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Travelling for abortion services in Mexico 2016–2019: community-level contexts of Mexico City public abortion clients

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► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/bmjshr-2021-201079>).

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Received 17 February 2021
Accepted 6 July 2021
Published Online First
28 July 2021



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To cite: Jacobson LE, Saavedra-Avendano B, Fuentes-Rivera E, et al. *BMJ Sex Reprod Health* 2022;**48**:e81–e87.

ABSTRACT

Objective To describe the community context of women who travel to access Mexico City's public sector abortion programme and identify factors associated with travelling from highly marginalised settings.

Methods We used data from the Interrupción Legal de Embarazo (ILE) programme (2016–2019) and identified all abortion clients who travelled from outside Mexico City. We merged in contextual information at the municipality level and used descriptive statistics to describe ILE clients' individual characteristics and municipalities on several measures of vulnerability. We also compared municipalities that ILE clients travelled from with those where no one travelled from. We used logistic regression to identify factors associated with travelling to access ILE services from highly marginalised versus less marginalised municipalities.

Results Our sample included 21 629 ILE clients who travelled to Mexico City from 491 municipalities within all 31 states outside Mexico City. The majority of clients travelled from the least marginalised (81.9%) and most populated (over 100 000 inhabitants; 91.3%) municipalities. Most (91.2%) ILE clients came from municipalities with adolescent fertility rates in the bottom three quintiles. Clients with a primary or secondary education (vs high school or more) and those from a municipality with a high adolescent fertility rate (top two quintiles) had higher odds of travelling from a highly marginalised (vs less) municipality (adjusted odds ratio (aOR) 1.46, 95% CI 1.35 to 1.58 and aOR 1.89, 95% CI 1.68 to 2.12, respectively).

Conclusion ILE clients travel from geographically and socioeconomically diverse communities. There is an unmet need for legal abortion across Mexico.

INTRODUCTION

In Mexico, abortion law is determined at the state level and access to legal abortion

Key messages

- Clients travel for abortions from all Mexican states to Mexico City indicating unmet need for abortion services.
- Women from more vulnerable communities are not travelling to Mexico City to obtain public sector abortion services.
- Abortion law allows access to safe abortion in Mexico City but creates disparities in access to safe abortion services for women in vulnerable communities.

is available only under narrow indications in 30 of Mexico's 32 states.¹ In 2007, first-trimester abortion was decriminalised in Mexico City, followed by Oaxaca in 2019. The Mexico City Ministry of Health (Secretaría de Salud) operates a public sector first-trimester abortion programme, known as the Interrupción Legal de Embarazo (ILE) programme. Abortion services are available to anyone who presents for care at no cost or on a sliding scale for residents outside of Mexico City.^{2 3} Since 2007, the ILE programme has provided over 225 000 first-trimester abortions and approximately 30% of clients have travelled from outside Mexico City, with little change in this proportion over time.³ Previous work showed that ILE clients who were unmarried, with less than a high school education, and who resided outside of Mexico City experienced difficulties travelling to ILE facilities.⁴ Evidence also shows that access to abortion under legal indications, or 'causales', remains very limited

in public facilities outside of Mexico City,^{5 6} making travel for services an important research focus.

Little is known about the community contexts ILE clients come from. Previous work has either used very large geographical units (regions or groups of states)⁷ or has focused only on the Mexico City metropolitan area⁸; it suggested that those who could travel to access services had higher levels of education than the average population in their home geographical area. The geographical distribution of ILE clients at the community level is unknown, as are community-level characteristics of places ILE clients come from and places with no ILE clients. Community-level marginalisation influences healthcare access⁹ and varies at the municipality level, with higher marginalisation observed in the south and in rural areas.¹⁰

The purpose of this study was to describe individual and community (municipality)-level factors among those who travel from outside of Mexico City to obtain abortions in the ILE programme. We hypothesised that (1) clients who access ILE services come from geographically and socioeconomically diverse municipalities, (2) that municipalities that are home to ILE clients are different from municipalities with no ILE clients on key markers of socioeconomic status and (3) we further explore (individual and contextual) factors associated with travel for abortion services from more marginalised compared with less marginalised municipalities.

