COMPETENZA DEL’ENDOSCOPISTA

E CANCRO POST-COLONSCOPIA

NEI PROGRAMMI ORGANIZZATI

BACKGROUND

- CRC screening programs based on Fecal Immunochemical Testing (FIT) are highly effective in reducing CRC incidence and mortality
- ADR is inversely correlated to post-colonoscopy CRC
  - Opportunistic colonoscopy setting
  - Primary screening colonoscopy setting

Kaminski et al. NEJM 2010
Corley et al. NEJM 2014
Zorzi et al. Gut 2015
Senore et al. Gut 2019

BACKGROUND

- Post FIT+ colonoscopy:
  - Advanced adenomas are 5 times more prevalent
  - CRC is 30 times more prevalent

- Role of (A-)ADR in FIT+ programs is still unexplored
- High rate of ADR variability in FIT+ programs has been reported
- High rate of complete polypectomy variability

Quintero et al. NEJM 2014
Zorzi et al. Gut 2015
Alsayid et al. Clin Gas Hepatol 2018
Pohl et al. Gastroenterology 2013

AIMS

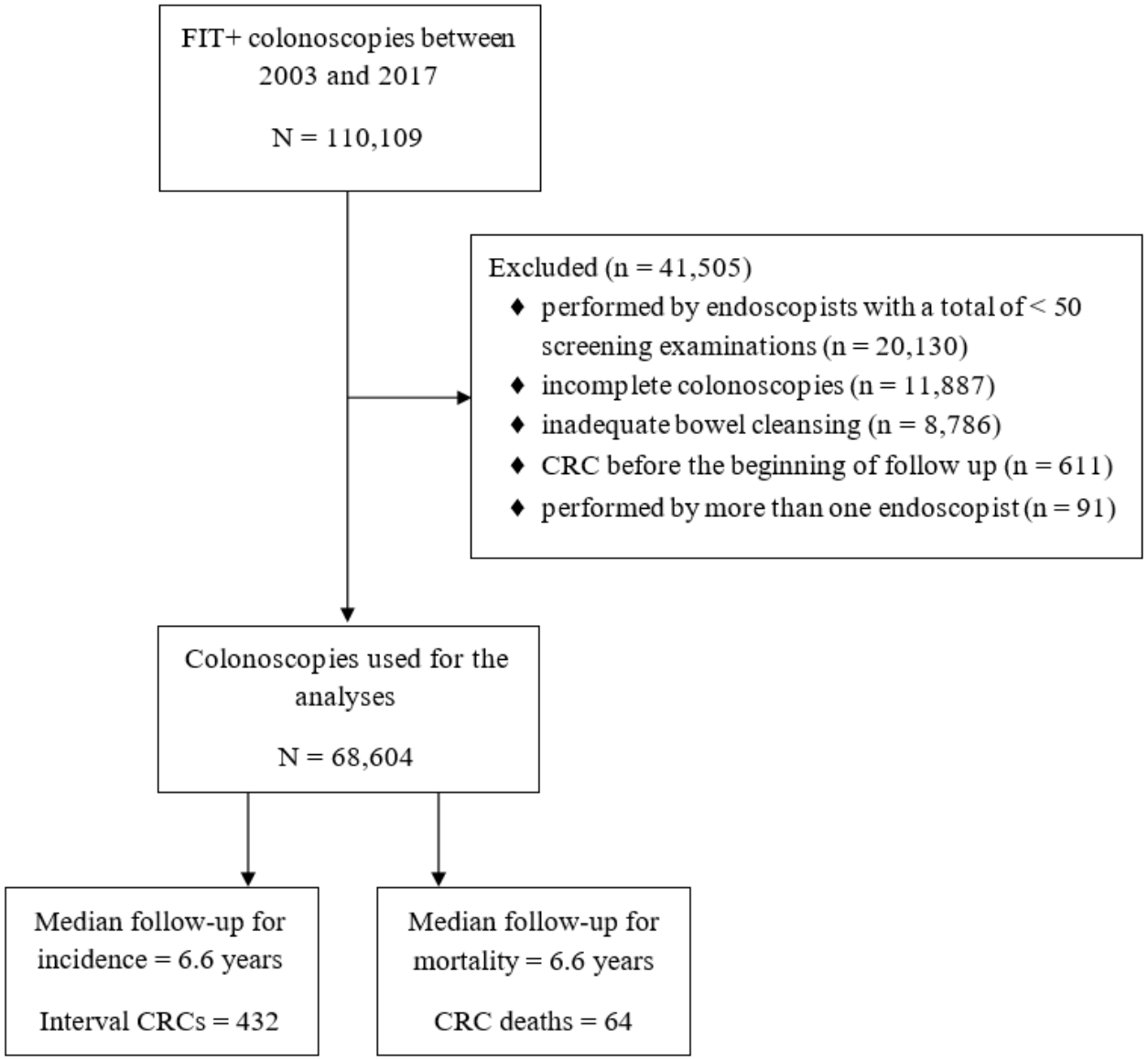
- Assess, in the setting of a FIT+ screening program, the influence of single endoscopist ADR on:
  - Post-colonoscopy CRC Incidence
  - Post-colonoscopy CRC Mortality
  - Distribution of PCCRC to be related to incomplete resection (WEO definition) across different ADR groups

