

# Mexican pharmacies: benefits and risks for border residents in the United States of America and Mexico

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**ABSTRACT** **Objective.** To determine the benefits and risks of using Mexican pharmacies by better understanding the sociodemographics and medication needs of pharmacy clients in Ciudad Juárez; and to ascertain the role and expertise of pharmacy clerks and their impact on medication use.

**Methods.** Cross-sectional study of a convenience sample of 32 pharmacies in Ciudad Juárez conducted in August 2007–January 2008. Medical professionals interviewed 230 pharmacy clients and 25 pharmacy owners and clerks, and observed 152 clerk-client interactions. The cost of the most frequently-purchased medications was compared with pricing at pharmacies in El Paso, Texas, United States.

**Results.** Of the 311 medications purchased, the most frequent were: antibiotics (54), analgesics (49), fixed drug combinations (29), and blood pressure medications (26). Only 38% were purchased with a prescription; 62% of the prescription drugs bought without a prescription were self-prescribed. Many products purchased were of limited therapeutic value, and others could be harmful when used inappropriately. Pharmacy clerks were poorly trained and did not offer appropriate information on drug use; contraindications were never discussed. Contrary to popular perception, some generic drugs were cheaper in the United States than in Mexico. Conflicts of interest were identified that could be leading to over-medication.

**Conclusions.** While the risks are evident, some uninsured, chronically-ill United States residents may benefit from access to medications previously recommended by a physician, without obtaining a new prescription. The authors suggest five steps for reducing the risks and improving pharmaceutical utilization in the border area.

**Key words** Community pharmacy services; education, pharmacy; prescription drugs; border areas; Mexico; United States.

The high cost of pharmaceuticals in the United States of America has many consumers turning to neighboring countries or the Internet for their medications. The practice of purchasing medication north

of the border, from Canada, was a topic of public debate, with federal and state legislators repeatedly pursuing legalization (1, 2). The Pharmaceutical Market Access and Drug Safety Act of 2007 (3) legalized the purchase of medicines in approved Canadian pharmacies if the United States Food and Drug Administration (FDA) guaranteed their quality.

Likewise, United States residents living near the country's southern border

frequently obtain medicine at Mexican pharmacies, but legalization of the practice has not captured the attention of legislators. A possible explanation for this is the uncertainty regarding what impact it would have on the health of United States border residents. Some researchers (4–6) discourage the use of Mexican pharmacies based on the absence of a robust and reliable quality assurance program in the country. In 2004, the FDA

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found that some Mexican border pharmacies were selling simvastatin (Zocor®) and carisoprolol with lower quantities of the active ingredients than stated on the labels; a similar observation was made in 2005 with regard to Evista,® Lipitor,® and Viagra® (7, 8). However, other studies (9, 10) have shown that Mexican medications comply with the standards of the United States Pharmacopeia.

The United States has 24 counties that border Mexico comprising a population of about 6.5 million individuals, mostly young (29% < 18 years of age) and Hispanic (> 50%). The area has high poverty rates, low levels of education, a high proportion of uninsured individuals (mean: 26%; range: 20%–38%), and a chronic shortage of health professionals (11). Within this area are the two cities selected for the present study: Ciudad Juárez, Mexico, and El Paso, Texas—economically and socially intertwined, essentially constituting one metropolitan area with 2 million inhabitants, yet separated by an international border.

Several studies of United States border cities show that 20%–30% of the residents receive health care services in Mexico (12–16), and an even higher percentage use its pharmacies. Buying medication in Mexico is convenient because regulators only enforce the prescription requirement for controlled substances<sup>3</sup> and antibiotics, the latter only since August 2010. Socioeconomics also come into play: the proportion of United States residents using Mexican pharmacies is higher among low-income groups (15–20). A study of 80 low-income migrant households in El Paso County, Texas, found that 40% of those who had been sick during the 12 months prior to the interview self-medicated, while an additional 10% used Mexican pharmacies and a full 85% had obtained medications from Mexico (21). In Ciudad Juárez, pharmacy chains are rapidly expanding. Individually-owned pharmacies, referred to as traditional pharmacies, are dispersed throughout the city and primarily serve the local population. They tend to be small and their prices are higher than those of pharmacy chains. Unable to compete with the chains, traditional pharmacies are closing, or staying afloat by reducing their pharmaceutical stocks and selling other products, such as food, flowers, and/

