

## The Retail Pharmacy Market in the Brazilian Federal District

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### Abstract

Pharmacies are important sites for accessing medication use, promoting rational use of medicines and educating the community. The study aimed to investigate the retail market of drugs in pharmacies and drugstores in the Brazilian Federal District and to better understand about this scenario evaluated some aspects and used indicators. Information was extracted from the database of the Regional Pharmacy Board of the FD covering the period from 2000 to 2012. The numbers of drugstores and compounding pharmacies increased by 353.72% and 138%, respectively, during the period and most have opened than closed. The drugstore per capita ratio, which was 1/8,044 in 2000, is now 1/2,680 in 2010. Moreover, these facilities are now concentrated in areas with higher incomes and greater economic activity. In 2012, 32.5% of drugstores and 79% of compounding pharmacies were identified as belonging to pharmacists, and only the minority of the establishments was registered as a pharmacy chain. The main violations of pharmaceutical establishments detected by the Board were the absence or lack of a pharmacist and lack of legal registration. It was concluded that there was a great expansion of the pharmaceutical retail market in the Federal District of Brazil. Increasing in the number of establishment was higher than the population growth and the data suggest that the concentration of properties is related to the population purchasing power.

**Keywords:** Pharmacy; Community pharmacies; Pharmaceutical services

### Introduction

The availability and rational use of drugs are critical elements for the health of the general population. Access to essential medications is important for the effectiveness of actions to promote health, and their rational use should follow a prescription grounded in scientific and ethical criteria, timely availability, guided dispensing and informed use [1].

The irrational use of drugs can assume distinct forms, such as their abusive or unnecessary use, polypharmacy (the concomitant use of multiple drugs), the excessive use of antibiotics and injections, the use of non-prescribed drugs against clinical guidelines and unsuitable prescribing. Despite the global issue of the inappropriate and abusive use of drugs, only a few countries effectively monitor the use of medications or take measures to improve this situation [2].

The sanitary and economic outcomes due to the irrational use of medicines are also relevant, including the increased incidence of adverse drug reactions, increased hospital admissions and increased multi-drug-resistant bacteria, among others. These factors can lead to increased individual and collective costs associated with health care, increased hospital-acquired infections, the prolongation and worsening of disease, unnecessary suffering, death, maintenance of the disease transmission chain and decreased credibility of health services [1,3].

The World Health Organization-WHO considers community pharmacies to be commercial establishments for the selling and supplying of drugs and products for health as well as a relevant venue for the promotion of rational drug use and community health education [4]. Moreover, the WHO considers pharmacies to be primary care services, constituting a valuable means of accessing the health system for the general population. According to previous studies in Brazil, pharmacies and drugstores are responsible for 76% of the non-refundable direct medicines supplied to the general population, indicating their considerable importance in national public health. Moreover, these establishments represent an ideal environment for actions to promote the safe and rational use of medicines [5].

Community pharmacies are establishments able to provide and sell medicines and ambulatory prescription supplies. These pharmacies directly serve patients and the community. In Brazil, this nomenclature encompasses ambulatory pharmacies in health care facilities, drugstores and compounding pharmacies [6].

In the majority of countries, medicine dispensing occurs in pharmacies. In Brazil, the legislation defines 2 types of private establishments: drugstores and pharmacies. Drugstores are responsible for the trade and dispensing of drugs as well as pharmaceutical products in original packing, whereas pharmacies are dedicated to compounding commercial drugs and medicines as well as pharmaceutical supplies [7].

Worldwide, the pharmacy market possesses great economic power. According to the monthly survey of retail trade conducted by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia Estatística - IBGE), the section that comprises

pharmaceutical, medical and orthopaedic supplies as well as perfumery and cosmetics displayed a remarkable increase in 2010. This section also demonstrated the 6th greatest participation in the global retail index. These advances were primarily due to the diversification of products commercialised in stores and the expansion of salaries [8].

Given the sanitary and economic relevance of pharmaceutical establishments in Brazil, this study aimed to investigate the retail market of drugs in pharmacies and drugstores in the Federal District (FD) of Brazil and to better understand about this scenario evaluated some aspects and used indicators.

## Methods

This descriptive cross-sectional study was performed to assess the distribution of compounding pharmacies and drugstores in FD. This study was conducted from January 02, 2000 to December 31, 2012 using computerised information that facilitated data collection.

