

Potential of LARC to recover loss in satisfied demand for modern contraception after the COVID-19 pandemic: a case scenario analysis of Brazil and Mexico

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ABSTRACT

Objectives. To estimate inequalities in demand for family planning satisfied with modern methods among women in Latin America and the Caribbean, with an emphasis on Brazil and Mexico, and to calculate the scenario for recovery of modern contraceptive coverage by expanding access to long-acting contraceptives (LARC) after the COVID-19 pandemic.

Methods. National health surveys from 2006 to 2018 were used to estimate the demand for family planning satisfied with modern methods and how it was affected by the COVID-19 pandemic. The scenario included three variables: coverage, health outcomes, and costs. Considering coverage, United Nations Population Fund data were used to estimate the impact of COVID-19 on access to contraception in Latin America and the Caribbean. Health outcomes were assessed with the Impact 2 tool. Direct investment was used to evaluate cost-effectiveness.

Results. Substantial inequalities were found in the use of modern contraceptive methods before the pandemic. We showed the potential cost-effectiveness of avoiding maternal deaths by introducing LARCs.

Conclusions. In the scenario predicted for Brazil and Mexico, the costs of modern family planning and averted disability-adjusted life years are modest. Governments in Latin America and the Caribbean should consider promoting LARCs as a highly efficient and cost-effective intervention.

Keywords

Long-acting reversible contraception; health services accessibility; COVID-19; Latin America; Caribbean region; Brazil; Mexico.

According to 2020 estimates by the United Nations, to achieve further reductions in total fertility rates in countries where fertility levels remain high, it is crucial to continue working toward gender equality and female empowerment (1, 2). Since the 1994 International Conference on Population and

Development Programme of Action, and through to the 2030 Agenda for Sustainable Development, governments have made commitments to promoting access to sexual and reproductive health and rights (3). Meeting the demand for modern contraceptives by investing in sexual and reproductive health (SRH)

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and providing access to SRH services is crucial to ensuring universal health coverage (4).

Health inequities are driven by social determinants, and significant wealth-related inequalities in contraceptive coverage have been identified in countries of Latin America and the Caribbean (LAC) (5). The global COVID-19 pandemic, which has struck the LAC region particularly hard, threatens to exacerbate these inequalities (5, 6) and set back decades of progress (6, 7).

Universal access to modern contraceptives (8) is one of the most cost-effective investments a country can make to improve its future (9) and increase population health and development (10). Contraceptive use rates exceed 70% in Europe, LAC, and North America (11). However, estimates for 2019 showed that SRH services fell well short of meeting the needs of the population in low- and middle-income countries (LMICs). Approximately 218 million women in these countries have an unmet need for modern contraception—that is, they want to avoid pregnancy but are not using a modern method—and 49% of pregnancies in LMICs, some 111 million annually, are unintended (10–12). Sexual and reproductive health and rights have far-reaching implications for individuals, families, and society (4).

There is limited evidence of the impact of the COVID-19 pandemic on SRH (13). The United Nations Population Fund (UNFPA) has determined that, if no action is taken, up to 19.7 million women in the LAC region—which has the second-highest rate of unsafe abortion worldwide due to unplanned pregnancies (14)—could have an unmet need for contraception.

Long-acting reversible contraceptives (LARC) are the most effective and cost-effective contraceptives, especially after disasters and pandemics. Based on predicted estimates currently available, home isolation and the fear of contracting COVID-19 appear to have led to a decrease in utilization of SRH services, increased reports of intimate partner violence, and, in some settings, reduced access to counseling and modern contraceptive methods, especially LARCs (7, 15). The Guttmacher Institute estimates that a 10% decrease in the use of short-acting and LARC methods in LMICs due to COVID-19 would lead to 49 million additional women with an unmet need for modern contraceptives and 15 million unintended pregnancies over the course of a year (16). If no action is taken, this could result in 1.7 million unintended pregnancies, almost 800 000 abortions, 29 000 maternal deaths, and almost 39 000 infant deaths (14).

