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Safe and unsafe abortions: Total monetary costs and health care system costs in Argentina in 2018

Abortos seguros e inseguros: Costos monetarios totales y costos para el sistema de salud de la Argentina en 2018

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ABSTRACT During the first semester of 2018, a profound debate on the legalization of the practice of abortion was initiated in Argentina, which exposed the lack of scientific studies addressing the economic dimension of abortion in this country. This work seeks to move forward in the quantification of the costs of abortion under two scenarios: the current context of illegality and the potential costs if the recommended international protocols were applied in a context of legalization of the practice. The results of the comparison between, on the one hand, the total monetary costs in 2018 (private or out-of-pocket expenditure and costs for the health care system) of the current scenario of illegality and unsafe practice of abortion and, on the other hand, potential scenarios of safe practices, shows that a large amount of resources could be saved if the recommended protocols were implemented. These results proved to be robust after carrying out a series of sensitivity exercises on the main assumptions included in the comparisons.
KEY WORDS Abortion; Illegal Abortion; Costs and Cost Analysis; Argentina.

RESUMEN Durante el primer semestre de 2018, en Argentina se inició un profundo debate sobre la legalización de la práctica del aborto, que puso en evidencia la falta de estudios científicos que aborden la dimensión económica del tema en la Argentina. Este trabajo busca avanzar en la cuantificación de los costos del aborto bajo dos escenarios: el del actual contexto de ilegalidad y los costos potenciales si se aplicaran los protocolos internacionales recomendados, en un contexto de legalización de la práctica. Los resultados de la comparación de los costos monetarios totales en 2018 (privados o de bolsillo y para el sistema de salud) del escenario actual de ilegalidad y práctica insegura del aborto, frente a escenarios potenciales de prácticas seguras, muestran que se podría ahorrar una gran cantidad de recursos si se implementaran los protocolos recomendados. Dichos resultandos, además, se muestran robustos al realizar una serie de ejercicios de sensibilidad sobre los principales supuestos incluidos en las comparaciones.
PALABRAS CLAVES Aborto; Aborto Ilegal; Costos y Análisis de Costos; Argentina.

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INTRODUCTION

The legislative process dealing with the proposed Law for the Voluntary Interruption of Pregnancy during the first half of 2018 in Argentina sparked a wide-ranging debate around the ethical, legal, religious, human rights, civil, public health, gender equality, and economic dimensions of the issue and its implications. The proposed law, initially passed by the Chamber of Deputies (Congress), was blocked by the Senate. Despite this situation, the importance of and interest regarding the issue have been firmly established in society and the process has demonstrated the lack of scientific and technical studies in Argentina which tackle the question in depth.

In the light of the possibility of advancing towards the legalization of abortion, apart from other dimensions of the debate, it is essential to also consider the economic feasibility of its implementation. Even when there is evidence that a new method, treatment, or medication offers a favorable cost-benefit balance for society as a whole, it is necessary to determine the budgetary impact of such a measure for those who must secure the necessary resources to guarantee its implementation in the terms established by the law.

Among the most significant lacunae in the data required to develop an economic and budgetary analysis of abortion and its implications for Argentina are, on the one hand, the lack of an up-to-date estimate of the total number of abortions which are performed in the country annually, and on the other hand a detailed analysis of the economic costs related to the practice in its two varieties: the clandestine practice (often unsafe) and the costs of complications associated with it, and the safe alternative that can be guaranteed under the framework of a law that abides by the recommendations of relevant international organizations.

It is possible to approach the economic dimension from three broad perspectives: a) exploring the financial resources implied for the public healthcare system and the private healthcare system as well as for individuals (out-of-pocket expenditures); b) exploring the total financial resources required (public and private); and c) a broader economic perspective that encompasses the financial and non-financial resources, the latter associated with unforeseeable costs (costs arising from premature deaths, disability, absenteeism, psychological harm and loss of productivity, among others).

The latter perspective is the most comprehensive and is particularly important when comparing the costs of safe and unsafe alternatives given that the potential harm in terms of subjective health and well-being could be especially elevated in the context of clandestine and unsafe practices. However, an economic assessment of the non-financial aspects would entail the difficult task of obtaining ad hoc information (complicated largely due to the illegality of the issue) which is beyond the capacities of our research at this moment.

On the other hand, comparing the legal and safe alternative to the clandestine one through the lens of the first perspective would entail exploring in depth certain aspects related to the financing structure adopted in the case of legalization, which should be part of a subsequent analysis of the strict quantification of the costs of both alternatives (legal or clandestine) and so will also not be addressed in this study.

The main aim of this study is therefore to move forward with the economic analysis of abortion in Argentina from the second perspective, that is, estimating the total financial resources, both public and private, in both contexts: abortion services provision in a legal context with reliable services, and procedures conducted in clandestine conditions.

While this approach does not seek to produce a disaggregation of the total burden for each source of financing, it does differentiate between the share of the costs incurred by the health system as a whole (without distinguishing between public and private sectors) and the share met by individuals in a direct way (out-of-pocket expenditures), given that this distinction is of fundamental importance

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when assessing to what extent the legalization of abortion would involve increased pressure on the resources of the health system (with the assumption that the change of legal status would imply a wider coverage by the public and private healthcare systems), regardless of variations in the total cost.

In order to address these dimensions, we generated estimates of the following magnitudes: i) the total number of abortions currently performed annually in Argentina, ii) the cost of complications associated with abortions in the current context (illegality) for the healthcare system, iii) the out-of-pocket costs of abortion in the current context, and iv) the cost of safe abortions.

On the basis of these four components it is possible to compare the magnitude of the costs in the current situation (costs of unsafe procedures and their complications) in contrast with a context of legal and safe practice, given an updated estimation of the total number of abortions carried out annually in Argentina.

Studies of Latin America and Argentina

One of the most important recent studies at an international level which estimates the number of abortions at a global scale in different regions around the world was published in the prestigious journal *The Lancet*.[1] The study is based on data from 182 countries and utilizes, for the first time in a study of this type, an up-to-date frame of reference regarding the abortion practices considered to be safe, as it takes into account changes over recent years associated with an increased availability of simple and safe abortion methods (manual vacuum aspiration), and the spread of misoprostol use beyond the formal healthcare systems in countries in which access to abortion is restricted.

