Prevalence and correlates of colorectal cancer test use in men and women in Germany

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Research Project

- Funded by the Deutsche Krebshilfe (2004 – 2007)
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- In cooperation with TNS Healthcare München (Dr. Bernd Güther)

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Background

- So far, only a few studies exist which explicitly analysed gender differences in CRC test use.
- One main goal of our study was to analyse gender difference in the prevalence of FOBT and colonoscopy use and correlates of that use.

Sample of our study

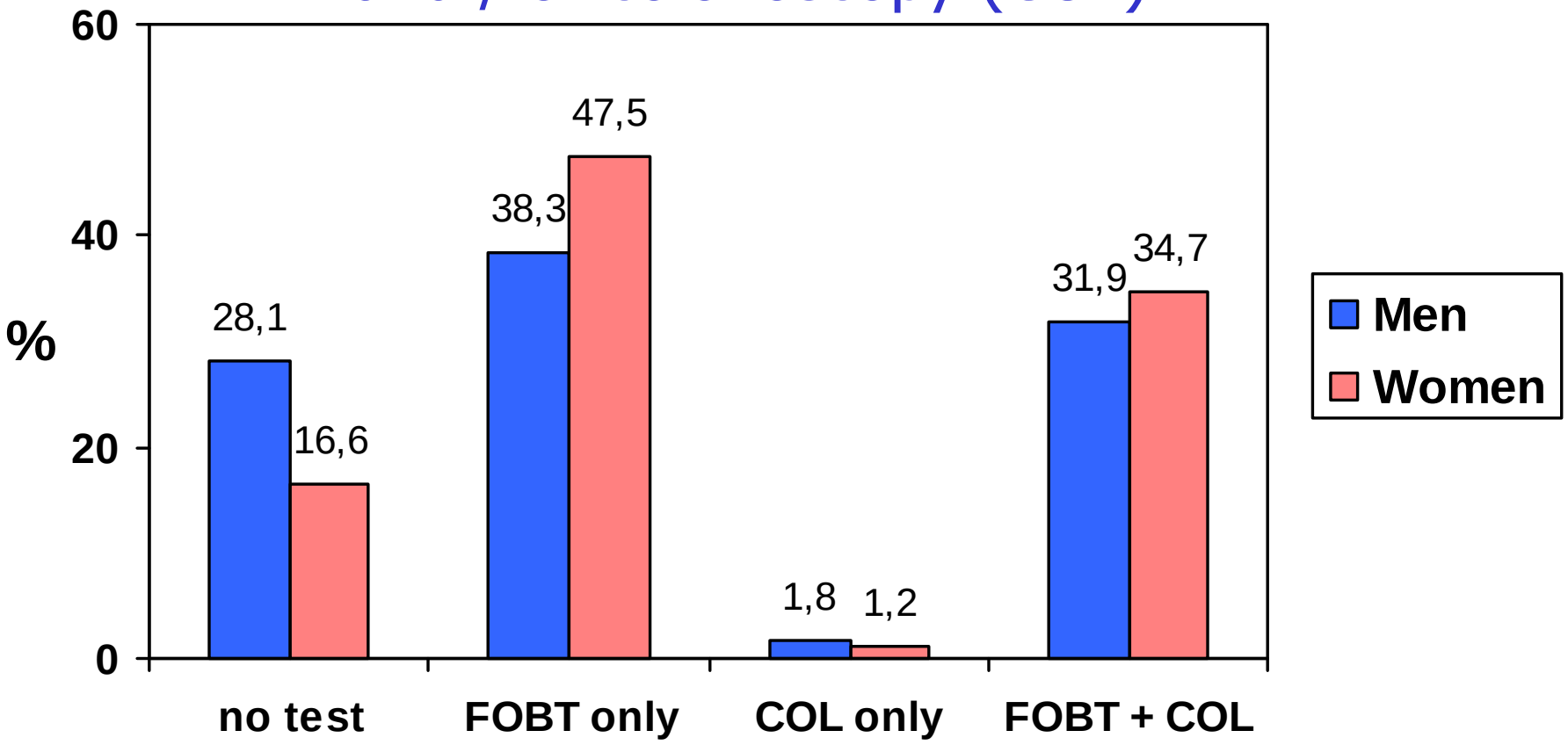
- The data for the study were collected through the Health Care Access Panel (HCAP)*.
- The sample for the present study was constituted by selecting all persons aged 50 – 70 from the HCAP without a personal history of cancer:
- 15,810 adults (7,735 men and 8,075 women), with a mean age of 58 years
- Data collection took place between August and October 2004 by mailed questionnaires.
- Final data were weighed to be nationally respresentative.

*in cooperation with TNS Healthcare (see Potthoff et al., 2004)

Dependent Variables:
Self reports of CRC test use

- Past FOBT use („Test auf verborgenes Blut im Stuhl"):
  - "never"
  - „irregularly"
  - „regularly every 1 – 2 years"
- Past colonoscopy (either diagnostic or screening) use (in German: „Darmspiegelung):
  - „never"
  - „once"
  - „more than once"

