Patient Characteristics and Service Trends Following Abortion Legalization in Mexico City, 2007–10

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Legal abortion services have been available in public and private health facilities in Mexico City since April 2007 for pregnancies of up to 12 weeks gestation. As of January 2011, more than 50,000 procedures have been performed by Ministry of Health hospitals and clinics. We researched trends in service users' characteristics, types of procedures performed, post-procedure complications, repeat abortions, and postabortion uptake of contraception in 15 designated hospitals from April 2007 to March 2010. The trend in procedures has been toward more medication and manual vacuum aspiration abortions and fewer done through dilation and curettage. Percentages of post-procedure complications and repeat abortions remain low (2.3 and 0.9 percent, respectively). Uptake of postabortion contraception has increased over time; 85 percent of women selected a method in 2009–10, compared with 73 percent in 2007–08. Our findings indicate that the Ministry of Health's program provides safe services that contribute to the prevention of repeat unintended pregnancies.
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In many developing countries, abortion-related complications are a leading cause of maternal morbidity and mortality, particularly where legal restrictions limit access to safe abortion care. Induced abortion is illegal in most Latin American and Caribbean countries under all but a few extreme circumstances. As a result, procedures are often performed by unskilled providers under unhygienic conditions. Women who resort to such procedures often suffer serious complications, or even death. Nearly 4 million unsafe abortions are carried out annually in Latin America and the Caribbean, and abortion-related complications account for 11 percent of all maternal deaths (WHO 2007).

In Mexico, which comprises 31 states plus the federal district of Mexico City, abortion law is determined at the state level. Elective abortion is heavily restricted everywhere except in the federal district. Most state laws allow for abortion in cases of rape or risk to a woman's life, but only 14 states permit abortion in cases of severe congenital malformation, and only 11 allow it when a woman's health is at serious risk (GIRE 2011). Even in states where abortion is legal, few women are able to obtain safe services. In most states, women seeking legal termination of pregnancy face major barriers, including uncodified or unclear administrative procedures, cumbersome reporting requirements, lack of knowledge about abortion laws, and stigmatizing attitudes by providers and legal officials (Human Rights Watch 2006; Lara et al. 2006).

Unintended pregnancy rates remain high in Mexico, despite high levels of contraceptive use. Although the percentage of married women with unmet need for family planning is relatively low (12 percent), 12 percent of currently pregnant women reported their pregnancy as unwanted and 15 percent reported it as mistimed in the 2006 ENADID (*Encuesta Nacional de la Dinámica Demográfica*) survey (Juarez et al. 2008). An estimated 875,000 induced abortions were carried out in Mexico in 2006, despite legal restrictions (Juarez et al. 2008). Complications

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from this large number of illegal, unsafe procedures led to the hospitalization of 150,000 women. Complications related to unsafe abortions are the fifth leading cause of maternal mortality in Mexico, according to federal government figures (DGIS 2006).

For more than three decades, health officials, local and international women's groups, and public health professionals have recognized the need to address the public health problems associated with unsafe abortion in Mexico and have advocated for the liberalization of abortion laws, particularly in Mexico City (the nation's capital) (Lamas and Bissell 2000). On 24 April 2007, despite opposition from pro-life advocates and the Catholic Church, the Mexico City legislature took the unprecedented step of legalizing first-trimester elective abortion. Immediately after the reform was passed, the Mexico City Ministry of Health (MOH) launched the country's first public-sector program providing legal abortion services. As of January 2011, more than 50,000 procedures have been conducted in MOH[1] health facilities.

Under the new law, abortion is available in both public and private facilities in Mexico City (Asamblea Legislativa del Distrito Federal 2009). Although private facilities are not yet monitored by the MOH, and service statistics on procedures performed there are not systematically collected, the MOH has begun implementing quality-control measures in these facilities (Archundia 2011). In a recent study conducted among private physicians, the mean number of monthly abortion procedures per private clinic was three, and just 5 percent reported more than ten procedures per month. More than 70 percent of facilities offered dilation and curettage (D&C), and the cost ranged from US$157–505 (Schiavon et al. 2010).

