Even if the health-care systems in Western countries are usually considered good, there is an urgent need to improve their quality. Safety, effectiveness, and efficiency of care must be enhanced. The maladjustment of health-care systems to the new challenges of the 21st century was pointed out several years ago by experts at both the Institute of Medicine and the World Health Organization.1,2 These still growing challenges include the rising costs of health care, the aging population, the pandemic of chronic diseases, the empowerment of active and demanding patients, the continuing explosion of knowledge, and the emergence of new medical and patient information technology.

On the other hand, the health-care market is also affected by the principles of the consumer society in force in Western countries. It is currently very challenging to obtain quality drug information that is not influenced by pressure from the pharmaceutical industry.3-7 The continuing education opportunities for physicians are very often sponsored by the pharmaceutical industry, and industry representatives are received by almost every general practitioner (GP; primary care physician in the US).8,9 Moreover, awareness of the most recent practice

BACKGROUND: Six pioneer physicians-pharmacists quality circles (PPQCs) located in the Swiss canton of Fribourg (administratively corresponding to a state in the US) were under the responsibility of 6 trained community pharmacists moderating the prescribing process of 24 general practitioners (GPs). PPQCs are based on a multifaceted collaborative process mediated by community pharmacists for improving compliance with clinical guidelines within GPs’ prescribing practices.

OBJECTIVE: To assess, over a 9-year period (1999–2007), the cost-containment impact of the PPQCs.

METHODS: The key elements of PPQCs are a structured continuous quality improvement and education process; local networking; feedback of comparative and detailed data regarding costs, drug choice, and frequency of prescribed drugs; and structured independent literature review for interdisciplinary continuing education. The data are issued from the community pharmacy invoices to the health insurance companies. The study analyzed the cost-containment impact of the PPQCs in comparison with GPs working in similar conditions of care without particular collaboration with pharmacists, the percentage of generic prescriptions for specific cardiovascular drug classes, and the percentage of drug costs or units prescribed for specific cardiovascular drugs.

RESULTS: For the 9-year period, there was a 42% decrease in the drug costs in the PPQC group as compared to the control group, representing a $225,000 (USD) savings per GP only in 2007. These results are explained by better compliance with clinical and pharmacovigilance guidelines, larger distribution of generic drugs, a more balanced attitude toward marketing strategies, and interdisciplinary continuing education on the rational use of drugs.

CONCLUSIONS: The PPQC work process has yielded sustainable results, such as significant cost savings, higher penetration of generics and reflection on patient safety, and the place of “new” drugs in therapy. The PPQCs may also constitute a solid basis for implementing more comprehensive collaborative programs, such as medication reviews, adherence-enhancing interventions, or disease management approaches.

KEY WORDS: community pharmacy services, cost containment, drug prescription, implementation, patient care team, quality of health care, Switzerland.
guidelines is not sufficient; the practitioners should also implement these guidelines in their routines. Furthermore, the costs of health care have been increasing constantly for several decades in most countries. To counteract this increase, action plans generally result from political decisions and medical professionals are often put under pressure to limit the costs of their services without guarantees for the quality of the care. To deal with all of these new parameters, the health-care process must be rethought. Interprofessional collaboration and continuous improvement of the efficiency of care provisions are among the strategic priorities. To be effective, this revolution must affect the health-care professionals’ education, the legislative framework, and the socioeconomic incentives.

In response to these trends, physicians-pharmacists quality circles (PPQCs) for drug prescription were developed in the French-speaking part of Switzerland. In primary care settings and nursing homes, PPQCs are used as a model of collaborative care programs for community pharmacists and GPs. Such a model caters to the professional strategy of community pharmacists (retail pharmacists in the US system) by facilitating the evolution of the profession from a drug delivery role toward the provision of cognitive pharmaceutical services. The key elements are local networking; feedback of comparative and detailed data regarding costs, drug choice, and volume of medical prescriptions; as well as interdisciplinary continuing education adapted to primary care needs. The particular role of the pharmacist involves educational outreach visits, where prescribers are visited by a knowledgeable health-care professional (often a pharmacist) to discuss issues of use and overuse, a process that has been demonstrated to change the attitudes of GPs and improve patients’ outcomes.

