

# Contraceptive Receipt Among First-Trimester Abortion Clients and Postpartum Women in Urban Mexico

**CONTEXT:** In Mexico, first-trimester abortion is legal in Mexico City and is available in the public and private sectors. Understanding subsequent contraceptive uptake and method mix among first-trimester abortion clients relative to that of women who deliver a live birth at a health facility could help identify where improvements in care following an obstetric event can be made across the health system.

**METHODS:** This article uses a retrospective cohort study to compare uptake of contraception prior to discharge between abortion clients in Mexico City's public abortion program and postpartum women from urban settings. The two data sources were clinical records of 45,233 abortion clients in Mexico City and information from a population-based survey of 1,289 urban women on their immediate postpartum contraceptive adoption. The primary outcome investigated was receipt of any reversible modern contraceptive method; secondary outcomes were level of method effectiveness and method type. Logistic regression and calculated multivariable probabilities were used to control for the effects of sociodemographic factors across the two data sources.

**RESULTS:** The adjusted probability of uptake of any reversible modern method of contraception was higher among abortion clients than among postpartum women (67% vs. 48%). However, among all women who had received a contraceptive method, abortion clients had a lower adjusted probability of having received a long-acting reversible contraceptive than did postpartum women (49% vs. 82%) and a higher probability of having received a moderately effective method (38% vs. 13%). The adjusted probability of implant uptake was higher among abortion clients than among postpartum women (9% vs. 3%), while the adjusted probability of IUD uptake was lower (38% vs. 78%).

**CONCLUSIONS:** Women receiving abortions in Mexico City's public abortion program were more likely than urban postpartum women to receive a reversible modern contraceptive method before leaving the facility. Women should be offered the full range of contraceptive methods after any obstetric event, to help them prevent unintended pregnancy and avoid short interpregnancy intervals.

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In Mexico, a middle-income country, the total fertility rate has dropped dramatically over the past several decades, from nearly seven lifetime births per woman in 1960 to 2.1 in 2014.<sup>1</sup> As of 2014, 52% of women aged 15–49 used a modern contraceptive method. However, in 2009, more than half (55%) of pregnancies in Mexico were estimated to be unintended,<sup>2</sup> in part because of unmet need for contraception, which was highest (at 29% in 2014) among sexually active never-married nulliparous women.<sup>3</sup> An estimated 30% of all pregnancies ended in abortion in 2009.<sup>2</sup>

Government population policy endorses wide access to a range of modern contraceptive methods, but evidence suggests that the most effective methods are linked with childbirth, especially for younger women.<sup>4</sup> Immediate postpartum IUD insertion and sterilization are common: Between 2006 and 2011, 40–50% of postpartum women aged 12–39 left the place of delivery with a long-acting reversible contraceptive (LARC) method—an IUD or hormonal implant—or had chosen to undergo a sterilization

procedure.<sup>5</sup> However, high unmet need<sup>3</sup> and low rates of LARC use among young nulliparous women (2% among women aged 15–19 who reported ever using a method in 2014<sup>4</sup>) suggests that many Mexican women have limited access to the most effective methods outside the context of delivery. This makes primary prevention of unintended first pregnancies a challenge.

First-trimester abortion was decriminalized in Mexico City, one of Mexico's 32 states, in 2007, and the public-sector abortion program, known as *Interrupcion Legal del Embarazo* (ILE), has provided more than 200,000 abortions since its inception in spring 2007.<sup>6</sup> Contraceptive counseling and provision are essential components of abortion services, to help women avoid a future unintended pregnancy,<sup>7,8</sup> and these are integrated into Mexico City's ILE program at no cost to clients. Research on the first years of the ILE program (2007–2010) suggests that contraceptive uptake after abortion was 85%.<sup>9</sup> However, ILE has shifted to providing the majority of abortions as

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medication abortion (78% in 2020, compared with about half in 2007–2010).<sup>6</sup> Recent research in England and Wales has suggested that, compared with women having an aspiration abortion, those having a medication abortion have lower levels of immediate contraceptive uptake and are less likely to use LARCs.<sup>10</sup> It is not known whether the shift to more medication abortion has negatively affected contraceptive uptake in the ILE program.

Furthermore, it is not known whether postabortion contraceptive adoption and method choice among abortion clients differs from that among postpartum women who have delivered a live birth at a health facility.<sup>11</sup> Evaluating contraceptive provision in abortion services without comparison groups, especially other post–obstetric event services, makes it difficult to gauge where there may be room for improvement compared with obstetric services. While one might expect contraceptive uptake to be higher among abortion patients (since most likely did not want to be pregnant), it is hard to assess how well abortion-related services are performing without comparing them with other services in the same health system.

The purpose of this study was to compare uptake of any modern method, method effectiveness<sup>12</sup> and type of LARC (implant or IUD) between abortion and postpartum clients. We hypothesize that receipt of a contraceptive in the abortion population would not be lower than in the postpartum population but that the method mix would be different.