The survey sources were the database of the Regional Pharmacy Board of the Federal District (CRF-FD), PHP version 5 and the MYSQL database version 4. Additionally, information was obtained from the websites of the given agencies, including the FD govern (Governo do Distrito Federal – GDF), the Federal Board of Pharmacy (CRF-FD), the National Agency for Sanitary Surveillance (Agência Nacional de Vigilância Sanitária – ANVISA), the Company of Planning of the FD (Companhia de Planejamento do Distrito Federal – CODEPLAN) and the IBGE.

The following indicators were used to better understand the retail pharmacy market: the distribution (quantity and location) of the pharmacies and drugstores throughout FD; the pharmacy and drugstore per capita ratio; the number of establishments opened and closed during the period of the survey; affiliation with a pharmacy chain; the owner’s education level of the owner and the most frequent violations detected in sanitary inspections according to the legislation of the CRF-FD. It was not possible to identify the size and other commercial characteristics of the establishments with the database used in this study.

To determine the density of pharmacies and drugstores per capita, population data from census surveys conducted by IBGE in 2000[9] and 2010[10] were used. For the year 2004, the survey based on Administrative Regions (AR) performed by CODEPLAN was employed because no census was performed in that year [11]. Concerning geographic and administrative aspects, FD is organised into 30 AR. The present study adopted the number of ARs used by CODEPLAN because this criterion is also adopted by the CRF-FD.

For classification regarding the type of organisation, the following criteria were used. Chain-affiliated establishments were defined as those with administrative/commercial relations with other establishments, using the same banner, adopting the same corporate or trade names, with a head or branch office, having the same corporate name or demonstrating alignment with a franchising partner, association or cooperative with distinct corporate names. An independent establishment was defined as one that does not display any administrative/commercial relations to other establishments.

Regarding the educational level of the owner, the establishments were classified as exclusively owned by laypeople when the owner(s) were non-pharmacists, as owned by pharmacists when the owner(s) were exclusively pharmacists or as mixed when shareholders were combinations of pharmacists and laypeople, regardless of the amount of shares or corporate interests.

The indicators were expressed as means, percentages and rates using the 95% confidence interval (CI).

## Results

The number of drugstores displayed an increase of 353.7% in FD during the period analysed. In fact, the number of drugstores increased from 255 in 2000 to 1,157 in 2012, while the population growth was approximately 25% in FD [11]. The drugstore per capita ratio, which was 1/8,044 in 2000, was 1/5,431 in 2004 and 1/2,680 in 2010, as shown in Table 1.

Year	Administrative Regions	Inhabitants	2000		2004		Inhabitants	2010		
			Number of drugstores	Pharmacy per capita ratio	Number of drugstores	Pharmacy per capita ratio		Number of drugstores	Pharmacy per capita ratio	
	Brasília	198,422	51	1/3,891	198,906	81	1/2,456	209,855	164	1/1,280
	Lago Sul	28,137	2	1/14,069	24,406	3	1/8,135	29,537	13	1/2,272
	Gama	130,580	15	1/8,705	112,019	19	1/5,896	135,723	50	1/2,714
	Taguatinga	243,575	41	1/5,941	223,452	60	1/3,724	361,063	123	1/2,935
	Ceilândia	344,039	32	1/10,751	332,455	52	1/6,393	402,729	134	1/3,005
	Others AR	1,106,393	114	1/9,705	1,205,296	171	1/7,048	1,431,253	475	1/3013
	Total	2,051,146	255	1/8,044	2,096,534	386	1/5,431	2,570,160	959	1/2,680

**Table 1:** Distribution of active drugstores in the ARs of the FD and the pharmacy per capita ratio from 2000 to 2010. Source: CODEPLAN, Domicile-based Sample District Survey (Companhia de Planejamento do Distrito Federal, 2004); IBGE, Demographic Census 2000 – DF (Instituto Brasileiro de Geografia e Estatística, 2000); IBGE, Demographic Census 2010 – DF (Instituto Brasileiro de Geografia Estatística, 2010) CRF-FD database (Conselho Regional de Farmácia do Distrito Federal, 2013).

In the period, there were drugstores located in 29 of the 30 ARs, with the exception of one AR that was recently populated. In all of the regions, the number of establishments increased by 100%. The higher concentrations of establishments were in the Brasília, Lago Sul, Gama and Taguatinga ARs.