METHODS

Data and variables

We conducted a retrospective study using publicly available individual records from the ILE programme¹¹ and publicly available municipality-level data from the census. Our data include all individual-level client records from all 14 ILE sites that provided services from 2016 to 2019. In this analysis, we include only individuals who reported living outside of Mexico City (32.5%; 21 629/66 462). We leverage publicly available municipality-level data to provide community contextual information for individual ILE clients. A municipality is a second-level administrative division (below a state) that varies in size and is similar to a county in the United States.¹⁰ In 2010, the last available national census at the time of the study, there were 2457 municipalities in Mexico, including the 16 municipalities in Mexico City. Each municipality has a unique code; using the client's municipality code, we merged in municipality-level information from the most recent available census (2010 complete or 2015 intercensal survey) acquired from multiple publicly available sources (online supplemental table 1). Thus, if two clients came to the ILE programme from the same municipality, they were both assigned the same value for each municipality-level variable. Nearly 12% of clients (2882/24 511) were missing a municipality code value and were excluded from the

study because we do not know where they travelled from. The majority of excluded clients travelled from the central region (87.8%) as determined by their state of residence, but otherwise there were no patterns in missingness of municipality data (online supplemental table 2).

Our outcome is municipality-level marginalisation from the census, merged into individual ILE records. In Mexico, community marginalisation is measured by a marginalisation index, 'grado de marginación', a standard measure used by the Mexican government¹² that includes composite measures of education, income, household materials, and the proportion of the population that is rural (<2500 inhabitants). This index is divided into quintiles where higher values indicate higher marginalisation (more vulnerability). We also created a binary variable indicating higher marginalisation (top four quintiles) versus low marginalisation (the bottom quintile). We chose these cut-offs based on the distribution in the data where the majority of clients (81.9%) came from the least marginalised municipalities (bottom quintile).

At the individual level, we extracted additional data from the ILE client record. We included age (12–17, 18–24, 25–29, 30–39, 40+ years; REF 18–24); we chose to cut-off our adolescent category at 17 because women aged under 18 years must have parental or legal guardian consent.¹³ We included education level (primary, secondary, high school, university); marital status (single, married/cohabitating or divorced/widowed); occupation (*ama de casa*: works at home/unemployed, employed or student); number of pregnancies (1, 2–3, 4+); and municipality and state of residence.

We created a variable to classify states into regions (North, Central, South). We included the municipality-level adolescent fertility rate, divided into quintiles and also collapsed into a binary variable indicating high (fourth and fifth quintiles) or moderate/low (first through third quintiles). This binary variable represents values above and below the median. We also included the following commonly used indicators of municipality socioeconomic status: whether <2% of the population aged 3 years or older spoke an indigenous language; if >75% of households owned a washing machine; if >30% of households had in-home internet; the proportion of the female population with at least 9 years of education; if <40% of adolescents in the municipality did not attend school; and if >30% of the female population was economically active, defined as females aged 12 years and older who worked or looked for work in the reference week. We created these binary variables based on data distributions (cut-off at the median) except for 9 years of schooling for females, which represents the national minimum standard in Mexico.¹⁴ We calculated proportions using the relevant population denominators (online supplemental table 1). We also

included an indicator of whether the municipality had an Adolescent Friendly Service Center, which provides adolescent-specific sexual and reproductive health services within Ministry of Health facilities.¹⁵

Analysis

First, we described the ILE clients' individual characteristics. Next, we described the binary municipality-level characteristics of socioeconomic status by whether ILE clients travelled from the municipality or not. We calculated municipality-level averages for the municipalities where ILE clients travelled from (n=491 municipalities) and did not travel from (n=1950 municipalities outside Mexico City) and used bar graphs to compare the proportions.