or furniture, and offering services, such as photocopying (22). Pharmacy chains tend to be located in shopping centers and within close proximity of the international bridges (1–3 blocks away). There are no Mexican regulations dictating who can own a pharmacy, but physicians are not permitted to practice on the premises (23). Nevertheless, most pharmacies have arrangements with physicians in nearby “clinics,” some adjacent to the pharmacy, but with a separate entrance. These walk-in clinics offer consultations at affordable prices (22, 24). Mexican pharmacies require a current doctor’s prescription only for controlled substances and antibiotics (as of August 2010); all other prescriptions can be reused for as long as the client keeps them (23). Thus, simply having a prescription does not ensure that the client is currently under medical supervision. Moreover, a controversial regulation to discourage self-medication limits the amount of information available on the pamphlet insert that accompanies most prescription medications (23); therefore, patients have to rely on the information written in the prescription, or on the verbal recommendation of clerks.

Regarding pharmacy clerks, Mexico does not impose any educational prerequisites beyond completion of secondary education for the position, though clerks can be quite influential. Clerks work largely unsupervised since Mexican law requires that a chemist-pharmacobiologist (QFBs) be present only for a few hours per week in pharmacies where controlled substances are sold. QFBs are primarily trained to work for industries and chemical or clinical labs; only recently have a few universities started training hospital and community pharmacists.

The study objectives were: 1) to determine the sociodemographic characteristics and health and pharmaceutical needs of pharmacy clients in Ciudad Juárez; and 2) to establish the role and capability of the pharmacy clerks to contribute to the appropriate use of pharmaceuticals in the area.

## MATERIALS AND METHODS

This was a descriptive, cross-sectional study of pharmacies, pharmacy clerks, and pharmacy clients in Ciudad Juárez, Mexico, conducted in August 2007–January 2008. A convenience sample of pharmacies was drawn from the 2007 municipal records of Ciudad Juárez, which listed

308 private pharmacies; of these, 208 were individually-owned, and the remainder, pharmacy chains. After plotting these on a city map, 32 pharmacies were selected, giving preference to those frequented by border residents. Of these, 23 were pharmacy chains and 9 were traditional. Some were accessible to pedestrians crossing from El Paso; others were in or near major shopping centers frequented by United States residents; and a few were located in the interior of Ciudad Juárez. All of the traditional pharmacy owners agreed to participate. Access to pharmacy chains had to be obtained from the company headquarters, all but one of which was located in other cities. This was a cumbersome process that, in some cases, took several months. All but two agreed to participate.

The study had three components:

- I. A survey of 230 pharmacy clients, half of which were United States residents. The interviewers approached the clients as they left the pharmacy, explained the study and, if eligible, obtained their consent and applied the questionnaire. Eligible clients had to have purchased medications and be at least 18 years of age. After asking to see their purchases, the interviewer took note of product names; amounts purchased; whether or not the consumer had a prescription, and if not, who had recommended the medication; the sociodemographic characteristics of the client; the sociodemographic characteristics and health problems of the end-user of the products; the reason(s) why a United States resident was purchasing medicine in Mexico; and their experience with United States customs. All, except one, of the interviews were conducted in Spanish; 82% took place in the pharmacy and the remainder, on the sidewalk immediately outside.
- II. To ascertain the role and influence of pharmacy clerks on the selection and purchase of medication, study observers monitored 152 interactions between clerks and clients from a discrete position near the counter using a guide specifically prepared for this purpose.
- III. To gather information on each pharmacy’s history, services offered, sociodemographics, training of its clerks, and its relationship with the

<sup>3</sup> Medications such as analgesic opioids, benzodiazepines, codeine, and barbiturates.

pharmaceutical industry and wholesalers, interviews were conducted with the pharmacy owner or highest-ranking clerk. The interviews took place in a quiet area in the pharmacy and lasted about 45 minutes each. For budgetary reasons, only 25 of the 32 pharmacies were included (16 chain pharmacies and 9 traditional).

