

## Prevalence of induced abortion and associated factors in a cohort of women living with HIV/AIDS, Rio de Janeiro, Brazil, 1996-2016

Prevalência e fatores associados ao aborto induzido no ingresso em uma coorte de mulheres vivendo com HIV/aids, Rio de Janeiro, Brasil, 1996-2016

Prevalencia y factores asociados al aborto inducido en el ingreso en una cohorte de mujeres que viven con VIH/SIDA, Río de Janeiro, Brasil, 1996-2016

Rosa Maria Soares Madeira Domingues <sup>1</sup>  
Cosme Marcelo Furtado Passos da Silva <sup>2</sup>  
Beatriz Gilda Jegerhorn Grinsztejn <sup>1</sup>  
Ronaldo Ismerio Moreira <sup>1</sup>  
Monica Derrico <sup>1</sup>  
Angela Cristina Andrade <sup>1</sup>  
Ruth Khalili Friedman <sup>1</sup>  
Paula M. Luz <sup>1</sup>  
Lara Esteves Coelho <sup>1</sup>  
Valdiléa G. Veloso <sup>1</sup>

doi: 10.1590/0102-311X00201318

### Abstract

*The aim of this study was to verify the prevalence of induced abortion and associated factors at the time of inclusion in a cohort of women living with HIV/AIDS in the city of Rio de Janeiro, Brazil, from 1996 to 2016. Eligibility criteria for inclusion in the cohort were female sex at birth, age 18 years and older, and confirmed HIV infection. At the baseline visit, data on sexual, reproductive, and behavioral aspects and HIV infection were obtained through a face-to-face interview with the attending physician. Lifetime prevalence of induced abortion was calculated, and factors associated with induced abortion were verified by multiple logistic regression for all the women and for those with previous pregnancy. In the entire cohort of women, 30.4% reported a history of induced abortion, compared to 33.5% in women with previous pregnancy. Frequency of reported induced abortion showed a significant reduction during the period (41.7% in 1996-2000 versus 22.5% in 2011-2016,  $p < 0.001$ ). Factors associated with induced abortion, both for the entire cohort and for the women with previous pregnancy, were age, schooling,  $\geq 5$  lifetime sexual partners, teenage pregnancy, lifetime use of any illicit drug, and inclusion in the cohort after the year 2005. Changes in the socioeconomic, sexual, reproductive, and HIV infection profile are possible explanations for the reduction in abortions during the period. Studies that use direct methods to measure abortion should be conducted in other populations to confirm the downward trend in induced abortion and its determinants in Brazil.*

*Induced Abortion; HIV Infections; Cohort Studies*

### Correspondence

R. M. S. M. Domingues  
Instituto Nacional de Infectologia Evandro Chagas,  
Fundação Oswaldo Cruz,  
Av. Brasil 4365, Rio de Janeiro, RJ 21040-360, Brasil.  
rosa.domingues@ini.fiocruz.br

<sup>1</sup> Instituto Nacional de Infectologia Evandro Chagas, Fundação Oswaldo Cruz, Rio de Janeiro, Brasil.

<sup>2</sup> Escola Nacional de Saúde Pública Sergio Arouca, Fundação Oswaldo Cruz, Rio de Janeiro, Brasil.



## Introduction

Voluntary termination of pregnancy is considered a crime in Brazil, except in cases of rape, risk to the mother's life, and fetal anencephaly. According to data from the *Brazilian National Abortion Survey* (PNA) in 2016 <sup>1</sup>, one out of five Brazilian women had undergone an abortion by age 40. Among women 18 to 39 years of age, the reported abortion rate was 13%, without a significant difference in relation to the 15% rate found by the survey in 2010 <sup>2</sup>.

Few studies in Brazil have analyzed the issue of induced abortion in women living with HIV/AIDS. In 2003-2004, a study in 13 Brazilian municipalities compared women 18 years and older living with HIV/AIDS (WLHA) and women not living with HIV/AIDS (WNLHA) and found a lifetime prevalence of induced abortion of 17.5% in WLHA and 10.4% in WNLHA ( $p < 0.001$ ) <sup>3</sup>. Studies with a similar methodology, comparing WLHA and WNLHA, conducted subsequently in Porto Alegre <sup>4</sup> in 2011 and in São Paulo <sup>5</sup> in 2013-2014, found estimates for induced abortion of 13% and 14.1% in WLHA and 4.9% and 3.2% in WNLHA, respectively, and this difference between the groups was significant.

Time series with estimates of abortion by direct methods are not available in Brazil, since all the studies that estimated prevalence of abortion, whether in the general population <sup>1,2,6,7</sup>, in WLHA and WNLHA <sup>3,4,5</sup>, used a cross-sectional design, generating point estimates for the study period. Studies that assessed hospitalization for complications from abortion using the Brazilian Hospital Admissions System of the Brazilian Unified National Health System (SIH/SUS), furnishing indirect estimates, have shown a reduction in abortion rates in Brazil from 1995 to 2013 <sup>8,9</sup>, but the results are subject to the method's limitations <sup>10</sup>.

The National Institute of Infectious Diseases Evandro Chagas under the Oswaldo Cruz Foundation (INI/Fiocruz) is a referral unit for persons with HIV/AIDS. A cohort of women was launched in 1996 with the aim of providing gynecological care for WLHA, and the inclusion of women was concluded on December 31, 2016. A previous study <sup>11</sup> that assessed the incidence of pregnancies, deliveries, and abortions in the follow-up of women included from June 1996 to February 2003 found that 41.8% had a history of induced abortion recorded at the time of inclusion in the cohort.

The current study aimed to verify the prevalence of induced abortion and associated factors at inclusion in the INI/Fiocruz cohort of women from 1996 to 2016, with emphasis on the identification of changes in the prevalence of induced abortion over time.

## Methods

This is an analysis of data from the appointment at inclusion in the INI/Fiocruz cohort of women. The INI/Fiocruz cohort is an open cohort whose inclusion criteria were: female sex at birth, age 18 years or older, and confirmed HIV infection. INI/Fiocruz is located in the Manguinhos neighborhood in the city of Rio de Janeiro, Brazil, and does not have a specific coverage area, rather receiving patients that come to the service spontaneously or are referred by other health services.

In the entry visit to the cohort, all the women were interviewed by the attending physician during individual appointments, using a standardized questionnaire on socioeconomic status, sexual and reproductive history, behavioral data, and data on HIV infection. After the cohort entry appointment, the women were followed up with biannual or annual visits, when clinical examination and laboratory tests were performed and a follow-up form was completed. All the participating physicians were trained for standardization of the data collection at both the initial and follow-up visits.

