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# **Pregnant and Out of Options: The Quest for Abortion in Latin America Due to the Zika Virus Pandemic**

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## **Abstract**

Latin America has some of the strictest abortion rules in the world, where the procedure is criminal in cases of rape, incest, or even to save the life of the mother. More than 97% of women in Latin America and the Caribbean live in countries where access to abortion is either restricted or banned altogether. As a result, unsafe abortion is widespread and causes 10% of all maternal deaths in the region. With the onset of the Zika virus pandemic in 2015, and the identification of the virus as causing poor pregnancy outcomes including fetal infection, microcephaly, and other malformations, there became an increased demand for abortions in Latin American countries. The response of many Latin American governments to Zika infection during pregnancy was to recommend that women avoid or postpone their pregnancies. These recommendations were not possible for many women at risk in the affected countries, especially those who were uneducated or living in poverty. As a result of the Zika pandemic, there has been an increased demand for abortion in many of the affected countries that, because of the clandestine and illegal nature of the procedure, carries the heightened risk for additional maternal morbidity and mortality.

**Keywords:** Zika virus, congenital Zika syndrome, unsafe abortion, unmet need, family planning, pregnancy, illegal abortion, microcephaly, Latin America, Central America, South America, abortion, human rights, reproductive rights, reproductive health, viral infection, public health, contraception

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## **1. Introduction**

The accessibility and utilization of family planning methods in Central and South America have historically been limited by several factors, including availability, affordability, and education, especially when comparing indigenous with nonindigenous women, the poor

and the wealthy, and rural and urban dwellers. Throughout Latin America, multiple studies have demonstrated a variety of ethnic, financial, and social risk factors for unintended and unwanted pregnancies, unmet need for family planning, and unsafe abortion. These include widespread poverty, lower education levels, high fertility rates, early age at first intercourse, adolescent and teen pregnancy, rural areas of residence, cultural and language barriers in health-care facilities which are especially prevalent among indigenous women, sexual violence, and insubordination [1, 2]. Because the predominant religion in these countries is Roman Catholicism, religious doctrine has significantly impacted the use of family planning methods. In particular, abortion is unlawful in almost all Latin American countries, except under certain circumstances that are determined by national laws. Because of widespread unmet need for contraception, poverty, stigmatization, and unacceptably large numbers of adolescent and teenage pregnancies, women have historically sought to terminate unwanted pregnancies by means of unlawful abortion in these countries. With the advent of the Zika virus pandemic in 2015 and its spread throughout Latin America, this situation has increased. With the recognition that girls and women who become infected with the Zika virus while pregnant are at risk for developing such poor obstetrical outcomes as spontaneous abortion, stillbirth, infants with microcephaly, and other forms of fetal malformation, even if they exhibit no symptoms during gestation, the demand for abortion has increased. More than 97% of women in Latin America and the Caribbean live in countries where access to abortion is either restricted or banned altogether. In six Latin American countries, abortion is not permitted for any reason, including rape or to save the life of the mother [3]. As a result, they must often seek terminating their pregnancies through less-than-legal means, including performance of abortions in an environment lacking even minimal medical and sanitary standards and often performed clandestinely by persons lacking the necessary medical skills. The potential health consequences of unsafe abortion to the mother are well known [4]—just prior to the advent of the Zika pandemic in 2014, a minimum of 10% of all maternal deaths in Latin American and Caribbean countries, representing almost 900 girls and women, resulted from complications of unsafe abortions [5]. About 760,000 women in the region are treated annually for complications from unsafe abortion [3]. The ongoing public health problem of unsafe abortion was to be unexpectedly exacerbated when a newly emergent virus, the Zika virus, began to spread through South America in 2015 [6]. As it became known that the virus was responsible for the occurrence of microcephaly and other fetal malformations, it left those women at risk in endemic areas without a viable alternative to carrying a potentially infected fetus through to delivery. As a result, there has been an increased demand for abortion, even though it is illegal in most Latin American countries and, in some cases, can result in the incarceration of both the mother and abortionist, nurse, or physician. Penalties can be extreme—up to 10 years in prison for mothers having abortions in Paraguay and Honduras. In El Salvador, several single mothers have been imprisoned for having miscarriages during their pregnancy; women convicted of having an abortion face imprisonment of up to 50 years [7].

This chapter discusses the legal, medical, and social issues surrounding the dilemma among the predominantly poor women of Latin America who are impacted by the emergence of the Zika virus pandemic, its effect on the unborn fetus, and their fears of having a malformed infant.

## 2. Legal status of abortion in Latin America

The countries which compose Central and South America have the most restrictive and harsh penalties for performance of an abortion of any region in the world (**Figure 1**). In four Latin American countries—Suriname, El Salvador, Honduras, and Nicaragua—abortion is not permitted legally for any reason whatsoever, including in cases of rape, incest, or to save the life of the mother [3, 8–10].

Chile had been included in the list of countries that completely prohibit abortion, with penalties of up to 5 years in prison, until the government lifted the ban in 2017 [11, 12]. In Guyana, abortion is legal in the first 8 weeks of pregnancy, after which it can only be legally performed when it endangers the health of the mother or fetus. The legality of abortion in Mexico is determined by each individual state—in Mexico City, abortion was decriminalized in 2007 only if performed during the first 12 weeks of gestation; however, the rest of Mexico has much stricter regulations [13]. Two countries in Central and South America permit legal abortion



**Figure 1.** The status of abortion law in Latin America, United Nations 2013 report. In some cases, this map may not accurately depict the content of this article. ■ Legal on request; ■ restricted to cases of maternal life, mental health, health, rape, fetal defects, and/or socioeconomic factors; ■ restricted to cases of maternal life, mental health, health, rape, and/or fetal defects; ■ restricted to cases of maternal life, mental health, health, and/or rape; ■ restricted to cases of maternal life, mental health, and/or health; ■ restricted to cases of maternal life; ■ illegal with no exceptions. After Wikipedia, Abortion Law. Available from: [https://en.wikipedia.org/wiki/Abortion\\_law](https://en.wikipedia.org/wiki/Abortion_law).