All of the questionnaires, including pre-coded and open-ended questions, and the observer's guide were pilot-tested in three pharmacies.

In August–November 2007, two bilingual nurses from the Mexican Institute of Social Security (IMSS) carried out components I and II of the study, conducting client interviews and observing clerk-client interactions 7 days a week at varying times of day (8 a.m.–8 p.m.).

In December 2007–January 2008, the Mexican physician who had supervised the fieldwork completed component III by interviewing 25 pharmacy owners/clerks. To verify any price advantage of Mexican pharmacies over United States pharmacies, the researchers visited several on both sides of the border, gathering pricing information on 15 of the medications most frequently purchased by the study respondents.

This quantitative information is supplemented by fieldwork observations and knowledge acquired during the years that the authors have resided along and conducted research on the United States–Mexico border.

One of the principal researchers (NH) and the Mexican physician coded all open questions. All data were entered into a Microsoft Excel™ (Microsoft Corp., Redmond, Washington, United States) spreadsheet and were analyzed using IBM SPSS Statistics software, version 18 (SPSS Inc., an IBM company, Chicago, Illinois, United States).

The study and consent methods were approved by the Institutional Review Boards of the University of Texas, Health Science Center in Houston, and of the National Institute of Public Health, Cuernavaca, Mexico.

## RESULTS

### Characteristics of clients and pharmacies

Table 1 shows that among clients of the 32 pharmacies studied in Ciudad

**TABLE 1. Sociodemographics and health condition of pharmacy clients at 32 pharmacies in Ciudad Juárez, Mexico, and of the medication's intended recipient (end-user), by country of residence, August–November 2007**

Characteristic	Country of residence			
	Mexico		United States	
	No.	%	No.	%
Clients of pharmacies in Ciudad Juárez				
Total number of pharmacy clients	121	100	109	100
Country of employment				
Mexico	86	71	10	9
United States	24	20	81	74
Retired	11	9	18	17
Client intends to import medicine into the United States				
Yes	13	11	104	95
No	109	89	5	5
Average number of medications purchased, (range)	1.3 (1–3)		1.4 (1–5)	
Total medications purchased	157	100	154	100
Sociodemographics of end-user				
Age of end-user, in years				
< 30	68	43	35	23
30–49	60	38	75	49
≥ 50	29	19	43	28
Gender of end-user				
Male	82	52	84	55
Female	75	48	70	45
Insurance coverage of end-user <sup>a</sup>				
No insurance	58	37	89	58
Mexican Social Security	69	44	17	11
Public United States insurance	13	8	16	10
Private United States insurance	5	3	12	8
No information	12	8	20	13
Health problem/symptoms of end-user				
Total symptoms mentioned	139	100	141	100
Musculoskeletal and joint pain	21	15	12	9
Gastrointestinal problem	21	15	20	14
Upper Respiratory problem	18	13	21	15
Infections	15	11	22	16
Gynecological problem	11	8	13	9
High blood pressure	8	6	11	8
Diabetes	4	3	7	5
Fatigue	8	6	3	2
Thyroid problem	1	1	8	6
Other problems and symptoms	32	23	24	17
Symptoms diagnosed by a physician	89	57	65	42

<sup>a</sup> At the time of the study very few residents of Ciudad Juárez had enrolled in Seguro Popular, a Mexican insurance program for the underprivileged that offers free medications.

Juárez, 20% were Mexican residents working in the United States, a number of which purchased medication for a United States resident. Similarly, 9% were United States residents working in Mexico, of which 5% purchased medication for a Mexican resident.

Only 38% of the medications were purchased with a prescription, and 90% of the prescriptions had been written by Mexican physicians, including 68% of those prescriptions presented by United States residents.

An important person within the association of traditional pharmacies men-

tioned that if patients lack prescriptions some pharmacies would sell them along with the medicine to facilitate their entry into the United States (13 May 2007). One pharmacy chain advertised the presence of a nearby physician who, for a small fee (about US\$ 2.00), would diagnose an individual and write a prescription.

According to the responses to a multiple-response question United States residents had bought their medicine in Ciudad Juárez because of cost (81%), perceived quality (37%), and because a prescription was not required (37%).

