

**Technical note**  
**on good practices to prevent**  
**mother-to-child transmission**  
**of HTLV-1 in the context of the**  
**EMTCT Plus initiative**



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# Abbreviations and acronyms

<b>AFASS</b>	acceptable, feasible, affordable, sustainable, and safe
<b>ATLL</b>	adult T-cell leukemia/lymphoma
<b>ELISA</b>	enzyme-linked immunosorbent assay
<b>EMTCT</b>	elimination of mother-to-child transmission
<b>EMTCT Plus</b>	Elimination of mother-to-child transmission of HIV, syphilis, hepatitis B, and congenital Chagas disease initiative
<b>HAM</b>	HTLV-1-associated myelopathy
<b>HBIG</b>	Hepatitis B immunoglobulin
<b>HBsAg</b>	hepatitis B surface antigen
<b>HIV</b>	human immunodeficiency virus
<b>HTLV</b>	human T-lymphotropic virus
<b>MTCT</b>	mother-to-child transmission
<b>NAAT</b>	nucleic acid amplification test
<b>PAHO</b>	Pan American Health Organization
<b>STAG</b>	Strategic Technical Advisory Group
<b>STI</b>	sexually transmitted infection
<b>TSP</b>	tropical spastic paraparesis
<b>UNICEF</b>	United Nations Children's Fund
<b>WHO</b>	World Health Organization

# **Technical note on good practices to prevent mother- to-child transmission of HTLV-1 in the context of the EMTCT Plus initiative**



# Introduction

## Background

The Pan American Health Organization (PAHO) and its Member States have a portfolio of diseases that are candidates for elimination. The ambitious and feasible goal is to end more than 30 communicable diseases and related conditions by 2030 (1). Another important platform promoted by PAHO, which predates and complements the overarching objectives of the elimination program, is the initiative for the elimination of mother-to-child transmission of HIV, syphilis, hepatitis B, and congenital Chagas disease (EMTCT Plus) (2). This framework was first established in 2010, when Member States committed to the elimination of vertical transmission of HIV and syphilis. In 2015, targets to achieve this goal were established (Resolution CD50.R12), and the program was expanded in 2016 with the inclusion of hepatitis B and Chagas disease (Resolution CD55.R5). The EMTCT Plus strategy encompasses well-established process and standards to validate country-level elimination of those infections in the context of vertical transmission. Since its inception, EMTCT Plus has achieved impressive outcomes, culminating with the certification of dual elimination (HIV and syphilis) in nine countries and territories by 2023 (Anguilla, Antigua and Barbuda, Belize, Bermuda, Cayman Islands, Cuba, Dominica, Montserrat, and Saint Kitts and Nevis). With this extensive experience, the Region of the Americas assumed the forefront of the global effort for the elimination of communicable diseases.

The Strategic and Technical Advisory Group (STAG) of the Elimination Initiative has highlighted the opportunity to expand the range of candidates for elimination by including human T-lymphotropic virus type 1 (HTLV-1) (3), focusing on the elimination of vertical transmission and early childhood infection. HTLV-1 is a retrovirus that causes lifelong infection. It is transmitted by condomless sex, via blood, and vertically, mainly through breastfeeding. Since its discovery in the late 1980s, HTLV-1 is known to be the etiological agent of two important clinical conditions: adult T-cell leukemia/lymphoma (ATLL), and HTLV-1-associated myelopathy (HAM), formerly known as tropical spastic paraparesis (TSP). ATLL is a blood neoplasm with poor outcome, despite treatment. HAM is the clinical consequence of spinal cord inflammation triggered by HTLV-1 infection. Patients with HAM have an increased mortality rate compared to patients with asymptomatic HTLV-1 infection. This is consistently seen in cohorts from Brazil, Japan, and the United Kingdom (4, 5). ATLL affects about 5% of people living with HTLV-1 (6). However, the risk is much higher if infection happens early in life (7). HAM is estimated to affect about 3% of HTLV-1 carriers, but other neurological symptoms were seen in up to 26% of patients living with HTLV-1 in two distinct Brazilian cohorts (8, 9). The impact of HTLV-1 infection is not limited to these two severe diseases. Infective dermatitis, Sjögren's syndrome, uveitis, and lung disease are some examples of many inflammatory conditions that are linked to HTLV-1 infection. A meta-analysis of epidemiological data revealed that HTLV-1 infection is associated with a 57% increase in all-cause mortality (10). The same study, commissioned by the World Health Organization (WHO), confirmed that HTLV-1 is associated with 14 clinical conditions in addition to HAM and ATLL (10). Another feature of HTLV-1 infection is that it targets CD4+ T lymphocytes. This may explain the impaired immune response to coinfections reported in people living with HTLV. People living with HTLV-1 have increased odds of being infected by a range of infectious pathogens (11), with a clear association between HTLV-1 infection and negative outcome of *Strongyloides stercoralis* coinfection (12). People living with HTLV-1 have a 60-fold increased risk of developing severe strongyloidiasis (12). More recently, data have emerged linking HTLV-1 infection with increased risk of noncommunicable diseases, such as chronic renal disease and diabetes (13, 14), but data remain incipient and this association

needs to be better described. HTLV-1 also plays an important role in deepening health inequities. Infection is more common in areas with low human development index (15, 16). People with low income and low education are most affected by HTLV-1. The consequences of HTLV-1 infection, including premature death, stigma, and disability, impact work capacity and accentuate health disparities in affected communities.

In the light of these data and considering an increasing interest in HTLV-1 infection in the Region, PAHO and its Member States undertook efforts to better understand the HTLV-1 situation in the Region (17, 18). Engagement activities with different stakeholders identified that elimination of mother-to-child transmission (MTCT) of HTLV-1 as a public health problem is feasible and a priority in the response to this neglected virus (17, 19). The provision of a package of interventions with clear targets and measurable outcomes for the elimination of vertically transmitted infectious diseases, as defined in the EMTCT Plus framework, represents the right opportunity and provides a set of tools to expand and strengthen the response to HTLV-1 by integrating efforts to eliminate multiple conditions that are transmitted perinatally.

This movement observed in the Region of the Americas is in consonance with discussions initiated at the global level. Following the publication of a WHO technical report on HTLV-1 in 2020 (6), the WHO global health sector strategies on, respectively, HIV, viral hepatitis, and sexually transmitted infections for the period 2022–2030 (1) included HTLV-1 as an infection of importance, emphasizing the need to focus on preventing vertical transmission and prevention of sequelae and morbidity.

The need to advance the response to HTLV-1 in the Region is clear. Member States have stressed that having guidance on how to achieve the final goal to eliminate MTCT would be beneficial. In this context, PAHO has developed this publication to compile current practices and to assist countries to control HTLV-1 spread in the Region.

## Objective

This technical note is intended to support PAHO Member States in developing their national response toward the elimination of vertical transmission of HTLV-1 as a public health problem. It compiles evidence on interventions available to prevent MTCT of HTLV-1 and shares good practices implemented by countries within the Region as they scale up national responses to HTLV.

## Audience

This technical note is addressed primarily to national program managers and other decision-makers within ministries of health and those responsible for health policies, programs, and services at local, regional, and national level. This publication will be particularly relevant for those responsible for maternal and child health programs; HIV, hepatitis, and other sexually transmitted infections programs; and neglected infectious diseases programs. Additionally, this publication will be useful to healthcare professionals and community-based organizations, as well as potential donors and agencies funding public health initiatives.

## Methods to develop this technical note

The development of this technical note was informed by a systematic review of the literature (20), complemented by a review of good practices and current policies regarding HTLV (Box 1). A series of online consultations ensured the contribution and participation of various stakeholder groups, including patient representatives, community-based organizations, representatives of ministries of health, HTLV researchers and clinicians, and PAHO and UNICEF secretariat. The document was revised based on feedback and then critically reviewed. Additionally, an online survey about the public health response to HTLV-1 conducted by PAHO complemented the content of this document. The survey was publicly available and disseminated among national programs, healthcare workers, civil society, and academia.

