Screening for Hepatitis C virus and HIV-1 infections among pregnant women in Central Brazil

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Abstract

**Background:** Hepatitis C (HCV) and HIV infections are a major burden to public health worldwide. Routine antenatal HIV-1 screening to prevent maternal-infant transmission is universally recommended.

**Objectives:** To evaluate the prevalence of and potential risk factors for HCV and HIV infection among pregnant women who attended prenatal care under the coverage of public health in Central Brazil.

**Methods:** This screening and counselling for HIV and hepatitis C virus (HCV) infections was offered free of charge to all pregnant women attending antenatal clinic (ANC) in the public health system, in the city of Goiania (~ 1.1 million inhabitants) during 2004-2005. Initial screening was performed on a dried blood spot collected onto standard filter paper and sent daily to the Central Laboratory; positive or indeterminate results were confirmed by a second blood sample. HCV infection was defined as a positive or indeterminate sample (EIA test) and confirmed HCV-RNA technique. HIV infection was defined according to standard criteria. Factors associated with HIV and HCV infections were identified with logistic regression. The number needed to screen (NNS) to prevent a case of HIV-1 vertical transmission was calculated.

**Results:** A total of 28,561 pregnant women were screened for HCV and HIV-1 in ANC. Mean maternal age was 23.9 years (SD=5.6), with 45% of the women experiencing their first pregnancy. Prevalence of HCV infection was 0.15%, and the risk increased with age (p<0.01). The prevalence of anti-HIV antibodies was 0.13%, with nine confirmed HIV-1 infections per 10,000 pregnant women screened. Black women had a 4.8-fold (IC95% 1.4-16.7) greater risk of HIV-1 infection compared to non-black. The number needed to screen to detect one HIV vertical transmission varied from 6,216 to 16,734.
**Conclusion:** Overall, the prevalence of HIV infection was lower than the prevalence of HCV infection in pregnant women, with high acceptability rates of screening in the opt-in strategy. Black women were more likely to be HIV-1-infected, and this ethnic pattern is in agreement with the epidemiology of HIV-1 in Brazil. Cost-effectiveness analysis for the maintenance of HCV testing is warranted for public health policy.

**Introduction**

Hepatitis C virus and HIV infections are a major burden to public health worldwide and share common blood-borne transmission routes. Approximately 130 million individuals are HCV-infected, with 3.4 million newly infected cases per year, representing a leading cause of liver cancer and transplant worldwide [1]. HIV infection affects around 33 million individuals, with an increasing trend among women that results in mother-to-child transmission being the major route for HIV infection in children [2, 3]. Among HIV-infected individuals, four to five million are estimated to be co-infected with HCV [1].

Routine antenatal HCV screening to prevent vertical transmission is a controversial issue and is not universally implemented. Although HCV infection is considered an important public health problem for which reliable screening tests exist, treatment is contra-indicated during pregnancy due to the potential risks of the diagnostic procedure [4-7]. In general, antenatal and population screening is recommended for those possessing a risk factor for HCV acquisition, such as intravenous drug users, recipients of blood transfusions or organs before 1990, haemodialysis patients and HIV-infected individuals [8, 9]. In Brazil, universal screening is mandatory for blood donors. A few
population-based studies have reported anti-HCV prevalence varying from 1.2% to 1.9% [10-13], and the vast majority of studies were restricted to high risk groups in selective areas.

Antenatal HIV screening is universally recommended to prevent vertical transmission [14, 15]. The mother-to-child transmission rate varies from 15% to 25% without preventive measures, but this rate can be substantially decreased to 2% or less with the adoption of an evidence-based group of interventions based upon the use of antiretroviral drugs, the avoidance of breastfeeding and elective caesarean section [2, 16-18]. However, by 2005, only 11% of HIV-positive pregnant women had gained access to preventive intervention worldwide [19].

After almost three decades of the AIDS epidemic in Brazil, an estimated 620 thousand individuals are living with HIV/AIDS. The prevalence of infection remained stable over the past years, but the increased heterosexual transmission led to a decline of the male-to-female ratio, which reached 1.5 to 1 in 2002 [20, 21]. Approximately 90% of the AIDS cases among children (<13 years old) are attributable to mother-to-child-transmission (MTCT). Although the rate of vertical transmission has been declining, the implementation of antenatal HIV screening and timely management of infected pregnant women varies across the country due to disparities of health care access, suggesting missed opportunities for prevention [22-24].

