



Il sottoscritto LAURO BUCCHI

*ai sensi dell'art. 3.3 sul Conflitto di Interessi, pag. 17 del Reg. Applicativo
dell'Accordo Stato-Regione del 5 novembre 2009,*

dichiara

*X che negli ultimi due anni NON ha avuto rapporti diretti di
finanziamento con soggetti portatori di interessi commerciali in campo
sanitario*

☐ *che negli ultimi due anni ha avuto rapporti diretti di finanziamento
con i seguenti soggetti portatori di interessi commerciali in campo
sanitario:*



L'impatto sull'epidemiologia del tumore del colon-retto

GISCoR²²



Flavia Baldacchini, Orietta Giuliani, Lauro Bucchi, Orietta Giuliani, Silvia Mancini, Rosa Vattiato, Alessandra Ravaioli, Federica Zamagni, Fabio Falcini e Emilia-Romagna screening tumore colorettale Working Group

Registro tumori della Regione Emilia-Romagna, IRST, Meldola



How a faecal immunochemical test screening programme changes annual colorectal cancer incidence rates: an Italian intention-to-screen study

Lauro Bucchi¹, Silvia Mancini¹✉, Flavia Baldacchini¹, Alessandra Ravaoli¹, Orietta Giuliani¹, Rosa Vattiato¹, Federica Zamagni¹, Paolo Giorgi Rossi², Cinzia Campari³, Debora Canuti⁴, Enza Di Felice⁵, Priscilla Sassoli de Bianchi⁵, Stefano Ferretti⁶, Nicoletta Bertozzi⁵, Annibale Biggeri⁷, Fabio Falcini^{1,8} and the Emilia-Romagna Region Workgroup for Colorectal Screening Evaluation*

British Journal of Cancer

Published online: 20 April 2022

**Incidenza di cancro colo-rettale nella popolazione-bersaglio:
osservata vs. attesa**



How a faecal immunochemical test screening programme changes annual colorectal cancer incidence rates: an Italian intention-to-screen study

Lauro Bucchi¹, Silvia Mancini^{1,2}, Flavia Baldacchini¹, Alessandra Ravaoli¹, Orietta Giuliani¹, Rosa Vattiato¹, Federica Zamagni¹, Paolo Giorgi Rossi², Cinzia Campari³, Debora Canuti⁴, Enza Di Felice⁵, Priscilla Sassoli de Bianchi⁵, Stefano Ferretti⁵, Nicoletta Bertozzi⁵, Annibale Biggeri⁷, Fabio Falcini^{1,8} and the Emilia-Romagna Region Workgroup for Colorectal Screening Evaluation*

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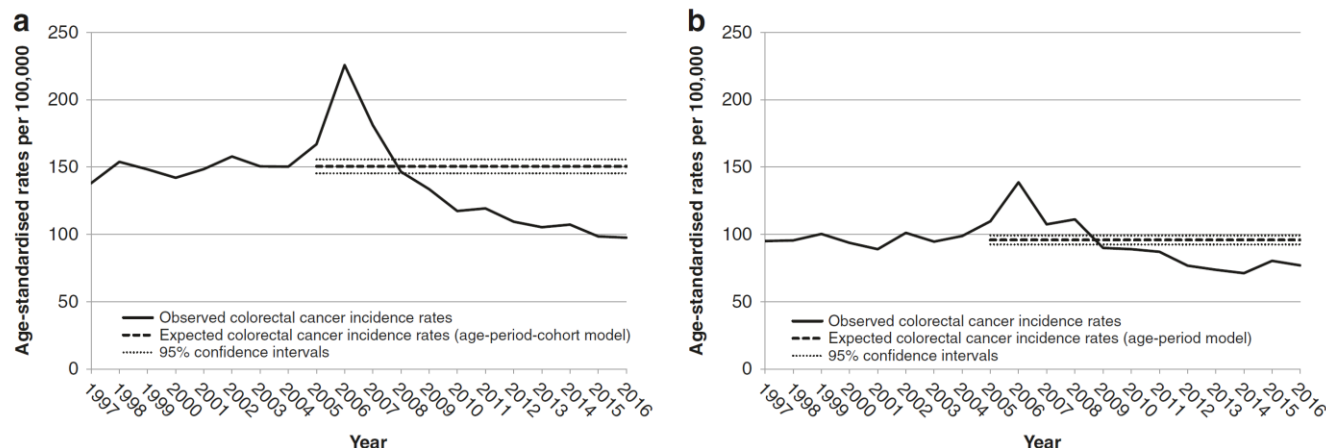


