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Patient and Physician Gender Concordance in Preventive Care in University Primary Care Settings

AUTHORS

Simone Krähenmann-Müller, MD[1]*, Vanessa S. Virgini, MD[1]*, Manuel R. Blum, MD[1], Bruno R. da Costa, PhD[1,2], Tinh-Hai Collet, MD[3,4], Yonas Martin, BSc[3], Jacques Cornuz, MD, MPH[3], Lukas Zimmerli, MD[5], Jean-Michel Gaspoz, MD, MSc, FACP[6], Douglas C. Bauer, MD[7], Eve A. Kerr, MD, MPH[8,9], Drahomir Aujesky, MD, MSc[1], Nicolas Rodondi, MD, MAS[1]

*contributed equally to the article

Affiliations:

[1]Department of General Internal Medicine, Inselspital, University of Bern, Bern, Switzerland; [2]CTU Bern, Department of Clinical Research and Institute of Social, and Preventive Medicine (ISPM), University of Bern, Bern, Switzerland; [3]Department for Ambulatory Care and Community Medicine, University of Lausanne, Lausanne, Switzerland; [4]Service of Endocrinology, Diabetes, and Metabolism, Lausanne University Hospital, Lausanne, Switzerland; [5]Division of Internal Medicine, University Hospital of Zürich, Zürich, Switzerland; [6]Department of Community Medicine, Primary Care and Emergency Medicine, University Hospitals of Geneva and Faculty of Medicine, Geneva, Switzerland; [7]Division of General Internal Medicine, Department of Medicine, University of California, San Francisco; [8]Division of General Internal Medicine, Department of Medicine, School of Medicine, University of Michigan, Michigan; [9]Center for Clinical Management Research, Veterans Affairs Ann Arbor Healthcare System, Ann Arbor, Michigan.

Corresponding author:

Nicolas Rodondi, MD, MAS
Department of General Internal Medicine
Inselspital, University of Bern, 3010 Bern, Switzerland
Email: Nicolas.Rodondi@insel.ch, Phone: +41 (31) 632 41 63, Fax: +41 (31) 382 43 60

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ABSTRACT

OBJECTIVE:

To assess the quality of preventive care according to physician and patient gender in a country with universal health care coverage.

METHODS:

Retrospective cohort study of 1001 randomly selected patients aged 50-80 years followed over 2 years (2005-2006) in 4 Swiss university primary care settings (Basel, Geneva, Lausanne, Zürich). We used indicators derived from RAND's Quality Assessment Tools and examined percentages of recommended preventive care. Results were adjusted using hierarchical multivariate logistic regression models.

RESULTS:

1001 patients (44% women) were followed by 189 physicians (52% women). Female patients received less preventive care than male patients (65.2% vs. 72.1%, $p<0.001$). Female physicians provided significantly more preventive care than male physicians ($p=0.01$) to both female (66.7% vs. 63.6%) and male patients (73.4% vs. 70.7%). After multivariate adjustment, differences according to physician ($p=0.02$) and patient gender ($p<0.001$) remained statistically significant. Female physicians provided more recommended cancer screening than male physicians (78.4 vs. 71.9%, $p=0.01$).

CONCLUSIONS:

In Swiss university primary care settings, female patients receive less preventive care than male patients, with female physicians providing more preventive care than male physicians. Greater attention should be paid to female patients in preventive care and to why female physicians tend to provide better preventive care.

INTRODUCTION

The proportion of female physicians has increased over the last decades, particularly in primary care (Phillips et al., 2009). Several studies have reported physician gender differences in preventive health care, especially for gender-specific preventive services (e.g. screening mammograms, Pap smears) or chronic disease care (Schmittdiel et al., 2009; Lurie et al., 1993; Roter et al., 2002). However, only limited data exist on the role of patient and physician gender and gender concordance in the broad spectrum of preventive care (Franks et al., 2003; Flocke et al., 2005; Henderson et al., 2001). Since the time of these studies, standard indicators of quality of preventive and chronic disease care have been developed and evaluated in the United States, such as the RAND's Quality Assessment Tools, a quality assessment system consisting of over 30 conditions and prevention items (McGlynn et al., 2003; Asch et al., 2006). However, continental Europe, and more specifically Switzerland, a country with universal healthcare coverage, have limited documentation about the quality of preventive care, and have no data on the quality of preventive care according to gender. Switzerland differs from the US healthcare system on several points. Switzerland has universal healthcare coverage with no standardized preventive recommendations, systematic performance monitoring, annual reports on quality of care or financial incentives.