Next, we created a heat map of the number of ILE clients that travel from each municipality collapsed into categories (0, 1, 2–100, >100). Finally, we built a logistic regression model to identify individual and contextual factors associated with presenting for abortion services from a highly marginalised municipality (top four quintiles) compared with a municipality of low marginalisation (bottom quintile). We included individual age, education, marital status, and parity as well as municipality-level adolescent fertility (dichotomised as highest two quintiles vs bottom three) and region. We used Stata version 16 (StataCorp, College Station, TX, USA) for all analyses. This study was deemed non-human subjects research by the Oregon Health & Science University IRB.

RESULTS

Of the 21 629 clients who travelled from outside Mexico City between 2016 and 2019 to access legal first-trimester abortion services in the ILE programme, the majority travelled from the least marginalised (81.9%) and most populous (more than 100 000 inhabitants; 91.3%) municipalities. The largest age group was 18–24 years old (46.5%); had a high school (45.5%) or university (20.3%) education; and reported to be single (58.1%) (table 1).

The majority of ILE clients who travelled to Mexico City were experiencing at least a second pregnancy (62.3%). ILE clients primarily travelled from the central region (94.2%). They travelled from 491 of 2441 (20.1%) municipalities within all 31 states outside Mexico City. The majority of clients (91.2%) travelled from municipalities with the lowest adolescent fertility rates (lowest three quintiles; table 1).

Figure 1 shows the difference in municipality-level socio-economic characteristics between the 491 municipalities from which ILE clients traveled, and the average levels from the other 1,950 municipalities outside Mexico City with no ILE clients. For example, 62% of the municipalities that ILE clients traveled from (orange bar) had adolescent fertility in the lowest 3 quintiles compared to 56% of those where they did not (grey bars). Figure 1 highlights that

Table 1 Sociodemographic characteristics of Interrupción Legal de Embarazo (ILE) clients who travelled to Mexico City (N=21 629)

Individual level	n (%)
Age (years)	
12–17	1048 (4.9)
18–24	10 053 (46.5)
25–29	5233 (24.2)
30–39	4608 (21.3)
40+	687 (3.2)
Education level	
Primary or lower	1270 (5.9)
Secondary	6100 (28.2)
High school	9840 (45.5)
University	4384 (20.3)
Missing data	35 (0.2)
Marital status	
Single	12 558 (58.1)
Married/cohabitating	7968 (36.8)
Widowed/divorced	936 (4.3)
Missing data	167 (0.8)
Occupation	
'Ama de casa'/unemployed	6430 (29.7)
Employed	7136 (33.0)
Student	5873 (27.2)
Missing data	2190 (10.1)
Pregnancies (n)	
1	7443 (34.4)
2–3	9606 (44.4)
4+	3860 (17.9)
Missing data	720 (3.3)
Year of service	
2016	5607 (25.9)
2017	5587 (25.8)
2018	5374 (24.9)
2019	5061 (23.4)
Municipality level	
Regions	
North	240 (1.1)
Central	20 374 (94.2)
South	1015 (4.7)
Municipality population size	
<15K	236 (1.1)
15–99K	1647 (7.6)
>1000K	19 746 (91.3)
Marginalisation index	
Most marginalised	32 (0.2)

Continued

Municipality level	
More marginalised	196 (0.9)
Medium	409 (1.9)
Less marginalised	3273 (15.1)
Least marginalised	17 719 (81.9)
Adolescent fertility quintiles	
Lowest	4077 (18.9)
Low	4001 (18.5)
Middle	11 643 (53.8)
High	725 (3.4)
Highest	1178 (5.4)
Missing data	5 (0.0)

the municipalities that ILE clients come from are on average less marginalized than other municipalities in Mexico on key measures of socioeconomic status.

Figure 2 presents a heat map of the numbers of ILE clients that traveled from each municipality in Mexico outside Mexico City. The municipalities with the largest number of ILE clients (over 100) are clustered in the central region near or bordering Mexico City. This figure highlights both that ILE clients come from all across Mexico and that there are large areas of the country where no one travels to the ILE program.

