The Quality of Primary Care in a Country with Universal Health Care Coverage

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BACKGROUND: Standard indicators of quality of care have been developed in the United States. Limited information exists about quality of care in countries with universal health care coverage.

OBJECTIVE: To assess the quality of preventive care and care for cardiovascular risk factors in a country with universal health care coverage.

DESIGN AND PARTICIPANTS: Retrospective cohort of a random sample of 1,002 patients aged 50–80 years followed for 2 years from all Swiss university primary care settings.

MAIN MEASURES: We used indicators derived from RAND's Quality Assessment Tools. Each indicator was scored by dividing the number of episodes when recommended care was delivered by the number of times patients were eligible for indicators. Aggregate scores were calculated by taking into account the number of eligible patients for each indicator.

KEY RESULTS: Overall, patients (44% women) received 69% of recommended preventive care, but rates differed by indicators. Indicators assessing annual blood pressure and weight measurements (both 95%) were more likely to be met than indicators assessing smoking cessation counseling (72%), breast (40%) and colon cancer screening (35%; all p<0.001 for comparisons with blood pressure and weight measurements). Eighty-three percent of patients received the recommended care for cardiovascular risk factors, including >75% for hypertension, dyslipidemia and diabetes. However, foot examination was performed only in 50% of patients with diabetes. Prevention indicators were more likely to be met in men (72.2% vs 65.3% in women, p<0.001) and patients <65 years (70.1% vs 68.0% in those ≥65 years, p=0.047).

CONCLUSIONS: Using standardized tools, these adults received 69% of recommended preventive care and 83% of care for cardiovascular risk factors in Switzerland, a country with universal coverage. Prevention indicator rates were lower for women and the elderly, and for cancer screening. Our study helps pave the way for targeted quality improvement initiatives and broader assessment of health care in Continental Europe.

BACKGROUND

Standard indicators of the quality of preventive and chronic disease care have been developed and evaluated in the United States.[1,2] Using RAND's Quality Assessment (QA) Tools, a quality assessment system that spans over 30 conditions and prevention, McGlynn et al. found that US adults received 55% of recommended health care services in 12 metropolitan areas.[1] In the UK, a systematic performance monitoring was introduced in 2004 coupled with financial incentives,[3] the Quality and Outcomes Framework (QOF).

We have limited information about the quality of preventive care in Continental Europe. Most previous studies on the quality of preventive care in Europe have assessed only a few indicators of quality for many conditions,[4] or one condition at a time, such as hypertension[5,6] or diabetes.[7,8] Thus, we have limited data on the quality of preventive care given to adults in Continental Europe, particularly using standardized tools. In Switzerland, quality of care has been assessed for only a few specific conditions.[9–11]

The Swiss and US health care systems differ on at least two points. In Switzerland, all patients have universal health care coverage, including adults with low income who receive social

aid to cover health care costs, regardless of their age or whether they work. Patients are free to choose their primary care physician (PCP). Second, systematic performance monitoring and annual report cards on quality of care, such as the US Healthcare Effectiveness Data and Information Set (HEDIS),[12] and financial incentives to improve quality are not implemented in Switzerland. While this practice is not universal in the US and in Europe, limited data exist on the quality of care in a country without such quality improvement programs.

We therefore sought to assess the quality of care in Switzerland, using indicators adapted from RAND's QA Tools.[1] We focused our study on primary and secondary prevention, and thus assessed the delivery of preventive care and chronic care for cardiovascular risk factors (CVRFs) to 1,002 randomly selected adults from all Swiss university primary care settings.