Among a random sample of 1001 patients followed in 4 university primary care settings in Switzerland, we aimed to examine gender influences in preventive care, to assess the association between physician gender, patient-physician gender concordance and the quality of preventive care measured by standard indicators of quality of preventive care. Our hypothesis was that there would be no differences between patient and physician gender.

METHODS

Study Design and Patients

Detailed methodology was previously described by Collet et al. (2011). We abstracted medical charts from a random sample of 1001 patients followed for at least one year by primary care practitioners in 4 Swiss university primary care settings (Basel, Geneva, Lausanne and Zürich) in a retrospective cohort study. The random sample was identified from electronic administrative data of all patients aged 50 to 80 years followed in 2005-2006. We limited our sample to this age group to have a high prevalence of examined indicators (e.g. eligibility for cancer screening or influence immunization). Among 1889 initially identified patients, 54 charts could not be found, probably because the patients decided to leave the university clinical setting for another primary care practice, 591 had <1 year follow-up in the primary care setting during the review period, 125 patients had no visit to a primary care physician during the analyzed period and 117 were followed only in a specialized clinic. To have adequate follow-up time and data to assess provided preventive care services, patients who were followed in the primary care setting for < 1 year were excluded. Finally, the sample included 1002 abstracted medical charts. Because of missing data on one physician, we had to exclude one last patient, which led to a final sample of 1001 patients. As this cohort study mainly aimed at assessing rates of preventive care, there was no formal sample size calculation. We used a convenience sample for this study, with similar number of participants to a previous study on quality of care indicators (ref Kerr et al, 2003). This study was approved by the Ethics Committee of Basel, the Human Research Ethics Committee of Geneva, the Human Research Ethics Committee of Vaud, and the Ethics Committee of Zürich, at the sites of Basel, Geneva, Lausanne, and Zürich respectively. Because of the retrospective cohort design and the anonymization of patient data, individual patient consent was waived by the approving Institutional Review Boards.

Quality Indicators

As previously reported (Collet et al., 2011), we used 14 quality indicators derived from the English version of RAND's Quality Assessment Tools pertaining to preventive care (physical examination: 3 indicators; health behavioral counseling: 7 indicators; cancer screening: 2 indicators; influenza immunization: 2 indicators) and calculated percentages of recommended preventive care according to physician and patient gender. We did not use translation of the RAND's QA Tools, as there was no validated version of this tool in official Swiss languages (German, French, Italian and Romansh). The selected indicators focused on processes of care, because they represent the activities that clinicians control most directly (McGlynn et al., 2003). We did not include preventive care indicators that were not applicable to the Swiss primary practitioner care settings (e.g., pregnancy follow-up or Pap smear not performed in university primary care settings in Switzerland) (Collet et al., 2011). To balance the groups for the potential of preventive care according to gender, we performed a sensitivity analysis excluding breast cancer, all other indicators applying to both gender equally.

Chart Abstraction

A data abstraction form was created to assess the 14 selected indicators for preventive care derived from RAND's QA Tools (Collet et al., 2011). Other abstracted covariates (e.g. demographics) were based on a chart abstraction form from the TRIAD study (Translating Research into Action for Diabetes), a study designed to assess the quality of diabetes care in the United States (Kerr et al., 2004). Nine medical students were centrally trained for direct data abstraction from paper medical charts in the four Swiss university primary care settings.