REGION	NUMBER OF ABORTIONS (MILLIONS)		ABORTION RATE		PERCENT PREGNANCIES ENDING IN AN ABORTION
	1990-1994	2010-2014	1990-1994	2010-2014	2010-2014
<b>CENTRAL AMERICA</b>	<b>0.8</b>	<b>1.3</b>	<b>27</b>	<b>33</b>	<b>24</b>
<b>SOUTH AMERICA</b>	<b>3.1</b>	<b>4.6</b>	<b>43</b>	<b>48</b>	<b>34</b>

Figure 2. Number of abortions performed in Latin America prior to the Zika epidemic, 1990–1994 and 2010–2014 [3].

only in those cases to save the life of the mother—Paraguay and Guatemala [14, 15]. Brazil permits abortion to save the life of the mother, as well as in cases of rape and anencephaly [16]. In Panama, abortion can also be performed in cases of rape as well as fetal impairment or with parental authorization [17]. Five Latin American countries permit abortion to save a mother's life and preserve physical health—Argentina, Bolivia, Costa Rica, Ecuador, and Peru [3, 18, 19]). In addition to the aforementioned reasons, both Belize and Colombia permit abortion to preserve the mental health of the woman [20, 21]. Only one country in Latin America permits legal abortion—Colombia passed the legislation in 2012, and elective pregnancy termination in that country is now widely available [22].

However, criminalizing abortion in Latin American countries does not prevent abortion—similar to other regions of the world, unsafe abortions occur most frequently as a result of harsh regulations governing the access of girls and women to legal and safe termination of pregnancy [4].

During the period extending from 2010 to 2014 (and prior to the Zika virus outbreak), an estimated 6.5 million induced abortions occurred each year in Latin America and the Caribbean, up from 4.4 million during 1990–1994. As can be seen in **Figure 2**, the greatest number occurred in South America, where there were 4.6 million performed annually in 2010–2014. The annual rate of abortion was estimated at 44 procedures per 1000 women of reproductive age (15–44 years old). The Latin American abortion rate is approximately 48 for married women and 29 for unmarried women. Even prior to the introduction of Zika virus in this region, the proportion of pregnancies ending in abortion had increased between 1990–1994 and 2010–2014, from 23 to 32% [3].

### 3. Who performs illegal abortions in Latin America?

In Latin American countries, all but one of which do not legally permit abortion on request, women will often seek the services of untrained or inadequately trained persons in dangerous and unsterile conditions or attempt to self-induce an abortion. Because of such circumstances, abortion mortality rates are up to 100 times higher in Latin America than in industrialized nations. For reasons that are obvious, there are scant published data available on who actually perform illegal abortions in Latin American countries. It must be remembered that not all illegal abortions are unsafe and not all unsafe abortions are illegal. Illegal abortions can be divided into those that are (1) performed clandestinely by medically qualified physicians in their medical offices or clinics; (2) performed by an individual, sometimes a physician but often by an abortionist who is medically unqualified, in an environment lacking the minimum medical standards, often termed “back alley,” “back street,” or “back yard” abortions; and (3)

a self-administered abortion by the pregnant woman. Of these, the latter two are considered unsafe abortions and are probably responsible for the large majority of fatalities and medical complications arising from illegal abortion procedures.