Mexico City Ministry of Health's Abortion Program

The Mexican public health system is decentralized and composed of both a federal Ministry of Health (MOH-MX) and a separate Ministry of Health in each state and in the federal district (Mexico City). Mexico's legal abortion program is operational only in Mexico City Ministry of Health facilities, not in Mexico City–based facilities of the MOH-MX or other programs that comprise the public health system, such as the health facilities of the Mexican Social Security Institute (IMSS), the Institute for Social Security and Services for State Workers (ISSSTE), or the National Defense Secretariat (SEDENA), which provide health-care services to eligible private- and public-sector employees.

Women requesting a procedure must be at no more than 12 weeks gestation, determined by an ultrasound administered during the first visit. Women less than 18 years of age can receive an abortion with the written permission of a parent or guardian. A parent or guardian must also accompany the woman at her visits. In participating hospitals, abortion services are offered at no cost to residents of the capital and on a sliding-scale fee for women from other states or countries (the fee depends on socioeconomic status as calculated by a social worker; the maximum fee is approximately US$100). In two specialized abortion clinics, however, the services are free for all women. Some Mexican nongovernmental organizations (NGOs) offer financial support for women coming to the capital from other Mexican states. The Maria Fund for Social Justice, for example, offers eligible women accompaniment plus a stipend to cover transportation costs and lodging (http://www.redbalance.org/maria/inicio_maria.html).

Shortly after the abortion law was passed in Mexico City, several local and international NGOs collaborated with the Mexico City MOH to provide training on clinical and counseling protocols. Clinical training covered sexual and reproductive rights, manual/electrical vacuum aspiration (MVA/EVA), gestational age limits, therapeutic protocols including procedures and abortion/contraceptive counseling, and misoprostol doses and routes of administration. The training emphasized patients' rights, especially the right to privacy, confidentiality, and informed consent regarding the abortion procedure and post-procedure contraceptive methods. Lastly, training included how to manage antichoice demonstrators. Follow-up refresher training was provided as needed.

MOH abortion facilities offer surgical procedures (MVA and D&C) for pregnancies between 9 and 12 weeks gestation. They are increasingly using MVA rather than the more invasive and expensive D&C. For women with gestation of up to nine weeks, the pregnancy is terminated with either MVA or a regimen of misoprostol administered buccally (within the oral mucosal cavity) (Middleton et al. 2005; Winikoff et al. 2008). Women who have traveled long distances for care can opt for MVA even if they are less than nine weeks gestation. Roughly 75 percent of women who opt for medication abortion (which is the use of medication to end a pregnancy) use home administration of misoprostol; the other 25 percent take all doses at the facility. Women who have undergone medication abortion return two weeks later for a follow-up visit and ultrasound. Approximately 75–80 percent of women who choose medication abortion return to the facility for a follow-up visit (Flores-Villalón 2011). MVA is performed when evidence of fetal vitality or persistence of gestational sac exists (Flores-Villalón 2011). Lastly, while mifepristone is currently unavailable in Mexico, the MOH recently completed a study in collaboration with Gynuity Health Projects to introduce a mifepris-

tone-plus-misoprostol medication abortion regimen, in accordance with evidence-based standards and practices in the United States (http://gynuity.org/news/training-for-mexican-study-team-to-introduce-mifepristone-medical-abortion).

The Mexico City abortion program provides postabortion contraception free of charge to all women who request it. Women are offered counseling on family planning (FP) and contraceptive methods. FP counseling and provision of methods are generally performed by staff social workers, except for IUD insertion and tubal ligation, which are performed by physicians. Once an abortion is deemed successful, all FP methods are made available to women, either on the day of the procedure or at a follow-up appointment in the case of medication abortion. For IUD insertions and tubal ligations, women return to the facility within two days. The services and protocols have been informed by years of relevant clinical operations and research on postabortion care (Hyman and Kumar 2003) and elective abortions conducted largely in developing countries.

Given how recently the MOH abortion program began, limited data are available to evaluate the impact of these reproductive health services. In this study, we use data collected as part of the MOH's routine health information system to describe the characteristics of clients who sought legal abortion care, including changes in client characteristics over time. We also examine trends in the types of abortion procedures performed, post-procedure complications, repeat abortions, and client uptake of postabortion contraception. This analysis sheds light on the health and behavioral effects of the abortion-policy reform in Mexico City, and can inform future program planning and advocacy.