The current study only used data obtained in the cohort entry interviews. Inconsistencies or errors in completion of the questionnaire were corrected by means of review and consultation of the hospital charts. The analysis included the following variables: age, skin color, schooling in years, work, income in times the minimum wage, marital status (living versus not living with spouse/partner), gynecological and obstetric history (age at sexual initiation, number of pregnancies, births, spontaneous and induced abortions, age at first pregnancy), history of diagnosis of sexually transmissible diseases (STDs), current use of contraceptive methods, smoking (current or previous), lifetime use of illicit drugs (marijuana, inhaled cocaine, injecting cocaine, glue), lifetime sexual partners, and report of physical domestic violence and sexual violence. In 2006 the questionnaire with gynecological and

obstetric information was modified to include information on the timing of the abortion (before or after diagnosis of HIV infection). This variable applied to women included in the cohort since 2006. However, for all the other analyses, the variable “induced abortion” refers to one or more lifetime induced abortions, independently of the timing in relation to HIV diagnosis.

The descriptive analysis presents the characteristics of the women included during the study period, with quantitative variables described as medians and interquartile ranges (IQR) and categorical variables as proportions. To verify whether the women’s characteristics changed over time (considering 1996-2000, 2001-2005, 2006-2010, and 2011-2016), the chi-square test for trend<sup>12</sup> was used for categorical variables, with statistical significance set at 0.05.

Factors associated with induced abortion were identified by simple and multiple logistic regression for the total cohort of women and for the group of women with previous pregnancy. Both analyses used as the outcome variable “previous induced abortion”, defined as the report of having undergone one or more induced abortions any time in life. The simple analysis included variables related to the woman’s life course: age, skin color (white, brown, and black, and the only indigenous woman excluded from the analysis), schooling, age at sexual initiation (< 15 years, 15-19 years, 20 or older), teenage pregnancy (under 20 years of age)<sup>13</sup>, total number of lifetime sexual partners (categorized as < 5 or ≥ 5), lifetime use of any illicit drug (regardless of duration and frequency), lifetime report of some episode of violence (physical or sexual), and time of inclusion in the cohort (1996-2000, 2001-2005, 2006-2010, 2011-2016). The variable “previous diagnosis of STD” was not included in this analysis due to the high proportion of unknown answers. Variables related to the timing of the pregnancy that resulted in the abortion, which may have changed in relation to the timing of the interview, such as income, marital status, contraceptive use, and number of pregnancies were also not included in this analysis. Variables with p-value < 0.20 in the simple logistic regression were included in the multiple logistic regression. All variables with level of significance < 0.05 were maintained in the final model, and the results were expressed as adjusted odds ratios (OR) with their 95% confidence intervals (95%CI). The final model’s fit was verified with the Hosmer-Lemeshow test. All the analyses used the R statistical package, version 3.5.1 (<http://www.r-project.org>).

The INI women’s cohort study was approved the Institutional Review Board of INI/Fiocruz. All the participating women signed a free and informed consent form upon inclusion in the cohort.

## Results

From January 1996 to December 2016, 1,383 WLHA were included in the INI/Fiocruz gynecology cohort, and there were no refusals. More than one-third of the inclusions (32%) occurred in 2006-2010. Median age at inclusion in the cohort was 36 years (IQR 29, 43), and one third of the women belonged to the 30-39-year bracket. The majority of the women were non-white (61.8%), with low schooling (54.2% with 8 years or less of formal education), low family income (63.5% with income of up to twice the minimum wage), and were unemployed (52.3%) at entry in the cohort. More than half of the women were not living with a spouse or partner (56.1%), 30.9% had a current partner who was HIV-positive, and one fourth reported having a partner who had died of HIV/AIDS. Current or past smoking was reported by 42.4% of the women, and 16.6% reported lifetime use of any illicit drug, with marijuana and inhaled cocaine as the frequent (11% each). History of physical violence and sexual violence were reported by 31.3% and 16% of the women, respectively (Table 1). Approximately 90% of the women reported having been infected with HIV by the sexual route.

Median age at sexual initiation was 17 years (IQR 15, 18), with 18.7% of the women reporting sexual initiation before 15 years of age. Half of the women reported 5 or more lifetime sexual partners, and 41% reported a prior diagnosis of some STD (Table 2), the most frequent diagnoses being herpes or vesicles (20%), HPV/condyloma (15.8%), and syphilis (12.1%).

More than 90% of the women reported one or more previous pregnancies (median of three pregnancies, IQR 1, 4), and 51.7% had their first pregnancy during adolescence (under 20 years of age). Of the women with previous gestations, 93% had given birth at least once and 52% reported at least one spontaneous or induced abortion. Of the women with previous spontaneous or induced abortion, 44.4% reported at least one spontaneous abortion and 64.5% reported at least one induced abortion.

**Table 1**

Socioeconomic and behavioral characteristics of women living with HIV/AIDS at inclusion in the cohort. Rio de Janeiro, Brazil, 1996-2016.

Characteristics of the women	n (N = 1,383)	%
Age (years)		
Median (interquartile range)	36	(29, 43)
10-19	30	2.2
20-29	340	24.6
30-39	504	36.4
40-49	357	25.8
≥ 50	152	11.0
Skin color		
White	528	38.2
Black	318	23.0
Brown	536	38.8
Indigenous	1	0.1
Schooling (in years)		
0-4	306	22.1
5-8	444	32.1
9-11	476	34.4
≥ 12	144	10.4
Not informed	13	0.9
Income (in minimum wage)		
< 1	212	15.3
1-2	666	48.2
3-5	247	17.9
> 5	231	16.7
Not informed	27	2.0
Work		
Unemployed	723	52.3
Steady work	145	10.5
Sporadic work	443	32
Not informed	72	5.2
Marital status		
Not living with partner	776	56.1
Living with partner	606	43.8
Not informed	1	0.1
Current partner HIV-positive		
No	415	30.0
Yes	428	30.9
Not informed	539	39.0
Partner died of AIDS		
No	893	64.6
Yes	333	24.1
Not informed	157	11.4
Current or past smoking		
No	795	57.5
Yes	586	42.4
Drug use		
No	1,148	83.0
Yes	229	16.6
Not informed	6	0.4

(continues)

**Table 1 (continued)**

Characteristics of the women	n (N = 1,383)	%
Physical domestic violence		
No	916	66.2
Yes	433	31.3
Not informed	34	2.5
Sexual violence		
No	1,144	82.7
Yes	221	16.0
Not informed	18	1.3

Of all the women (with and without previous pregnancy), 30.4% reported an induced abortion any time in life (Table 2), and 39.9% reported more than one induced abortion. In the period from 2006 to 2016, 96% of the induced abortions occurred before the woman was diagnosed with HIV.

At the cohort entry appointment, one fourth of the women under 50 years of age that did not report natural or surgical menopause were not using any contraceptive method, 23.9% had undergone tubal ligation, and more than 40% used condoms associated with natural or hormonal methods (Table 2).