Fig. 1 Curves of observed and expected annual colorectal cancer incidence rates. The graphs show the curve of observed annual colorectal cancer incidence rates per 100,000 persons aged 50–69 years in 1997–2016 (bold line) and the curve of rates that would be expected in 2005–2016 in the absence of the organised faecal immunochemical test screening programme (dashed line) by sex (**a** men; **b** women). The dotted lines represent the 95% confidence bands around the expected annual rates. The expected annual rates were estimated by analysing the observed annual rates in 1997–2016 with an age-period-cohort model (men) and an age-period model (women). 2005 was the year of introduction of the screening programme. 2006 was the first full year of screening. All rates were age-standardised using the European standard population. Emilia-Romagna Region, Italy, 1997–2016.



How a faecal immunochemical test screening programme changes annual colorectal cancer incidence rates: an Italian intention-to-screen study

Lauro Bucchi¹, Silvia Mancini^{1,2}, Flavia Baldacchini¹, Alessandra Ravaoli¹, Orietta Giuliani¹, Rosa Vattiato¹, Federica Zamagni¹, Paolo Giorgi Rossi², Cinzia Campari³, Debora Canuti⁴, Enza Di Felice⁵, Priscilla Sassoli de Bianchi⁵, Stefano Ferretti⁶, Nicoletta Bertozzi⁵, Annibale Biggeri⁷, Fabio Falcini^{1,8} and the Emilia-Romagna Region Workgroup for Colorectal Screening Evaluation*

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Table 2. Ratio between the observed annual colorectal cancer incidence rates per 100,000 persons aged 50–69 years in 2005–2016 and the rates that would be expected in the absence of the organised FIT screening programme, and annual and cumulative number of prevented colorectal cancer cases, by sex.

Year ^a	Men			Women		
	Incidence rate ratio [95% CI]	Annual number prevented	Cumulative number prevented	Incidence rate ratio [95% CI]	Annual number prevented	Cumulative number prevented
2005	1.11 [1.06, 1.16]	–91	–91	1.18 [1.13, 1.22]	–97	–97
2006	1.52 [1.46, 1.59]	–427	–518	1.45 [1.40, 1.51]	–249	–346
2007	1.20 [1.15, 1.25]	–163	–681	1.11 [1.07, 1.15]	–62	–408
2008	0.97 [0.93, 1.01]	21	–660	1.16 [1.12, 1.20]	–70	–478
2009	0.88 [0.85, 0.92]	77	–583	0.93 [0.89, 0.96]	32	–446
2010	0.78 [0.75, 0.81]	146	–437	0.94 [0.90, 0.97]	28	–418
2011	0.80 [0.76, 0.83]	137	–300	0.91 [0.88, 0.94]	41	–377
2012	0.73 [0.70, 0.76]	185	–115	0.80 [0.77, 0.83]	90	–287
2013	0.70 [0.67, 0.73]	204	89	0.77 [0.74, 0.80]	108	–179
2014	0.71 [0.68, 0.74]	179	268	0.74 [0.71, 0.77]	108	–71
2015	0.65 [0.62, 0.68]	220	488	0.84 [0.81, 0.87]	69	–2
2016	0.65 [0.62, 0.67]	229	717	0.81 [0.78, 0.84]	85	83

Emilia-Romagna Region, Italy, 2005–2016.

FIT faecal immunochemical test, CI (bootstrap-estimated) confidence interval.

^a2005 was the year of introduction of the screening programme. 2006 was the first full year of screening. The annual incidence rates that would be expected in 2005–2016 in the absence of screening were estimated by analysing the observed annual rates in 1997–2016 with an age-period-cohort model for men and an age-period model for women, i.e. the models providing the best fit to the observed rates. In both models, the values of parameters of the non-linear period effect were set to zero. All rates were age-standardised using the European standard population.