METHODS

Study Design and Patients

In a retrospective cohort study, we abstracted medical charts from a random sample of patients followed by PCPs in all Swiss university primary care settings (Basel, Geneva, Lausanne and Zürich). This study was approved by the Institutional Review Board at each site. Most of the care was provided by residents in general internal medicine at the end of their postgraduate training (n=902, 90%), supervised by university attendings, while 100 patients (10%) were followed by university attendings. The random sample was drawn 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 enough prevalence of examined indicators (e.g., CVRFs, eligibility for cancer screening or influenza immunization). A similar sample size was used in previous studies on quality of care based on chart abstraction.[13,14]

Among the 1,889 patients in the starting random sample identified from electronic administrative data, 54 charts could not be found, most likely because the patients left the clinical setting for another practice. Compared to included patients, these 54 patients had a similar age (63.5 years vs 64.0, p=0.65) and proportion of women (35% vs 44%, p=0.22). Among the 1,835 reviewed medical charts, 591 had <1 year follow-up in the primary care clinic during the review period, 125 patients had no outpatient visit to a PCP during the review period (emergency visits or nurse appointments only), and 117 were followed in a specialized clinic only. We did not include patients who were followed in the clinical setting for <1 year to have adequate time and information to assess provided preventive care. The final sample included 1,002 abstracted medical charts.

Quality Indicators

We selected 37 quality indicators from RAND's QA Tools[1,2] concerning preventive care and the care of CVRFs. This system was previously developed in the US to evaluate the quality of care delivered to adults.[15] Briefly, RAND staff physicians reviewed established national guidelines and the medical literature for each condition. Chosen indicators focused on

processes of care, because they represent the activities that clinicians control most directly.[1] Multispecialty expert panels chose the final RAND indicators using the RAND-UCLA modified Delphi method.[16]

As our aim was to examine care related to primary and secondary prevention, we selected 37 indicators: 14 for preventive care (physical examination: 3; alcohol: 2; smoking cessation: 5; cancer screening: 2; influenza immunization: 2), 19 for chronic care of three major CVRFs (hypertension: 4; dyslipidemia: 2; diabetes: 13) and 4 for chronic care for cardiovascular disease (Tables 2 and 3, unabridged indicators in Appendix Table 1, available online). The definitions of hypertension, dyslipidemia and diabetes were adapted from a previous study[17] (Appendix Table 2, available online). We did not include preventive care indicators that were not applicable to our local guidelines or PCP settings (e.g., pregnancy follow-up is very rarely performed by PCPs in Switzerland) or that involved information usually not collected in charts in Switzerland or adults aged 50–80 years, or indicators for conditions of low prevalence in our sample (e.g., asthma). Excluded quality indicators are listed at the bottom of Appendix Table 1 (available online). We included indicators on coronary artery disease, as it is the most common cause of death in Switzerland.[18]

Chart Abstraction

A chart review was performed for data abstraction, similar to previous studies with direct abstraction from medical charts.[1,13,14,19] A data abstraction form was created to assess the 37 selected indicators for chronic and preventive care derived from RAND's QA Tools[1] (Appendix Table 2, available online). Other abstracted covariates (demographics, chronic comorbid conditions) were based on a chart abstraction form from the TRIAD study[19] (Translating Research into Action for Diabetes), a study about the quality of diabetes care in the US. Nine medical students were centrally trained at one site (Lausanne) for data abstraction from medical charts in each Swiss university primary care setting and then entered the data with EpiData software (version 3.1, EpiData Association, Denmark).

To assess inter-rater reliability, we repeated the chart abstraction on a random sample of patients (n=45, to detect a statistically significant kappa[20]) at one site (Lausanne). Inter-rater reliability using the kappa statistic ranged from 0.66 to 1.0 for the main quality indicators, consistent with a previous study using a similar method.[19] The inter-rater reliability was lower (0.35 to 0.57) for some indicators that were prone to interpretation (e.g., lifestyle modifications for hypertension) or those that required a specific recommended frequency over the 2 years (e.g., eye exam annually, foot exam and HbA1c twice a year for diabetics). As a sensitivity analysis, we tested whether the exclusion of indicators with lower inter-rater reliability (kappa <0.6) or indicators that are gender-specific (breast cancer screening) changed the global aggregate scores.

Statistical Analysis

For each selected indicator of preventive care and chronic care for CVRFs, we calculated the percentage of provided

recommended care by dividing all episodes in which recommended care was delivered by the number of times patients were eligible for indicators (overall percentage method[21]). When care was refused by eligible patients, it was counted as provided care to measure physician-initiated care. The results were presented as percentages with 95% binomial exact confidence intervals (CI). To summarize the selected indicators, we calculated aggregate scores of quality of care among the different categories of prevention (physical examination, counseling, screening and immunization) and a global aggregate score for preventive care. All these aggregate scores were calculated by taking into account the number of eligible patients for each selected indicator. The same method of calculation was used to obtain the aggregate scores of chronic care for hypertension, dyslipidemia and diabetes, and a global aggregate score for chronic care for CVRFs, summarizing care for these three conditions.

