and because these individuals are not included in the birth cohorts of 2018.

4. COLONOSCOPY PARTICIPATION



- In total, 82% of the individuals with an unfavourable FIT result underwent a colonoscopy. Colonoscopy participation was slightly lower in the third round compared with the first and second round.
- The proportion of men who underwent a colonoscopy was similar to the proportion of women.
- Of the individuals with an unfavourable FIT result who during the intake interview were advised to undergo a colonoscopy, 98% underwent a colonoscopy.

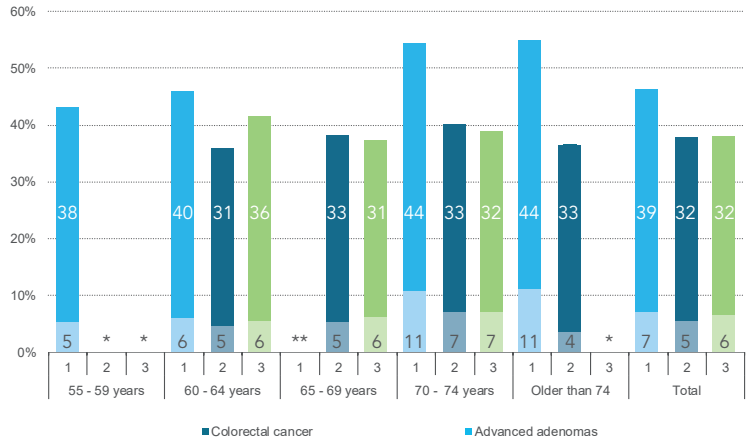
	1st round	2nd round	3rd round	all screening rounds
55 - 59 years	18,723	*	*	18,723
60 - 64 years	1,091	9,315	435	10,841
65 - 69 years	31	6,167	5,496	11,663
70 - 74 years	686	5,560	4,153	10,399
Older than 74	6,858	112	*	6,970
Total	**27,389**	**21,154**	**10,084**	**58,627**

* No participants in this age group in this round; ** Age group 65-69 years is not shown due to low numbers (n=31) and because these individuals are not included in the birth cohorts of 2018.

A total number of 62,854 colonoscopies was performed in 2018. An individual may have undergone more than one colonoscopy.

5. POSITIVE PREDICTIVE VALUE

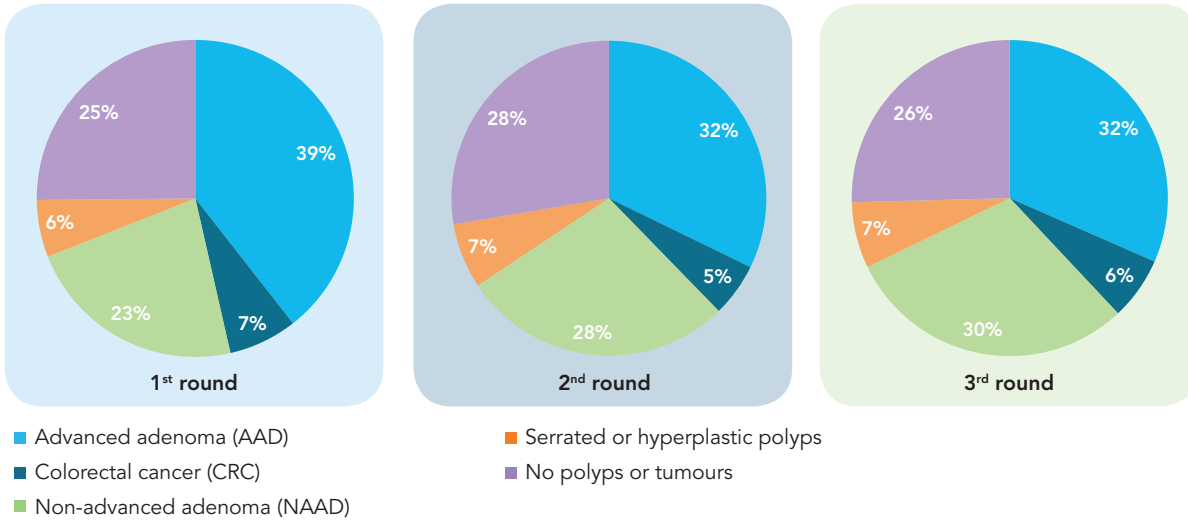
per screening round and age group



- The positive predictive value for colorectal cancer and/or advanced adenoma increased with age.
- The positive predictive value decreased after the first invitation round. Similar positive predictive values were found in the second and third round.

