
# BISOGNA CAMBIARE LE FASCE D'ETÀ DELLO SCREENING?

## Gli scenari e l'impatto sullo screening

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# European Code against Cancer, 4th Edition: Cancer screening☆

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Cancer Epidemiology 39S (2015) S139–S152

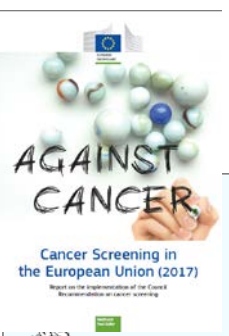
**Box 2.** Primary test, age and interval between tests for colorectal, breast and cervical screening in organized European programs.

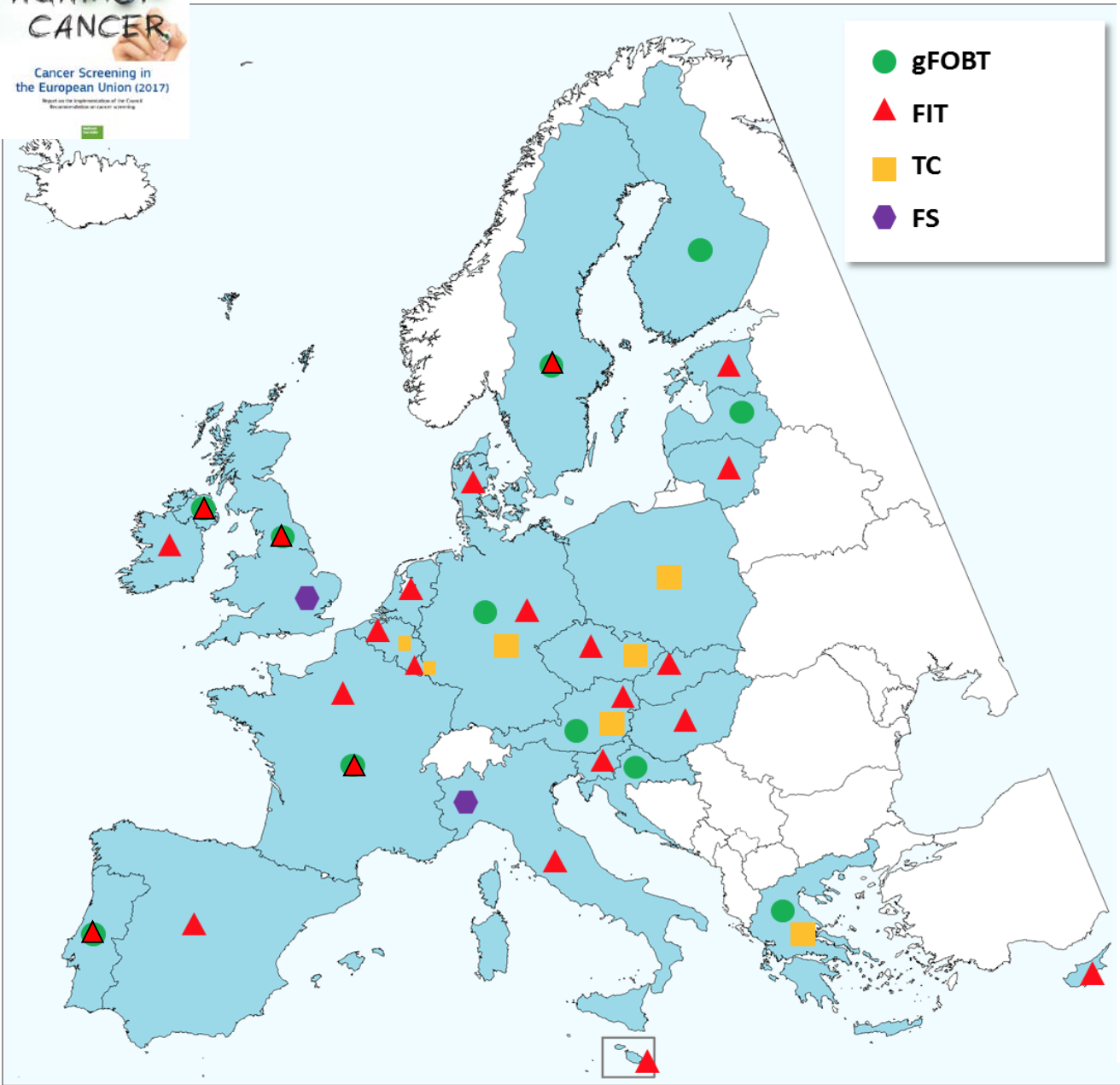
**Colorectal cancer screening:**

- men and women starting at age 50–60 years,
- and from then on, every 2 years if the screening test is the guaiac-based faecal occult blood test (gFOBT) or the fecal immunochemical test (FIT),
- or every 10 years or more if the screening test is flexible sigmoidoscopy (FS) or colonoscopy (TC).

Most programs continue sending invitations to screening up to age 70–75 years.

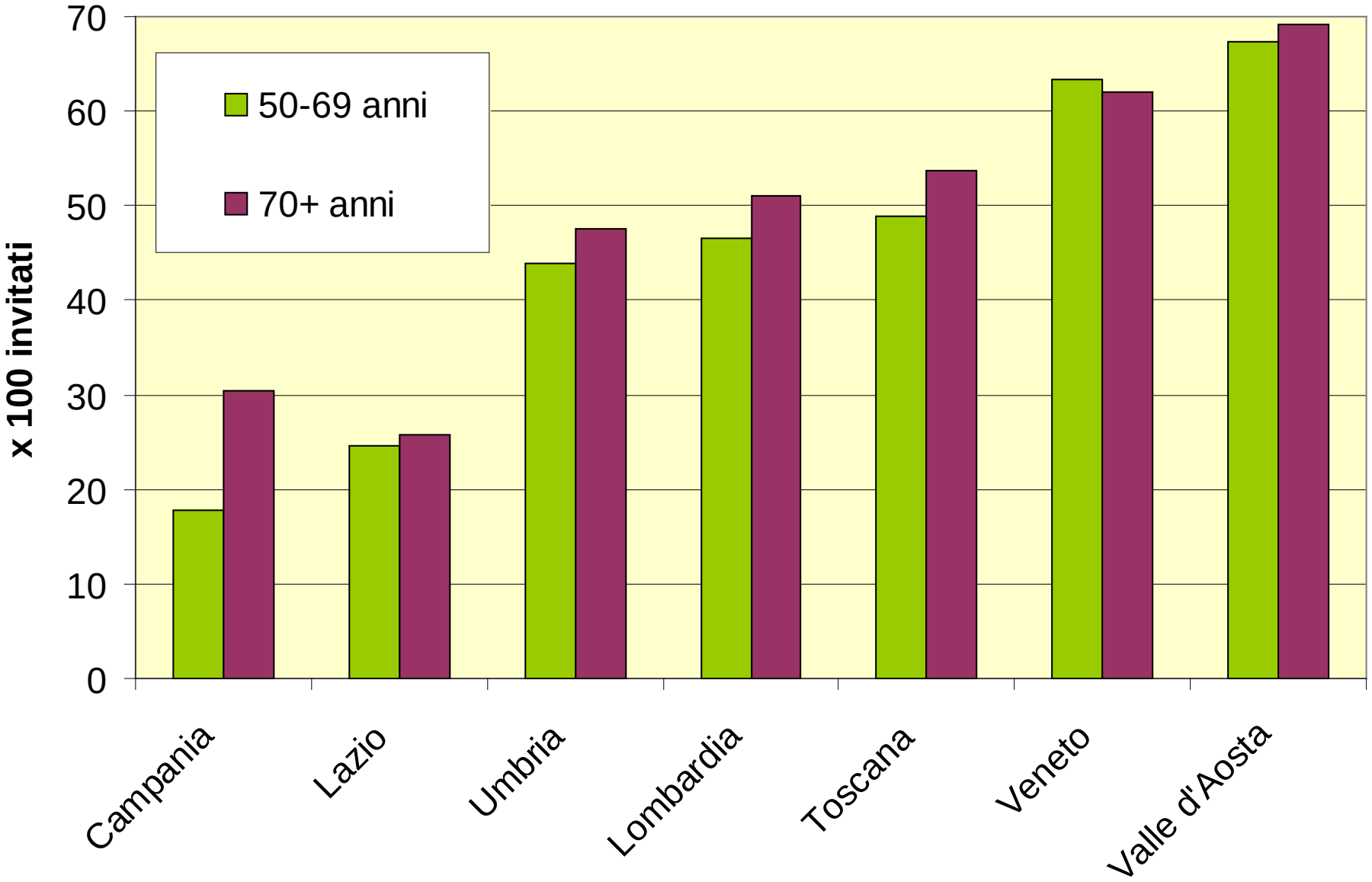
# Tests Used for CRC Screening in the EU Member States