Six quality circles, each composed of a community pharmacist trained specifically to moderate such circles and 3–10 GPs, had regular meetings beginning in 1998. This combination of local networking and innovative collaborative care methodology has brought great satisfaction to motivated health-care professionals since the beginning of its implementation. Preliminary results showed some modifications of the prescribing practice, but do the PPQCs contribute to durably contain the costs generated by prescribing medication?

**Aim of the Study**

The aim of the study was to assess, over a 9-year period (1999–2007), the cost-containment impact of a multifaceted collaborative process mediated by community pharmacists for improving the enforcement of clinical guidelines within GPs’ prescribing practices.
nomic data and the search for alternatives in the drug market is then run by each PPQC to build its own consensus. An annual assessment is conducted for facilitating the continuing improvement of the process.

The PPQCs worked primarily on 18 therapeutic classes* (representing about 70% of the costs of drugs they prescribe), comparing the risk/benefit of drugs, discussing prescribing patterns, and trying to agree on treatment options based on 3 objectives: improving the drugs’ effectiveness, safety, and efficiency. The pharmacist put the prescribing profiles of the individual GPs of the PPQCs and control group in perspective, using both the clinical practice guidelines and the most current information concerning the safety and efficiency of medicines. A prescribing profile is the synthesis of the annual drugs prescribed, delivered, and billed according to the national compulsory health insurance.

Pharmacists are accredited to organize a PPQC when they have completed a basic course of 52 hours, organized by pharmaSuisse. This course includes basic knowledge on the effectiveness, safety, and efficiency of drugs frequently prescribed by GPs in a primary care setting. In addition, they must complete an annual 16-hour continuing training course to acquaint themselves with clinical and pharmacotherapeutic updates. After completing the training and 2 years of PPQC moderation, pharmacists can obtain accreditation as a specialist in PPQC moderation from the accreditation board of pharmaSuisse.

The discussions within PPQCs are often lively and end in the determination of a common consensus that everyone makes a commitment to apply to the best of his or her ability. Indeed, the adaptation of care to the specificity of each patient stays at the center of the concerns of the GPs and the committed pharmacists. The evaluations of the GPs’ prescriptions are performed every year to provide concrete feedback and a source of motivation for the group to change prescription attitudes. From the pharmacist, every GP receives feedback on his or her own prescriptions, focusing on the successes achieved, the progress still to be made with regard to a control group, and the results (benchmarking) of other colleagues participating in PPQCs. GPs’ participation in PPQC meetings is accredited by the association for their continuing education because of the quality of the scientific information provided by the pharmacists. The present study is a retrospective comparison between the prescription data of the PPQCs (costs per treated patient, generic proportion, and choice within a defined therapeutic class) and those of a control group over a 9-year period.

**CONTROL GROUP**

Prescription data were compared to average data of a control group of GPs with practices similar to those of the GPs participating in the PPQCs but working without particular collaboration with pharmacists (ie, usual care). Their number fluctuates each year (from 79 to 753) along with the increasing number of PPQCs. New cantons were included in the project each year, but the statisticians of health insurance companies have validated the composition of the control group. To ensure a practice setting similar to that of the PPQC group, the GPs in the control group were required to work in the French-speaking part of Switzerland, to have at least 300 patients of a mean age between 30–60 years old, and to be customers of OFAC clearing office pharmacy members. Dispensing physicians, who represent 24% of Swiss physicians, were not included in the control group because we were unable to obtain their detailed prescription data. In addition, because their income partly depended on their prescriptions, dispensing physicians had no incentive to take part in the project (major conflict of interest).

**DATA ANALYSIS**

Several indicators have been defined to describe the impact of the PPQCs. The annual drug cost per patient (ADCPP) is the total cost of a given therapeutic class or individual drug for the whole group divided by the number of treated patients. One patient is defined as a person to whom a physician prescribes a drug of a given therapeutic class or a given drug at least once in the year. The cost-containment effect for a particular therapeutic class is the ADCPP in the PPQC group divided by the ADCPP in the control group for the corresponding therapeutic class and year. The generic penetration index is the number of generic prescriptions divided by the total prescriptions of the corresponding therapeutic class for the PPQC group divided by the same percentage for the control group. The anatomical therapeutic chemical class (ATC) penetration is the number of delivered prescriptions of a particular ATC class compared to the total prescriptions of the corresponding therapeutic class. This indicator is used to monitor more carefully whether the PPQCs are consistently implementing the consensus.