* No participants in this age group in this round; ** Age group 65-69 years is not shown due to low numbers (n=9) and because these individuals are not included in the birth cohorts of 2018.

6. COLONOSCOPY FINDINGS



Participants were classified according to the most relevant abnormality found during colonoscopy.

- In 2018, colorectal cancer was found in 3,733 (6%) individuals. In 20,805 (36%) individuals the most relevant finding was an advanced adenoma.
- During colonoscopy in the first round, 1,920 (7%) participants were diagnosed with colorectal cancer. An advanced adenoma was the most important finding in 10,796 (39%) participants. These percentages slightly decreased to 5% and 32% in the second round, and 6% and 32% in the third round.
- Overall, the proportion of individuals for whom no polyps or tumours were found was between 25%-28% and the proportion of individuals with serrated or hyperplastic polyps between 6% -7%. The proportion of individuals with a non-advanced adenoma increased from 23% in the first round, to 28% in the second round, to 30% in the third round.

7. DETECTION RATE

	Advanced adenomas		Colorectal cancer	
	Detection rate *	Number	Detection rate *	Number
55 - 59 years	13.3	7,048	1.9	1,015
60 - 64 years	10.1	3,506	1.5	525
65 - 69 years	10.8	3,746	1.9	664
70 - 74 years	13.2	3,464	2.9	759
Older than 74	28.2	3,041	7.2	770
Total	**13.1**	**20,805**	**2.3**	**3,733**

* per 1,000 screened individuals

- An advanced adenoma was found in 20,805 individuals, this corresponds to a detection rate of 13.1 per 1,000 screened individuals.
- Colorectal cancer was found in 3,733 individuals, this corresponds to a detection rate of 2.3 per 1,000 screened individuals.

8. INCIDENCE- AND MORTALITY RATE

	2013	2014	2015	2016	2017	2018
Incidence rate colorectal cancer	55.5	62.8	65.1	62.1	56.1*	55.4*
Mortaliry rate colorectal cancer	19.7	19.0	19.5	19.2	18.3	

Incidence-/mortality rate are adjusted fot the European standard population. *Incidence rates for 2017 and 2018 are based on estimations.

Data source: Netherlands Cancer Registry (NCR); www.cijfersoverkanker.nl; Data source: CBS

- The incidence of colorectal cancer decreased since 2016. The incidence rate in 2018 was 55.4 per 100,000 individuals.
- At the time this monitor was submitted for publication, mortality rates for 2018 had not yet been made available. In 2017, the mortality rate slightly decreased compared with previous years.

9. COMPARISON OF IMPORTANT TEST RESULTS BETWEEN 2014-2018

	1st round					2nd round		
	2014	2015	2016	2017	2018	2016	2017	2018
Participation rate	72%	73%	72%	71%	70%	76%	75%	74%
Referral rate	8.3%	6.8%	6.5%	6.0%	4.9%	4.9%	4.8%	4.1%
Detection rate CRC per 1,000	5.6	4.6	4.1	3.9	2.9	2.5	2.3	1.9
Detection rate CRC and/or AAD per 1,000	34.7	29.9	27.0	24.5	18.9	15.9	15.5	12.9
PPV FIT	8.9%	8.8%	8.2%	8.0%	7.0%	6.6%	6.1%	5.5%
PPV CRC and/or AAD	56%	57%	53%	51%	46%	42%	41%	38%

Results from 2014-2017 have been updated with recent data. Therefore they might differ from previous reported results.

- The participation rate in both the first and second round slightly decreased over the past few years.
- The referral rate, detection rate and positive predictive value also decreased over time, in particular from 2017 to 2018.
- Compared with the first round, the participation rate was higher in the second round. However, as expected, the referral rate, detection rate and positive predictive value all decreased in the second 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.