We used generalized estimating equation (GEE) binomial models to compare differences in rates of recommended preventive care and to assess the association between demographic characteristics (age, gender) and the proportion of provided care. GEE models were used to account for correlation of multiple measurements for the same patient and for different numbers of eligible patients for each recommended preventive care. To account for clustering by the four sites, we treated each primary care center as a fixed effect. For all statistical analyses, Stata software (version 10.1, Stata Corp., College Station, TX) was used.

RESULTS

Characteristics of the Patients

The mean age of our sample was 63.5 years with 44% women and 51% married patients (Table 1). Thirty-eight percent of patients were retired and 29% employed. During the 2-year review period, the median number of outpatient visits was 10 (range 2–63, SD 6.5). The prevalence of CVRFs was 75% for hypertension, 62% for dyslipidemia and 29% for diabetes. Twenty-three percent of the participants were current smokers, 36% had a prior cardiovascular disease, 22% a psychiatric disorder and 20% a chronic pulmonary disease.

Analysis of Delivered Care

Tables 2 and 3 show the selected indicators, the aggregate scores, the number of eligible patients for each indicator and the number of patients who were provided such care. Patients received 69% of recommended preventive care, but this result differed by specific indicators. Indicators assessing annual blood pressure and weight measurements (both 95%) were more likely to be met than indicators assessing alcohol consumption counseling (77%), smoking cessation counseling (72%), breast cancer (40%) and colon cancer screening (35%; all p<0.001 for comparisons with blood pressure and weight measurements). The level of performance according to the

Table 1. Patients' Characteristics: Random Sample of 1,002 Adults Aged 50–80 Years in All Swiss University Primary Care Settings

Characteristic	
Age, mean (SD)	63.5 (8.3)
Range, minimum – maximum	50–80
Women, no. (%)	445 (44.4)
Civil status, no. (%)	
Married	506 (51.0)
Divorced, separated	233 (23.5)
Single	151 (15.2)
Widow/-er	103 (10.4)
Occupation, no. (%)	
Retired	372 (37.9)
Employed	285 (29.0)
At home or in education	115 (11.7)
Social aid	109 (11.1)
Unemployed or other	101 (10.3)
Number of outpatient visits over 2 years	
Median (interquartile range)	10 (7–15)
Range, minimum – maximum	2–63
Cardiovascular risk factors	
Hypertension*, no. (%)	753 (75.2)
Dyslipidemia*, no. (%)	622 (62.1)
Diabetes*, no. (%)	292 (29.1)
Family history of early CHD†, no. (%)	99 (9.9)
Smoking status at baseline‡, no. (%)	
Former smokers	177 (17.7)
Current smokers	230 (23.0)
Comorbid conditions	
Cardiovascular disease§, no. (%)	364 (36.3)
Chronic pulmonary disease‖, no. (%)	201 (20.1)
Non-metastatic solid cancer¶, no. (%)	133 (13.3)
Metastatic solid cancer, no. (%)	16 (1.6)
Hematological cancer, no. (%)	10 (1.0)
Dementia, no. (%)	24 (2.4)
Psychiatric disorders#, no. (%)	287 (28.6)

For criteria of dyslipidemia, hypertension and diabetes, see Appendix Table 2 (available online)

†*Early coronary heart disease (CHD) defined as a CHD event in male relatives <55 years or in female relatives <65 years*

‡*Smoking status defined as: former smoker=stopped smoking ≥6 months before baseline; current smoker=smoking at baseline or stopped <6 months before baseline*

§*History of transient ischemic attack, cerebral vascular accident, coronary artery disease, angina, myocardial infarction, congestive heart failure or peripheral vascular disease*

‖*Classification based on Charlson index[37]: chronic obstructive pulmonary disease (COPD), asthma, sleep apnea syndrome, sarcoidosis, pulmonary hypertension, bronchiectases, interstitial pulmonary disease or global respiratory insufficiency*

¶*Includes prostate, colorectal, breast, lung, kidney, urothelial, gynecological and other types of cancer in the last 5 years*

#*Classification based on Charlson index[37]: depression, psychotic disorder and bipolar disorder*

particular aggregate score ranged from 88% for physical examination to 33% for influenza immunization.