In the current manuscript, we present the prevalence of HCV and HIV infection among pregnant women attending an official program (named Mother’s Testing) launched in 2004 that aims to extend the coverage of antenatal screening in public health settings in
Central Brazil. This study also analyses potential risk factors for acquisition of these infections associated with maternal characteristics, focusing on the discussion of timely strategies and the estimated outcomes of this screening program.

**Methods**

**Study Design, Population and Recruitment**

A cross-sectional study was conducted among pregnant women who attended prenatal clinics located in Goiania, a city of ~1.1 million inhabitants in Central Brazil, between 2004 and 2005. Since 2004, screening for nine infectious diseases (including HIV and HCV) has been offered free of charge by an extended Women’s Prevention Program sponsored by the State Secretariat of Health (Programa de Proteção à Gestante). This screening program covers all pregnant women who attend the 243 public health centres, which corresponds to 60% of the estimated number of pregnant women in this region. In 1997, the policy of universal screening for HIV and counselling for pregnant women was adopted by the Brazilian Ministry of Health. HCV testing is not part of the routine antenatal screening for vertical transmission prevention.

**Data collection**

During the first prenatal visit, a standardized questionnaire is filled in by the health technicians. At the time of blood collection, the following variables are recorded: clinic of attendance; date of maternal birth; last menses; gestational age (weeks); parity; type
of previous delivery; number of abortions. Enclosed in the questionnaire was a consent form; informed consent was obtained for HIV-1 testing as an “opt in” procedure.

Specimen collection and serological tests

At the first screening, blood samples were collected by digital puncture onto standard filter paper (S&S 903), dried at room temperature (~4 hours) and sent daily by special mail to the Central Reference Laboratory. For confirmatory tests, a second blood venous puncture (vaccutainer) was collected for all pregnant women with positive and indeterminate results in the serological screening using filter paper eluate.

HCV screening and confirmatory tests

HCV screening was based on the detection of antibodies against HCV core, NS3, NS4 and NS5 antigens (DETECT® commercial kit ADALTIS INC., Canada). As part of the confirmatory procedure the second serum sample obtained from venous puncture was retested by another ELISA kit (Hepanostika HCV Ultra Beijing United Biomedical Co.Ltd., China). In parallel, detection of HCV-RNA was obtained by qualitative AMPLICOR Hepatitis C Virus (HCV) Test (Roche, USA). Samples positive or indeterminate to ELISA and confirmed by HCV-RNA were considered HCV infected. The HCV genotypes were identified by a hybridization technique using INNO-Lipa tests (Innogenetics, Belgium) performed in “Centro de Genoma”-São Paulo/São Paulo, Brazil.
HIV screening and confirmatory tests

Serological screening for HIV1/2 in filter paper used an anti-HIV TETRA ELISA commercial kit (Biotest, Germany) to detect anti-HIV1 antibodies (gp41, gp36 and p24) and anti-HIV2 antibodies with sensitivity of 100.0% and specificity of 99.8%, according to the manufacturer. Screened women with positive and indeterminate results were re-tested using sera from venous puncture blood samples (GENSCREEN® HIV1/2 kit Bio-Rad, France) that recognizes antibodies against antigens gp160 and gp25 or by HIV-1/2 ELISA test (Wiener lab., Argentina) that detects antibodies against the pop and gag regions’ antigens.

In parallel, at least one of the following confirmatory tests were applied: Indirect Immunofluorecence by IFI - HIV1 kit (Bio-Manguinhos, Fundação Oswaldo Cruz, Rio de Janeiro); Immuno Blot (IB) using a NEW LAV BLOT 1 kit (Bio-Rad, France) that detects antibodies against HIV-1 gp160, gp110/120, p68, p55, p52, gp41, p40, p34, p24/25 and p18; Western Blot (WB) for detection of HIV1 and HIV2, using HIV BLOT 2.2 kit (Genelabs ® Diagnostics Pte Ltd, Singapore) and qualitative “Nested” PCR to detect pro viral HIV1 DNA in blood mononuclear cells (50 copies/mL detection limit), performed at the Center of Genomics Laboratory (São Paulo, Brazil).