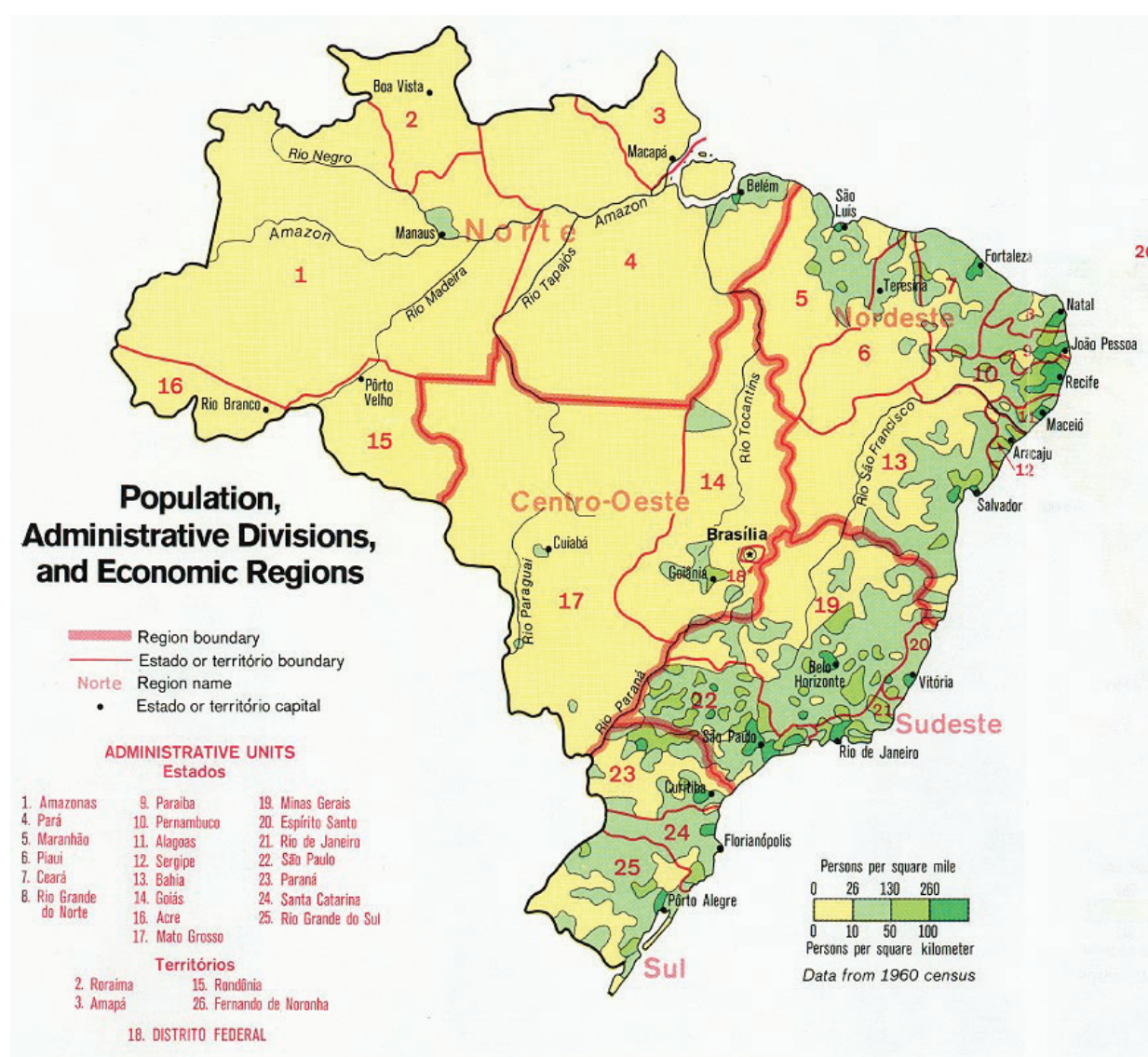
In many Central and South American countries, a large part of the population has indigenous ancestry—this is especially true for Mexico, Honduras, Guatemala, Brazil, Peru, Ecuador, Bolivia, Colombia, and Chile. Unfortunately, indigenous women frequently reside in poor, rural, and medically underserved areas and have little access to modern medical care and family planning education and interventions. As a result, indigenous women in Latin America are more likely to have high rates of adolescent and teen fertility and unintended or unwanted pregnancies and are disproportionately affected by adverse reproductive and sexual health outcomes [23]. It is not surprising that unsafe induced abortion is practiced among indigenous women, where it contributes to the high rate of maternal morbidity and mortality among these populations. It has been estimated that 18% of maternal mortality in Ecuador, 16% in Peru, and 28% in Colombia resulted from complications due to unsafe abortion [24]. In Guatemala, where 40% of women are indigenous and abortion is illegal except to save the life of the mother, the annual abortion rate is 24 per 1000 women of reproductive age, with 22,000 women treated in 2003 for abortion complications [25]. In Mexico, indigenous women are five times more likely to abort unsafely than are nonindigenous women [26]. These figures are probably significant underestimates of the true prevalence of unsafe abortion and burden of abortion-associated complications among indigenous women, a result of underreporting bias and challenges to data collection. Because of harsh penalties to the woman and their abortion provider, demographic research is hampered by the illegality of abortion throughout most of Latin America, together with issues relating to stigmatization, social, religious, and political constraints. This sampling bias is significant, as it often does not include those girls/women who successfully complete an unsafe abortion, cannot seek medical care or hospitalization because of geographic and financial barriers, or decline to seek medical care for fear of legal or social repercussions [27].

Because many indigenous communities where unsafe abortions are practiced are in rural or isolated areas that are not routinely serviced by a physician or nurse, the procedures are typically performed either by the pregnant woman herself or with the aid of another indigenous woman who has some experience in terminating pregnancies. In a study of elective abortion performed among women in Guatemala, 49–63% of indigenous women had obtained their abortions from traditional birth attendants (TBAs), and less than 15% had been attended by trained professionals (compared to two-thirds of higher socioeconomic class women in urban centers) [25]. Self-induced abortion appears to be more common among those women residing in rural areas—abortion services are unavailable or limited because of the geographic isolation. In a study across 20 cities in Peru, Bernabé-Ortiz and colleagues [28] found that the prevalence of induced abortion in the jungle regions was nearly twice as high as that in the coastal and highland regions.

#### **4. The Zika virus pandemic and pregnancy**

In 2015 the already desperate situation that pregnant girls and women in Latin American countries found themselves in when seeking to terminate a pregnancy was made worse by the introduction of a new emerging viral agent into Brazil, the Zika virus. This virus, previously identified only from Africa and Oceania, was new to the Western Hemisphere [29].

The initial recognition that a public health problem was occurring occurred on March 2, 2015, when the Brazilian authorities reported to the World Health Organization (WHO) that a large number of cases of an illness characterized by skin rash had been occurring in its northeastern states. The illness was initially identified from persons in Pernambuco in December 2014, after which there were more reports from Rio Grande do Norte, Maranhão, and Bahia in February and March 2015 (Figure 3). From February to April 2015, there were almost 7000 additional cases of illness characterized by skin rash reported from these states, but as Zika virus was not suspected, no tests were conducted for it. On April 29, 2015, the Bahia State Laboratory in Brazil reported to WHO that the Zika virus had been found in patient's samples, which was subsequently confirmed by polymerase chain reaction (PCR) testing at Brazil's National Reference Laboratory on May 7th. The same day, WHO and Pan American Health Organization (PAHO) issued an epidemiological alert that Zika virus



**Figure 3.** Map of Brazil. Zika virus infections and fetuses with microcephaly were first identified in Northeastern Brazil from the state of Pernambuco (10 on the map). Public Domain, <https://commons.wikimedia.org/w/index.php?curid=1665180>.