## METHODS

### Data and Sample

This secondary analysis leverages two data sources: clinical data extracted from medical charts in the ILE program, and a population-based survey representing the immediate postpartum population. The ILE data set contains information on more than 55,000 abortions from four high-volume public abortion facilities in Mexico City between 2007 and 2015. These clinical data give information on gestational age, type of procedure, sociodemographics of the woman (e.g., age, education, state of residence, marital status and occupation), her number of previous births and postabortion contraceptive receipt. Details of the data are presented elsewhere.<sup>13</sup> Briefly, we generated a database pooling information from an existing electronic database and a database created by our research team with information extracted from paper medical records.

For the postpartum sample, we used 2012 household survey data from the Encuesta Nacional de Salud y Nutricion [National Health and Nutrition Survey] (ENSANUT). This survey is representative at the state level and by rural-urban stratum,<sup>14</sup> and has information on utilization of nutrition and health services, including a module about prenatal and delivery care, which we used for this analysis. All women in each household who had a live birth up to five years prior to the date of the survey (2006–2011; n=7,467) were asked a series of questions

about their utilization of health services, including their immediate postpartum contraceptive adoption (prior to hospital discharge).

We restricted our two samples to women residing in large urban areas (populations of more than 100,000) in four states: Mexico City, the State of Mexico (Estado de Mexico), Jalisco and Nuevo Leon. We selected these four states, which contain the largest urban areas in the country, to make the ENSANUT sample more comparable with the ILE sample, which is largely from the Mexico City metropolitan area (74%). We excluded abortion clients who did not receive an abortion because they were past the gestational age limit, those who had had an ectopic pregnancy and those who were referred to a different facility for another reason, since they were not eligible to receive a contraceptive (n=6,864; 13% of total ILE sample). Women who were missing outcome data (3.5% of abortion clients and 0.2% of postpartum patients) were also excluded. Our final analytic samples consisted of 45,233 abortion clients (ILE sample) and 1,298 postpartum women (ENSANUT sample).

## Measures

- **Dependent variables.** Our primary outcome was receipt of any reversible modern contraceptive method prior to discharge from the place of abortion or delivery. Our secondary outcomes focused on method efficacy, classified by the World Health Organization effectiveness tiers: “Most effective” included permanent methods and LARCs (the IUD and implant), “moderately effective” included all other hormonal methods and “less effective” methods were barrier methods.<sup>12</sup> We also examined receipt of individual LARC methods in the abortion and postpartum samples. Contraceptive receipt and method type were self-reported for the postpartum sample: Women who had had a live birth at a health facility (94% of all births in Mexico<sup>15</sup>) were asked if they received a contraceptive method prior to discharge. For the abortion sample, this information was drawn from the social worker’s or physician’s note in clients’ charts; those with missing contraceptive method information were coded as no method receipt. We were unable to identify subsequent contraceptive uptake (such as at a six-week postpartum visit) for the postpartum sample; however, our interest was in comparing contraceptive provision prior to discharge after an obstetric event. We classified all observations as using a modern reversible method or not and classified individual methods (e.g., IUD, implant, pill, injectable and condoms); we then collapsed methods into indicator variables for most effective methods (versus moderately effective and less effective methods) and moderately effective methods (versus most effective and less effective methods).

- **Independent variables.** Our key independent variable is population: whether the observation came from the abortion client (ILE) sample or the postpartum (ENSANUT) sample. We created a variable to flag the source of each observation.

We also included sociodemographic variables that were available in the abortion medical charts and the national survey: age (<20, 20–24, 25–29, 30–39 and 40–54), education (highest level achieved: primary, junior high school, high school and university or higher), state of residence (Mexico City, State of Mexico, Nuevo Leon and Jalisco, collapsed as Mexico City or not), marital status (married or cohabitating, widowed, divorced or separated, and single) and number of births prior to the index abortion or delivery (0, 1 and ≥2).

## Analysis

We used descriptive and bivariate statistics (chi-square tests) to characterize the samples and to examine differences in covariate distributions across the two data sources; we then calculated crude proportions of contraceptive receipt and method type by population (abortion client/ILE medical chart data and postpartum/ENSANUT survey data). In our descriptive analysis, we included the postpartum sample both with and without women who chose sterilization, since sterilization is not available at the time of abortion in the public abortion program. We did not use survey weights for the postpartum sample, given

that we restricted the samples to large urban areas in the four states and pooled data sources.

We next developed a series of logistic regression models for each of our outcomes: any contraceptive receipt among all women in the sample, and receipt of a most effective or moderately effective method among those with a modern method. We included an indicator of data source (abortion clients or postpartum women) in the model, with abortion clients as the reference group. Women in the postpartum sample who chose sterilization (a common postpartum method used by older women and those who have reached desired family size<sup>5</sup>) were excluded from these models, because of sterilization's unavailability in the public abortion program. Additionally, the postpartum sample skewed older than the postabortion sample; excluding women who chose sterilization left the age-distribution of the two samples more similar.