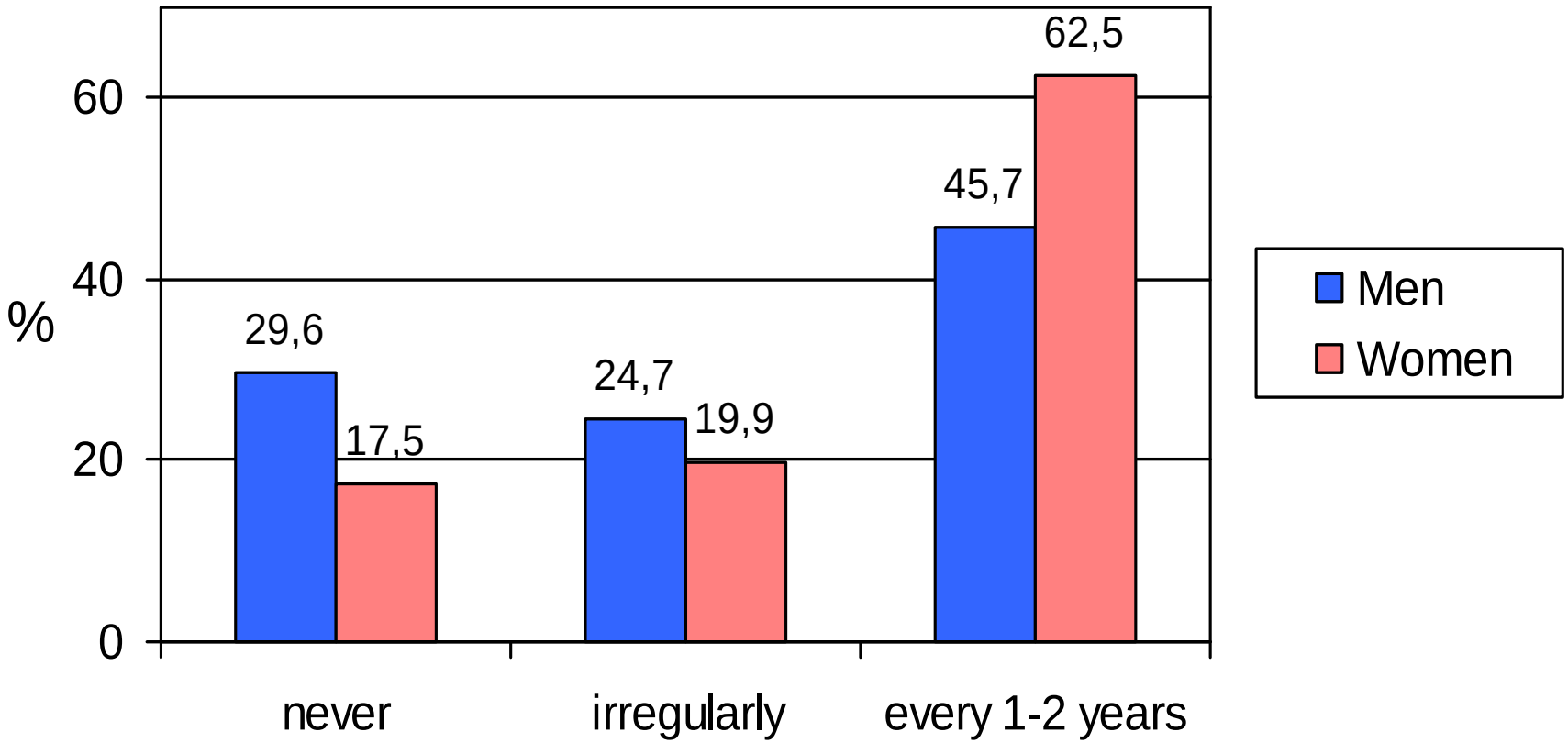
Lifetime use of fecal occult blood test (FOBT) and / or colonoscopy (COL)



The majority of men (72%) and women (83%) reported to have utilized at least one CRC test. The gender difference is significant.

Men and women aged 50 to 70 years (HCAP, *n* = 15810)