A pregnant woman was considered to be HIV-infected if the initial positive and indeterminate screening test was confirmed by anti-HIV1/2 ELISA in a second serum sample combined with a positive result obtained in any other technique (IFI, IB, WB or PCR), as recommended by the Brazilian Ministry of Health [25].
Data analysis

Data were checked for duplicity and consistency and positive test results were confirmed with the original laboratory documents. SPSS 13.0 for Windows was used for statistical analysis. Descriptive analysis of the population was performed, and chi-square or Fischer test measures of central tendency were applied as appropriate. Values of p<0.05 were considered statistically significant for all tests. Prevalence with 95% CI was calculated for HIV and HCV infections, and the absolute number per 10,000 participants with 95% CI was presented using the Poisson distribution [26]. For univariate comparison, $X^2$ tests or Fischer exact tests (two-sided) were performed for discrete outcomes. For multivariate analysis, logistic regression was used to estimate the adjusted odds ratio (AOR) and 95% confidence intervals (95% CI).

We have estimated the benefits of HIV screening in pregnant women under the following assumptions: 90% of asymptomatic pregnant women screened receive the test results; 60% to 90% receive the antiretroviral therapy (TARV); 37% to 50% are submitted to elective caesarean and between 12% and 22% of HIV vertical cases are prevented with TARV [15, 27]. The benefits of avoiding breastfeeding were not included in the analysis. We estimated the number of women needed to screen to prevent one case of mother-child transmission (NNT) using the relative risks of the untreated and treated groups with the current preventive measures.

The sample size of approximately 28,000 participants was considered sufficient to detect HIV or HCV prevalence between 0.05% and 0.55% with 0.01% error [28].
Ethical issues

The informed consent was signed by the participants for HIV and HCV screening as “opt in” procedures. The State Public Health Program (Programa de Proteção à Gestante/PPG-Go) ensures the release of test results and medical counselling free of charge and also monitors maternal-child outcomes.

Results

During the study period, a total of 28,561 pregnant women were screened for HCV and HIV infections in prenatal public health clinics. Only 15 out of 28,576 participants (0.05%) refused to sign the informed consent for HIV tests. Approximately 85% of the women enrolled were under 30 years of age (mean=23.9; sd=5.6), 0.8% were between 12 to 14 years old and approximately 1% were older than 40 years. More than 90% of the study population self-referred as white or mixed/biracial, with 8.3% black and a minority of Asian descendents and indigenous individuals (Table 1).

The maternal characteristics and delivery history are presented in Table 1. Approximately half of the women were experiencing their first pregnancy, and 11% reported four or more pregnancies. For those with a previous history of pregnancies, around 55% reported vaginal delivery and around 30% reported caesarean sections (with or without previous abortions). One third of the women reported having at least one abortion. For the majority of the attendees (95.5%) the first prenatal medical visit, which included the first screening test occurred before the 27th gestational week and 60% were screened before the 14th week (mean=13.5; sd=6.3).
The prevalence of anti-HCV antibodies was 0.22% at the first screening using filter paper eluate. Of the anti-HCV positive women, 92.3% (60/65) were re-tested for HCV RNA and of these, 72% (43/60) had detectable viremia. The percentage of false-positive results was 28.3% (17/60), and the majority of indeterminate results on the serological screening were not confirmed by molecular test. The prevalence of HCV infection was 0.15% (43/28,561), which means 15 (95%CI 8-25) HCV-infected pregnant women per 10,000 screened at the prenatal public health services.

The prevalence of antibodies to HIV-1 was 0.13% at the initial screening, and 86.8% of the positive participants were re-tested (33/38). The percent of false positive results was 18.2% (6/33), and all indeterminate results onto filter paper eluate were negative at confirmatory tests. The prevalence of HIV infection was 0.09% (27/28,561), which represents nine (95%CI 4.1-17.1) infected pregnant women among 10,000 screened (Figure 1). Two women were HCV-HIV-1 co-infected, resulting in an estimate of seven (95%CI 2-56) co-infected cases per 100,000 screened women. Among HIV-1 infected women, the prevalence of HCV infection was 7.4% (2/27) (data not shown).