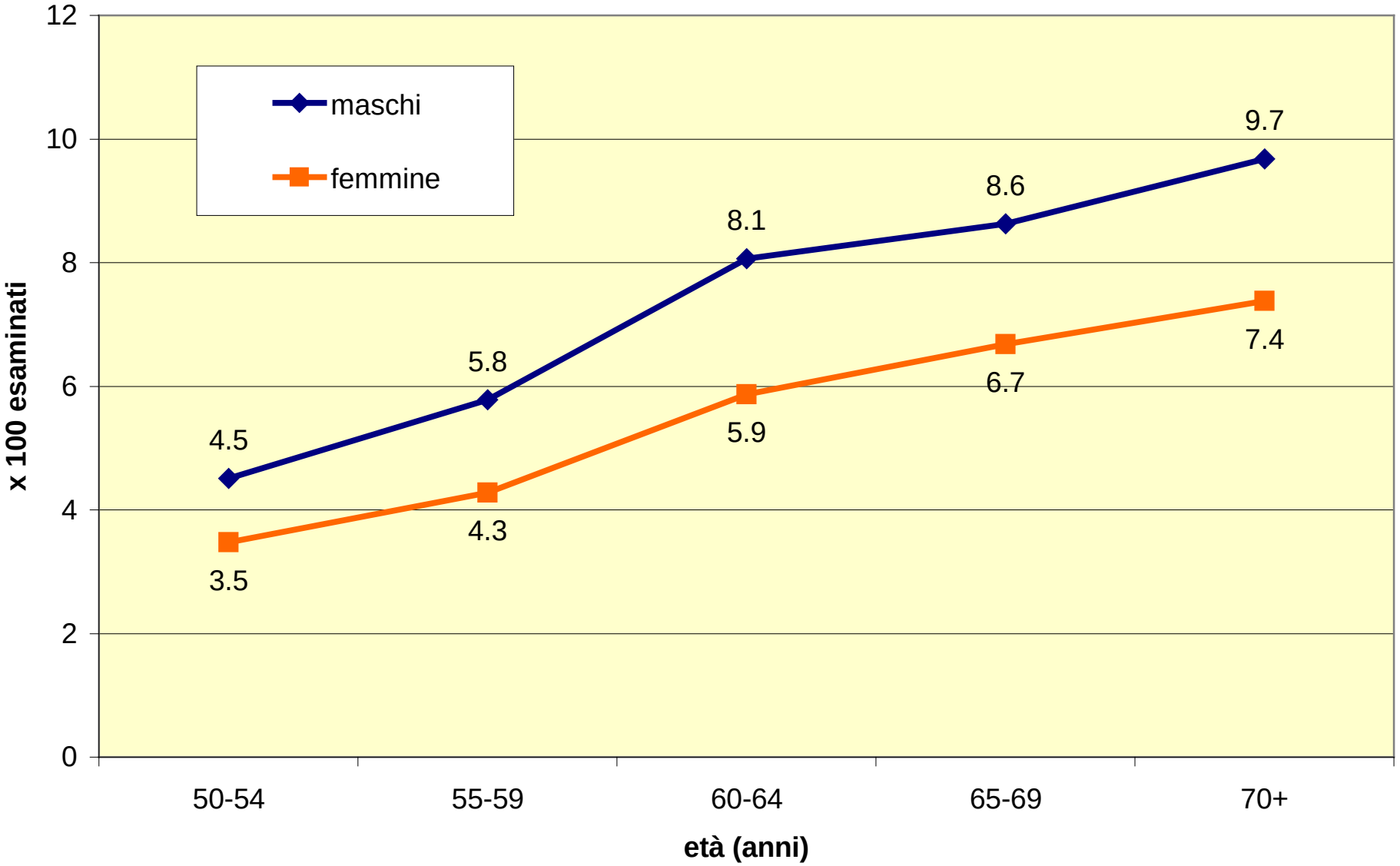




| Member states | Year of programme initiation | Target age (years) |
|---|---|---|
| Austria[1] | 2003 | 40-80 (FIT); 50+ (TC)[1] |
| Belgium | 2009[2] | 50-74 (WAL-BRU); 56-74 (Flemish) |
| Bulgaria | NA | – |
| Croatia | 2008 | 50-74 |
| Cyprus | 2013 | 50-69 |
| Czech Republic | 2000[3] | 50+ (FIT); 55+ (TC)[3] |
| Denmark | 2014 | 50-74 |
| Estonia[4] | 2016[4] | 60-69[4] |
| Finland | 2004 | 60-69 |
| France | 2002 | 50-74 |
| Germany[5] | 1974[5] | 50-74 |
| Greece | NA | 50-70 |
| Hungary | 2007 | 50-70 |
| Ireland | 2012 | 60-69[7] |
| Italy | 1982[8] | 50-69 |
| Latvia | 2009 | 50-74 |
| Lithuania | 2009[9] | 50-74 |
| Luxembourg[10] | 2016 | 55-74 |
| Malta | 2013 | 55-66 |
| Netherlands | 2014 | 55-75 |
| Poland | 2012 | 55-64 |
| Portugal | 2009 | 50-70 |
| Romania | NA | – |
| Slovak Republic | NA | – |
| Slovenia | 2009 | 50-74 |
| Spain | 2000 | 50-69 |
| Sweden[11] | 2008 | 60-69 |
| United Kingdom | 2006[12] | 60-74 (Scotland 50-74) |

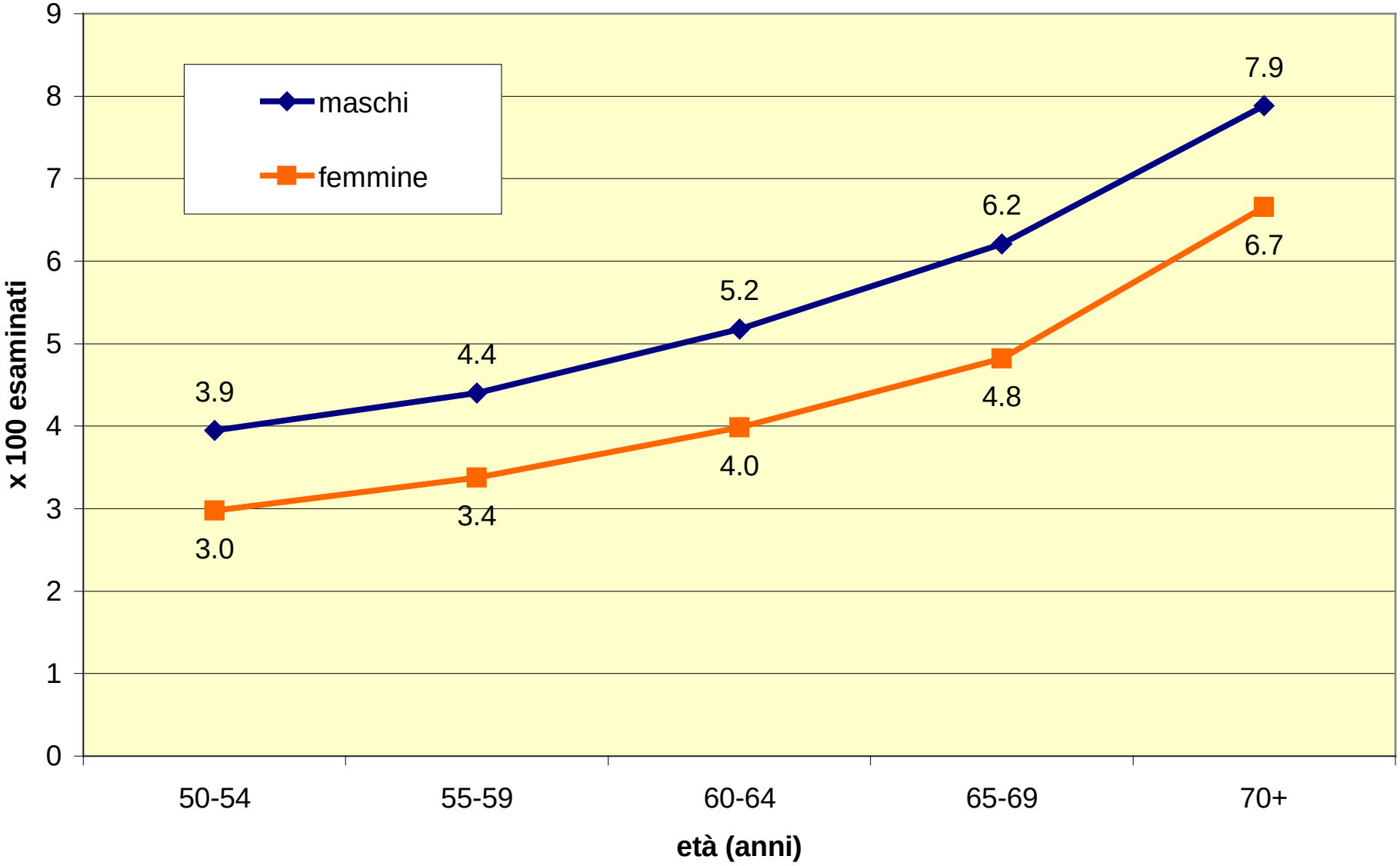
# Adesione corretta all'invito per Regione
# 50-69 anni vs. 70-74 anni