Eighty-three percent of patients received the recommended care for CVRFs, including >75% for hypertension, dyslipidemia and diabetes. However, glycosylated hemoglobin was measured at least twice a year in 72% of diabetics, and foot examination was performed twice a year in 50%. Daily aspirin was recommended to 95% of patients with coronary artery disease (n=152). Among the 60 patients with previous myocardial infarction, beta-blockers were prescribed to 82% of patients. Eighty-nine percent of patients received antiplatelet therapy after stroke or transient ischemic attack (n=74) and 89% of patients with heart

Table 2. Recommended Preventive Care

Indicator	Preventive care	Eligible patients no.	Care provided* no.	Care provided % (95% CI)
	Physical examination			
1	Annual blood pressure measurement	1,002	952	95.0 (93.5–96.3)
2	Weight measurement	1,002	952	95.0 (93.5–96.3)
3	Height measurement	1,002	753	75.1 (72.4–77.8)
	Aggregate score for physical examination			88.4 (87.2–89.5)
	Alcohol consumption counseling			
4	Asked about drinking problem	1,002	671	67.0 (64.0–69.9)
5	Advice to decrease drinking for at-risk or binge drinkers†	132	102	77.3 (69.2–84.1)
	Aggregate score for alcohol consumption counseling			68.2 (65.4–70.9)
	Smoking cessation counseling			
6	Smoking status documented	1,002	789	78.7 (76.1–81.2)
7	Annual advice to quit smoking	230	165	71.7 (65.4–77.5)
8	Counseling offered to smokers attempting to quit	77	52	67.5 (55.9–77.8)
9	Pharmacotherapy offered to smokers attempting to quit if >10 cigarettes/day	77	37	48.1 (36.5–59.7)
10	Abstinence documented 4 weeks after smoking cessation counseling	52	24	46.2 (32.2–60.5)
	Aggregate score for smoking cessation counseling			74.2 (71.9–76.4)
	Cancer screening			
11	Screening for colon cancer (aged 50–80)‡	984	345	35.1 (32.1–38.1)
12	Screening for breast cancer (aged 50–70)‡	310	125	40.3 (34.8–46.0)
	Aggregate score for cancer screening			36.3 (33.7–39.0)
	Influenza immunization			
13	Annual influenza vaccine for patients ≥65 years	426	150	35.2 (30.7–40.0)
14	Annual influenza vaccine for immunocompromised patients <65 years§	276	81	29.3 (24.0–35.1)
	Aggregate score for influenza immunization			32.9 (29.4–36.5)
	Global aggregate score for Preventive Care			68.6 (67.6–69.7)

When care was refused by eligible patients, it was counted as provided care to measure physician-initiated health care. When care was provided less frequently than specified (i.e., once a year instead of twice a year or only once instead of annually), it was counted as unprovided care to measure physician adherence to recommendations

†*At-risk drinking was defined as >14 drinks per week for men <65 years or >7 drinks per week for others. Binge drinking was defined as >4 drinks per occasion for men <65 years or >3 drinks for others*

‡*Patients were excluded from screening because of a prior diagnosis of colon cancer (n=18) or breast cancer (n=17)*

§*Indications for influenza immunization for <65 years: living in a nursing home, chronic cardiovascular disease, chronic obstructive pulmonary disease, renal failure, diabetes, immunosuppression, hemoglobinopathy*

failure (n=47) an angiotensin-converting enzyme inhibitor or an angiotensin-receptor blocker.

In multivariate analyses adjusted for age, gender and center as a fixed effect, prevention indicators were more likely to be met in men (72.2% vs 65.3% in women, p<0.001) and patients <65 years (70.1% vs 68.0% in those ≥65 years, p= 0.047, Fig. 1). Removing the only gender-specific indicator (i.e., breast cancer screening) from this analysis yielded similar results.