Statistical Analysis

For each selected indicator of preventive care, we calculated the percentage of provided care by dividing all episodes in which recommended care was delivered by the number of

times patients were eligible for indicators (overall percentage method)(Reeves et al., 2007). To focus on the physicians' behavior, preventive care was considered provided, regardless of whether the patient accepted the recommendations or not. The results were presented as percentages with 95% binominal exact confidence intervals (CI). To summarize the selected indicators, we calculated aggregate scores for the different categories of prevention, such as physical examination, health behavioral counseling, cancer screening, immunization and a global aggregate score for preventive care. To compare differences in percentages of recommended preventive care and to assess the association between demographic characteristics and the proportion of provided care, we used hierarchical multivariate logistic regression models to account for correlation of multiple measurements for the same patient and for clustering of patients within the different treatment centers. Models were adjusted for characteristics specific to physicians (physicians' age, function and center) as well as for patients' characteristics (patients' age and occupation) to account for potential socio-economic differences. To assess patient-physician gender concordance, interaction effects were used by inserting a global patient-physician gender interaction term into the models, as done in a previous study (Schmittdiel et al., 2009). A p for interaction <0.05 indicates that the relationship between preventive care and patient gender differed depending on the physician's gender, for example if male physicians provided better care to male patients and female physicians provided better care to female patients. All statistical analyses were performed with Stata software (Version 12.1, Stata Corp., College Station, TX). All p-values are 2 sided.

RESULTS

Characteristics of Patients and Physicians

The 1001 patients were followed by 189 physicians. The mean age of our patient sample was 63.5 years and 44% were female patients (Table 1). The proportions of married patients, Swiss citizens, patients employed or retired did not significantly differ according to physician gender. Over the 2-year review period, the median number of outpatient visits was 10. Most patients (97.6%) were followed by the 179 residents in general internal medicine at the end of their postgraduate training, while 24 patients (2.4%) were directly treated by 10 university attendings. The mean age of physicians was 34.2 years (SD 5.8, age range 24.5-64.1 years) (Table 2). A total of 90 physicians were male and 99 were women (52.4%).

Analysis of Provided Care

Table 3 shows the global aggregate scores for preventive care according to gender concordant and discordant patient-physician pairs. Overall, patients received 69% of recommended preventive care (unadjusted results). Female patients received less preventive care than male patients (65.2% vs. 72.1%, $p<0.001$). Female physicians provided significantly more preventive care than male physicians ($p=0.01$) to both female (66.7% vs. 63.6%) and male patients (73.4% vs. 70.7%, Figure 1). After multivariate adjustment, female patients still received significantly less recommended preventive care than male patients ($p<0.001$) and female physicians provided significantly more preventive care than male physicians ($p=0.04$) to both female (88.8% vs. 87.7%) and male patients (91.6% vs. 90.7%). Physicians' age was the largest negative confounding factor, indicating that older physicians provide less preventive care (p for trend across age 0.03, after adjustment for resident/attending status). As patients were mostly followed by residents (97.6% of patients), we performed a sensitivity analysis excluding the attending physicians, which showed that the results were consistent. In fact, female patients still received less preventive care than male patients (65.2% vs. 72.4%, $p<0.001$). Female physicians provided

significantly more preventive care than male physicians (p=0.01) to both female (66.6% vs. 63.8%) and male patients (73.6% vs. 71.1%)

We found no evidence of gender concordance for preventive care among gender concordant patient-physician pairs (p for interaction=0.78). Table 4 shows the aggregate scores for different categories of prevention according to patient and physician gender. Male patients received significantly more preventive care compared to female patients concerning alcohol counseling (95.6% from female physicians and 96.3% from male physicians vs. 88.8% and 90.4% respectively, p<0.001 for patient gender, Table 4) and smoking cessation counseling (95.7% from female physicians and 95.2% from male physicians vs. 94.1% and 93.5% respectively, p=0.03 for patient gender). Table 5 shows the specific provided preventive care according to gender concordance between patients and physicians. Male patients received significantly more preventive care concerning annual blood pressure measurement (p=0.04) and annual influenza vaccination in patients ≥65 years (p=0.02). Female physicians provide significantly more preventive care than male physicians, particularly for colon cancer screening (38.6% vs. 30.9%, p=0.01). After excluding breast cancer from indicators of recommended preventive care, female patients still received less preventive care than male patients (68.0% vs. 72.1%, p<0.001). Female physicians provided significantly more preventive care than male physicians (p=0.04) to both female (69.5% vs. 66.4%) and male patients (73.4% vs. 70.7%). After multivariate adjustment, differences according to physician (p=0.001) and patient gender (p=0.04) remained statistically significant.