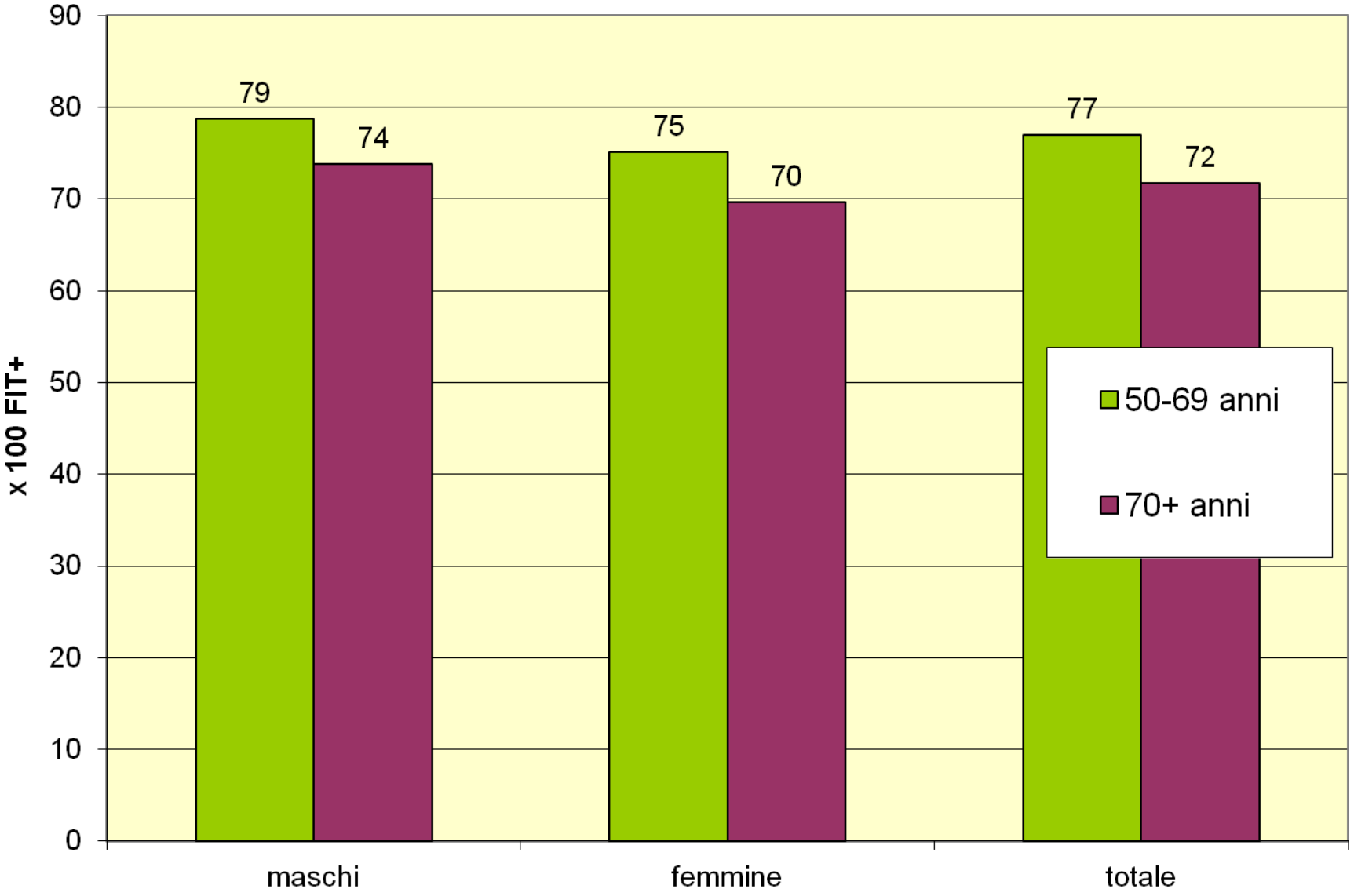
# Positività al sangue occulto per età e sesso
# Primi esami