The estimates presented by this study are based on hierarchical statistical models, which facilitate the incorporation of a wide range of variables with different levels of aggregation (hierarchy) related to the degree of safety attributed to the practices across different regions of the world, such as methods employed to perform the abortions, the type of service provider, availability of safe abortion services, socioeconomic conditions, gender inequality, and women's empowerment, among other factors. The models are used to estimate the distribution of abortions according to the category of "safety," based on definitions of the World Health Organization (which divides abortion practices into safe and unsafe categories, and within unsafe defines two levels).

On the basis of this methodology the authors estimate that between 2010 and 2014, 55.7 million abortions were performed per year globally, of which 30.6 million were safe, 17.1 were less safe, and 8 million were unsafe. One particularly concerning piece of data is that of the 25.1 million unsafe annual abortions, 24.3 were conducted in developing countries, confirming that it is in countries with highly restrictive laws (as in the case of Argentina) where most unsafe abortions take place.

In the case of Latin America, total annual abortions rose to 6.4 million, of which 4.9 million were considered unsafe (77%). In this region the greater concentration of abortions is in South America with 4.6 million annual abortions, of which 3.4 million were unsafe (74%).

Other two relatively recent studies published in scientific journals estimate and compare the costs of safe and unsafe abortions in Latin America. The first, published in 2009, looks at the costs and economic consequences of unsafe abortion in Mexico City in 2005 before the legalization of abortion was adopted through a reform in the first semester of 2007.[2] The study estimates the (average) direct and indirect costs of different methods of safe (although illegal) abortion in private institutions and compares them with the (average) direct and indirect costs of treatments after unsafe abortions (whether simply services for incomplete abortions or treatments for complications) in public and private institutions. The services for incomplete abortions include surgical methods such as manual vacuum aspiration or dilation and curettage, and the medical method of abortion, with

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misoprostol being the medication available in Mexico at that time. In turn, the treatments for complications taken into consideration (according to severity) include: treatments for hemorrhage, sepsis, uterine perforation, cervical trauma and shock. The direct costs in the analysis included personnel costs, medication, disposable materials, laboratory tests, and medical equipment used for induced abortion or for the treatment of incomplete abortions or other complications. The indirect costs include: travel expenditures, childcare, and loss of earnings. This study explains that poor women and those who live in rural areas disproportionately suffer the consequences of unsafe abortion, although by the period in which the study was conducted an increasing use of misoprostol was underway not only in Mexico but across Latin America (which reduced the complications arising from unsafe abortions in the region). The study's findings show that the average costs of the safe abortion options were: US$143 for dilation and curettage, between US$53 and US$111 for manual vacuum aspiration (in private clinics and public hospitals respectively), and US$79 for abortions using misoprostol. The average cost of treatments for severe complications in public hospitals rose to between US$601 and US$2100. Drawing on these figures the authors estimate that improving access to abortion with manual vacuum aspiration and early term abortions with misoprostol could reduce costs for the state (public budgets) by 62%, which would imply savings of up to US$ 1.6 million per year. As a general conclusion to the study the authors assert that the reduction of complications through improving access to safe outpatient services would even further reduce the costs of medical attention for abortion, with significant benefits both for the healthcare system in Mexico and for the women seeking the procedure.

Another important study which compares the costs of safe and unsafe abortions in the region was conducted by Elena Prada and colleagues,[3] focusing on Colombia. Colombia also underwent a process of legislative change in relation to abortion in 2006, although the legality of the practice was limited to a reduced group of circumstances (when a doctor certifies that the life of the pregnant woman is threatened, when the fetus has abnormalities incompatible with viable life, or when the pregnancy is the result of rape or incest), and its subsequent implementation was delayed for several years as a consequence of a ruling by the Council of State (an organ of the judicial branch). This authority suspended the use of guidelines established by the Ministry for Health based on directives of the World Health Organization (WHO), which regulated practices for the provision of legal abortion services in the country after the law was passed. Added to this, women seeking a legal abortion procedure frequently faced significant administrative and legal barriers, and some institutions simply refused to provide safe abortions (even though this was prohibited by the law).

As a consequence of all the above, despite Colombia having passed a law for the provision of safe legal abortion, it is estimated that around 99% of abortions are conducted outside the protection of the law,[4] leading to a greater risk that they are carried out in unsafe conditions (as they are conducted by providers without adequate training or equipment), which is in turn associated with both immediate complications and long term consequences for health. Other studies indicate that, in spite of the existence of safer abortion procedures now than in previous decades, in Colombia the rates of treatment for complications related to induced abortion increased from 7.2 to 9.1 per 1000 women between the ages of 15-44, from 1989 to 2008. In this context, Prada and colleagues[3] aim to estimate and compare the costs that the healthcare system incurs for the treatment of complications associated with unsafe abortions and the costs of providing safe abortion services, at the same time exploring the most important factors that explain the divergences between the two scenarios. This study also includes direct and indirect costs, however employing different definitions of the two concepts than those used in the Mexican study by Levin and colleagues.[2] In this

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case, the direct costs include health workers' salaries, medication and other medical materials, and the indirect costs cover capital and overhead expenditures, not including non-financial or collateral costs (such as loss of earnings) or other indirect costs (such as transport expenses, childcare, etc.), which are included in the Mexico study. In a similar way to the Mexico study, services related to incomplete abortions are considered, along with the following treatments for complications (according to severity): sepsis, cervical laceration, uterine perforation, and shock. Data on the scope of these treatments was provided by informants from each type of institution (public and private).