We developed separate models for most effective methods and moderately effective methods among the subsample of women using any modern method; here again, we excluded from the postpartum sample women who chose sterilization. We ran similar separate models for the IUD and implant. All models included the covariates described above (age, education, marital status, state of residence and number of previous births). Finally, we calculated absolute margins or multivariable predicted probabilities for our outcomes (receipt of any contraceptive, of a most effective or a moderately effective method, of an implant and of an IUD) for key covariate values (abortion vs. postpartum and age-group), to improve interpretation.<sup>16</sup>

We conducted a series of sensitivity analyses to assess the robustness of the results. We tried several kinds of matching (propensity scores, entropy balancing and coarsened exact matching);<sup>17,18</sup> the results were robust, but our ability to achieve good matches was limited. We restricted both samples to women residing in Mexico City and to women younger than 25; results again were robust to these changes. Finally, we ran separate models for each data source to examine covariate patterns within each data source.

This study was approved by the ethics committee of the Instituto Nacional de Salud Pública and by the Mexico City Ministry of Health, and it was deemed non-human subjects research by the Oregon Health & Science University.

## RESULTS

### Descriptive Findings

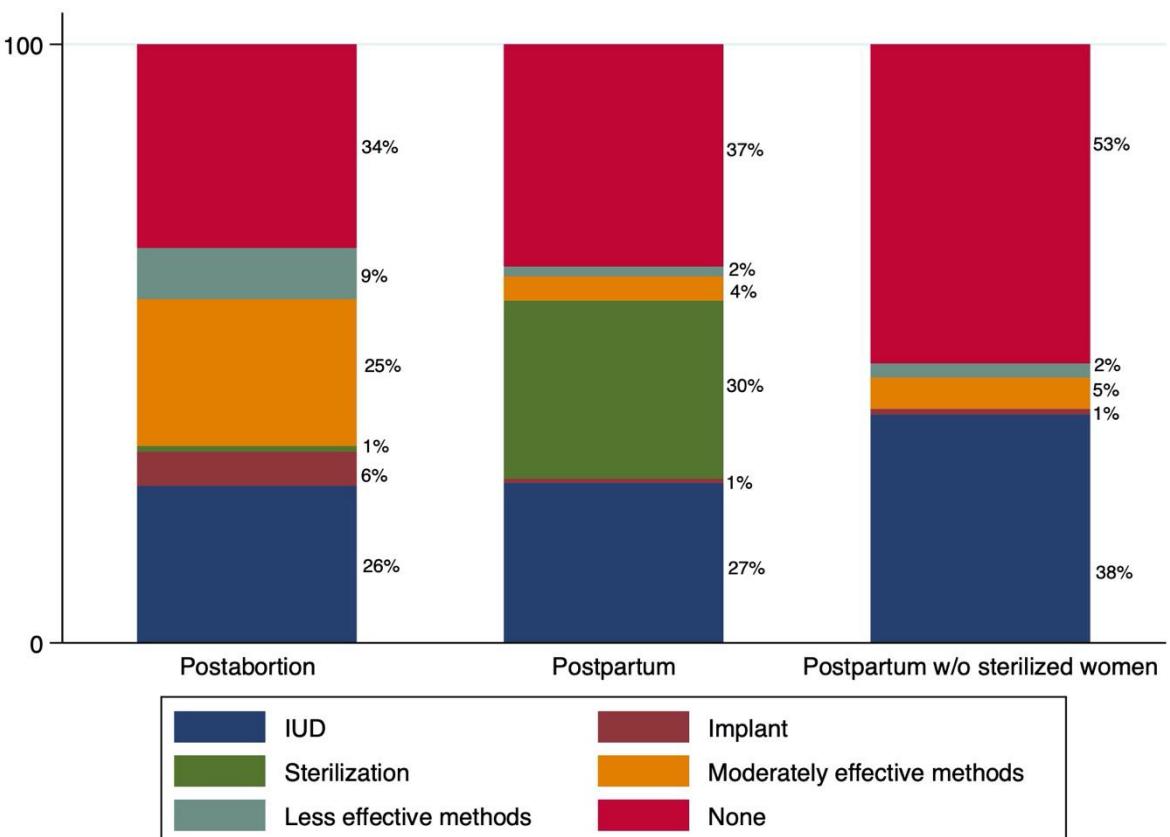
Among our samples, 20% of abortion clients were younger than 20 and 35% were aged 20–24, compared with 5% and 8%, respectively, among postpartum women (Table 1). Abortion clients also were more educated: For example, a greater proportion reported having finished high school (39% vs. 24%). Seventy-four percent of abortion clients were from Mexico City, compared with 31% of postpartum women. The proportion of women who were single was much higher among abortion clients than among postpartum women (42% vs 8%). Thirty-four percent of abortion