# Positività al sangue occulto per età e sesso
# Esami successivi



# Adesione alla colonscopia. per età e sesso

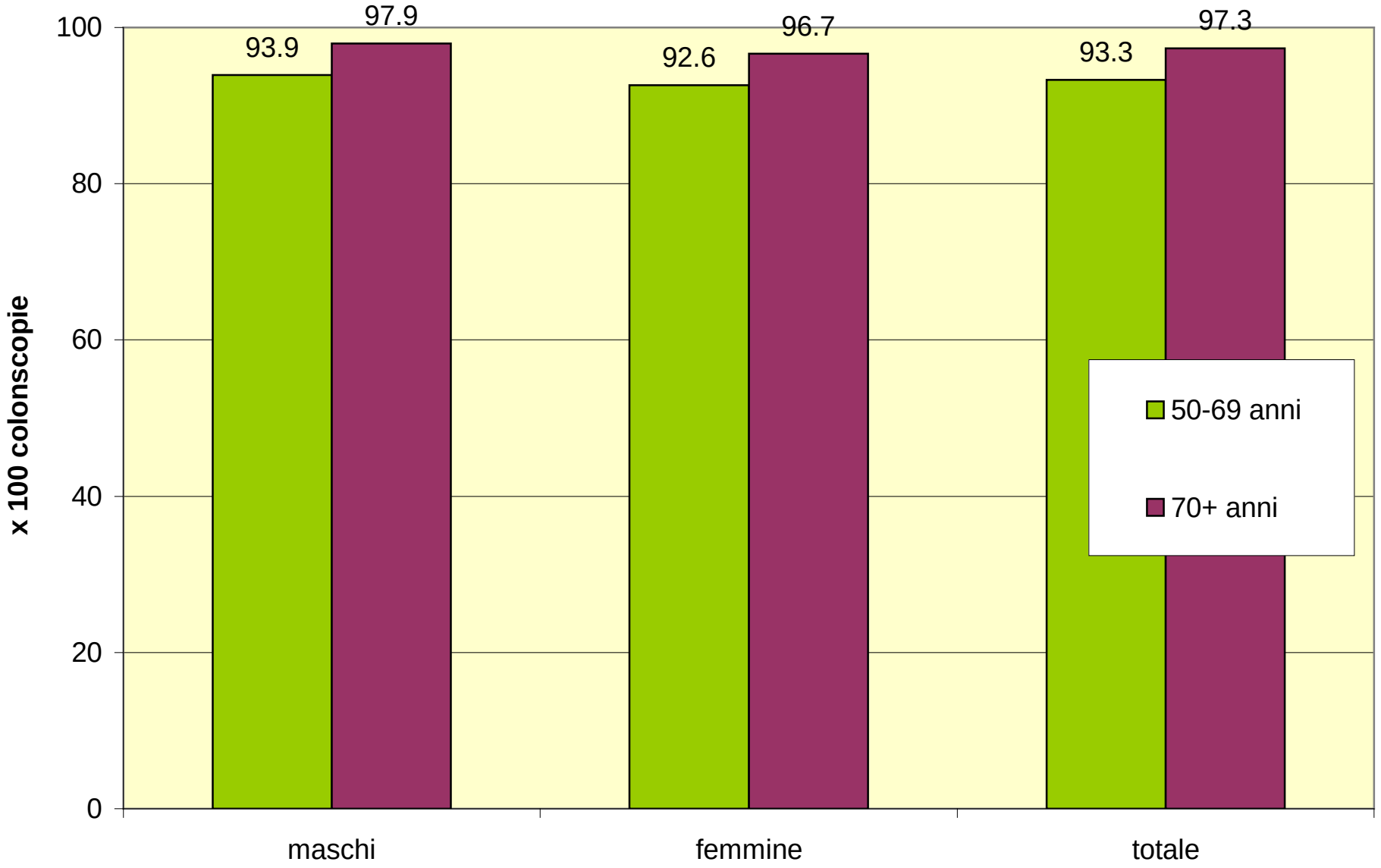


# Estensione screening a 70-74enni

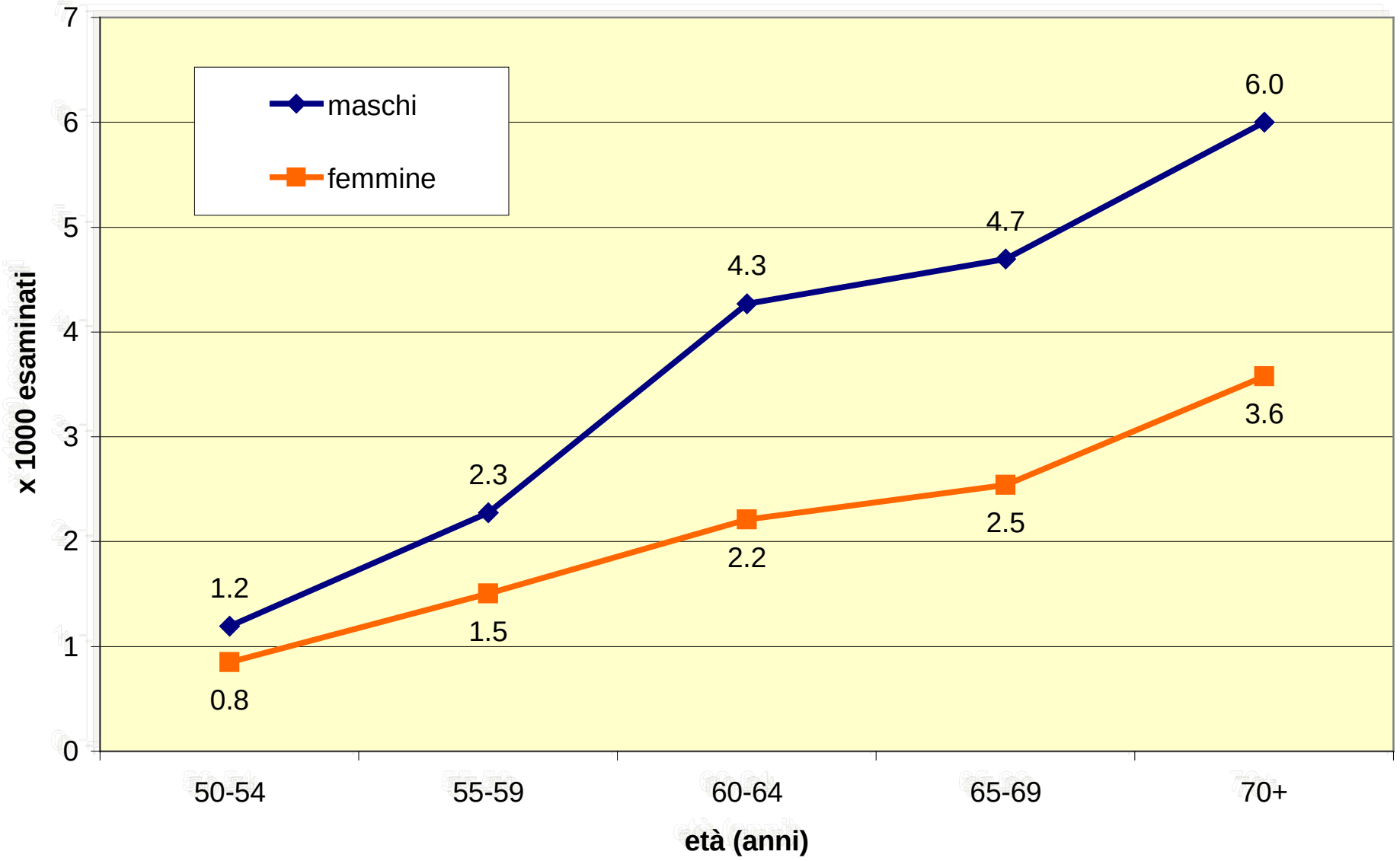
| | | Adesione | % positivi | N Colonscopie | |
|---|---|---|---|---|---|
| 50-54 | Uomini | 36% | 4.3% | 31682 | 29817<br>21.8% |
| | Donne | 41% | 3.3% | 27951 | |
| 55-59 | Uomini | 39% | 4.8% | 34324 | 106727<br>78.2% |
| | Donne | 44% | 3.7% | 29486 | |
| 60-64 | Uomini | 43% | 6.1% | 41009 | |
| | Donne | 47% | 4.6% | 32755 | |
| 65-69 | Uomini | 46% | 6.8% | 42905 | |
| | Donne | 47% | 5.3% | 32976 | |
| 70-74 | Uomini | 46% | 8.3% | 40200 | 37106<br>**+ 27.2%**<br>su totale 50-69 anni |
| | Donne | 47% | 6.8% | 34012 | |