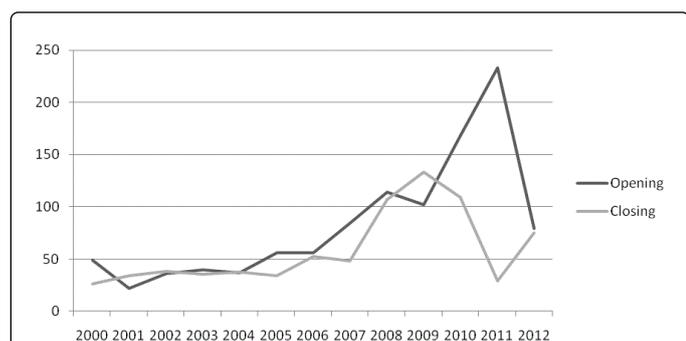
During the studied period, there was also an increase in the number of compounding pharmacies, from 34 in 2000 to 81 in 2012, resulting

in a growth of approximately 138%. The compounding pharmacy per capita values were 1/60,328 in 2000, 1/43,678 in 2004, 1/35,697 in 2010. The compounding pharmacies were concentrated in only 11 of the 30 existing ARs prior to 2012 (Table 2).

Year	2000			2004			2010		
Administrative region	Inhabitants	Number of pharmacies	Pharmacy per capita ratio	Inhabitants	Number of pharmacies	Pharmacy per capita ratio	Inhabitants	Number of pharmacies	Pharmacy per capita ratio
Brasília	198,422	25	1/7,936	198,906	30	6,630	209,855	44	4,769
Gama	130,580	1	1/130,580	112,019	2	56,009	135,723	4	33,930
Taguatinga	243,575	6	1/40,595	223,452	9	24,828	361,063	11	32,823
Planaltina	147,114	-	-	141,097	-	-	171,303	2	85,651
Ceilândia	344,039	1	1/0,339	332,455	2	166,227	402,729	3	134,243
Others AR	1,331,455	1	1/1,331,455	1,088,605	5	1/217,721	1,023,663	8	1/127,958
Total	2,051,146	34	1/60,328	2,096,534	48	1/43,678	2,570,160	72	1/35,697

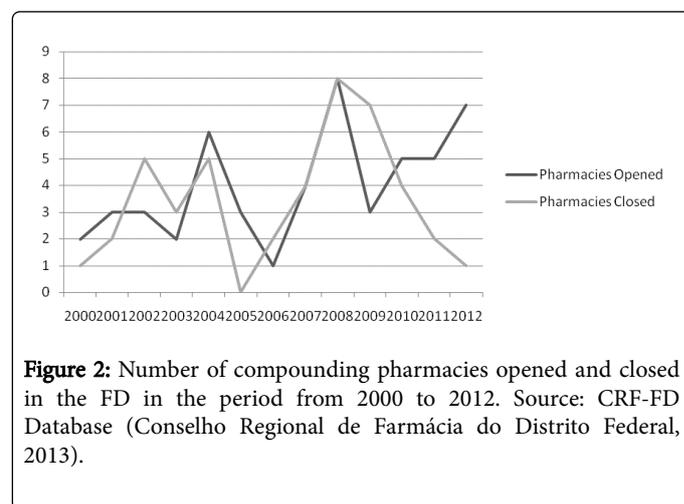
**Table 2:** Distribution of active compounding pharmacies in the ARs of the FD and the pharmacy per capita ratios from 2000 to 2010. Source: CODEPLAN, Domicile-based Sample District Survey (Companhia de Planejamento do Distrito Federal, 2004); IBGE, Demographic Census 2000 – FD (Instituto Brasileiro de Geografia e Estatística, 2000); IBGE, Demographic Census 2010 – DF (Instituto Brasileiro de Geografia e Estatística, 2010); CRF-FD database (Conselho Regional de Farmácia do Distrito Federal, 2013).

Regarding the numbers of establishments opened and closed during the period analysed, more drugstores were opened during this period, with the exception of the years 2001, 2002 and 2009, as depicted in Figure 1.



**Figure 1:** Number of drugstores opened and closed in the FD in the period from 2000 to 2012. Source: CRF-FD Database (Conselho Regional de Farmácia do Distrito Federal, 2013).