Table 3 shows some of the women's characteristics at inclusion in the cohort in the four periods. There was a significant increase in the proportion of women 50 years or older and a significant decrease in the 20-29-year bracket. There was also an increase in the proportion of women with 9 to 11 years of schooling, while the proportion of white women decreased. The report of sexual violence decreased significantly during the period, while the report of physical domestic violence and illicit drug use remained unchanged. There was an increase in the proportion of women that reported sexual initiation before 15 years and from 15 to 19 years of age, in the proportion of women with 5 or more lifetime sexual partners, without previous pregnancies, and with a history of teenage pregnancy. The proportion of spontaneous abortions increased, while the proportion of induced abortions decreased significantly over the 20 years, from 41.7% in 1996-2000 to 22.5% in 2011-2016. There was also a significant increase in the use of condoms associated with hormonal methods and a decrease in the proportion of women with tubal ligation.

In the simple logistic regression (Table 4), the variables "year since inclusion in the cohort", age, skin color, schooling, age at sexual initiation, lifetime number of sexual partners, teenage pregnancy, report of violence (physical or sexual), and drug use were significantly associated with the outcome "lifetime induced abortion". In the multiple logistic regression (Table 5), age and schooling presented an upward gradient with induced abortion, with an OR of 1.03 (95%CI: 1.02-1.05) for age and an OR of 3.33 (95%CI: 2.01-5.56) in women with 12 or more years of schooling. More lifetime partners (OR = 2.10; 95%CI: 1.60-2.77), history of teenage pregnancy (OR = 1.78; 95%CI: 1.35-2.36), and lifetime illicit drug use (OR = 1.51; IC95%: 1.06-2.15) showed a significant association with more abortions. The two entry periods after 2005 showed an association with a lower proportion of induced abortions when compared to 1996-2000, even after adjusting for all the women's characteristics. The simple and multiple logistic regression analyses only with women with previous pregnancies showed a similar pattern (Table 5), with both models presenting good fit (Hosmer-Lemeshow test with p-values of 0.404 and 0.388).

**Table 2**

Sexual and reproductive characteristics of women at inclusion in the cohort. Rio de Janeiro, Brazil, 1996-2016.

Characteristics	n (N = 1,383)	%
Age at sexual initiation (years)		
Median (interquartile range)	17	(15, 18)
< 15	258	18.7
15-19	884	63.9
≥ 20	223	16.1
Not informed	18	1.3
Lifetime sexual partners		
<5	628	45.4
≥ 5	696	50.3
Ignored	59	4.3
Previous STD		
No	337	24.4
Yes	567	41.0
Not informed	479	34.6
Number of previous pregnancies		
Median (interquartile range)	3	(1, 4)
0	128	9.3
1-2	553	40.0
≥ 3	702	50.8
Teenage pregnancy		
No	523	37.8
Yes	715	51.7
Never became pregnant	128	9.3
Not informed	17	1.2
Number of previous births		
Median (interquartile range)	2	(1, 3)
0	88	6.4
1-2	732	52.9
≥ 3	435	31.5
Never became pregnant	128	9.3
Previous abortions		
Median (interquartile range)	1	(0, 1)
0	602	43.5
1	376	27.2
≥ 2	277	20.0
Never became pregnant	128	9.3
Previous induced abortions		
Median (interquartile range)	0	(0, 0)
0	957	69.2
1	217	15.7
≥ 2	73	5.2
Never became pregnant	128	9.3
Not informed	8	0.6
Previous induced abortions		
Median (interquartile range)	0	(0, 1)
0	827	59.8
1	253	18.3
≥ 2	168	12.1
Never became pregnant	128	9.3
Not informed	7	0.5

(continues)

**Table 2 (continued)**

Characteristics	n (N = 1,383)	%
Contraceptive method (n = 1,136) *		
None	281	24.7
Rhythm/Withdrawal/Other	9	0.8
Hormonal/IUD	64	5.6
Condom (with or without natural methods)	409	36.0
Combined (condom + hormonal or IUD)	96	8.5
Tubal ligation	272	23.9
Not informed	5	0.4

IUD: intrauterine device; STD: sexually transmissible diseases.

\* Women under 50 years of age without report of natural or surgical menopause.

**Table 3**

Characteristics of women according to period of inclusion in the cohort. Rio de Janeiro, Brazil, 1996-2016.

Women's characteristics	Period of inclusion								p-value *
	1996-2000 (n = 311)		2001-2005 (n = 248)		2006-2010 (n = 446)		2011-2016 (n = 378)		
	n	%	n	%	n	%	n	%	
Age (years)									
< 20	7	2.3	4	1.6	10	2.2	9	2.4	0.780
20-29	97	31.2	48	19.4	121	27.1	74	19.6	0.008
30-39	112	36.0	103	41.5	159	35.7	130	34.4	0.372
40-49	70	22.5	64	25.8	117	26.2	106	28.0	0.107
≥ 50	25	8.0	29	11.7	39	8.7	59	15.6	0.008
Schooling (in years)									
0-4	84	27.0	65	26.2	90	20.2	72	19.0	0.003
5-8	126	40.5	67	27.0	144	32.3	114	30.2	0.021
9-11	75	24.1	93	37.5	161	36.1	148	39.2	< 0.001
≥ 12	26	8.4	23	9.3	51	11.4	44	11.6	0.108
Skin color **									
White	163	52.4	118	47.6	117	26.3	130	34.4	< 0.001
Black	55	17.7	49	19.8	110	24.7	104	27.5	< 0.001
Brown	93	29.9	81	32.7	218	49.0	144	38.1	< 0.001
Sexual violence									
No	218	71.7	201	83.1	388	87.8	337	89.4	< 0.001
Yes	86	28.3	41	16.9	54	12.2	40	10.6	< 0.001
Physical domestic violence									
No	220	73.1	153	63.8	269	62.1	274	73.1	0.921
Yes	81	26.9	87	36.2	164	37.9	101	26.9	0.921
Lifetime drug use									
No	256	82.6	205	82.7	372	84.0	315	83.8	0.593
Yes	54	17.4	43	17.3	71	16.0	61	16.2	0.593
Age at sexual initiation (years)									
< 15	46	14.9	35	14.3	90	20.6	87	23.2	0.001
15-19	182	58.9	154	63.1	301	68.9	247	65.9	0.023
≥ 20	81	26.2	55	22.5	46	10.5	41	10.9	< 0.001

(continues)

