

## Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Kaminski MF, Regula J, Kraszewska E, et al. Quality indicators for colonoscopy and the risk of interval cancer. *N Engl J Med* 2010;362:1795-803.

Supplementary Table 1. Characteristics of interval colorectal cancers and affected individuals.

<b>Case No*</b>	<b>Sex</b>	<b>Age - yr†</b>	<b>Family history of CRC</b>	<b>Screening colonoscopy findingsP‡</b>	<b>Extent of examination</b>	<b>Interval CRC localization</b>	<b>Interval CRC pathology; ICD-O§</b>	<b>Time from screening endoscopy - yr</b>	<b>Scheduled time of surveillance - yr</b>
1	M	55	None	Normal	Complete	Sigmoid colon	82113	0.5	10
2	F	57	None	Normal	Complete	Cecum	81403	0.6	10
3	M	62	None	ATV, HGD, < 10mm, Rectum, Complete removal	Complete	Colon, not specified	82113	0.6	3
4	F	57	None	Diverticuli, Sigmoid colon	Complete	Cecum	82303	0.8	10
5	F	59	None	HP, Sigmoid colon	Complete	Sigmoid colon	81403	0.9	10
6	F	63	None	Normal	Complete	Rectum	81403	1.0	10
7	F	61	None	Normal	Complete	Sigmoid colon	82113	1.0	10
8	F	56	None	Normal	Complete	Recto-sigmoid junction	81403	1.2	10
9	M	51	None	ATV, LGD, <10mm, Descending colon;	Complete	Rectum	81403	1.2	3

				Two AT, LGD, <10mm , Sigmoid colon; ATV, LGD, ≥10mm, Rectum, Completeness of removal not assessed					
10	M	62	None	Normal	Complete	Descending colon	81403	1.5	10
11	M	59	None	Normal	Complete	Rectum	81403	1.5	10
12	F	52	None	Normal	Complete	Sigmoid colon	81403	1.5	10
13	F	53	None	Normal	Complete	Sigmoid colon	82113	1.6	10
14	M	63	None	Normal	Incomplete; Transverse	Rectum	81403	1.8	5 <sup>¶</sup>
15	F	53	None	Normal	Incomplete; Ascending	Rectum	82113	1.9	5
16	F	52	None	Normal	Complete	Hepatic flexure	81403	1.9	10
17	F	51	None	Normal	Complete	Colon, not specified	81403	2.1	10
18	F	65	None	Diverticuli, Sigmoid colon	Incomplete; Splenic flexure	Rectum	81403	2.1	5
19	F	65	None	Polyp, <5mm, not retrieved,	Complete	Rectum	81403	2.2	10

				Ascending colon					
20	F	61	None	Normal	Complete	Sigmoid colon	81403	2.2	10
21	M	65	None	Normal	Complete	Rectum	81403	2.4	10
22	F	61	None	HP, Sigmoid colon	Complete	Sigmoid colon	81403	2.5	10
23	F	62	None	Diverticuli, Descending colon	Complete	Rectum	84803	2.5	10
24	F	52	None	Normal	Complete	Cecum	84803	2.6	10
25	M	58	First degree relative >60 yr	Two AT, LGD <5mm, Ascending colon, Rectum, Complete removal	Complete	Hepatic flexure	81403	2.7	5
26	M	53	None	Diverticuli Sigmoid colon	Complete	Not specified	81403	2.7	10
27	M	51	None	Two polyps, < 5mm, not retrieved, Rectum	Complete	Hepatic flexure	82113	2.7	10
28	F	63	First degree relative >60 yr	Normal	Complete	Colon, not specified	82113	2.8	5
29	M	50	First degree relative <60 yr	Diverticuli Sigmoid colon	Complete	Ascending colon	81403	2.9	5