**TABLE 1. Percentage distribution of urban Mexican women, by selected characteristics, according to sample**

Characteristic	Postabortion (N=45,233)	Postpartum (N=1,298)
<b>Age</b>		
<20	20.4	4.8***
20–24	35.2	7.6***
25–29	21.4	11.4***
30–39	20.1	41.2***
40–54	2.7	35.1***
Missing data	0.1	0.0
<b>Education</b>		
Primary	8.7	25.0***
Secondary	33.6	37.5**
High school	38.9	24.1***
University	16.6	13.4**
Missing data	2.2	0.0***
<b>State</b>		
Mexico City	74.3	31.4***
State of Mexico	25.2	24.0
Jalisco	0.4	18.3***
Nuevo Leon	0.1	26.2***
Missing data	0.0	0.0
<b>Civil status</b>		
Married/free union/	50.8	73.6***
Widowed/divorced/ separated	5.3	18.0***
Single	42.4	8.5***
Missing data	1.5	0.0***
<b>No. of births</b>		
0	40.4	0.0***
1	25.3	22.5*
≥2	33.7	77.5***
Missing data	0.6	0.0**
<b>Total</b>	100.0	100.0

\*Difference is statistically significant at p<.05. \*\*Difference is statistically significant at p<.01. \*\*\*Difference is statistically significant at p<.001.

Notes: Data for postabortion clients are from ILE patient records for 2007–2015; data for postpartum women are from 2012 ENSANUT survey. Chi-square tests were conducted for group differences between postpartum and postabortion patients. Percentages may not add to 100.0 because of rounding.

**FIGURE 1. Percentage distribution of urban Mexican women, by contraceptive receipt prior to discharge from their place of abortion or delivery, according to sample**

*Notes:* For the postabortion sample, n=45,233; for the postpartum sample, n=1,298 including sterilized women and n=859 excluding them. Most effective methods are female sterilization, the IUD and the implant. Moderately effective methods are the pill, injectable, patch and vaginal ring. Less effective methods are barrier methods.

clients had had at least two births, compared with 78% of the postpartum women.

Among all of the women, the crude proportions who had received a modern contraceptive method prior to discharge did not differ by sample—67% of abortion patients and 64% of postpartum women (Figure 1). When women who chose postpartum sterilization were excluded from the postpartum sample, the proportion who had received a method dropped to 46% ( $p<.000$  for the difference with the postabortion sample).

Overall, about 33% of postabortion clients and 58% of postpartum women elected to receive a most effective method (LARC or sterilization), although the latter proportion dropped to 39% when women who underwent sterilization were removed from the postpartum sample ( $p<.001$  for the difference between postpartum and postabortion patients). Overall, 25% of the postabortion clients and 4% of the postpartum women had received moderately effective methods ( $p<.001$  for the difference between postpartum and postabortion women).

### Multivariate Findings

In our multivariable models, postabortion clients had a higher adjusted probability than postpartum women of

receiving any reversible modern method, once women who chose sterilization were excluded (67% vs. 48%; Table 2). Among women who had received a method, abortion clients had a lower adjusted probability than postpartum women of receiving a most effective method (49% vs. 82%). Compared with postpartum women, abortion clients had a higher probability of receiving an implant (9% vs. 3%) but a lower probability of receiving an IUD (38% vs. 78%). Abortion clients had a higher adjusted probability than postpartum women of receiving a moderately effective method (38 vs. 13%).

Table 3 presents adjusted probabilities of women's receiving any modern reversible contraceptive method, an IUD and an implant among the two samples, by age-group. Abortion clients younger than 20 had a 68% probability of receiving any contraceptive method, whereas the probability among postpartum women (after sterilized women were excluded) was 50%. There were no large disparities by age; however, older women (those aged 40–54) had a higher probability of receiving a postabortion IUD than women younger than 20 (41% vs. 36%). Patterns for implant receipt were somewhat different than those for IUD receipt: Among women who had received a reversible modern method, the probability of receiving an implant was higher postabortion

**TABLE 2. Adjusted probability (and 95% confidence intervals) of women's immediate receipt of a modern reversible contraceptive method, by method type, according to sample**

Method type	Postabortion	Postpartum
Any	66.7 (66.3–67.1)	47.6 (44.1–51.1)
Most effective†	49.4 (48.8–49.9)	82.0 (78.0–85.9)
IUD‡	37.5 (37.0–38.1)	77.6 (73.3–81.9)
Implant‡	8.5 (8.1–8.8)	2.7 (0.8–4.5)
Moderately effective†	37.5 (36.9–38.0)	13.0 (9.4–16.5)

†Among women who received a method. Notes: Models control for age, education, state of residence, civil status and number of previous births. Postpartum sample excludes women who chose sterilization. Most effective methods are the IUD and the implant. Moderately effective methods are the pill, injectable, patch and vaginal ring.