Rutter et al. Gastroenterology 2018

METHODS

- Analysis of the Veneto Region (population: 4.8m) screening program:
  - 50-69 y old undergo FIT every 2 years →if positive→colonoscopy
  - **Included all FIT+ subjects from 2003 to 2017**, f-up to CRC diagnosis, death, last visit
  - Linked with Endoscopic databases, Tumor Databases, Pathology Records, Hospital discharge records and Mortality Registry
  - All colonoscopies linked to individual endoscopists, classified according to year specific ADR in **5 Quintiles**
  - **3 categories of PCCRC**: 6-11/12-35 and >36 months from index colonoscopy

RESULTS


FIT+ colonoscopies between 2003 and 2017
N = 110,109
Excluded (n = 41,505)
performed by endoscopists with a total of < 50 screening examinations (n = 20,130)
incomplete colonoscopies (n = 11,887)
inadequate bowel cleansing (n = 8,786)
CRC before the beginning of follow up (n = 611)
performed by more than one endoscopist (n = 91)
Colonoscopies used for the analyses
N = 68,604
Median follow-up for incidence = 6.6 years
Interval CRCs = 432
Median follow-up for mortality = 6.6 years
CRC deaths = 64

RESULTS

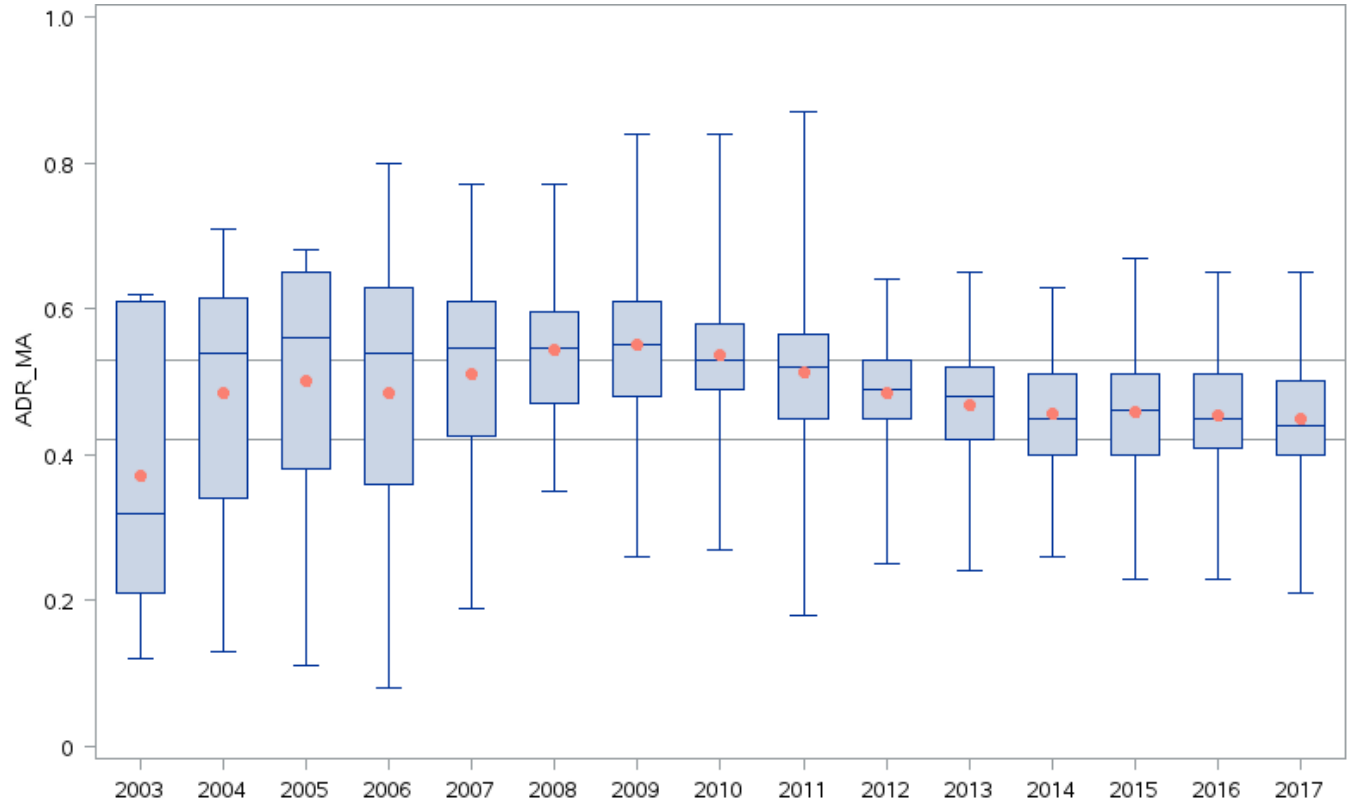
Patient Characteristics	Value
Study patients	
Total	68,604
Age at colonoscopy – years (mean, SD)	59.8 (5.97)
Age at colonoscopy (years) **50-59** **60-70**	 32,226 (47.0%) 36,378 (53.0%)
Sex **Male** **Female**	 39,421 (57.5%) 29,183 (42.5%)