# Colonscopie complete

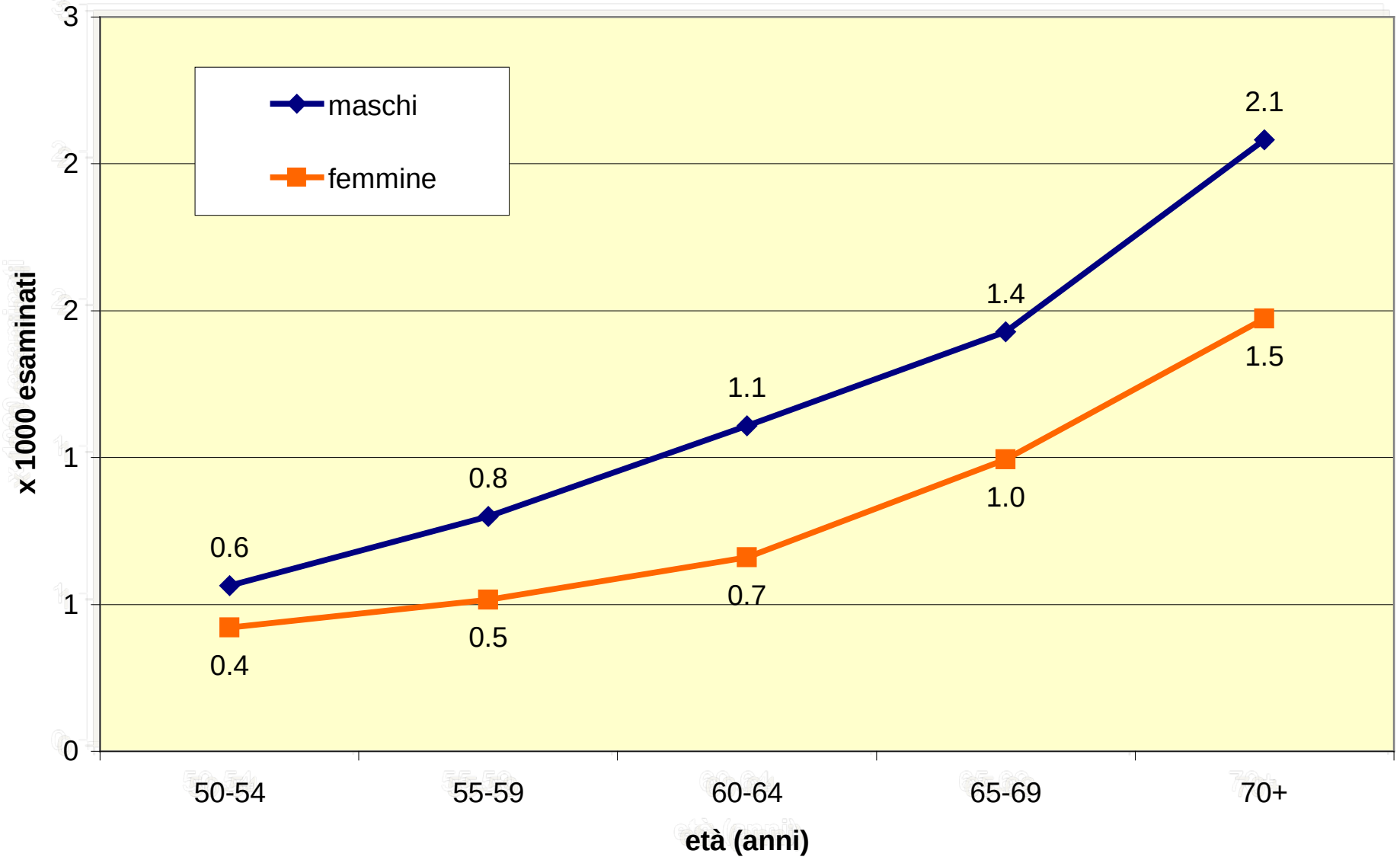
## per età e sesso



# Detection rate di carcinoma. per età e sesso.
# Primi esami

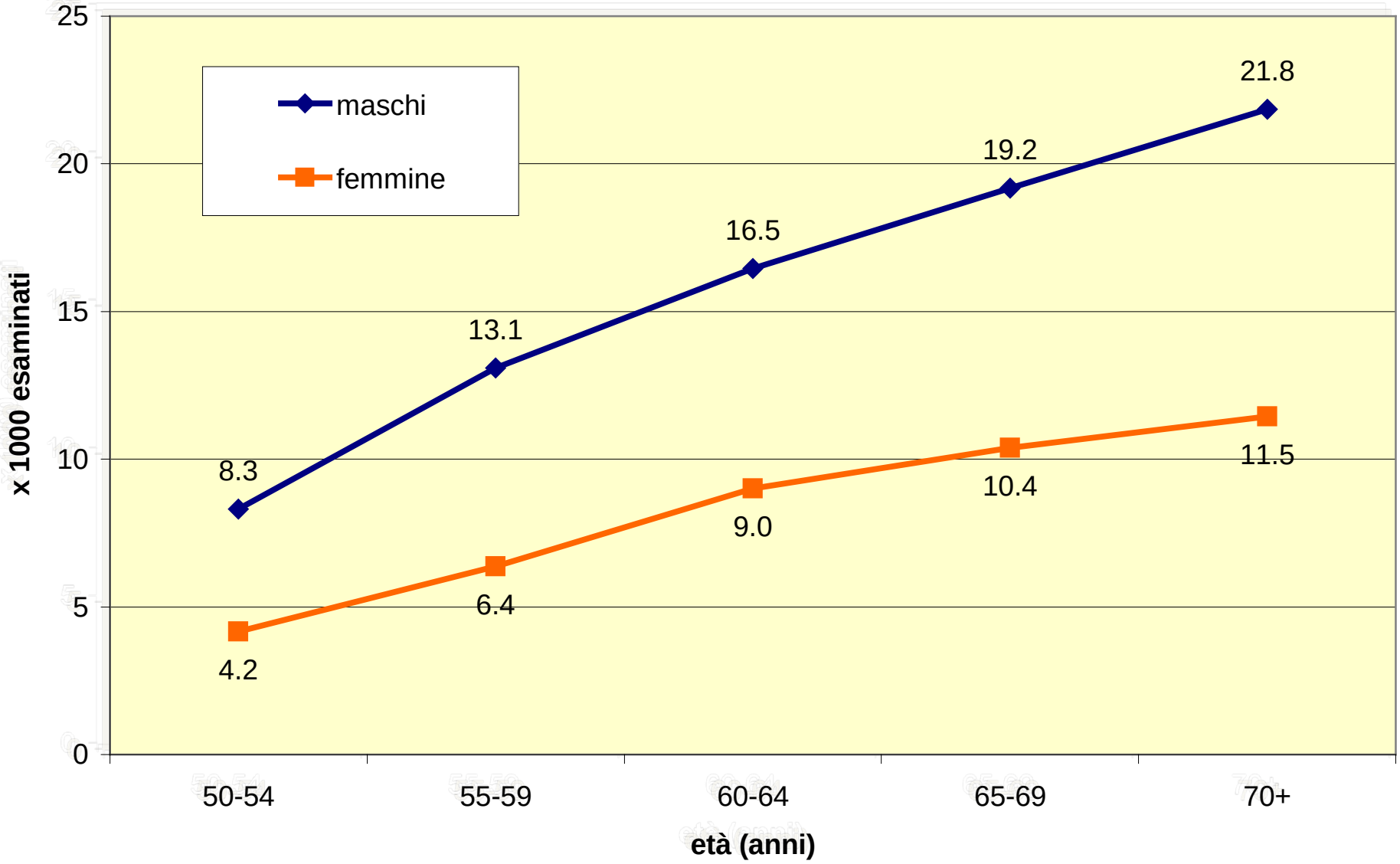


# Detection rate di carcinoma. per età e sesso.
# Esami successivi



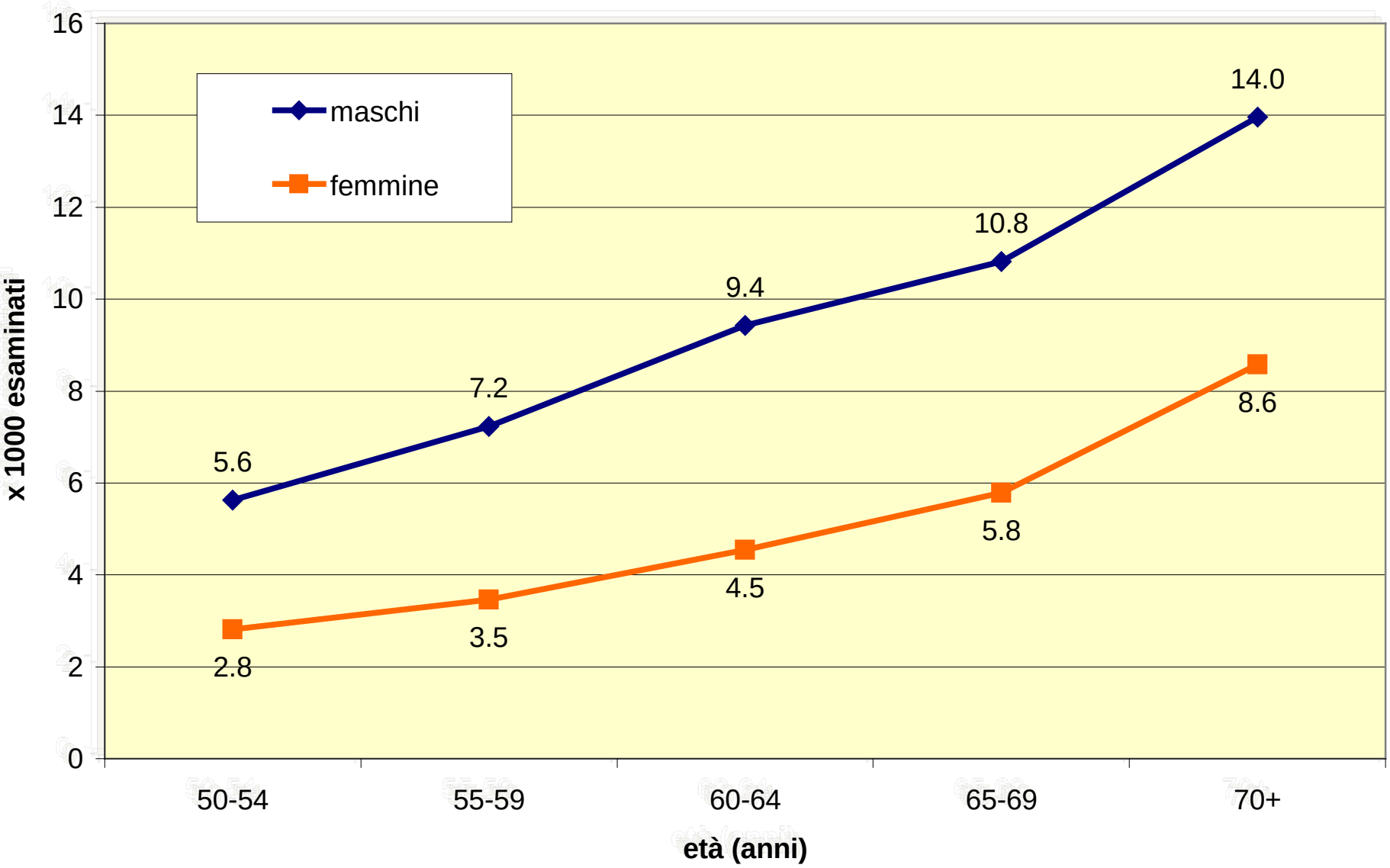
# Detection rate di adenoma avanzato

# per età e sesso - Primi esami

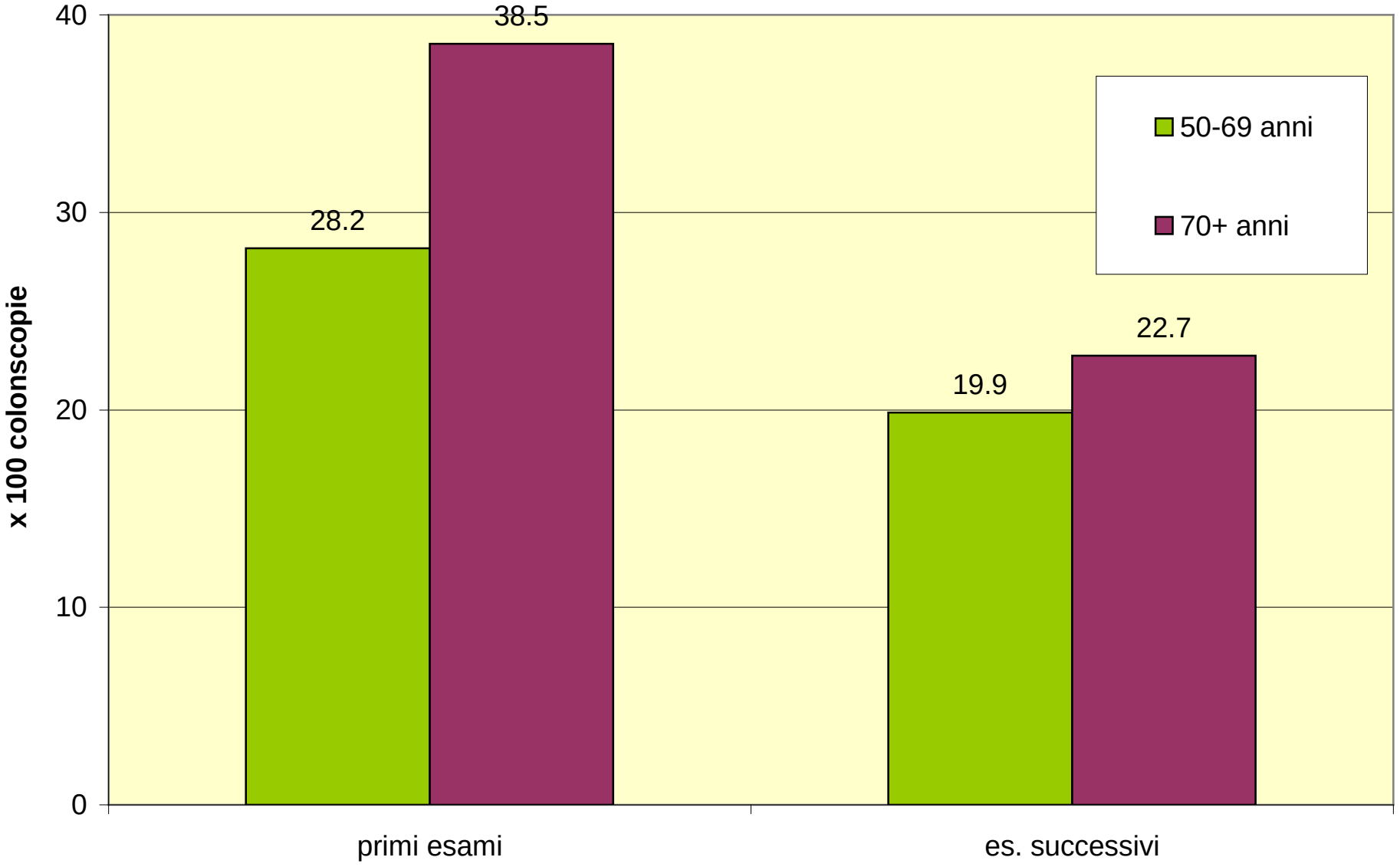


# Detection rate di adenoma avanzato

# per età e sesso - Esami successivi



# Valore Predittivo Positivo di FIT+ per neoplasia avanzata. per età



# Indicatori di performance
# Confronto 50-54 enni e 70-74 enni

| | | DONNE | | | UOMINI | |
|---|---|---|---|---|---|---|
| | | 50-54 | 70-74 | | 50-54 | 70-74 |
| PR (%) | Primi esami | 3.5 | 7.4 | | 4.5 | 9.7 |
| | Esami successivi | 3.0 | 6.7 | | 3.9 | 7.8 |
| DR CCR (‰) | Primi esami | 0.8 | 3.6 | | 1.2 | 6.0 |
| | Esami successivi | 0.4 | 1.5 | | 0.6 | 2.1 |
| DR AAD (‰) | Primi esami | 4.2 | 11.5 | | 8.3 | 21.8 |
| | Esami successivi | 2.8 | 8.6 | | 5.6 | 14.0 |
| PPV AN (%) | Primi esami | 16.8 | 29.2 | | 24.8 | 40.9 |
| | Esami successivi | 12.5 | 18.8 | | 18.7 | 25.8 |