**TABLE 2. Price of medications most frequently purchased from select pharmacies in Ciudad Juárez, Mexico, compared to prices in El Paso, United States, in US\$,<sup>a</sup> January 2008**

Medication (quantity in tablets unless otherwise specified)	Lowest price		Highest price	
	Location	Price	Location	Price
<b>Antibiotics</b>				
Amoxicillin 500 mg (30)	Mexican pharmacy chain	3.39	Mexican pharmacy chain	17.28
Cephalexin 500 mg (30)	Walmart <sup>b</sup> and other United States pharmacies	4.00	Mexican pharmacy <sup>c</sup>	46.80
<b>Pain</b>				
Acetaminophen 500 mg (200)	Walmart	4.00	Mexican pharmacy chain	49.80
Diclofenac (see varying quantities)	Walmart (60 tablets, 75 mg)	4.00	Mexican pharmacy (30 tablets, 100 mg)	18.72
Ibuprofen 200 mg (200)	Walmart	4.00	Mexican pharmacy	78.00
Ibuprofen 400 mg (90)	Walmart	4.00	Mexican pharmacy chain	80.73
Ibuprofen 800 mg (60)	Walmart	4.00	Mexican pharmacy chain	53.82
<b>Diabetes</b>				
Glyburide 5 mg (60)	Mexican pharmacy chain	2.16	Mexican pharmacy chain	4.56
Insulin NPH (10 ml)	United States FQHC <sup>d</sup> pharmacy	10.06	United States pharmacy	46.49
<b>Blood pressure</b>				
Propranolol 40 mg	United States pharmacy (180 pills)	12.00	Mexican pharmacy chain (30 pills)	22.20
<b>Other</b>				
Omeprazole 20 mg (30)	Mexican pharmacy chain	3.99	Mexican pharmacy	19.32
Sildenafil 50 mg/Viagra <sup>®</sup> (30)	United States FQHC pharmacy	10.06	Walmart	433.84
Multivitamin/iron (100)	United States FQHC pharmacy	7.50	Mexican pharmacy chain	44.00

<sup>a</sup> At the time of the study, the exchange rate was US\$ 1.00 = 10.7 Mexican pesos.

<sup>b</sup> Walmart in the United States (Wal-Mart Stores, Inc., Bentonville, Arizona, United States).

<sup>c</sup> Differs from a Mexican pharmacy chain in that it is independently or family-owned, i.e., a traditional pharmacy.

<sup>d</sup> Federally Qualified Health Center in the United States.

## Cost comparison

The price of the 15 most frequently purchased medicines, all of which were out of patent, had wide variability among the pharmacies in Ciudad Juárez, and when compared to those of El Paso. Contrary to client perception, at the time of this study, Walmart (Wal-Mart Stores, Inc., Bentonville, Arizona, United States) and federally qualified health center (FQHC) pharmacies offered some of the medications at prices lower than those found at pharmacies in Ciudad Juárez (Table 2).

## Medications purchased in Ciudad Juárez

Table 3 presents the type of medications purchased with and without a prescription, according to the end-user's country of residence.

Some fixed drug combinations are considered irrational; for example, combinations of several nonsteroidal anti-inflammatory drugs (NSAIDs), NSAIDs and muscle relaxants, NSAIDs and antihistaminics, and antidiarrheals with penicillin. Other products, such as antidiarrheals and cough medicines, are of little thera-

peutic value, and could represent a waste of resources. More troublesome is the fact that of the 192 products sold without a prescription, 120 were prescription-only drugs. Thus, none of the patients who obtained analgesic opioids or oral contraceptives had a prescription; and a high proportion of antibiotics, blood pressure medications, thyroid medicine, and corticosteroids were sold without prescriptions. None of the United States residents who obtained thyroid medicine and/or testosterone had a prescription; and only 10%, 20%, 25%, and 50% of those who purchased blood pressure medication, corticosteroids, antibiotics, and antiepileptics/antidepressants/ansiolitics, respectively, had one.