RESULTS

Study endoscopists characteristics	133
Number of endoscopies per year	
2003-2006	2,308 (3.4%)
2007-2010	12,340 (18.0%)
2011-2014	26,936 (39.3%)
2015-2017	27,020 (39.4%)
Mean value of ADR by ADR quintile (n. of colonoscopies)	
1st	35% (10,856)
2nd	44% (12,877)
3rd	49% (16,753)
4th	53% (15,866)
5th	61% (12,252)
Mean value of AADR by AADR quintile (n. of colonoscopies)	
1st	22% (10,641)
2nd	27% (13,111)
3rd	30% (18,355)
4th	32% (14,235)
5th	38% (12,262)

RESULTS

Distribution of endoscopists' Adenoma Detection Rate, per year.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
N	10	16	28	37	52	72	85	97	100	102	99	95	96	91	92
Min	0.12	0.13	0.11	0.08	0.19	0.35	0.26	0.27	0.18	0.25	0.24	0.26	0.23	0.23	0.21
Max	0.62	0.71	0.68	0.8	0.77	0.77	0.84	0.84	0.87	0.64	0.65	0.63	0.67	0.65	0.65
Q1	0.21	0.34	0.38	0.36	0.425	0.47	0.48	0.49	0.45	0.45	0.42	0.4	0.4	0.41	0.4
Q2	0.32	0.54	0.56	0.54	0.545	0.545	0.55	0.53	0.52	0.49	0.48	0.45	0.46	0.45	0.44
Q3	0.61	0.615	0.65	0.63	0.61	0.595	0.61	0.58	0.565	0.53	0.52	0.51	0.51	0.51	0.5

RESULTS

Follow up recommendations by Adenoma Detection Rate quintile, according to the result at the index colonoscopy

Index colonoscopy	High risk adenoma						
ADR quintile	FIT N (%)	1-year colonoscopy N (%)	2-year colonoscopy N (%)	3-year colonoscopy N (%)	5-year colonoscopy N (%)	Exit screening N (%)	Missing N (%)
1	21 (1.1)	431 (22.3)	37 (1.9)	1,259 (65.1)	182 (9.4)	3 (0.2)	2 (0.1)
2	38 (1.3)	840 (27.8)	130 (4.3)	1,659 (54.9)	183 (6.1)	168 (5.6)	6 (0.2)
3	70 (1.7)	974 (23.5)	92 (2.2)	2,260 (54.5)	303 (7.3)	426 (10.3)	19 (0.5)
4	62 (1.3)	1,085 (22.7)	95 (2.0)	2,292 (47.8)	220 (4.6)	994 (20.8)	43 (0.9)
5	40 (0.9)	1,299 (30.4)	58 (1.4)	2,202 (51.6)	317 (7.4)	337 (7.9)	17 (0.4)
Index colonoscopy	Low risk adenoma						
ADR quintile	FIT	1-year colonoscopy	2-year colonoscopy	3-year colonoscopy	5-year colonoscopy	Exit screening	Missing
1	290 (14.5)	114 (5.7)	26 (1.3)	418 (20.9)	1,115 (55.8)	35 (1.8)	2 (0.1)
2	433 (14.5)	177 (5.9)	63 (2.1)	589 (19.7)	1,576 (52.8)	143 (4.8)	4 (0.1)
3	717 (17.8)	318 (7.9)	107 (2.7)	633 (15.8)	1,889 (47.0)	341 (8.5)	13 (0.3)
4	781 (18.4)	281 (6.6)	42 (1.0)	592 (13.9)	1,835 (43.2)	690 (16.3)	26 (0.6)
5	559 (15.4)	259 (7.1)	24 (0.7)	565 (15.5)	2,008 (55.2)	216 (5.9)	8 (0.2)
Index colonoscopy	Negative						
ADR quintile	FIT	1-year colonoscopy	2-year colonoscopy	3-year colonoscopy	5-year colonoscopy	Exit screening	Missing
1	5,245 (75.8)	149 (2.2)	14 (0.2)	366 (5.3)	3 (14.8)	102 (1.5)	18 (0.3)
2	5,019 (73.1)	135 (2.0)	19 (0.3)	427 (6.2)	1,103 (16.1)	157 (2.3)	8 (0.1)
3	6,487 (75.5)	129 (1.5)	18 (0.2)	599 (7.0)	1,202 (13.9)	138 (1.6)	18 (0.2)
4	5,410 (79.2)	111 (1.6)	12 (0.2)	411 (6.0)	766 (11.2)	101 (1.5)	17 (0.3)
5	3,272 (75.3)	83 (1.9)	8 (0.2)	258 (5.9)	621 (14.3)	93 (2.1)	10 (0.2)

RESULTS

Characteristics of PCCRC	PCCRC N=432
Age at colonoscopy (years)	
50-59	145 (33.6%)
60-70	287 (66.4%)
Sex	
Male	274 (63.4%)
Female	158 (36.6%)
Time from index colonoscopy	
6-11 months	7 (1.6%)
12-35 months	115 (26.6%)
≥ 36 months	310 (71.8%)
Screen Detected	
Yes	62 (21.4%)
No	227 (78.6%)
Site (available for 368/432 cancers)	
Right Colon	190 (51.6%)
Left Colon	86 (23.4%)
Rectum	92 (25.0%)
Deceased	
Total	64
Male	42 (65.6%)
Female	22 (34.4%)