How a faecal immunochemical test screening programme changes annual colorectal cancer incidence rates: an Italian intention-to-screen study

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2006	1.52 [1.46, 1.59]	–427	–518	1.45 [1.40, 1.51]	–249	–346
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2009	0.88 [0.85, 0.92]	77	–583	0.93 [0.89, 0.96]	32	–446
2010	0.78 [0.75, 0.81]	146	–437	0.94 [0.90, 0.97]	28	–418
2011	0.80 [0.76, 0.83]	137	–300	0.91 [0.88, 0.94]	41	–377
2012	0.73 [0.70, 0.76]	185	–115	0.80 [0.77, 0.83]	90	–287
2013		204	89		108	–179
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Effects of Attendance to an Organized Fecal Immunochemical Test Screening Program on the Risk of Colorectal Cancer: An Observational Cohort Study

Flavia Baldacchini,^{*} Lauro Bucchi,^{*} Orietta Giuliani,^{*} Silvia Mancini,^{*}
Alessandra Ravaoli,^{*} Rosa Vattiato,^{*} Federica Zamagni,^{*} Paolo Giorgi Rossi,[‡]
Lucia Mangone,[‡] Cinzia Campari,[§] Romano Sassatelli,^{||} Paolo Trande,[¶]
Pasqualina Esposito,[#] Federica Rossi,[#] Giuliano Carrozzi,^{**} Omero Triossi,^{‡‡,a}
Carlo Fabbri,^{§§} Enrico Strocchi,^{||||} Mauro Giovanardi,^{¶¶} Debora Canuti,^{##}
Priscilla Sassoli de Bianchi,^{##} Stefano Ferretti,^{***} and Fabio Falcini,^{*,†††} on behalf of
the Emilia-Romagna Region Workgroup for Colorectal Screening Evaluation

Clinical Gastroenterology and Hepatology 2022;

**Incidenza di, e mortalità da, cancro colo-rettale nelle persone aderenti vs.
le persone non aderenti**



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CRITERI DI INCLUSIONE:

- Persone residenti
- Senza una diagnosi di CCR precedente il primo invito
- Invitate tra il 2005 e il 2016
- Età al primo invito compresa tra i 50 e i 69 anni

ESPOSIZIONE:

Definita in base all'adesione **ai primi due inviti**

Aderenti: coloro che hanno risposto a tutti e due gli inviti

Non aderenti: coloro che non hanno risposto a nessuno dei due inviti

Per chi ha solo un invito, l'esposizione è valutata solo al primo invito



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Numerosità della coorte e follow-up per sesso, adesione ed età al primo invito

	Numero soggetti invitati (%)			Numero Aderenti (%)	Numero Non Aderenti (%)	Anni Follow up	
	Un invito	Due inviti	Totale			Mediana	p25-p75
Maschi							
50-54	39,739 (21.7)	143,349 (78.3)	183,088	89,166 (48.7)	93,922 (51.3)	6.1	2.9-9.7
55-59	1,994 (3.5)	54,600 (96.5)	56,594	30,453 (53.8)	26,141 (46.2)	10.2	9.6-10.7
60-64	2,196 (4.4)	47,178 (95.6)	49,374	27,694 (56.1)	21,680 (43.9)	10.2	9.5-10.8
65-69	27,078 (50.9)	26,147 (49.1)	53,225	28,817 (54.1)	24,408 (45.9)	10.4	9.5-11.1
Totale	71,007 (20.7)	271,274 (79.3)	342,281	176,130 (51.5)	166,151 (48.5)	9.5	4.9-10.5
Femmine							
50-54	39,494 (20.8)	150,665 (79.2)	190,159	103,310 (54.3)	86,849 (45.7)	6.1	2.9-9.8
55-59	2,076 (3.3)	60,461 (96.7)	62,537	37,300 (59.6)	25,237 (40.4)	10.2	9.7-10.8
60-64	1,815 (3.4)	51,914 (96.6)	53,729	31,644 (58.9)	22,085 (41.1)	10.3	9.5-10.9
65-69	29,718 (50.3)	29,327 (49.7)	59,045	32,267 (54.7)	26,778 (45.4)	10.7	9.6-11.2
Totale	73,103 (20.0)	292,367 (80.0)	365,470	204,521 (56.0)	160,949 (44.0)	9.6	5.3-10.6