**TABLE 3. Adjusted probability (and 95% confidence intervals) of women's immediate receipt of any reversible modern contraceptive method, an IUD or an implant, by age-group, according to sample**

Method/age	Postabortion	Postpartum
<b>Any method†</b>		
<20	68.4 (67.4–69.5)	49.5 (45.8–53.2)
20–24	65.8 (65.1–66.6)	46.6 (43.0–50.2)
25–29	65.5 (64.5–66.4)	46.2 (42.6–49.8)
30–39	67.4 (66.4–68.4)	48.4 (44.8–52.0)
40–54	69.1 (66.7–71.5)	50.3 (46.3–54.3)
<b>IUD‡</b>		
<20	35.7 (34.4–37.0)	76.2 (71.6–80.9)
20–24	37.8 (36.8–38.8)	77.8 (73.5–82.2)
25–29	37.2 (35.9–38.4)	77.4 (72.9–81.8)
30–39	38.9 (37.6–40.3)	78.6 (74.4–82.9)
40–54	40.5 (37.2–43.7)	79.7 (75.3–84.1)
<b>Implant‡</b>		
<20	7.7 (6.9–8.4)	2.4 (0.7–4.1)
20–24	9.5 (8.9–10.1)	3.1 (1.0–5.2)
25–29	9.3 (8.5–10.0)	3.0 (0.9–5.0)
30–39	7.1 (6.4–7.8)	2.2 (0.7–3.8)
40–54	5.3 (3.7–6.8)	1.6 (0.4–2.8)

†Among all women. ‡Among women who received a method. Note: Postpartum sample excludes women who chose sterilization.

than postpartum across all ages, peaking at ages 20–24 among abortion clients and postpartum women (10% and 3%, respectively).

Finally, Table 4 presents the corresponding adjusted odds ratio estimates for associations between sample (abortion clients vs. postpartum women) and the outcomes, as well as additional variables controlled for in the models that produced the adjusted probabilities in Tables 2 and 3. In addition to sample (postabortion vs. postpartum) and age, other factors associated with receiving any modern method were civil status and area of residence. Compared with married women, those who were single or previously married had greater odds of receiving any modern method (odds ratios, 1.3 and 1.2, respectively). And compared with women in Mexico City, those residing in other urban areas were slightly more likely to have received any reversible method (1.1), but less likely to have received an implant (0.7).

## DISCUSSION

To our knowledge, this study is the first in Mexico to compare postprocedure contraceptive receipt between women who had had an induced abortion and those who had had a live birth. Comparing abortion and other types of obstetric clients allows us to better understand where improvements in access to contraceptives can be made across the health system, and to avoid siloing and stigmatizing abortion clients about perceived contraceptive nonuse. Women should be offered the full range of contraceptive methods after any obstetric event, to help them prevent unintended pregnancy and avoid short interpregnancy intervals.

**TABLE 4. Odds ratios (and 95% confidence intervals) from multivariate logistic regression analyses examining women's likelihood of receiving a contraceptive, by method type, according to sample and other characteristics**