RESULTS

CCR location by Adenoma Detection Rate quintile (available for 368 CRCs)

ADR Quintile	CRC Location N (%)			
	Right	Left	Rectum	Total
1	33 (46.5)	24 (33.8)	14 (19.7)	71
2	44 (60.3)	14 (19.2)	15 (20.6)	73
3	47 (51.1)	19 (20.6)	26 (28.3)	92
4	44 (51.8)	21 (24.7)	20 (23.5)	85
5	22 (46.8)	8 (17.0)	17 (36.2)	47
All	190 (51.6)	86 (23.4)	92 (25.0)	368

RESULTS

Unadjusted risk of CRC incidence and mortality at follow up, by Adenoma Detection Rate Quintile

Follow up for CRC incidence			
ADR Quintile	Number of CRC cases	Years of Follow Up	Unadjusted risk per 10,000 person/years
1	82	72327.8	11.3
2	86	96539.3	8.9
3	101	120111.9	8.4
4	107	114379.1	9.4
5	56	87669.0	6.4
Follow up for mortality due to CRC			
ADR Quintile	Number of CRC deaths	Years of Follow Up	Unadjusted risk per 10,000 person/years
1	11	72589.5	1.5
2	9	96880.2	0.9
3	14	120436.6	1.2
4	20	114790.0	1.7
5	10	87900.8	1.1

RESULTS

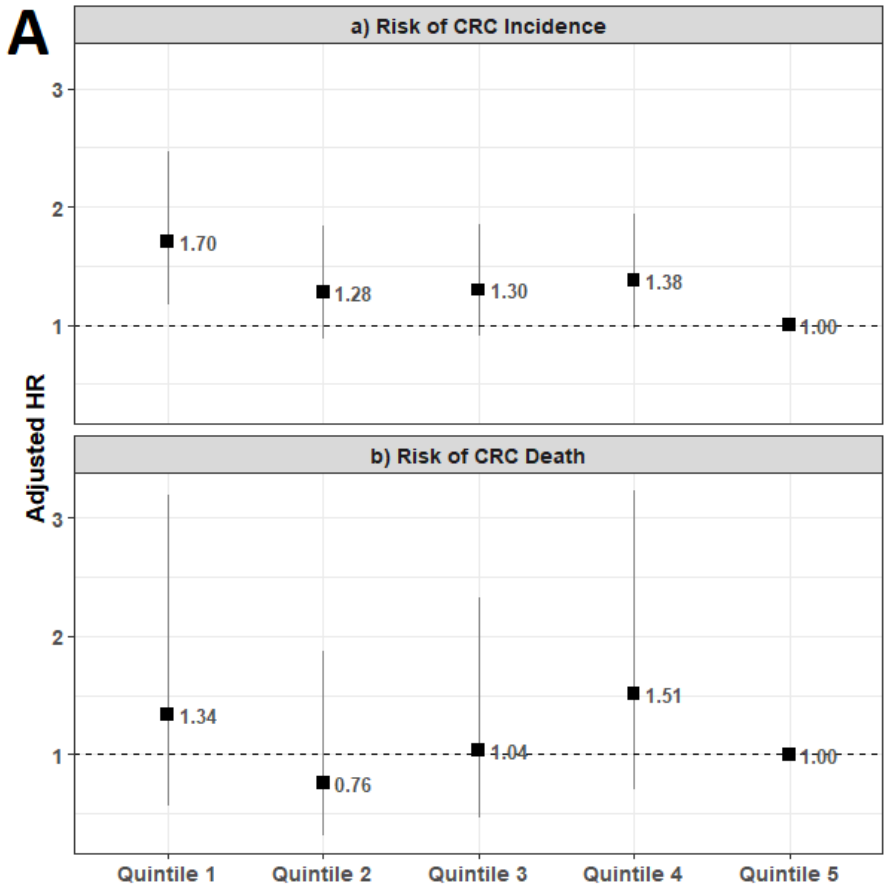
CRC INCIDENCE		
Variable	Hazard Ratio	95% Confidence Interval
Sex		
Female	1.00	–
Male	1.29	1.06 – 1.55
Age (years)		
50-59	1.00	–
60-70	1.76	1.44 – 2.15
ADR quintile		
1st	**1.70**	**1.18 – 2.46**
2nd	1.28	0.89 – 1.84
3rd	1.30	0.91 – 1.85
4th	1.38	0.98 – 1.94
5th	1.00	–
AADR quintile		
1st	1.11	0.78 – 1.58
2nd	1.13	0.81 – 1.59
3rd	0.89	0.65 – 1.23
4th	1.12	0.81 – 1.54
5th	1.00	–