10. COMPLICATIONS* DURING OR AFTER COLONOSCOPY

	Mild		Moderate		Severe		Fatal	
Perforation	17	0.027%	8	0.013%	4	0.006%		
Bleeding	148	0.235%	158	0.251%	10	0.016%	1	0.002%
Other	34	0.054%	10	0.016%	8	0.013%	4	0.006%
Total	**199**	**0.317%**	**176**	**0.280%**	**22**	**0.035%**	**5**	**0.008%**

*The proportion of complications is based on the total number of colonoscopies that were performed. An individual may have undergone more than one colonoscopy. A total number of 62,854 colonoscopies were performed in 2018.

Data source: complication registration (DCRE)

- In total, the following complications were registered in 2018: 199 (0.317%) individuals with a mild complication (i.e. hospitalization <4 days), 176 (0.280%) individuals with a moderate complication (i.e. hospitalization 4-10 days), 22 (0.035%) individuals with a severe complication (i.e. hospitalization> 10 days) and 5 (0.008%) individuals with a fatal complication (i.e. death of a person).
- Compared with 2017, the mild, moderate and serious complication rates decreased in 2018 (0.388% mild complication, 0.296% moderate complication and 0.068% severe complication). The fatal complication rate increased compared with the rate of reported complications in 2017 (0.002% fatal complications).

11. COMPARISON BETWEEN 2014-2018

	2014	2015	2016	2017	2018
Target population					
Target population	917,883	1,331,892	1,589,184	2,133,216	2,348,535
Number of invited individuals	738,141	1,138,640	1,407,497	1,897,624	2,154,616
Coverage rate invitations	81%	90%	94%	95%	99%
Respons					
Non-participants	9.6%	8.8%	8.4%	7.2%	5.5%
Non-respondents	19%	18%	18%	20%	22%
Participation screening FIT test					
Participation rate	72%	73%	73%	73%	73%
Participation rate initial invitations	62%	63%	63%	62%	61%
Participation rate reminder	9.2%	10%	10%	11%	12%
Re-attendance			94%	93%	93%
FIT findings					
Referral rate	7.8%	6.3%	5.4%	5.1%	4.5%
Colonoscopy					
Proportion colonoscopy after unfavourable FIT test	81%	82%	84%	84%	82%
Proportion colonoscopy intake interview	88%	88%	90%	91%	90%
Proportion colonoscopy after positive advise intake interview	99%	99%	99%	99%	98%
Colonoscopy findings					
Detection rate CRC and/or AAD	27.5	28.5	23.1	19.4	15.4
PPV CRC and/or AAD	46%	59%	51%	46%	42%
Time intervals					
Travel distance to intake interview location <40 km	96%	90%	97%	99%	98%
Waiting time intake interview <15 working days	60%	37%	65%	76%	74%
Waiting time colonoscopy (after intake) <15 working days	88%	78%	81%	83%	85%

Results are based on the total target population per year. The various invitation and age groups of the participants should be taken into account when interpreting the results.

- In 2018 the target population comprised more than 2.3 million people. This is an increase of 7.7% compared with 2017.
- In 2018, 14% more individuals were invited compared with 2017; 2,154,616 individuals received an invitation.
- Of all individuals who were invited in 2018, 757,775 men and 831,547 women participated in the colorectal cancer screening programme. The participation rate was 73%, similar to previous years.
- In 2018, 4.5% of the participants received an unfavourable FIT result. These individuals were referred for a colonoscopy. The referral rate in 2018 was lower compared with 2017.
- A relevant finding was found in 1.5% of the participants (colorectal cancer and/or advanced adenoma) in 2018.
- The waiting time for a colonoscopy intake interview was less than 15 business days in 74% of the participants. The waiting time slightly decreased compared with 2017.

12. INTERVAL CANCERS

Preliminary analyses showed that there were approximately 875 interval cancers in 2015. The sensitivity of the FIT test was around 84% in 2015. The sensitivity is similar compared with 2014 (85.5%).

Disclaimer: *the information in this monitor has been carefully compiled. This year a new way of data processing has been used. This could possibly lead to minor corrections in the results in the upcoming months.*

IKNL Netherlands comprehensive cancer organisation

IKNL is the quality institute for oncological and palliative research and practice. IKNL collaborates with healthcare professionals and managers and patients on the continuous improvement of oncological and palliative care.