Adherence rates to chronic care for CVRFs did not differ according to age and gender (both p>0.10). Sensitivity analyses excluding two indicators for hypertension and three indicators for diabetes, with lower inter-rater reliability (see Methods), yielded a higher aggregate score for chronic care of CVRFs (93% vs 83%). Results for aggregate scores were similar between patients followed by residents and university attendings.

Comparison with Other Settings

The rates of recommended preventive care and chronic care for CVRFs in this study were compared with similar indicators from US HEDIS 2006 results,[12] when available (Table 4). Overall, quality of care did not differ between the two settings for CVRFs and smoking cessation. The major differences were for influenza

immunization and breast and colorectal cancer screening, which were performed far more frequently in the US than in Switzerland.

DISCUSSION

Using standardized indicators developed in the US,[1] we found that adults in university primary care settings received 69% of recommended preventive care and 83% of chronic care for CVRFs in Switzerland, a country with universal health care coverage but no systematic performance monitoring. Women and the elderly had lower receipt of recommended preventive care, and rates of cancer screening were low (<40%).

In the US, several studies have been conducted about the quality of care. McGlynn et al.[1] found that US adults received about 55% of recommended care. The comparison of our results with the McGlynn study was limited because that study reported data from 1998–2000. The comparison with US HEDIS 2006 results[12] yielded a mixed picture (Table 4). Interestingly, although the methods of measurement and the studied populations differed somewhat between HEDIS[12] and our study, quality of care in Swiss university primary care settings was comparable to that in the US, except for lower rates of cancer screening and influenza immunization in Switzerland, even though there is no systematic performance monitoring, nor mandatory

Table 3. Recommended Chronic Care for Cardiovascular Risk Factors

Indicator	Chronic care for cardiovascular risk factors	Eligible patients no.	Care provided* no.	Care provided % (95% CI)
	Diabetes			
15	Diabetes documented for patients <75 years	249	241	96.8 (93.8–98.6)
16	Glycosylated hemoglobin (HbA1c) twice a year†	292	210	71.9 (66.4–77.0)
17	Annual eye and visual exam†	292	163	55.8 (49.9–61.6)
18	Cholesterol tests documented	292	285	97.6 (95.1–99.0)
19	Annual proteinuria	292	190	65.1 (59.3–70.5)
20	Foot examination twice a year†	292	147	50.3 (44.5–56.2)
21	Blood pressure documented	292	291	99.7 (98.1–100.0)
22	Follow-up visits twice a year	292	259	88.7 (84.5–92.1)
23	Glucose monitoring for diabetics taking insulin	103	101	98.1 (93.2–99.8)
24	Dietary and exercise counseling for newly diagnosed diabetics	58	57	98.3 (90.8–100.0)
25	Oral hypoglycemics for type 2 diabetics who have failed dietary therapy (HbA1c ≥7% after 6 months)	75	67	89.3 (80.1–95.3)
26	Insulin offered to type 2 diabetics who have failed oral hypoglycemics (HbA1c ≥7% with two oral drugs after 6 months)	75	54	72.0 (60.4–81.8)
27	Angiotensin-converting enzyme inhibitor or angiotensin receptor blocker‡ offered within 3 months after noting proteinuria or microalbuminuria§	96	85	88.5 (80.4–94.1)
	Aggregate score for diabetes			79.6 (78.1–81.1)
	Hypertension			
28	Diagnosis of hypertension when 3 separate visits with blood pressure ≥140/90 mmHg	639	614	96.1 (94.3–97.5)
29	Lifestyle modification for hypertension†	753	485	64.4 (60.9–67.8)
30	Annual visit for hypertensive patients	753	751	99.7 (99.0–100.0)
31	Pharmacotherapy or lifestyle modification for uncontrolled hypertension (≥140/90 mmHg over 6 months)†	502	389	77.5 (73.6–81.1)
	Aggregate score for hypertension			84.6 (83.2–85.9)
	Dyslipidemia			
32	Two cholesterol tests before start of therapy	174	154	88.5 (82.8–92.8)
33	Cholesterol tests if heart disease and no pharmacological therapy	138	134	97.1 (92.7–99.2)
	Aggregate score for dyslipidemia			92.3 (88.8–95.0)
	Global aggregate score for care for cardiovascular risk factors			82.6 (81.6–83.6)
	Chronic care for cardiovascular diseases‖			
34	Aspirin for coronary artery disease	152	144	94.7 (89.9–97.7)
35	Beta-blockers after acute myocardial infarction	60	49	81.7 (69.6–90.5)
36	Antiplatelet therapy after stroke or transient ischemic attack	74	66	89.2 (79.8–95.2)
37	Angiotensin-converting enzyme inhibitor or angiotensin-receptor blocker‡ for heart failure with ejection fraction <40%	47	42	89.4 (76.9–96.5)