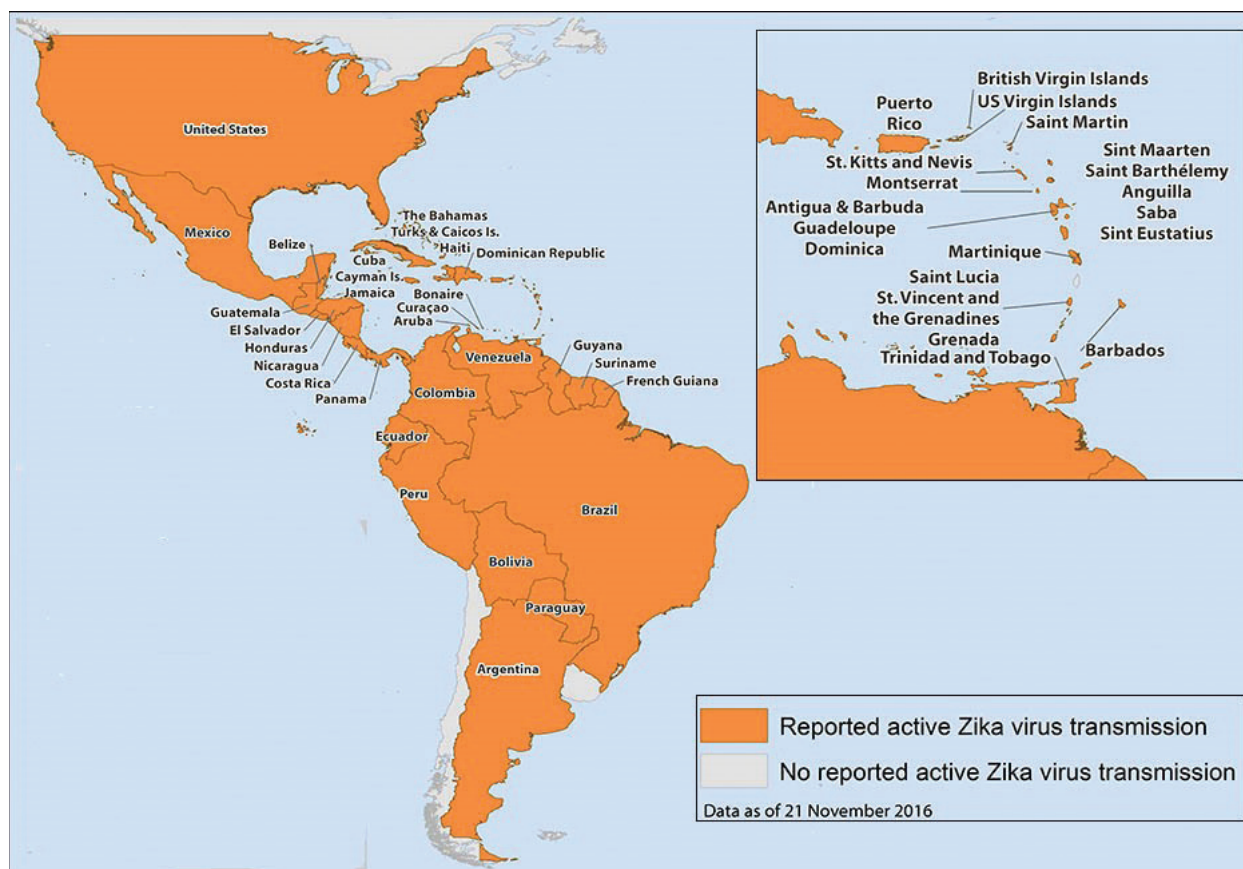
infections were occurring in Brazil and, for the first time, in the Western Hemisphere. By July 2015, Brazil reported the association of Zika infection with neurological disease in adults—these included 49 cases of confirmed Guillain-Barré syndrome (GBS). In October 2015, Colombia announced that PCR-confirmed cases of Zika infection had been identified in that country as well.

It was on October 30, 2015, that the Brazilian authorities first reported an unexplained increase in the number of newborns with microcephaly. Soon after that announcement, a national public health emergency was declared as the number of suspected microcephaly cases continued to increase. Brazil announced on November 11th that there were 140 cases of newborns with suspected congenital microcephaly occurring in Pernambuco State alone and made world headlines by declaring a national public health emergency. The number of Brazilian infants with microcephaly suspected as being associated with Zika virus infections reached over 700 cases by mid-November 2015, and the virus was found in the amniotic fluid of two pregnant women. In response, both WHO and PAHO issued an epidemiological alert and requested that PAHO member states report increases of congenital microcephaly and other central nervous system malformations. On November 28, 2015, Brazil reported that Zika virus genomic material had been isolated from both tissue and blood specimens from an infant with congenital abnormalities, including microcephaly—the neonate had expired within minutes following delivery. Following this important report, both PAHO and WHO issued an alert to the association of ZIKV infection with neurological syndromes and congenital malformations in the Americas [6].