Methods

This study draws upon data from the Mexico City Ministry of Health database of all women who received an abortion in 15 Mexico City MOH hospitals from 24 April 2007 through 31 March 2010. Information from the MOH's two designated abortion clinics is not included in this analysis because the clinics were not in operation at the beginning of the program. The database is centrally maintained at the MOH's Systems Division, and new cases are entered daily by participating facilities. Physicians fill out clinical data on the intake form and send an electronic version to the Systems Division; social workers add other client information. The Systems Division is responsible for merging all data collected from the hospitals into one dataset. The hard copy of the intake form is added to the patients' medical record at the hospital. Methods applied to ensure the high quality of the data are labor-intensive, and "clean" databases are approximately six months behind the daily report record. The MOH stores data in strict accordance with ethical procedures aimed at protecting patient privacy and in keeping with federal guidelines for managing patient records. To protect confidentiality, forms include only patient identifiers (information that specifies patient identity to those who have access to the hospital's medical records).

The abortion patient intake form was developed by the MOH in collaboration with the Population Council's Mexico office, the Mexican National Institute of Public Health, and other external experts (see Acknowledgments). In addition to standard sociodemographic and health information, the patient intake form contains information about previous contraceptive use; whether the woman received postabortion contraceptive counseling; whether she accepted a method at the time of postabortion contraceptive counseling and, if so, which method (the form only asked about the primary method selected); whether the woman had obtained a previous legal abortion in Mexico City; whether she gave informed consent to undergo the procedure; which type she received (MVA, D&C, medication); whether any abortion-related complications arose (nausea, headache, vomiting) and, if so, what treatment was administered.

Analysis

Using the database of women who received abortions in MOH facilities since the launch of the legal abortion program, we compared the proportion of women who obtained abortions across a range of reproductive health and sociodemographic variables for three time periods: 24 April 2007 to 31 March 2008, 1 April 2008 to 31 March 2009, and 1 April 2009 to 31 March 31 2010. We also compared the types of abortions performed, gestational age at which abortions occurred, proportion of patients who experienced complications, proportion of repeat abortions, and patient uptake of postabortion contraception, including methods selected. We tested for trends over time using chi-square tests and one-way Anovas to compare proportions and means for the different years.

To analyze factors associated with client uptake of postabortion contraception, we conducted chi-square tests to estimate bivariate associations between sociodemographic factors, abortion-visit factors, and postabortion uptake of contraception. Finally, we conducted multivariate logistic regression analysis to identify factors independently associated with postabortion uptake of a contraceptive method. We included in the multivariate logistic regression model all variables except for ever use of contraception, which could not be included because of

lack of variability. The model did not converge when we tried to include it.

The original database from the 15 MOH hospitals consisted of 20,937 records. Of these, 884 records (4 percent) had missing data and were excluded from the analysis. Our final analytic sample included 20,053 women who had undergone first-trimester abortions.

Results

Table 1 presents descriptive characteristics of the 20,053 women who underwent abortions in one of 15 MOH hospitals between 24 April 2007 and 31 March 2010. The average age was 25 years (not shown; the range was 11–52), and 5 percent of the sample were minors aged 11–17. Forty-four percent were currently in union (married or cohabiting), 53 percent were never in union, and 3 percent were formerly in union. Women's educational attainment was distributed as follows: 40 percent attended school for 9 or fewer years, 39 percent attended for 10–12 years, and 21 percent attended for 13 or more years.[2] The majority of the women (69 percent) were not part of the paid labor force (homemakers [36 percent], students [26 percent], unemployed [6 percent]). Most women were Catholic (84 percent), and 12 percent did not report a religious affiliation. The majority (68 percent) were Mexico City residents; almost all of the non-residents came from the neighboring State of Mexico. Two thirds of the women (67 percent) had at least one child. Eighty percent of the women reported having ever used contraception. The intake form did not ask which methods had been used or how recently, so we know neither the range of methods previously used nor whether women were using a contraceptive method at the time of conception.

Eighty percent of the sample of women obtaining abortions reported that they were enrolled in a health benefits program through the MOH (whether federal or Mexico City) at the time of the abortion; 18 percent were beneficiaries of federal social security health programs or had private insurance.