### **Box 1. Human T-lymphotropic virus type 1 (HTLV-1)**

HTLV-1 is a retrovirus that causes lifelong infection in T lymphocytes. Infection is more common in communities with low human development index.

#### **Transmission**

HTLV-1 is a sexually transmitted bloodborne virus. Vertical transmission occurs mainly through breastfeeding.

#### **Diseases caused by or associated with HTLV-1**

HTLV-1 can cause multiple clinical conditions, including adult T-cell leukemia/lymphoma and HTLV-1-associated myelopathy.

HTLV-1 infection increases the risk of all-cause mortality. This chronic infection may trigger inflammation in different tissues and organs, leading to, for example, infective dermatitis, HTLV-1-associated uveitis, lung disease, and Sjögren's syndrome.

People living with HTLV-1 have higher odds of being infected with other pathogens, such as *Strongyloides stercoralis*, *Mycobacterium tuberculosis*, *Treponema pallidum*, HIV, and other sexually transmitted infections.

There is limited awareness about HTLV-1 infection.

# Interim targets and objectives for the elimination of mother-to-child transmission of HTLV-1

The vision of the EMTCT Plus initiative is to have generations free of HIV, congenital syphilis, hepatitis B, and Chagas disease in the Americas by achieving the elimination targets as follows:

- Reduction of the rate of MTCT of HIV to 2% or less;
- Reduction of the incidence of congenital syphilis (including stillbirths) to 0.5 cases or less per 1000 live births;
- Reduction of hepatitis B surface antigen (HBsAg) prevalence among 4–6-year-old children to 0.1% or less;
- ≥90% of children cured of Chagas infection with post-treatment negative serology.

The EMTCT Plus framework also establishes a well-characterized list of interventions that should be implemented at different levels of the health system. To achieve and sustain the elimination targets, countries should expand access to these interventions and meet programmatic objectives. These include access to diagnosis, treatment, and vaccination (Table 1).

In order to fully align and integrate the EMTCT of HTLV-1 into the EMTCT Plus framework, as well as to provide guidance and directions to national programs, this document suggests a set of interim programmatic objectives and impact targets. These objectives and targets are defined based on the existing evidence and reported experience, allowing for potential revisions in response to new evidence or the incorporation of innovative interventions aimed at preventing MTCT of HTLV-1.

## Interim programmatic objectives for EMTCT of HTLV-1

- >95% coverage of HTLV-1 antenatal screening.
- >90% coverage of core interventions (90% of pregnant women living with HTLV-1 informed about their options on infant feeding and nutrition and receive necessary support consistent with the decision made).
- >90% coverage of HTLV-1 testing in infants born to HTLV-1-seropositive mothers, according to the current national algorithms.

**Rationale:** Acceptance of interventions to prevent MTCT of HTLV-1 (shortening or avoidance of breastfeeding) is considered high (above 90%) (21–23). Literature is scarce, but this is reinforced by people living with HTLV-1 (19, 24). In Nagasaki, Japan, a successful program to prevent MTCT of HTLV-1 was implemented in the late 1980s, with approximately 90% of pregnant women enrolled and opting for interventions to prevent transmission. This resulted in a reduction of MTCT from 20% to 3% (25). This program was expanded and in 2010 it became a national policy (26).

## Interim impact target

- <5% of HTLV-1 mother-to-child transmission rate.

**Rationale:** Current interventions prevent 80% of HTLV-1 mother-to-child transmissions. Without intervention, approximately 20% of infants born from seropositive mothers will become infected. Less than 5% of babies born from seropositive mothers that are not breastfed are infected by HTLV-1 (20). This residual infection may happen during pregnancy or at delivery. Currently, there is no intervention to prevent infections via these routes. Therefore, it could be expected that less than 5% of infants born to seropositive mothers would be infected by HTLV-1 in a successful program.

Considering that the response to HTLV-1 in the context of maternal and child health is still incipient, countries are encouraged to consider the use of a tiered approach with intermediate objectives and targets, nationally established and adapted to the local context. This approach is aligned with the current path to elimination defined in the WHO methodology for the validation of the EMTCT of HIV, syphilis, and hepatitis B (27). The path-to-elimination approach consists of different levels of progress (bronze, silver, and gold) with specific intermediate objectives and targets. The intention is to duly recognize the efforts and progress of countries toward the achievement of elimination targets (27).

Additionally, a subnational approach focusing on hotspot areas and vulnerable populations can also be considered. An example of this approach being used is reported in Brazil, with the adaptation of PAHO/WHO validation methodology and tools for the subnational certification of EMTCT Plus. In this process, cities or states may apply for the path to elimination (bronze, silver, or gold medal), or the validation, with the diamond medal being awarded to those that achieve the elimination goals established by PAHO/WHO (28).

National programs are encouraged to adopt these approaches, as well as other context-specific strategies as they shape their HTLV responses, leveraging the structure and experience of EMTCT Plus programs.

**Table 1. Integrating HTLV-1 programmatic objectives into the EMTCT Plus framework**

Impact targets	
	<ul style="list-style-type: none"><li>• ≤2% mother-to-child transmission of HIV</li><li>• ≤0.5 congenital syphilis cases per 1000 live births</li><li>• ≤0.1% HBsAg prevalence among 5-year-old children</li><li>• ≥90% of children cured of Chagas infection with post-treatment negative serology</li><li>• &lt;5% of HTLV-1 mother-to-child transmission rate [interim target]</li></ul>
Programmatic objectives	
For all	<ul style="list-style-type: none"><li>• ≥95% coverage of antenatal care and hospital deliveries</li><li>• ≤10% of unmet family planning needs among women (15–49 years)</li></ul>
HIV	<ul style="list-style-type: none"><li>• ≥95% coverage of HIV testing of pregnant women</li><li>• ≥95% antiretroviral therapy coverage in pregnant women</li></ul>
Syphilis	<ul style="list-style-type: none"><li>• ≥95% coverage of syphilis testing of pregnant women</li><li>• ≥95% coverage of adequate syphilis treatment in pregnant women</li></ul>
Hepatitis B	<ul style="list-style-type: none"><li>• ≥95% coverage of hepatitis B vaccine birth dose (&lt;24 hours)</li><li>• ≥95% coverage of hepatitis B vaccine third dose in the first year</li><li>• ≥85% coverage of birth and third dose in all provinces [supporting target]</li><li>• ≥80% coverage of HBsAg testing of pregnant women [supporting target]</li><li>• ≥80% coverage of HBIG to exposed neonates [supporting target]</li></ul>
Chagas disease	<ul style="list-style-type: none"><li>• ≥90% testing of pregnant women</li><li>• ≥90% testing of neonates of seropositive mothers</li><li>• ≥90% treatment of seropositive mothers</li></ul>
HTLV-1	<ul style="list-style-type: none"><li>• &gt;95% coverage of HTLV-1 antenatal screening [interim target]</li><li>• &gt;90% coverage of core interventions (90% of pregnant women living with HTLV-1 informed about their options on infant feeding and nutrition and receive necessary support consistent with the decision made; i.e., replacement feeding with properly prepared infant formula, short-term breastfeeding, thermal treatment of breast milk [interim target])</li><li>• &gt;90% coverage of HTLV-1 testing in infants born to HTLV-1 seropositive mothers, according to the current national algorithms [interim target]</li></ul>

HBIG, hepatitis B immunoglobulin; HBsAg, hepatitis B surface antigen.

# Action points and good practices to address HTLV-1 transmission

The consultation process with experts, civil society, and program officers, complemented by the literature review and the online survey, allowed the identification of good practices and interventions to prevent MTCT of HTLV-1, which countries are encouraged to consider when designing and implementing their national response to HTLV-1.

This section highlights some key interventions and good practices as well as examples of implementation grouped in 10 main action points (Figure 1): awareness; training; testing; education and information; core interventions available to reduce MTCT of HTLV-1; additional support to mothers and infants; follow-up of exposed infants; surveillance; contact-tracing; closing knowledge gaps through research.

It is strongly advised to engage with people living with HTLV-1 and HTLV-1 experts when planning public health policies and interventions, strengthening the participation of the community in every stage of policy making.

