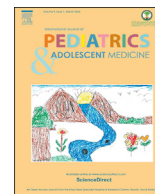


HOSTED BY



Contents lists available at ScienceDirect

# International Journal of Pediatrics and Adolescent Medicine

journal homepage: <http://www.elsevier.com/locate/ijpam>

Original article

## Analysis of births, abortions and maternal mortality in adolescents in Ecuador from 2013 to 2016

Mónica García <sup>a</sup>, María Luciana Armijos Acurio <sup>a,\*</sup>, Ruth Jimbo Sotomayor <sup>a</sup>,  
Xavier Sanchez <sup>a</sup>, Susana Guijarro <sup>b</sup>

<sup>a</sup> Pontificia Universidad Católica del Ecuador. Postgrado de Ginecología y Obstetricia, Avenue 12 de Octubre 1076, Quito, Ecuador

<sup>b</sup> Hospital Gineco-Obstetrico Maternidad Isidro Ayora, Av. Gran Colombia N14-66 y, Luis Sodiro, Ecuador

### ARTICLE INFO

#### Article history:

Received 9 January 2019  
Received in revised form  
11 June 2019  
Accepted 2 July 2019  
Available online 4 July 2019

#### Keywords:

Adolescents  
Pregnancy  
Maternal mortality  
Abortion  
Public health

### ABSTRACT

**Introduction:** Adolescent pregnancy is associated to school desertion, violence, termination of pregnancy under suboptimal conditions, obstetric complications and other consequences that can put the woman's quality of life at risk and of those that surround her. The purpose of this study is to describe the situation and tendencies of adolescent pregnancies, abortions and maternal deaths between 2013 and 2016 in Ecuador.

**Methods:** This cross-sectional study uses secondary data from national Ecuadorian vital statistics reports of adolescents between 10 and 19 years old. The data sources used register all the births, deaths and hospital discharges in the country at both public and private health establishments. We performed a descriptive analysis of qualitative and quantitative variables.

**Results:** Ecuador has approximately 1.5 million female adolescents that gave birth to 256,561 newborns between 2013 and 2016, resulting in an average annual birth rate in early adolescence of 13.9 live births per 1000 and in late adolescence of 86.6 per 1000 live births.

The number of registered abortions among adolescents between 2013 and 2016 was of 19,214. The estimated annual abortion rate in late stage adolescents is 6.3 abortions per 1000 women between 15 and 19. The estimated abortion ratio for this same age group is 72.9 per 1000 live births.

Of all the adolescents that gave birth, 84.9% self-identified as mestiza, while 71.9% of Ecuador's general population identifies as such. Only 7% of the general population in Ecuador self-identifies as indigenous, while 21.6% of pregnancies come from this population. Out of all adolescents that gave birth, 57.4% of those aged 17 and over; 43% of those between 14 and 16 and 96.7% of adolescents from 10 to 13, completed the level of education for their age. There were 81 maternal deaths among this group. The maternal mortality rate for late stage adolescents is of 7.72 per 100,000.

© 2019 Publishing services provided by Elsevier B.V. on behalf of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### 1. Introduction

Every year, 7.3 million adolescents give birth, representing 11% of all the newborns in the world [1]. The real number of adolescent pregnancies is estimated to be a lot higher, considering all those pregnancies that came to an end before birth.

Adolescence can be considered as early stage, from 10 to 14

years old, and late stage, from 15 to 19 years old, being a much more vulnerable group those in the early stage of adolescence. Even though in most cases pregnancy in early adolescence occurs in situations of vulnerability, in many cultures, late stage adolescents are voluntarily having children, with or without a stable couple.

Adolescent pregnancy is a risk factor for both the mother and future child. It is associated to school desertion, violence, termination of pregnancy under suboptimal conditions, obstetric complications and other consequences that can put the woman's quality of life at risk and of those that surround her [2]. Pregnancy is also considered the second leading cause of death among this group of females.

Even if the pregnancy and birth go through without

\* Corresponding author.

E-mail address: [lucianaarmijos@gmail.com](mailto:lucianaarmijos@gmail.com) (M.L. Armijos Acurio).

Peer review under responsibility of King Faisal Specialist Hospital & Research Centre (General Organization), Saudi Arabia.

complications, studies have shown that when living in poverty, with a lack of education and access to health services, a child can have a negative impact towards the mother's quality of life and her family's, decreasing the possibility of continuing her education or reintegration in the labor market [3].