In the univariate analysis, there was an increasing trend of HCV infection among older age-groups ($\chi^2=14.6$ (gl=1); $p<0.01$). HCV infection was positively associated with increasing number of pregnancies. However, after adjusting for age, the association did not remain statistically significant for four or more pregnancies compared to the first pregnancy ($\text{OR}_{\text{adjusted}}=2.4$; 95%CI 0.9-6.3) (Table 2). The most prevalent HCV genotype was 1a (n=7) followed by 2a (n=3).
In univariate analysis, HIV-1 infection was associated with increasing age up to 39 years old and with women self-referred as black. Other maternal characteristics were not related to HIV-1 infection. In the multivariate analysis, black women had an approximately four-fold greater risk of being infected compared to white subjects, independent of age (OR_{adjusted}=4.8; 95%CI 1.4-16.7). Among HIV-1 positive pregnant women, 34.6% (9/26) had a history of previous abortion. The confirmatory tests were performed by the 14th gestational week for ~60% of HIV-1 positive women and the remainder by the 27th gestational week.

The outcomes of the HIV-1 screening and the Number Needed to Screen (NNS) were calculated for 0.9% HIV-1 prevalence (Table 2). For each nine HIV-1 positive asymptomatic pregnant women per 10,000 screened, 8.1 would receive the results of the tests, between 4.9 and 7.4 would receive TARV and 3.0 to 4.1 would be submitted to elective caesarean section. Considering that the number needed to treat with interventions to prevent one case of mother-to-child transmission of HIV (NNT) was between 4.6 and 8.2, we estimate that 6,200 to 16,700 women should be screened to prevent one case of HIV vertical transmission.

Discussion

In the present study, among 28,561 pregnant women from 12 to 29 years who attended a prenatal screening program, the prevalence of 0.15% for HCV infection was higher than the prevalence of 0.09% for HIV-1 infection. The first prenatal screening was performed by the second gestational trimester among young pregnant women. Increasing age was a risk factor for both HCV and HIV-1 infection, and women self-referred as black were at greater risk for HIV infection. This ethnic pattern is in
agreement with the recent epidemiology of HIV-1 infection in pregnant women in Brazil [29].

The overall anti-HCV antibody prevalence among pregnant women of 0.22% in our region is comparable to the figures reported in a similar antenatal program implemented in the neighbouring State in the Centralwest of Brazil [30]. Screening of pregnant women conducted in other Brazilian regions indicated higher HCV frequencies, varying from 1.0% to 2.6% according to the characteristics and risk factors of the population [31-33]. In general, the prevalence of anti-HCV antibodies is lower among pregnant women compared to the general population [11, 23] as shown in our results, since women of childbearing age are usually less than 40 years old. Older age is a known risk factor for HCV infection due to the long period of viral exposure during lifetime. In our study among pregnant women, HCV infection peaked after 40 years of age, which was similarly to the most affected age-group reported in a population survey in the US [34].

Around 70% of the suspected cases were confirmed by HCV RNA by PCR, a marker of active viral replication [35] that is compatible with previous reports [11, 36, 37]. In our study, 15 pregnant women (95% CI 8-25) of 10,000 screened had detectable viremia. This value represents 6 to 13 acquired HCV infections in childhood per year based on the prevalence obtained among the estimated 90 thousand pregnant women in this State [38] and the rates of mother-to-child transmission of 5% to 8% [39, 40]. Genotype 1a (70%) was predominant in our study and is the most frequent circulating genotype in Brazil [41, 42].

Routine antenatal HCV screening, although implemented in this Public Health Screening Program for pregnant women (Goias State), is not mandatory in Brazil, a
policy that is in agreement with the current international guidelines [5, 43]. In the general population, the screening for hepatitis C is restricted to high risk groups and is not recommended for asymptomatic adults who are not at increased risk [43]. In Japan, since 2003, HCV screening for the general population and high risk groups, targeting those over 40 years old, was implemented and considered to be cost-effective in comparison to a non-screening strategy [44]. Despite the knowledge that no intervention can be offered to HCV-infected pregnant women to reduce vertical transmission, some issues about universal screening should be considered. If the screening was restricted to high risk group pregnant women, only 40% of those with hepatitis C infection would be identified [45, 46]. In this sense, the universal screening during pregnancy represents an opportunity for the early detection of HCV infection among women, consequently neonatal transmission can be monitored in order to implement adequate interventions, improving the prognosis of the disease progression. However, a cost-effectiveness analysis based on sound outcomes needs to be evaluated before routine antenatal HCV screening is introduced in public health.