Two-thirds of the 120 prescription-only medications obtained without a prescription were for United States residents, and of those, 70% were self-prescribed and 10% were recommended by a physician, though the absence of a prescription suggests that the patient was not currently under medical supervision. The remaining 20% were either recommended by a pharmacy clerk (10%) or others (9%) including traditional healers. Mexican residents were less prone to self-prescribe (46%)

with prescription-only medicines, and tended to rely more on the advice of physicians (24%) and pharmacy clerks (20%).

Most clients bought the amount of medicine required to treat an episode, but some United States residents purchased excessive amounts of antibiotics (e.g., four clients bought 100 pills, cough medicine (e.g., one client bought 200 pills), thyroid medication (e.g., two clients bought 250 pills), and contraceptives (e.g., four clients bought 10 months-worth). Antibiotics and analgesic opiates were among the products most frequently recommended (data not shown) by pharmacy clerks.

The drug dispensed<sup>4</sup> was matched by the researchers with the health problem of its intended user, as reported by the purchaser (see Table 1). This information needs to be interpreted with caution since 41% of the products were purchased for a friend or relative by a purchaser who may not have had a

<sup>4</sup> In this paper, the term "dispensation" is being used to mean "the handing over of the pre-packaged drug to the client." The authors are aware that dispensation frequently implies pharmaceutical care or could be understood in a legal sense according to the Supplement of the Mexican Pharmacopeia available at <http://www.farmacopeia.org.mx/>. This was not the case in our sample of pharmacies.

**TABLE 3. Types of medicines purchased with or without a prescription in the pharmacies of Ciudad Juárez, Mexico, by country of residence of the intended recipient (end-user), August–November 2007**

Medications type	Total		End-user's country of residence			
			Mexico		United States	
	No.	% with prescription	No.	% with prescription	No.	% with prescription
Analgesics	49	35	31	32	18	39
Analgesic opiates	9	0	3	0	6	0
Antibiotics	54	35	22	50	32	25
Antifungal/antiviral/antiparasitics	18	44	9	78	9	11
Fixed combinations	29	59	22	50	7	86
Blood pressure medication	26	19	7	43	19	11
Oral antidiabetics	9	78	4	50	5	100
Proton pump inhibitors/antiacids/ histamine H2-receptor antagonists	15	47	9	44	6	50
Antidiarrheals	7	57	5	40	2	100
Antihistaminic	7	43	6	50	1	0
Cough medicine	11	18	7	29	4	0
Anticoagulants + antiplatelet drugs	2	100	1	100	1	100
Contraceptives	8	0	1	0	7	0
Bronchodilators	4	50	1	100	3	33
Antiepileptic/antidepressants/anxiolytics	6	67	4	75	2	50
Osteoporosis treatment	2	50	—	—	2	50
Thyroid medicine	6	17	1	100	5	0
Cholesterol lowering medication	3	67	—	—	3	67
Vitamins/minerals/other nutrients	13	46	8	50	5	40
Testosterone	1	0	—	—	1	0
Corticosteroids	7	29	2	50	5	20
Other OTC medicines <sup>a</sup>	25	40	14	57	11	18
Total (all types)	311	38	157	47	154	29

<sup>a</sup> Over the counter medication, available in the United States without a prescription.

full understanding of the symptoms; nevertheless some of the findings are revealing. For instance, multivitamins were bought for six persons who were feeling tired, four who had lost weight, and three who were tired and had lost weight; thyroid medicine, for three who had gained weight; cough medicine, for eight with productive coughs; and antibiotics, for 15 of 19 individuals who may have had upper respiratory infections.

### Characteristics of pharmacy clerks

Given that in this study most products (62%) were dispensed without a prescription, it was important to understand if the person dispensing the medication had the pharmaceutical knowledge and expertise necessary to promote its appropriate use. The interviews with the 9 traditional pharmacy owners and the highest ranking pharmacy clerk at 16 chain pharmacies indicated that clerks were young, had low levels of educa-

tion, and the majority (91%) had learned how to dispense medicine from their colleagues who themselves had not received formal training (Table 4).

Clerks at traditional pharmacies had more years of experience, in part because some of these pharmacies had been family-owned for many years and employees were related by kinship or friendship. Despite low levels of training, all clerks, except those in three traditional pharmacies, wore white coats, giving them the appearance of being professionals; 60% felt that they were well- or very well-qualified to advise clients on medications. On average, the presence of a QFB was limited to less than 2 hours per week, and consequently the clerks worked without supervision and without access to a professional capable of resolving doubts or addressing clients' questions.