Within this context, our report aimed to estimate inequalities in demand for family planning satisfied with modern methods (mDFPS) among women in the LAC region, with an emphasis on Brazil and Mexico, and to calculate the scenario for recovery of modern contraceptive coverage by expanding access to LARCs after the COVID-19 pandemic.

MATERIALS AND METHODS

A cross-sectional study was conducted using data from national health surveys performed between 2006 and 2018. The mDFPS was estimated, defined as the proportion of women of reproductive age (15–49 years) in need of contraception whose need is currently being satisfied with a modern contraceptive method (15).

Brazil and Mexico represent 54% of women of reproductive age in the region, and half of the women who potentially would discontinue use of contraceptives due to the COVID-19 pandemic.

We estimated mDFPS using publicly available data from Demographic and Health Surveys, Multiple Indicator Cluster Surveys, and Reproductive Health Surveys carried out between 2006 and 2018. These surveys have a focus on reproductive, maternal, and child health and nutrition, and are highly comparable in terms of methods. To include the most recent estimates, we used the 2013 Brazilian *Pesquisa Nacional de Saúde* and the 2012 *Encuesta Nacional de Salud y Nutrición* from Ecuador. We used standard definitions for all indicators to ensure comparable results across surveys, and all estimates were calculated from survey microdata.

These were assessed in terms of wealth, women's education, area of residence, and ethnicity (17–20). For Argentina, Brazil, Ecuador, Nicaragua, and Peru, information regarding women in need of contraception was not available. Given the high correlation between mDFPS and prevalence of contraceptive use, we estimated mDFPS using the predictive equation proposed previously (21), which has been shown to provide fairly accurate predicted values of DFPS from contraceptive use estimates:

$$\text{logit}(mDFPS) = 0.61 + 0.68 \log(mCPR) + 3.57 mCPR^2$$

where mDFPS is the demand for contraception satisfied by modern methods, and mCPR is the prevalence of modern contraceptive use.

The analyzed scenario includes three variables: coverage, health outcomes, and costs. Coverage analysis was based on United Nations Department of Economic and Social Affairs projections (22) and the assessment made by UNFPA for estimating the impact of COVID-19 on access to contraceptives in LAC (14). Further, we used Impact 2, which is a model developed by Marie Stopes International that allows construction of counterfactual scenarios (23). Taking the couple-years of protection (CYP) provided by each modern contraceptive method as the independent variable, Impact 2 estimates unintended pregnancies, abortions, unsafe abortions, and maternal deaths avoided. In addition, years of life lost and disability-adjusted life years (DALYs) averted are forecasted based on their elasticity to mCPR and adjusted by vital statistics.

To calculate the total users of modern contraceptives, we added the number of users before the proposed intervention and the number of users considered for post-pandemic recovery of mCPR. Impact 2 then provided the rest of the parameters of interest (CYP, unintended pregnancies, abortions, maternal deaths avoided, and DALYs). The cost of LARCs was obtained from the UNFPA Procurement Catalogue according to the corresponding Incoterm (24, 25). The COVID-19 pandemic can disrupt the progress that has been made to end unmet family planning needs by 2030 in the LAC region, and we measure this disturbance through information on 12 LAC countries. For the public sector, data were collected from surveys conducted by the ministries of health; for the private sector, estimations were made using results from the publicly available sales data during a five-year period. A simulation of the impact of an increase in LARC use in Brazil and Mexico was performed using this model.