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Casi CCR per sesso, adesione ed età al primo invito

	Maschi		Femmine	
	Casi CCR Aderenti N = 1,994	Casi CCR Non Aderenti N = 2,496	Casi CCR Aderenti N = 1,681	Casi CCR Non Aderenti N = 1,628
Età				
50-54	354 (17.8)	527 (21.1)	373 (22.2)	405 (24.9)
55-59	392 (19.7)	479 (19.2)	361 (21.5)	331 (20.3)
60-64	512 (25.7)	625 (25.0)	390 (23.2)	337 (20.7)
65-69	736 (36.9)	865 (34.7)	557 (33.1)	555 (34.1)
Stadio ^a				
I	830 (42.3)	508 (20.7)	657 (40.6)	290 (18.7)
II	426 (21.7)	560 (22.8)	335 (20.7)	409 (26.4)
III	402 (20.5)	551 (22.4)	361 (22.3)	358 (23.1)
IV	224 (11.4)	661 (26.9)	195 (12.0)	400 (25.8)
Missing	80 (4.1)	175 (7.1)	71 (4.4)	93 (6.0)
Sede				
Colon prossimale	723 (36.3)	750 (30.0)	688 (40.9)	567 (34.8)
Colon distale	697 (35.0)	915 (36.7)	575 (34.2)	549 (33.7)
Retto	528 (26.5)	764 (30.6)	343 (20.4)	417 (25.6)
Ano e canale anale	32 (1.6)	41 (1.6)	62 (3.7)	78 (4.8)
Colon Nas	14 (0.7)	26 (1.0)	13 (0.8)	17 (1.0)

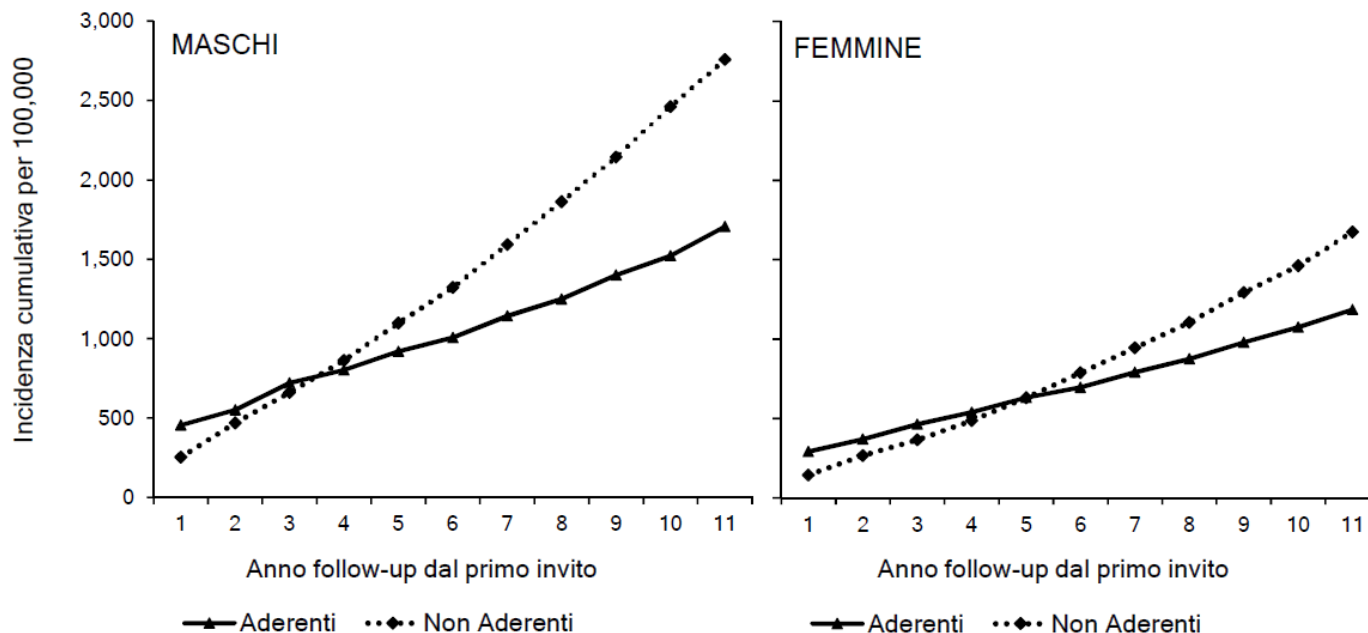
^a Casi con sede ano, canale anale e giunzione anorettale (C21) sono stati esclusi