## 5. Governments respond to Zika virus, reproductive health, and pregnancy

On November 17, 2015, the Pan American Health Organization (PAHO) issued an epidemiologic alert regarding Zika virus in Latin America [30]. As the Zika virus spread throughout Latin America in 2016 (**Figure 4**), the response of many Latin American governments to the threat of Zika virus infecting pregnant women, their unborn fetus, and the possible development of microcephaly was to recommend that women avoid or postpone their pregnancies. However, the restrictive abortion regulations that existed in these countries in the pre-Zika era remained intact. In Colombia and El Salvador, for example, women were cautioned by the Health Ministers of both countries to avoid becoming pregnant [31]. These recommendations provided a paradox, as greater than 50% of pregnancies in Colombia are unplanned, and El Salvador has the one of the highest rates of adolescent and teenage pregnancy in the region, with girls between the ages of 10 and 18 years representing approximately one-third of all pregnancies. In addition, sexual violence is prevalent in both countries. When the World Health Organization stated in June 2016 that women living in Latin American countries where Zika virus transmission was endemic should consider delaying becoming pregnant, the announcement affected millions of women living in 46 Latin American and Caribbean countries [32]. Unfortunately, in order to comply with these recommendations, reproductive-age girls and women would need to have access to family planning services and the corresponding education, which for the majority of impoverished women at risk for infection was either





**Figure 4.** Active Zika virus transmission in the Western Hemisphere up to November 2016. Available from: [https://en.wikipedia.org/wiki/2015%E2%80%9316\\_Zika\\_virus\\_epidemic](https://en.wikipedia.org/wiki/2015%E2%80%9316_Zika_virus_epidemic).

incompatible with religious and personal convictions or financially or geographically beyond reach. In addition, facilities in the most Zika-affected regions lack the capacity to respond to the increased demand for family planning [33]. This is due to inadequate infrastructure and delivery systems, insufficient commodities and supplies (including such medications as emergency contraceptives, long-acting reversible contraception, condoms, electric and/or manual and vacuum aspiration (MVA), and mifepristone and misoprostol), as well as a lack of trained personnel to provide quality care to meet the needs of the population. The deficiency in providing adequate contraceptive and safe abortion services, in combination with severely restrictive abortion laws in most countries where Zika was becoming endemic, forced many girls and women to consider, and eventually seek, clandestine and unsafe abortion methods.

## 6. The Zika pandemic has increased demand for abortion

In the United States and other Western countries where abortions are legal, a number of women whose fetuses have shown evidence of congenital abnormalities as a result of Zika virus infection have chosen to undergo elective pregnancy terminations—subsequent evaluation revealed that the fetal brains had been damaged [34].

In Northeastern Brazil, which was both the epicenter for the Zika virus pandemic and had the highest rates of infection and greatest numbers of cases, the mostly impoverished girls and women in the region were frightened by the news of fetal malformations. Although many attempted to delay or avoid pregnancy, they were hampered by a lack of clear information about reproductive health and family planning, or it was difficult to access contraceptive methods. An investigation by the international nongovernmental organization Human Rights Watch found that the public health system in Brazil may not have been providing consistent and comprehensive reproductive health information to the girls and women in Northeastern Brazil [35]. Many told interviewers that during their prenatal appointments, they had not been informed of how to prevent Zika infection during pregnancy or that it could be transmitted sexually and thus were not using condoms even when they were available. As a result, they were resorting to clandestine (and frequently unsafe) methods to terminate their pregnancies. This was no surprise, as the illegality of abortion in Brazil had resulted in almost one-half million abortions in 2015, most of which were clandestine, just prior to the Zika outbreak [35]. Investigators from Human Rights Watch interviewed several women who stated they had witnessed or even experienced complication from unsafe abortions. Some physicians interviewed stated that they had personally treated girls and women who had terminated their pregnancies using caustic acid and other unsafe methods. Women related that, despite fearing that they had been exposed to Zika virus while pregnant, they had difficulty in obtaining the necessary diagnostic tests or ultrasonographic evaluation to determine if their pregnancies had been affected by Zika.

In 2016, Dr. Abigail R.A. Aiken from the University of Texas at Austin and her colleagues wanted to examine the effect that the Zika virus pandemic has had on requests for abortions from the endemic Latin American countries where the procedure was criminal [36]. To accomplish this, they collaborated with Women on Web (WoW)—a nonprofit online abortion help service based in the Netherlands. They offer an Internet-based portal through which women can request abortion medications—mifepristone and misoprostol. WoW has a small team of physicians who review requests from women desiring access to abortion medications outside the formal health-care setting through online telemedicine in countries where safe abortion is not universally available. If there are no medical contraindications identified, the doctor at WoW then authorizes a partner group in India to ship two drugs designed to induce abortion during early pregnancy to the woman's home [37–39]. The organization has offered free abortion medication for pregnant women with Zika virus [40]. Aiken and her colleagues analyzed the WoW data for all abortion requests from January 1, 2010 to March 2, 2016 in 19 Latin American countries affected by the Zika virus pandemic [36]. They compared these data to three countries where Zika was not expected to have an effect: Chile, Poland, and Uruguay. The sample was large—28,670 requests for abortion were analyzed by employing a regression-discontinuity design to determine if requests for abortion increased after the Pan American Health Organization (PAHO) alert, as compared with preannouncement trends. During the final three study weeks, women were asked specifically if they were seeking an abortion because of concern about Zika virus infection. In their response, women did not confirm whether they had received a diagnosis of Zika infection. The results showed that in those countries with autochthonous Zika transmission, legally restricted abortion, and national public advisories to pregnant women, statistically significant increases of from 36 to 108% over baseline occurred for requests for

abortion through WoW after the PAHO announcement [36]. The increased demand for abortion was most pronounced in Brazil (108% increase,  $p < 0.001$ ), Ecuador (107.7% increase,  $p < 0.001$ ), Venezuela (93.3% increase,  $p < 0.001$ ), and Honduras (75.7% increase,  $p < 0.001$ ). Increases in requests for abortion were also statistically found in Colombia (38.7% increase), Costa Rica (36.1% increase), and El Salvador (35.6% increase). In several countries where health advisories were not issued, the requests for abortions had increased but to a lesser degree. An exception to this was in Bolivia, with an approximately 68% increase demand. Abortion requests increased in Nicaragua, Panama, and Paraguay from 21 to 25% and Guatemala by more than 8% [36]. “It seems as though as though women were responding not only to the threat of Zika but to the advisories issued by their governments,” said Dr. Aiken [37].