TABLE 1. Data source, demand for family planning satisfied with modern methods (mDFPS), and unweighted sample size for each studied country

Country	Year	Source	mDFPS (%)	mDFPS in the poorest 20% (%)	Unweighted sample size
Argentina	2011	MICS	76.9	74.2	21 660
Barbados	2012	MICS	70.7	67.3	782
Belize	2015	MICS	66.0	52.2	2 344
Bolivia	2008	DHS	56.9	44.0	10 188
Brazil	2013	PNS	93.7	93.0	12 437
Colombia	2015	DHS	86.5	82.1	17 268
Costa Rica	2011	MICS	89.3	84.9	2 502
Cuba	2014	MICS	89.7	--	5 152
Dominican Republic	2014	MICS	85.2	79.5	14 240
Ecuador	2012	ENSANUT	89.8	87.2	12 509
El Salvador	2014	MICS	84.8	81.3	6 390
Guatemala	2014	DHS	65.3	47.9	11 116
Guyana	2014	MICS	52.4	45.1	2 648
Haiti	2016	DHS	43.1	36.8	5 511
Honduras	2011	DHS	76.0	68.0	10 925
Mexico	2015	MICS	86.1	80.7	6 397
Nicaragua	2006	RHS	89.0	83.5	9 420
Panama	2013	MICS	76.4	56.1	4 844
Paraguay	2016	MICS	86.4	85.1	3 757
Peru	2018	DHS	69.2	68.1	23 184
Saint Lucia	2012	MICS	72.5	71.7	523
Suriname	2018	MICS	58.7	41.9	3 571
Trinidad and Tobago	2011	MICS	64.3	56.8	1 196

Notes: DHS, Demographic and Health Survey; MICS, Multiple Indicator Cluster Survey; RHS, Reproductive Health Survey; PNS, *Pesquisa Nacional de Saúde*; ENSANUT, *Encuesta Nacional de Salud y Nutrición*.
Source: Prepared by the authors using data of the sources.

RESULTS

Table 1 shows the countries included in our analysis, sources of data, mDFPS at the national level and among the poorest 20%, and sample sizes. Almost all countries presented high levels of coverage. Among the poorest 20%, coverage was lower in all included countries.

The mDFPS at a national level and among the poorest 20% and the share of each method used by women are presented in Figure 1. Short-acting contraceptives (SARC) are the most-used method in the region. Colombia, Dominican Republic, Ecuador, El Salvador, and Mexico had different patterns, with sterilization accounting for the highest share among modern contraceptive methods. The LARC methods were highly prevalent in Cuba, Mexico, Bolivia, and Guyana. Figure 2 presents differences between proportions of modern methods used in the two selected countries, Brazil and Mexico. In Mexico, the share of each contraceptive method was similar between different groups, considering wealth, education, area of residence, and ethnicity, with a smaller share of SARCs and a high prevalence of sterilization. In Brazil, SARCs were the most-used methods among all population subgroups, but LARC use increased with wealth and women's education.

Among the poorest Brazilian women, LARCs were not used at all on average, while they accounted for 6% of mDFPS among

the richest women. In terms of education, the highest share of LARC use was observed among those with at least a secondary education (4%), while it was only 1% among those with primary-level education and 0% among those with no formal education. Furthermore, LARCs accounted for 3% of mDFPS among women living in urban areas and 1% for those living in rural areas. According to ethnicity, LARCs accounted for 4% of mDFPS among women of the reference group but only 1% among Indigenous and Afro-descendant women.

In terms of decline in CYP, access to contraceptive methods dropped in the private sector, with a CYP estimated for LAC, per thousand, of 2 621.7 (95% confidence interval 1 369.0–3 887.3); Argentina (321.3 [167.8–476.4]), Brazil (1 024.8 [535.1–1 519.6]), and Mexico (518.3 [270.6–768.5]) together represented almost three-fourths of this loss. When analyzing the public sector, the estimated CYP for LAC was 2 532.1, where Brazil accounted for two-thirds of this loss in CYP (1 582.5).