Variables	Any modern method		Most effective method (vs. moderately effective or less-effective method)	Moderately effective method (vs most effective or less-effective method)	IUD (vs. other methods)	Implant (vs. other methods)
	All women	Excluding sterilized women				
<b>Sample</b>	(N=45,151)	(N=44,712)	(N=28,349)	(N=28,349)	(N=29,664)	(N=29,664)
Postabortion (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Postpartum	0.85 (0.75–0.96)**	0.45 (0.39–0.52)**	4.73 (3.61–6.20)**	0.25 (0.18–0.34)**	5.82 (4.53–7.49)**	0.30 (0.15–0.61)**
<b>Age</b>						
<20	1.15 (1.08–1.23)**	1.14 (1.07–1.22)**	0.84 (0.78–0.91)**	1.23 (1.14–1.34)**	0.94 (0.87–1.02)	0.81 (0.71–0.93)**
20–24	1.02 (0.97–1.08)	1.02 (0.96–1.07)	1.01 (0.94–1.07)	1.06 (0.99–1.13)	1.03 (0.96–1.10)	1.03 (0.92–1.15)
25–29 (ref)	1.00	1.00	1.00	1.00	1.00	1.00
30–39	1.10 (1.03–1.17)**	1.09 (1.07–1.16)**	1.03 (0.96–1.11)	0.97 (0.89–1.04)	1.08 (1.00–1.16)*	0.75 (0.65–0.86)**
40–54	1.25 (1.11–1.40)**	1.18 (1.05–1.33)**	1.04 (0.90–1.20)	0.97 (0.83–1.14)	1.15 (0.99–1.33)	0.54 (0.39–0.74)**
<b>Education</b>						
Primary (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Secondary	1.13 (1.05–1.22)**	1.13 (1.05–1.21)**	1.03 (0.94–1.13)	1.01 (0.92–1.11)	0.98 (0.90–1.07)	1.13 (0.96–1.34)
High school	1.18 (1.10–1.27)**	1.18 (1.09–1.27)**	0.89 (0.81–0.97)*	1.11 (1.01–1.23)*	0.85 (0.77–0.93)**	1.15 (0.97–1.36)
University	1.28 (1.18–1.39)**	1.27 (1.17–1.38)**	0.80 (0.73–0.89)**	1.22 (1.10–1.36)**	0.82 (0.74–0.91)**	0.99 (0.82–1.20)
<b>Area of residence</b>						
Urban area outside Mexico City	1.06 (1.01–1.11)*	1.06 (1.01–1.11)*	0.87 (0.82–0.91)**	1.11 (1.05–1.17)**	0.97 (0.92–1.03)	0.74 (0.67–0.82)**
Mexico City (ref)	1.00	1.00	1.00	1.00	1.00	1.00
<b>Civil status</b>						
Married/in free union (ref)	1.00	1.00	1.00	1.00	1.00	1.00
Widowed/divorced/separated	1.20 (1.10–1.31)**	1.22 (1.11–1.33)**	1.20 (1.08–1.33)**	0.81 (0.73–0.91)**	1.07 (0.97–1.19)	1.60 (1.35–1.89)**
Single	1.34 (1.28–1.40)**	1.34 (1.28–1.39)**	0.95 (0.90–1.00)	1.06 (1.01–1.12)*	0.86 (0.82–0.91)**	1.27 (1.16–1.39)**
<b>No. of births</b>						
0–1 (ref)	1.00	1.00	1.00	1.00	1.00	1.00
≥2	1.04 (0.98–1.09)	1.01 (0.96–1.07)	1.19 (1.12–1.27)**	0.85 (0.79–0.90)**	1.09 (1.02–1.16)**	1.04 (0.93–1.16)

\*p<.05. \*\*p<.01. Note: ref=reference group.

It is important to avoid evaluating abortion services in a vacuum: Stigmatization of women who need abortion services persists, particularly with respect to individual responsibility around contraceptive use or nonuse.<sup>19,20</sup> By focusing exclusively on abortion clients' contraceptive practices, one runs the risk of ignoring the need for contraceptive counseling to respect women's preferences—both for type of method and for contraceptive use in general.<sup>21,22</sup> Not all abortion clients will want to practice contraception following their procedure, just as not all women who deliver will want to use a contraceptive method immediately after a birth (or at all).

Our findings suggest that uptake of a reversible contraceptive method following an obstetric event is higher among abortion clients in Mexico City's public abortion program than among urban postpartum women, which reinforces previous work linking provision of contraceptives in Mexico—especially the most effective methods—with an obstetric event.<sup>4,5</sup> The distribution of type of contraceptive method differs between the two groups, with a higher proportion of postabortion women electing moderately effective methods (primarily short-acting hormonal contraceptives) and postpartum women tending more to receive the most effective methods (LARCs and sterilization). Postpartum patients were much more likely to receive an IUD, while abortion clients were more likely to receive an implant (although reliance on this method remained quite low).

According to a study of eight countries in Africa and Asia, 73% of clients received a contraceptive in public-sector facilities after an induced abortion or postabortion care.<sup>23</sup> Earlier work in Mexico using ILE clinic data found that 85% of clients adopted a method,<sup>9</sup> and a study using exit surveys with ILE clients reported contraceptive uptake at 90%.<sup>24</sup> Our estimate (an adjusted probability of 67%) is considerably lower, however.

This difference may be explained by differences in self-reported data compared with the medical chart data used in our study. It may also be explained by changes in abortion methods. In the early years of the ILE program (prior to 2011), aspiration abortion was common: Fifty-two percent of a sample of 402 ILE clients in 2009 received an aspiration abortion.<sup>24</sup> In contrast, since the ILE program's inception, 78% of its clients have had medication abortions.<sup>6</sup> In recent years, ILE clinics have been moved out of hospital settings into primary care clinic settings, the procedure rooms of which have limited capacity. To provide free services to the greatest number of women, it is now standard practice in the ILE program to provide medication abortion for residents of Mexico City at or before 10 weeks' gestation. Protocols usually offer aspiration abortions to women beyond 10 weeks or who are traveling from outside the city. In previous research,<sup>10,23,24</sup> aspiration abortion was found to be associated with higher immediate contraceptive uptake overall than was medication abortion, as well as with higher use of LARC methods, particularly the IUD.<sup>10</sup> Thus, contraceptive method use patterns

in the public abortion program are likely tied to abortion method.