The prevalence of HIV-1 infection detected among pregnant women in our setting (0.09%) was similar to the global prevalence of HIV-1 infection among women in some developed European and American countries [47]. In Brazil, surveillance data from public hospitals showed around 0.4% HIV-1 prevalence among a representative sample of labouring women between 15 to 40 years old, with regional disparity [48, 49]. We estimated that 6,200 to 16,700 pregnant women are needed to screen to prevent one case of HIV vertical transmission (NNS). We estimated that this screening program could enable the prevention of five to fourteen HIV mother-to child transmissions per year if the well-established intervention measures were applied, pointing out the importance of
early screening during the gestational period. These figures reflect the HIV-‘prevalence rate in our region, and it has been found that, in areas with ~50% prevalence such as Sub-Saharan Africa, NNS is 113 to 304 pregnant women [15].

In the 1990s, the HIV-1 vertical transmission rate was estimated as 16% in the southeast of Brazil [50], with a reduction to 7.1% reported in a multicentre study by the year 2001 [22]. Despite the progress in the implementation of screening and free prophylactic measures in recent years in Brazil [20, 51], it was estimated that approximately 60% of pregnant women had effective coverage for HIV-1 screening and ~35% of HIV/AIDS positive pregnant women had access to antiretroviral therapy, with differences among regions [48, 52]. In our setting, the strategy adopted to sign for testing (opt-in) in the antenatal screening program was well-accepted, with minimal refusal rates (0.05%). Besides, the use of dried blood spots on filter paper, as performed by this program, enhances the coverage of the screening by the simplicity of the blood collection/storage and mailing procedure, reducing costs and improving the feasibility of this program [53]. Other large scale screening for infectious disease among neonates and pregnant women have also used dried blood spots [30, 53], which have been validated with good correlation with conventional serological tests [54]. In our study, the initial HIV-1 screening was conducted among 60% of women before 14 weeks of gestation, 95% of the testing was performed before 27 weeks, and the final diagnosis was returned within two weeks, timely for the implementation of preventive measures.

Our analysis pointed out that women who self-referred as black had a 4.8-fold increase in HIV infection compared to white women. In recent years, national official data suggests an increased proportion of cases among biracial individuals [55]. Recent data
show that the coverage of HIV-testing during pregnancy is lower for non-white pregnant women and for those with a lower level of education in Brazil [52]. Nevertheless, data about ethnicity is troublesome and may be confounded with socio-economic conditions.

The prevalence of HIV-HCV co-infection among pregnant women was low (7 per 100,000); however, among the HIV-1 infected subgroup, 7% were HCV-infected. This frequency of prevalence of hepatitis C infection among HIV-infected individuals is similar to the value reported by the HIV Testing Center regionally [56] and in line with the current recommendations to screen HIV/AIDS patients for hepatitis C virus due to the viruses’ common route of transmission and their clinical and therapeutic interactions [57, 58].

One of the limitations of this study was the inability to assemble data on known risk factors related to sexual behaviour and drug abuse. This program is intended to cover a large population, and it would be unfeasible to collect information about sensitive issues like these in public health settings. Nevertheless, the ongoing screening program could be used as a surveillance system to monitor HIV-1 and HCV infection patterns for pregnant women and their offspring over an extended period of time. A cost-effectiveness analysis is recommended in order to ensure that preventive measures are targeted appropriately in the context of public health policy.
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Competing interests

The authors declare that they have no competing interests.

Authors’ contributions

ZBC, GCM, CMTM contributed to study concept and design. MMA, CGF, JVMF, ALM, MDT, MMAS revised the manuscript for intellectual content. All authors approved the current version of the manuscript.

