

# Interval cancers after two rounds of population-based Fecal Immunochemical Test screening in Sweden with gender-specific cut-off levels

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# Lower FIT cut-off levels in women in colorectal cancer screening?



- Lower sensitivity for colorectal cancer (CRC) and higher rate of interval CRC in women in Fecal Immunochemical (FIT) screening programs<sup>1-4</sup>
- Lower test sensitivity in women in the previous gFOBT screening in Stockholm-Gotland region, Sweden<sup>5</sup>



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# The Stockholm-Gotland screening program

- Guaiac-based (gFOBT) screening started in 2008
- Biennial invitation to all residents 60-69-year-olds (100% coverage)
- Positives are offered colonoscopy
- Since October 2015 FIT-screening with cut-off level  $40\mu\text{g/g}$  in women and  $80\mu\text{g/g}$  in men.
- Implemented throughout Sweden and gradually expanding to 74 year-olds.



# Interval cancers in the Stockholm-Gotland screening program

Aim: To evaluate interval cancers (IC) in two rounds of a gender-based screening program

Study cohort: all invited to screening October 2015 to September 2019  
(two screening rounds)

Two years of follow-up from last date of invitation

All CRCs were identified in the Swedish Colorectal Cancer Register (SCRCR)

# Outcome measures

- Interval cancer (IC) = CRC diagnosed after a negative FIT (FIT IC) or negative screening colonoscopy (Colonoscopy IC) or in those non-compliant to screening colonoscopy and before the next screening invitation.
- Test sensitivity = screening detected CRC (SD CRC) / (SD CRC + FIT IC)
- IC rate = number of total ICs per 10'000 FIT-negatives or negative screening colonoscopies
- IC incidence rate = IC rate per 100'000 person-years of follow-up
- The IC incidence rate was compared to the mean CRC incidence per 100'000 in different age and gender groups in 1998-2007.

# Test sensitivity in the Stockholm-Gotland screening program 2015-2019

- First round: 214'356 invited, 68.6% participated, 2.8% FIT positive
- Second round: 229'187 invited, 70.9% participated, 2.3% FIT positive

Age at invitation and gender	SD CRC 2015-2019 N	FIT IC 2015-2019	Test sensitivity 2015-2019 (95% CI)*
Women <65	107	46	0.70 (0.63-0.77)
Women ≥65	97	52	0.65 (0.57-0.73)
Men <65	139	67	0.67 (0.61-0.74)
Men ≥65	107	74	0.59 (0.52-0.66)
All	450	239	0.65 (0.62-0.69)

\*) p-value >0.05 for difference in test sensitivity between all men and women and between participants <65 and ≥65 years of age

# IC rate in men and women in the Stockholm-Gotland screening program 2015-2019

Age at invitation and gender	IC rate 2015-2017 (95% CI)	IC rate 2017-2019 (95% CI)	IC rate 2015-2019 (95% CI)*
Women <65	4.5 (2.6-6.5)	5.9 (3.8-8.0)	5.2 (3.8-6.7)
Women ≥65	7.6 (4.6-10.6)	10.2 (6.7-13.7)	8.9 (6.6-11.2)
Men <65	8.6 (5.8-11.3)	9.0 (6.4-11.7)	8.8 (6.9-10.7)
Men ≥65	16.2 (12.3-20.0)	12.6 (8.5-16.8)	14.3 (11.2-17.5)
All	8.5 (7.0-9.9)	8.9 (7.4-10.3)	8.7 (7.6-9.7)

\*) p-value= 0.000092 for difference in IC rate between all men and women.