Our findings suggest areas for continued improvement in access to the most effective methods in the ILE program. It was not until 2013 that women who had medication abortions could be offered LARCs at the time of the abortion, when the "quick start" implant protocol was implemented.<sup>25</sup> This protocol involves the immediate insertion of an implant on the day that the client takes mifepristone,<sup>8</sup> which means that the client has no need to return to the clinic to receive a LARC. Insertion of an IUD, however, still requires a follow-up consultation. While abortion clients in our study had a higher probability than postpartum women of implant receipt, the probabilities for both were low; we anticipate that implant use has increased in the public-sector abortion program in the years following our study. We were unable to ascertain whether observed differences in contraceptive acceptance and method mix were related to patient preferences and needs or to supply issues in the health services serving abortion clients and postpartum women. In addition, our two samples come from overlapping but different time periods; future work should update these findings as data become available.

Postpartum sterilization prior to discharge from the hospital is a common contraceptive practice in Mexico: For example, 40% of women aged 30–39 who deliver at a health facility choose sterilization prior to discharge.<sup>5</sup> While contraceptive sterilization is safe and effective, it is a permanent method, intended for women who wish to stop childbearing. Sterilization is not appropriate for all women, especially for younger women who seek to delay a first birth or to space births.<sup>26</sup> The ILE abortion client sample was younger and had a higher proportion who were nulliparous than the ENSANUT postpartum sample; thus, the proportion of abortion clients desiring sterilization—or even a LARC method—may have been lower. Additionally, female sterilization is not available in an outpatient setting in Mexico. We therefore presented our results both including and excluding women who chose sterilization postpartum. Abortion clients are as likely as postpartum patients to receive reversible contraceptive methods. The differences in our results when we included and excluded women who chose immediate postpartum sterilization highlight the younger age distribution of the abortion population and the lack of immediate availability of sterilization procedures at ILE clinics.

### **Limitations**

By leveraging two data sources to compare postabortion clients with postpartum women, our observational study had some limitations. First, our two samples differed on key variables, such as age distribution. We applied matching techniques but were unable to achieve satisfactory matches. However, we improved the comparability of our samples by restricting the population-based samples to large urban areas, and we performed sensitivity analyses focused on Mexico City and women younger than age 25. Our results

were robust to all model specifications, giving us confidence in the overall relationships that we observed. Second, data abstracted from clinical charts (such as the ILE abortion information) may not be comparable to the self-reported measures derived from surveys, such as ENSANUT. Third, we were unable to account for hospital-level factors that may have driven provision of postpartum contraception in the ENSANUT sample, such as counseling practices or available stocks. We have little evidence about counseling practices in the postpartum setting, but concerns exist around the potential for limited or weak informed consent processes. Fourth, ENSANUT, like any survey, may suffer from recall bias. Women were asked about deliveries within the five years prior to the survey; in our previous work, we found no differences in outcomes when we restricted the sample to two years prior to the survey, to assess recall bias.<sup>27</sup> Finally, ILE is a public program that serves the population using Ministry of Health services, but it is open to all women, regardless of their type of health insurance. The ENSANUT sample included women who use Ministry of Health and other public-sector systems (ISSSTE and IMSS), as well as the private sector. Our two samples thus may differ on insurance status, an important indicator of socioeconomic status.

## CONCLUSIONS

Contraceptive services are integrated into both public abortion services and obstetric services in Mexico. We found that women receiving abortions in Mexico City's public abortion program, ILE, were more likely than urban postpartum women to receive a reversible modern contraceptive method before leaving the facility. Compared with postpartum women, abortion clients were less likely to receive an IUD, but more likely to receive an implant; however, overall rates of implant receipt were low during the study period. Our results can be used to identify areas for ongoing improvement in access to postabortion contraception, such as immediate insertion of implants with medication abortion or of IUDs after an aspiration abortion. Labor and delivery wards in hospitals could also increase their provision of implants.

All women should be provided with high-quality counseling before, during and after obstetric events—counseling that focuses on their specific reproductive needs (spacing or limiting), their age and their parity, and that always respects their informed choice.<sup>28,29</sup> Policies and programs should also guarantee the availability in clinics and hospitals of the widest possible choice of contraceptives, particularly of the most effective methods. Future work should focus on the counseling practices in both delivery wards and ILE clinics.

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## RESUMEN

**Contexto:** En México, el aborto de primer trimestre es legal en la Ciudad de México y está disponible en los sectores público y privado. Comprender la forma en que las clientas de aborto de primer trimestre adoptan el uso de anticonceptivos y la combinación de métodos subsiguientes en comparación a como lo hacen las mujeres que dan a luz a un nacido vivo en una institución de salud, podría ayudar a identificar dónde, en el sistema de salud, se pueden realizar mejoras en la atención después de un evento obstétrico.