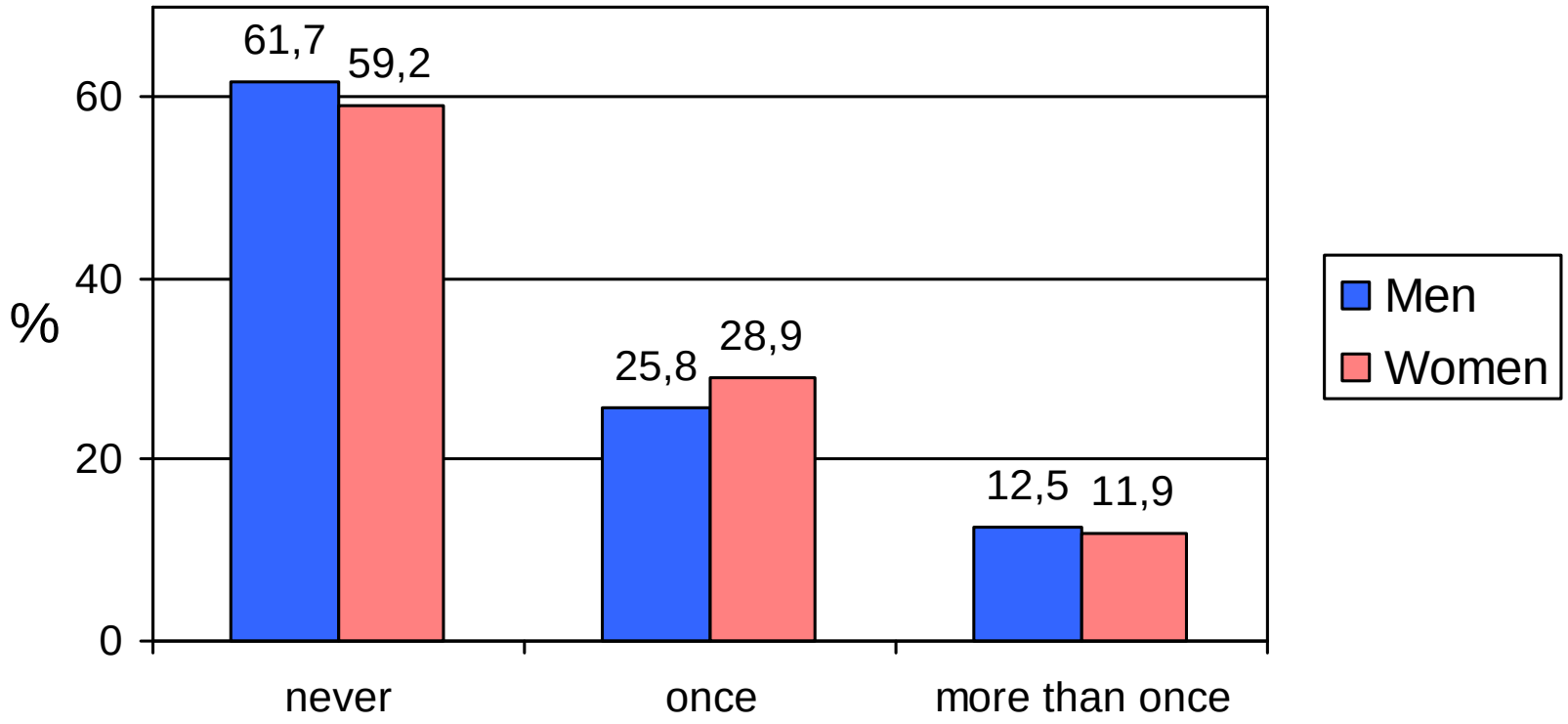
FOBT-Use



In FOBT use, a striking gender difference emerged. Women had used FOBT on a regular basis more often than men.

Men and women aged 50 to 70 years (HCAP, *n* = 15810)

Colonoscopy*-Use



*Screening as well as diagnostic colonoscopies

Although significant gender differences were observed, these were marginal in size.

Men and women aged 55 to 70 years (HCAP, *n* = 10846)

Colonoscopy use

- The gender difference in colonoscopy use in our study is smaller than in the analysis of screening colonoscopies which were introducted 2002 in Germany (Knöpnadel et al: almost 60 % women, 2005; Sieg & Theilmeyer, 2006: 57 % women).
- One explanation could be that more men than women had undergone a colonoscopy for diagnostic reasons.

The following variables were assessed as possible correlates of CRC test use

- Sociodemographic variables
  - Age
  - Marital status (living alone / with partner)
  - Family size
  - Income
  - Education
  - Type of health insurance (public / private)
- „Cues to Action"- Variables
  - Family history of cancer
  - Physician's recommendation
  - Use of Medical Checkup („Checkup 35")

Significant results from linear regression predicting FOBT use*
Step 1: Sociodemographic variables only

Variables	R^2adj.	Beta	Unique Variance
	.05		
Sex		.18	3.0 %
Age		.07	0.4 %
Marital Status		.08	0.4 %
Family Size		-.09	0.5 %
Income		.08	0.4 %
Education		n.s.	
Health Insurance		n.s.	

*Coding from 1 (never) to 3 (regularly every 1 – 2 years)

Significant results from linear regression predicting FOBT use*
Step 2: Sociodemographic + "Cues to action" variables

Variables	R^2adj.	Beta	Unique Variance
	0.40		
Sex		.06	0.3 %
Age		.03	< 0.1 %
Marital Status		.03	< 0.1 %
Family Size		-.04	< 0.1 %
Income		.03	< 0.1 %
Education		.02	< 0.1 %
Health Insurance		.02	< 0.1 %
Use of medical checkup		.52	23.0 %
Physician recommendation		.19	3.0 %
Family history of cancer		.04	0.1 %

*Coding from 1 (never) to 3 (regularly every 1 – 2 years)

Results from multivariate logistic hierarchical regression predicting **colonoscopy use** (yes/no) adjusted for all variables[a]

	Men (n = 5258)		Women (n = 5263)	
	OR	(95 % CI)	OR	(95 % CI)
Sociodemographic variables				
Age				
55-59	1.00		1.00	
60-64	**1.28****	(1.09 – 1.51)	**1.31*****	(1.13 – 1.51)
65-70	**1.20***	(1.01 – 1.43)	**1.55*****	(1.33 – 1.80)
Marital status				
No	1.00		1.00	
Yes	1.20	(0.90 – 1.59)	0.93	(0.75 – 1.16)
Family size				
1	1.00		1.00	
2	**0.57****	(0.42 – 0.79)	0.94	(0.74 – 1.20)
3	**0.60****	(0.42 – 0.87)	0.95	(0.70 – 1.29)
4	0.65	(0.41 – 1.02)	0.81	(0.49 – 1.33)
4+	**0.49***	(0.27 – 0.89)	1.67	(0.75 – 3.70)

[a]Including FOBT-use, *p< .05, **p< .01, ***p< .001

Results from multivariate logistic hierarchical regression predicting **colonoscopy use** (yes/no) adjusted for all variables[a]

	Men (n = 5258)		Women (n = 5263)	
	OR	(95 % CI)	OR	(95 % CI)
Soc.dem. variables (cont.)				
Family income/month				
< 1,750 €	1.00		1.00	
1,750 – 2,749 €	0.98	(0.83 – 1.15)	1.07	(0.93 – 1.24)
≥ 2,750 €	0.90	(0.70 – 1.03)	**1.36****	(1.13 – 1.64)
Education				
9th grade or under	1.00		1.00	
10th grade	1.09	(0.91 – 1.29)	0.98	(0.86 – 1.12)
High school degree	**1.35***	(1.05 – 1.74)	0.83	(0.64 – 1.06)
College degree	1.16	(0.96 – 1.39)	0.88	(0.70– 1.08)
Health insurance				
Public	1.00		1.00	
Private	1.04	(0.85 – 1.27)	0.94	(0.75– 1.20)

[a]Including FOBT-use , *p< .05, **p< .01, ***p< .001

Results from multivariate logistic hierarchical regression predicting **colonoscopy use** (yes/no) adjusted for all variables[a]

	Men (n = 5258)		Women (n = 5263)	
	OR	(95 % CI)	OR	(95 % CI)
Cues to Action Variables				
Family history of cancer				
No	1.00		1.00	
One family member	1.06	(0.78 – 1.22)	**1.30*****	(1.14 – 1.47)
Two or more family	**1.38****	(1.11 – 1.73)	**1.60*****	(1.31 – 1.85)
Medical checkup				
Never	1.00		1.00	
Irregularly	1.00	(0.78 – 1.28)	1.13	(0.90 – 1.44)
Every two years	1.16	(0.90 – 1.50)	**1.63****	(1.29 – 2.05)
Annually	**1.57*****	(1.22 – 2.02)	**1.88*****	(1.50 – 2.34)
Physician's recommendation				
No	1.00		1.00	
Yes	**1.26****	(1.09 – 1.45)	1.08	(0.95 – 1.23)