In our multivariable logistic regression model, ILE clients who had a primary or secondary education (vs high school or more) had larger adjusted odds of travelling from a highly marginalised (vs less) municipality (adjusted odds ratio (aOR) 1.46; 95% CI 1.35 to

1.58), controlling for individual factors, municipality-level adolescent fertility rate, and region (table 2).

ILE clients travelling from municipalities with adolescent fertility rates in the top two quintiles (aOR 1.89; 95% CI 1.68 to 2.12) and municipalities in the southern region (aOR 2.98; 95% CI 2.58 to 3.45) had larger odds of travelling from a highly marginalised versus a less marginalised municipality (table 2).

DISCUSSION

We present novel data on the geographical distribution of ILE clients at the municipality level, and the individual and community context of women who travelled from outside of Mexico City to obtain abortion services at the ILE programme. The majority of ILE clients came from the least marginalised and most populous municipalities with lower adolescent fertility rates. Generally, the municipalities that ILE clients travelled from were on average better off than other areas of Mexico on several measures of socioeconomic status. Clients who had a primary or secondary education and those who came from a place with high adolescent fertility had larger odds of travelling from a highly marginalised municipality compared with a municipality of low marginalisation.

Our findings show that ILE clients come from all corners of Mexico and support previous work which demonstrates high unmet demand for legal abortion services.⁸ While our study data do not include those who needed an abortion but were unable to travel, the disparities in vulnerability we observe at the community level between communities ILE clients travel from and communities where no one travels from suggests more