**Table 3 (continued)**

Women's characteristics	Period of inclusion								p-value *
	1996-2000 (n = 311)		2001-2005 (n = 248)		2006-2010 (n = 446)		2011-2016 (n = 378)		
	n	%	n	%	n	%	n	%	
Lifetime sexual partners									
< 5	173	56.4	126	52.1	179	43.7	150	41.1	< 0.001
≥ 5	134	43.6	116	47.9	229	56.3	215	58.9	< 0.001
Number of pregnancies									
0	18	5.8	25	10.1	37	8.3	48	12.7	0.006
1-2	129	41.5	90	36.3	191	42.8	143	37.8	0.682
≥ 3	164	52.7	133	53.6	218	48.9	187	49.5	0.238
Teenage pregnancy									
No	147	47.9	96	39.5	152	34.6	128	34.0	< 0.001
Yes	142	46.3	122	50.2	250	56.9	201	53.3	0.024
Never became pregnant	18	5.9	25	10.3	37	8.4	48	12.7	0.007
Number of births									
0	22	7.1	14	5.6	35	7.8	17	4.5	0.335
1-2	182	58.5	132	53.2	233	52.2	185	48.9	0.014
≥ 3	89	28.6	77	31.0	141	31.6	128	33.9	0.147
Never became pregnant	18	5.8	25	10.1	37	8.3	48	12.7	0.006
Previous spontaneous and induced abortions									
No	124	39.9	98	39.5	206	46.2	174	46.0	0.039
Yes	169	54.3	125	50.4	203	45.5	156	41.3	< 0.001
Never became pregnant	18	5.8	25	10.1	37	8.3	48	12.7	0.006
Previous spontaneous abortions									
No	240	78.2	179	73.4	296	66.4	242	64.0	< 0.001
Yes	49	16.0	40	16.4	113	25.3	88	23.3	0.002
Never became pregnant	18	5.9	25	10.2	37	8.3	48	12.7	0.008
Previous induced abortions									
No	161	52.4	127	51.8	294	65.9	245	64.8	< 0.001
Yes	128	41.7	93	38.0	115	25.8	85	22.5	< 0.001
Never became pregnant	18	5.9	25	10.2	37	8.3	48	12.7	0.008
Contraceptive use ***									
None	54	21.2	68	33.0	86	22.8	73	24.8	0.890
Rhythm/Withdrawal/Other	4	1.6	1	0.5	2	0.5	2	0.7	0.268
Only hormonal or IUD	17	6.7	4	1.9	28	7.4	14	4.8	0.962
Condom with or without natural methods	94	37.0	64	31.1	148	39.3	103	35.0	0.816
Combined (condom + hormonal or IUD)	15	5.9	5	2.4	37	9.8	40	13.6	< 0.001
Tubal ligation	70	27.6	64	31.1	76	20.2	62	21.1	0.011

IUD: intrauterine device.

\* chi-square test for trend;

\*\* One indigenous woman excluded from this analysis;

\*\*\* In women under 50 years of age and without natural or surgical menopause (n = 1,136).



**Table 4**

Simple logistic regression of factors associated with lifetime induced abortion for all women in the cohort and for those with previous pregnancy. Rio de Janeiro, Brazil, 1996-2016.

Women's characteristics	TALL the women (n = 1,383)			Mulheres com gestação prévia (n = 1,252)		
	OR	95%CI	p-value	OR	95%CI	p-value
Year of inclusion in cohort						
1996-2000	1.00			1.00		
2001-2005	0.86	0.61-1.21	0.374	0.93	0.65-1.32	0.681
2006-2010	0.49	0.36-0.66	< 0.001	0.49	0.36-0.68	< 0.001
2011-2016	0.41	0.29-0.56	< 0.001	0.44	0.31-0.61	< 0.001
Age (continuous)	1.03	1.02-1.04	< 0.001	1.03	1.01-1.05	< 0.001
Skin color *						
White	1.00			1.00		
Black	0.60	0.44-0.81	0.001	0.60	0.43-0.81	0.001
Brown	0.62	0.48-0.81	< 0.001	0.60	0.46-0.79	< 0.001
Schooling in years						
0-4	1.00			1.00		
5-8	0.92	0.67-1.27	0.630	0.94	0.68-1.29	0.688
9-11	0.98	0.72-1.34	0.910	1.15	0.84-1.58	0.386
≥ 12	1.43	0.94-2.16	0.092	2.00	1.29-3.12	0.002
Age at sexual initiation (years)						
< 15	1.18	0.79-1.77	0.426	1.05	0.70-1.60	0.803
15-19	1.37	0.98-1.92	0.067	1.22	0.87-1.74	0.244
≥ 20	1.00			1.00		
Lifetime sexual partners						
< 5	1.00			1.00		
≥ 5	1.84	1.45-2.35	< 0.001	1.81	1.42-2.32	< 0.001
Teenage pregnancy						
No	1.00			1.00		
Yes	1.80	1.42-2.29	< 0.001	1.32	1.04-1.69	< 0.001
Physical or sexual violence						
No	1.00			1.00		
Yes	1.52	1.20-1.91	< 0.001	1.50	1.17-1.93	< 0.05
Drug use						
No	1.00			1.00		
Yes	1.85	1.38-2.48	< 0.001	1.78	1.32-2.40	< 0.001

95%CI: 95% confidence interval; OR: odds ratio.

\* One indigenous woman excluded from this analysis.

**Table 5**

Multiple logistic regression of factors associated with lifetime induced abortion for all women in the cohort and for those with previous pregnancy. Rio de Janeiro, Brazil, 1996-2016.

Women's characteristics	All the women (N = 1,383) *			Women with previous pregnancy (n = 1,252) **		
	OR	95%CI	p-value	OR	95%CI	p-value
Year of inclusion in cohort						
1996-2000	1.00			1.00		
2001-2005	0.77	0.52-1.13	0.184	0.77	0.53-1.14	0.194
2006-2010	0.32	0.22-0.46	< 0.001	0.32	0.22-0.46	< 0.001
2011-2016	0.27	0.19-0.40	< 0.001	0.28	0.19-0.41	< 0.001
Age (continuous)	1.03	1.02-1.05	< 0.001	1.03	1.02-1.05	< 0.001
Schooling (in years)						
0-4	1.00			1.00		
5-8	1.31	0.92-1.89	0.139	1.31	0.92-1.89	0.142
9-11	1.94	1.35-2.82	< 0.001	1.95	1.35-2.84	< 0.001
≥ 12	3.33	2.01-5.56	< 0.001	3.32	2.00-5.53	< 0.001
Lifetime sexual partners						
< 5	1.00			1.00		
≥ 5	2.10	1.60-2.77	< 0.001	2.10	1.59-2.77	< 0.001
Teenage pregnancy						
No	1.00			1.00		
Yes	1.78	1.35-2.36	< 0.001	1.76	1.33-2.34	< 0.001
Drug use						
No	1.00			1.00		
Yes	1.51	1.06-2.15	0.021	1.52	1.07-2.17	0.019

IC95%: intervalo de 95% de confiança; RC: razão de chance.

\* Teste de Hosmer e Lemeshow: p = 0,404;

\*\* Teste de Hosmer e Lemeshow: p = 0,388.