Messages sent to WoW requesting abortifacients have reflected not only the strong feelings but also the desperation of the women at risk for Zika virus infection in these countries. From Venezuela, a woman wrote “I contracted Zika four days ago. I need an abortion. I love children, but I don’t believe it is wise to keep a baby who will suffer. I don’t know who to turn to – please help me” [41]. From the same country, WoW received this appeal—“We are going through a really serious situation for the economic and humanitarian crisis unleashed by Zika. There are no treatments, contraceptives nor pills to abort. I want to terminate my pregnancy but I cannot” [38]. A woman pleaded from Brazil “I need to do an abortion because of the great risk of infection with Zika here ... Please help me. My economic situation is extremely difficult.” And there is an entreaty from a woman in Colombia—“Here Zika is a major problem and the health authorities do not help with it ... I have no resources at this time and want to ask for your help because fear overwhelms me. What if the baby is born sick?” [38].

Amanda Klasing, a senior researcher with Human Rights Watch who specializes on women in Latin America, said “Regardless of the fact that you can go to jail for having an abortion in many of these countries, it’s not surprising that women and girls would turn to clandestine avenues to procure abortions. Imagine how scary it must feel to be a girl or woman who becomes pregnant in a Zika-affected country right now” [39].

## 7. The past predicts the future

In Latin America, the Zika virus pandemic has disproportionately affected women in the reproductive-age group and especially the most vulnerable members of society—those girls and younger women who live in conditions of poverty. It has brought renewed attention to the multifaceted human rights problems that, although predating the onset of the pandemic in 2015, have significantly been worsened by the spread of Zika virus infection. These include ethnic and socioeconomic health disparities, access to reproductive health education, restrictions on sexual and reproductive rights, inadequate access to water and sanitation, and stigmatization and criminalization of women seeking to terminate their pregnancies [35]. Data published in 2016 clearly indicate an increase in demand for abortions following the advent of the Zika epidemic, but because of the clandestine nature of both unsafe and safe abortions, criminalization of pregnancy termination, and the threat of penalties, the actual numbers of abortions occurring as a result of Zika in these countries are likely much greater. The Zika

pandemic has caused several countries to rethink their reproductive health and education policies, including those on the criminalization and restriction of abortion [16, 42].

The situation of Zika virus infection during pregnancy, congenital infection, and malformation syndromes and abortion rights is not without precedent. Rubella is another virus causing congenital infection which, like the Zika virus, is a TORCH agent. TORCH is an acronym for those infectious agents which can cause congenital infections following vertical (mother-to-fetus) transmission—Toxoplasmosis, Other, Rubella, Cytomegalovirus, and Herpes) [29]. Between 1963 and 1965, rubella (also termed German measles) was epidemic in the United States. Similar to the Zika virus, pregnant women who became infected had relatively minor symptoms. However, the virus produced severe birth defects, and when maternal infection occurred during the first trimester, there was a 90% probability of passing the virus to the fetus [43]. The congenital rubella syndrome included microcephaly and brain damage, congenital heart disease, sensorineural deafness, ocular abnormalities, micrognathia, bone alterations, liver and spleen damage, and neurodevelopmental abnormalities. Miscarriage and stillbirth were also caused by the virus [44]. As the number of cases increased in the United States, the fear caused by the threat of having an infant with congenital rubella syndrome was not confined to any one ethnic or socioeconomic group—the virus could affect any nonimmune pregnant woman and her unborn child. During the epidemic there were approximately 20,000 surviving babies born with the congenital rubella syndrome, with many requiring intensive care or the possibility of lifetime institutionalization. During that time, abortion was illegal in the United States, but that did not stop women at risk for seeking terminations of their pregnancies. Approximately 11,250 pregnant women had miscarriages or, despite their illegality, therapeutic abortions during the epidemic. *Williams Obstetrics*, the standard obstetrical textbook at the time, recommended that abortion be performed in those cases of first trimester infection when the parents did not desire to assume responsibility of caring for an infant with congenital infection [45]. The rubella virus epidemic, and the public response to it, helped to facilitate the eventual 1973 US Supreme Court decision (*Roe v Wade*) that made abortion a fundamental right of a woman. Time will tell what effect, if any, that the Zika virus pandemic will have on abortion rights in Latin American countries.

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## References

- [1] Eggleston E. Determinants of unintended pregnancy among women in Ecuador. *International Family Planning Perspectives*. 1999;25(1):27-33