Comparing the average costs of treatments after unsafe abortion with those of legal abortion, the study found that both the level as well as ratio of costs between the two scenarios varied substantially according to the types of facilities and procedures used in each case. The average direct cost of treatments for complications ranges from US$44 to US$141 and represents an annual cost to the healthcare system of around US$14 million. A legal abortion in a secondary or tertiary care unit (facility) is more costly (with averages of US$213 and US$189 respectively), which is in part due to the use of methods of dilation and curettage, and also as a result of administrative barriers. In contrast, a legal abortion in a specialized unit using medication and aspiration carries a much lower cost (US$45). The overall conclusion of the study is that the provision of services, both post-abortion treatments and legal abortion, in facilities with high levels of complexity (second or tertiary care units) generates unnecessarily high healthcare costs. These costs can be significantly reduced through the provision of services at the appropriate time in a primary care unit with the use of safe, non-invasive, and less costly methods.

Among the studies of abortion in Argentina published in scientific journals or books, the most recent and detailed is that produced by Silvia Mario and Edith Pantelides,[7] which generates some estimations of the numbers of induced abortions in the country in 2000 based on two alternative indirect methods, given the lack of official data and the difficulties of measuring a practice which is still illegal in this country. We were unable to find any published studies estimating the costs of procedures related to abortion and its consequences in Argentina.

This study by Mario and Pantelides[7] mentions as supporting material four studies which yield information about the magnitude of induced abortion in Argentina, of which only one provides findings related to the total number of abortions in the country for the year 1991, in which it is estimated that 385,931 abortions took place annually.[8] However, this figure is the product of estimating the abortion ratio (abortions per 1000 live births) and the abortion rate (abortions per 1000 women of a fertile age) constructed on the base of the total number of abortions in 1973 (published by the Argentine Association for Family Protection).[7] In order to update the figure for 1991, the ratio and the rate (estimated at 555 and 50 respectively) are assumed to be constant and are projected in terms of population growth and births from that year. Additionally, the authors produce alternative estimates based on more updated information about the use and effectiveness of contraceptive methods in women of reproductive age. On the basis of this information, they estimate that the ratio of abortions was 0.68 per live birth, raising the figure of total annual abortions to a range of 450,894 to 498,358.

In order to calculate estimates for Argentina in the year 2000, Mario and Pantelides select two indirect methods of calculating induced abortions: Singh and Wulf's proposal[9] and Johnson and Hill's residual method,[10] which in turn draws on the Bongaarts model[11,12] and the ideas of Davis and Blake.[13] As the authors themselves state, the selection of these methods (and the exclusion of others) is due to the fact that they are based on data available in Argentina that does not require obtaining additional information which could be subject to possible problems of declaration given the illegal nature of the practice in this country.

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Singh and Wulf's method uses as input the data from hospital discharges and proposes the estimation of a multiplier in order to rectify the underestimation of hospital discharge records (as a source of data about total induced abortions). This underestimation is due to the fact that these records only register a portion of the total number of abortions, largely because they only record abortions with complications which required hospitalization. Hence, the estimation of the multiplier requires additional information (collected through surveys of key informants in Mario and Panteildes' study) about the habitual type of abortion providers, techniques utilized, probability of complications, and hospitalization.

The residual method bases the estimation of induced abortions on an equation which relates the values of determinants related to fertility (proportion of sexually active women in each age group, use of contraceptive methods, postpartum infertility, and induced abortion), the total fertility rate, and the potential fertility rate defined as the number of live births that a woman can have during her fertile life, estimated at 15.3. The method is called residual because the coefficient for the expression of abortion is obtained as a difference after assigning values to the other components of the equation. In order to apply this, Mario and Pantelides use secondary sources of data for Argentina: the National Survey of Nutrition and Health [*Encuesta Nacional de Nutrición y Salud*],[14] fertility rates (from vital statistics), and population projections. The average estimation (combining both methodologies) for the total number of induced abortions in Argentina in the year 2000 is 456,788 annual abortions.

According to the first methodology (based on hospital discharge records), the figure ranges from 371,965 to 446,998 abortions (depending on whether adjustments are made to discharge records to account only for coverage or also for erroneous classification). These figures correspond to annual rates of induced abortion of 40.8 and 49 respectively per 1000 women in the age range of 15-49. The methodology of residual calculation yields a higher range of total abortions: 485,974 to 522,216 annual abortions, with rates of 60.8 to 65.4 per 1000 women.

Conceptual framework: safe and unsafe abortion

The WHO estimates that 22 million unsafe abortions are carried out every year, of which 47,000 result in death and more than 5 million cause complications such as incomplete abortions (in which not all the fetal tissue is extracted or expelled from the uterus); hemorrhage (severe bleeding); infection; uterine perforation (when a sharp object perforates the uterus); and damage to the genital tract and internal organs due to the introduction of dangerous foreign objects such as wires, knitting needles, or broken glass into the vagina or anal cavity.[15]

It is estimated that in developed regions, for every 100,000 unsafe abortions there are 30 deaths. This number increases to 220 deaths per 100,000 unsafe abortions in developing regions, and 520 deaths per 100,000 unsafe abortions in Sub-Saharan Africa.[15]

The WHO defines unsafe abortion as a procedure to terminate a pregnancy either performed by an individual without the necessary training, or in an environment lacking the minimum medical standards, or both.[16] Abortions are considered safe when they are conducted following the methods and protocols recommended by the WHO, which depend on the gestational age and whether the person performing or assisting with the abortion is properly trained.[17,18]

Safe abortion can be performed using medications (medical abortion) or simple outpatient procedures. The personnel, training, and standards considered safe for induced abortion are different in the cases of non-surgical medical abortion (performed using only medication) and surgical abortion (performed using manual or electric vacuum aspirators). The training and medical standards required for the provision of a safe abortion also vary depending on the gestational age.[18]

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In the case of medical abortion, the use of mifepristone followed by misoprostol is recommended, and misoprostol alone is only recommended when mifepristone is not available.[18,19] Furthermore, there is an intermediate category of less safe abortions, which are those performed using non-recommended outdated methods such as dilation and curettage even if the person performing the procedure is trained, or when women use medication without access to proper information or the assistance of a trained person if they need help.[15]

The barriers to accessing safe abortion identified by the WHO are: restrictive laws, poor availability of services, high service costs, stigmatization, conscientious objection of healthcare providers, and unnecessary requirements such as mandatory waiting periods, mandatory counselling, provision of misleading information, third-party authorization, and medically unnecessary tests that delay care.[15]