[a]Including FOBT-use, *p< .05, **p< .01, ***p< .001

Results from multivariate logistic hierarchical regression predicting **colonoscopy use** (yes/no) adjusted for all variables

	Men (n = 5258)		Women (n = 5263)	
	OR	(95 % CI)	OR	(95 % CI)
FOBT				
Never	1.00		1.00	
Irregularly	**8.40*****	(6.38 – 11.05)	**8.43*****	(6.30 –11.26)
Every 1 – 2 years	**11.22*****	(8.49 – 14.81)	**10.41*****	(7.89 – 13.74)

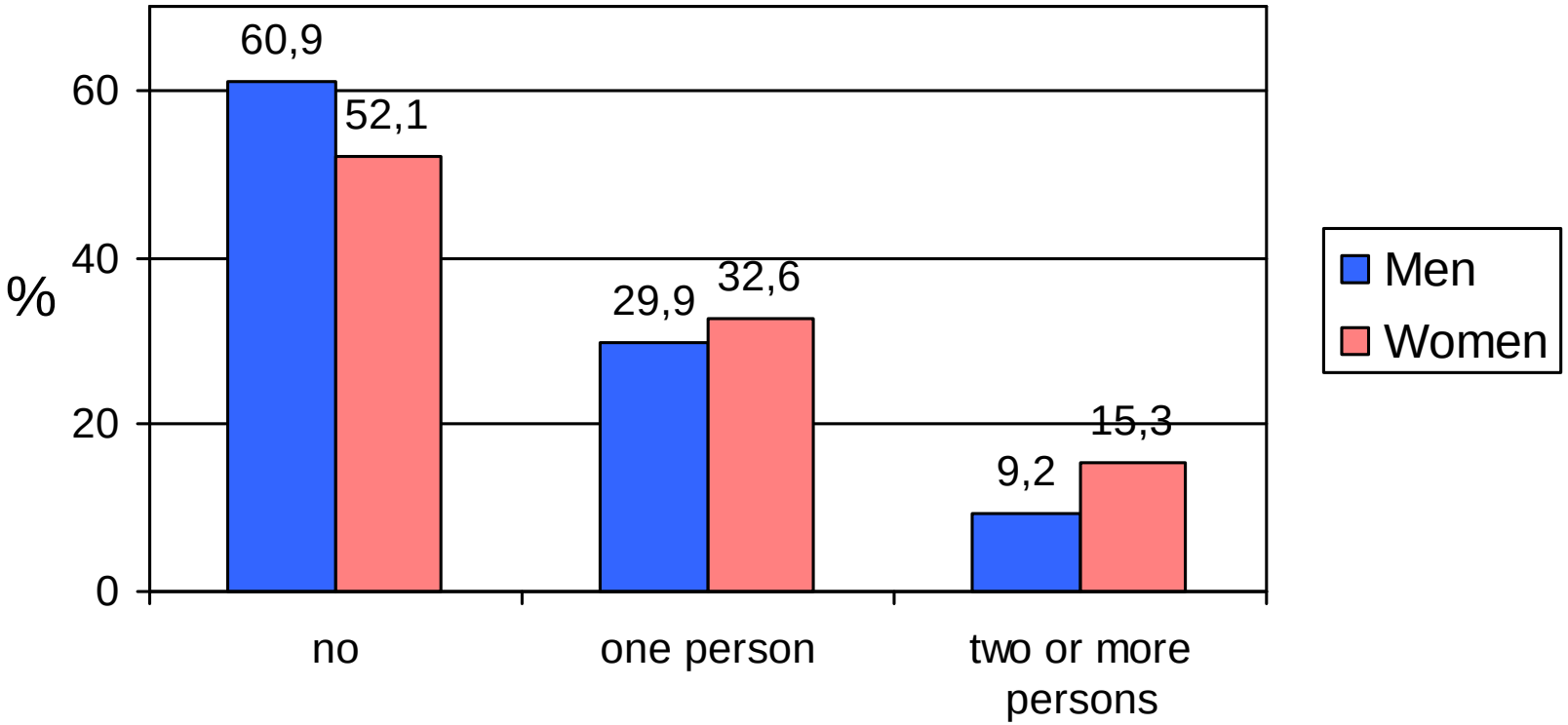
*p< .05, **p< .01, ***p< .001

Main Findings

- Socioeconomic variables were either not significantly associated with CRC test use or explained only a minimal amount of variance in our study.
- The „Cues to Action" variables were more clearly associated with CRC test use:
  - Family history of cancer
  - Physician's recommendation, and especially
  - Attendance of regular medical checkups
- In these „Cues to Action" variables gender differences were found as well:

Gender Differences in the „Cues to Action“ variables:

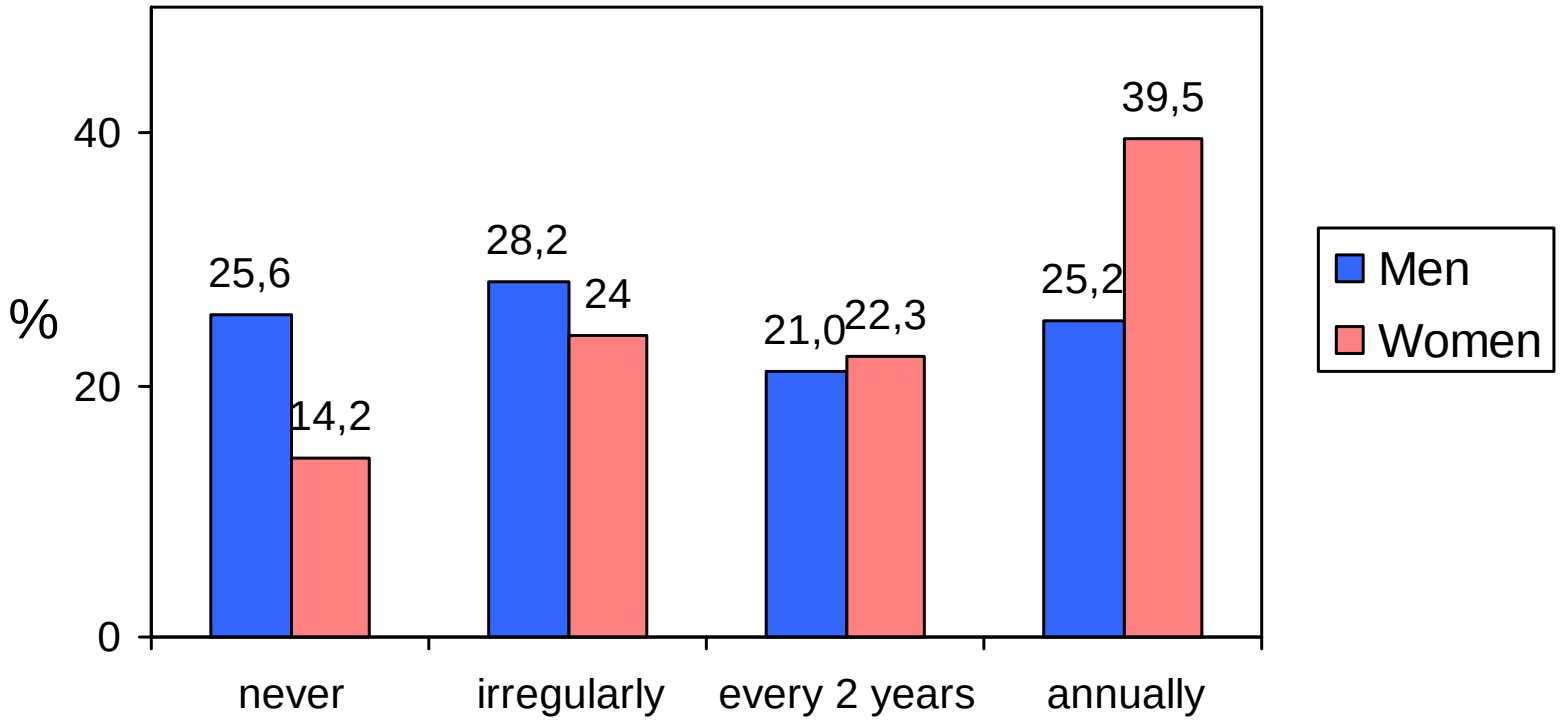
Family history of cancer



Participants were asked whether they had knowledge of (any) cancer amongst their grand parents, parents or siblings, $\chi^2 = 178.6$, $p < .01$

Gender Differences in the „Cues to Action“ variables:

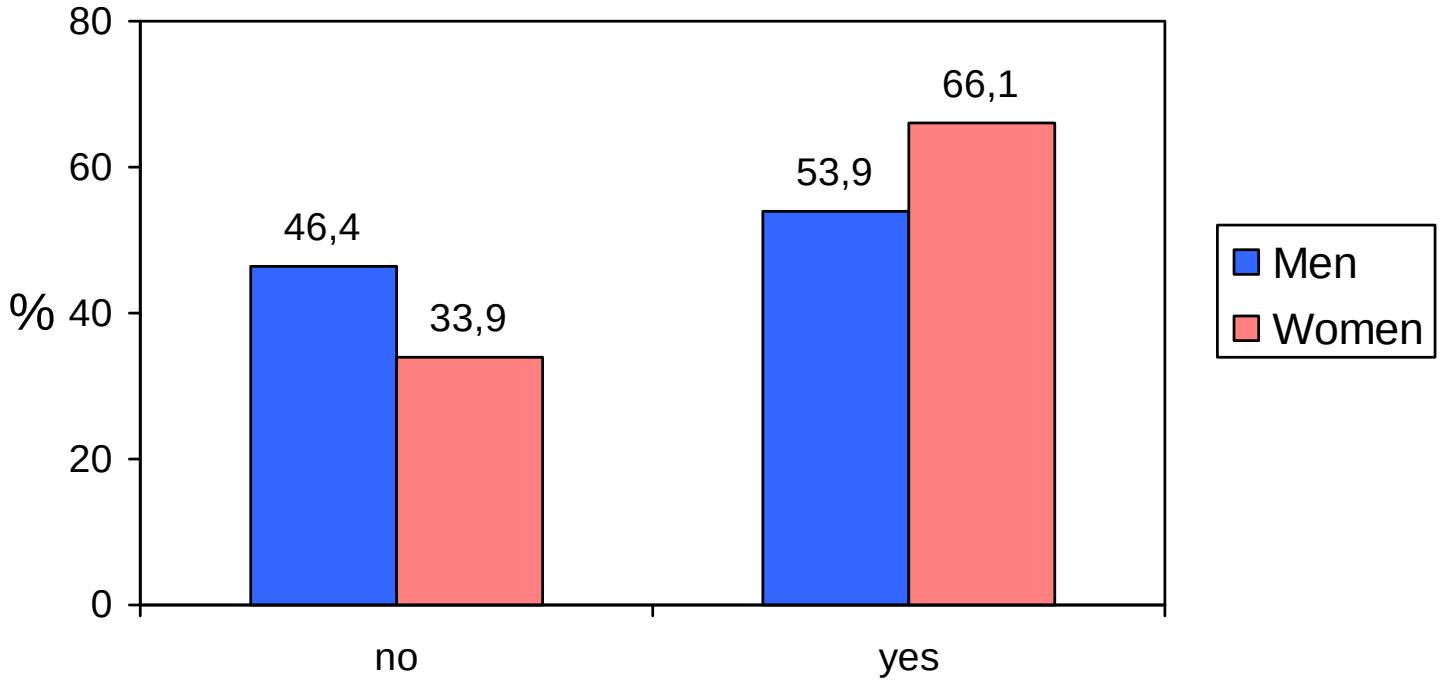
Use of medical checkup



Participants were asked to indicate whether and how regularly they had attended a free medical checkup as provided by the German health care system starting at age 35 ($\chi^2 = 532.2$, $p < .001$)

Gender Differences in the „Cues to Action“ variables:

Physician‘s recommendation



Participants were asked whether a physician had recommended they undergo a test for the early detection of cancer; $\chi^2 = 252.1$, $p < .001$

Summary: Gender Differences in FOBT use

- We found a striking gender difference in FOBT use. In Germany the FOBT is often combined with a medical checkup; the fact that men compared to women attended these checkups less often and less regularly may explain their lower use of FOBT.
- This backs the internationally observed trend of men to generally make less use of the health care system, particularly for preventive reasons.