Recovery of lost modern family planning coverage by expanding LARC use in Brazil and Mexico

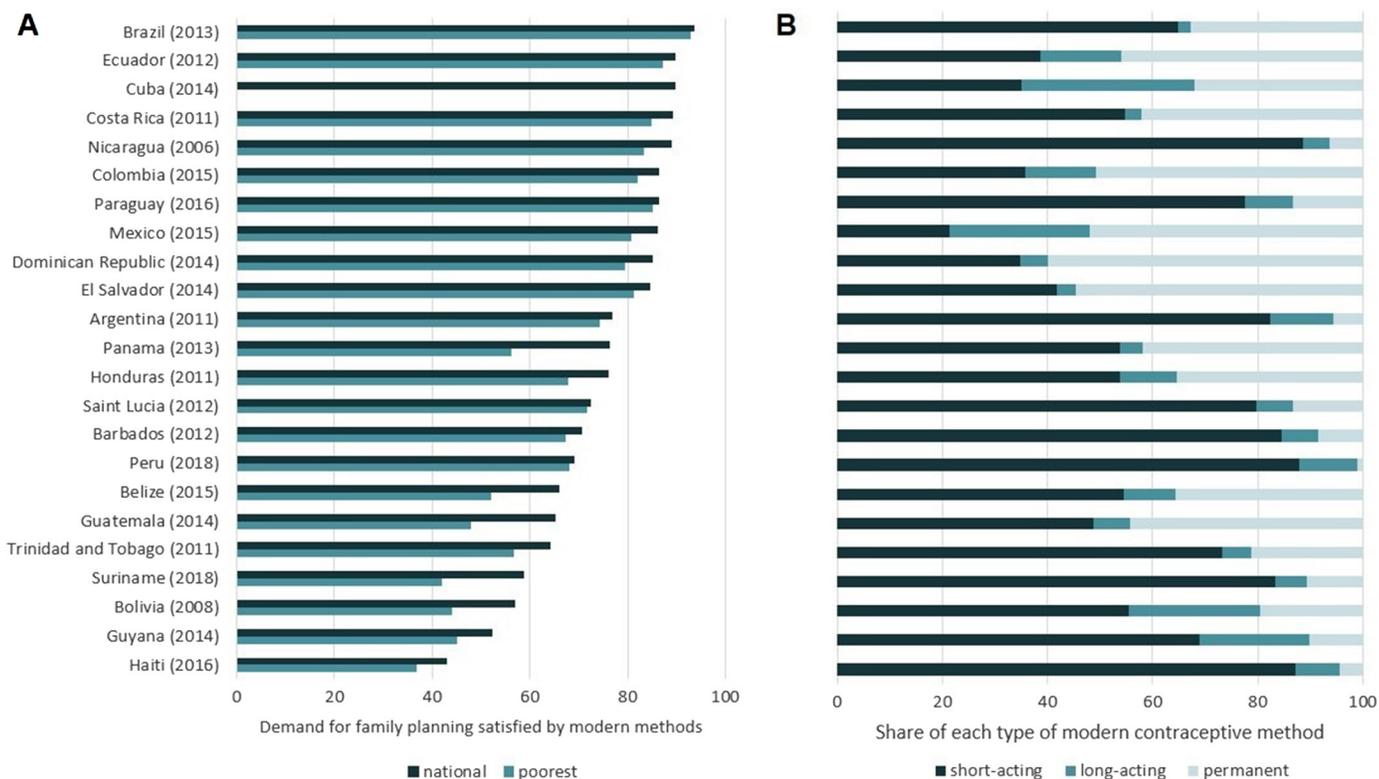
The situation in Brazil and Mexico, including comparisons with the LAC region, is shown in Table 2. Further, Table 3 shows results for Brazil and Mexico considering the recovery of that coverage lost due to the COVID-19 pandemic, exclusively through LARCs, in a scenario where half of women use intrauterine devices (IUDs) and half receive a levonorgestrel implant. We observed that 47 776 women would have access to modern family planning methods. The resulting increase in LARC use (from 5 731 users to 15 874 if the need for modern family planning methods was to be met exclusively via LARCs) would result in averting 2 452 unplanned pregnancies and 1 167 abortions (of which 874 would have been unsafe abortions) and preventing 214 maternal deaths (163 in Brazil and 51 in Mexico), with a low cost of US\$ 34 681.00 for Brazil and US\$ 10 635.00 for Mexico, being highly cost-effective.