Studies have shown how sociocultural determinants and other characteristics of the individual and their family can influence in the incidence of adolescent pregnancy [4]. These characteristics can also influence the number of adolescents that decide to end their pregnancies. Many developing countries have laws that ban abortion to different extents. There can be very difficult consequences of abortion under inadequate conditions. Even though abortions done in clandestine clinics are not registered, studies have shown that many women perform abortions using self-induced methods, that lead them to regular clinics to get health attention. In some cases, these pregnancies or abortions can have fatal endings, even for this young age group.

Analyzing the situation of adolescents in a country is a cornerstone to decision making and policy development to protect this section of the population [5]. Considering the higher rate of adolescent pregnancy and abortion in developing countries compared to developed ones, it is crucial to analyze the situation in Ecuador to start working on the problem stated.

In Ecuador, all pregnancies of adolescents between 10 and 14 are considered statutory rape. The Ecuadorian law bans every kind of abortion, even if the pregnancy was product of rape. Considering these two statements, there is a thought that registers of births, abortions and maternal mortality may lack complete information. Nevertheless, these registries still give us a scope of the situation in countries with prohibitive laws like Ecuador. The purpose of this study is to describe the situation and characteristics of adolescent pregnancies, abortions and maternal deaths between 2013 and 2016 in Ecuador.

## 2. Methods

### 2.1. Study design

This cross-sectional study uses secondary data from national Ecuadorian vital statistics reports to describe adolescent pregnancies, abortions and maternal deaths. The data sources used are the National Registry of Hospital Discharges, National Registry of Births and the National Registry of Deaths. These databases register all the births, deaths and hospital discharges in the country at both public and private health establishments.

### 2.2. Population

For this study, we selected the population of adolescents between 10 and 19 years old. From the National Registry of Births, we selected all mothers that gave birth at 10–19 years old between 2013 and 2016. The variables considered from this registry are related to the mother (nationality, ethnic identification, civil status, level of education), characteristics of the health establishment (type of establishment, health professional that attended the birth, type of delivery) and newborn characteristics (province of birth, gestational age, size and weight).

From the National Registry of Hospital Discharges, we selected all the female adolescents whose hospital discharge was registered as any of the ICD-10 codes related to abortion (O00 – O08). The variables considered from this registry allow us to define the frequency and characteristics of registered abortion in the country (gestational age of fetal death, age of mother, civil status, level of education and ethnic self-identification).

From the National Registry of Deaths, we selected all the females

who died between the age of 10 and 19 and whose death was categorized as maternal mortality by the INEC between 2013 and 2016. This allows us to calculate the maternal mortality rate of adolescents in the country.

### 2.3. Statistical analysis

We performed a descriptive analysis of qualitative and quantitative variables. Quantitative and qualitative results are presented through frequency distributions, proportions, rates, measures of central tendency and of dispersion.

For the statistical analysis, we used Stata Version 14 and Microsoft Excel.

## 3. Results

### 3.1. Births

Ecuador has approximately 1.5 million female adolescents that gave birth to 256,561 newborns between 2013 and 2016 (Table 1), resulting in an average annual birth rate among adolescents of 43.4 live births per 1000 female adolescents. The birth rate in early adolescence is of 3.5 live births per 1000 and in late adolescence of 86.6 per 1000 live births. Only 4.2% of all births came from early stage adolescents. Adolescents considered legally under age in Ecuador (under 18) are responsible for 47.9% of all adolescent births.

The number of registered abortions among adolescents between 2013 and 2016 was of 19,214. The estimated annual abortion rate in late stage adolescents is 6.3 abortions per 1000 women between 15 and 19. The estimated abortion ratio for this same age group is 72.9 per 1000 live births. The general abortion rate is detailed in Table 2.

Of all the adolescents that gave birth, 84.9% self-identified as mestiza, while 71.9% of Ecuador's general population identifies as such. Only 7% of the general population in Ecuador self-identifies as indigenous, while 21.6% of pregnancies come from this population. Less than 2% of adolescents that gave birth identified as either Afro-Ecuadorian, black, mulatto, montubio, white or other.

Eight-seven percent of abortions happened in adolescents that self-identified as mestizas, which is close to the percentage of births given by this population. Adolescents identified as indigenous were registered to have had 4.9% of abortions, which is less than the percentage of the general population that self-identifies as such.