When care was refused by eligible patients, it was counted as provided care to measure physician-initiated health care. When care was provided less frequently than specified (i.e., once a year instead of twice a year, or only once instead of annually), it was counted as unprovided care to measure physician adherence to recommendations

†These indicators with lower inter-rater reliability (kappa <0.6) were excluded in a sensitivity analysis

*‡Angiotensin-receptor blocker was added according to Joint National Committee 7th guidelines[38]*

§Microalbuminuria was added according to American Diabetes Association guidelines[39]

‖When care was contraindicated, the patient was not counted as eligible, thus reducing the denominator

annual report cards on quality of care in Switzerland. Our study was not designed to assess the reasons for unprovided recommended care, but hypotheses are the lack of a national campaign for cancer screening, the limited information in the media about health issues in Switzerland, compared to the US, and the lack of systematic performance monitoring with regular feedback (which might improve PCP performance[22]). An older Swiss study[23] found similarly low rates of influenza immunization (41% if age <65 years with chronic illness and 51% if >65 years), suggesting a lower acceptance of influenza immunization[24] than in the US. Another study using RAND's QATools showed that quality of care in the US Department of Veterans Affairs (VA) was higher than that in the community.[14] Much of the difference was attributable to VA scoring higher in conditions subject to VA performance monitoring. The high overall level of care we found may be related to universal coverage or to the specific setting. Indeed, quality of care might have been lower if we had included community-based

PCP offices outside of university primary care settings, like in the US[14] or UK[25,26] studies.

To our knowledge, this is the first study to document the quality of a broad range of primary and secondary preventive care indicators in Continental Europe. In the UK, the systematic performance monitoring known as QOF[3] was introduced in 2004. Current published data were limited to patients with cardiovascular diseases[26] or diabetes,[25] which may not be applicable to the general population. In over a million patients with diabetes followed in 147 clinics, Calvert et al.[25] found higher rates of HbA1c testing (89.3% vs 71.9% in our study), annual eye examination (75.0% vs 55.8%) or screening for nephropathy (74.1% vs 65.1%), but a lower rate of cholesterol testing (89.7% vs 97.6%). Other quality indicators of the prevention and management of cardiovascular diseases in primary care have been developed across nine European countries,[4] but no data using this new set of
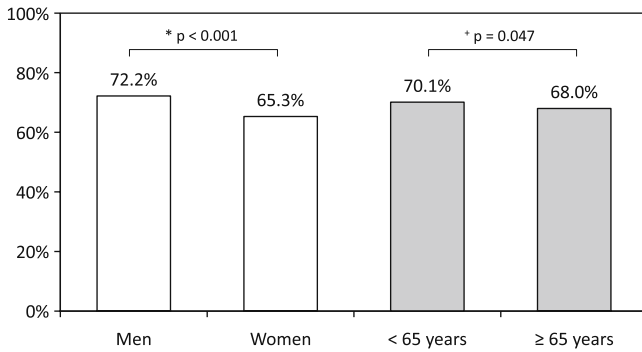
Figure 1. Preventive care according to gender and age.
Legend: Preventive care according to gender (white columns,
p value adjusted for age and center as a fixed effect) and age
(grey columns, p value adjusted for gender and center as a
fixed effect).

indicators have been published yet. For Switzerland, no study has been published on the overall quality of preventive care, but only on specific conditions.[9–11]

Men received more recommended care than women. The gender differences in quality of care are consistent with studies on hypertension,[27] dyslipidemia,[28] diabetes care[29,30] or therapy introduced after cardiovascular events.[31–33] More attention should be placed on preventive care for women in Switzerland.