**Figure 1.** Action points for the elimination of HTLV-1 mother-to-child transmission



## Action point 1: Awareness

Strategies to **increase awareness** about HTLV-1 are crucial for an effective response to HTLV-1 and to achieve the final goal to eliminate MTCT of HTLV-1 as a public health problem.

**Rationale:** There is a lack of awareness about HTLV-1 infection (29). This was confirmed by the survey conducted by PAHO (see [Annex 1](#)). On a scale of 0–10, where zero represents no knowledge at all and 10 excellent knowledge, the knowledge about HTLV-1 among the general public scored 2.8 (standard deviation = 2.6).

### Strategies:

- Include HTLV-1 in awareness activities targeting other infections (vertically transmitted infections, sexually transmitted infections (STIs), bloodborne and neglected diseases) (30).
- Stand-alone communication about HTLV-1 (see [Annex 2](#)).
- Use social media platforms.
- Include HTLV-1 web pages on governments' websites (see [Annex 3](#)).
- Target campaigns for women of reproductive age and most-vulnerable groups.
- Include this topic in meetings regarding vertically transmitted infections, sexually transmitted infections, bloodborne and neglected diseases.
- Share lived experiences of people living with HTLV-1 (24, 29).

Examples of HTLV awareness campaigns can be seen in [Annex 2](#).

### Good practice: Use of social media platforms to promote action on HTLV

Social media platforms, such as HTLV Channel and the website HTLV Consciente, are catalytic to increase awareness about HTLV-1.

HTLV Channel is a social media platform co-founded by researchers from Brazil and the United Kingdom, available on YouTube, Instagram, and Facebook. It aims to increase awareness about HTLV and to share new research findings and advances on public policies with the general public. It engages daily with people living with HTLV-1 and their family members, healthcare workers, health managers, students, and community. It also promotes collaboration between different stakeholders and organizes national and international meetings, such as the national meeting for people living with HTLV in Brazil, in collaboration with the Brazilian Ministry of Health, the patients' organization HTLVida, and the international forum on HTLV public policies, co-organized with PAHO. The Instagram account has more than 1000 posts about HTLV, and the YouTube channel has a collection of more than 100 videos, including interviews with international and national researchers, health managers, healthcare professionals, and representatives from civil society, as well as answers to frequently asked questions and awareness campaigns. Another goal of HTLV Channel is to empower people living with HTLV and increase their representativeness. An e-book was produced to share lived experiences of people living with HTLV-1 with the public.

HTLV Consciente is a website created by a group of researchers and patients' representatives from Argentina, Australia, Brazil, and the United Kingdom. In this website it is possible to find information about HTLV and its associated diseases in Spanish. An English version is also



available (HTLV Aware). HTLV Aware and HTLV Consciente can also be found on X (formerly Twitter). The main audience is people living with HTLV and those who care for them. Examples of awareness materials can be seen in [Annex 2](#).

Ministries of health and international organizations should also take advantage of their social media platforms. The Brazilian Ministry of Health has been producing regular campaigns to mark national HTLV day and the international World HTLV Day. In addition, they have included HTLV-1 in campaigns targeting sexually transmitted infections that are published on their social media accounts (see [Annex 2](#)).

## Action point 2: Training

**Training of healthcare workers** is essential to guarantee that they can support women to make an informed decision regarding strategies to prevent MTCT of HTLV-1.

**Rationale:** Many healthcare professionals are not aware of HTLV-1 infection or do not have accurate information; therefore, they cannot offer proper counseling and care to those living with HTLV-1. This has been confirmed by patients' representatives. The survey revealed that respondents considered the knowledge of healthcare providers a weakness, with a mean score of 3.9 (standard deviation = 2.0) on a scale of 0–10, where zero represents no knowledge at all and 10 excellent knowledge.

### Strategies:

- Prepare and disseminate clinical guidelines for prevention, diagnosis, and care of people living with HTLV (with HTLV-1-associated diseases and asymptomatic infection) for pregnant women and exposed infants (31–33).
- Include HTLV in training courses for healthcare professionals as part of general training for other diseases and as stand-alone training materials.
- Leverage online platforms and technologies for a wider audience (see [Annex 3](#)).
- Develop informative campaigns and materials targeting healthcare professionals, particularly in primary health care (see [Annex 2](#)).
- Ensure the inclusion of HTLV-related topics in the program of national and international scientific and health conferences and meetings.

### Good practice: Online training in Argentina

A collaborative project led by researchers from the Institute of Biomedical Research in Retroviruses and AIDS (INBIRS) in Argentina, in collaboration with the Hemocentro Foundation and researchers from Chile, Colombia, and Uruguay and representatives from civil society, has been providing complimentary online training on different aspects of HTLV-1 infection, targeting healthcare workers and program managers.

## Action point 3: Testing

The elimination of MTCT of HTLV-1 requires the identification and diagnosis of all pregnant women living with HTLV-1. Antenatal **testing** includes a screening test, followed by confirmation by western blotting, line immunoassay, or nucleic acid amplification test (NAAT) in reactive samples (Figure 2).

**Rationale:** HTLV-1 screening tests have a high sensitivity (usually considered 100%). A confirmatory test is needed to ensure accurate diagnosis and to discriminate between HTLV-1 and HTLV-2. Currently, no single laboratory test can provide a definitive diagnosis. The diagnostic algorithm varies in different countries.

Screening tests are based on the detection of antibodies to HTLV-1 in blood by immunoassays, such as ELISA and chemiluminescence. Confirmatory tests may detect specific antibodies to different HTLV-1 proteins (western blotting or line immunoassay) or detect (or quantify) HTLV-1 provirus DNA integrated into the host cell genome (NAAT). Point-of-care tests are under development and will be a valuable addition to improve testing coverage (34, 35). Minimally invasive sampling techniques such as use of dried blood spots and oral fluid sampling have been suggested to increase testing uptake (36–38), but there is no commercially available assay validated for such samples. In order to increase the positive predictive value of the testing, some algorithms include serial testing at the screening stage (39). Universal HTLV-1 antenatal screening is cost-effective in settings where this has been assessed (Brazil and Japan) (40, 41). Where prevalence is low, pooled testing can be considered (42, 43).

There is no evidence or specific recommendation on when during pregnancy pregnant women should be tested for HTLV-1. Considering the need for confirmatory testing and counseling and in line with other antenatal screening programs, a single HTLV-1 test can be offered at the first antenatal visit, as early as possible. If there is a risk of exposure to HTLV-1 during pregnancy (e.g., sexual partner with HTLV-1 infection, sex work, use of injecting drugs, diagnosis of sexually transmitted infection during pregnancy) additional tests could be considered (Box 2). This strategy should also be adapted according to local prevalence and incidence of HTLV-1 infection. Women without testing results at delivery can be offered a test. Some countries and milk banks recommend screening of milk donors for HTLV-1 infection as a strategy to prevent transmission to infants (44–49).

The Region of the Americas has a high coverage of HTLV-1 screening in blood banks, but testing is seldom available in the antenatal setting. A stepwise process for the implementation of antenatal screening, prioritizing regions or communities with high prevalence of HTLV-1 infection, was considered appropriate by experts.

### Box 2. Additional strategies to prevent HTLV-1 transmission

#### Prevention of bloodborne HTLV-1 infection

If a blood unit contaminated by HTLV-1 is transfused, the risk of infection is estimated to be 63%.<sup>1</sup> Screening of blood donors is one of the main strategies to prevent HTLV-1 dissemination, and this policy is implemented by most countries in the Americas, reaching an overall coverage of 90% of blood units in the Region tested for HTLV-1 annually.<sup>2</sup> Blood units with reactive samples are discarded, and HTLV-1 infection is a reason for permanent deferral of blood donors. Although a screening test alone may be sufficient to guarantee the safety of the blood donation, a confirmatory test is essential to guarantee accurate diagnosis for the blood

## **Box 2. Additional strategies to prevent HTLV-1 transmission (*continued*)**

donor. HTLV-1 confirmatory tests are seldom available in the Region. This was confirmed by experts, who pointed out that there is limited or no support for newly diagnosed individuals in blood banks in most countries. Donors who test positive should be informed about the results and linked to clinical care.