DATA SOURCES AND METHODOLOGY

To produce an updated estimate for 2018 of the total number of abortions in Argentina, it is assumed that the rate of abortion per 1000 women of a reproductive age (15-49 years) estimated by Mario and Pantelides[7] for the year 2000 remains constant, and the total population is updated on the basis of official population projections.[20]

In order to assess the costs of the procedures, we utilized the costs corresponding with the official classifications of the national and provincial social security systems and of pre-paid healthcare providers as the average, minimum, and maximum prices respectively, as of July 2018. The fact that there are no set prices for the more than 300 institutions comprising the healthcare system means that individual negotiations take place with the providers in order to establish the prices of each practice, procedure, or service, thus hindering the establishment of a single price with which to assess the costs of these procedures. As a consequence, we opted for an estimation of the average price established for each procedure for the three groups of institutions (national healthcare plans, provincial healthcare plans, and pre-paid healthcare providers), drawing on the prices set by those institutions with more than 50% of the total number of beneficiaries for each group.

In order to assess the costs of medications, the retail price (RP) has been used, obtained from the Pharmaceutical Manual [*Manual Farmaceútico*],[21] since the institutional purchasing prices are undisclosed and moreover vary among the purchasing institutions.

According to key informants, during 2018 the private costs (out-of-pocket expenditures) that women incurred to access an abortion in the Autonomous City of Buenos Aires [*Ciudad Autónoma de Buenos Aires*] (CABA) ranged from AR$15,000 to AR$30,000. Given that information is not available from other regions of the country, in order to approximate the average cost at a national level, we adjusted the values obtained for CABA according to the differential income observed across different regions, based on microdata produced by the Permanent Household Survey [*Encuesta Permanente de Hogares*] for the second trimester of 2018.[22] The average household income for three regions was calculated: the Center (Greater Buenos Aires, La Pampa, and Cuyo), the North (Northeastern and Northwestern Argentina), and the South (Patagonia), and the relationship between the income of these regions and that of CABA was calculated. The values of the costs of abortions in CABA were adjusted in relation to the income of each region and the weighted average for said costs was estimated using the distribution of the female population between 15 and 49 years old in the three regions as a weighting factor.

Furthermore, four scenarios (in terms of the proportions of the different procedures) were considered in order to calculate access to safe abortion, since it is not possible to know in advance which methods will be chosen to perform the abortions, even though the World Health Organization recommends the

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use of misoprostol and mifepristone as the primary recommended method (or misoprostol alone as an alternative when mifepristone is not available), manual vacuum aspiration as a secondary option, and dilation and curettage as a less safe option, although it is not unsafe when the provider is trained. In the first scenario it is assumed that all the abortions are performed with medication, in the second all are performed with manual vacuum aspiration, in the third it is assumed that 50% are performed with manual vacuum aspiration and 50% with medication, and in the fourth scenario it is assumed that 50% are performed with medication, 25% by manual vacuum aspiration, and 25% by dilation and curettage.

Given the lack of official data for Argentina regarding the distribution of complications associated with unsafe abortions, as well as the type of treatment provided according to those complications, we used the findings of the study conducted by Pardo and Uriza,[23] based on a study of the structure of initial diagnoses for incoming patients at 36 institutions in countries in the region in which the practice is also performed in a context of illegality. This study estimates that 75.6% of abortions have some contact with the healthcare system for some reason, whether for a consultation or incomplete abortion, and not necessarily as a result of serious complications. This figure aligns with data gathered by the WHO for Latin America and the Caribbean which puts that figure at 75%,[24] and with estimates from a recent study by Ganatra and colleagues,[1] who indicate that 74% of all abortions in South America are unsafe.

Of the total number of abortions which come into contact with the health system, 67.2% require a sharp curettage to complete an incomplete abortion, 19.1% require treatment for a local infection, 2.1% present septicemia, 9.5% need treatment for a severe hemorrhage, 1.45% suffer severe lesions to the uterus, bladder, or intestines, and the remaining 0.6% present a septic shock that in 90% of cases leads to death.[23]

In addition, the above distribution was compared with the opinions of doctors with extensive experience in the management of public hospitals in the City of Buenos Aires and the province of Buenos Aires, who considered these figures to be consistent with their experience.

FINDINGS

In this section we will present the main findings of our study: the total number of induced abortions estimated for Argentina in 2018, the costs of treatments for complications associated with unsafe abortions for the same year (for the healthcare system), the out-of-pocket expenditures for those abortions, and an approximation of the potential cost to the healthcare system of the four alternatives for safe abortion recommended by the World Health Organization.

The last column of Table 1 displays the total number of abortions estimated for 2018 based on official projections of the female population from 15 to 49 years of age in that year, and the rates of abortion per 1000 women calculated by Mario and Pantelides[7] for Argentina in the year 2000. The updated values for 2018 range from 457,000 to 733,000 abortions per year in this country, which represents an increase of the order of 20% to 40% in relation to the estimate for the year 2000 (ranging from 372,000 to 522,000 abortions), an increase exclusively due to the increase of the female population of a reproductive age in the period 2000-2018.

Figure 1 shows the unitary costs of treatments for complications according to the values of the categories produced by pre-paid medical and social security providers, and the (weighted) average of the minimum and maximum values obtained from each source, in Argentine pesos as of July 2018. We can observe a striking difference in the costs of the procedures required according to the type of complication. The lowest values are for the cost of incomplete abortions, the average cost of which is AR$22,691– or US$829 at the official exchange rate provided by the Central Bank of the Republic of Argentina

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Table 1. Total number of estimated abortions in Argentina, 2018.

Indirect Method Abortion Rates	Abortion Rate per 1000 women aged 15 to 49[1]	Total Projection of Women aged 15 to 49[2]	Total Number of Abortions Estimated in 2018
Hospital Discharges Method 1	40.8	11,214,540	457,553
Hospital Discharges Method 2	49.0		549,512
Residual Method 1	60.8		681,844
Residual Method 2	65.4		733,431

Source: Own elaboration based on abortion rates calculated by Mario and Pantelides(7) and population projections by sex and age groups from the National Institute of Statistics and Censuses [Insituto Nacional de Estadística Censos].(20)

on 16 July 2018[25] – followed by the average cost of treatment for severe hemorrhage at AR$51,547 (US$1,884), treatment for local infection at AR$93,807 (US$3,429), for perforations at AR$147,879 (US$5,405), for sepsis at AR$218,711 (US$7,994), and the highest cost is for treatment for septic shock at AR$276,511 (US$10,106).