# Increased Post-procedural Non-gastrointestinal Adverse Events After Outpatient Colonoscopy in High-risk Patients

David A. Johnson,[*] David Lieberman,[‡] John M. Inadomi,[§] Uri Ladabaum,[‖] Richard C. Becker,[¶] Seth A. Gross,[#] Kristin L. Hood,[**] Susan Kushins,[**] Mark Pochapin,[#] and Douglas J. Robertson[‡‡]

Clinical Gastroenterology and Hepatology 2017;15:883–891

| Age | Average-risk | COPD only (n = 43,659) | OSA only (n = 10,498) | Antiplatelet only (n = 1755) | Anticoagulant only (n = 20,975) |
|---|---|---|---|---|---|
| < 50 | 1.00 n = 74,541 | 2.58 (2.02-3.30) n = 8195 | 1.79 (0.98-3.27) n = 1567 | 14.70 (5.92-36.46) n = 91 | 18.47 (14.94-22.84) n = 1893 |
| 50-59 | 1.10 (0.94-1.26 n = 181,033 | 2.34 (1.92-2.85) n = 16,674 | 2.72 (2.02-3.67) n = 4787 | 10.15 (6.17-16.70) n = 440 | 14.46 (12.32-16.96) n = 6077 |
| 60-69 | 2.19 (1.92-2.50) n = 104,087 | 4.48 (3.75-5.36) n = 11,985 | 3.72 (2.71-5.10) 3103 | 8.38 (5.45-12.90) n = 716 | 17.06 (14.66-19.85) n = 6575 |
| ≥70 | 6.14 (5.38-7.00) n = 39,002 | 11.77 (10.00-13.84) n = 6805 | 7.49 (5.12-10.97) n = 1041 | 19.85 (13.94-28.27) n = 508 | 25.75 (22.34-29.69) n = 6430 |

# 100.000 persone invitate

| | Donne 50-54 | Donne 70-74 | Differenza& 70-74 - 50-54 | Uomini 50-54 | Uomini 70-74 | Differenza& 70-74 - 50-54 |
|---|---|---|---|---|---|---|
| N colonscopie | 4484 | 5078 | 594 | 5801 | 5993 | 191 |
| N CCR | 92 | 171 | 79 | 138 | 249 | 111 |
| N adenomi avanzati | 553 | 889 | 336 | 1100 | 1478 | 379 |
| PPV AN (%) | 14.4 | 20.9 | | 21.4 | 28.9 | |
| NNScope AN | 7.0 | 4.8 | 1.4 | 4.7 | 3.5 | 0.4 |
| N CT per 1 CCR | 48.7 | 29.7 | 7.5 | 42.0 | 24.1 | 1.7 |
| Stima CCR prevenuti* | 11 | (17) | | 21 | (28) | |
| Eventi avversi GI | 4-10 | 11-20 | | 6-13 | 13-24 | |

& Variazione di volumi attività e performance sostituendo la classe 50-54 anni con la classe più anziana

* Pinsky et al. Gastroenterology 2019

** Warren et al. Ann Intern Med 2009; vanHees et al. JAMA Intern Med 2014; Vanaclocha-Espi et al. Prev Med 2019

# 100.000 aderenti FIT

| | Donne 50-54 | Donne 70-74 | Differenza[&] 70-74 - 50-54 | Uomini 50-54 | Uomini 70-74 | Differenza[&] 70-74 - 50-54 |
|---|---|---|---|---|---|---|
| N colonscopie | 7838 | 15180 | 7743 | 10148 | 17835 | 8828 |
| N CCR | 160 | 492 | 332 | 240 | 708 | 469 |
| N adenomi avanzati | 980 | 2638 | 1658 | 1950 | 4356 | 2406 |
| PPV AN (%) | 14.5 | 20.6 | | 21.6 | 28.4 | |
| NNScope AN | 6.9 | 4.8 | 3.7 | 4.6 | 3.5 | 2.7 |
| N CT per 1 CCR | 49.0 | 30.9 | 22.1 | 42.3 | 25.2 | 16.4 |
| Stima CCR prevenuti* | 19 | (55) | | 38 | (96) | |
| Eventi avversi GI** | 2.0 | 8.5 | | 2.6 | 14.5 | |
| Eventi avversi CV | | 6.6 | | | 11.3 | |

[&] Variazione di volumi attività e performance sostituendo la classe 50-54 anni con la classe più anziana

* Pinsky et al. Gastroenterology 2019

** Warren et al. Ann Intern Med 2009; vanHees et al. JAMA Intern Med 2014; Vanaclocha-Espi et al. Prev Med 2019

# Anticipare l'avvio dello screening?

Aumento relativo dell'incidenza nelle fasce di età al di sotto dei 50 anni corrisponde in realtà a un incremento assoluto del numero dei casi molto ridotto

In Italia non si osserva un aumento dell'incidenza nelle fasce di età più giovani

*Journal of Medical Screening* 1997;4:142–146

# Cost analysis in a population based screening programme for colorectal cancer: comparison of immunochemical and guaiac faecal occult blood testing

G Castiglione, M Zappa, G Grazzini, C Sani, A Mazzotta, P Mantellini, S Ciatto

*Table 5 Costs of screening (per 10 000 invited subjects; attendance rate of 38.7%) per screened subject and subject with cancer or adenoma/s according to FOBT type, population age, and screening round. Costs are reported in American dollars* according to two different estimates (Ministerial tariffs/SIED† estimates)*

| | *First screening* | | | *Repeat screening* |
|---|---|---|---|---|
| | *Rehydrated hemoccult* | *RPHA (+ and +/−)* | *RPHA (+ only)* | *RPHA (+ and +/−)* |
| Subjects aged 50–70 | | | | |
| For each subject screened | 31.3/36.2 | 35.1/41.3 | 25.0/27.6 | 25.1/27.8 |
| For each subject with cancer | 12 900/14 900 | 10 000/11 750 | 9 020/9 940 | 18 990/21 030 |
| For each subject with adenoma/s | 2 200/2 540 | 1 780/2 090 | 2 180/2 400 | 3 450/3 820 |
| For each subject with adenoma/s >9 mm | 4 530/5 230 | 3 730/4 380 | 3 860/4 260 | 6 330/7 010 |
| Subjects aged 40–49 | | | | |
| For each subject screened | 24.5/27.3 | 27.1/31.3 | 20.6/21.1 | 24.6/27.3 |
| For each subject with cancer | 23 930/26 700 | 26 580/30 650 | 20 220/21 680 | 14 700/16 360 |
| For each subject with adenoma/s | 7 990/8 900 | 4 690/5 400 | 12 130/13 010 | 7 350/8 180 |
| For each subject with adenoma/s >9 mm | 35 980/40 050 | 13 290/15 330 | 20 220/21 680 | 14 700/16 360 |

*$1=1550 Italian liras.