DISCUSSION

Our study showed that most LAC countries have high levels of mDFPS. Short-acting contraceptives are the most widely used form of contraception in the region; LARCs were more prevalent in Cuba, Mexico, Bolivia, and Guyana. Out of all LAC countries, Brazil and Mexico had the highest family planning coverage and account for almost half of the women of reproductive age in the LAC region. Our findings indicated inequalities in both countries; however, these were greater in Brazil, where the richest women had more access to LARCs and the general population used more SARCs. Furthermore, the distribution of the use of contraceptives was similar across different sociodemographic strata of wealth in Mexico, where a high prevalence of sterilization was observed and LARC use was more prevalent in urban than in rural areas.

SRH services were severely affected in previous health crises (26, 27), and the COVID-19 pandemic was no different. In several LAC countries, efforts and achievements in this field are at serious risk, with the potential to return to a 1990–1998 scenario (14). Achieving universal health coverage and the realization of SRH services are essential to fulfilling the pledge of the 2030 Agenda for Sustainable Development that “no one will be left behind” (28). This will require intensified support

FIGURE 1. Demand for family planning satisfied with modern methods: national average and among the poorest 20% (A); share of each method used by modern contraceptive users, by country (B); countries are arranged by level of demand for family planning satisfied with modern methods



Source: Prepared by the authors using data of the sources.

for contraceptive services, including the implementation of effective government policies and programs. Universal access to modern contraception is a highly cost-effective intervention (14, 28).