DISCUSSION

Applying standard indicators of preventive care developed in the US (McGlynn et al., 2003), we found that female patients receive less preventive care than male patients and female physicians provide significantly more preventive care than their male colleagues, particularly for colon cancer screening in Swiss university primary care settings. We found no evidence of gender concordance for preventive care among gender concordant patient-physician pairs.

In the US several studies have been conducted about the impact of patient and physician gender and patient-physician gender concordance on primary care (Schmittdiel et al., 2009; Lurie et al., 1993; Roter et al., 2002). Flocke et al., 2005, used quality indicators derived from the US Preventive Services Task Force and found that female physicians provide more counseling services and immunizations than male physicians and no patient-physician gender concordance for delivery of preventive care. Other studies also found that female physicians deliver better preventive care for specific preventive services, such as physical examination (Franks et al., 2003), health behavioral counseling (Flocke et al., 2005; Henderson et al., 2001), cancer screening (Lurie et al., 1993; Franks et al., 2003) and immunizations (Flocke et al., 2005). However, comparisons with US studies should be only done with caution, as Switzerland differs from the United States healthcare system on several points, as described in the introduction.

Although our study was not designed to assess the reasons why female tended to provide better preventive care, we hypothesize that female physicians may be more patient-centered in their communication with patients (Bertakis et al., 2009; Roter et al., 2004). As the majority of the physicians in this study were residents, our findings suggest that the current training in medical school and early residency on prevention might be improved. Steps should be taken to reduce the gap in preventive care provided by male and female residents. For example, the use of standardized protocols and forms during consultations might reduce the gender imbalance. In addition, specific curriculum development in

medical school and residency may increase awareness of patient and physician gender-specific differences in preventive care. This is of particular importance in the Swiss healthcare system, as most general internal medicine residents will become general practitioners in private practice who provide primary and preventive care to the majority of the population. The lack of gender concordance for preventive care among gender concordant patient-physician pairs is consistent with some previous studies on gender neutral preventive services (Flocke et al., 2005; Henderson et al., 2001). Other studies have found that female patients treated by female physicians had higher scores for delivered female prevention procedures (Lurie et al., 1993; Franks et al., 2003). One hypothesis to explain these results was an easier performance of breast screening mammography because of gender concordance. Differences between these studies and the present one may be partly explained by age, as our study was limited to patients aged 50-80.

To our knowledge, this is the first study that assessed patient and physician gender concordance on the broad spectrum of preventive care indicators in Europe. As strengths, we had a large sample of patients aged 50-80 years, which led to enough power to detect potentially clinically relevant differences in preventive care between groups of patients. Patients were randomly sampled from all medical records available, which guaranteed a 100% participation rate and minimized selection bias.

Our study has two main limitations. As previously reported (Collet et al., 2011), our data were only abstracted from medical charts with potential underreport. A previous study compared process-based quality scores using standardized patients, clinical vignettes and abstraction of medical charts and found that measurement of quality of care using abstraction of medical charts was about 5% lower than using clinical vignettes and 10% lower than using standardized patients (Peabody et al., 2000). For influenza immunization, we validated the influenza immunization indicators with an external administrative register at one site (Lausanne), and found that 8% of patients had actually been immunized

although this information was not reported in the medical chart, a similar rate as in the previous report described above (Peabody et al., 2000). A second limitation was that our data were abstracted in university primary care settings where almost all patients were treated in the first instance by residents at the end of their postgraduate training. Our sample included few patients followed by attendings, but a previous study found similar performance rates of preventive care between residents and attendings (Dresselhaus et al., 2004). However, our data may not be generalizable to community-based primary care physicians. Third, in Switzerland cervical cancer screening is not performed in university primary care settings, because it is not part of the clinical training in general internal medicine. We could therefore not assess the performance of Pap smears.