# IC incidence in relation to the background CRC incidence 2015-2019

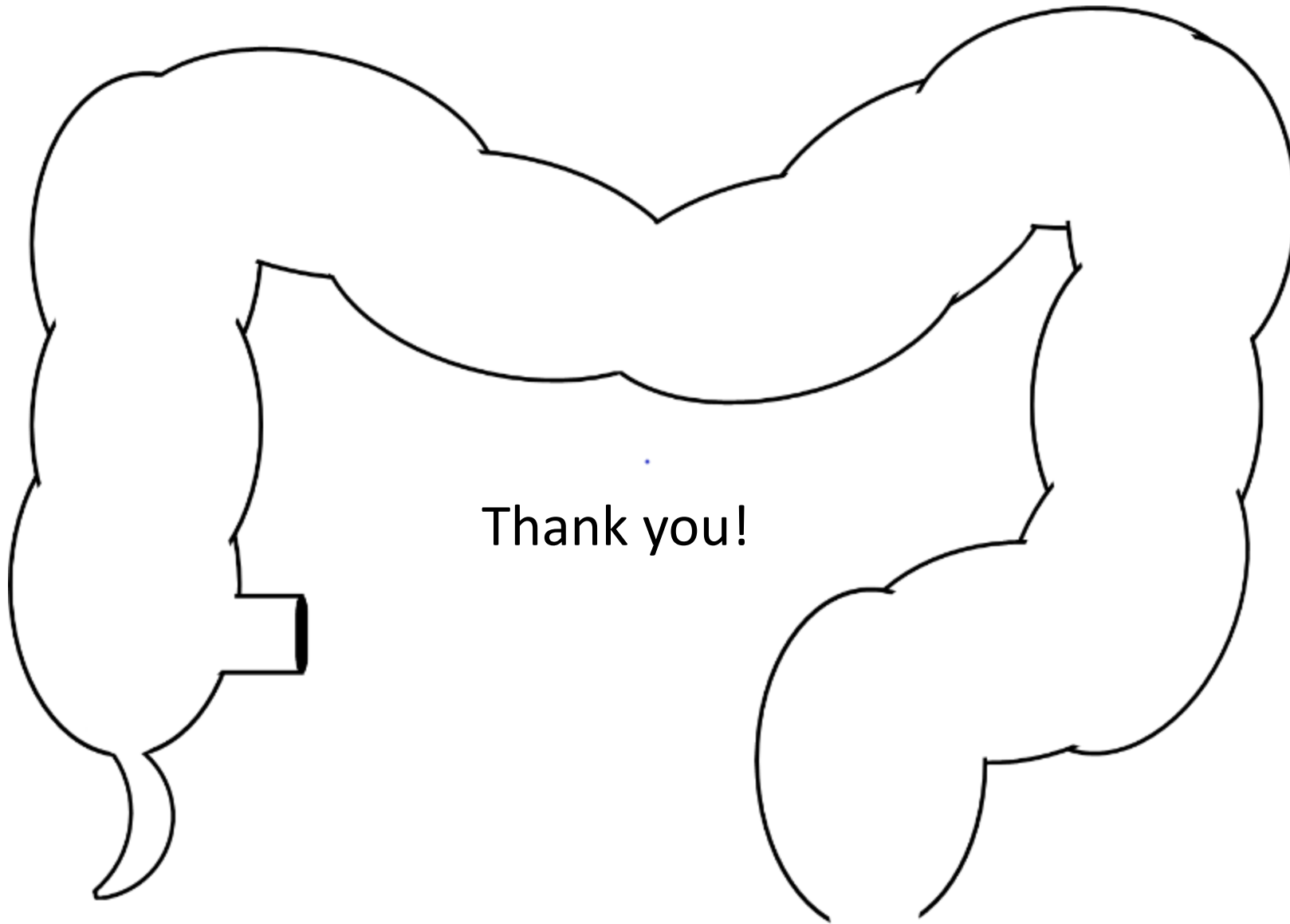
Age at invitation and gender	Background incidence per 100'000	Total ICs 2015-2019, N	Person-years of follow-up, 2015-2019	IC incidence rate 2015-2019 (95% CI)	Proportional IC incidence rate 2015-2019 (95% CI)
Women <65	78	52	198'171	26.2 (19.6-34.4)	0.34 (0.23-0.48)
Women ≥65	132	57	127'974	44.5 (33.7-57.7)	0.34 (0.24-0.46)
Men <65	124	80	181'640	44.0 (34.9-54.8)	0.36 (0.26-0.47)
Men ≥65	198	79	110'125	71.7 (56.8-89.4)	0.36 (0.28-0.47)

Background incidence= mean CRC incidence in Stockholm-Gotland region for the years 1998-2007 in different age and gender groups per 100 000. IC incidence rate= number of ICs among FIT negatives or FIT positives with negative or no colonoscopy per 100 000 person-years of follow-up. Proportional IC incidence rate= IC incidence rate/background incidence.



# Conclusion

- Over two screening rounds the in the Stockholm-Gotland screening program
- The IC rate was lower in women than in men
- The IC incidence relative to the background CRC incidence was similar in men and women
- No significant difference in test sensitivity between men and women
- Our results support the continued use of a gender-specific screening strategy, but further evaluations by screening rounds are required.



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