Summary: Gender Differences in colonoscopy use

- Some interesting differences in correlates of colonoscopy use emerged which might be relevant when planning interventions aimed at improving particiaption rates in men:

Summary: Gender Differences in colonoscopy use

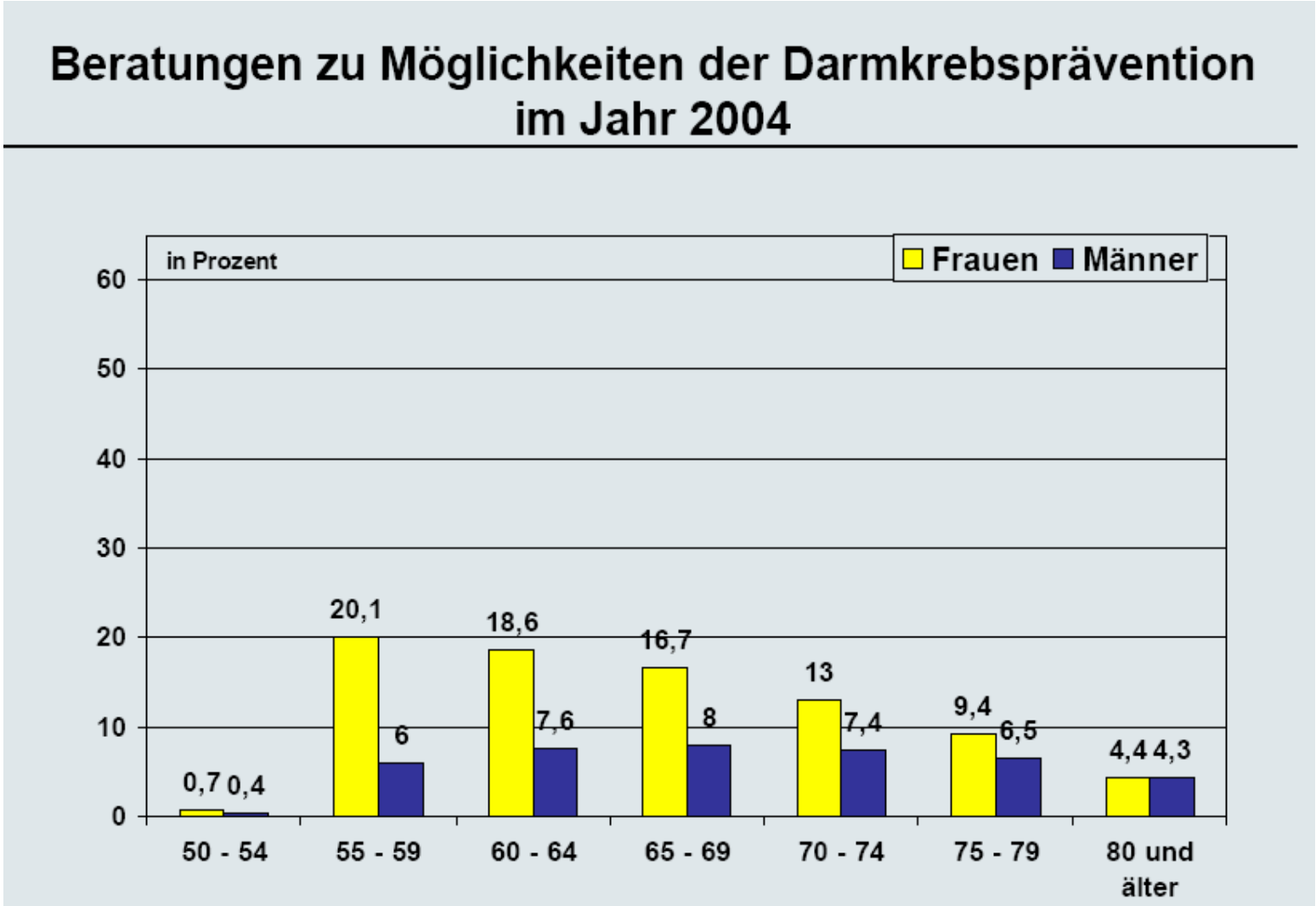
- Among men, only those with two or more family members with cancer were more likely to have undergone colonoscopy.
  - Men also reported family members with cancer significantly less often than women, a finding which was also reported in studies from the UK (Wardle et al., 2005) and the U.S. (McQueen et al., 2006).
- Men needed to undergo medical checkups annually in order to have increased odds to undergo colonoscopy while women had increased odds also when checkups took place every two years.

Conclusion

- These results suggest that men may generally need more intense exposure to health relevant stimuli in order to make the decision to act.
- The fact that nearly half of the men had not received (or could not remember) a physician‘s recommendation and every fourth man had never undergone a medical checkup highlights the need to intensify systematic counseling in men.

Thank you for your attention!