Table 1 Percentage distribution of women who obtained legal abortions in Mexico City Ministry of Health hospitals, by selected sociodemographic characteristics, 2007–10

Characteristic	24 Apr. 2007–31 Mar. 2008	1 Apr. 2008–31 Mar. 2009	1 Apr. 2009–31 Mar. 2010	Total	p value-comparing year 1 with year 3
Age range					
11–17	6.1	6.1	3.1	5.1	***
18–19	11.3	12.3	12.2	12.0	
20–24	35.3	35.3	37.5	36.0	**
25–29	21.2	22.3	22.6	22.1	
30–34	15.2	13.3	13.2	13.9	
35–39	8.1	8.0	8.6	8.2	
40+	2.7	2.7	2.9	2.8	
Marital status					
Currently in union[a]	42.2	45.9	43.8	44.1	
Formerly in union	3.6	2.9	3.1	3.2	
Never in union	54.2	51.1	53.2	52.8	
Years of schooling					
≤ 9	42.1	40.2	38.4	40.2	
10–12	36.9	39.2	40.9	39.1	
13+	21.1	20.6	20.7	20.8	
Occupation					
Homemaker	36.8	35.7	35.9	36.1	
Student	27.2	26.7	24.9	26.2	
Unemployed	4.2	6.5	8.1	6.3	***
Employed	31.8	31.2	31.1	31.4	
Religion					
Catholic	84.2	84.5	82.4	83.7	
Other Christian	4.1	4.1	4.3	4.2	
None	11.7	11.3	13.3	12.1	***
State of residence					
Mexico City	61.7	67.7	74.2	68.0	***
State of Mexico	37.1	30.0	24.3	30.2	***
Other states	1.2	2.4	1.5	1.7	**
Number of children					
None	22.6	35.5	38.3	32.5	**
1	29.1	25.6	24.4	26.3	
2	21.1	22.5	22.3	22.0	
3	15.0	10.8	9.8	11.7	
4–8	12.1	5.6	5.2	7.4	
Ever use of contraceptives					
Yes	72.6	82.9	83.0	79.8	
No	27.4	17.1	17.0	20.2	
Health benefits program					
Ministry of Health[b]	80.6	80.1	80.0	80.2	
IMSS/ISSSTE	11.7	15.4	15.0	14.1	***
PEMEX/SEDENA	3.9	2.5	3.9	3.4	
Other	3.8	2.0	1.1	2.2	***
(N)[c]	(6,099)	(7,218)	(6,736)	(20,053)	

**Significant at $p < 0.01$; ***$p < 0.001$. P-values derived from Wald chi-square tests. IMSS/ISSSTE = Instituto Mexicano del Seguro Social/Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado. PEMEX/SEDENA = Petróleos Mexicanos/Secretaría de la Defensa Nacional.

[a]"In union" refers to being married or cohabitating. [b]Includes the federal and Mexico City Ministries of Health. [c]The Ns in the second and third periods are for complete years, whereas the N in the first period is for 342 days.

Trends in Client Characteristics

During the three-year period, the proportion of abortion procedures among the entire sample that were received by adolescents (those aged 11–17 years) was halved, decreasing from 6 percent to 3 percent (see Table 1), whereas the proportion among women aged 20–24 increased. The proportion of women who were unemployed rose from 4 percent to 8 percent. The proportion of women receiving legal abortions who lived in Mexico City rose from 62 percent to 74 percent, whereas the proportion from the neighboring State of Mexico decreased from 37 percent to 24 percent, and the proportion from other states increased slightly. The proportion of childless women rose over time from 23 percent to 38 percent.

Characteristics of Abortion Procedure and Postabortion Experience

Table 2 presents information about characteristics of the abortion procedure and the postabortion experience. The average gestational age at the time of the procedure was 7.7 weeks. Fifty-one percent of women had a misoprostol-only abortion, 38 percent received MVA abortions (3 percent MVA alone; 35 percent MVA with misoprostol to prime the cervix), and 12 percent had abortions performed using D&C (with misoprostol to prime the cervix). Two percent of the women experienced mild complications from the procedure. One hundred seventy-two women (< 1 percent) had a previous abortion in the MOH abortion program.

Trends in Characteristics of Abortion Procedure and Postabortion Experience

The gestational age of women receiving abortion care rose from 7.3 weeks to 7.9 weeks two years later (see Table 2). The percentage of women undergoing misoprostol-only abortion procedures also increased, from 36 percent to 64 percent, whereas the proportion of women receiving D&C abortions (with misoprostol) decreased substantially, from 29 percent to 2 percent. The proportion of women having repeat abortions increased from 0.1 percent to 1.3 percent. The percent reporting post-procedure complications decreased from 1.6 percent to 0.5 percent.