Table 4 also shows that 32% of the pharmacies were routinely visited by 7–10 drug retailers per week; 84% of the respondents felt that the informa-

tion provided by retailers is useful, and almost three-fourths trust them. Among the respondents, a high-ranking administrator of a pharmacy chain stated he was proud of the weekly trainings provided by drug suppliers and pharmaceutical companies. In addition, the study uncovered that pharmaceutical companies were offering financial incentives to promote their products, and those incentives were often extended to pharmacy clerks. The final income of some clerks, especially those working for pharmacy chains, was based on the amounts and types of products they were able to sell.

### Clerks' recommendations to clients

Table 5 shows that when clients without a prescription requested a specific drug, only 37% of the clerks inquired about the nature of the health problem. When clients had a prescription, clerks offered an alternative product in 23% of the cases and one-third accepted the

**TABLE 4. Characteristics of Ciudad Juárez pharmacies and clerks, and opinions of clerks by type of pharmacy (chain or traditional/independently-owned), August 2007–January 2008**

Characteristic	Pharmacy type					
	Total		Chain		Traditional	
	No.	%	No.	%	No.	%
<b>Pharmacies</b>						
Average hours per week with pharmacist present (range)	1.4 hours (1–4)		1.4 hours (1–2)		1.5 hours (1–4)	
Average number of pharmacy clerks (range)	5 (1–13)		5 (2–10)		4 (1–13)	
All employees wear a white coat	25	88	16	100	9	67
<b>Pharmacy clerks</b>						
Total number of clerks	113		78		35	
<b>Gender</b>						
Males	55	49	34	44	21	60
Females	58	51	44	56	14	40
<b>Educational attainment</b>						
Primary school only	8	7	3	4	5	14
Secondary school	93	82	66	85	27	77
Technical/university training	12	11	9	12	3	9
<b>Learned to manage medicines through:</b>						
Practice	103	91	76	97	27	77
Courses	8	7	—	—	8	23
University degree	2	2	2	3	—	—
Ability to communicate in English	50	44	32	41	18	51
Average pharmacy experience (range)	8.5 years (< 1–57)		6.9 years (1–43)		12 years (< 1–57)	
Average age	34.4 years		32.7 years		38.1 years	
<b>Opinions of pharmacy clerks</b>						
Total number of respondents	25		16		9	
<b>How could you better respond to your clients?<sup>a</sup></b>						
More frequent and periodic training	12	48	9	56	3	33
Training on how to serve the client	7	28	6	38	1	11
A better facility	9	36	6	38	3	33
Better inventory and better prices	3	12	—	—	3	33
Everything is fine	4	16	3	3	1	11
<b>How often are you visited by pharmaceutical retailers?</b>						
< 1 per week	7	28	2	13	5	55
1–3 per week	10	40	7	44	3	33
7–10 per week	8	32	7	44	1	11
Information of drug representatives is useful	21	84	14	88	7	78
Information provided by drug representatives is trustworthy	18	72	13	81	5	56

<sup>a</sup> Open-ended questions with a maximum of three responses.

recommendation. Overall, the clerk’s recommendation was accepted in 69% of the cases.

Ninety percent of clients who bought any type of medicine without a prescription asked for the product by name, and none of the clerks referred the client to a physician or expressed concern about selling the product without a prescription. Of 19 clients who went to the pharmacy seeking advice, all received a recommendation from the clerk and all but one bought the recommended drug. Only one client was referred to a physician.

Of all the products dispensed, 13% were accompanied by verbal information only. The clerks provided very little information about adverse events; drug interactions were not discussed during any of the observed clerk-client interactions.