# Table 1 - Simulation screening-specific scenarios

| # | Screening Test | Target Age | Screening Interval | Adherence | Invitation Coverage |
|---|---|---|---|---|---|
| Scenario 1 | No screening | No screening | No screening | No screening | No screening |
| Scenario 2 | Current Screening | Current Screening | Current Screening | Current Screening | Complete coverage |
| Scenario 3 | FIT | 50-74 | 2 years | Current Screening | Complete coverage |
| Scenario 4 | FIT | 55-74 | 2 years | Current Screening | Complete coverage |
| Scenario 5 | FIT | 45-69 | 2 years | Current Screening | Complete coverage |

# Table 2. Screening outcomes (in 10,000) for each simulated scenario in individuals aged 40-100, 2018-2050

| | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 |
|---|---|---|---|---|---|
| Colorectal cancer incidence reduction (%,40-100) compared to no screening | 0 | 8.13 | 9.24 | 8.83 | 8.33 |
| Colorectal cancer mortality reduction (%,40-100) compared to no screening | 0 | 18.67 | 24.25 | 23.03 | 19.16 |
| Positive screening tests | 0 | 605.74 | 758.74 | 645.45 | 704.4 |
| Diagnostic follow-up colonoscopies performed | 0 | 465.93 | 583.74 | 496.68 | 541.78 |
| False Positive (%) | 0 | 1.93 | 1.98 | 2.19 | 1.71 |
| Colonoscopy complications | 0 | 3.21 | 4.56 | 4.32 | 3.15 |

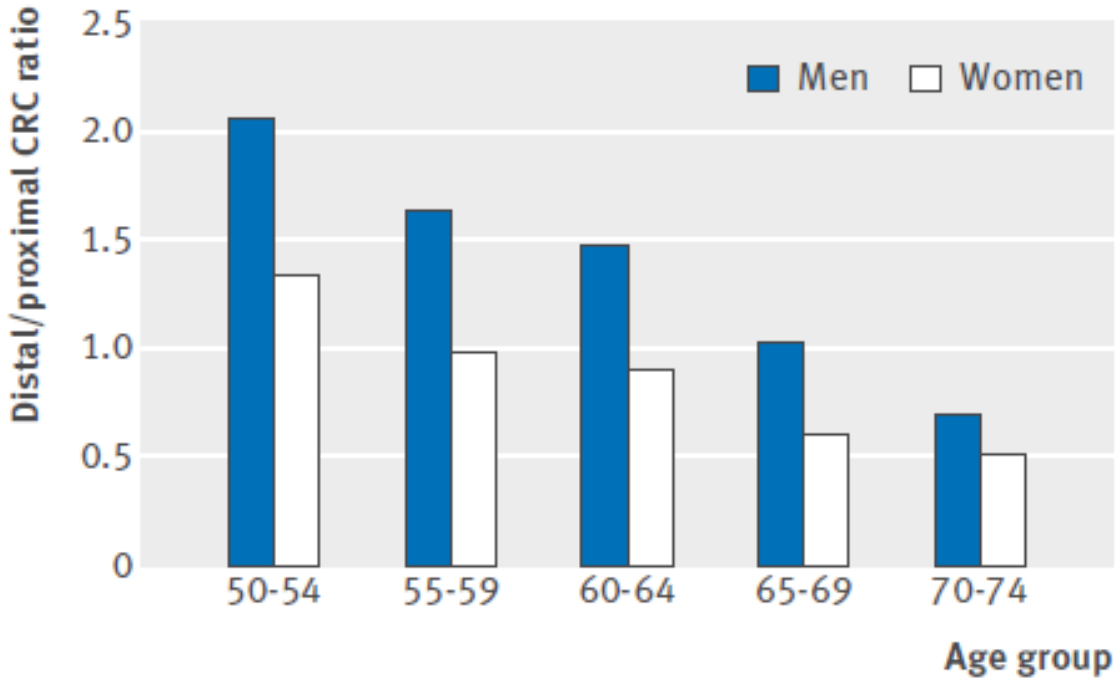
# Effectiveness of flexible sigmoidoscopy screening in men and women and different age groups: pooled analysis of randomised trials

Øyvind Holme,[1,2] Robert E Schoen,[3] Carlo Senore,[4] Nereo Segnan,[4] Geir Hoff,[5,6] Magnus Løberg,[2,8] Michael Bretthauer,[1,2,7,8] Hans-Olov Adami,[2,7,9] Mette Kalager[2,7,8]

| | Screening group *v* control group | | | |
|---|---|---|---|---|
| | Colorectal cancer incidence (relative risk (95% CI)) | P for interaction | Colorectal cancer mortality (relative risk (95% CI)) | P for interaction |
| **Colon and rectum** | | | | |
| Both sexes* | 0.79 (0.74 to 0.84) | | 0.73 (0.64 to 0.83) | |
| Men† | 0.76 (0.70 to 0.83) | | 0.67 (0.57 to 0.80) | |
| ≥60 years‡ | 0.76 (0.68 to 0.84) | | 0.67 (0.55 to 0.82) | |
| <60 years§ | 0.76 (0.65 to 0.88) | 0.12 | 0.67 (0.49 to 0.91) | 0.55 |
| Women¶ | 0.83 (0.75 to 0.92) | | 0.82 (0.67 to 1.00) | |
| ≥60 years‡ | 0.90 (0.80 to 1.02) | | 0.88 (0.69 to 1.12) | |
| <60 years§ | 0.71 (0.59 to 0.84) | | 0.73 (0.53 to 1.02) | |
| **Distal colon** | | | | |
| Both sexes* | 0.73 (0.66 to 0.80) | | 0.60 (0.49 to 0.72) | |
| Men† | 0.71 (0.63 to 0.80) | | 0.51 (0.40 to 0.65) | |
| ≥60 years‡ | 0.72 (0.62 to 0.84) | | 0.48 (0.35 to 0.64) | |
| <60 years§ | 0.69 (0.56 to 0.85) | 0.66 | 0.58 (0.38 to 0.90) | 0.39 |
| Women¶ | 0.76 (0.65 to 0.88) | | 0.79 (0.58 to 1.09) | |
| ≥60 years‡ | 0.74 (0.61 to 0.91) | | 0.85 (0.57 to 1.27) | |
| <60 years§ | 0.78 (0.61 to 0.99) | | 0.71 (0.42 to 1.18) | |

# Effectiveness of flexible sigmoidoscopy screening in men and women and different age groups: pooled analysis of randomised trials

| Proximal colon | | | | |
|---|---|---|---|---|
| Both sexes* | 0.86 (0.79 to 0.93) | | 0.87 (0.73 to 1.04) | |
| Men† | 0.83 (0.73 to 0.94) | | 0.89 (0.70 to 1.13) | |
| ≥60 years‡ | 0.82 (0.71 to 0.95) | | 0.96 (0.73 to 1.28) | |
| <60 years§ | 0.84 (0.66 to 1.07) | 0.04 | 0.71 (0.44 to 1.14) | 0.61 |
| Women¶ | 0.91 (0.79 to 1.03) | | 0.85 (0.66 to 1.10) | |
| ≥60 years‡ | 1.03 (0.88 to 1.20) | | 0.89 (0.65 to 1.21) | |
| <60 years§ | 0.65 (0.50 to 0.84) | | 0.79 (0.51 to 1.23) | |



# Prevention, Early Detection, and Overdiagnosis of Colorectal Cancer Within 10 Years of Screening Colonoscopy in Germany

Hermann Brenner,[*,‡] Lutz Altenhofen,[§] Christian Stock,[*,‖] and Michael Hoffmeister[*]