We performed a comparison between the level of education achieved by each adolescent that gave birth and the recommended level of education for each age, according to the Ministry of Education in Ecuador. Out of all adolescents that gave birth, 57.4% of those aged 17 and over; 43% of those between 14 and 16 and 96.7% of adolescents from 10 to 13, completed the level of education for their age.

The adolescent's nationality was Ecuadorian in 99% of cases and foreign in only 1%.

Analyzing the civil status, 51% of the adolescents declared themselves as under "union" (considered as being in a relationship and living together), 39% as single, 9% as married and the other 1% adds up between separated, widows and registered partnerships.

In Ecuador, 19.6% of late stage adolescents and 4.6% of early stage adolescents had two or more children before the age of 20. Out of these births, 1% of newborns were born dead.

Out of all adolescent births, 57.3% happened in the coastal region of the country, 33.9% in the mountainous regions, 23.3% in the amazon and less than 0.5% in Galapagos.

**Table 1**

Adolescent birth rate per year.

Year	Number of births (adolescents 10 to 14)	Annual birth rate (per 1000 adolescents between 10 and 14)	Number of births (adolescents 15 to 19)	Annual birth rate (per 1000 adolescents between 15 and 19)
2013	2456	3.2	58,534	82.5
2014	1790	2.3	52,169	73.5
2015	3655	4.7	75,167	105.9
2016	2803	3.6	59,985	84.5
Total births	10,704	3.5	245,855	86.6
Total adolescents	769,671		709,768	

**Table 2**

Frequencies and rates of births, abortions and maternal mortality in Ecuador by region.

Region	Average number of female adolescents	Average number of births per year	Average number of abortions per year	Average number of maternal deaths per year	Birth rate (per 1000)	Abortions (per 1000)	Maternal mortality (per 100,000)
Coastal region	750,000	36771	2631	43	49	3.5	5.7
Mountainous Region	660,000	21754	2204	26	33	3.3	3.9
Amazon	76,000	14752	421	12	194	5.5	15.8

### 3.1.1. Characteristics of the newborns

Out of all the newborns with adolescent mothers, 78.7% have an adequate weight for gestational age at birth, 7.1% are below the 3rd percentile and 14.3% over the 97th percentile. The median weight of all newborns was of 3000 g (SD: 492.5), and the height of 49 cm (SD: 2.54).

According to the registered gestational age, 6.8% of births from adolescents were preterm and 5.5% were post-term.

### 3.2. Induced abortions

Several studies have identified that the ICD-10 codes that are mostly related to induced abortion are O04, O05, O06 and O07. The frequency of abortions registered in our population for each of these ICD-10 codes is shown in Table 3.

The median amount of days of hospital stay was 1 day for all the hospital discharges coded as abortion.

### 3.3. Maternal mortality

Maternal mortality is defined as any death of women while pregnant or within 42 days of termination of pregnancy according to the World Health Organization [6]. There were 81 maternal deaths among adolescents in Ecuador from 2013 to 2016. The maternal mortality rate for late stage adolescents is of 7.72 per 100,000. Most of the cases happened in three provinces in the country: Pichincha, Guayas and Manabí.

When distributing the cases by age, we can see that 93.8% (N = 76) correspond to late stage adolescents. The most common registered causes of death were: eclampsia (n = 11), postpartum hemorrhage (n = 10), complications of anesthesia during the puerperium (n = 10) and death from any obstetric cause occurring

more than 42 days but less than one year after delivery (n = 7).

### 3.4. Characteristics of the health care system

The type of delivery that adolescents had was 64% vaginal and 36% by Cesarean-section (C-section). When stratifying by type of health center, we can observe that in public establishments of the Ministry of Health, 28% gave birth by a C-section, compared to 73.9% in private establishments (Table 4).

The health professionals that delivered the newborns were 75.7% (n = 188,816 births) physicians, 17.7% (n = 44,134 births) "obstetra" (like a midwife), 2.4% midwives without proper qualifications to perform labor, and the rest were nurses, nurse technicians, qualified midwives and other health professionals.

## 4. Discussion

When comparing the average annual birth rate, we can see there are 6 times less births among early stage adolescents than late stage adolescents. In the Ecuadorian culture it is very common to decidedly have children during the late adolescence with a partner. This can be seen when analyzing that half of the births come from adolescents aged 18–19.