- [2] Goicolea I, Wulff M, Ohman A, San Sebastian M. Risk factors for pregnancy among adolescent girls in Ecuador's Amazon basin: A case-control study. *Revista Panamericana de Salud Pública*. 2009;**26**(3):221-228
- [3] Guttmacher Institute. Abortion in Latin America and the Caribbean [Internet]. 2017. Available from: <https://www.guttmacher.org/fact-sheet/abortion-latin-america-and-caribbean> [Accessed: 2017-10-22]
- [4] Schwartz DA. Unsafe abortion: A persistent cause of maternal death and reproductive morbidity in resource-poor nations. In: Schwartz DA, editor. *Maternal Mortality: Risk Factors, Anthropological Perspectives, Prevalence in Developing Countries and Preventive Strategies for Pregnancy-Related Death*. New York: Nova Science Publishers, Inc.; 2015. p. 425-439. ISBN: 978-1-63482-709-6
- [5] Singh S, Darroch JE, Ashford LS. *Adding It up: The Costs and Benefits of Investing in Sexual and Reproductive Health 2014*. New York: Guttmacher Institute; 2014. p. 2014. Available from: <https://www.guttmacher.org/report/adding-it-costs-and-benefits-investing-sexual-and-reproductive-health-2014> [Accessed: 2017-10-05]
- [6] Alvarado MG, Schwartz DA. Zika virus infection in pregnancy, microcephaly and maternal and fetal health—What we think, what we know, and what we think we know. *Archives of Pathology & Laboratory Medicine*. 2017;**141**(1):26-32
- [7] Machado A. In Latin America, Abortion Laws have put Many Women in Danger. Here's How. Vol. 2016. Available from: <https://matadornetwork.com/change/latin-america-abortion-laws-put-women-danger/2016> [Accessed: 2017-10-05]
- [8] Gorman A. The 9 Countries with the most Draconian Abortion Laws in the World. 2016. Available from: <http://www.businessinsider.com/countries-strictest-abortion-laws-2016-12/#el-salvador-has-a-complete-ban-on-abortions-and-the-strictest-reproductive-rights-laws-in-the-world-1> [Accessed: 2017-9-10]
- [9] Human Rights Watch. Nicaragua: Abortion Ban Threatens Health and Lives. Women, Providers Describe Fear and Stigma. 2017. Available from: <https://www.hrw.org/news/2017/07/31/nicaragua-abortion-ban-threatens-health-and-lives> [Accessed: 2017-10-1]
- [10] WHO (World Health Organization). *World Abortion Policies 2013*. 2013. Available from: [https://web.archive.org/web/20160415084202/http://www.un.org/en/development/desa/population/publications/pdf/policy/WorldAbortionPolicies2013/WorldAbortionPolicies2013\\_WallChart.pdf](https://web.archive.org/web/20160415084202/http://www.un.org/en/development/desa/population/publications/pdf/policy/WorldAbortionPolicies2013/WorldAbortionPolicies2013_WallChart.pdf) [Accessed: 2017-09-15]
- [11] Jazeera A. Chile Court Lifts Complete Ban on Abortion. 2017. Available from: <http://www.aljazeera.com/news/2017/08/chile-court-lifts-complete-ban-abortion-170821174541491.html> [Accessed: 2017-09-18]
- [12] Vivanco JM, Undurruga V. How Chile Ended its Draconian Ban on Abortion. 2017. Available from: <https://www.nytimes.com/2017/09/01/opinion/chile-abortion-ban.html> [Accessed: 2017-09-15]

- [13] Becker D, Olavarrieta DC. Decriminalization of abortion in Mexico City: The effects on women's reproductive rights. *American Journal of Public Health*. 2013;**103**(4):590-593. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3673241/> [Accessed: 2017-09-15]
- [14] Erickson A. Dutch Vessel Offering Abortion Services Docked in Guatemala. The Army Seized It. 2017. Available from: [https://www.washingtonpost.com/news/worldviews/wp/2017/02/24/dutch-vessel-offering-abortion-services-docked-in-guatemala-the-army-seized-it/?utm\\_term=.45f07be42fc9](https://www.washingtonpost.com/news/worldviews/wp/2017/02/24/dutch-vessel-offering-abortion-services-docked-in-guatemala-the-army-seized-it/?utm_term=.45f07be42fc9) [Accessed: 2017-09-4]
- [15] Hill TS. Generation of Hope: The Girls Challenging Misogyny in the Heart of Rural Paraguay. 2016. Available from: <https://www.theguardian.com/global-development-professionals-network/2016/oct/24/new-generation-girls-rights-education-abortion-paraguay> [Accessed: 2017-09-3]
- [16] Human Rights Watch. Brazil: Court Reviewing Criminalization of Abortion. Amicus Briefs Cite Violations of Women's Rights. 2017. Available from: <https://www.hrw.org/news/2017/04/25/brazil-court-reviewing-criminalization-abortion> [Accessed: 2017-09-13]
- [17] Davaine C. Latin America: The Toughest Abortion Policies in the World. 2016. Available from: <https://www.internationalwomensinitiative.org/news/2016/5/31/latin-america-the-toughest-abortion-policies-in-the-world> [Accessed: 2017-09-4]
- [18] Clyde J. Doctors in Peru Become Strong Champions of Safe and Legal Abortion. 2016. Available from: <https://iwhc.org/2016/05/doctors-peru-become-strong-champions-safe-legal-abortion/> [Accessed: 2017-09-15]
- [19] McCormick M. Bolivia Women's Rights Groups Hope Revised Law is Step Toward Legal Abortion. 2017. Available from: <https://www.theguardian.com/global-development/2017/jul/07/bolivia-abortion-law-womens-rights-penal-code> [Accessed: 2017-10-13]
- [20] Moloney A. In Colombia, abortion is legal but denied to many women, advocates say. Reuters. 2016. Available from: <https://www.reuters.com/article/us-abortion-colombia-law/in-colombia-abortion-is-legal-but-denied-to-many-women-advocates-say-idUSKC-N0YG1GX> [Accessed: 2017-10-02]
- [21] Women on Web. (no date). Belize: Abortion law. Available from: <https://www.womenonweb.org/en/page/5108/belize--abortion-law> [Accessed: 2017-10-09]
- [22] Adams P. From Uruguay, a Model for Making Abortion Safer. 2016. Available from: <https://www.nytimes.com/2016/06/28/opinion/from-uruguay-a-model-for-making-abortion-safer.html> [Accessed: 2017-09-02]
- [23] Schwartz DA. Introduction to indigenous women and their pregnancies—Misunderstood, stigmatized, and at risk. In: Schwartz DA, editor. *Maternal Health, Pregnancy-Related Morbidity and Death Among Indigenous Women of Mexico and Central America: An Anthropological, Epidemiological and Biomedical Approach*. New York: Springer; 2018