## Discussion

The study's results revealed high lifetime prevalence of induced abortion in WLHA, namely 30.4%, in the period from 1996 to 2016 at the time of entry in the gynecology cohort in Rio de Janeiro. This rate is far higher than the rates estimated in the *Brazilian National Demographic and Health Survey* (PNDS) in 1996<sup>6</sup> and 2006<sup>7</sup> (2.3% and 2.4%), using direct interviews, and by the PNA in 2010<sup>2</sup> and 2016<sup>1</sup> (15% and 13%), using the ballot-box method. When comparing our results to specific studies with WLHA, our rates were also higher, both in comparison to studies using the ballot-box method (17.5%)<sup>3</sup> and those using direct interviews (13%<sup>4</sup>, 14.1%<sup>5</sup>), with the caveat that the latter only analyzed women with prior pregnancies. Previous studies<sup>6,14</sup> had already identified a high prevalence of induced abortion in Rio de Janeiro.

As in other studies that assessed factors associated with lifetime abortion prevalence<sup>3,6,15,16,17,18</sup> or in pregnancies that ended in abortion<sup>4,19</sup>, we found that increasing age<sup>3,4,6,15</sup>, higher lifetime number of sexual partners<sup>3,4,16,17,18,19</sup> and lifetime drug use<sup>3</sup> were associated with induced abortion. Age at sexual initiation was not associated with induced abortion as in other studies<sup>3,16,17</sup>. However, teenage pregnancy showed a positive association, possibly reflecting early initiation of unprotected sexual activity.

We found a gradient between schooling and induced abortion, an association that was also observed by Pilleco et al.<sup>4</sup> in WLHA in Porto Alegre, Brazil. A multicenter study in three Brazilian cities with women 18-24 years of age<sup>20</sup> showed that unintended pregnancy competes with the personal projects of young people seeking more education and participation in the work market. For women with less schooling, keeping a pregnancy (although unplanned) may be associated with less access to safe methods for termination of the pregnancy, but may also be a strategy for social recogni-

tion through motherhood or even a possible life project in a society with limited possibilities<sup>20,21</sup>. Thus, our results may reflect reverse causality, that is, women with more schooling at the time of the interview opted for termination of an unplanned pregnancy in the past.

Unlike other Brazilian studies that have reported higher rates of induced abortion in black women<sup>1,3,6,16,17</sup>, our study did not find an association between induced abortion and self-reported skin color. This finding may result from the association between schooling and skin color, with white women reporting more schooling (14.6% of white women with 12 years of schooling or more, versus 7.7% of black and brown women,  $p < 0.001$ ), which may have attenuated the association between induced abortion and non-white skin color, as reported in other studies.

An association between self-reported STD and induced abortion has also been reported in other Brazilian studies<sup>3,17</sup>. In our study, a high proportion of women were unable to report on previous diagnosis of STDs, which prevented the variable's inclusion in the adjusted analysis. Among the women who were able to provide this information, the self-reported STD rate was high, especially for syphilis, herpes, and HPV, revealing this population's vulnerability to STDs.

Prevalence of physical domestic violence and sexual violence was high, corroborating findings by Pinho et al. in São Paulo<sup>5</sup>. However, although history of violence was associated with induced abortion in the simple regression, this association lost significance after adjusting for the other variables, contrary to findings from international studies demonstrating an association between domestic violence and induced abortion<sup>22,23,24</sup>. In these studies, domestic violence is defined as physical and/or sexual violence by an intimate partner and can include psychological violence in the definition<sup>22</sup>. In our study, the exclusion of psychological violence, the lack of specification of the aggressor, and the use of different instruments for measuring domestic violence limit the results' comparison. In the study of WLHA by Barbosa et al.<sup>3</sup>, the association between sexual violence and induced abortion lost significance after adjusting for lifetime casual partners and self-reported STDs, both heavily and jointly associated with history of sexual violence and lifetime induced abortion. In our study, three factors associated with induced abortion were also associated with violence, which may explain the loss of association in the adjusted analysis. Women with more sexual partners and report of drug use showed higher prevalence of sexual violence (5 or more partners 20.1% versus < 5 partners 11.4%,  $p < 0.001$ ; drug use 26% versus no drug use 14.3%,  $p < 0.001$ ) and physical domestic violence (5 or more partners 36.7% versus < 5 partners 23.7%,  $p < 0.001$ ; drug use 52.5% versus no drug use 28%,  $p < 0.001$ ), while teenage pregnancy was associated with physical domestic violence (39.2% versus 27.4%,  $p < 0.001$ ).

A factor that was not investigated in previous studies and is thus unprecedented is the change in abortion rates over time. Our study found a significant reduction in induced abortion in the most recent periods (2006-2010 and 2011-2016) when compared to the late 1990s and early 2000s, even after adjusting for all the women's characteristics that also changed in these same 20 years. The last period showed an increase in the proportion of spontaneous abortion when compared to induced abortions, which may have resulted from a measurement error if women in the more recent periods omitted induced abortions, leading to a false reduction in them. However, there was a drop in the total number (spontaneous plus induced abortions) throughout the period, and even if all the fetal losses reported as spontaneous abortions were actually induced, which is unlikely, there still would have been a decrease in the number of abortions.

There are no other studies with direct estimates that have assessed the trend in induced abortion over time and that would allow comparison with our findings. The two PNDS, conducted with a 10-year interval (1996-2006)<sup>6,7</sup>, and the 2 PNA, with a 6-year interval (2010<sup>2</sup>, 2016<sup>1</sup>), did not identify a significant decrease in the estimated number of induced abortions. Indirect estimates based on hospital admissions due to complications from abortion in hospitals affiliated with the Brazilian Unified National Health System (SUS) show a decline in the number of abortions<sup>8,9</sup>. However, these estimates are subject to error because they use parameters to correct for hospitalizations due to spontaneous abortions, admissions to private hospitals, and abortions that did not result in hospitalization. Thus, the decrease in hospitalizations may reflect a change in other aspects (proportion of admissions to private hospitals due to an increase in coverage by health plans; less occurrence of complications and hospitalizations due to the use of safer methods for termination of pregnancy; alteration in the proportion of spontaneous abortions due to changes in women's age at pregnancy), and not in the practice of induce abortions itself.

Among the factors analyzed here that presented a significant association with induced abortion, four showed increasing prevalence during the period: women's age, more schooling, teenage pregnancy, and more sexual partners. Thus, other factors not investigated here must explain the decrease in prevalence of induced abortion since 2005. We can raise several hypotheses related to changes in Brazilian women's socioeconomic and reproductive characteristics and the scenario of HIV infection in the country. There was a decrease in the social vulnerability of the cohort's women over time, with an increase in years of schooling and less report of sexual violence. We also found a significant increase in the proportion of women without previous pregnancies. In 1996-2006, data from the PNDS 2006 showed a reduction in Brazilian women's fertility and an increase in the use of contraceptive methods, although with varying intensity according to economic class<sup>25</sup>. PNDS data subsequent to 2006 are not available, which prevents comparison with the periods 2006-2010 and 2011-2016 in our study. Our study also showed an increase in contraceptive use, especially dual contraception (condoms associated with another highly effective method), although this information refers to the time of the interview and not to the moment when the abortion occurred. Brazilian data also show an increase in condom use, especially in casual sexual relations<sup>26,27</sup>.