Leukoreduction significantly reduces the risk of HTLV-1 transmission via blood transfusion and can be done as part of the strategy to reduce the risk of transmitting HTLV-1 and other bloodborne pathogens.

Screening of organ and tissue donors for HTLV-1 is also an important strategy. Data indicate that risk of transmission and early onset of HTLV-1-associated diseases following infection via organ transplantation is high: 40% of patients infected via renal transplantation developed HTLV-1-associated myelopathy (HAM) within four years.<sup>3,4</sup>

Harm reduction strategies targeted to people who inject drugs will benefit the control of HTLV-1 spread within this population. HTLV-1 transmission during self-flagellation rituals was reported,<sup>5</sup> and additional harm reduction interventions could be considered in communities where these practices are part of their culture.

### **Prevention of HTLV-1 sexual transmission**

Sexual transmission is an important route of HTLV-1 infection. Male-to-female transmission is more common than female-to-male. Prevention of sexual transmission has been focusing on the use of male and female condoms during sex. Leveraging the response to HIV, an integral approach including biomedical, socio-behavioral, and structural interventions would benefit the prevention of HTLV-1 sexual transmission. Strategies to reduce stigma and improve access to care are good practices and should include HTLV-1 and those living with the virus.

Offering HTLV-1 screening for people attending sexual health clinics and for individuals exposed to or infected with other sexually transmitted infections is an important strategy to be considered. The survey revealed that HTLV-1 is included in the sexually transmitted infections program in half of the participating countries. Trinidad and Tobago is testing all people living with HIV for HTLV infection as part of its national HIV program.<sup>6</sup>

The use of pre- and post-exposure prophylaxis (PrEP and PEP) in preventing HTLV-1 transmission, particularly with integrase inhibitors, shows promising results *in vitro*<sup>7,8,9</sup> but requires further investigation to define its potential as an intervention.

### **Counseling and contact tracing**

Every individual living with HTLV-1 should receive information about the virus and strategies to prevent transmission. Offering testing for sexual partners, children, parents, and siblings is good practice. About 40% of sexual partners and family members of an index case are found to be positive.<sup>10,11</sup>

## Box 2. Additional strategies to prevent HTLV-1 transmission (continued)

### Notes:

1. World Health Organization. Human T-lymphotropic virus type 1: technical report. Geneva: WHO; 2021. Available from: <https://iris.who.int/handle/10665/339773>.
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**Figure 2. Rationale for inclusion of HTLV-1 screening in antenatal care**

Setting	Management	Public health concern
<ul style="list-style-type: none"> <li>• Antenatal care</li> </ul>	<ul style="list-style-type: none"> <li>• Screening pregnant women for HTLV-1 at first antenatal care visit</li> <li>• Repeat test at third trimester if there is risk of infection during pregnancy</li> <li>• Screening women without testing results available at delivery</li> <li>• Confirmatory test on reactive samples</li> </ul>	<ul style="list-style-type: none"> <li>• HTLV-1 can be transmitted to babies, particularly during breastfeeding</li> <li>• Mothers that go undiagnosed may transmit to partners</li> <li>• Delayed diagnosis of HTLV-1-associated diseases</li> </ul>

### Strategies:

- Define and disseminate national algorithms and guidelines for testing (screening and confirmation) of HTLV (31–33).
- Provide training to laboratory staff on HTLV testing and diagnostics.
- Leverage deployed capacity to increase access to HTLV testing. Consider using the know-how and system available for blood donor screening and the HIV/STI laboratory network.
- Piggyback on other screening programs offered during pregnancy.
- Ensure availability and procurement of supplies and equipment to accelerate access to testing and diagnosis of HTLV.

### Good practice: Universal HTLV screening in pregnant women in Saint Lucia

The Ministry of Health of Saint Lucia has implemented a national program to prevent MTCT of HTLV-1. The program is integrated into the maternal and child health program and the EMTCT Plus initiative. Pregnant women are tested for HTLV-1, and replacement feeding with properly prepared infant formula is recommended for seropositive women. As part of the policy, complimentary formula is offered for mothers living with HTLV-1 who cannot afford it, as a piggyback strategy on the HIV program. Surveillance data on HTLV-1 antenatal screening are generated in parallel with other infections included in the EMTCT Plus initiative. HTLV-1 testing is also offered as part of the screening for sexually transmitted infections (19).

### Action point 4: Education and information

It is important to provide adequate **information for pregnant women** living with HTLV-1 and to ensure linkage to care. Mothers living with HTLV-1 need to have adequate information to understand about HTLV-1, its consequences for their health, how it is transmitted, and strategies to prevent transmission. This will allow these women to make an informed decision on feeding strategies. It is also important to link them to care for detailed assessment to identify signs or symptoms of HTLV-1-associated diseases and to receive integrated care.

**Rationale:** Women who receive information on HTLV-1 and strategies to reduce the risk of MTCT feel empowered (50–52). This allows them to make informed decisions and increases adherence to interventions and care. Early detection of symptoms and signs allows early treatment of HTLV-1-associated diseases. Early treatment is usually associated with better outcome or delayed disease progression.

### Strategies:

- Define a clear line of care with referral and counter-referral pathways (consider telementoring and telemedicine).
- Capacity-building of healthcare professionals.
- Consider support from a civil society organization and peer counseling.
- A patient’s leaflet developed in collaboration between representatives of civil society and specialists is useful to support the process of decision-making.
- Dissemination of information to healthcare workers and community is essential.

A list of key points to consider when providing information to pregnant women living with HTLV-1 is available in [Annex 4](#) of this publication.

## Action point 5: Core interventions available to reduce MTCT of HTLV-1

**Replacement feeding with properly prepared infant formula** should be encouraged for women living with HTLV-1 in settings where this intervention is acceptable, feasible, affordable, sustainable, and safe (AFASS).

**Rationale:** Replacement feeding with properly prepared infant formula is an effective strategy to prevent MTCT of HTLV-1, avoiding approximately 80% of infant infections. This is recommended policy to prevent infant infections by HTLV-1 in most countries, including Brazil, Canada, Chile, Colombia, Japan, Saint Lucia, United States of America, and Uruguay (20).

When exclusive formula feeding does not meet AFASS criteria, **short-term breastfeeding** is an alternative, ideally for up to three months.

**Rationale:** Exclusive formula feeding is the most effective intervention to prevent transmission; however, it may not be AFASS. In such situations, short-term breastfeeding could be considered an alternative to reduce the risk of HTLV-1 transmission. Breastfeeding for up to six months doubles the risk of MTCT of HTLV-1 compared to exclusive formula feeding (53). Long-term breastfeeding increases the risk of HTLV-1 transmission and therefore should be discouraged. Breastfeeding for up to three months did not increase the risk of HTLV-1 transmission compared to exclusive formula feeding. However, data included in the study were mainly from Japan, and there is a need to consider that other risk factors may impact transmission. Some known risk factors are:

- If the mother has HTLV-1-associated disease (e.g., leukemia, myelopathy, infective dermatitis);
- High maternal proviral load (where test is available);<sup>1</sup>
- Mothers who have had a previous child with HTLV-1 infection;
- Mothers coinfecting with *Strongyloides stercoralis*;<sup>2</sup>
- Immunocompromised mothers.

Experts agree that it is plausible that mixed feeding may increase the risk of MTCT of HTLV-1, as seen for HIV. Therefore, if mothers opt for short-term breastfeeding it is suggested that babies be exclusively breastfed during that period.

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<sup>1</sup> There is no defined threshold established to determine the risk of MTCT of HTLV-1, and it would depend on the assay used. Data show that high proviral load is associated with increased risk of vertical transmission.