Even though the PPQC project started in 1998, the number of patients necessary to compare data has been available only since 1999. In Switzerland, drugs are classified according to the Drug National Formulary in Therapeutic Index (IT). Corresponding ATC classes according to the International Anatomical Therapeutic Chemical classification are given to ease understanding.

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*Analgesics (corresponding to the Anatomical Therapeutic Classification codification N02A + N02BE01), antacids (A02A), antibiotics (J), antidepressants (N06A), antihypertensive agents (angiotensin-converting enzyme inhibitors, angiotensin II antagonists, antihypertensive associations; C09 + C02A), anxiolytics (N05B), antipsychotics (N05A), antithrombotic agents (B01), β-blockers (C07), calcium-channel blockers (C08), diuretics (C03 + C02L), drugs for obstructive airway diseases (R03); drugs used in diabetes (A10), lipid-lowering drugs (C10), nonsteroidal antiinflammatory drugs (M01), proton pump inhibitors (A02BC), sleeping pills (N05C), and vasodilators used in cardiac disease (C01D).
Results

COST-CONTAINMENT IMPACT

Between 1999 and 2007, the overall ADCPP per patient increased by about 74% in the control group and 32% in the PPQCs (Figure 2). This 42% difference in 2007 represents a saving of about $225,000 (USD) per GP. The Swiss inflation rate was 7.8% for the same period. To more thoroughly analyze the Swiss drug market between 2000 and 2007 (in particular, generics and the influence of drug advertisements), we detailed the prescription costs of the 5 main cardiovascular classes in the PPQC group and the control group (Figures 3–5). Figure 3 presents the difference between the annual cost per treated patient in the PPQC group and the control group for 5 cardiovascular classes. This figure shows that cost-containment varies between drugs and years, but the potential savings are also related to the natural evolution of the cost per treated patient in the control group.

IMPACT ON GENERICS PRESCRIPTION

The percentage of generic prescriptions in the PPQC group was always higher than that of the control group for the 5 main cardiovascular classes (Figure 4).

IMPACT ON MARKETING STRATEGIES

The influence of the PPQCs, with respect to the advertising messages from the pharmaceutical industry, is illustrated by the following example. The proportion of angiotensin II antagonist prescriptions in the therapeutic class IT 02.07, including angiotensin-converting enzyme inhibitors (ACE inhibitors), and combinations of antihypertensive agents, is higher in the control group than in the PPQC group (Figure 5). This trend has been increasing since 2000, reaching a difference of 48% in 2007. The 2007 proportion of angiotensin II antagonists in the PPQCs group then returned to the 2003 level.

Discussion

The PPQC process includes a combination of several elements (eg, local networking, feedback, interdisciplinary continuing education) that facilitate changes in prescribing practice. This process facilitates the enforcement of national and international clinical guidelines and results in a certain drug cost-containment (Figure 2). Regarding other European projects, the specific interest of the Swiss PPQC project lies in the quality of the data collection, the therapeutic class benchmarking by GPs, as well as the longevity of the experience. However, the primary interest of this project is in the collaboration between GPs and pharmacists in the community setting. In such a paradigm, pharmacists put forward a new dimension of drug use, and patients in general benefited from the increased communication between their health-care professionals, which is facilitated by the PPQC collaboration. Even if local collaboration between GPs and community pharmacists is promoted, a certain standardization of the process is guaranteed by the specific training of pharmacists, the validated source of prescription data, the independent review of scientific and pharmacoeconomic information (provided by pharmaSuisse), and the annual monitoring and feedback system.