Table 2 Percentage distribution of women surveyed, by type of abortion procedure and postabortion experience, 2007–10 (N = 20,053)

Characteristic	24 Apr. 2007–1 Mar. 2008	1 Apr. 2008–31 Mar. 2009	1 Apr. 2009–31 Mar. 2010	Total	p value-comparing year 1 with year 3
Gestational age in weeks (mean)	7.29	7.86	7.89	7.70	***
Type of procedure					
Misoprostol-only	36.0	50.1	63.9	50.5	***
MVA with misoprostol	31.9	40.9	31.5	35.0	***
MVA	3.2	3.8	2.1	3.1	***
D&C with misoprostol	28.9	5.3	2.4	11.5	***
Previous abortion in MOH program					
Yes	0.1	1.0	1.3	0.9	
No	99.9	99.0	98.7	99.1	
Mild complications associated with the procedure					
Yes	1.6	4.5	0.5	2.3	***
No	98.4	95.5	99.5	97.7	***
Postabortion contraceptive method selected					
None	26.9	12.3	15.0	17.7	***
IUD	41.1	43.8	39.8	41.6	***
Hormonal[a]	6.5	17.2	32.3	19.0	***
Male condoms	6.3	7.1	7.8	7.1	
Sterilization	5.5	6.8	4.2	5.5	***
Other (method type not specified)	13.8	12.7	1.0	9.1	***

***Significant at $p < 0.001$. P-values derived from Wald chi-square tests and t-tests. [a]Hormonal methods include pills, injectables, implant, patch.

Uptake of Postabortion Contraception

Uptake of postabortion contraception has been high overall and has increased over time. In 2007–08, 27 percent of women did not choose any method of contraception following abortion, compared with 15 percent in 2009–10. The proportion choosing an IUD following abortion has remained around 40 percent, with a slight decrease from 41 percent to 40 percent from 2007–08 to 2009–10. The proportion of women choosing hormonal methods rose from 7 percent to 32 percent, and the proportion requesting sterilization decreased slightly from 6 percent to 4 percent. The proportion for whom the specific method selected was not recorded decreased markedly over time, from 14 percent to 1 percent.

In bivariate analysis (not shown), we found that uptake of postabortion contraception was associated with marital status, education, occupation, religion, parity, type of health insurance, ever having practiced contraception, type of abortion procedure received, gestational age, experience of mild post-procedure complications, and whether the client had a previous abortion. The most striking association was with ever use of contraception. Among women who had never practiced contraception, only 13 percent adopted postabortion contraception, compared with 100 percent of women who had previously practiced contraception. (This variable could not be included in our multivariate analysis because of its lack of variability; the model did not converge when we tried to include it.)

The results of the multivariate logistic regression analysis are shown in Table 3. Uptake of postabortion contraception was higher for women with 10 or more years of education, those who were unemployed (compared with homemakers), those who were nulliparous, and those who had social security insurance or private insurance (compared with those who received services from the Ministry of Health welfare program). Postabortion uptake of contraception was also significantly greater among those who were at gestational ages of 10–12 weeks and for those who experienced mild complications following the abortion. Uptake of postabortion contraception was reduced among women who had a previous abortion and among those who received a D&C or medication abortion (compared with those provided with MVA). No significant differences in uptake of postabortion contraception were found by age, marital status, religion, or state of residence.

Table 3 Multivariate logistic regression analysis of factors associated with uptake of postabortion contraception (N = 20,053)

Characteristic	Odds ratio
Age (years)	1.00
Marital status	
Currently in union (r)	1.00
Formerly in union	1.00
Never in union	1.07
Years of schooling	
≤ 9 (r)	1.00
10+	1.13***
Occupation	
Homemaker (r)	1.00
Student	0.94
Unemployed	1.64***
Employed	0.97
Religion	
Other Christian (r)	1.00
Catholic	1.08
None	0.97
State of residence	
Mexico City (r)	1.00
State of Mexico	1.00
Other states	0.79
Parity	
Parous (r)	1.00
Nulliparous	1.26***
Health benefits program	
Ministry of Health (r)	1.00
IMSS/ISSSTE	1.45**
PEMEX/SEDENA	2.30***
Other	1.39*
Gestational age in weeks	
≤ 9 weeks (r)	1.00
10–12 weeks	1.11*
Type of procedure	
MVA[a] (r)	1.00
Misoprostol-only	0.54***
D&C with misoprostol	0.31***
Mild post-procedure complications	
No (r)	1.00
Yes	1.98***
Previous abortion in MOH program	
No (r)	1.00
Yes	0.61**

*Significant at $p < 0.05$; **$p < 0.01$; ***$p < 0.001$. (r) = Reference category. IMSS/ISSSTE = Instituto Mexicano del Seguro Social/Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado. PEMEX/SEDENA = Petróleos Mexicanos/Secretaría de la Defensa Nacional. [a]This group includes women who received MVA alone and MVA with misoprostol to prime the cervix.