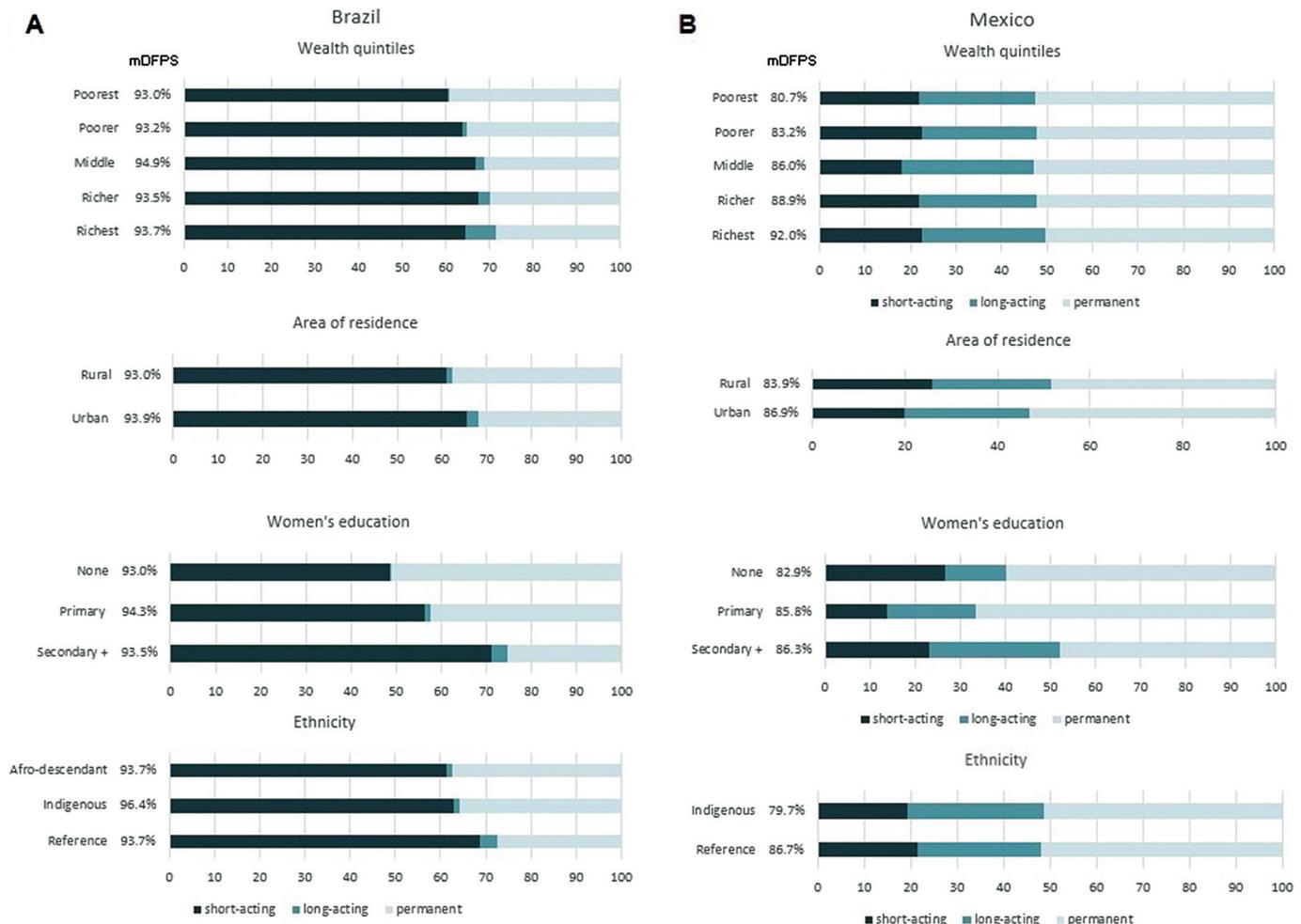
The Family Planning 2030 partnership is one of the new significant possibilities for the LAC region (29). Starting in 2021, countries and partners in the LAC region will have the opportunity to make commitments to the next global Family Planning partnership and to engage in shaping the movement for the upcoming decade and beyond. LARCs convey many other characteristics other than avoiding unintended pregnancy; that is, non-contraceptive benefits (30). When media strategies are used to promote modern contraceptive methods, a 5%–27% greater positive effect is achieved when compared with those who were not exposed to these strategies. Once the demand for contraceptive use is created, the availability and accessibility of contraceptive methods should be ensured (31).

According to United Nations Population Division estimates, as of early 2020, 19.72 million women had an unmet need for modern contraceptive methods in the LAC region (14). If the drop in contraception due to the COVID-19 pandemic is included in this estimate, 20 million women will have discontinued use of contraceptives in the region. The unmet need for modern family planning methods is expected to have increased from 11.4% to 17.7% by the end of 2020, which reflects the situation seen in 1998—representing over 20 years of lost progress (14).

Regarding the understanding of the impact of COVID-19 on access to contraception, several important recommendations could be made. Health systems should consider dispensing multi-month supplies of SARCs, thereby reducing the need for travel to health facilities; offering subcutaneous depot medroxyprogesterone acetate (DMPA-SC) to women who desire injectable contraception; and massively informing providers and women about the possibility of the extended use of LARCs during the pandemic (32).

Our findings would help governments in the LAC region make informed decisions to minimize the impact of the COVID-19 pandemic on SRH and maternal health, using evidence-based interventions to provide modern family planning. Our study has strengths including the use of a validated method to simulate recovery scenarios based on innovative actions to support modern contraceptive services, with effective government policies and programs, as a cost-effective intervention. However, one of the limitations is that although shortages were observed for some contraceptives, women may have substituted other methods, or even changed their sexual behaviors, moving them out of the need-for-contraception group. Even when SRH services were shut down due to pandemic-related lockdowns, few governments implemented innovative outreach strategies to continue providing contraceptive services. Finally, failure to acquire contraceptives does not always translate directly to unavailability of methods, given that countries may have small

FIGURE 2. Inequalities in the shares of modern contraceptive methods used in Brazil (A) and Mexico (B)



Note: mDFPS, demand for family planning satisfied with modern methods.
Source: Prepared by the authors using data of the sources.

preexisting stocks. Due to these and other limitations, we were unable to assess all inequalities in the region.