RESULTS

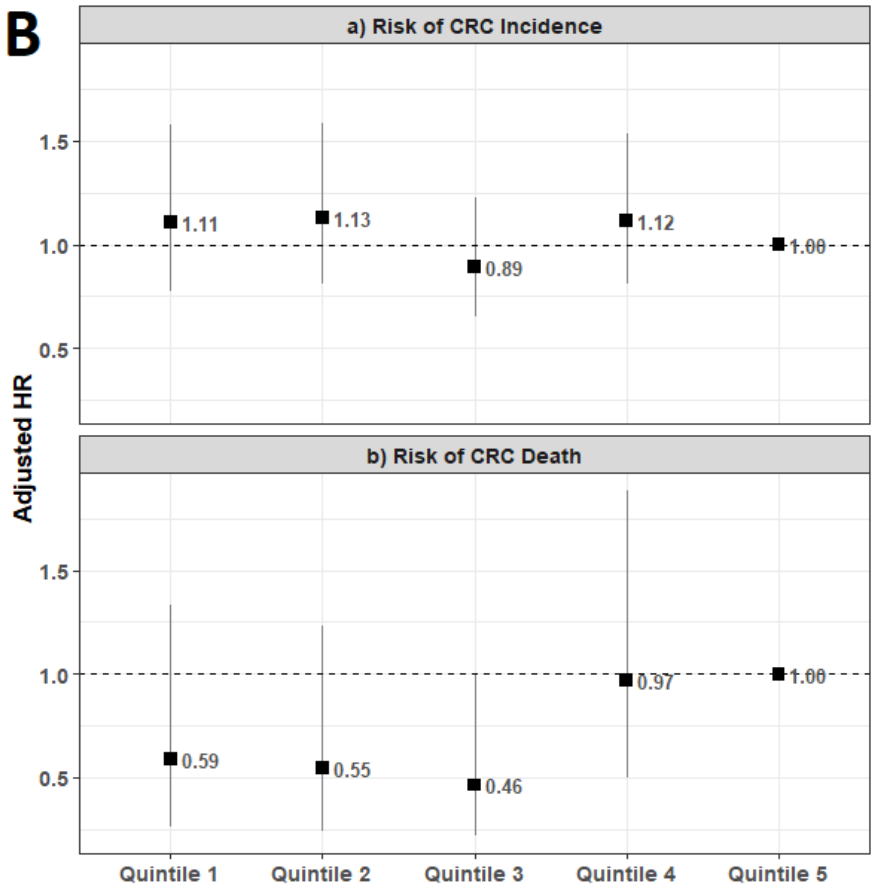
Death from CRC		
Variable	Hazard Ratio	95% Confidence Interval
Sex		
Female	1.00	–
Male	1.43	0.85 – 2.39
Age (years)		
50-59	1.00	–
60-70	1.57	0.94 – 2.62
ADR quintile		
1st	1.34	0.56 – 3.19
2nd	0.76	0.31 – 1.88
3rd	1.04	0.46 – 2.33
4th	1.51	0.71 – 3.23
5th	1.00	–
AADR quintile		
1st	0.59	0.26 – 1.33
2nd	0.55	0.24 – 1.23
3rd	0.46	0.22 – 0.99
4th	0.97	0.50 – 1.89
5th	1.00	–