On the basis of the estimates for the total number of abortions (the higher and lower limits of the range of values shown in Table 1), the unitary costs of the treatments for complications associated with unsafe abortions (expressed in millions of Argentine pesos), the out-of-pocket costs of those abortions and the number of hospital admissions and interventions which these procedures would involve, the total financial costs incurred in 2018 as a result of the illegal and unsafe practice of abortion in Argentina can be estimated. The estimates enable us to differentiate the component of cost for the health system (related

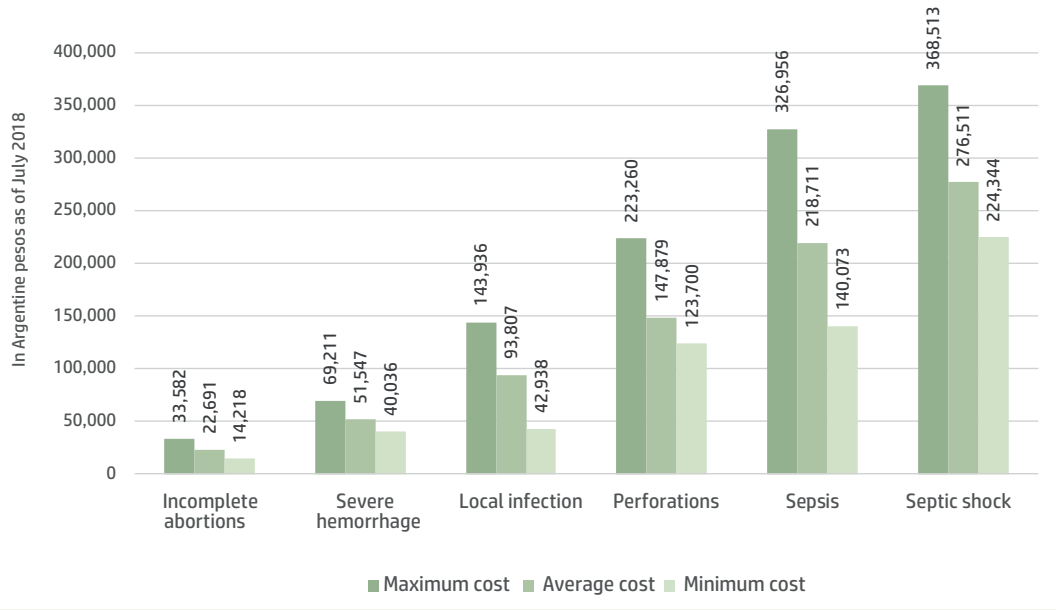

Figure 1. Unitary costs of treatments for complications arising from unsafe abortions in Argentina. In millions of pesos, July 2018.

Source: Own elaboration based on prices in July 2018 for Argentina, according to social security and pre-paid medical providers

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Table 2. Estimated costs for complications, out-of-pocket expenditures, and total costs of (unsafe) abortions in Argentina for 2018 (in millions of current Argentine pesos as of July 2018).

Category	Total cost for 457,553 abortions (Millions of AR$)			Total cost for 733,431 abortions (Millions of AR$)		
	Maximum	Average	Minimum	Maximum	Average	Minimum
Incomplete abortions	7,806	5,274	3,305	12,513	8,455	5,298
Local infection	9,509	6,197	2,837	15,243	9,935	4,547
Sepsis	2,375	1,589	1,017	3,807	2,547	1,631
Severe hemorrhage	2,274	1,694	1,316	3,646	2,715	2,109
Perforations	1,120	742	620	1,795	1,189	995
Septic shock	765	574	466	1,226	920	746
Subtotal complications	23,849	16,070	9,561	38,230	25,760	15,326
Subtotal out-of-pocket	6,950	5,212	3,475	11,140	8,355	5,570
Total	30,798	21,282	13,035	49,370	34,115	20,896

Source: Own elaboration based on 1) prices as of July 2018 for social security and pre-paid medical providers in Argentina; 2) abortion rates calculated by Mario y Pantelides[7]; 3) population projections by sex and age group from the National Institute of Statistics and Censuses[20] and 4) the Permanent Household Survey from the second trimester of 2018.[22]

to treatments for complications) from the costs directly incurred by the women themselves or their families (out-of-pocket expenditures) in order to access an abortion.

These estimates can be seen in Table 2. The columns on the left-hand side contain the figures for the most conservative estimate of the total number of abortions in Argentina in 2018 (457,553 abortions), and the columns to the right contain the figures for the highest estimated total number of abortions (733,431). In both cases the minimum, average, and maximum values for the unitary costs of the treatments are presented. It is noteworthy that the cost of treatments for complications represents the greater proportion of the total financial cost, which in all cases more than triples the out-of-pocket expenditures for access to an abortion. It is also noteworthy that even in the most conservative scenario (based on the minimum unitary costs for services and the lowest end of the range for the total number of abortions), the total resources deployed in 2018 in Argentina reaches 13 billion pesos (equivalent to US$ 476 million), and in the most pessimistic scenario (maximum unitary costs and maximum total number of abortions) the resources are as high as 49 billion pesos (US$ 1,804 million).

In Table 3, the estimates of the average unitary costs of safe abortions performed in compliance with the WHO recommended guidelines are presented, along with the total costs for the two scenarios of the overall number of abortions: the minimum (457,533) and the maximum (733,431).

It is worth highlighting that the abortion practices following the protocols recommended by the WHO are considered to be safe (with non-existent risks or minimal complications), involve very low complexity interventions, and are less costly (as the 2013 study conducted by Prada and colleagues shows).[3] Therefore, the total costs of the four alternatives based on WHO protocols are lower than the average out-of-pocket expenditures for unsafe procedures (Table 2).