In conclusion, applying RAND's Quality Assessment Tools, female patients in university primary care settings receive less preventive care than male patients, which suggests that greater attention should be paid to female patients in preventive health care. Additionally, female physicians – mainly residents - provide significantly more preventive care than their male colleagues, which should be taken into account for resident training. Future studies should explore why female physicians tend to provide better preventive care.

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Preliminary results were presented at the SGIM 36th annual meeting April 2013, in Denver, Colorado and at the 81th Annual Meeting of the Swiss Society of General Internal Medicine, May 2013, Basel, Switzerland.

POTENTIAL CONFLICTS OF INTEREST

An investigator-initiated grant from Pfizer (Switzerland) was provided only for data collection and analysis, but Pfizer had no role in the study design, the choice of statistical analyses, or the preparation of the manuscript.

Table 1. Baseline characteristics of 1001 adults aged 50-80 years in 4 Swiss university primary care settings (Basel, Geneva, Lausanne, Zürich) followed over 2 years (2005-2006)

	All	99 Female physicians	90 Male physicians	p-value for difference
Gender, n (%)				0.08
Female	444 (44.4)	255 (46.9)	189 (41.4)	
Male	557 (55.6)	289 (53.1)	268 (58.6)	
Age, mean (SD)	63.5 (8.3)	63.4 (8.4)	63.5 (8.1)	0.83
Civil status, n (%)				0.06
Married	506 (51.0)	292 (54.3)	214 (47.1)	
Divorced, separated	232 (23.4)	109 (20.3)	123 (27.1)	
Single	151 (15.2)	80 (14.9)	71 (15.6)	
Widow, -er	103 (10.4)	57 (10.6)	46 (10.1)	
Birth place, n (%)				0.30
Switzerland	458 (46.2)	251 (46.8)	207 (45.5)	
Europe	195 (19.7)	100 (18.7)	95 (20.9)	
Eastern Europe	177 (17.8)	99 (18.5)	78 (17.1)	
Africa	59 (6.0)	38 (7.1)	21 (4.6)	
Latin America	53 (5.4)	23 (4.3)	30 (6.6)	
Other	49 (4.9)	25 (4.7)	24 (5.3)	
Social status, n (%)				0.28
Swiss	559 (57.9)	305 (58.4)	254 (57.3)	
Residence permit	325 (33.7)	180 (34.5)	145 (32.7)	
Asylum seeker, immigrant	81 (8.4)	37 (7.1)	44 (9.9)	
Occupation, n (%)				0.60
Retired	371 (37.8)	201 (37.4)	170 (38.3)	
Employed	285 (29.1)	158 (29.4)	127 (28.6)	
At home, in education	115 (11.7)	70 (13.0)	45 (10.1)	
Social aid	109 (11.1)	56 (10.4)	53 (11.9)	
Unemployed, other	101 (10.3)	52 (9.7)	49 (11.0)	
Confession, n (%)				0.85
Catholic	236 (35.9)	126 (35.1)	110 (36.8)	
Protestant	112 (17.0)	65 (18.1)	47 (15.7)	
Muslim	111 (16.9)	63 (17.6)	48 (16.1)	
Other	105 (16.0)	57 (15.9)	48 (16.1)	
None	94 (14.3)	48 (13.4)	46 (15.4)	
BMI, n (%)				0.90
<30 kg/m^2	471 (47.0)	255 (46.9)	216 (47.3)	
≥30 kg/m^2	530 (53.0)	289 (53.1)	241 (52.7)	
N of visits, median (IR)	10 (7-15)	10 (7-15)	10 (7-15)	0.64

Abbreviations: N, number; SD, standard deviation; BMI, body mass index; IR, interquartile range.