## DISCUSSION

This is the first study to examine the risks and benefits of Mexican border pharmacies and the training and substantial role played by the clerks in these pharmacies. This study has shown that the use of Ciudad Juárez pharmacies entails risks, can be a waste of resources, and might lead to overmedication. Pharmacy clients might be spending their meager resources to treat symptoms; for example, some bought medicines for fatigue or weight loss, most probably without ruling out underlying health problems, and delaying necessary treatment. Patients also purchased medicines that could hinder recovery (e.g., cough medicine when having productive cough), medicines that when used inappropriately could be detrimental to their health (e.g., thyroid medicine and some irrational fixed-dose

combinations), or that of the community at large (e.g., antibiotics).

The availability of walk-in clinics—where physicians diagnose and prescribe for a minimal fee—is very attractive to patients, including United States residents who are either uninsured, cannot access medical care in a timely manner, or cannot afford co-payments. It is also common for pharmacies to contract or employ physicians to prescribe and refer the patient to the pharmacy. In some instances, the physician’s compensation is based on the number of prescriptions, a situation that creates a conflict of interest and might lead to the prescription of unneeded medicines (24).

The Mexican government’s decision (August 2010) to enforce the legislation requiring a prescription to purchase antibiotics may have decreased the number of OTC sales of antibiotics. However,

**TABLE 5. Information provided by pharmacy clerks in Ciudad Juárez while dispensing medicines to clients, August 2007–January 2008**

Interaction and information given	Type of interaction observed							
	Client has prescription		Client requests medicine without prescription		Client seeks advice		Total	
	No.	%	No.	%	No.	%	No.	%
Cases observed per type of interaction	53	100	80	100	19	100	152	100
Clerk asks about the health problem of the end user								
Yes	NA <sup>a</sup>	NA	30	37	NA	NA	NA	NA
No	NA	NA	50	63	NA	NA	NA	NA
Clerk recommends a different product or a product								
Yes	12	23	28	35	19	100	59	39
No	41	77	72	65	--	--	41	61
Client follows the clerk's recommendations								
Yes	4	33	19	69	18	95	41	69
No	8	67	9	31	1	5	18	31
Instructions for medication usage								
In writing only (pamphlet or personalized label)	22	42	17	21	--	--	39	26
In writing and verbally by pharmacy clerk	27	51	38	48	13	68	78	51
Only verbally by pharmacy clerk	3	6	16	20	4	21	23	15
No information	1	2	9	11	2	11	12	8
Recommendations made by clerks	30	57	54	68	17	89	101	66
What the medicine will do for the client	23	77	40	74	17	100	80	79
Dosage	25	83	47	87	16	94	88	87
Interval between dosages	20	67	32	59	14	82	66	65
Duration of the treatment	7	23	24	44	14	82	45	45
Adverse events	1	3	6	11	1	6	8	8

<sup>a</sup> NA = not applicable.

researchers at the Instituto Nacional de Salud Pública (National Institute of Public Health, Cuernavaca, Mexico) have pointed out that this led to an increase in the number of consultation rooms near pharmacies (personal communication, 16 April 2011). Now, patients have to visit a physician, but little was done to limit over-prescription by medical/dental professionals and to encourage the appropriate use of antibiotics.

The potentially biased information offered by the drug industry and distributors and compensating pharmacy clerks based on sales also may cause overmedication. The sale of unneeded medicines coupled with the absence of pharmacists, the presence of untrained clerks, the observed tendency of Mexican physicians to write few instructions in their prescriptions, and the limited information contained in the package inserts of prescription-only medicines, translate into clients having access to medications, but receiving very little or incorrect information on how to use them.

This study has documented that, contrary to people's perception, medicines are not always cheapest in Mexico, therefore United States-Mexico border cross-

ers might want to compare prices before buying. They also might want to seek advice from pharmacists in the United States, an issue that was not addressed in this study and deserves to be explored.

### Study limitations

The study limitations are the use of a convenience sample, the fact that two pharmacy chains refused to participate, and its relatively small sample size. While the findings cannot be extrapolated to all Mexican pharmacies, the study has unveiled regulatory voids and pervasive organizational practices that are not exclusive to the pharmacies studied, ones that impact the type of products purchased and how medication is used. Additionally, the observers of client-clerk interactions could not always capture the name of the product under discussion, which limited analysis of the dispensation process.