In the scenario projecting 457,000 annual abortions, the total costs range from AR$ 2,842 million to AR$ 3,965 million (the equivalent of US$ 104-145 million). For the

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Table 3. Estimation of (potential) costs of access to safe abortion for the healthcare system according to scenarios of methods recommended by the WHO. Argentina, July 2018.

Scenarios by method	Average costs per case by scenario (in AR$)	Total costs (in millions of AR$)	
		457,533 abortions	733,431 abortions
100% medical abortions	6,212	2,842	4,556
100% manual vacuum aspiration	6,515	2,981	4,778
50% manual vacuum aspirtation and 50% medical abortions	6,363	2,911	4,667
50% medical abortions + 25% manual vacuum aspirtation and 25% dilation and curettage	8,665	3,965	6,355

Source: Own elaboration based on: 1) prices as of July 2018 for social security and pre-paid medical providers in Argentina; 2) abortion rates calculated by Mario y Pantelides[7]; 3) population projections by sex and age group from the National Institute of Statistics and Censuses.[20]

scenario with 733,000 annual abortions, the total costs range from AR$ 4,556 million to AR$ 6,355 million (US$ 167-232 million). Figure 2 illustrates the magnitude of the difference in the total financial costs of abortions and their associated complications between the safe and unsafe alternatives. To that end, and for the sake of simplicity, we have utilized the most conservative scenario of the total number of abortions (457,553 annually), and the average values of the costs of medical services and treatments, although our conclusions are consistent regardless of the scenario used in terms of total number of abortions and unitary costs of services.

The main conclusion which can be drawn from Figure 2 is the huge difference in costs between unsafe and safe abortions, and that these differences are largely due to the costs of treatments for complications,

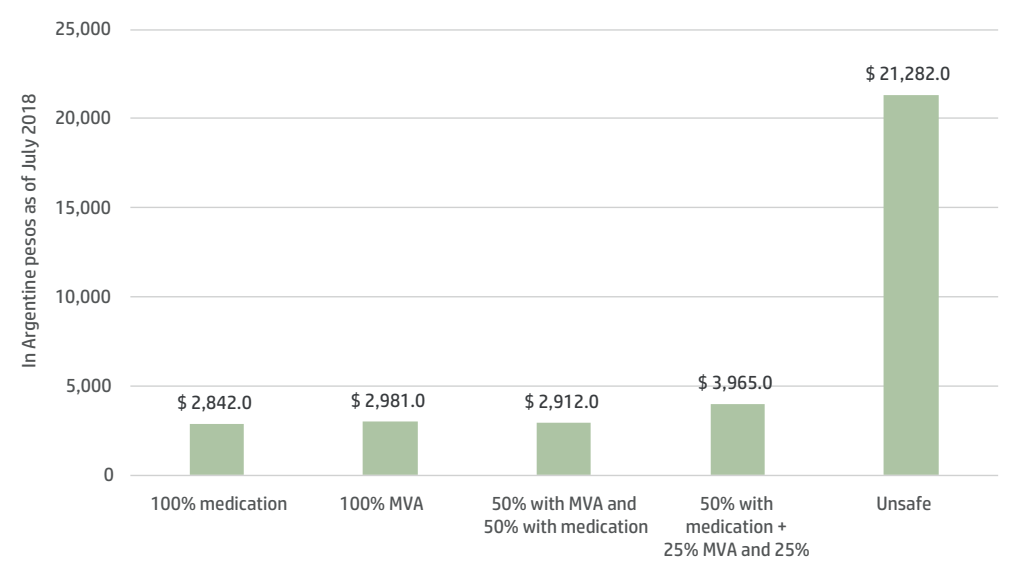

Figure 2. Comparison of costs for safe and unsafe abortions. Scenarios of 457,553 total abortions and average costs of medical services. Argentina, millions of pesos, July 2018.

Source: Own elaboration based on 1) prices as of July 2018 for social security and pre-paid medical providers in Argentina; 2) abortion rates calculated by Mario y Pantelides[7]; 3) population projections by sex and age group from the National Institute of Statistics and Censuses[20] and 4) the Permanent Household Survey from the second trimester of 2018.[22]
Note: MVA = manual vacuum aspiration; D&C = dilation and curettage.

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although unsafe procedures also carry higher out-of-pocket costs.

For example, comparing the worst-case scenario in terms of the method of safe abortion used (which includes 25% of procedures performed using dilation and curettage), the total costs of safe abortions are AR$3,965 million per year (US$145 million), and the total costs under current conditions of illegality and unsafe procedures rises to AR$21,282 million (US$778 million), in other words 5 times higher.

Disaggregating the costs for the unsafe scenario, it can be observed that even the out-of-pocket expenditures incurred by the women seeking abortions or their families in a context of illegality and unsafe practices exceed the costs of any safe alternative complying with WHO protocols by 30% or 80% (depending on the scenario of safer methods). In turn, the resources expended by the healthcare system for the treatment of complications (without taking into account out-of-pocket expenditures) exceeds by up to 4 or 5 times the costs to the system of any scenario of safe abortion methods.

DISCUSSION

During the first semester of 2018 in Argentina, a profound and widespread debate was set in motion about the legalization of abortion (in the context of the legislative treatment of the proposed Law for the Voluntary Interruption of Pregnancy) which exposed the lack of scientific studies which address specific aspects of the issue in the context of this country.

The overall number of abortions currently performed, the costs for the healthcare system of treatments for complications associated with unsafe abortion procedures, the private or out-of-pocket costs incurred for accessing an illegal and unsafe procedure in the current context, the costs of the safe alternatives – complying with the protocols recommended by the WHO[15,18,19] – as well as non-financial and other costs which are more difficult to quantify (such as those related to loss of productivity, loss of working days, psychological consequences, etc.), are all scarcely studied aspects on which it was not possible to find published scientific studies at the time when the legislative bill for the proposed law was being debated.

The aim of our study is, therefore, to attempt to reduce the existing gap of knowledge about the aforementioned dimensions drawing on the best currently available data, utilizing a series of assumptions and scenarios (discussed in this section) in order to draw some comparisons between the private (out-of-pocket) costs and costs borne by the healthcare system (both public and private) in the current context, and the costs of four projected scenarios of safe abortion practices.