Table 2. Baseline characteristics of physicians according to their gender in 4 Swiss university primary care settings (Basel, Geneva, Lausanne, Zürich) followed over 2 years (2005-2006)

	All N=189	Female physician N=99	Male physician N=90	p-value for difference
Age, mean (SD)	34.2 (5.7)	33.6 (4.4)	34.9 (6.9)	0.14
Function, n (%)				0.05
Resident	179 (94.7)	97 (98.0)	82 (91.1)	
Attending	10 (5.3)	2 (2.0)	8 (8.9)	
University Primary Care Settings, n (%)				0.10
Basel	45 (23.8)	18 (18.2)	27 (30.0)	
Geneva	58 (30.7)	37 (37.4)	21 (23.3)	
Lausanne	46 (24.3)	22 (22.2)	24 (26.7)	
Zürich	40 (21.2)	22 (22.2)	18 (20.0)	

Abbreviations: N, number; SD, standard deviation

Table 3. Provided preventive care, according to patient-physician gender concordance in 4 Swiss university primary care settings (Basel, Geneva, Lausanne, Zürich) followed over 2 years (2005-2006)

Aggregate scores, point estimate (95% CI)	N patients	Female patients		Male patients		p-values		
		Female physician	Male physician	Female physician	Male physician	Patient gender	Physician gender	Interacti
		255	189	289	268			
Provided preventive care %, unadjusted	1001	66.7 (57.2-75.1)	63.6 (53.8-72.5)	73.4 (64.8-80.6)	70.7 (61.6-78.3)	<0.001	0.01	0.70
Provided preventive care %, multivariate adjusted[a]	1001	84.6 (78.1-89.5)	83.0 (75.9-88.4)	88.4 (83.2-92.2)	87.2 (81.4-91.3)	<0.001	0.02	0.94
Provided preventive care %, multivariate adjusted[b]	981	88.8 (80.0-94.0)	87.7 (78.2-93.4)	91.6 (84.7-95.6)	90.7 (83.2-95.1)	<0.001	0.04	0.78

Abbreviations: CI, confidence interval; N, number.
[a] Data adjusted for physicians' age, function and clustering within centers.
[b] Data adjusted for patients' age, occupation and for physicians' age, physicians' function (resident, attending) and clustering within centers.
[c] Interaction effect is determined by inserting a global patient-physician gender interaction term into the models. A p for interaction < 0.05 indicates that the relationship between preventive care and patient gender differs depending on the physician's gender.

Table 4. Specific provided preventive care, according to gender concordance between patients and physicians in 4 Swiss university primary care settings (Basel, Geneva, Lausanne, Zürich) followed over 2 years (2005-2006)

	Overall		Female patients		Male patients		p-values		
	Female physician	Male physician	Female physician	Male physician	Female physician	Male physician	Patient gender	Physician gender	Interactio
Aggregate score for physical examination, % (95 CI)	97.6 (93.6-99.1)	97.2 (92.7-99.0)	97.3 (93.0-99.0)	97.0 (92.0-98.9)	97.8 (94.1-99.2)	97.5 (93.3-99.1)	0.13	0.30	0.23
Aggregate score for alcohol consumption counseling, % (95 CI)	94.1 (65.3-99.3)	95.1 (69.1-99.4)	88.8 (52.3-98.3)	90.4 (55.7-98.6)	95.6 (73.5-99.4)	96.3 (76.1-99.5)	< 0.001	0.46	0.99
Aggregate score for smoking cessation counseling, % (95CI)	95.0 (83.8-98.6)	94.6 (82.5-98.5)	94.1 (81.3-98.2)	93.5 (79.7-98.2)	95.7 (85.8-98.8)	95.2 (84.5-98.7)	0.03	0.54	0.57
Aggregate score for cancer screening, % (95 CI)	78.4 (53.1-92.1)	71.9 (44.3-89.1)	78.9 (53.7-92.4)	72.5 (45.0-89.5)	77.7 (51.8-91.9)	71.0 (43.1-88.8)	0.58	0.01	0.52
Aggregate score for influenza immunization, % (95 CI)	46.3 (17.9-77.3)	39.1 (13.6-72.4)	42.0 (15.3-74.4)	23.7 (11.4-68.8)	49.8 (19.9-79.8)	42.1 (15.0-75.0)	0.07	0.07	0.39
Global aggregate score for Preventive Care, % (95 CI)	86.6 (80.7-90.9)	85.4 (79.0-90.1)	84.6 (78.1-89.5)	83.0 (75.9-88.4)	88.4 (83.2-92.2)	87.2 (81.4-91.3)	< 0.001	0.02	0.94

Mixed-effects logistic regression model, adjusted for patient and physician gender, physicians' age, physicians' function (resident, attending) and clustering by center and patient (as random effects).