Conclusion

In the scenario predicted for Brazil and Mexico, the costs of modern family planning and averted DALYs are modest, allowing governments to consider LARC promotion in LAC as a highly efficient and cost-effective intervention. Inaction by governments in this area will cost not only more lives but also many more resources, leaving many women and their families behind.

Author contributions. RGPL, MVB, LB, and SJS conceived the original idea. FH, AB, and FT collected and analyzed data. RGPL, MVB, FH, AB, FT, MA, LB, PIGS, MFS, JB, MS, and SJS contributed to data analysis and interpretation of findings. RGPL, MVB, MFS, FT, LB, and AB wrote the manuscript. All authors reviewed and approved the final version.

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TABLE 2. Use of long-acting reversible contraceptives (LARC) and modern contraceptives in Brazil, Mexico, and Latin America and the Caribbean (LAC), including the impact of COVID-19

Indicator	Brazil	Mexico	LAC
Women of fertile age (thousands) (24)	57 599	35 946	174 778
Users of modern contraceptives (thousands) (25)	13 527	18 375	9 557
Women discontinuing the use of modern contraceptives because of disruptions caused by COVID-19 (thousands) (14)	7 763.1	2 380.6	20 128.3
LARC users (%)	1.4	13.7	6.1
Users of subdermal implants (%) (24)	--	3.5	1.5
Users of intrauterine devices (IUDs) (%) (24)	1.4	10.2	4.6

Source: Prepared by the authors using data of the cited sources.

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TABLE 3. Brazil and Mexico recovering their contraceptive prevalence rate (CPR) lost because of COVID-19 through the expansion of the use of long-acting reversible contraceptives (LARC) (half of the women with intrauterine devices [IUDs] and half with levonorgestrel generic implants)

Indicator	Brazil	Mexico	Both countries
Women using LARCs before the intervention (000)	806.4	4 924.6	5 731.0
Women using LARCs after the intervention (000)	8 569.4	7 305.2	15 874.6
Incremental IUDs to be delivered (000)	3 881.5	1 190.3	5 071.8
Incremental implants to be delivered (000)	3 881.5	1 190.3	5 071.8
Total users of modern methods (000)	22 096.4	25 680.2	47 776.6
CYP to gain with IUDs (000) (23) ^a	17 855.0	5 475.3	23 330.3
CYP to gain with implants (000) (23) ^a	14 749.8	4 523.1	19 272.9
CYP to gain, total (000) (23) ^a	17 855.0	5 475.3	23 330.3
Unintended pregnancies avoided (000) (23) ^a	1 876.8	575.5	2 452.3
Abortions avoided (000) (23) ^a	893.4	273.9	1 167.3
Unsafe abortions averted (000) (23) ^a	669.5	205.3	874.8
Maternal deaths avoided (23) ^a	163.8	50.2	214.0
DALYs averted ^b (mortality and morbidity)	10 354.6	3 175.3	13 529.8
Direct investments (000) ^c	34 681	10 635	45 316.6
Cost per CYP	1.9	1.9	1.9
Cost per averted DALY	3 349.4	3 349.4	3 349.4

Notes:

^a Assessment based on Impact 2 – MSI Reproductive Choices (23).

^b Estimates of child deaths averted may be unreliable because there are currently very limited data on the links between CPR, birth spacing, and mortality. This part of

Impact 2 will be updated as improved research becomes available.

^c The cost only includes FOB commodities.

CYP, couple-years of protection; DALY, disability-adjusted life years.

Source: This table was prepared by the authors using data of the sources.