Physician's counseling about possibilities of CRC testing as a function of age and sex of patients in 2004

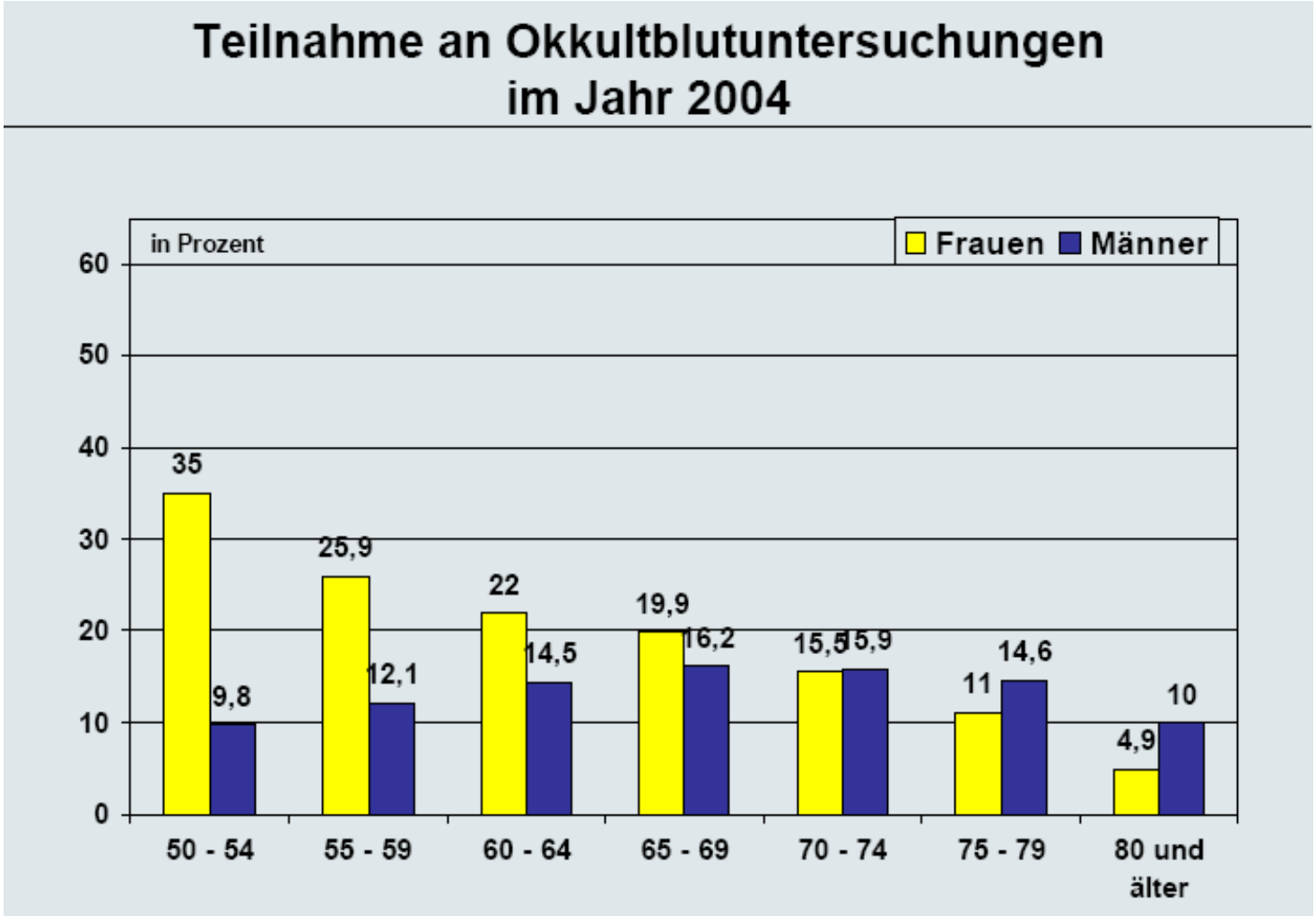


Source: Altenhofen, L. (2006). Zentralinstitut für die Kassenärztliche Versorgung (www.zi-berlin.de)

Background: Gender Differences in (colorectal) cancer test use in Germany

- In the year 2004 e.g., 48 % of eligible women, but only 18 % of eligible men participated in a general examination for the early detection of cancer (Altenhofen, 2006).
- More women then men also make use of the FOBT in one year, e.g. in 2004 ...

Official Statistics: FOBT use as a function of age and sex in one year (2004)



Source: Altenhofen, L. (2006). Zentralinstitut für die Kassenärztliche Versorgung (www.zi-berlin.de)

Gender Differences in Screening Colonoscopy Use

- In Germany after the introduction of screening colonoscopy prevalence of uptake was clearly higher for women:
- Of all the screening colonoscopies carried out in Germany in 2003 almost 60% were obtained by women (Knöpnadel et al., 2005).
- An evaluation of nearly 110.000 screening colonoscopies (carried out from October 2003 to July 2005) found that only 43 % were obtained by males (Sieg & Theilmeier, 2006).