A factor not investigated in our study was the woman's religion at the time of entry in the cohort. Although the PNAs in 2010<sup>2</sup> and 2016<sup>1</sup> found that Brazilian women of all religions reported previous induced abortions, the prevalence rates differ according to the woman's religion. In the PNDS 1996, having a religion protected against abortion<sup>6</sup>. Since we lack this information, we do not know to what extent changes in Brazilian women's religious profile may have contributed to the reduction in the prevalence of induced abortion at entry in the cohort.

Most of the abortions reported in this study probably occurred before the diagnosis of HIV infection. However, Brazil's advances in care for persons living with HIV/AIDS during the period of women's inclusion in the cohort may have affected in some way the decision to not terminate pregnancy after diagnosis of the infection. These advances feature the reduction in mother-to-child transmission (MTCT) of HIV. France reported a significant drop in the proportion of induced abortions following the introduction of zidovudine (AZT) to reduce MTCT in 1994<sup>28</sup>. Although the INI cohort was only launched in 1996 (after the introduction of AZT), it is known that measures to prevent MTCT of HIV in Brazil were implemented gradually, not reaching 100% of WLHA<sup>29</sup>. According to a study in the South of Brazil in 2011, the main reason for termination of pregnancy after diagnosis of HIV infection was related to the infection itself (being infected or fear of bearing an infected child), reported by 47.6% of the women that underwent abortion<sup>4</sup>. It is thus possible that with the expansion of measures to prevent MTCT of HIV, Brazilian women have opted less for termination of pregnancy if the concern with infection was the main reason for the induced abortion.

Other improvements in care for persons living with HIV/AIDS in Brazil include encouragement of early diagnosis and expansion of access to highly active antiretroviral therapy (HAART). A study at our service found an increase from 1996 to 2016 in the proportion of women with undetectable viral load, high CD4 count, and use of HAART at entry in the cohort<sup>30</sup>, demonstrating that these women have also benefited from these advances. The declining mortality and increasing survival of persons living with HIV/AIDS<sup>31</sup>, the reduction in MTCT of HIV infection, and the expansion of more effective contraceptive methods in our cohort, based not only on exclusive condom use, may have resulted in less use of abortion as a way of regulating fertility, affecting the reproductive choices of these WLHA. However, Brazilian WLHA still face numerous barriers to sexual and reproductive health services. A recent systematic review of studies with WLHA in Latin America revealed higher prevalence of unmet contraceptive needs, unplanned pregnancies, induced abortions, risk of sterilization in the immediate postpartum, and exposure to sexual and institutional violence in WLHA compared to WNLHA. The reduction in institutional barriers, facilitation of access to services, and reduction of stigma and discrimination by health professionals are necessary in order for WLHA to make their sexual and reproductive choices free of violence and coercion<sup>32</sup>.

This study has some limitations. Since it was an outpatient-based study, the women included in the cohort could represent a group of WLHA with specific characteristics related to the service offered by INI/Fiocruz. However, the characteristics of the women observed in the four periods of inclusion in the cohort over the course of the 20 years – with a predominance of heterosexual transmission, increasing age and schooling, and reduction in the proportion of white women – are similar

to the pattern observed in the HIV/AIDS epidemic in women in the Brazilian scenario <sup>31</sup>, suggesting absence of selection bias in the women included in the cohort.

The second limitation relates to the form of measurement of induced abortion. Since induced abortion is illegal in Brazil, there are methodological difficulties in measuring this event, and the information obtained by direct interview may have underestimated its occurrence. However, the observed frequency was much higher than in Brazilian studies that measured abortion by direct estimates in WLHA and WNLHA, whether through interviews or the ballot-box technique, the latter considered less subject to under-recording since it guarantees the information's secrecy <sup>33,34</sup>. In the current study, even when we only analyzed the period 2011-2016 and women in the 18-39-year age bracket, the inclusion criterion for the period in which the two PNA were performed, we obtained higher prevalence rates for induced abortion (18.5%) than estimated in the two national surveys (15% and 13%). Although comparison with the two surveys are limited by differences in the study populations, the data suggest that there was no underestimation of induced abortion.

A third limitation was the lack of identification of the timing of the induced abortion in relation to HIV infection, information that was only available for 2006-2016, when nearly all of the induced abortions were performed before diagnosis of the infection. Brazilian studies that verified factors associated with induced abortion in WLHA and WNLHA <sup>3,4</sup>, whether analyzing lifetime induced abortion <sup>3</sup> or pregnancies that ended in abortion <sup>4</sup>, found no important differences in the factors identified in each of these populations. The hypothesis raised by these studies is that the factors associated with induced abortion are similar in the two populations, but since WLHA display increased vulnerability, with higher prevalence of these factors, the prevalence of induced abortion is also higher <sup>3,4,5,35</sup>. In Barbosa et al. <sup>3</sup>, the difference in prevalence of induced abortion in WLHA and WNLHA lost significance when age, marital status, and lifetime number of sexual partners were included in the adjusted analyses. Thus, lack of identification of the timing of induced abortion in relation to HIV diagnosis should not be an important limitation to this study, since the factors associated with abortion do not appear to differ between these two populations of women.

One last limitation was the lack of inclusion of variable related to the pregnancy that resulted in abortion, which limited identification and discussion of factors associated with induced abortion in this population of WLHA.

Finally, the regression model with the total population of women has limitations, since women without prior abortion included women who had never become pregnant (and thus could not have aborted). However, we opted to present this model in order to allow comparison with other Brazilian studies that used the total population of women in their analyses. Since 90% of the women at inclusion in our cohort had already been pregnant, the two models (with the total population of women and only with those with previous pregnancy) presented the same results.

## Conclusion

The study's data show a high rate of lifetime induced abortion at inclusion in the cohort of WLHA in the city of Rio de Janeiro, with a significant reduction after 2006. This is an unprecedented result, since there are no previous studies in Brazil that have measured change over time in the frequency of induced abortion using direct estimates, whether in WLHA or in WNLHA.

The factors associated with abortion – older maternal age, more sexual partners, teenage pregnancy, drug use – and high prevalence of these factors are consistent with the results of other studies in WLHA and indicate their increased vulnerability, both to HIV infection and to unplanned pregnancies and induced abortion.

It was not possible to verify the reason for the observed drop in the prevalence of induced abortion. Some hypotheses include socioeconomic and reproductive changes and changes in the context of HIV infection/AIDS in Brazil, such as a reduction in the prevalence of risk factors, decreasing fertility, and greater access to contraceptive methods and HIV/AIDS services. Further studies, preferably population-based and using direct measurement methods, are necessary to confirm the downward trend in induced abortion and its determinants in Brazil.