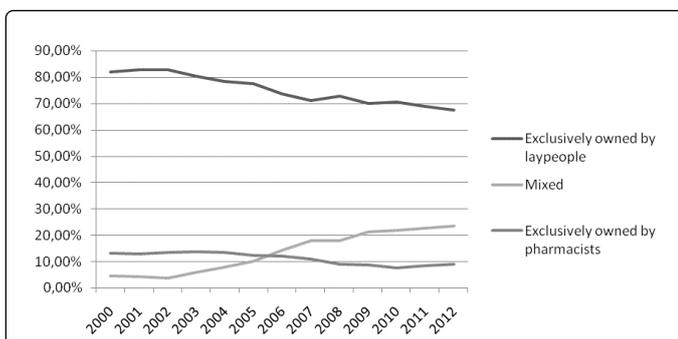
The number of opened compounding pharmacies was highest in the years 2004, 2008, 2010 and 2012, and this number was higher than the number of establishments closed during this period. However, in 2002, 2003, 2006 and 2009, this trend was not continued, as shown in Figure 2. It should also be noted that higher opening rates were found in 2008 compared to closures.



**Figure 2:** Number of compounding pharmacies opened and closed in the FD in the period from 2000 to 2012. Source: CRF-FD Database (Conselho Regional de Farmácia do Distrito Federal, 2013).

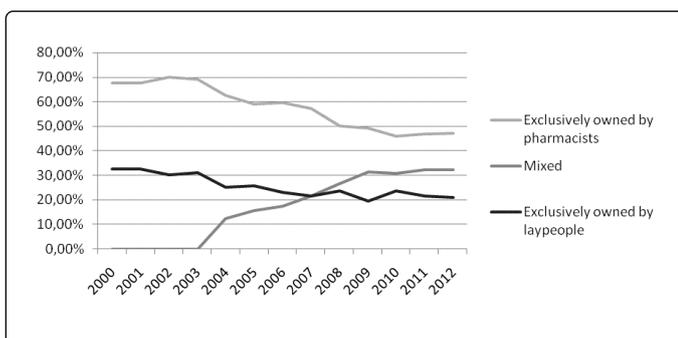
Regarding establishment stratification, the number of independent pharmacies was higher than the number of chain-affiliated establishments in all of the studied years. Whereas 17.7% (45) of pharmacies were affiliated with a particular chain in 2000, this frequency had increased to 19.6% (227) by 2012. However, chain-affiliated drugstores are frequently registered as independent establishments in the CRF-FD.

The percentage of drugstores owned by pharmacists decreased in the analysed period, from 13.3% (34) in 2000 to 8.9% (103) in 2012 (Figure 3).



**Figure 3:** Ownership characterisation of drugstores in the FD from 2000 to 2012. Source: CRF-FD Database (Conselho Regional de Farmácia do Distrito Federal, 2013).

Exclusively pharmacist-owned compounding pharmacies represented 67.6% of the establishments [23] in 2000 and 46.9% (38) in 2012 (Figure 4).



**Figure 4:** Ownership characterisation of the compounding pharmacies in the FD from 2000 to 2012. Source: CRF-FD Database (Conselho Regional de Farmácia do Distrito Federal, 2013).

The number of inspections conducted by the CRF-FD in the drugstores and pharmacies of FD increased during the studied period from 3 inspections in 2000 to 4,374 in 2012. In compounding pharmacies, this number of inspections increased from 0 to 235 in 2012.

The violation fines applied to drugstores increased by 355.8%, from 321 fines administered in 2000 to 1,463 in 2012. The most frequent violation fines involved the absence of the pharmacist at the pharmacy (n=1,356), the lack of a registered pharmacist for the establishment (n=75) and the lack of establishment affiliation to the CRF-FD (n=32). In compounding pharmacies, the violation fines decreased from 26 in 2000 to 7 in 2012 and the same violation types were found in both years.

## Discussion

A progressive increase in the number of drugstores and compounding pharmacies was observed in the period analysed, particularly from 2006 to 2011. In addition, the increase in the number of drugstores was higher than the population growth during the same period.

In FD, a higher concentration of drugstores and compounding pharmacies was detected in the Brasilia and Lago Sul ARs, which are economically richer regions. The next highest concentrations were detected in Taguatinga and Gama, which are highly populated and economically active areas, suggesting that the concentration of pharmacies is related to the purchasing power and economic activities of the studied regions.

Due to the urbanism concept under which FD was planned and built, there is concentration of certain retail activities in specific areas. This characteristic can be observed in the pharmacy sector; for instance, Pharmacy Street (Rua das Farmácias) in South Wing (a neighbourhood of the city of Brasilia) includes 37 pharmacies that are located virtually side by side in an area of only 2 blocks. The same phenomenon can be observed in the South Hospital Sector (SHS) of Brasilia as well as in the Central Sector, North Sector C and Taguacenter, located in the city of Taguatinga.