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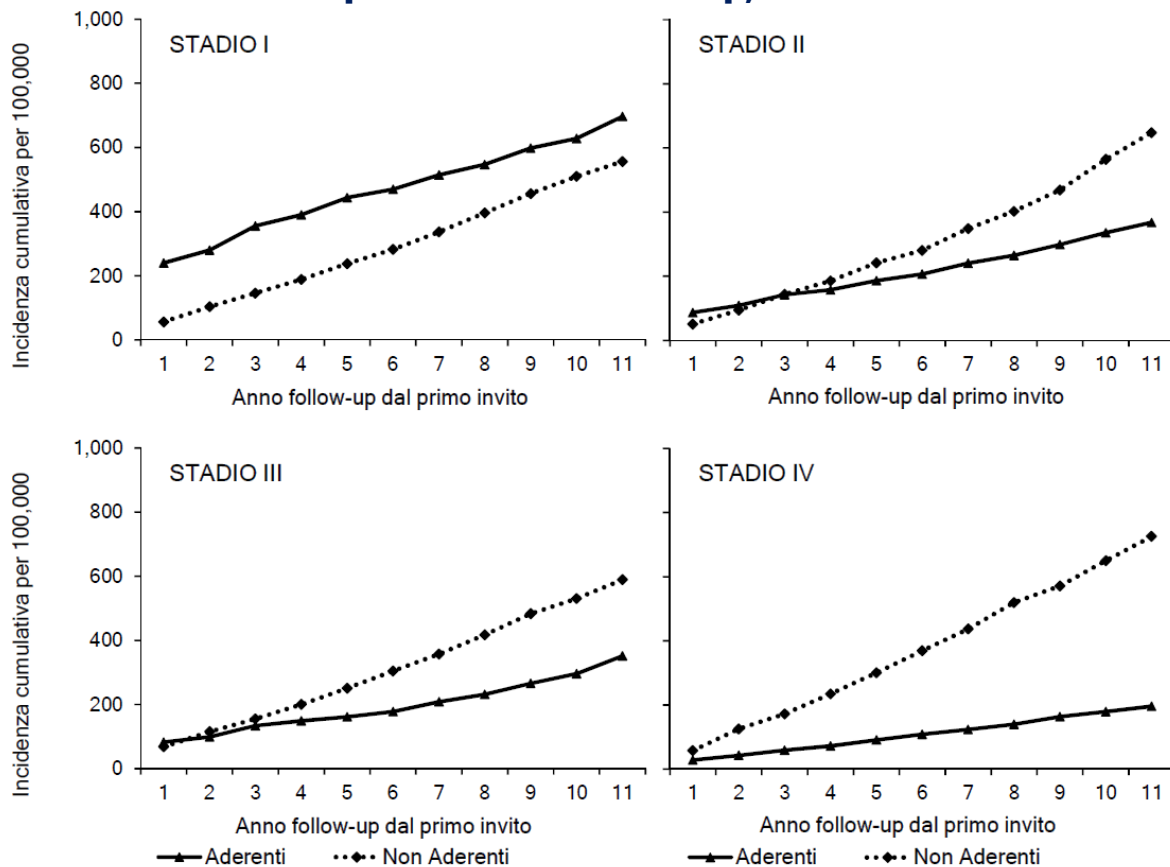
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Incidenza cumulativa per anno di follow-up, adesione e sesso