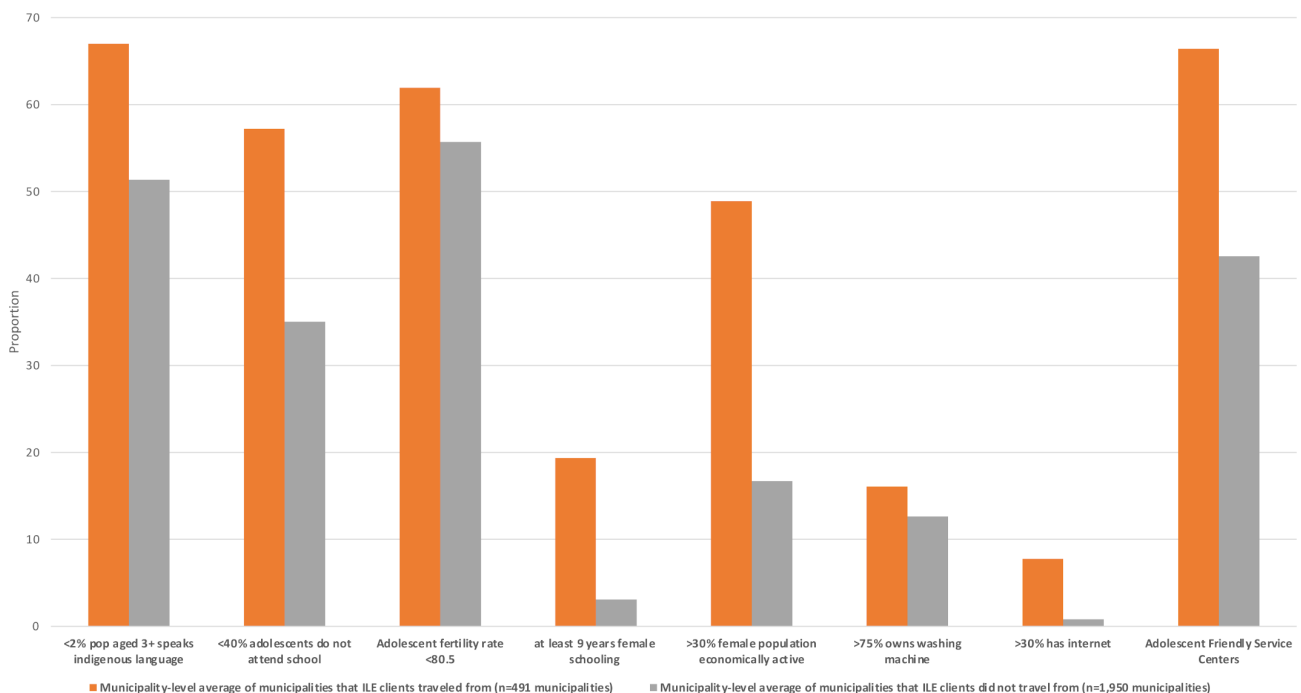


Figure 1 Characteristics of municipalities that ILE clients traveled from versus other Mexican municipalities.

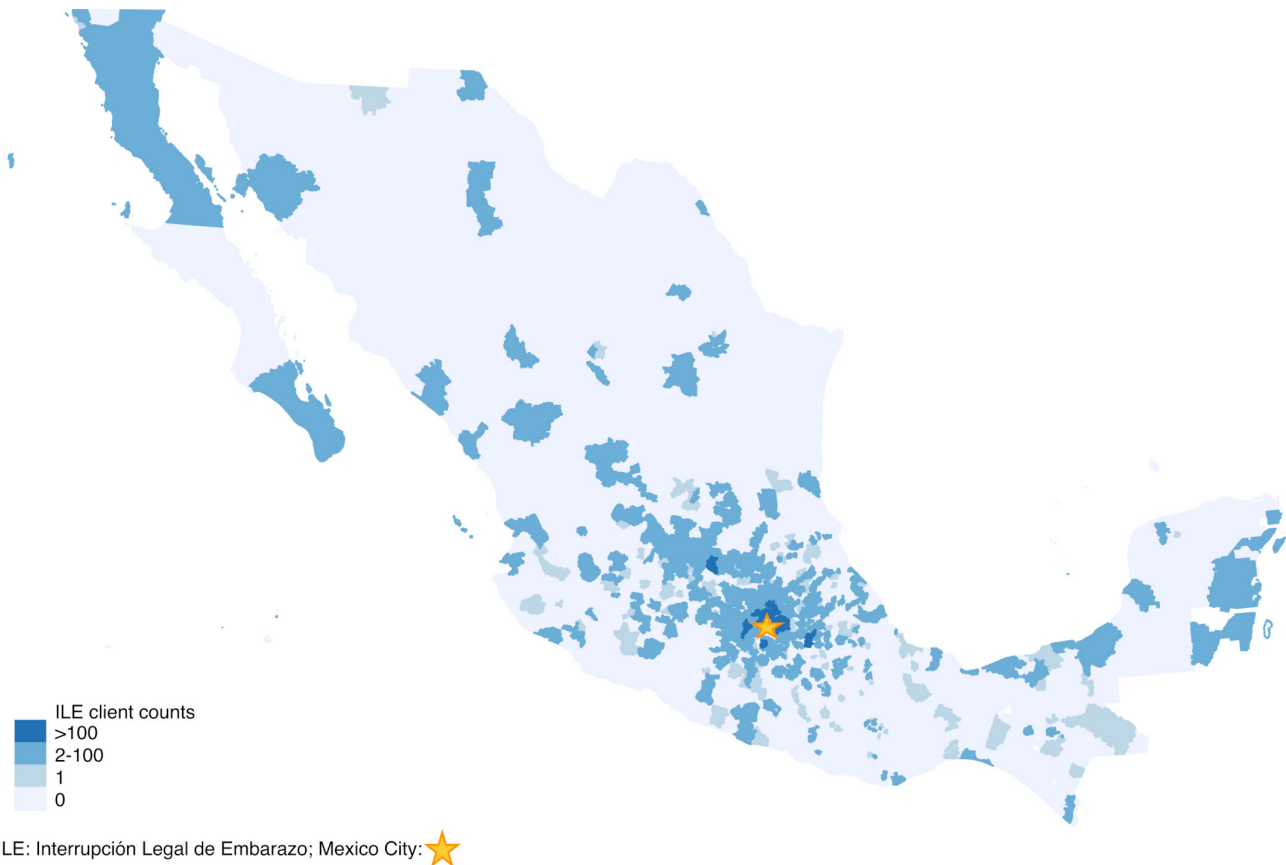


Figure 2 ILE Client Count by Municipality, (Mexico 2016–2019).