The 4.2% of births that correspond to adolescents 14 and under are considered statutory rape. Even though it is not a big number, it is important to consider it includes 10 year olds that are having children.

There is a marked tendency of the annual birth rate in every year except in 2015, where there is a significantly higher rate. Further research would be needed to understand the reasons. We can also see a birth rate almost six time higher in the amazon than in the mountainous region, an abortion rate of almost twice as much and

**Table 3**

Estimation of induced abortions.

Possibly induced abortion	Frequency	Percent of all abortions
Complications following induced termination of pregnancy (O04)	1007	5.2
Other abortions (O05)	208	1.1
Non specified abortion (O06)	9784	50.9
Failed attempted termination of pregnancy (O07)	33	0.2
Total induced abortions	11032	

**Table 4**  
Type of delivery by type of health establishment.

Type of delivery	Type of health care establishment						Total
	Ministry of health	Social security	Social organizations	Other public	Private	Others	
Vaginal	115,301	2942	9338	2892	11,389	17955	159,817
C-section	44,836	2832	7761	1608	32,244	169	89,450
Percent of C-section	28.0	49.0	45.4	35.7	73.9	7.2	
Total	160,137	5774	17,099	4500	43,633	18124	249,267

a maternal mortality rate of almost four times as much. The amazon region in Ecuador is semi-isolated and has communication issues that can affect the population reaching health establishments.

Other studies comparing the birth rate according to ethnic identification have shown that less represented ethnic groups tend to have higher birth rate [7]. In our study, we also found that indigenous people, considered an underrepresented group in Ecuador, have a much higher birth rate than other highly represented ethnicities like mestizos.

Considering other studies have calculated that in countries with illegal abortion, the actual amount of abortions lays somewhere between 1 and 3 times the amount of abortions reported, we should consider that the reported abortion rate is actually much higher.

## 5. Conclusion

We consider that, supported by our results, Ecuador has a colossal problem with adolescent pregnancy. The country needs to focus on implementing policies that are focused on adolescent pregnancies. A strong focus on birth control and family planning could help prevent many pregnancies and allow adolescents to thrive.

## Declarations of interest

None.

## Ethical considerations

All databases used for this study are of open access to the public

in general. They can be found in the National Institute of Statistics and Census of Ecuador. The database was properly anonymized by an identifier before any of the authors had access to it.

## Visual abstract

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijpam.2019.07.002>.

## References

- [1] WHO. Preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries [Internet]. WHO. [citado 29 de junio de 2018]. Disponible en: <http://www.who.int/reproductivehealth/publications/adolescence/9789241502214/en/>.
- [2] Sedgh G, Finer LB, Bankole A, Eilers MA, Singh S. Adolescent pregnancy, birth, and abortion rates across countries: levels and recent trends. *J Adolesc Health Off Publ Soc Adolesc Med.* febrero de 2015;56(2):223–30.
- [3] UNFPA. Maternidad en la Niñez [Internet]. 2013 [citado 28 de junio de 2018]. Disponible en: <https://www.unfpa.org/sites/default/files/pub-pdf/SP-SWOP2013.pdf>.
- [4] Mendoza W, Subiría G. El embarazo adolescente en el Perú: situación actual e implicancias para las políticas públicas. *Rev Peru Med Exp Salud Pública.* septiembre de 2013;30:471–9.
- [5] Every UNFPA. Woman every child [Internet]. 2017 [citado 29 de junio de 2018]. Disponible en: [https://www.unfpa.org/sites/default/files/pub-pdf/UNFPA\\_EWEC\\_Report\\_EN\\_WEB.pdf](https://www.unfpa.org/sites/default/files/pub-pdf/UNFPA_EWEC_Report_EN_WEB.pdf).
- [6] Maternal mortality [Internet]. [citado 20 de agosto de 2018]. Disponible en: <http://www.who.int/news-room/fact-sheets/detail/maternal-mortality>
- [7] Ventura SJ, Curtin SC, Abma JC, Henshaw SK. Estimated pregnancy rates and rates of pregnancy outcomes for the United States, 1990–2008. *Natl Vital Stat Rep Cent Dis Control Prev Natl Cent Health Stat Natl Vital Stat Syst.* 2012;60(7): 1–21. 20 de junio de.