**Métodos:** Este artículo utiliza un estudio de cohorte retrospectivo para comparar la adopción de anticonceptivos por parte de clientas de servicios de aborto que participan en el Programa de Interrupción Legal del Embarazo en el sector público de la Ciudad de México y las mujeres posparto de entornos urbanos, previo a ser dadas de alta de la institución de salud. Las dos fuentes de datos fueron los registros clínicos de 45,233 clientas de servicios de aborto en la Ciudad de México y la información de una encuesta poblacional aplicada a 1,289 mujeres urbanas sobre su adopción inmediata de anticonceptivos posparto. El resultado primario investigado fue la recepción de cualquier método anticonceptivo moderno reversible; los resultados secundarios fueron el nivel de efectividad del método y el tipo de método. Se utilizó regresión

logística y probabilidades multivariadas calculadas para controlar los efectos de los factores sociodemográficos en las dos fuentes de datos.

**Resultados:** La probabilidad ajustada de la adopción de cualquier método anticonceptivo moderno reversible fue mayor entre las usuarias de aborto que entre las mujeres en período posparto (67% vs. 48%). Sin embargo, en el total de mujeres que habían recibido un método anticonceptivo, las clientas de servicios de aborto tuvieron una probabilidad ajustada menor de haber recibido un anticonceptivo reversible de acción prolongada que las mujeres posparto (49% frente a 82%) y una probabilidad más alta de haber recibido un método anticonceptivo moderadamente eficaz (38% vs. 13%). La probabilidad ajustada de adopción del implante fue mayor entre las usuarias de aborto que entre las mujeres en período posparto (9% vs. 3%), mientras que la probabilidad ajustada de adopción del DIU fue menor (38% vs. 78%).

**Conclusiones:** Las mujeres que se recibieron servicios de aborto en el Programa de Interrupción Legal del Embarazo en el sector público de la Ciudad de México tuvieron más probabilidades que las mujeres urbanas en período posparto de recibir un método anticonceptivo moderno reversible antes de ser dadas de alta de la institución de salud. A las mujeres se les debe ofrecer la gama completa de métodos anticonceptivos después de cualquier evento obstétrico, para ayudarlas a prevenir embarazos no deseados y evitar intervalos cortos entre embarazos.

## RÉSUMÉ

**Contexte:** Au Mexique, l'avortement au premier trimestre de la grossesse est légal dans la ville de Mexico et peut être obtenu dans le secteur public et privé. Comprendre l'adoption ultérieure de la contraception par les patientes de l'avortement au premier trimestre et leur éventail de méthodes, par rapport aux femmes qui accoucheut d'un enfant vivant en structure sanitaire pourrait aider à identifier les possibilités d'amélioration des soins après un événement obstétrical dans l'ensemble du système de santé.

**Méthodes:** Sur la base d'une étude de cohorte rétrospective, cet article compare l'adoption de la contraception avant la sortie de la structure de soins, entre les patientes ayant subi un avortement dans le cadre du programme public d'avortement de Mexico et les femmes post-partum en milieu urbain. Les deux sources de données considérées sont les dossiers cliniques de 45 233 patientes de l'avortement à Mexico et l'information obtenue d'une enquête en population relative à 1 289 femmes urbaines concernant leur adoption immédiate de la contraception après l'accouchement. Le résultat principal examiné était l'obtention d'une méthode contraceptive moderne réversible quelconque; les résultats secondaires étaient le niveau d'efficacité de la méthode et le type de méthode. Pour les deux sources de données, les effets de facteurs sociodémographiques ont été contrôlés par régression logistique et probabilités multivariées calculées.

**Résultats:** La probabilité corrigée d'adoption d'une méthode de contraception moderne réversible quelconque s'est avérée

supérieure parmi les patientes de l'avortement (67% contre 48% chez les femmes post-partum). Cependant, sur la totalité des femmes ayant reçu une méthode contraceptive, les patientes de l'avortement présentaient une moindre probabilité corrigée d'avoir obtenu une méthode réversible à longue durée d'action (49% contre 82% des femmes post-partum) et une plus forte probabilité d'avoir obtenu une méthode modérément efficace (38% contre 13%). La probabilité corrigée d'adoption de l'implant s'est révélée supérieure parmi les clientes de l'avortement (9% contre 3% chez les femmes post-partum), tandis que la probabilité corrigée d'adoption du DIU était plus faible (38% contre 78%).

**Conclusions:** Les femmes qui obtiennent un avortement dans le cadre du programme public d'avortement de Mexico étaient plus susceptibles que leurs homologues post-partum urbaines de recevoir une méthode contraceptive moderne réversible avant de quitter la structure. La gamme complète de

méthodes contraceptives doit être proposée aux femmes après tout événement obstétrical, pour les aider à éviter les grossesses non planifiées et les intervalles de grossesse courts.

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