30	F	64	None	Diverticuli, Sigmoid colon	Complete	Hepatic flexure	81403	3.1	10
31	M	53	None	Diverticuli, Sigmoid colon	Complete	Rectum	82113	3.2	10
32	F	60	First degree relative <60 yr	Normal	Incomplete, Descending/ Sigmoid	Rectum	81403	3.3	5
33	F	64	None	Non specific colitis, Sigmoid colon	Complete	Sigmoid colon	84803	3.4	10
34	F	65	None	Normal	Complete	Cecum	81403	4.1	10
35	M	53	None	Normal	Complete	Sigmoid colon	82113	4.4	10
36	M	62	None	Normal	Incomplete; Transverse	Rectum	81403	4.4	5
37	M	46	None	Normal	Complete	Ascending colon	81403	4.4	10
38	M	62	First degree relative >60 yr	Diverticuli, Descending colon	Complete	Rectum	81403	4.4	5
39	F	55	First degree relative <60 yr	Normal	Complete	Rectum	81403	4.4	5
40	F	55	None	Normal	Complete	Rectum	82113	4.5	10

41	F	59	First degree relative >60 yr	HP, Sigmoid colon and rectum	Complete	Not specified	84803	4.7	5
42	M	66	None	Normal	Complete	Ascending colon	81403	4.7	10

\*Cases are listed in the order of increasing time from screening colonoscopy.

†Age at screening examination.

‡ Following abbreviations were used for the endoscopy findings: AT – tubular adenoma, ATV – tubulovillous adenoma, HP – hyperplastic polyp, LGD – low grade dysplasia, HGD – high grade dysplasia.

§82113 – tubular adenocarcinoma; 81403 – adenocarcinoma, not otherwise specified; 84803 – mucinous adenocarcinoma; 82303 – solid carcinoma, not otherwise specified<sup>17</sup>

¶ With normal endoscopy findings screening at 5 years was indicated when examination was limited to the left colon.

□ Patient with no family history of colorectal cancer (CRC), but screened below the age of 50 years.

Supplementary Table 2. Risk factors for interval colorectal cancer occurrence in the secondary analysis population\*

<b>Covariates in the model for interval cancer occurrence</b>	<b>Number of participants</b>	<b>Number of interval cancers</b>	<b>P value (LR test)†</b>	<b>Hazard Ratio [95% CI]</b>	<b>P value</b>
Screenee's age – yr			<0.001		
40 – 49	6,981	1		1	
50 – 54	15,649	13		6.91 [0.87, 55.22]	0.07
55 – 59	13,777	11		6.84 [0.84, 55.59]	0.07
60 – 66	12,551	23		15.72 [2.02, 122.63]	0.009
Screenee's family history of CRC			0.78		
No family history	38,698	40			
Two first-degree relatives with CRC	444	1			
One first-degree relative <60 yr of age with CRC	2,615	2			

One first-degree relative $\geq 60$ yr of age with CRC	7,201	5			
Sex of screene			0.55		
Female	31,490	29			
Male	17,468	19			
Endoscopist's adjusted cecal intubation rate			0.45		
<85%	7,358	9			
85% – 89.9%	7,210	11			
90% – 92.9%	7,824	8			
93% – 94.9%	4,313	2			
95% – 100%	22,253	18			
Endoscopist's adenoma detection rate			0.06‡		

≥20%	10,716	4		1	
15% – 19.9%	7,080	7		3.81 [1.08, 13.45]	0.04
11% – 14.9%	13,920	14		3.86 [1.20, 12.39]	0.02
<11%	17,242	23		3.43 [1.05, 11.24]	0.04
Age of endoscopist – yr			0.05		
≤39	18,958	13		1	
40 – 49	24,989	24		1.65 [0.80, 3.40]	0.17
≥50	5,011	11		3.26 [1.29, 8.24]	0.01
Sex of endoscopist			0.08		
Female	8,454	12			
Male	40,504	36			

Specialization of endoscopists			0.72		
Gastroenterology	18,632	17			
Internal medicine or no specialty	14,220	14			
Surgery (any kind)	16,106	17			

\* The secondary analysis did not exclude participants with inadequate bowel preparation. Moreover, ‘interval cancer’ was re-defined to include cancers occurring in bowel segments that were not evaluated during the screening colonoscopy. The secondary analysis population consisted of 48,958 participants followed in cancer registers for a median of 52.3 months (interquartile range, 41.4 to 60.0 months) for the occurrence of interval cancer. Over the follow-up period of 205,745 person years, a total of 48 interval colorectal cancers were identified. Of the six additional interval cancers as compared to primary population analysis, two occurred in participants with inadequately prepared colons and four in participants with incomplete examinations.

† The likelihood ratio test for models with and without the specified covariate

‡ Although significant at a border level, we decided to present the hazard ratio, because the factor was significant in the primary analysis