Discussion

This is the first study of the characteristics of women using public sector abortion services in Mexico City hospitals since the procedure was legalized in 2007. Some of the noteworthy findings were that two-thirds of the women already had children, 25 percent were aged 30 or older, 44 percent were currently married or in union, and the vast majority identified themselves as Catholic. These findings dispel some of the common misconceptions about women who use legal abortion services. Contrary to the popular presumption that abortions are sought largely by young unmarried women who have no children and who are not religious, these data indicate that women seeking abortions are diverse with respect to age, marital status, and parity, and that a high percentage are Catholic. One notable trend in client characteristics over time is the decrease in the proportion of minors having abortions, from 6 percent in 2007–08 to 3 percent in 2009–10. Whether this decrease in the proportion of minors obtaining abortions at hospitals reflects an overall decline in the proportion of minors inducing abortion is not known, however. Over time, the Ministry of Health focused service delivery for minors at two health clinics, and these were not included in our sample.

Another important finding from this study is the shift toward safer and less invasive methods, in accordance with international recommendations for safe abortion care. The Mexico City abortion program has taken programmatic steps to phase out D&C. Misoprostol-only abortions and MVA are now the most common procedures. Abortions using D&C decreased from 29 percent in 2007–08 to less than 3 percent in 2009–10. The percent of clients experiencing mild complications after the procedure has remained low, and complications have decreased over time. This may reflect a shift in the types of procedures performed and/or improvements in clinical care.

We also found a low rate of repeat abortion—typically about 1 percent per year. This low rate may reflect the high acceptance of postabortion contraception and the program's relative success in providing access to contraceptive methods for all abortion patients in Mexico City (Asamblea Legislativa del Distrito Federal 2009). It also suggests that, contrary to the concern among some opponents of legal reform, women are not using abortion as their primary method of fertility control even though it is legal. Although the rate of repeat abortion increased from 0.1 percent in the first year of the program to 1.3 percent in 2009–2010, this increase likely reflects the increase in the period of time during which legal abortion was previously available.

The rate of repeat procedures has been low so far, but it may increase over time if women do not practice contraception following abortion or do not sustain contraceptive use. Studies of rates of repeat abortion in countries where abortion has been legal for a longer period of time have found higher rates than those we have found in Mexico—for example, 38 percent in Sweden and 39 percent in China (Xu, Huang, and Cheng 2007; Cheng et al. 2008; Heikinheimo, Gissler, and Suhonen 2008). Our rates for Mexico City may be underestimates if women were unwilling to self-report previous induced abortions, which is possible given the considerable stigma

associated with the procedure (Amuchástegui Herrera and Rivas Zivy 2002; Kumar, Hessini, and Mitchell 2009; Shellenberg 2010; Norris et al. 2011).

Overall, for the three-year analysis, the proportion of women opting for a contraceptive method following abortion has been high (82 percent). Furthermore, over time the proportion of women not opting for a method following the procedure has substantially decreased, from 27 percent in the first year to 15 percent in the third year. The provision of postabortion contraception may have improved over time because of the MOH's family planning training. Although practice of contraception following abortion is high overall, we found systematic variation in uptake by characteristics such as education, parity, type of procedure undergone, and whether women were repeat abortion clients. Additionally, a striking finding was that just 13 percent of women who had never used contraceptives began doing so following abortion. These findings suggest that gaps in family planning service provision and counseling remain. Groups that should be targeted in an effort to improve contraceptive uptake include women with lower education (less than ten years), and those who are parous, have had a previous abortion, receive health benefits through the Ministry of Health (not through social security or private insurance), have never used contraception, and have undergone a D&C or medication abortion (rather than MVA).