- Ureta-Vidal A, Angelin-Duclos C, Tortevoye P, Murphy E, Lepère JF, Buigues RP, et al. Mother-to-child transmission of human T-cell-leukemia/lymphoma virus type I: Implication of high antiviral antibody titer and high proviral load in carrier mothers. *Int J Cancer*. 1999;82(6):832–836. Available from: [https://doi.org/10.1002/\(SICI\)1097-0215\(19990909\)82:6<832::AID-IJC11>3.0.CO;2-P](https://doi.org/10.1002/(SICI)1097-0215(19990909)82:6<832::AID-IJC11>3.0.CO;2-P).
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<sup>2</sup> Pregnant women living with HTLV-1 should be tested for *S. stercoralis* and be treated if positive. Rationale: People living with HTLV-1 have higher risk of developing severe strongyloidiasis and to fail anthelmintic treatment. Mothers coinfecting with *S. stercoralis* had higher odds of transmitting HTLV-1 to their babies.

- Ye L, Taylor GP, Rosadas C. Human T-Cell Lymphotropic Virus Type 1 and *Strongyloides stercoralis* Co-infection: A Systematic Review and Meta-Analysis. *Front Med (Lausanne)*. 2022;9:832430. Available from: <https://doi.org/10.3389/fmed.2022.832430>.
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Thermal treatment of milk (**freezing and thawing**) may be effective to reduce transmission of HTLV-1. However, the acceptance of this intervention is low and usually results in short-term duration. This strategy also needs to be AFASS.

**Rationale:** Literature shows that freezing and thawing milk may be effective to reduce transmission due to the inactivation of infected cells. This intervention was previously recommended in Japan. However, data from Japan indicate that acceptance is low (21, 22) and duration is usually short. Patients need to have access to clean water, freezer, instruments to feed the baby, and need to be able to properly clean materials used to prepare the milk.

Additional interventions that have been proposed include pre-labor cesarean section, early clamping of the umbilical cord, and antiretroviral medicines. The rationale for pre-labor, pre-rupture of membranes cesarean section is that this avoids the placental inflammation and maternofetal blood mixing of the labor process (54). It is biologically plausible that this can also be protective in HTLV-1 infection, but a risk–benefit analysis is required. Although very limited, the data are supportive of cesarean section. Early clamping of the umbilical cord is recommended in Brazil (55). Care should be taken to avoid contact between maternal and infant blood during labor and perinatally. Promising data show that integrase inhibitors successfully prevent cell-to-cell transmission in vitro (56–58). Studies, however, are needed to determine their effectiveness to prevent MTCT.

There is no information in the literature on advice regarding family planning to serodiscordant couples. Childbearing decisions may be challenging in this setting. Thus, an integral support is needed. The clinical guideline from the Brazilian Ministry of Health recommends home artificial insemination or to refrain from using condoms during the fertile period, if the woman is seropositive. If the male is seropositive, semen washing followed by artificial insemination is recommended (33). There is also a recommendation in Brazil to test semen donors for HTLV-1/2 (59). It is good practice to offer HTLV-1 screening and information at the pre-conception stage, during family planning.

Policies to prevent HTLV-1 vertical transmission must be patient-focused. This involves shared decision-making between healthcare professionals and mothers living with HTLV-1. In this process, healthcare workers play an important role in improving patient-centered communication and shared decision-making, by listening actively, assessing a patient's understanding of all aspects of HTLV-1 infection and options to reduce the risk of vertical transmission, and communicating empathy (verbally and nonverbally). The patient's autonomy in making the decision regarding strategies to prevent transmission must be respected.

### **Good practice: An interprogrammatic approach to accelerate the response to HTLV in Brazil**

The Brazilian Ministry of Health has been calling attention to HTLV-1 via different platforms, including social media campaigns, information on its website, printed materials distributed to primary healthcare units, and publication of manuscripts in peer-reviewed journals (30, 60–64). Civil society has been playing a vital role in the response to HTLV in the country (65). The inclusion of representatives of people living with HTLV-1 in the committee established by the Ministry of Health for articulation with civil society groups on HIV/AIDS, tuberculosis, hepatitis, and sexually transmitted infections represents an important achievement (66).

An online training course on HTLV-1 was prepared by the Ministry of Health and is freely available (see [Annex 3](#)). The Ministry of Health has been implementing workshops across Brazilian states on HTLV-1, targeting healthcare professionals working in the HIV program and civil society organizations focusing on HIV and key populations.

A clinical guideline for the management of HTLV-1 commissioned by the Ministry of Health is available. In Brazil, cabergoline (to prevent lactation) and complimentary formula are offered to mothers living with HTLV-1, as a piggyback strategy on the HIV program (33, 62).

The elimination of MTCT of HTLV-1 is a goal of the Healthy Brazil Program, led by the Committee for the Elimination of Tuberculosis and Other Socially Determined Diseases in Brazil (67). The Committee is composed of 14 ministries and aims to promote intersectoral actions to support efforts for the elimination of multiple diseases (68, 69). This was recognized as an important step in the response to HTLV-1 in the country and to ensure that political commitment is sustained. Subnational certification of the elimination of MTCT of HTLV-1 is planned to start soon. This will be integrated in the subnational certification process for the elimination of MTCT HIV, syphilis, hepatitis B and Chagas disease (28). The Brazilian Committee for Health Technology Assessment (CONITEC) has approved universal antenatal HTLV-1 screening in the public health system (70). The notification of HTLV-1 infection in pregnancy will be compulsory in the country (71).

## Action point 6: Additional support to mothers and infants

It is good practice to provide **free infant formula milk** and medicine (e.g., cabergoline) to stop lactation for mothers living with HTLV-1 who opt for exclusive formula feeding or short-term breastfeeding.

**Rationale:** Socially vulnerable populations are disproportionately affected by HTLV-1 (15, 16). Costs associated with replacement feeding can be prohibitive (52). To reduce costs some mothers may do inappropriate dilution of the infant formula, resulting in inadequate preparation of the replacement feeding (72). The provision of complimentary formula will facilitate adherence and will help to ensure that exclusive formula feeding is AFASS.

### Strategies:

- Prepare clinical guidelines for healthcare professionals, including distribution of formula (ensure timely access and consider social issues; e.g., other demands, such as children from a previous pregnancy).
- Piggyback on and leverage existing replacement feeding programs for newborns exposed to HIV.
- Guidance for mothers on how to prepare replacement infant feeding.
- Dissemination of information to healthcare workers.
- Use of vouchers to increase access to formula.
- Consider support from a civil society organization and peer support.
- Support from social care services.
- Additional support for equipment including bottles, hygiene supplies, safe water, etc.

### Good practice: Guidance and information on HTLV in Colombia

Information about HTLV-1 can be found on the website of the Ministry of Health and Social Protection of Colombia. On this website, they recommend testing pregnant women from high-endemic areas, such as Bogotá, Nariño, Cauca, Valle del Cauca, Chocó, Antioquia, La Guajira, Cesar, Amazonas, Córdoba, and Putumayo. In 2022, a comprehensive guideline was published regarding diagnosis and management of HTLV-1/2 infection and its associated diseases in the country (31). A recommendation to avoid breastfeeding can also be found on the website (73).



## Action point 7: Follow-up of exposed infants

Testing **infants** born from seropositive mothers should be considered. **Follow-up** to verify if transmission has occurred is important. Algorithms for the diagnosis of HTLV-1 infection among infants are heterogeneous and vary across countries and services, but regardless of the methodology applied, those with early life infection should undergo detailed clinical evaluation to identify potential early signs or symptoms of HTLV-1-associated diseases, in particular infective dermatitis or signs of juvenile HTLV-1-associated myelopathy (HAM)<sup>3</sup>. Nutritional support may be needed.

Rationale: Follow-up of exposed babies is important to assess if MTCT has occurred. Diagnosis of HTLV-1 status is also essential to provide timely information to ensure adolescents and young people can make informed decisions. Delaying diagnosis beyond infancy reduces the likelihood of eventual diagnosis.