The positive impact on overall ADCPP between 1999 and 2007 is shown by the impressive differential between PPQCs and usual care (Figure 4). If all of the Swiss GPs (n = 3512) would adopt the same approach, the extrapolated cost-containment estimated per GP could represent a total amount of more than $785,000,000 (USD) in 2007. It is noteworthy that the PPQC group had contained the overall increase of prescription costs during the first 5 years of the study and then succeeded in decreasing these costs since 2004. The effect of the PPQCs is progressive. Indeed, time is needed to instill trust between physicians and pharmacists to discuss all the therapeutic classes and for physicians to implement the consensus reached by their PPQC in their routine. The constant feedback on progress achieved and the further possible improvements are other success factors. During the study period, various policy measures have been put into action in order to limit health-care costs, such as the following: the new mode of remuneration based on the benefits of pharmacists instead of profit margins (2001),
the right of pharmacists to substitute generics (2001), declines in prices of medicines (2005, 2006), the encouragement of mail-order and telemedicine, the prevention of conflicts of interest between health-care professionals and the pharmaceutical industry (2002), and the reform of medical professionals’ education (2007). The positive effect of PPQCs was maintained throughout the period, adding to or accelerating the natural evolution of policy measures.

The market for generics increased in Switzerland during the study period, particularly through the expiration of patents on foreground therapeutic molecules (eg, for the cardiovascular system: amlodipine, various β-blockers, various ACE inhibitors, various statins, torasemide). The PPQCs introduce new generics faster and more intensely than the control group despite the implementation of several national policies in favor of generics (eg, generics sub-

Figure 3. Five-year cost-containment effect of physicians-pharmacists quality circles (PPQCs) for the prescription of 5 cardiovascular therapeutic classes with respect to the annual drug cost per treated patient (ADCPP) in the control group (2003–07). Therapeutic index (IT) 02.03 = β-blockers (corresponding to the Anatomical Therapeutic Chemical codification C07); IT 02.06 = calcium-channel blockers (C08); IT 02.07 = angiotensin-converting enzyme inhibitors, angiotensin II antagonists, and combinations with diuretics (C09 + C02A); IT 05.01 = diuretics, excluding combinations with antihypertensive agents classed in IT 02.07 (C03 + C02L); and IT 07.12 = lipid-lowering drugs (C10).
stitution right of the pharmacists, decreased prices of generics and the related original brands, introduction of a 10% copay for generics and nonsubstitutable original brands, and a 20% copay for originals that could have been substituted). The difference between generics’ penetration of the PPQCs and the control group decreases slightly with time due to the improvement of the control group (Figure 4). In 2007, however, the proportion of generics was still higher in the PPQC group when compared to the control group.

The results obtained on the angiotensin II antagonist prescriptions (Figure 5) are also an example of the PPQC group’s ability to objectively evaluate advertising from the pharmaceutical industry. Indeed, according to the literature, angiotensin II antagonists only represent a more expensive alternative to ACE inhibitors for the vast majority of patients.

Indeed, angiotensin II antagonists are recommended only in the case of adverse effects in response to ACE inhibitors or for patients with diabetes and renal failure with protein loss.28 The marketing strategies of pharmaceutical companies have led to an exaggerated increase in angiotensin II antagonist prescription, considering their efficiency. The PPQCs can prevent these trends and improve GP training to take into account the economic impact of their actions without impairing the quality of care.

The detailed results discussed here focused on the 5 main cardiovascular therapeutic classes (representing about 21% of the overall cost of drugs in 2007 for the control group), but similar results are globally obtained with the 13 other therapeutic classes.

The results come from an interdisciplinary reflection that focuses on the choice of drugs prescribed and, thus, their price. The impact of PPQCs on the volume of prescriptions is less easy to observe but still exists by waiving the prescription of certain “useless” drugs or correctly limiting the duration or dose of a treatment. Quality of care is probably not altered, as the physician remains responsible for the therapeutic monitoring of patients, and the pharmacist’s recommendations are based independently on scientific literature. Prescription data could be used to measure prescribing quality according to a previous publication, but it also would be valuable to proceed with a clinical evaluation within a case-controlled study between patients followed by a GP participating in a PPQC and those followed by a GP who is not. Specific studies are needed to confirm these hypotheses.29,30

Prescription data drive the work of PPQCs and represent an accurate indicator of ambulatory practice, which monitors changes in the Swiss drugs market (see control group) and the implementation of the consensus developed by the PPQCs.