- [24] Lafaurie MM, Grossman D, Troncoso E, Billings DL, Chavez S. Women's perspectives on medical abortion in Mexico, Columbia, Ecuador, and Peru: A qualitative study. *Reproductive Health Matters*. 2005;**13**(26):75-83
- [25] Singh S, Prada E, Kestler E. Induced abortion and unintended pregnancy in Guatemala. *International Family Planning Perspectives*. 2006;**32**(3):136-145
- [26] Sousa A, Lozano R, Gakidou E. Exploring the determinants of unsafe abortion: Improving the evidence base in Mexico. *Health Policy and Planning*. 2010;**25**:300-310
- [27] Wurtz H. Indigenous women of Latin America: Unintended pregnancy, unsafe abortion, and reproductive health outcomes. *Pimatisiwin*. 2012;**10**(3):271-282 Available from: <http://www.pimatisiwin.com/online/wp-content/uploads/2013/02>
- [28] Bernabé-Ortiz A, White PJ, Carcamo CP, Hughes JP, Gonzeles MA, Garcia PJ, et al. Clandestine induced abortion: Prevalence, incidence, and risk factors among women in a Latin American country. *Canadian Medical Association Journal*. 2009;**180**(3):298-304
- [29] Schwartz DA. The origin and emergence of Zika virus, the newest TORCH infection—What's old is new again. *Archives of Pathology & Laboratory Medicine*. 2017;**141**(1):18-25
- [30] PAHO (Pan American Health Organization). Epidemiological Alert: Increase of Microcephaly in the Northeast of Brazil. 2015. Available from: [http://www.paho.org/hq/index.php?option=com\\_docman&task=doc\\_view&itemid=270&gid=32285](http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&itemid=270&gid=32285) [Accessed: 2017-10-02]
- [31] Moloney A. Advice to Delay Pregnancy Due to Zika Virus Is Naive, Activists Say. 2016. Available from: <http://www.reuters.com/article/us-america-health-zika/advice-to-delay-pregnancy-due-to-zika-virus-is-naive-activists-say-idUSKCN0V100H> [Accessed: 2017-10-01]
- [32] McNeil DG Jr. Delay Pregnancy in Areas with Zika, W.H.O. Suggests. 2016. Available from: <https://www.nytimes.com/2016/06/10/health/zika-virus-pregnancy-who.html> [Accessed: 2017-09-10]
- [33] Ali M, Folz R, Miller K, Johnson BR Jr, Kiarie J. A study protocol for facility assessment and follow-up evaluations of the barriers to access, availability, utilization and readiness of contraception, abortion and postabortion services in Zika affected areas. *Reproductive Health*. 2017;**14**:18. Available from: <https://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-017-0283-8> [Accessed: 2017-09-13]
- [34] Fox M. Zika Virus Epidemic Has Doubled Abortion Requests, Study Finds. 2016. Available from: <https://www.nbcnews.com/storyline/zika-virus-outbreak/zika-virus-epidemic-doubles-abortion-requests-study-finds-n597276> [Accessed: 2017-09-13]
- [35] Human Rights Watch. Neglected and unprotected. The impact of the Zika outbreak on women and girls in Northeastern Brazil. 2017. Available from: <https://www.hrw.org/report/2017/07/12/neglected-and-unprotected/impact-zika-outbreak-women-and-girls-northeastern-brazil> [Accessed: 2017-09-10]

- [36] Aiken AR, Scott JG, Gomperts R, Trussell J, Worrell M, Aiken CE. Requests for abortion in Latin America related to concern about Zika virus exposure. *New England Journal of Medicine*. 2016;**375**(4):396-398 Available from: <http://www.nejm.org/doi/full/10.1056/NEJMc1605389#t=article>
- [37] Aizenman A. Has Zika Pushed More Women toward Illegal Abortions? 2016. Available from: <http://www.npr.org/sections/goatsandsoda/2016/06/22/483098802/has-zika-pushed-more-women-toward-illegal-abortions> [Accessed: 2017-09-10]
- [38] Boseley S. Abortion Demand Soars in Countries Hit by Zika Outbreak, Study Finds. 2016. Available from: <https://www.theguardian.com/world/2016/jun/22/abortion-information-zika-virus-birth-defects-latin-america-study> [Accessed: 2017-09-05]
- [39] Ravitz J. In Latin America, Requests for Abortions Rise as Zika Spreads. 2016. Available from: <http://www.cnn.com/2016/06/22/health/zika-abortions-latin-america/index.html> [Accessed: 2017-10-02]
- [40] Women on Web. Free medical abortions for pregnant women with Zika. (no date). Available from: <https://www.womenonweb.org/en/page/11475/free-medical-abortions-for-pregnant-women-with-zika> [Accessed: 2017-10-10]
- [41] Wilson C. Zika Virus Prompts Increase in Unsafe Abortions in Latin America. 2016. Available from: <https://www.newscientist.com/article/2094448-zika-virus-prompts-increase-in-unsafe-abortions-in-latin-america/> [Accessed: 2017-09-18]
- [42] Killian C. Could there be a silver lining to Zika? *Contexts*. 2017;**16**(1):36-41 <https://doi.org/10.1177/1536504217696062> [Accessed: 22-10-2017]
- [43] WHO. Rubella and Congenital Rubella Syndrome (CRS). 2017. Available from: [http://www.who.int/immunization/monitoring\\_surveillance/burden/vpd/surveillance\\_type/passive/rubella/en/](http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/passive/rubella/en/) [Accessed: 2017-10-20]
- [44] Centers for Disease Control and Prevention. Pregnancy and rubella. 2017. Available from: <https://www.cdc.gov/rubella/pregnancy.html> [Accessed: 2017-10-20]
- [45] Ravitz J. Before Zika: The Virus that Helped Legalize Abortion in the US. 2017. Available from: <http://www.cnn.com/2016/08/09/health/rubella-abortion-zika/> [Accessed: 2017-10-20]