The number of compounding pharmacies in FD also progressively increased, mainly from 2008 to 2012. However, there were compounding pharmacies in only 12 of the 30 ARs, and these were primarily present in the ARs with high economic power.

According to the most recent census conducted by the IBGE, the population growth of FD was higher than the mean growth in the country population [10]. Despite the influence of population growth, the drugstore per capita ratio increased from 1/8,044 in 2000 to 1/2,647 in 2010.

Although there are no official international recommendations regarding the optimal number of pharmacies per capita, some countries have defined their own criteria and specific regulations. Countries with a high human development index (HDI), such as Austria, Australia, France, Sweden, Italy, Luxemburg, and some Canadian provinces, have adopted parameters to establish 1 pharmacy for every 3,500-5,000 inhabitants. Other nations have delineated geographic criteria for the opening of new establishments at a distance of 500 to 1,500 meters from each other [12-14]. Although Brazil has not adopted any official criteria for regulating the opening of pharmacies and drugstores, recommendations from specialists suggest the establishment of 1 pharmacy for every 8,000 inhabitants [15].

On one hand, the increase in the number of drugstores may lead to the impression that the cost of medication is lower due to competition. On the other hand, the fragmentation or decrease in the profit of an establishment may motivate aggressive selling strategies, leading to an unnecessary and irrational use of medicines [16,17]. Other consequences derived from decreased profit could include the progressive actions of pharmacies to diversify the products offered, irrespective of current national legislation.

According to Giovanni [18] the historic and unexpected increase in the number of pharmacies in Brazil may be due to, at least in part, the progressive necessity of product commercialization in the pharmaceutical industry. As a result, the drugstore would adopt a depository role for the industrialised medicine trade. Moreover, the relationship between producers, distributors and establishments that directly sell to the consumer, supports the final commercial sector as a chain-dependent industry, forcing the development of aggressive selling strategies by retail sellers.

The commercial practices of the pharmaceutical industry and its persuasive effort upon medical professionals and pharmaceutical retail may contribute to the formation of buying habits in the population

over time. Together, this may instigate the exacerbated and indiscriminate consumption of industrialised medications. Studies conducted in Brazil have highlighted that the relationship between the pharmaceutical industry and individuals in charge of the retail commerce of drugs (pharmacy assistants) is reflected in training, courses, gratifications and commission, in disagreement with the current legislation [3,19].

In the present study, the number of compounding pharmacy and drugstore openings was higher compared to the number of closures of throughout the entire period analysed, especially in 2008. In this year, the number of pharmacies and drugstores dramatically increased despite the remarkable international economic crises that affected a myriad of economic sectors in Brazil. In this regard, it should be mentioned that the consequences of the 2008 crises may have also influenced the findings for 2009, when the number of closures overtook the number of openings after a decade of sustained growth. In 2012, although some residual effects of the economic crisis may have persisted, the closure of drugstores could possibly be explained by the increase in the inspections conducted by appropriate agencies after the exigent need for presence of a pharmacist in the establishment during its hours of operation was made apparent [15].

Although the presence of a pharmacist in charge during the hours of operation of drugstores and pharmacies has been demanded by the Brazilian legislation for 40 years, a majority of establishments only maintain pharmacists from Monday to Friday during business hours. In addition, the daily workload of pharmacists is only 8 hours for a period of nearly 14-24 hours of daily operation. Therefore, the CRF-FD began requiring the presence of a pharmacist during the entire period of establishment operation, and this requirement was initiated in 2012 for companies that opened after the date of this study publication. For the pharmacies that were already active, this requirement officially went into effect in February 2013.

In FD, the following pharmaceutical retail structure was observed. On one side, there are a relatively small number of large companies that collectively dominate the market and individually control considerable sections of the commercialization of medicines and health products; on the other side, a large number of small- and medium-sized companies that fiercely compete for a small share of the market (15).

Although the number of independent drugstores remains high and is currently expanding, the pharmaceutical market in FD tends toward the formation of chain pharmacies. It should be noted that among the high number of independent pharmacies found, a significant portion of those may actually be chain-affiliated drugstores since they are commonly registered as independent.

The tendency for the drugstore sector to associate and form nationwide chains is advantageous for the owners because they can negotiate discounts on product purchasing from the supplier as well as reductions in advertising spending.

The majority of national chains eventually distribute their stores beyond their original state. Although the most targeted markets are those in the South and Southeast states, these chains have also operated in the Midwest market since 2008, including in FD [15].