One factor that may contribute to low uptake of postabortion contraception is that some women may not perceive themselves to be at risk of a future unintended pregnancy—such as those who have just ended a relationship, and those who have sex infrequently—and may therefore be reluctant to adopt an ongoing method of contraception. For these women, a postcoital option such as emergency contraception (EC) may be more suitable. EC is infrequently used in Mexico; in 2009, less than 1 percent of women aged 15–49 reported use of EC (CONAPO 2010).

We found that the postabortion contraceptive method accepted most frequently was the IUD, which significantly reduces the likelihood of future unwanted pregnancy and repeat abortion (Goodman et al. 2008; Heikinheimo, Gissler, and Suhonen 2008). The high postabortion acceptance of the IUD may reflect the generally high rate of acceptance of this contraceptive method in Mexico. National data from 2009 indicate that the IUD is used by 16 percent of reproductive-age women in union (CONAPO 2010). In addition, family planning counselors tend to emphasize the potential health benefits (beyond avoidance of unwanted pregnancy) associated with use of this method.

Our analyses have some limitations. Our sample is limited to women who have received abortion services in 15 Mexico City public hospitals; thus, it excludes women who received abortion services provided at two Ministry of Health clinics specializing primarily in reproductive and sexual health, one launched in May 2008 and the other in July 2010, which together currently provide 31 percent of all MOH abortion services. A second limitation is that the data were collected for a health information system rather than for research**.** Thus, they contained a limited set of measures, and the quality of the data collection may have varied over time. For example, the trend we found of fewer classifications over time of "not specified" in reports of the postabortion contraceptive method selected likely reflects an improvement in recordkeeping.

An important area for future research is the monitoring of private sector services. No equivalent database for procedures performed in private clinics exists (Schiavon et al. 2010), so we do not know the extent to which the characteristics of women or the nature of the services provided differ between MOH and private sector facilities that perform abortion. Longitudinal studies that follow women over time after they have an abortion are needed to better understand patterns of contraceptive use. The generally high uptake of postabortion contraception is a positive sign; however, the high uptake may not translate into long-term reductions in repeat unintended pregnancy if clients discontinue methods adopted or use them inconsistently or incorrectly. Research that follows clients after their abortion would help address these questions.

Implementing a large-scale data-collection system for the Mexico City abortion program has proven useful for understanding the characteristics of women who receive legal abortions, the types of services received, and the measures taken to prevent future unwanted pregnancies. Our results can inform future planning and budgetary decisions, such as those related to contraceptive procurement, patient flow, and staffing. Future studies of abortion services in Mexico City can build on these data to explore questions about quality of care, trends in types of abortion procedures, and reproductive health characteristics of patients over time.

Our findings have relevance not only for Mexico City but also for other countries, particularly in Latin America, where measures have recently been taken to greatly restrict access to reproductive health services, including legal abortion to save a woman's life, and contraception. The Mexico City legal abortion program has shown that evidenced-based techniques for early surgical (MVA) and medication abortion can be mainstreamed in a relatively short time period when adequate and periodic training is provided, and that these services can be linked to an effective post-procedure family planning program. Where political will exists to defend the reproductive health and rights of women, concomitant reductions in maternal mortality and morbidity can be expected.

Notes

1 Unless otherwise specified, "MOH" refers to the Mexico City Ministry of Health.

2 In Mexico, 9 or fewer years of education corresponds to an elementary or middle school education, 10–12 years corresponds to a high school education, and 13 or more years reflects schooling beyond high school.

References

Amuchástegui Herrera, Ana and Marta Rivas Zivy. 2002. "Clandestine abortion in Mexico: A question of mental as well as physical health," *Reproductive Health Matters* 10(19): 95–102.

Archundia, Mónica. 2011. "GDF: Educación evitará embarazos no deseados," *El Universal*, 7 February. <http://www.eluniversal.com.mx/ciudad/105114.html>. Accessed 20 July 2011.

Asamblea Legislativa del Distrito Federal. 2009. "Decreto por el que se expide la Ley de Salud del Distrito Federal," *Gaceta Oficial del Distrito Federal*, 17 September. <http://www.pgjdf.gob.mx/temas/8-7-2/fuentes/ley_de_salud_del_DF.pdf>. Accessed 20 July 2011.

Cheng, Yimin, Xiao Xu, Juncai Xu, et al. 2008. "The need for integrating family planning and postabortion care in China," *International Journal of Gynecology and Obstetrics* 103(2): 140–143.