One of the aspects debated during the consideration of the bill, in relation to which strongly expressed viewpoints circulated (often accompanied by nebulous evidence), concerned the costs to the public healthcare system of a scenario of legalized abortion with universal access to the practice in health centers throughout the country. Our estimates do not distinguish between the cost to the public or private healthcare system (as the perspective of the financer/provider was not taken into consideration), and the distribution of the economic burden between the two subsystems in the case of the legalization of abortion would depend on how it was operationalized: a) if abortion were only decriminalized (involving no guarantee of coverage), or b) if decriminalization were accompanied by a guarantee of universal access, and the participation of each subsystem (public and private) in this latter scenario.

In the first scenario, of decriminalization of the practice and the strict control over compliance with safe abortion protocols with private or out-of-pocket funding of abortion access, savings for both subsystems (of public and private healthcare) would be the expected result, as long as the treatments for complications (which according to our calculations represent the largest expenditure of resources for the healthcare system) were kept to a minimum and the costs of the procedures

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continued to fall directly on the shoulders of individuals. Furthermore, in this first scenario, savings in terms of out-of-pocket costs for those paying for an abortion are also to be expected, given the lower costs of procedures under safe conditions with the latest methods which are also less costly (in line with the declarations of the WHO and also the findings of the 2013 study conducted by Prada and colleagues),[3] and would involve savings with respect to the inflated costs of clandestinity.

However, in the second scenario, in which decriminalization is accompanied by the guarantee of universal access, our estimations suggest that a net saving of resources would be generated for the healthcare system overall, since the savings recouped from preventing complications as a result of safe practices would far outstrip the costs of providing access to abortion services under safe conditions in public and private health clinics. In relation to this it is important to bear in mind the evidence presented by Prada *et al.*'s study,[3] which shows that to make an efficient use of resources (and maximize savings), it is essential to use the two methods most strongly recommended by the WHO (medication or manual vacuum aspiration), and to perform the procedure in specialized centers where both the medical personnel and the equipment are adequate for the procedure and costs are much lower than in other types of high complexity facilities.

However, these findings contain at least three assumptions which it is important to discuss and assess as they could affect the more general conclusion.

First assumption

Of all abortions currently performed (mostly illegal and unsafe), 75.6% require some kind of post-abortion service or treatment (due to being incomplete or with complications, which can range from a simple consultation to high-complexity treatments), while safe abortions do not require those services. We should keep in mind that the figure of 75.6% of abortions currently coming into contact with the healthcare service comes from Pardo and Uriza's study[23] on other countries in the region (not including Argentina) presenting similarities as regards the illegality of the practice, and that, although the data was verified by local experts, it may be subject to error. The WHO asserts that the risks as a result of complications and the need for post-abortion treatment when the protocols are followed are minimal or null, which implies an adequate implementation of the legal practice which, at least to begin with, may not be the case. The question addressing how these assumptions could be affecting the comparison of costs for the healthcare system between the legal scenario (costs of the safe procedure for the healthcare system) and the illegal one (costs of treatments after unsafe abortions) is: How much would the post abortion treatment differential have to be reduced between the illegal and legal procedure (from the 75.6% in our study) for the costs of legal abortion for the healthcare system to exceed the post-abortion costs (as a result of incomplete abortions or complications)? In order to respond to this question we carried out a sensitivity analysis in which it can be observed that the differential would have to drop from 75.6% to 18% (whether due to an increase in post-abortion treatments in the legal scenario or by reduction of the same in the illegal scenario) for the cost to the healthcare system of safe abortion to exceed the cost of post-abortion treatment. In this case, 18% of abortions requiring post-abortion treatment would entail a cost to the healthcare system of AR$ 3,826 million (in the scenario with 457,553 annual abortions), and AR$ 6,133 million (for 733,431 abortions); figures which, when compared with those in Table 3, show that these costs would be slightly lower than the costs incurred by the most expensive safe abortion alternative (AR$ 3,965 million and AR$ 6,355 million respectively).

It can be deduced from the sensitivity analysis that in order for illegality to be less costly for the healthcare system than abortion services following safety protocols, the need for post-abortion treatment would have

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to be dramatically reduced, which is difficult to imagine in a context in which the practice is illegal (where it is not possible to foster the implementation of safe methods) and taking into account that abortion in itself is not and has not been preventable in any country.

Second assumption

The legalization of abortion does not imply an increase in the total number of abortions. The other implicit assumption in the comparisons is that the total number of abortions remains constant across both scenarios, while some claim that the legalization of abortion could increase the total number of abortions. The international evidence, while not conclusive, seems to suggest the contrary: in countries in which abortion has been legalized (for example France, Italy, Spain, and Uruguay) the abortion rates gradually reduced over time (due to improvement in prevention policies in a context of legality), although it is very difficult to make a comparison with the pre-legalization figures because of the difficulties obtaining reliable measurements under conditions of clandestinity. In the context of our study, and the worse imagined scenario, it is worth inquiring: By how much would the total number of abortions have to increase as a consequence of legalization in order for the costs of safe abortion to the healthcare system to exceed the costs for treatments after unsafe abortions? The findings of this second sensitivity analysis indicate that the total number of abortions would have to at least quadruple for the costs of medical attention to exceed the costs of post-abortion treatments projected for the current estimates of the total number of abortions (457,553 to 733,431 annually).

Third assumption

The legalization of abortion does not alter the average gestational age at the moment of intervention. Gestational age is strongly correlated with intervention costs and the risk of complications. To the extent that legalization of abortion eliminates or reduces administrative barriers and other less explicit but nonetheless extremely important obstacles (such as social prejudice against women who decide to have an abortion or economic limitations in the case of guaranteed access) it would be expected that medical care would improve and that abortion procedures would be performed at an earlier stage which would reduce even further the total costs of the practice in conditions of legality, thus reinforcing our findings from the comparative analysis between the legal and illegal scenarios.