Clinical Gastroenterology and Hepatology 2015;13:717–723

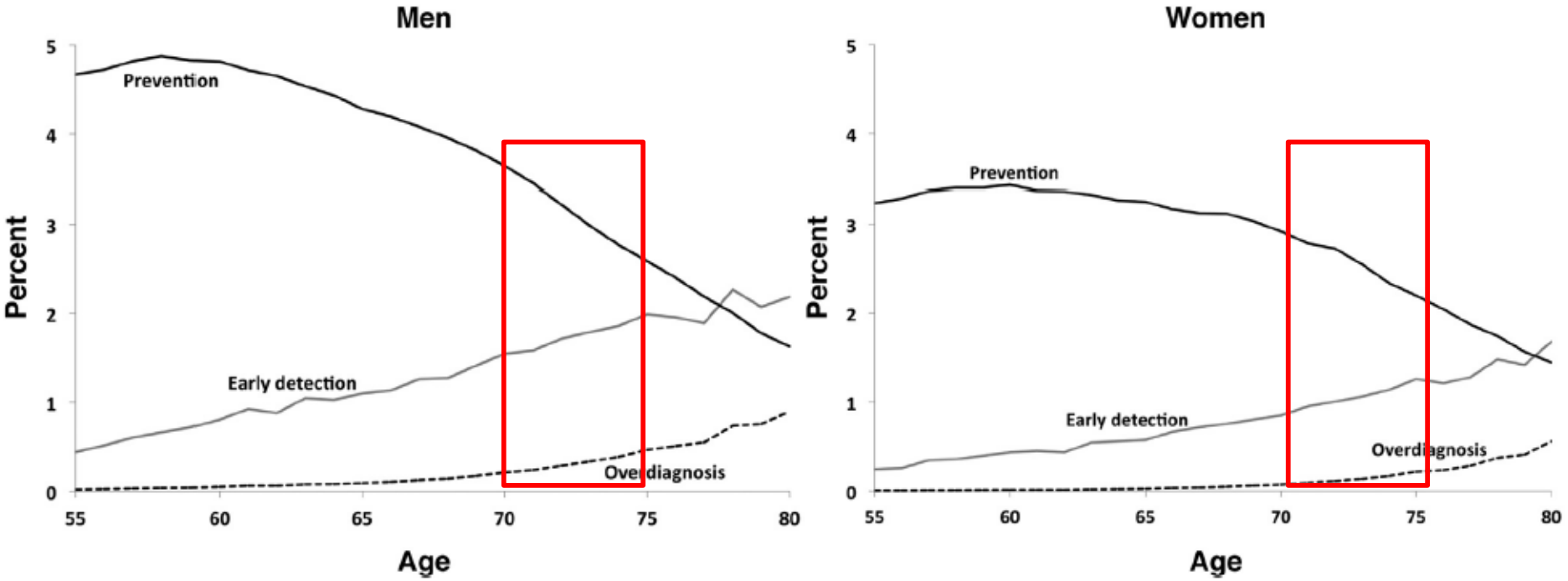
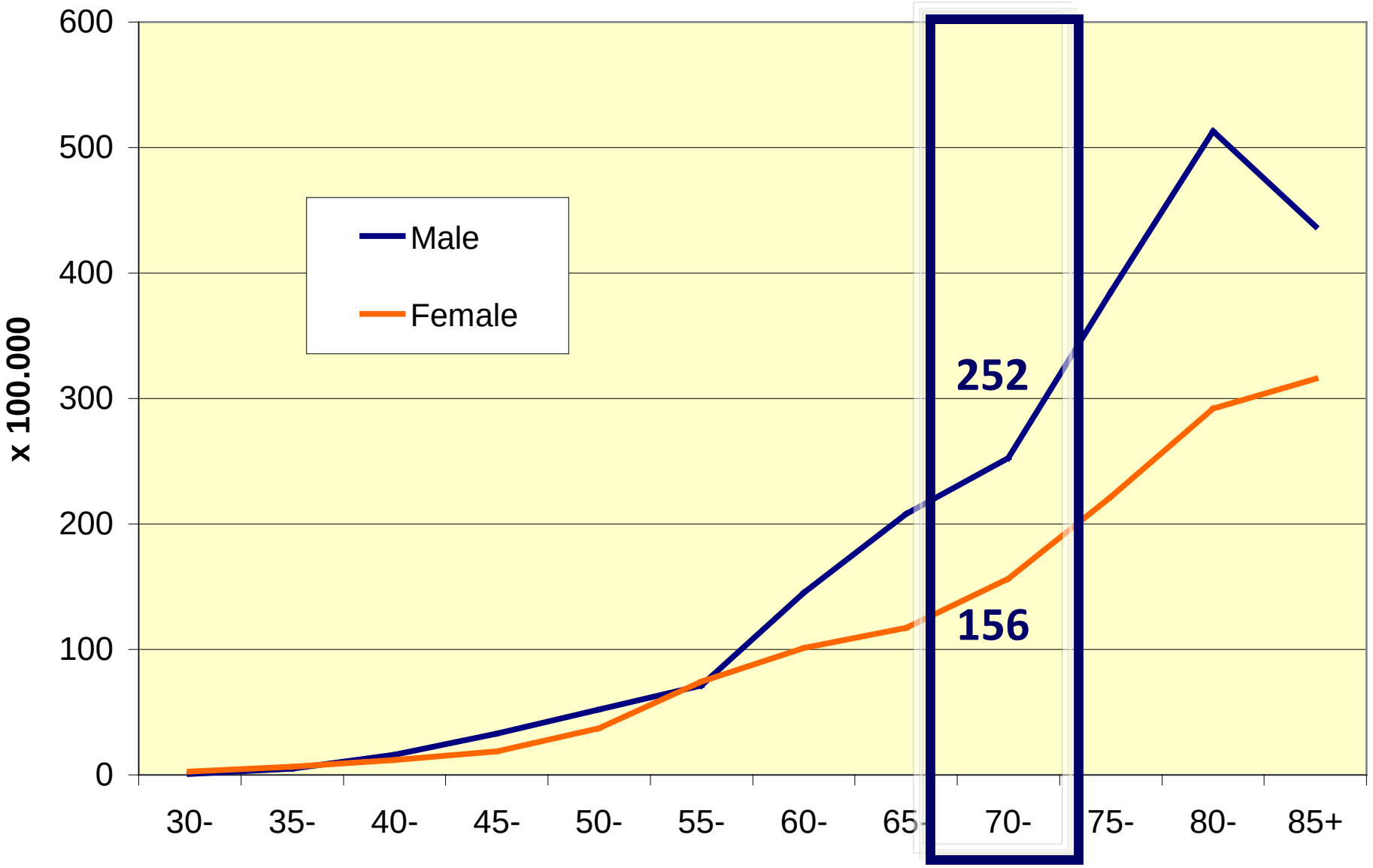



**Figure 1.** Probability of having CRC prevented or early detected or having overdiagnosis of CRC, according to sex and age at screening colonoscopy.

# Tassi di incidenza del tumore del colon retto per età e sesso. Emilia Romagna. 2013

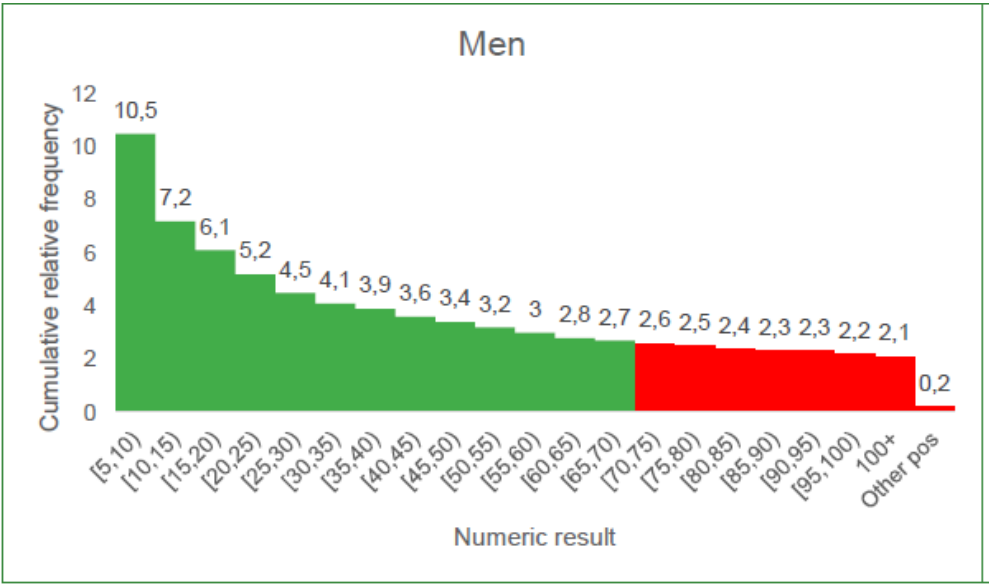


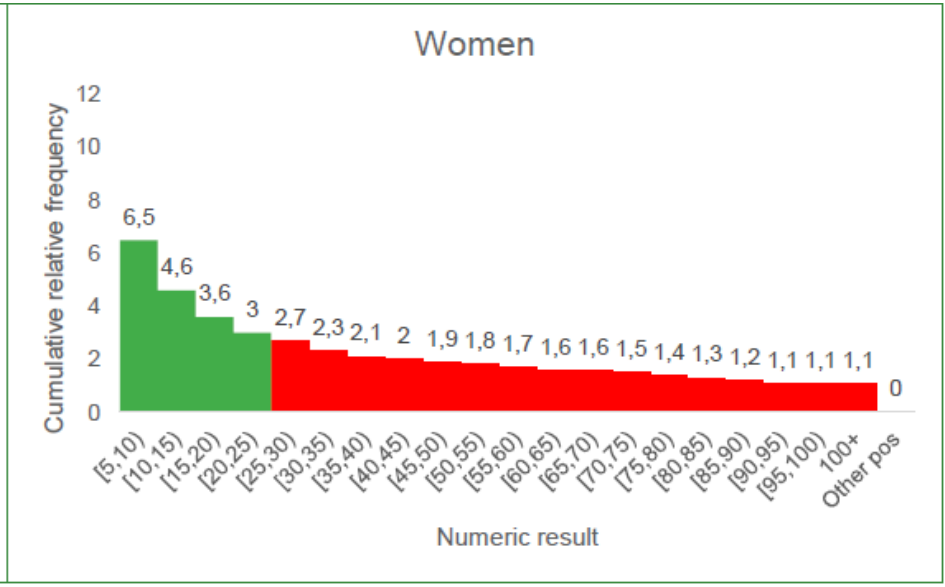
# ✓ Equity key issue

- Effectiveness has been shown to be higher in men than in women (33-37 % vs. 8-18 %) **(e.g. Shaukat et. al. 2013, 2018)**
  - Men vs. women
    - CRC incidence higher, increase in incidence at earlier age
    - colonic transit time faster
    - positive test results predict CRC better
    - less proximal and sessile serrated lesions (contribute to interval cancers)?

✓ **Gender-specific cutoffs (by age)?**

✓ **Gender-specific starting and stopping ages?**



# Conclusioni

- Screening fino a 74 anni giustificato da elevata prevalenza

- Atteso elevato valore predittivo positivo

- Impatto atteso attribuibile in gran parte a effetto di anticipazione della diagnosi

# Conclusioni

Carico endoscopico elevato

Considerare ridefinizione popolazione bersaglio?

Bassa adesione alla colonscopia di approfondimento

comorbidità

Ridefinire percorsi diagnositici utilizzando esami meno invasivi come triage?

# Grazie per l'attenzione

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e la Prevenzione Oncologica in Piemonte

# Effetti collaterali

## Adverse effects of the bowel preparation

- Serious event (SE) rate

  defined as a composite of non-elective hospitalization, emergency department visit, or death, within seven days of the colonoscopy

  was 17 per 1000 procedures

(Ho JM. et al. Can J Gastroenterol 2012)