Interaction effect is determined by inserting a global patient-physician gender interaction term into the models. A p for interaction < 0.05 indicates that the relationship between preventive care and patient gender differs depending on the physician's gender.

Abbreviations: CI, confidence interval.

Table 5. Specific provided preventive care according to gender concordance between patients and physicians in 4 Swiss university primary care settings (Basel, Geneva, Lausanne, Zürich) followed over 2 years (2005-2006)

	Overall		Female patients		Male patients		p-values		
	Female physician	Male physician	Female physician	Male physician	Female physician	Male physician	Patient gender	Physician gender	Interaction
Physical examination, n (%)									
Annual blood pressure measurement	517 (95.0)	434 (95.0)	237 (92.9)	177 (93.7)	280 (96.9)	257 (95.9)	0.04 *	0.79	0.54
Weight measurement	521 (95.8)	431 (94.3)	247 (96.9)	176 (93.1)	274 (94.8)	255 (95.2)	0.98	0.27	0.24
Height measurement	422 (77.6)	331 (72.4)	207 (81.2)	133 (70.4)	215 (74.4)	198 (73.9)	0.46	0.14	0.32
Aggregate score for physical examination, % (95 CI)	92.0 (82.3-96.6)	90.5 (79.5-95.9)	91.3 (80.8-96.3)	89.7 (77.7-95.6)	92.5 (83.1-96.9)	91.1 (80.4-96.2)	0.20	0.13	0.41
Alcohol consumption counseling, n (%)									
Asked about drinking problem	366 (67.3)	305 (66.7)	164 (64.3)	114 (60.3)	202 (69.9)	191 (71.3)	< 0.001 ***	0.63	0.70
Advice to decrease drinking for at-risk or binge drinkers	50 (74.6)	52 (80.0)	8 (66.7)	7 (87.5)	42 (76.4)	45 (79.0)	0.89	0.28	0.40
Aggregate score for alcohol consumption counseling, % (95 CI)	77.8 (39.5-94.9)	80.8 (43.6-95.8)	65.9 (26.9-91.0)	69.0 (29.5-92.2)	83.7 (48.6-96.6)	85.6 (51.9-97.0)	< 0.001	0.53	0.84
Smoking cessation counseling, n (%)									
Smoking status documented	433 (79.6)	356 (77.9)	198 (77.7)	137 (72.5)	235 (81.3)	219 (81.7)	< 0.001 ***	0.96	0.95
Annual advice to quit smoking	87 (73.7)	78 (69.6)	25 (69.4)	21 (70.0)	62 (75.6)	57 (69.5)	0.73	0.31	0.56
Counseling offered to smokers	26 (70.3)	26 (65.0)	4 (40.0)	10 (71.4)	22 (81.5)	16 (61.5)	0.27	0.69	0.03 *
Pharmacotherapy offered to smokers attempting to quit if > 10 cigarettes/day	18 (48.7)	19 (47.5)	5 (50.0)	6 (42.9)	13 (48.2)	13 (50.0)	0.84	0.97	0.52
Abstinence documented 4 weeks after smoking cessation counseling	11 (42.3)	13 (50.0)	3 (75.0)	6 (60.0)	8 (36.4)	7 (43.8)	0.28	0.78	0.58
Aggregate score for smoking cessation counseling, % (95CI)	78.7 (64.4-88.3)	76.3 (61.0-86.8)	75.6 (59.6-86.7)	72.8 (55.9-85.0)	80.8 (66.7-89.8)	78.4 (63.3-88.4)	0.05	0.31	0.77
Cancer screening, n (%)									
Screening for colon cancer (aged 50-80 yrs)	207 (38.6)	138 (30.9)	91 (36.0)	56 (30.6)	116 (40.9)	82 (31.2)	0.66	0.01 **	0.73
Screening for breast cancer (aged 50-70 yrs)	73 (41.0)	52 (39.4)	73 (41.0)	52 (39.4)	-	-	-	0.70	-
Aggregate score for cancer screening, % (95 CI)	38.5 (28.7-49.4)	30.9 (22.0-41.5)	39.2 (29.0-50.5)	31.6 (22.2-42.7)	37.6 (27.4-49.1)	30.1 (21.0-41.2)	0.61	0.01	0.41
Influenza immunization, n (%)									