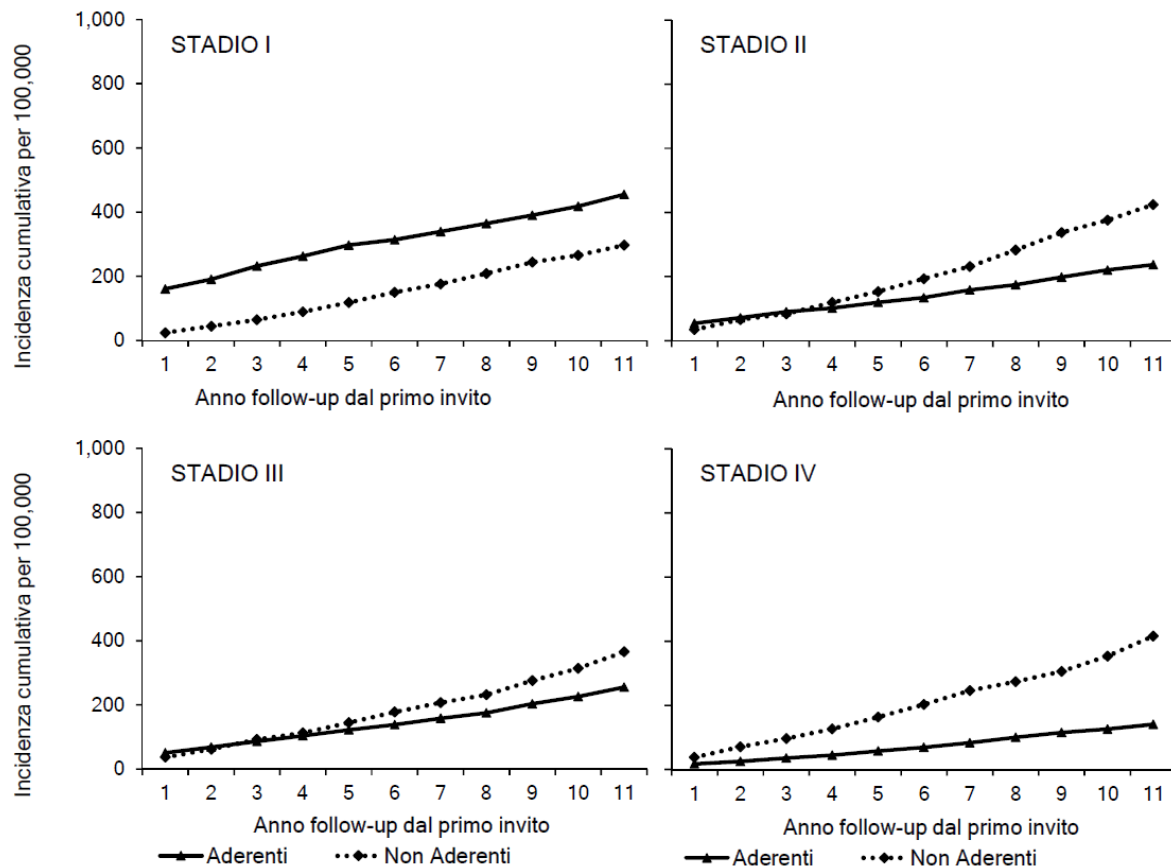


Incidenza cumulativa per anno di follow-up, adesione e stadio - MASCHI





Incidenza cumulativa per anno di follow-up, adesione e stadio - FEMMINE





Tassi standardizzati e IRR

	MASCHI			FEMMINE		
	Tasso standardizzato ^a		IRR (95% CI) Aderenti vs. Non Aderenti ^b	Tasso standardizzato ^a		IRR (95% CI) Aderenti vs. Aderenti ^b
	Aderenti	Non Aderenti		Aderenti	Non Aderenti	
Totale	156.4	242.2	0.65 (0.61-0.69)	109.3	145.8	0.75 (0.70-0.80)
Stadio^c						
<i>I</i>	65.0	50.2	1.35 (1.20-1.50)	43.00	26.3	1.64 (1.43-1.89)
<i>II</i>	33.9	55.6	0.61 (0.53-0.69)	22.1	37.0	0.60 (0.52-0.69)
<i>III</i>	31.2	52.8	0.60 (0.53-0.68)	23.2	31.8	0.73 (0.63-0.85)
<i>IV</i>	17.9	64.0	0.28 (0.24-0.32)	12.7	35.9	0.35 (0.30-0.42)
Totale III-IV	49.1	116.8	0.42 (0.38-0.47)	35.9	67.7	0.53 (0.48-0.59)
Sede						
<i>Colon prossimale</i>	57.1	73.9	0.78 (0.70-0.86)	45.3	51.6	0.88 (0.78-0.98)
<i>Colon distale</i>	55.3	89.7	0.62 (0.56-0.68)	37.3	47.9	0.76 (0.68-0.86)
<i>Retto</i>	40.6	72.4	0.57 (0.51-0.64)	22.1	38.2	0.60 (0.52-0.69)