The success of the PPQC group in Fribourg has encouraged other pharmacists and GPs to adopt the same approach in other regions. In
2009, PPQCs existed in 8 different cantons: Aargau, Bern, Fribourg, Neuchâtel, Ticino, Valais, Vaud, and Zurich. Thus, no fewer than 422 GPs collaborate in this way with 70 pharmacists. However, until 2006, only the PPQCs in Fribourg (107 GPs and 17 pharmacists) and Valais (8 GPs and 37 pharmacists) were funded by some health insurance companies.

The stability of the composition of PPQCs and their results illustrate the strength and potential of the local area network created. On this basis of trust, the PPQCs provided a collaborative setting to test, for example, an intervention concerning an electronic monitoring drug adherence program achieving better blood pressure control in hypertensive patients.31

The pioneer working process and the sustainable results of the PPQC program in Fribourg have been acknowledged in Switzerland and worldwide for their significant cost savings, higher penetration of generics, and reflection on global health-care costs, patient safety, and the place of new drugs in therapy (eg, me-too drugs). These elements of the PPQC project constitute a multifaceted, collaborative, and proactive approach that is more effective in changing prescription practices than a single, passive approach. The PPQCs may constitute a solid basis for implementing other collaborative and more comprehensive programs, such as medication reviews, adherence-enhancing interventions, or disease management approaches, for example, for cardiovascular diseases.

However, the current political debates on financing and organizing the Swiss health-care system constitute barriers to finalizing the negotiations for implementing a national remuneration of the pharmaceutical service. A financial incentive was granted for the pilot project (1999–2006); however, since that time, remuneration for all of the active PPQCs has been in negotiation. The uncertainty provoked by this situation represents a major risk for the future of this type of valuable pharmaceutical service. The 2009 national contract for the financing of medicines and services will introduce specific remuneration for leading a PPQC, starting in 2010.

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References

El Impacto de los Círculos de Calidad Medicos-Farmacéuticos Suizos en la Contención de Costes a lo Largo de Nueve Años

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RESUMEN

INTRODUCCIÓN: Seis círculos de calidad médicos-farmacéuticos pioneros (PPQCs), localizados en el cantón suizo de Friburgo (que corresponde administrativamente a un estado en USA), estuvieron bajo la responsabilidad de 6 farmacéuticos comunitarios entrenados, que moderaron el proceso de prescripción de 24 médicos generales (GP’s). Los PPQCs se basan en un proceso de colaboración polifacético, mediado por farmacéuticos comunitarios, para mejorar la adherencia de las prescripciones de los GPs a las guías clínicas.

OBJETIVO: Evaluar, a lo largo de un período de 9 años (1999–2007), el impacto de los PPQCs en la contención de costes.

MÉTODOS: Los elemento clave de los PPQCs son una mejora continua de la calidad estructurada y un proceso educativo, en una red local, de formación continuada basada en la retroalimentación de datos comparativos y detallados, sobre costes, selección de medicamentos y frecuencia de prescripción y revisiones estructuradas independientes de la literatura. Los datos se obtienen a partir de las facturas de las farmacias comunitarias a las compañías aseguradoras de salud.

RESULTADOS: El estudio analizó el impacto de los PPQCs en la contención de costes, comparando con GPs que trabajaban en condiciones similares de atención sanitaria sin una particular colaboración con farmacéuticos, el porcentaje de prescripciones de genéricos para grupos específicos de medicamentos cardiovasculares y el porcentaje de coste de los fármacos o unidades prescritas para medicamentos cardiovasculares específicos. En el periodo de 9 años, hubo una disminución del 42% en el coste de la medicación en el grupo PPQC comparado con el grupo control, lo que representó un ahorro de 225,000 dólares por GP sólo en 2007. Estos resultados se explican por la mayor adherencia a las guías clínicas y de farmacovigilancia, una mayor distribución de genéricos, una actitud más equilibrada frente a las estrategias de marketing y una formación continuada interprofesional sobre el uso racional de los medicamentos.

CONCLUSIONES: El proceso de trabajo de los PPQCs ha obtenido resultados sustanciosos tales como significativos ahorros de costes, mayor penetración de genéricos, y reflexiones sobre la seguridad de los pacientes y el lugar en la terapéutica de los “nuevos” medicamentos. Los PPQCs pueden constituir también una base sólida para implementar programas de colaboración más amplios, tales como revisiones de la medicación, intervenciones para incrementar la adherencia, o aproximaciones a la gestión de enfermedades.