Virtually all exposed babies born from seropositive mothers have anti-HTLV-1 antibodies at birth. Passively transferred anti-HTLV-1 antibodies gradually decline and those babies who are infected with HTLV-1 seroconvert later (74). In Japan, follow-up of exposed babies is done by testing for anti-HTLV-1 antibodies at 3 years of age. NAAT may be considered for the diagnosis of HTLV-1 infection in infants during follow-up; however, there are no data on the accuracy of such tests in infants, and sensitivity and specificity may vary according to the methodology used. Long-term follow-up of newborns with a positive NAAT result on cord blood revealed that some infants were not infected with HTLV-1. Therefore, evidence shows that testing cord blood using NAAT is not useful for diagnostics (75, 76). More research is needed about the laboratory follow-up of the exposed child.

In addition, more information on vaccine response in children living with HTLV-1 is needed. Emerging data indicate that vaccine response in adults living with HTLV-1 may be impaired; for example, with lower levels of antibodies produced after vaccination for SARS-CoV-2 (77, 78). Currently, no evidence is available to determine the response of children living with HTLV-1 to this and other routine vaccines in the childhood immunization calendar. Nonetheless, all children exposed to HTLV-1 should receive the recommended vaccines and complete their vaccination schedule in a timely manner.

### Strategies:

- Develop clinical guidelines for follow-up of exposed infants and pediatric patients living with HTLV-1.
- Capacity-building of child health programs for the follow-up of exposed babies.

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<sup>3</sup> Although HAM usually manifests in adulthood, juvenile cases have been reported. Rare cases of adult T-cell leukemia in infants have also been reported.

- Rojas Cerón CA, et al Signs and symptoms of human T-lymphotropic virus 1 and 2 infections in paediatric patients. *Trop Med Int Health*. 2023;28(6):432–441. <https://doi.org/10.1111/tmi.13879>.
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## Action point 8: Surveillance

A **surveillance**, monitoring, and evaluation system should be considered to monitor HTLV-1 infection in pregnant women and exposed babies and the performance of interventions regarding programmatic objectives and targets for HTLV-1.

**Rationale:** A surveillance system is beneficial to better understand HTLV-1 distribution among pregnant women and exposed babies and essential to monitor the coverage and performance of interventions to prevent MTCT of HTLV-1. Data may also facilitate optimization of strategies to deliver the policy. The system should ideally be integrated within or build upon the existing health information system.

### Strategies:

- Surveillance and reporting of HTLV-1 cases in the context of antenatal and maternal and child health.
- Piggyback on existing information systems (EMTCT Plus, antenatal care and maternal and child health, HIV/STI).
- Review and adapt tools and instruments to integrate HTLV-1 surveillance.
- Define a set of programmatic and impact indicators, with clear targets to monitor the national response and progress.
- Training healthcare workers.

## Action point 9: Contact tracing

The identification of a pregnant woman living with HTLV-1 provides an **opportunity to identify other family members living with this virus**, particularly children born from previous pregnancies, her mother, and sexual partners. Family aggregation is usually high in HTLV-1 infection. Following a positive test of a pregnant woman, voluntary HTLV-1 testing for her family members can be considered. Care must be taken to avoid causing additional stress to these families. Provision of informative and communication materials allows people living with HTLV-1 to encourage testing among family members.

**Rationale:** As family aggregation is high (56, 79–83), targeted testing of family members would facilitate the identification of people living with HTLV-1, optimizing the use of economic resources, further reducing transmission, and linking people living with HTLV-1 to care.

### Good practice: Guidance and surveillance driving actions in Chile

A clinical guideline for the management of HTLV-1 commissioned by the Ministry of Health is available in Chile. The guideline includes recommendations for the testing and diagnosis of HTLV-1 infection and recommends replacement feeding with properly prepared infant formula for mothers living with HTLV-1. For those situations where replacement feeding is not possible, breastfeeding for three months is recommended (32).

Chile has established decentralized blood donation screening for HTLV-1, with a centralized center providing confirmatory testing. This platform can be used to offer HTLV testing to pregnant women. Surveillance of HTLV-1 infection is done using data from the central laboratory, and an Epidemiological Bulletin was published in 2021 (84). The data have been used to identify areas with higher endemicity and to guide pilot activities to prevent MTCT of HTLV-1.

## Action point 10: Closing knowledge gaps through research

Despite the increasing evidence on HTLV-1 prevention and care, knowledge gaps and pending questions remain. Nonetheless, the evidence, information, and experiences already available indicate that it is possible to advance with public policies to prevent HTLV-1 and that the elimination of vertical transmission of HTLV-1 as a public health problem is feasible. The implementation and expansion of programmatic interventions may offer pathways to address some of these unanswered questions, as part of **operational research programs**.

The topics below have been identified as some of the key knowledge gaps that are expected to improve prevention and the care of people living with HTLV-1:

1. Strategies to improve delivery and coverage of interventions, including testing and diagnosis and interventions to reduce the risk of transmission.
2. Optimization of diagnostic methods: development of a point-of-care test, self-sampling, or minimally invasive methods to facilitate sample collection and improve coverage; development of low-cost confirmatory tests; standardization and commercialization of molecular assays; development of external laboratory quality control for HTLV-1 diagnostic tests; optimization of diagnostic algorithms (for pregnant women and exposed babies).
3. Better understand the impact of HTLV-1 on pregnancy outcome and infant health.
4. Cost-effectiveness studies on antenatal screening and interventions.
5. Development of novel interventions to prevent MTCT that would allow safe breastfeeding.
6. Assess risks and benefits of interventions such as cesarean section and antiretroviral medicines (particularly integrase inhibitors) in preventing MTCT.

### Good practice: Developing tools to support national programs – cost-effectiveness model

An editable tool to assess the cost-effectiveness of a program to prevent MTCT of HTLV-1 was developed in a Brazil–United Kingdom collaboration and is freely available (40). This is a mathematical model in an Excel spreadsheet. Those who are interested in assessing the cost-effectiveness of a program to prevent HTLV-1 vertical transmission can edit the data to populate the model using local information. The tool will automatically calculate the estimated number of infant infections expected to happen annually without intervention and the number of infant infections that would be averted if a program to prevent MTCT were implemented. This tool will also calculate the incremental cost-effectiveness ratio of the proposed intervention. Deterministic and probabilistic sensitivity analyses are included, and results are presented as graphs.

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# Annex 1. Survey on public health policies on HTLV-1

An online survey to collect information on the current public health response to HTLV-1 in the Region of the Americas was conducted in August–October 2023, targeted at policy makers, civil society, and healthcare workers.

In total, 97 respondents from 19 countries and territories of the Americas answered the questionnaire, including healthcare workers (64%), representatives from ministries of health (16.5%), local health managers and secretariat (19.6%), and civil society (9.3%). Half of all respondents were from Brazil.

On a scale of 0–10, awareness about HTLV-1 among the community and healthcare workers was reported as 2.8 and 3.9, respectively. Respondents from five countries and territories (Brazil, Montserrat, Paraguay, Peru, and Turks and Caicos) reported official HTLV-1 awareness campaigns, while four countries and territories (Brazil, Colombia, Saint Lucia, and Turks and Caicos) reported training for healthcare workers.

Respondents from five countries (Argentina, Plurinational State of Bolivia, Brazil, Colombia, and Panama) reported the existence of HTLV-1 civil society organizations, but only in two countries (Brazil and Colombia) was their engagement with health authorities reported. Respondents from 10 countries reported a focal point or advisor to support the national response to HTLV-1. Respondents from Argentina, Brazil, Chile, Colombia, Honduras, Mexico, Panama, Peru, Saint Lucia, and Turks and Caicos reported that HTLV-1 was included in the sexually transmitted infections (STI) program.

Regarding prevention of mother-to-child transmission, respondents from five countries reported the availability of complimentary formula and medication to stop lactation for mothers living with HTLV-1. Official HTLV-1 guidance was reported to be available in at least five countries, with three countries (Argentina, Brazil, and Colombia) having publicly funded centers for HTLV specialized care, and two (Brazil and Colombia) with funded research on HTLV. Respondents from nine countries reported that HTLV-1 surveillance was implemented but restricted to specific groups. ELISA was the screening test most reported by participants, available in 14 countries, but only seven respondents from seven countries reported the availability of confirmatory tests.