Due to the above, the main conclusion of this study is that from a strictly economic perspective there is no evidence to justify continuing the current regime of illegality in Argentina. The findings from the comparison of total financial costs (private or out-of-pocket and for the healthcare system) of the present scenario of illegality and unsafe abortion procedures, in contrast with potential scenarios of safe practices, shows that a huge quantity of resources could be saved if the recommended protocols were followed, which only seems possible in a context of legalization and strict controls. The sensitivity tests of the implicit and explicit assumptions in the comparisons also indicate that our findings are robust and do not contradict the more general conclusion as a consequence of errors in these assumptions.

It should also be added that our overall analysis focuses on the financial costs of abortion and post-abortion services, and therefore the comparisons of the legal and illegal scenarios do not consider non-financial costs. With regard to this, it is worth reflecting on how these costs operate in the two scenarios. In order to respond to this it would be necessary to develop the study of the differential consequences of abortion in safe and unsafe condition in terms of premature deaths, disability, absenteeism, psychological harm, and loss of productivity (among other dimensions). Including these would probably mean that the economic differences intensify, since abortion in a context of illegality is bound to impact more strongly on these dimensions.

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REFERENCES

1. Ganatra B, Gerdts C, Rossier C, Johnson Jr BR, Tunçalp O, Assi A, Sedgh G, Singh S, Bankole A, Popinchalk A, Bearak J, Kang Z, Alkema L. Global, regional, and subregional classification of abortions by safety, 2010-2014: estimates from a Bayesiand hierarchical model. The Lancet. 2017;390(10110):2372-2381.

2. Levin C, Grossman D, Berdichevsky K, Diaz C, Aracena B, Garcia AG, Goodyear L. Exploring the costs and economic consequences of unsafe abortion in Mexico City before legalization. Reproductive Health Matters. 2009;17(33):120-132.

3. Prada E, Maddow-Zimet I, Juarez F, The cost of postabortion care and legal abortion in Colombia. International Perspectives on Sexual and Reproductive Health. 2013;39(3):114-123.

4. Diaz Amado E, Calderón García MC, Cristancho KR, Salas EP, Hauzeur EB. Obstacles and challenges following the partial discrimination of abortion in Colombia. Reproductive Health Matters. 2010;18(36):118-126.

5. Prada E, Singh S, Remezand L, Villarreal C. Unitended pregnancy and induced abortion in Colombia: causes and consequences. New York: Guttmacher Institute; 2011.

6. Prada E, Singh S, Villareal C. Health consequences of unsafe abortion in Colombia, 1989-2008. International Journal of Gynecolgy & Obstetrics. 2012;118(Suppl. 2): S92-S98.

7. Mario S, Pantelides E. Estimación de la magnitud del aborto inducido en la Argentina (para el año 2000). Notas de Población. 2009;87:95-120.

8. Aller Atucha L, Pailles J. La práctica del aborto en Argentina. Buenos Aires: Marketing y Promoción Social para la Calidad de Vida; 1997.

9. Singh S, Wulf D. Niveles estimados de aborto inducido en seis países latinoamericanos. International Family Planning Perspectives. 1994;20(1):4-13.

10. Johnston H, Hill K. Induced abortion in the developing world: indirect estimates. International Family Planning Perspectives. 1996;22(3):108-137.

11. Bongaarts J. The fertility-inhibitings effects of the intermediate fertility variables. Studies in Family Planning. 1982;13(6/7):179-189.

12. Bongaarts J. A framework for analyzing the proximate determinants of fertility. Population and Development Review. 1978;4(1):105-132.

13. Davis K, Blake J. Social structure and fertility: an analytical framework. Economic Development and Cultural Change. 1956;4(3):211-235.

14. Argentina, Ministerio de Salud. Encuesta Nacional de Nutrición y Salud. Documento de resultados [Internet]. 2007 [cited 10 dic 2019]. Available from: https://tinyurl.com/y5xotrpr.

15. Organización Mundial de la Salud. Prevención del aborto peligroso [Internet]. 26 jun 2019 [cited 28 jun 2019]. Available from: https://tinyurl.com/yyrgec4r.

16. World Health Organization. WHO launches new guideline to help health-care workers ensure safe medical abortion care [Internet]. 2019 [cited Feb 2019]. Available from: https://tinyurl.com/yxdlbc66.

17. World Health Organization. Health worker roles in providing safe abortion care and post-abortion contraception [Internet]. Geneva: WHO; 2015 [cited 26 Feb 2019] Available from: https://tinyurl.com/yxaodhod.

18. World Health Organization. Medical management of abortion [Internet]. Geneva: WHO; 2018 [cited 26 Feb 2019] Available from: https://tinyurl.com/y3lzpjuh.

19. World Health Organization. Safe abortion: technical and policy guidance for health systems. 2nd ed. [Internet]. Geneva: WHO; 2012 [cited 26 Feb 2019]. Available from: https://tinyurl.com/yxuv5ka5.

SALUD COLECTIVA. 2019;15:e2275. doi: 10.18294/sc.2019.2275

20. Instituto Nacional de Estadística y Censos. Proyecciones de población por sexo y grupos de edad 2010-2040: Total del país. Buenos Aires: INDEC; 2013. Serie Análisis Demográfico N° 35.

21. Alfabeta. Manual Farmacéutico On Line [Internet]. 2019 [cited 2 Feb 2019]. Available from: https://tinyurl.com/ybmvucef.

22. Instituto Nacional de Estadística y Censos. Base de Microdatos Encuesta Permanente de Hogares [Internet]. 2018 [cited 10 Mar 2019]. Available from: https://tinyurl.com/yybsl7p8.

23. Pardo F, Uriza G. Estudio de morbilidad y mortalidad por aborto en 36 instituciones de Bolivia, Colombia, Perú y Venezuela. Revista Colombiana de Obstetricia y Ginecología. 1991;42(4):287-297. doi: 10.18597/rcog.939.

24. World Health Organization. Unsafe Abortion (6th ed.). Geneva: WHO; 2011.

25. Banco Central de la República Argentina. Cotización Histórica [Internet]. 2019 [cited 25 mar 2019]. Available from: https://tinyurl.com/y4vdy8pj.

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