RESULTS

ADR

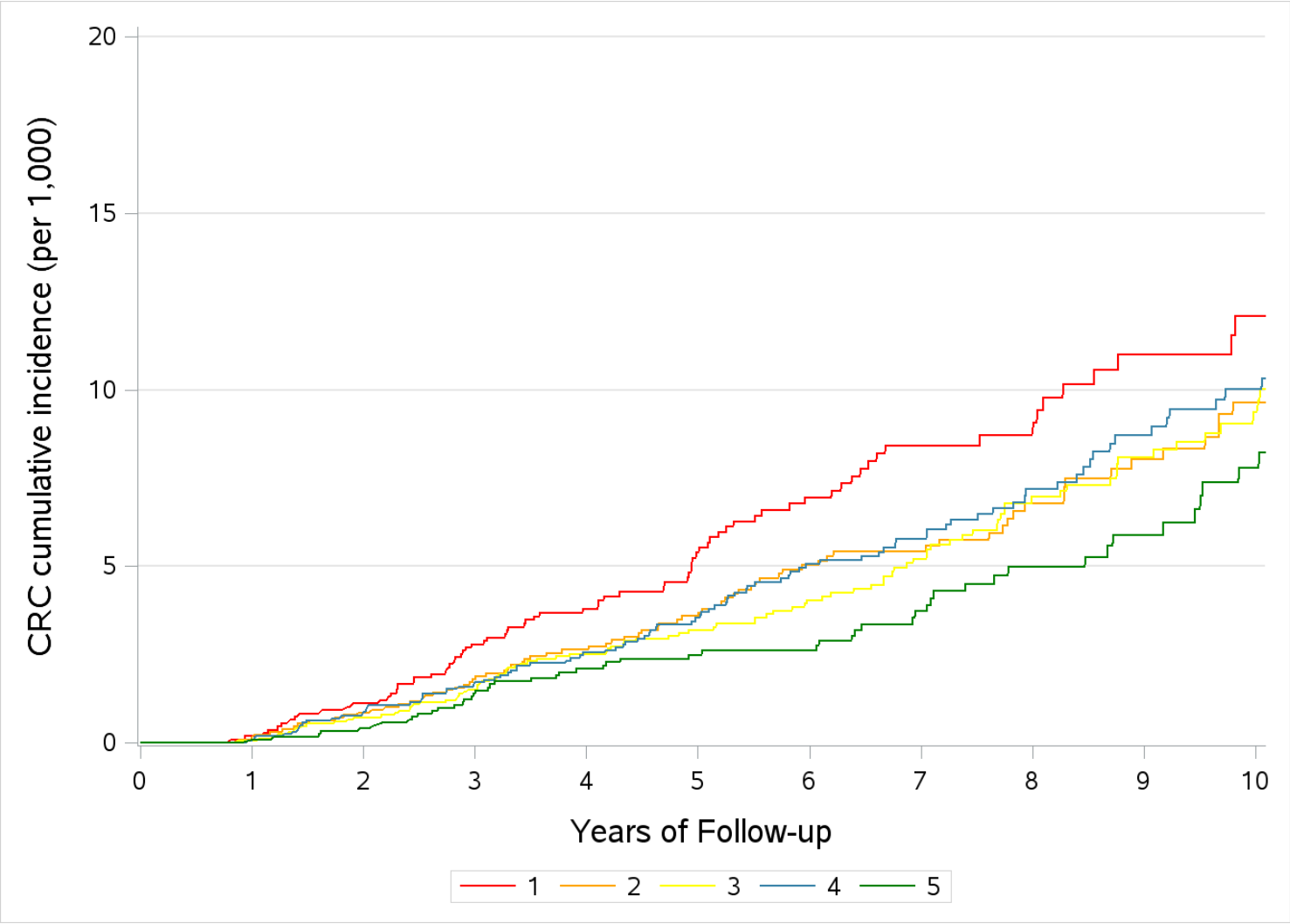


aADR



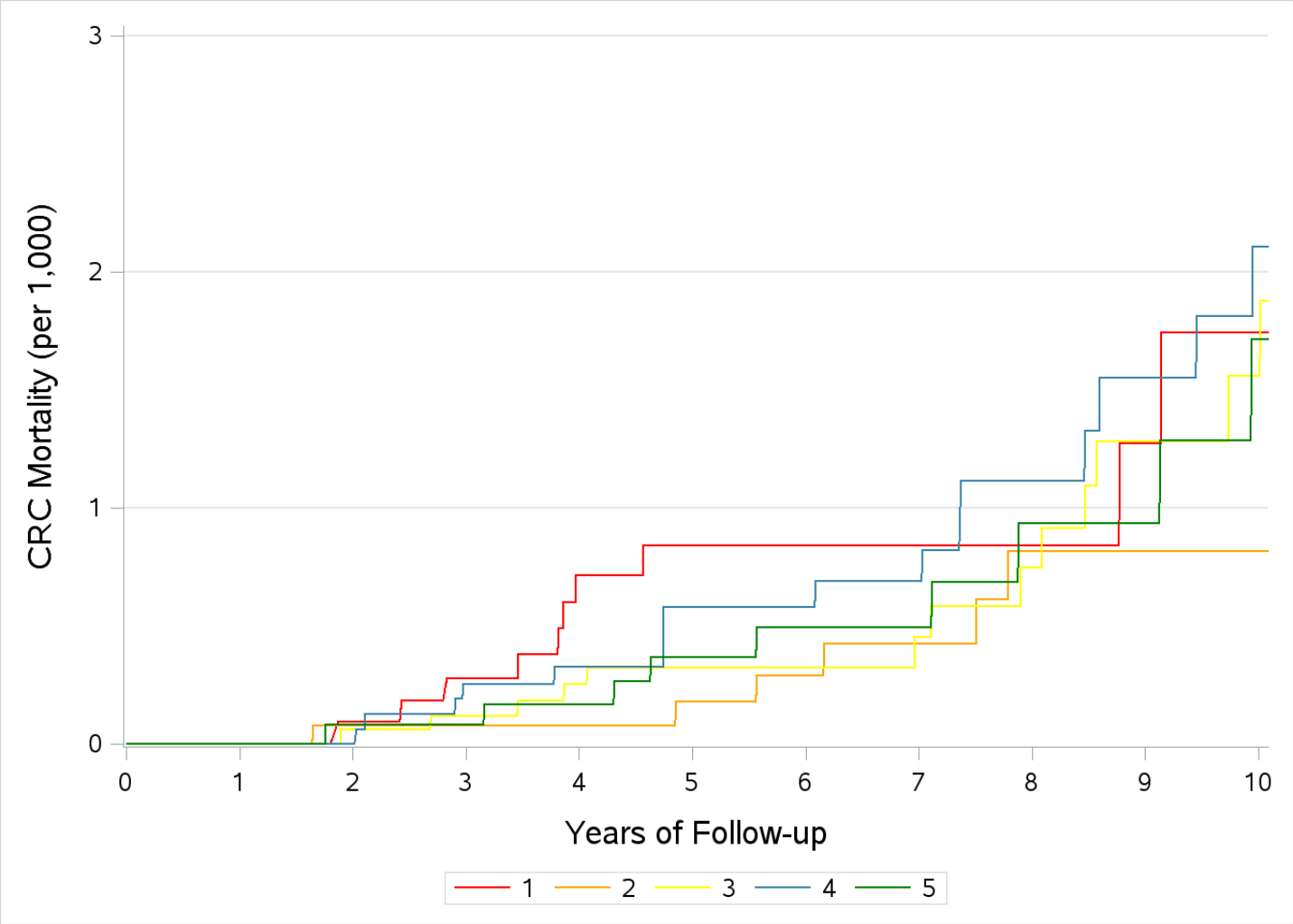
RESULTS

ADR and CRC Incidence



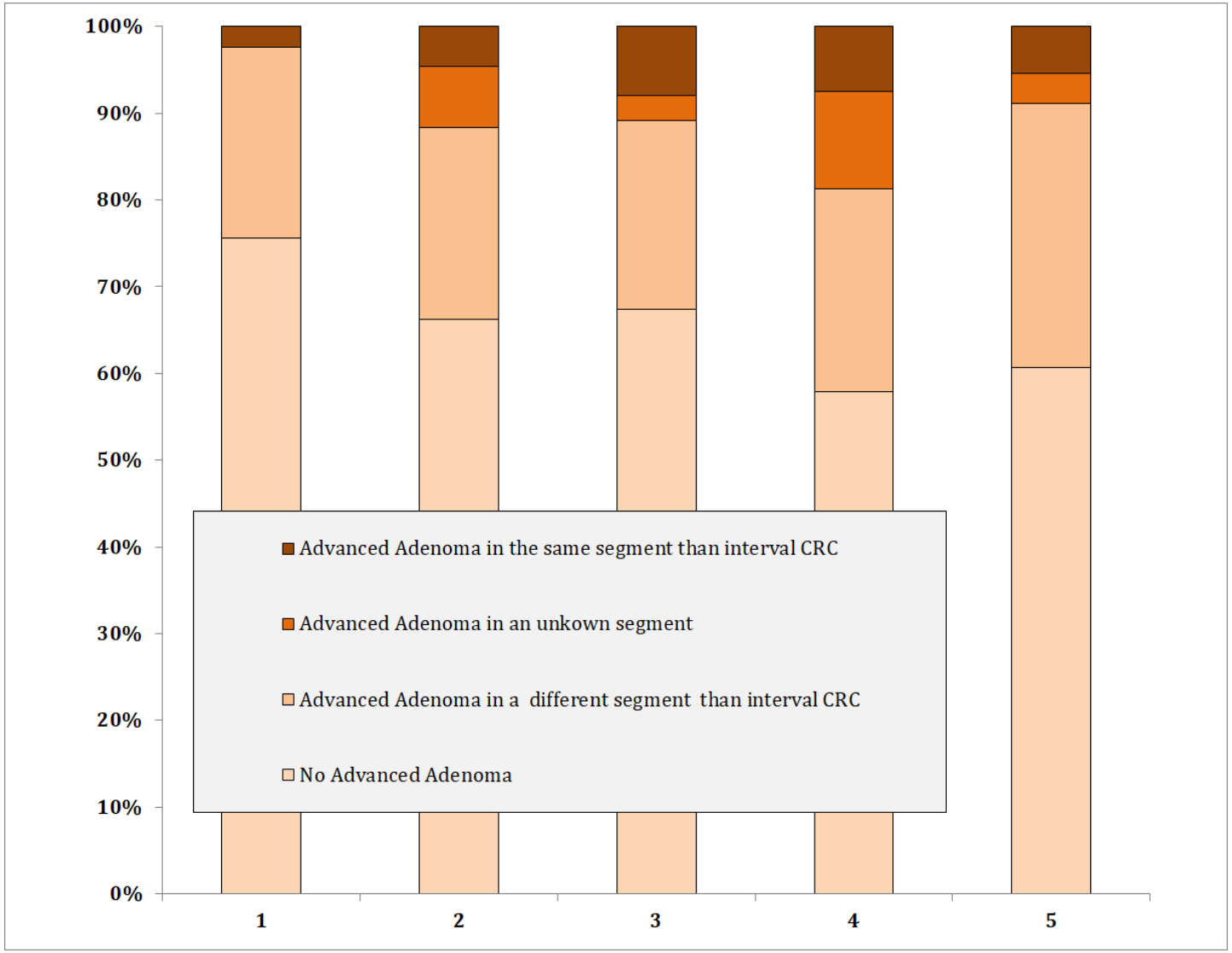
RESULTS

ADR and CRC Mortality



RESULTS

Previous adenoma resection by ADR Quintile



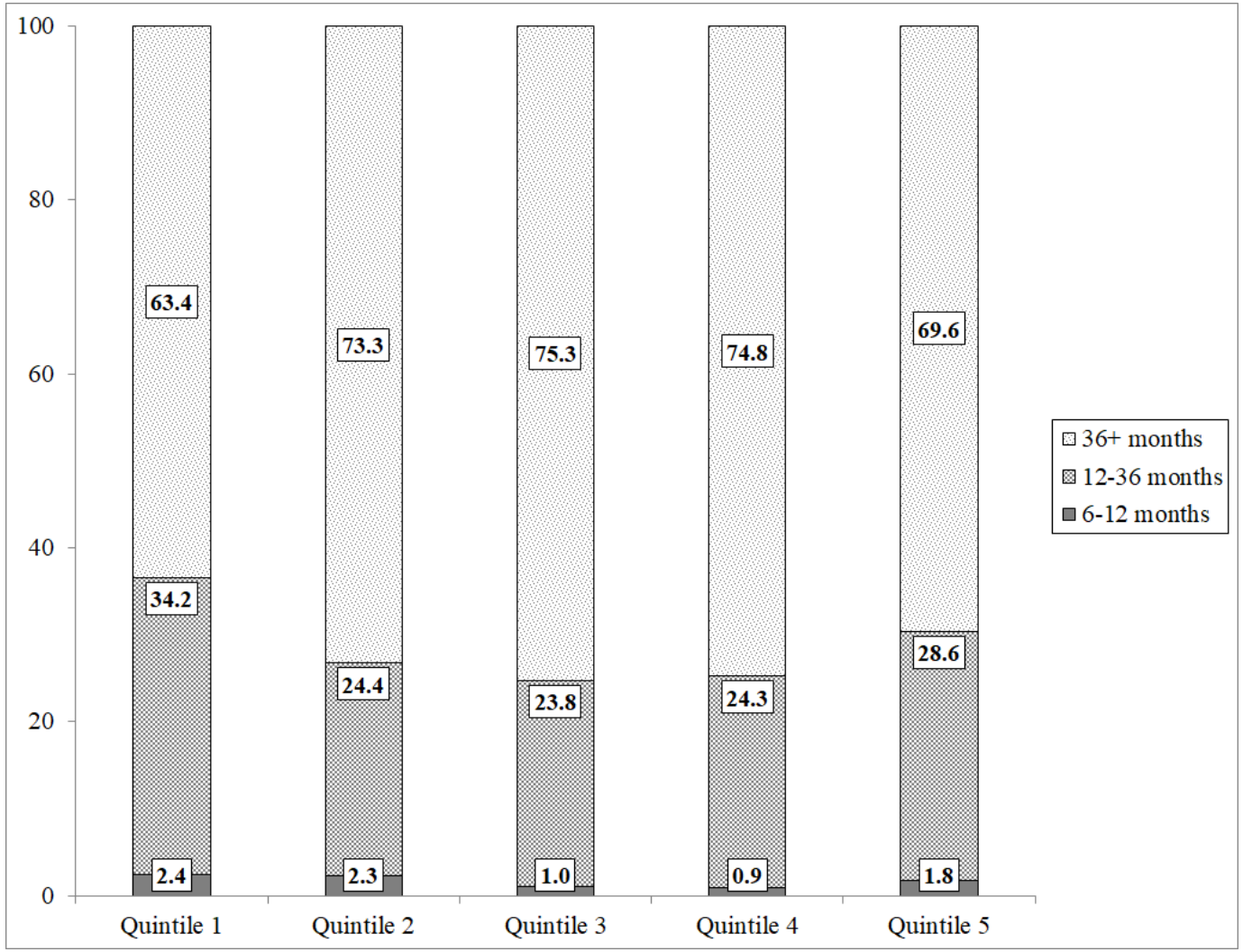
RESULTS

Previous adenoma resection by ADR Quintile

Quintile of endoscopists according to ADR	Findings at FIT+ colonoscopy				Total PCCRC N (%)
	No Advanced Adenoma N (%)	Advanced Adenoma in a different segment than PCCRC N (%)	Advanced Adenoma