Participants also shared policies and interventions currently being considered or planned for implementation in their countries. Examples include expansion of HTLV-1 testing in some areas in Argentina; implementation of blood donor screening in the Plurinational State of Bolivia; implementation of national universal screening, a surveillance system, and a subnational approach for the elimination of mother-to-child transmission in Brazil; and updating of clinical guidelines in Chile.

In conclusion, the survey revealed that the response to HTLV-1 remains incipient. According to respondents, awareness campaigns and training opportunities for healthcare workers have been scarce. Civil society has played a limited role, and this imposes difficulties to advancing the response in the Region. Countries are encouraged to respond to HTLV by leveraging existing programs (blood safety, HIV/STI, antenatal care), promoting an integrated approach to scale up access to interventions for the screening, diagnosis, and prevention of HTLV-1 infection.

# Annex 2. Examples of awareness campaigns and information for healthcare professionals

## Awareness campaign in Argentina

**HTLV NEGATIVO** SIGNIFICA QUE NO TE INFECTASTE. TU CUERPO NO DESARROLLÓ ANTICUERPOS ESPECÍFICOS CONTRA EL HTLV Y NO TENÉS EL VIRUS.

**HTLV POSITIVO** SIGNIFICA QUE SI ESTÁS INFECTADE Y LLEVÁS EL VIRUS.

**HTLV REACTIVO O INDETERMINADO** SIGNIFICA QUE NO SE SABE, PODES HABERTE CONTAGIADO O NO, Y NECESITAS UN NUEVO ANALISIS DE SANGRE MAS ESPECIFICO PARA CONFIRMAR EL DIAGNOSTICO.

www.htlvconsciente.com  
htivargentina@gmail.com  
TW/IG: HTLV\_Argentina



## DÍA MUNDIAL DEL HTLV

10 DE NOVIEMBRE


EL VIRUS LINFOTROPICO T HUMANO, ES UN RETROVIRUS MILENARIO QUE CIRCULA EN TODA LA ARGENTINA, MAS FRECUENTEMENTE EN EL NORTE, Y SE CONTAGIA POR VÍA SEXUAL, PARENTERAL Y LECHE MATERNA.

**HTLV-1 CAUSA LEUCEMIA Y PARALISIS EN EL 10% DE LES PORTADORES.**

htivargentina@gmail.com  
TW/IG: HTLV\_Arentina  
www.htlvconsciente.com



## Awareness campaign in Brazil



**A** USAR CAMISINHA é uma RESPONSABILIDADE de TODOS.

**B** QUAIS SÃO AS PRINCIPAIS IST? - Infecção pelo HIV; - Sífilis; - Herpes genital; - Gonorreia e infecção por clamídia; - Infecção pelo Papilomavírus Humano (HPV); - Hepatites virais B e C; - Câncer de colo; - Infecção pelo HTLV.

QUAIS SÃO AS PRINCIPAIS CARACTERÍSTICAS DAS IST? - Condições; - Feridas; - Venéreas anogenitais (no ânus e órgãos genitais).

**C** Dia Mundial de Combate ao Virus HTLV

**D** 29 DE MARÇO DIA NACIONAL DO ENFRENTAMENTO DO HTLV. Você sabe o que é HTLV?

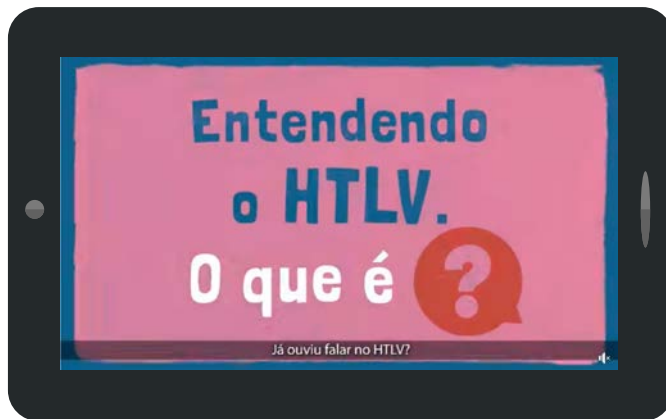
**E** 29 DE MARÇO DIA NACIONAL DO ENFRENTAMENTO DO HTLV. Conheça algumas características do vírus linfotrófico de células T humanas.

**F** Entendendo o HTLV. O que é HTLV?

FIGURE 4 | Awareness campaign about HTLV-1/2 promoted by the Brazilian Ministry of Health. (A,B) 2019 awareness campaign; (C) HTLV National day awareness campaign 2020; (D,E) HTLV National day awareness campaign 2021; (F) HTLV World Day awareness campaign 2021.

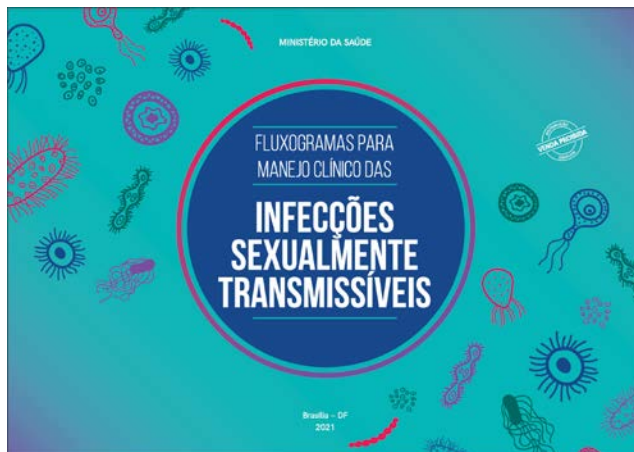
Source: Miranda AE, Rosadas C, Assone T, Pereira GFM, Vallinoto ACR, Ishak R. Strengths, weaknesses, opportunities and threats (SWOT) analysis of the implementation of public health policies on HTLV-1 in Brazil. *Front Med (Lausanne)*. 2022;9:859115. Available from: <https://doi.org/10.3389/fmed.2022.859115>

Video: Awareness campaign on social media platforms, Ministry of Health of Brazil



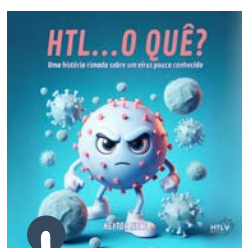
(Click to access video)

Informative material for primary healthcare workers in Brazil, Ministry of Health of Brazil



(Click to access)

Informative material for civil society: HTLV , Ministry of Health of Brazil



Informative material for civil society HTL...o que? (Portuguese)



Informative material for civil society: Know HTLV: scientific hobbies (Portuguese)



Informative material for pregnant women (Portuguese)



App about HTLV

# Annex 3. Additional resources and information on HTLV-1 infection

(click to follow links)

## International organizations

- WHO factsheet on HTLV-1 - <https://goo.su/UnBdW>
- WHO HTLV-1 technical report - <https://goo.su/UaUDoFy>
- International Health Policy Forum for the Elimination of HTLV: Advancing HTLV Health Policies around the World. Meeting Report, 10 November 2021 (PAHO) - <https://goo.su/5PHjEN>
- The Response to HTLV in the Framework of Maternal and Child Health. Meeting Report, 18 August 2022 (virtual) (PAHO) - <https://goo.su/RYP2>
- International Retrovirology Association (IRVA website) - <https://goo.su/T2EFF>

## Guidelines and guidance

- Clinical management of HTLV-1 infection (Brazil) - <https://n9.cl/qe8ng>
- Clinical protocol for patients with HTLV (Chile) - <https://n9.cl/dpq56>
- Integral clinical management of HTLV 1/2 infections and their associated diseases (Colombia) - <https://n9.cl/9iaeh>
- Revised Adult T-Cell Leukemia-Lymphoma International Consensus Meeting Report (IRVA) - <https://n9.cl/zsydk>
- Management of HAM/TSP Systematic Review and Consensus-based Recommendations 2019 (IRVA) - <https://n9.cl/dkfq1>
- Recommendations for Counseling Persons Infected with Human T-Lymphotropic Virus, Types I and II \* (Centers for Disease Control and Prevention [CDC], United States of America) - <https://n9.cl/qam77>
- Guidance on breastfeeding (Uruguay) - <https://n9.cl/ax8k9>
- Guidance on testing migrant women from high-endemic areas (United Kingdom) - <https://n9.cl/7u6e6y>
- Safe preparation, storage and handling of powdered infant formula: guidelines (WHO), 2012 - <https://n9.cl/4zqka>
- Infant Formula Preparation and Storage (Centers for Disease Control and Prevention [CDC], United States of America) - <https://n9.cl/mp980>
- Guide to bottle feeding (UNICEF, United Kingdom) - <https://n9.cl/ezx1a>