Consejo Nacional de Población (CONAPO). 2010. *Principales Indicadores de Salud Reproductiva ENADID 2009*. Mexico City: CONAPO. <http://www.conapo.gob.mx/publicaciones/SaludReproductiva/2009/4.%20Anticoncepcion%20en.pdf>. Accessed 20 July 2011.

Dirección General de Información en Salud (DGIS). 2006. *Sistema Nacional de Información en Salud: Datos hospitalarios*. Mexico City.

Flores-Villalón, Antonio Eduardo. 2011. Personal communication with physician responsible for the abortion program at the Beatriz Velasco Ministry of Health clinic.

Goodman, Suzan, Sarah Hendlish, Matthew Reeves, and Anne Foster-Rosales. 2008. "Impact of immediate postabortal insertion of intrauterine contraception on repeat abortion," *Contraception* 78(2): 143–148.

Grupo de Información en Reproducción Elegida (GIRE). 2011. *El aborto en los códigos penales de las entidades federativas*. <http://www.gire.org.mx/contenido.php?informacion=31>. Mexico City: GIRE. Accessed 13 August 2011.

Heikinheimo, Oskari, Mika Gissler, and Satu Suhonen. 2008. "Age, parity, history of abortion and contraceptive choices affect the risk of repeat abortion," *Contraception* 78(2): 149–154.

Human Rights Watch. 2006. *The Second Assault: Obstructing Access to Legal Abortion after Rape in Mexico*. New York.

Hyman, Alyson G. and Anu Kumar. 2003. "What is woman-centered comprehensive abortion care?" Ipas. <http://www.ipas.org/Publications/What_is_woman-centered_comprehensive_abortion_care.aspx>. Accessed 20 July 2011.

Juarez, Fatima, Susheela Singh, Sandra G. García, and Claudia Diaz Olavarrieta. 2008. "Estimates of induced abortion in Mexico: What's changed between 1990 and 2006?" *International Family Planning Perspectives* 34(4): 158–168.

Kumar, Anuradha, Leila Hessini, and Ellen Mitchell. 2009. "Conceptualising abortion stigma," *Culture, Health, and Sexuality* 11(6): 625–639.

Lamas, Marta and Sharon Bissell. 2000. "Abortion and politics in Mexico: 'Context is all,'" *Reproductive Health Matters* 8(16): 10–23.

Lara, Diana, Sandra García, Olivia Ortiz, and Eileen A. Yam. 2006. "Challenges accessing legal abortion after rape in Mexico City," *Gaceta Médica de México* 142(2): 85–89.

Middleton, Tamer, Eric Schaff, Stephen L. Fielding, et al. 2005. "Randomized trial of mifepristone and buccal or vaginal misoprostol for abortion through 56 days of last menstrual period," *Contraception* 72(5): 328–332.

Norris, Alison, Danielle Bessett, Julia R. Steinberg, Megan L. Kavanaugh, Silvia De Zordo, and Davida Becker. 2011. "Abortion stigma: A reconceptualization of constituents, causes, and consequences," *Women's Health Issues* 21(3 Supp.): S49–S54.

Schiavon, Raffaela, Maria Collado, Erika Troncoso, Jose Soto, Gabriela Zorrilla, and Tia Palermo. 2010. "Characteristics of private abortion services in Mexico City after legalization," *Reproductive Health Matters* 18(36): 127–135.

Shellenberg, Kristen M. 2010. "Abortion stigma in the US: Quantitative and qualitative perspectives from women seeking an abortion." Baltimore, MD: Johns Hopkins University. Doctoral dissertation.

Winikoff, Beverly, Ilana G. Dzuba, Mitchell D. Creinin, et al. 2008. "Two distinct oral routes of Misoprostol in Mifepristone medical abortion," *Obstetrics and Gynecology* 112(6): 1303–1310.

World Health Organization (WHO). 2007. *Unsafe Abortion: Global and Regional Estimates of the Incidence of Unsafe Abortion and Associated Mortality in 2003*. Fifth edition. Geneva.

Xu, Jie-Shuang, Yong-Mei Huang, Li-Nan Cheng. 2007. "Factors in relation to repeated abortions among unmarried young people in Shanghai," [In Chinese.] *Zhonghua Liu Xing Bing Xue Za Zhi* 28(8): 742–745.

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