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Potencial de los anticonceptivos de acción prolongada para recuperar las pérdidas en la demanda satisfecha de anticonceptivos modernos después de la pandemia de COVID-19: análisis de escenarios en Brasil y México

RESUMEN

Objetivos. Estimar las desigualdades en la demanda de planificación familiar satisfecha con métodos anticonceptivos modernos entre las mujeres de América Latina y el Caribe, especialmente en Brasil y México, y analizar el escenario de recuperación de la cobertura de los anticonceptivos modernos mediante la ampliación del acceso a los anticonceptivos de acción prolongada tras la pandemia de COVID-19.

Métodos. Se emplearon encuestas nacionales de salud desde el año 2006 hasta el año 2018 para estimar la demanda de planificación familiar satisfecha con métodos modernos y el impacto de la pandemia de COVID-19. El escenario comprendía tres variables: cobertura, resultados en materia de salud y costos. En lo respectivo a la cobertura, se emplearon datos del Fondo de Población de las Naciones Unidas para evaluar la repercusión de la COVID-19 en el acceso a los anticonceptivos en América Latina y el Caribe. Los resultados en materia de salud se examinaron con la herramienta Impact 2. Se empleó la inversión directa para evaluar la costo-efectividad.

Resultados. Se encontraron desigualdades sustanciales en el uso de métodos anticonceptivos modernos antes de la pandemia. Se demostró la posible costo-efectividad de evitar muertes maternas mediante la introducción de anticonceptivos de acción prolongada.

Conclusiones. De acuerdo con el escenario previsto para Brasil y México, los costos de la planificación familiar moderna y los años de vida ajustados en función de la discapacidad evitados son moderados. Los gobiernos de América Latina y el Caribe deberían considerar la posibilidad de promover los anticonceptivos de acción prolongada como intervención sumamente eficiente y costo-efectiva.

Palabras clave

Anticoncepción reversible de larga duración; accesibilidad a los servicios de salud; COVID-19; América Latina; región del Caribe; Brasil; México.

Potencial dos métodos contraceptivos reversíveis de longa duração para recuperar a perda de demanda por planejamento familiar atendida por métodos contraceptivos modernos após a pandemia de COVID-19: análise de cenários do Brasil e do México

RESUMO

Objetivos. Estimar as desigualdades na demanda por planejamento familiar atendida por métodos contraceptivos modernos em mulheres da América Latina e do Caribe, com ênfase no Brasil e no México, e calcular o cenário de recuperação da cobertura por métodos contraceptivos modernos por meio da ampliação do acesso a métodos contraceptivos reversíveis de longa duração (LARC) após a pandemia de COVID-19.

Métodos. Foram usadas pesquisas nacionais de saúde de 2006 a 2018 para estimar a demanda por planejamento familiar atendida por métodos contraceptivos modernos e como ela foi afetada pela pandemia de COVID-19. O cenário incluiu três variáveis: cobertura, desfechos de saúde e custos. Para cobertura, os dados do Fundo de População das Nações Unidas foram usados para estimar o impacto da COVID-19 no acesso à contracepção na América Latina e no Caribe. Desfechos de saúde foram avaliados com a ferramenta Impact 2. O investimento direto foi usado para avaliar a relação custo-benefício.

Resultados. Foram constatadas desigualdades importantes no uso de métodos contraceptivos modernos antes da pandemia. Demonstramos a potencial relação custo-benefício de evitar mortes maternas mediante a introdução de LARC.

Conclusões. No cenário previsto para o Brasil e o México, os custos do planejamento familiar moderno e dos anos de vida ajustados por incapacidade por ele evitados são modestos. Os governos da América Latina e do Caribe devem considerar a promoção dos LARC como uma intervenção altamente eficiente e custo-efetiva.

Palavras-chave

Contracepção reversível de longo prazo; acesso aos serviços de saúde; COVID-19; América Latina; região do Caribe; Brasil; México.