vulnerable communities and by extension, women, may face additional barriers to travelling for services. These findings support earlier work that showed that disparities in abortion access are exacerbated by

social and economic status.^{4 8 13 16} Previous work has shown that simply living where abortion is illegal in the State of Mexico, adjacent to Mexico City, significantly reduced utilisation, especially for women of lower socioeconomic status, even when accounting for travel time.⁸ Socioeconomic disparities persist in Mexico and other areas of Latin America, where poor and rural communities experience health worker shortages¹⁷; insufficient quality care¹⁸; and have fewer health facilities and less travel infrastructure.¹⁹ Studies on travelling for abortion services tend to evaluate women's experiences²⁰ or measure distance as an indicator of access.^{21 22} In the United States, availability of and distance from abortion services are determinants of access,^{23 24} and those who travel are most often rural residents accessing abortion services in cities.²⁵ Our study, however, shows that most of the women who travelled also came from more populous and less marginalised municipalities, highlighting that state-level restrictions on abortion in Mexico add to known disparities in access to healthcare including abortion services.^{18 26} These findings support our hypotheses that (1) ILE clients come from geographically and socioeconomically diverse municipalities and (2) that municipalities home to ILE clients are different (less marginalised) than municipalities with no ILE clients on key markers of socioeconomic status.

Table 2 Individual and contextual factors associated with accessing Interrupción Legal de Embarazo (ILE) services from a more marginalised (top four quintiles) versus less marginalised (bottom quintile) municipality, Mexico 2016–2019 (N=20 734)

	OR	95% CI
Individual-level variables		
Age (years) (REF=18–24)		
12–17	0.96	(0.80 to 1.15)
25–29	1.09	(0.99 to 1.19)
30+	0.94	(0.85 to 1.03)
Education: primary, secondary or less	1.46	(1.35 to 1.58)
Marital status: single	0.96	(0.89 to 1.04)
Parity: first pregnancy	1.03	(0.93 to 1.12)
Municipality-level variables		
Adolescent fertility rate above third quintile (80.54)	1.89	(1.68 to 2.12)
Regions (REF=Central)		
North	0.36	(0.21 to 0.60)
South	2.98	(2.58 to 3.45)

CI, confidence interval; OR, odds ratio; REF, reference.

We further explored factors associated with travel for abortion service from more marginalised communities. We show that most ILE clients are aged between 18 and 24 years, are single, and have a high school or university education. However, 33% of ILE clients had only a primary or secondary education, and these women are more likely to come from more highly marginalised municipalities. This is consistent with previous work that showed that less educated women from outside Mexico City may be less likely than their more educated peers to access services from the ILE programme.⁷ Additionally, we show that two-thirds (62%) of ILE clients who travel for abortion services are already parents or are experiencing at least a second pregnancy. This is similar to all ILE clients (61%) (including local, Mexico City clients)¹³ and abortion clients (59%) in the United States.²⁷ Previous work suggests that denying women an abortion may have negative socioeconomic or developmental effects on their existing children.²⁸ While prior studies on abortion in Mexico focused on young women and adolescent access to the ILE programme,²⁹ and abortion as a strategy to prevent first births,^{29 30} our findings highlight that people who are already parents also need access to legal abortion services.