References


Figure legend

Figure 1. Screening for HCV and HIV infection among pregnant women in Public Health Settings, Central Brazil
Table 1. Maternal characteristics, prevalence and risk factors for HCV and HIV infection among pregnant women in Public Health Settings, Central Brazil

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total(^a)</th>
<th>HCV</th>
<th>HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>Age, years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-19</td>
<td>6664 (23.6)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>20-29</td>
<td>17084 (60.4)</td>
<td>2.2 (0.8 – 6.5)</td>
<td>3.1 (0.7 – 13.6)</td>
</tr>
<tr>
<td>30-39</td>
<td>4272 (15.1)</td>
<td>3.5 (1.1–11.4)</td>
<td>5.1 (1.1 – 24.8)</td>
</tr>
<tr>
<td>≥ 40</td>
<td>268 (0.9)</td>
<td>24.9 (6.2–98.9)</td>
<td>–</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>7710 (40.6)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Biracial</td>
<td>9523 (50.2)</td>
<td>1.5 (0.7 – 3.3)</td>
<td>1.6 (0.6 – 4.7)</td>
</tr>
<tr>
<td>Black</td>
<td>1576 (8.3)</td>
<td>0.4 (0.02 – 3.3)</td>
<td>5.9 (1.8 – 19.2)</td>
</tr>
<tr>
<td>Asian/indigenous</td>
<td>176 (0.9)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Number of pregnancies</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>First</td>
<td>11637 (45.6)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2-3</td>
<td>11079 (43.5)</td>
<td>1.7 (0.8 – 3.4)</td>
<td>1.3 (0.5 – 3.1)</td>
</tr>
<tr>
<td>≥ 4</td>
<td>2780 (10.9)</td>
<td>3.5 (1.5 – 8.1)</td>
<td>2.3 (0.8 – 6.9)</td>
</tr>
<tr>
<td>Mode of delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal</td>
<td>7665 (55.3)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Cesarean section</td>
<td>4301 (31.0)</td>
<td>2.0 (0.9 – 4.6)</td>
<td>2.5 (0.7 – 9.0)</td>
</tr>
<tr>
<td>Abortions only</td>
<td>1893 (13.7)</td>
<td>0.6 (0.1 – 2.6)</td>
<td>3.2 (0.9 – 12.0)</td>
</tr>
<tr>
<td>Gestational age, weeks</td>
<td></td>
<td></td>
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<tr>
<td>&lt; 14</td>
<td>14647 (59.9)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>14-27</td>
<td>8741 (35.7)</td>
<td>0.8 (0.4 – 1.6)</td>
<td>1.3 (0.5 – 3.3)</td>
</tr>
<tr>
<td>≥ 28</td>
<td>1077 (4.4)</td>
<td>1.1 (0.2 – 4.5)</td>
<td>–</td>
</tr>
</tbody>
</table>

\(^a\) Totals for each variable excluded missing data.
Table 2. Outcomes of screening for HIV infection in 10,000 pregnant women

<table>
<thead>
<tr>
<th>Variables</th>
<th>0.09% de Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number identified as positive</td>
<td>9 / 10 000</td>
</tr>
<tr>
<td>Number receiving test</td>
<td>8.1 / 10 000 (90%)</td>
</tr>
<tr>
<td>Number receiving antiretroviral therapy (TARV)</td>
<td>4.9 - 7.4 (60% - 90%)</td>
</tr>
<tr>
<td>Number submitted to elective cesarean</td>
<td>3.0 – 4.1 (37% - 50%)</td>
</tr>
<tr>
<td>Number of vertical transmission (VT) among women without intervention</td>
<td>1.14 – 2.04 (14% - 25%)</td>
</tr>
<tr>
<td>Number of cases of mother-to child transmission prevented with TARV</td>
<td>0.6 (IC 95% 0.5-0.7) 1.6 (IC 95% 1.3-1.7)</td>
</tr>
<tr>
<td>Number needed to treat with TARV to prevent one case of VT (NNT)</td>
<td>4.6 (IC 95% 4.3-5.5) 8.2 (IC 95% 7.6-9.9)</td>
</tr>
<tr>
<td>Number needed to screen to prevent one case VT with TARV (NNS)</td>
<td>6 216 (IC 95% 5 810-7333) 16 734 (IC 95% 15 511-20 206)</td>
</tr>
</tbody>
</table>

MTC= Mother-to-Child Transmission
TARV= Terapia Antiretroviral
First screening

28,561 pregnant women

Positive
- 47 HCV
- 35 HIV

Indeterminate
- 18 HCV
- 3 HIV

Negative
- 28,511 HCV
- 28,523 HIV

Confirmatory tests

Positive
- 43 HCV
- 27 HIV

Indeterminate
- 17 HCV
- 6 HIV

Prevalence
- 0.15%
- 0.09%

Figure 1