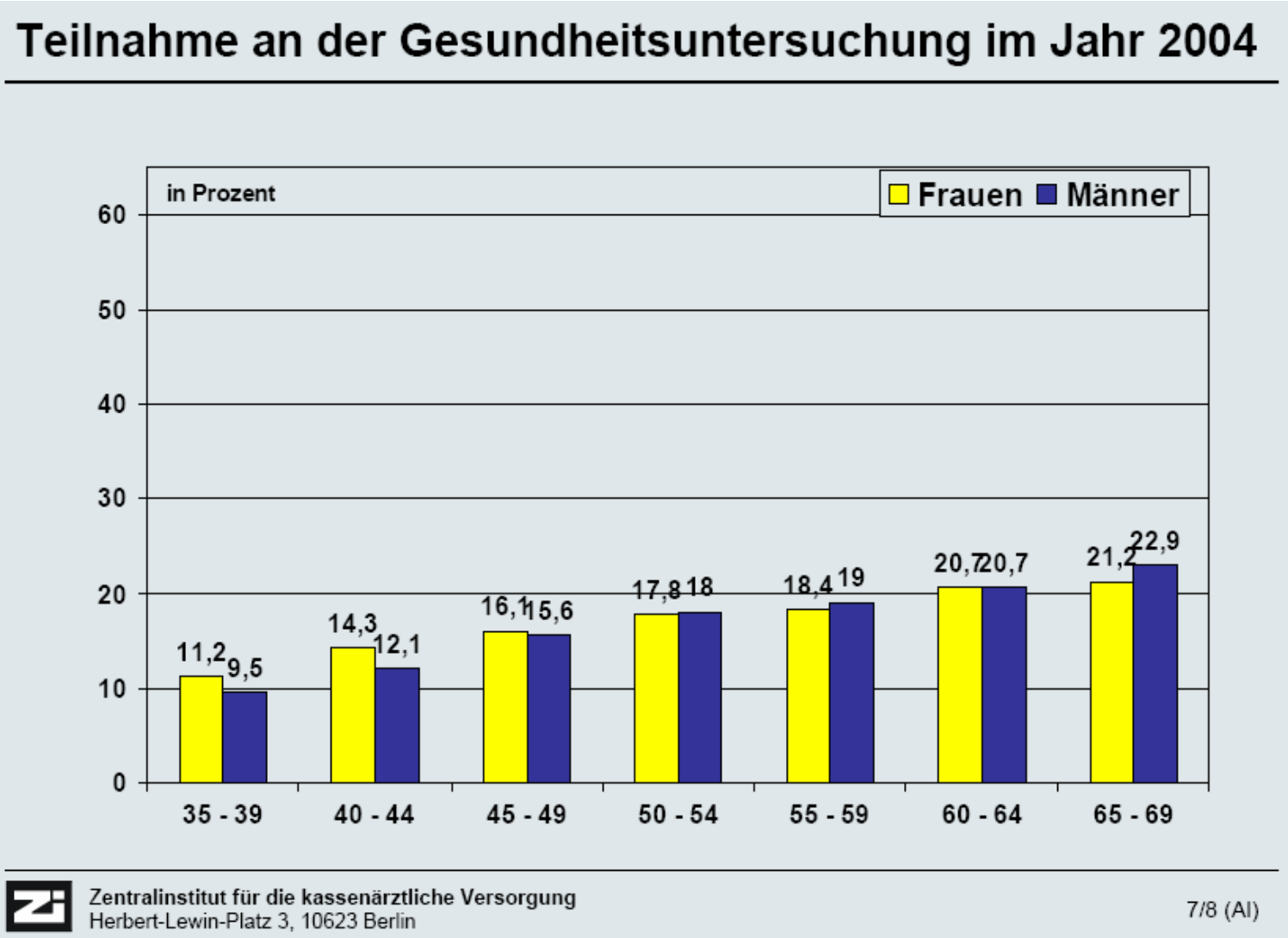
Gender Differences in CRC Test Use

- Wardle and colleagues (2005) cited several European studies finding a higher utilization of FOBT in women than men.
- In Germany, an evaluation of six years (1985 – 1990) of colorectal cancer screening showed that per year about 21 % of the eligible women but only 10 % of the men participated and had a FOBT (Gnauck, 1995).
- The situation for endoscopic procedures appears to be different. In the UK Flexible Sigmoidoscopy Trial more men than women attended screening (Wardle et al., 2005). McQueen and colleagues (2006) also reported gender differences in the uptake of CRC tests as a function of modality for the United States (U.S.). While women reported more use of FOBT (lifetime and in the past year) more men reported repeated endoscopy use.

Gender Differences in CRC Test Use: European Studies

- Wardle et al. (2005): The only study from Europe to explicitly examining prevalence and correlates of CRC test use by gender
- … cited several European studies finding a higher utilization of FOBT in women than men (UK, Denmark, France, Sweden) all of which used 'invitation system'.
- In Germany 'opportunistic system': hence comparisons difficult to make (trigger not letter but other cues, e.g. physician, wife etc)
- Hardcastle et al. (1996); Jorgensen et al. (2002); Rasmussen et al.(1999) only prelavence not correlates by gender reported (mostly trials of efficacy of CRC tests), Tazi et al. (1997) also socioeconomic
- These studies were important in detecting gender differences in acceptance of invitation but have not informed us about what contributes to these differences.

Official statistics: Use of medical checkup as a function of age of patients and sex in 2004



Significant results from linear hierarchical regression predicting FOBT use* for **men**

Step	Variablen	R^2cum	Beta	Unique Variance
1.	*Sociodemographic variables* Age Marital status Family size Income Education Health insurance	.04	 .06 n.s. -.02 .03 n.s. .02	 0.3 % < 0.1 % < 0.1 % < 0.1 %
2.	*Cues to Action* Use of medical checkup Physician's recommendation Familiy history of cancer	.50	 .59 .20 .04	 28.3 % 3.1 % 0.2 %

*Coding from 1 (never) to 3 (regularly every 1 – 2 years)

Significant results from linear hierarchical regression predicting FOBT use for **women**

Step	Variablen	R^2cum	Beta	Unique Variance
1.	*Sociodemographic variables* Age Marital status Family size Income Education Health insurance	.01	 n.s. .04 -.06 .03 n.s. n.s.	 < 0.1 % 0.2 % < 0.1 %
2.	*Cues to Action* Medical checkup Physician's recommendation Familiy history of cancer	.27	 .45 .17 .04	 18.3 % 2.6 % 0.1 %

*Coding from 1 (never) to 3 (regularly every 1 – 2 years)

Correlates of FOBT use

- Socioeconomic factors have no or only marginal influence on FOBT use in both sexes.
- Age is only associated with FOBT use in men, not in women.
- Familiy history of cancer is significantly associated with FOBT use, but the effect is only very small (less than 1 % unique variance in both sexes).
- The most important correlates of FOBT use are physician‘s recommendation and use of medical checkups.

Gender Differences in socioeconomic variables

- Women lived alone more often, held fewer college degrees, reported lower income and held a private health insurance less often than men.
- These results mirror the socioeconomic differences between men and women in the general German population.