Our findings and data source must be interpreted with the following limitations in mind. First, our data are only from those who successfully obtained an abortion from the public sector programme; we cannot therefore estimate unmet demand for abortion services throughout Mexico. Second, we are only able to observe travel to Mexico City for a public sector abortion; women who travel for a private sector abortion are likely less vulnerable. Third, we are unable to observe those who may travel across the US border. Fourth, while out-of-facility or self-managed medication abortion is increasing across Latin America,^{31 32} it cannot be estimated here. Fifth, we use clients' self-reported municipalities, and we do not know if they are reporting their permanent municipality (where they grew up) or a temporary municipality. However, a key strength of our study is our ability to include the full universe of ILE clients 2016–2019; previous work has relied on samples.^{2 13}

Conclusions

Women who are willing and able to travel to access legal first-trimester abortion in Mexico City's ILE programme come from geographically and socioeconomically diverse communities. Communities where ILE clients come from are, on average, less vulnerable than communities without ILE clients. There is an unmet need for access to abortion all across Mexico and lack of access to local legal abortion services increases disparities in access to care.

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Contributors BGD conceived the study and secured funding. LEJ, BSA, EFR, RS and BGD conducted the analysis. LEJ drafted the manuscript and BSA, EFR, RS and BGD provided substantive contributions.

Funding This study received no external funding. Dr. Darney is partially supported by the Office of Population Affairs (OPA).

Competing interests BGD receives research support from Merck.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available in a public, open access repository. All data used in this study are publicly available and details on the sources are provided in Supplemental Table 1.

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Supplemental Table 1. Data sources					
Source	Site retrieved from	Date downloaded	Year of data	Variable	Denominator used to calculate proportions
Interrupción Legal del Embarazo (ILE) en la Ciudad de México	https://datos.cdmx.gob.mx/dataset/interrupcion-legal-del-embarazo	10/10/2020*	2016-2019	education level	NA
				occupation	
				marital status	
				number of pregnancies	
				state/municipality of residence	
National Institute of Statistics and Geography (INEGI) 2010 Population and Housing Census	http://www.snim.rami.gob.mx/	4/23/20	2010	marginalization index	NA
				population aged 3 or older speaks an indigenous language;	Population (total)
				households washing machine	households (tot_viv_hab)
				households in-home internet	households (tot_viv_hab)
				average years of female education	NA
				females economically active	Female population 12+ years old (p12ymas_m)
National Institute of Statistics and Geography (INEGI) 2015 Intercensal Survey	https://datos.gob.mx/busca/dataset/salud-sexual-y-reproductiva	5/29/20	2015	adolescents do not attend school	NA: proportion given
				adolescent friendly service center	NA
				adolescent fertility rate	NA
Encuesta Nacional de Salud y Nutrición de Medio Camino (to define regions pg17)	https://www.insp.mx/resources/images/stories/2017/Avisos/docs/180315_encuesta_nacional_de_salud_y_nutricion_de_medio_Ca.pdf	4/20/20	2016	Geographic Regions: North (includes the states of Baja California, Baja California Sur, Coahuila, Chihuahua, Durango, Nuevo Leon, San Luis Potos, Sinaloa, Sonora, Tamaulipas, Zacatecas); Central (Aguascalientes, Colima, Guanajuato, Hidalgo, Jalisco, State of Mexico, Michoacain, Morelos, Nayarit, Queretaro; and South (Chiapas, Campeche, Guerrero, Oaxaca, Puebla, Tlaxcala, Quintana Roo, Tabasco, Veracruz, Yucatan)	NA
National Institute of Statistics and Geography (INEGI) Marco Geoestadístico	https://www.inegi.org.mx/temas/mg/default.html#Descargas	6/3/20	2019	source of maps file	NA

* A previous ILE dataset of 2016-Month 2019 was used for the preliminary analyses (downloaded on 2/20/2020), and then replaced when all of 2019 became available.