## Contributors

R. M. S. M. Domingues participated in the study conception and design, data analysis and interpretation, and writing of the manuscript's initial and final versions. C. M. F. P. Silva participated in the data analysis and interpretation, critical revision of the manuscript, and approval of the final version. B. G. J. Grinsztejn, R. I. Moreira, M. Derrico, A. C. Andrade, R. K. Friedman, P. M. Luz, L. E. Coelho e V. G. Veloso participated in the critical revision of the manuscript and approval of the final version.

## Additional informations

ORCID: Rosa Maria Soares Madeira Domingues (0000-0001-5722-8127); Cosme Marcelo Furtado Passos da Silva (0000-0001-7789-1671); Beatriz Gilda Jegerhorn Grinsztejn (0000-0003-3692-5155); Ronaldo Ismerio Moreira (0000-0003-2680-4317); Monica Derrico (0000-0003-3552-3584); Angela Cristina Andrade (0000-0003-3298-0456); Ruth Khalili Friedman (0000-0002-3330-0830); Paula M. Luz (0000-0001-9746-719X); Lara Esteves Coelho (0000-0001-7154-8151); Valdiléa G. Veloso (0000-0002-6622-3165).

## References

1. Diniz D, Medeiros M, Madeiro A. Pesquisa Nacional de Aborto 2016. *Ciênc Saúde Colet* 2017; 22:653-60.
2. Diniz D, Medeiros M. Aborto no Brasil: uma pesquisa domiciliar com técnica de urna. *Ciênc Saúde Colet* 2010; 10 Suppl 1:959-66.
3. Barbosa RM, Pinho AA, Santos NS, Filipe E, Villela W, Aidar T. Aborto induzido entre mulheres em idade reprodutiva vivendo e não vivendo com HIV/aids no Brasil. *Ciênc Saúde Colet* 2009; 14:1085-99.
4. Pilecco FB, Teixeira LB, Vigo A, Dewey ME, Knauth DR. Lifetime induced abortion: a comparison between women living and not living with HIV. *PLoS One* 2014; 9:e95570.
5. Pinho AA, Cabral CS, Barbosa RM. Differences and similarities in women living and not living with HIV: contributions by the GENIH study to sexual and reproductive healthcare. *Cad Saúde Pública* 2017; 33:e00057916.
6. Cecatti JG, Guerra GVQL, Sousa MH, Menezes GMS. Aborto no Brasil: um enfoque demográfico. *Rev Bras Ginecol Obstet* 2010; 32:105-11.
7. Camargo RS, Santana DS, Cecatti JG, Pacagnella RC, Tedesco RP, Melo Jr. EF, et al. Severe maternal morbidity and factors associated with the occurrence of abortion in Brazil. *Int J Gynaecol Obstet* 2011; 112:88-92.
8. Martins-Melo FR, Lima MS, Alencar CH, Ramos Jr AN, Carvalho FHC, Machado MMT, et al. Tendência temporal e distribuição espacial do aborto inseguro no Brasil, 1996-2012. *Rev Saúde Pública* 2014; 48:508-20.
9. Monteiro MFG, Adesse L, Drezett J. Atualização das estimativas da magnitude do aborto induzido, taxas por mil mulheres e razões por 100 nascimentos vivos do aborto induzido por faixa etária e grandes regiões. Brasil, 1995 a 2013. *Reprod Clim* 2015; 30:11-8.
10. Menezes GMS, Aquino EML, Fonseca SC, Domingues RMSM. Aborto e saúde no Brasil: desafios para a pesquisa sobre o tema em um contexto de ilegalidade. *Cad Saúde Pública* 2020; 36 Suppl 1:e00197918.
11. Friedman RK, Bastos FI, Leite IC, Veloso VG, Moreira RI, Cardoso SW, et al. Pregnancy rates and predictors in women with HIV/AIDS in Rio de Janeiro, Southeastern Brazil. *Rev Saúde Pública* 2011; 45:373-81.
12. Dalgaard P. *Introductory statistics with R*. 2nd Ed. New York: Springer; 2008.
13. Departamento de Ações Programáticas e Estratégicas, Secretaria de Atenção à Saúde, Ministério da Saúde. *Proteger e cuidar da saúde de adolescentes na atenção básica*. Brasília: Ministério da Saúde; 2017.
14. Martins IR, Costa SH, Freitas SRS, Pinto CS. Aborto induzido em mulheres de baixa renda: dimensão de um problema. *Cad Saúde Pública* 1991; 7:251-66.