### Conclusions

It is important to acknowledge that if United States border residents were unable to use Mexican providers and pharmacies, the unmet need for services

would double, and a relatively high percentage of poor, chronically ill patients (35%) would not be able to follow their treatment (21). As long as there is no universal access to medical care, United States border residents will continue to use Mexican pharmacies as their last resort.

We would like to suggest some measures that could reduce the risks and improve the use of pharmaceuticals in the border area.

1. It would be advisable to limit the conflicts of interest built into financial compensation offered to pharmacy clerks and physicians working in close collaboration with pharmacy chains. These financial incentives lead physicians to over-prescribe and pharmacy clerks to increase the sale of selected products, and do not contribute to promoting the appropriate use of pharmaceuticals.
2. Pharmacies could distribute informational leaflets with all pharmaceutical products, but especially in prescription-only products that are currently sold with very limited accompanying information. These leaflets should be designed by communi-

- cation specialists and the information should be provided by experts not under the payroll of the pharmaceutical industry.
- United States clinics and others serving the poor and uninsured might remind those in need about the availability of some low-priced, generic medicines in United States pharmacies.
  - Given the dearth of QFBs trained in community pharmacy (25), consideration should be given to the development of a technical degree, such as the pharmacy technician degree implemented in Cuba (26).
  - Given the importance of Mexican pharmacies for United States resi-

dents, the United States border leaders may consider collaborating with Mexican health authorities in the development of joint programs to promote the adequate use of pharmaceuticals, including antibiotics; in training pharmacy technicians; and in the development of educational materials to be distributed in pharmacies.

Finally, policymakers and professional associations may need to take decisive steps denouncing practices that put the health of pharmacy clients at risk. Successful implementation of these solutions will require a concerted effort by stakeholders, i.e., regulators, prescribers, in-

dustry, distributors, pharmacy owners, clerks, the community, and consumers.

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**Farmacias mexicanas:  
beneficios y riesgos para  
los residentes de la frontera  
entre Estados Unidos de  
América y México**

**RESUMEN**

**Objetivo.** Determinar los beneficios y riesgos que supone acudir a farmacias mexicanas mediante una mejor comprensión de los datos sociodemográficos de los clientes de las farmacias de Ciudad Juárez y sus necesidades de medicamentos; y evaluar la función y pericia de los auxiliares administrativos de farmacia y su repercusión sobre el uso de los medicamentos.

**Métodos.** Se realizó un estudio transversal de una muestra de conveniencia de 32 farmacias de Ciudad Juárez entre agosto del 2007 y enero del 2008. Los profesionales médicos entrevistaron a 230 clientes y 25 propietarios y auxiliares administrativos de las farmacias, y observaron 152 interacciones entre los auxiliares administrativos y los clientes. Se compararon los precios de los medicamentos adquiridos con mayor frecuencia con los de las farmacias de El Paso, Texas, Estados Unidos.

**Resultados.** De los 311 medicamentos adquiridos, los más frecuentes fueron antibióticos (54), analgésicos (49), asociaciones de medicamentos a dosis fijas (29) y antihipertensivos (26). Solo 38% de los medicamentos se compraron con receta; 62% de los medicamentos de venta con receta que se adquirieron sin ella eran automedicados. Muchos de los productos comprados tenían un valor terapéutico limitado y otros podían ser nocivos si se utilizaban de forma inadecuada. Los auxiliares administrativos de farmacia estaban mal capacitados y no ofrecían información adecuada sobre el consumo de medicamentos; nunca abordaban las contraindicaciones. Contrariamente a la percepción popular, algunos medicamentos genéricos resultaron ser más baratos en los Estados Unidos que en México. Se identificaron conflictos de intereses que podrían estar dando lugar a la sobremedicación.

**Conclusiones.** Aunque los riesgos son evidentes, algunos residentes de los Estados Unidos que padecen enfermedades crónicas y carecen de seguro médico pueden beneficiarse del acceso a medicamentos prescritos previamente por un médico, sin obtener una receta nueva. Los autores proponen cinco pasos para reducir los riesgos y mejorar la utilización de las farmacias en la zona fronteriza.

**Palabras clave**

Servicios comunitarios de farmacia; educación en farmacia; medicamentos bajo prescripción; áreas fronterizas; México; Estados Unidos.

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