Supplemental Table 2. Comparing demographics of clients included in the sample vs. those excluded from the sample because of missing municipality, ILE Clients, 2016-2019

	Excluded clients n=2882 (%)	Included clients n=21,629 (%)	Total n=24,511 (%)
Regions**			
North	78 (2.7)	240 (1.1)	318 (1.3)
Central	2531 (87.8)	20374 (94.2)	22905 (93.5)
South	263 (9.1)	1015 (4.7)	1278 (5.2)
<i>missing</i>	10 (0.4)	0 (0.0)	10 (0.0)
Age			
12-17	145 (5.0)	1048 (4.9)	1193 (4.9)
18-24	1302 (45.2)	10053 (46.5)	11355 (46.3)
25-29	679 (23.6)	5233 (24.2)	5912 (24.1)
30-39	651 (22.6)	4608 (21.3)	5259 (21.5)
40-max	105 (3.6)	687 (3.2)	792 (3.2)
Education Level**			
Primary or lower	192 (6.7)	1270 (5.9)	1462 (6.0)
Secondary	811 (28.1)	6100 (28.2)	6911 (28.2)
High school	1243 (43.1)	9840 (45.5)	11083 (45.2)
University	623 (21.6)	4384 (20.3)	5007 (20.4)
<i>missing</i>	13 (0.5)	35 (0.2)	48 (0.2)
Occupation**			
Ama de casa/unemployed	848 (29.4)	6430 (29.7)	7278 (29.7)
Employed	1041 (36.1)	7136 (33.0)	8177 (33.4)
Student	754 (26.2)	5873 (27.2)	6627 (27.0)
<i>missing</i>	239 (8.3)	2190 (10.1)	2429 (9.9)
Marital Status**			
Single	1564 (54.3)	12558 (58.1)	14122 (57.6)
Married/union	1105 (38.3)	7968 (36.8)	9073 (37.0)
Widowed/divorced	186 (6.5)	936 (4.3)	1122 (4.6)
<i>missing</i>	27 (0.9)	167 (0.8)	194 (0.8)
Number of pregnancies**			
1	995 (34.5)	7443 (34.4)	8438 (34.4)
2-3	1195 (41.5)	9606 (44.4)	10801 (44.1)
4+	408 (14.2)	3860 (17.9)	4268 (17.4)
<i>missing</i>	284 (9.9)	720 (3.3)	1004 (4.1)

Note: **p<0.01, *p<0.05

Resumen

Objetivo: Describir el contexto comunitario de las mujeres que viajan para acceder al programa de aborto del sector público de la Ciudad de México e identificar los factores asociados con el hecho de viajar desde entornos altamente marginados.

Métodos: Utilizamos información del programa Interrupción Legal de Embarazo (ILE) (2016-2019) e identificamos a todas las usuarias que viajaron desde fuera de la Ciudad de México. Agregamos información contextual a nivel municipal y utilizamos estadísticas descriptivas para describir las características individuales y de vulnerabilidad de las usuarias del programa ILE y de sus municipios de origen.

También comparamos los municipios desde los que viajaron las usuarias con los municipios desde donde nadie viajó. Utilizamos una regresión logística para identificar factores asociados con viajar para acceder a los servicios del programa desde municipios altamente marginados frente a viajar desde municipios menos marginados.

Resultados: Nuestra muestra incluyó 21,629 usuarias del programa ILE que viajaron a Ciudad de México desde 941 municipios de 31 estados fuera de Ciudad de México. La mayoría de las usuarias viajaron desde municipios menos marginados (81.9%), y más poblados (más de 100,000 habitantes; 91.3%). La mayoría de las usuarias procedía de municipios con tasas de fecundidad adolescente dentro de los 3 quintiles inferiores (91.2%). Las usuarias con educación primaria o secundaria (frente a preparatoria o más) y aquellas de municipios con una elevada tasa de fecundidad adolescente (los 2 quintiles superiores) tuvieron mayores odds de viajar desde un municipio de alta marginación (frente a los menos marginados) (aOR = 1.5; 95% IC = 1.35-1.58 y aOR 1.9; 95% IC 1.68 - 2.12, respectivamente).

Conclusión: Las usuarias del programa ILE viajan desde comunidades geográfica y socioeconómicamente diversas. Existe una necesidad insatisfecha de aborto legal en todo México.