15. Souza MG, Fusco CLB, Andreoni SA, Silva RS. Prevalência e características sociodemográficas de mulheres com aborto provocado em uma amostra da população da Cidade de São Paulo, Brasil. *Rev Bras Epidemiol* 2014; 17:297-312.
16. Fusco CLB, Silva RS, Andreoni S. Unsafe abortion: social determinants and health inequities in a vulnerable population in São Paulo, Brazil. *Cad Saúde Pública* 2012; 28:709-19.
17. Machado CJ, Lobato ACL, Melo VH, Guimarães MDC. Perdas fetais espontâneas e voluntárias no Brasil em 1999-2000: um estudo de fatores associados. *Rev Bras Epidemiol* 2013; 16:18-29.
18. Pilecco FB, Knauth DR, Vigo A. Aborto e coerção sexual: o contexto de vulnerabilidade entre mulheres jovens. *Cad Saúde Pública* 2011; 27:427-39.
19. van Benthem BH, de Vincenzi I, Delmas MC, Larsen C, van den Hoek A, Prins M. Pregnancies before and after HIV diagnosis in a European cohort of HIV-infected women: European Study on the Natural History of HIV infection in women. *AIDS* 2000; 14:2171-8.
20. Menezes GM, Aquino EM, Silva DO. Induced abortion during youth: social inequalities in the outcome of the first pregnancy. *Cad Saúde Pública* 2006; 22:1431-46.
21. Singh S, Darroch JE, Frost JJ. Socioeconomic disadvantage and adolescent women's sexual and reproductive behavior: the case of five developed countries. *Fam Plann Perspect* 2003; 33:251-8.
22. Kaye DK, Mirembe FM, Bantebya G, Johansson A, Ekstrom AM. Domestic violence as risk factor for unwanted pregnancy and induced abortion in Mulago Hospital, Kampala, Uganda. *Trop Med Int Health* 2006; 11:90-101.
23. Stöckl H, Filippi V, Watts C, Mbwambo JK. Induced abortion, pregnancy loss and intimate partner violence in Tanzania: a population based study. *BMC Pregnancy Childbirth* 2012; 12:12.
24. Palitto CC, García-Moreno C, Jansen HA, Heise L, Ellsberg M, Watts C. Intimate partner violence, abortion, and unintended pregnancy: results from the WHO Multi-country Study on Women's Health and Domestic Violence. *Int J Gynaecol Obstet* 2013; 120:3-9.
25. Centro Brasileiro de Análise e Planejamento, Ministério da Saúde. Pesquisa Nacional de Demografia e Saúde da Criança e da Mulher PNDS 2006: dimensões do processo reprodutivo e da saúde da criança. 2009. [http://bvsms.saude.gov.br/bvs/publicacoes/pnds\\_crianca\\_mulher.pdf](http://bvsms.saude.gov.br/bvs/publicacoes/pnds_crianca_mulher.pdf) (accessed on 05/Jun/2019).
26. Berquó E, Barbosa RM, Lima LP; Grupo de Estudos em População, Sexualidade e Aids. Trends in condom use: Brazil 1998 and 2005. *Rev Saúde Pública* 2008; 42 Suppl 1:34-44.
27. Departamento de DST, AIDS e Hepatites Virais, Secretaria de Vigilância em Saúde, Ministério da Saúde. Pesquisa de conhecimento, atitudes e práticas na população brasileira. [http://www.aids.gov.br/system/tdf/pub/2016/59392/pcap\\_2013.pdf?file=1&type=node&id=59392&force=1](http://www.aids.gov.br/system/tdf/pub/2016/59392/pcap_2013.pdf?file=1&type=node&id=59392&force=1) (accessed on 19/Oct/2018).
28. Bongain A, Berrebi A, Mariné-Barjoan E, Dunais B, Thene M, Pradier C, et al. Changing trends in pregnancy outcome among HIV-infected women between 1985 and 1997 in two southern French university hospitals. *Eur J Obstet Gynecol Reprod Biol* 2002; 104:124-8.
29. Domingues RMSM, Saraceni V, Leal MC. Mother to child transmission of HIV in Brazil: data from the "Birth in Brazil study", a national hospital-based study. *PLoS One* 2018; 13:e0192985.
30. Zachek CM, Coelho LE, Domingues RMSM, Clark JL, De Boni RB, Luz PM, et al. The intersection of HIV, social vulnerability, and reproductive health: analysis of women living with HIV in Rio de Janeiro, Brazil from 1996-2016. *AIDS Behav* 2018; 23:1541-51.
31. Secretaria de Vigilância em Saúde, Ministério da Saúde. Boletim Epidemiológico: HIV/AIDS 2017. <http://www.aids.gov.br/pt-br/pub/2017/boletim-epidemiologico-hiv-aids-2017> (accessed on 05/Oct/2018).
32. Gómez-Suárez M, Mello MB, Gonzalez MA, Ghidinelli M, Pérez F. Access to sexual and reproductive health services for women living with HIV in Latin America and the Caribbean: systematic review of the literature. *J Int AIDS Soc* 2019; 22:e25273.
33. Olinto M, Moreira Filho DC. Estimating the frequency of induced abortion: a comparison of two methods. *Rev Panam Salud Pública* 2004; 15:331-6.
34. Medeiros M, Diniz D. Recommendations for abortion surveys using the ballot-box technique. *Ciênc Saúde Colet* 2012; 17:1721-4.
35. Santos NJ, Barbosa RM, Pinho AA, Villela WV, Aidar T, Filipe EMV. Contexts of HIV vulnerability among Brazilian women. *Cad Saúde Pública* 2009; 25 Suppl 2:S321-33.

## Resumo

O objetivo deste estudo é verificar a prevalência e os fatores associados ao aborto induzido no ingresso em uma coorte de mulheres vivendo com HIV/aids, no Município do Rio de Janeiro, Brasil, no período 1996-2016. O critério de elegibilidade para o ingresso na coorte era ser do sexo feminino ao nascimento, ter mais de 18 anos de idade e ter infecção comprovada pelo HIV. Na visita inicial, dados sobre aspectos sexuais, reprodutivos, comportamentais e da infecção pelo HIV foram obtidos durante entrevista face a face com o médico assistente. Foi calculada a prevalência de aborto induzido na vida e verificados os fatores associados ao aborto induzido por meio de regressão logística múltipla, para o total de mulheres e entre aquelas com gestação prévia. Do total de mulheres, 30,4% referiram algum aborto induzido na vida, sendo este valor de 33,5% em mulheres com gestação prévia. A frequência de aborto induzido relatado apresentou queda significativa no período analisado (41,7% de 1996-2000 vs. 22,5% de 2011-2016,  $p < 0,001$ ). Os fatores associados ao aborto induzido, tanto para o total de mulheres quanto para aquelas com gestação prévia, foram o aumento da idade, escolaridade mais elevada, número de parceiros sexuais na vida  $\geq 5$ , gestação na adolescência, uso de qualquer droga ilícita na vida e período de ingresso na coorte após 2005. Mudanças no perfil socioeconômico, sexual, reprodutivo e da infecção pelo HIV são explicações possíveis para a redução da prática do aborto no período. Estudos que utilizem métodos de aferição direta do aborto devem ser conduzidos em outras populações, para confirmar a tendência de queda do aborto induzido no país e seus determinantes.

Aborto Induzido; Infecções por HIV; Estudos de Coortes

## Resumen

El objetivo de este estudio es verificar la prevalencia y los factores asociados al aborto inducido en el ingreso en una cohorte de mujeres, que viven con VIH/sida, en el municipio de Rio de Janeiro, durante el período 1996-2016. El criterio de elegibilidad para el ingreso en la cohorte era ser del sexo femenino al nacer, tener más de 18 años de edad y sufrir una infección comprobada por VIH. En la visita inicial, datos sobre aspectos sexuales, reproductivos, comportamentales y de infección por el VIH se obtuvieron durante la entrevista cara a cara con el médico asistente. Se calculó la prevalencia del aborto inducido en la vida y se verificaron los factores asociados al aborto inducido mediante regresión logística múltiple, para el total de mujeres y entre aquellas con gestación previa. Del total de mujeres, un 30,4% refería algún aborto inducido en la vida, siendo ese valor de un 33,5% en mujeres con gestación previa. La frecuencia de aborto inducido relatado presentó una caída significativa durante el período analizado (un 41,7% en el período 1996-2000 vs. 22,5% en el período 2011-2016,  $p < 0,001$ ). Los factores asociados al aborto inducido, tanto para el total de mujeres, como para aquellas con gestación previa, fueron el aumento de la edad de la mujer, escolaridad más elevada, número de parejas sexuales en la vida  $\geq 5$ , gestación en la adolescencia, consumo de cualquier droga ilícita en la vida y período de ingreso en la cohorte tras 2005. Cambios en el perfil socioeconómico, sexual, reproductivo y de infección por VIH son explicaciones posibles para la reducción de la realización de abortos durante el período. Se deben llevar a cabo estudios que utilicen métodos de medición directa del aborto en otras poblaciones para confirmar la tendencia de caída del aborto inducido en el país y sus determinantes.

Aborto Inducido; Infecciones por VIH; Estudios de Cohort

Submitted on 20/Oct/2018

Final version resubmitted on 05/Jun/2019

Approved on 12/Jun/2019