in an unkown segment N (%)	Advanced Adenoma in the same segment than PCCRC N (%)	
1	62 (75.6)	8 (21.9)	.	2 (2.4)	82 (100)
2	57 (66.2)	11 (22.1)	6 (7.0)	4 (4.5)	86 (100)
3	68 (67.3)	13 (21.8)	3 (3.0)	8 (7.9)	101 (100)
4	62 (57.9)	12 (23.4)	12 (11.2)	8 (7.5)	107 (100)
5	34 (60.7)	12 (30.4)	2 (3.6)	3 (5.4)	56 (100)
Total	283 (65.5)	56 (23.4)	23 (5.3)	25 (5.8)	432 (100)

RESULTS

Time to diagnosis by ADR Quintile



CONCLUSIONS

- In FIT+ screening programs → ADR is associated to CRC incidence risk
- Individual ADR must be monitored for each endoscopist within FIT programs
- Endoscopists with low ADR (<35%) in FIT programs should be retrained with specific courses.
- Lowest ADR quintile → mean ADR 35% → ADR Correction in FIT

Kaminski et al. NEJM 2010
Corley et al. NEJM 2014
Cubiella et al. UEG Journal 2017

CONCLUSIONS

- AADR is not associated → easy to detect? Not a reliable competence ass.
- Incomplete resection unrelated to PCCRC (ADR ≠ polypectomy competence)
- Risk of PCCRC is similar to other studies

Kaminski et al. NEJM 2010
Corley et al. NEJM 2014
Cubiella et al. UEG Journal 2017