Apparently, small companies, and especially those owned by pharmacists, do not have problems to follow the laws, innovate and grow. However, what may hinder their activities are the distinct economic and financial potentials between the establishment types. For

example, small and large companies use distinct selling strategies; independent pharmacies and drugstores commonly use promotions at the store, whereas large companies use broad advertising and marketing strategies to reach massive populations, including television marketing.

Increased competition for consumers also hinders the survival of most drugstores, mostly independent ones. Efforts to form chains are the main reasons for closure and replacement by new stores. According to the Brazilian Association of Pharmaceutical Commerce, the average life of a drugstore is approximately 5 years [20].

The lack of criteria regarding the number of inhabitants and the geographic distribution of new pharmacies in Brazil as well as the minimal requirements regarding the knowledge and education level of the owners, pharmacy assistants and technicians represent critical factors that may impact the growth of these establishments [3,21]. Moreover, increasing numbers of establishments that trade drugs may favour the irrational and abusive use of these substances, considering the market strategies for profit gain in the face of existing competition.

In countries with a high HDI the law states that only pharmacists can own pharmaceutical establishments, in addition to the demographic criteria, there are requirements regarding the qualifications of owners, such as national exams [12,22,23].

In the Brazilian scenario, drugstores and pharmacies can be owned by laypeople, and there are no demographic or geographic criteria for opening these establishments. The only mandatory requirement is that the registered pharmacist of the establishment is present. There is no limit to the number of pharmacies that can be owned by one individual, and there are no requirements regarding the qualification of pharmacy assistants, who are commonly paid on commission basis. The influences of the pharmaceutical companies, which offer courses and training to employees from the medical retail market, are also observed [3].

Regarding ownership, laypeople-owned drugstores constituted the majority in FD. Conversely, compounding pharmacies owned by laypeople were the minority. There was also a trend towards an increased number of establishments (both drugstores and compounding pharmacies) in which the property was under mixed ownership, and this trend may enable the pharmacist to concurrently gain experience and be engaged in clinical and educational activities associated with promoting the rational use of medicines. However, it should be noted that the existence of pharmacists as minority partners that assume technical responsibility for the establishment financially benefits the layperson because they do not pay the minimum fee or labour rights and taxes to the professional.

In Brazil, Regional Pharmacy Boards are responsible for the ethical and professional inspection of pharmaceutical establishments. In the period analysed in this study, a gradual increase in the number of inspections conducted by the Boards was verified. The most frequent types of violations included the absence of a pharmacist at the moment of the inspection, the lack of a pharmacist and the lack of pharmacy subscription to the Boards. Therefore, the necessary conditions and a sufficient number of professionals are available to comply with the law, which also guarantees the consumer's right to choice [15].

It can be inferred that the results found in the Federal District are similar throughout Brazil because the rules and regulations for the pharmaceutical market and pharmacies have national effect. According to IMS Health, which audits the global pharmaceutical market, Brazil

is the country with the largest number of pharmacies in the world, with a ratio of 3.34 pharmacies for every 10 thousand inhabitants [24].

Some of the problems encountered in FD-Brazil as lack of qualification of the pharmacies employees, the sale of medicines without prescription, lack of criteria for opening pharmacies, among others, are also seen in several countries in Latin America [25,26].

Since the 1960s, the representative entities of the pharmaceutical class in developed countries have discussed methods to improve the quality of the pharmaceutical services as well as the public assistance delivered by pharmacies. However, in Brazil, inspections are still mainly focused on requiring the presence of a pharmacist for community pharmacies.

## Conclusions

In light of our results, studies evaluating the national pharmacy scene in Brazil and other countries are highly recommended to encourage broader discussions on this topic. In addition to the criteria required to open pharmacies, the characterization of pharmacies as health establishments and the implementation of measures to promote rational use of drugs already existing in Brazilian legislation should also be discussed.

It is also necessary to develop approaches to avoid medicines commercialization without proper care (simply as a retail item). Considering the potential risks that derive from medication misuse it is imperative that the professionals and the establishments that dispense these products adopt rigorous procedures and are regularly evaluated to control and avoid those risks. Brazil is in need of an innovative way of thinking, structuring, developing and producing new pharmaceutical services. Pharmacist education and training must prepare these professionals to work as a fundamental part of the healthcare systems, providing the knowledge and skills that enable the implementation of pharmaceutical care and clinical pharmacy practices as a policy of promotion and restoration of health.

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