Patients <65 years also received more recommended care than the elderly, although the 2.1% difference was borderline statistically significant and may not be clinically meaningful. The lower rate of recommended care among older adults might be related to the higher number of indicators for which older adults became eligible or to lower attention to preventive care. Our findings of lower preventive care in the elderly are similar to those of a previous US study,[2] but need to be confirmed by further research.

The higher level of quality of care for CVRFs compared to preventive care might be explained by the ease of ordering laboratory tests or prescribing new medications compared to counseling on lifestyle modifications or cancer screening. Counseling might also have been subject to more underreport than laboratory tests in medical charts.

Our study has several limitations. Our data were only abstracted from medical charts with potential underreporting. 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.[34] As influenza immunization can be done directly by nurses in Switzerland, 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.[34] Another limitation was that some indicators had a lower inter-rater reliability (see Methods). Sensitivity analyses excluding these indicators yielded a higher aggregate score for chronic care of CVRFs (93% vs 83%), which might be explained by the lower rates of provided care for these indicators with a lower kappa statistic. A third limitation was that our data were only abstracted in university primary care settings, where almost

all patients received their care from residents. Aggregate scores were similar for patients followed by residents and university attendings, but the proportion of patients followed by university attendings (10%) was small for such comparisons. A previous study found a higher adherence to diabetes care guidelines by internal medicine residents compared to faculty members,[35] whereas another found similar rates of performance for preventive care between residents and attendings.[36] One study among Swiss community-based PCPs found similar results for diabetes care[11] (as measured by face-to-face interviews of PCPs) compared to our study. However, we did not find studies directly comparing performance between community-based PCPs and university-based residents. Therefore, our data may not be generalizable to community-based PCPs. Additionally, our study included slightly fewer women in university primary care settings than the natural gender ratio of the Swiss general population (44.4% vs 50.8% of women, respectively), which might be related to the fact that many healthy Swiss women are followed only by gynecologists.

In summary, using indicators from RAND's QATools, adults in university primary care settings received 69% of recommended preventive care and 83% of chronic care for CVRFs in Switzerland, a country without systematic performance monitoring but universal insurance coverage. Women and the elderly had lower receipt of recommended preventive care services, and cancer screening rates were low. Our findings suggest that, like in the US, there still is substantial room for improvement in preventive care delivered to Swiss adults, in particular for cancer screening

Table 4. Comparison with Healthcare Effectiveness Data and Information Set (HEDIS)*

Indicator		Switzerland 2005–2006	United States* 2006
	Smoking cessation counseling		
7	Annual advice to quit	71.7	73.8
8	Pharmacotherapy offered to smokers	48.1	43.9
	Diabetes		
16	HbA1c screening†	71.9	87.5
17	Annual eye exam screening	55.8	54.7
18	LDL-cholesterol screening	97.6	83.4
19	Monitoring nephropathy‡	65.1	79.7
	Cardiovascular disease		
35	Beta blockers a year after heart attack	81.7	72.5
	Cancer screening		
11	Colorectal cancer	35.2	54.5
12	Breast cancer§	39.7	72.0
	Influenza immunization		
13	All patients >65 years‖	35.2	70.3
14	Potentially immunocompromised <65 years	29.3	45.6

*Selection of similar indicators on 2006 data from HEDIS,[12] when available
†HbA1c screening twice a year in Switzerland, but once a year in the US
‡Recommended screening for proteinuria in Switzerland, medical attention for kidney disease in the US
§HEDIS US 2005 rates were reported here as recommended screening age (50–70 years) was the same as in Switzerland, instead of 40–70 years (since 2006 in the US)
‖HEDIS US 2005 rates were reported here because such Medicare data were not available in 2006

and influenza immunization. Our study may allow better targeting of future quality initiatives in specific areas and strengthening the case for broader performance review of quality of care across Continental Europe.

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