^a Popolazione standard Europa 2013

^b Aggiustati per età al primo invito

^c Casi con sede ano, canale anale e giunzione anorettale (C21) sono stati esclusi



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AGGIUSTAMENTO SELF-SELECTION BIAS

- Trend incidenza costante nel periodo pre-screening
- Rapporto OSSERVATI:ATTESI nei Non Aderenti
 - Maschi = 1.03 (95% CI, 0.99-1.07)
 - Femmine 1.06 (95% CI, 1.00-1.11)



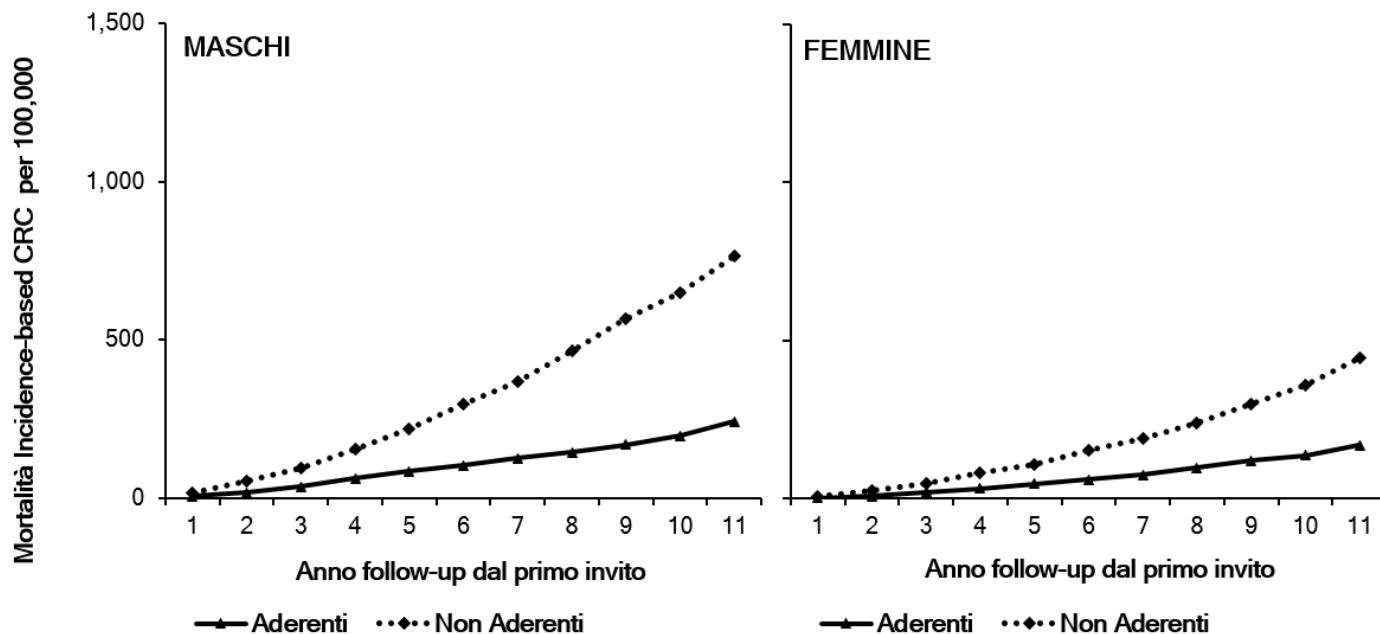
- IRR aggiustato
 - Maschi = 0.67 (95% CI, 0.62-0.72)
 - Femmine = 0.79 (95% CI, 0.72-0.88)