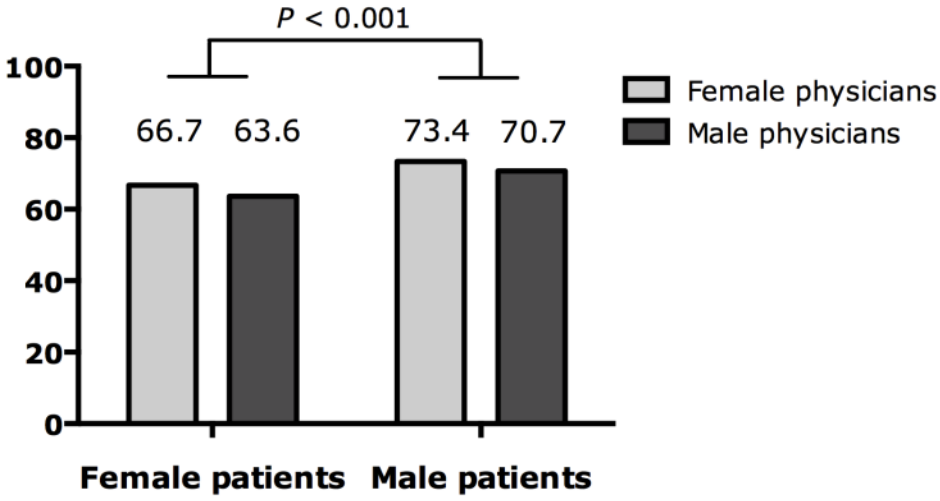
Annual influenza vaccine for patients ≥ 65 yrs	90 (39.3)	60 (30.6)		34 (32.1)	21 (25.9)		56 (45.5)	39 (33.9)		0.02 *	0.08	0.69
Annual influenza vaccine for patients < 65 yrs at high risk	44 (31.9)	37 (26.8)		15 (26.3)	14 (30.4)		29 (35.8)	23 (25.0)		0.67	0.40	0.28
Aggregate score for influenza immunization, % (95 CI)	36.0 (26.0-47.5)	29.3 (20.3-40.2)		32.0 (22.1-43.9)	25.4 (16.8-36.5)		39.2 (28.4-51.3)	31.8 (22.1-43.3)		0.06	0.05	0.34
Global aggregate score for Preventive Care, % (95 CI)	70.4 (61.6-77.9)	67.8 (58.6-75.7)		66.7 (57.2-75.1)	63.6 (53.8-72.4)		73.4 (64.8-80.6)	70.7 (61.6-78.3)		< 0.001	0.01	0.70

Aggregate scores and p-values: Mixed-effects logistic regression model, adjusted for physician center (as random effect).

Interaction effect is determined by inserting a global patient-physician gender interaction term into the models. A p for interaction < 0.05 indicates that the relationship between preventive care and patient gender differs depending on the physician's gender.

Abbreviations: n, number; CI, confidence interval; yrs, years. *p<0.05; **p<0.01; ***p<0.001

Figure 1. Provided preventive care (%) according to patient physician gender concordance in 4 Swiss university primary care settings (Basel, Geneva, Lausanne, Zürich) followed over 2 years (2005-2006)



Female patients received less recommended preventive care than male patients (p <0.001). Female physicians provided significantly more preventive care than male physicians (p=0.01).

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