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INCIDENCE-BASED MORTALITY – MORTALITA' CUMULATIVA





INCIDENCE-BASED MORTALITY - Tassi standardizzati e MRR

	MASCHI			FEMMINE		
	Tasso standardizzato ^a		MRR (95% CI) Aderenti vs. Non Aderenti ^b	Tasso standardizzato ^a		MRR (95% CI) Aderenti vs. Non Aderenti ^b
	Aderenti	Non Aderenti		Aderenti	Non Aderenti	
Totale	20.3 (257)	63.6 (651)	0.32 (0.28-0.37)	14.0 (212)	35.5 (387)	0.40 (0.34-0.47)
Stadio^c						
<i>I</i>	1.6 (21)	1.5 (14)	1.21 (0.61-2.37)	0.5 (8)	0.3 (3)	1.86 (0.49-7.01)
<i>II</i>	2.1 (27)	4.4 (43)	0.49 (0.30-0.80)	1.3 (19)	3.5 (37)	0.37 (0.21-0.65)
<i>III</i>	5.1 (63)	10.2 (102)	0.49 (0.36-0.67)	3.0 (47)	5.0 (54)	0.64 (0.44-0.95)
<i>IV</i>	10.4 (132)	42.6 (438)	0.24 (0.20-0.30)	7.9 (120)	22.9 (251)	0.35 (0.28-0.43)
Totale III-IV	15.4 (195)	52.8 (540)	0.29 (0.25-0.34)	11.0 (167)	27.9 (305)	0.40 (0.33-0.48)
Sede						
<i>Colon prossimale</i>	8.8 (112)	18.3 (184)	0.49 (0.39-0.62)	6.9 (103)	12.4 (134)	0.56 (0.43-0.72)
<i>Colon distale</i>	5.1 (64)	22.2 (227)	0.23 (0.17-0.30)	3.5 (54)	10.6 (118)	0.33 (0.24-0.46)
<i>Retto</i>	5.8 (74)	20.9 (217)	0.28 (0.21-0.36)	3.1 (48)	10.0 (106)	0.33 (0.23-0.46)

^a Popolazione standard Europa 2013

^b Aggiustati per età al primo invito

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INCIDENCE-BASED MORTALITY - Tassi standardizzati e MRR

	MASCHI			FEMMINE		
	Tasso standardizzato ^a		MRR (95% CI) Aderenti vs. Non Aderenti ^b	Tasso standardizzato ^a		MRR (95% CI) Aderenti vs. Non Aderenti ^b
	Aderenti	Non Aderenti		Aderenti	Non Aderenti	
Totale	20.3 (257)	63.6 (651)	0.32 (0.28-0.37)	14.0 (212)	35.5 (387)	0.40 (0.34-0.47)
	adj: 0.35			0.46		
Stadio^c						
<i>I</i>	1.6 (21)	1.5 (14)	1.21 (0.61-2.37)	0.5 (8)	0.3 (3)	1.86 (0.49-7.01)
<i>II</i>	2.1 (27)	4.4 (43)	0.49 (0.30-0.80)	1.3 (19)	3.5 (37)	0.37 (0.21-0.65)
<i>III</i>	5.1 (63)	10.2 (102)	0.49 (0.36-0.67)	3.0 (47)	5.0 (54)	0.64 (0.44-0.95)
<i>IV</i>	10.4 (132)	42.6 (438)	0.24 (0.20-0.30)	7.9 (120)	22.9 (251)	0.35 (0.28-0.43)
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L'articolo su Clinical Gastroenterology and Hepatology, una delle riviste ufficiali dell'American Gastroenterological Association, è stato commentato in un Editoriale che contiene una forte apertura nei confronti del FIT come test di screening per i programmi di sanità pubblica

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EDITORIAL

Fecal Immunochemical Tests: The Right Colorectal Cancer Screening Test for the Average-Risk Population?

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University of Lausanne
Lausanne, Switzerland

Evidence is mounting that although one should still offer colonoscopy as an initial screening test for selected individuals, especially those at increased risk of CRC, FIT may be the best test for the average-risk population in a programmatic setting.