## Epidemiological bulletins

- Argentina - <https://n9.cl/uqbxm>
- Brazil - <https://n9.cl/n57vw>
- Chile - <https://n9.cl/4sxgj>

## Web pages about HTLV within ministry of health websites

- Ministry of Health and Social Protection of Colombia - <https://n9.cl/jw6w0o>
- Public Health Institute, Ministry of Health of Chile - <https://n9.cl/izz32>
- Ministry of Health of Brazil - <https://n9.cl/v100c>
- Department of HIV/AIDS, Tuberculosis, Viral Hepatitis, and Sexually Transmitted Infections, Ministry of Health of Brazil - <https://n9.cl/sesmvr>
- Public Health Agency of Canada, Government of Canada - <https://n9.cl/p305i>

## Civil society

- HTLV Channel (Instagram) – Portuguese - <https://n9.cl/5ikyq>
- HTLV Channel (YouTube) – Portuguese - <https://n9.cl/xhf2g>
- HTLVida (Instagram) – Portuguese - <https://n9.cl/ofe3g>
- HTLVida (Website) – Portuguese - <https://n9.cl/hnzt1>
- HTLVaware – English - <https://n9.cl/tbk0a>
- HTLVconsciente – Spanish - <https://n9.cl/w74qg>

## Patient information leaflet

- Patient information, National Centre for Human Retrovirology (United Kingdom) - <https://n9.cl/7ca3ui>

## Online course on HTLV

- Course on sexually transmitted infections (Chapter 11: HTLV), Ministry of Health of Brazil (available in Portuguese, Spanish, and English) - <https://n9.cl/67q5u>
- HTLV, Ministry of Health of Brazil - <https://n9.cl/c1hd2>

## Online meetings

- International Health Policy Forum for the elimination of HTLV (PAHO, Ministry of Health of Brazil, and HTLV Channel) - <https://n9.cl/f2af1>
- The response to HTLV in the context of maternal and child health (PAHO, HTLV Channel) - <https://n9.cl/6kyqt>
- The diagnosis of human T lymphotropic virus (HTLV) and strategies to expand HTLV screening in the context of maternal and child health. Meeting Report (virtual) - <https://n9.cl/jyfxa>
- National meeting of people living with HTLV-1 2022 (HTLV Channel, HTLVida, and Ministry of Health of Brazil) - <https://n9.cl/gbi2s>
- Clinical Protocol for Sexually Transmitted Infection – Chapter about HTLV, Ministry of Health of Brazil - <https://n9.cl/qx807>

## International initiatives

- National Centre for Human Retrovirology (United Kingdom) - <http://htlv.eu/>
- HOT Lives (Japan) - <https://n9.cl/ibc79>

# Annex 4. Key points to consider when providing information for pregnant women living with HTLV-1

## General information about HTLV-1

- HTLV-1 is a lifelong infection.
- HTLV-1 is transmitted via condomless sex, via blood (blood transfusion, organ donation, sharing needles, or materials with blood) and from mother to child, mainly via breastfeeding.
- HTLV-1 is not transmitted via common day-to-day contact such as hugging and kissing. HTLV-1 is not transmitted by mosquitoes.
- There is no cure for HTLV-1 infection, but clinical follow-up is important for monitoring and eventual early diagnosis of diseases that are caused by HTLV-1.
- Health professionals involved in the care of people living with HTLV-1 should be aware about their infection.

## Symptoms of HTLV-1 infection

- Many people living with HTLV-1 infection will have no symptoms of HTLV-1 infection throughout their lives. However, different diseases are caused by or associated with this infection.
- In some patients, HTLV-1 may cause a blood cancer called adult T-cell leukemia/lymphoma (ATLL). People with ATLL usually present with swollen lymph nodes, fever, and skin rash. The survival rate of ATLL is still poor, despite chemotherapy.
- Some patients living with HTLV-1 will develop a disease of the nerves, called HTLV-1-associated myelopathy, also known as HAM. Patients with HAM usually present with impaired mobility, back pain, urinary urgency, or incontinence.
- HTLV-1 can cause inflammation in different parts of the body, including the eyes, skin, and lungs.
- People living with HTLV-1 infection may have an impaired response to other pathogens and may be at risk of having coinfections.
- As symptoms of HTLV-1 are broad and may overlap or mimic other diseases, it is important to see your healthcare team regularly, so they can identify symptoms of HTLV-1-associated diseases, if present.

## How to prevent transmission

- Condom use.
- Abstain from blood and organ donation.
- Do not share sharp objects.
- Replacement feeding with properly prepared infant formula is commonly advised to reduce the risk of HTLV-1 mother-to-child transmission.



## Specific topics to consider for pregnant women living with HTLV-1

- Explain that HTLV-1 mother-to-child transmission happens mainly through breastfeeding, and exclusive replacement feeding with formula prevents 80% of infant infections.
- Elucidate the risk of residual transmission. Less than 5% of babies born from seropositive mothers may be infected even in the absence of breastfeeding. This compares to about 20% of transmission seen in breastfed infants.
- Comment that the risk of HTLV-1 transmission varies between individuals. Although we do not completely understand it yet, some risk factors that increase the chance of transmitting HTLV-1 from a mother to her baby are known. Mothers with HTLV-1-associated diseases and those with a high number of HTLV-1 infected cells (where this information is available) have an increased risk of transmitting HTLV-1 to their babies.
- Long duration of breastfeeding is associated with higher risk of HTLV-1 transmission. Therefore, those mothers who opt to breastfeed are usually advised to do it for a short period of time, ideally up to three months.
- Discuss the benefits of breastfeeding balanced with the risk of HTLV-1 transmission.
- Explain that the risk of developing HTLV-1-associated diseases is higher when infection happens early in life. This is particularly important for ATLL and infective dermatitis.
- Discuss whether replacement feeding with infant formula is affordable, feasible, accessible, sustainable, and safe in her setting.
- Stress the importance of condom use to avoid transmission to sexual partners (for serodiscordant couples).
- Offer family testing.
- Provide linkage to representatives of civil society organizations, if available, and peer support.
- Offer support (including peer support, if available).
- If mothers opt for short-term breastfeeding, additional support is needed to ensure that they can comply with the recommendation to suspend breastfeeding early.

## Replacement feeding with infant formula

- Explain how to safely prepare infant formula.
- If complimentary formula is provided as part of the local policy, explain how to access free infant formula and ensure that formula is provided in a timely manner.
- Comment on strategies to increase the bond between mothers and babies, such as the use of sling, massage, and music therapy.
- Discuss additional support that may be available for the mother and her family as part of the local policy (such as economic support, peer support, etc.)

The Pan American Health Organization (PAHO) and its Member States have committed to eliminating over 30 communicable diseases and related conditions by 2030. Central to this effort is the EMTCT Plus initiative, which aims to eliminate the mother-to-child transmission (MTCT) of HIV, syphilis, hepatitis B, and Chagas disease. Since its inception, the EMTCT Plus framework has been instrumental in supporting countries to achieve validation of the dual elimination of HIV and syphilis. By 2023, eleven countries and territories had successfully attained this milestone. Building on this success, PAHO is now expanding the scope of EMTCT Plus to include the elimination of human T-lymphotropic virus type 1 (HTLV-1). HTLV-1 is a retrovirus that causes lifelong infection and is linked to severe conditions, such as adult T-cell leukemia/lymphoma (ATLL) and HTLV-1-associated myelopathy (HAM). Vertical transmission, primarily through breastfeeding, poses a significant risk to infants, particularly in regions where HTLV-1 is endemic. Infections acquired early in life are associated with a higher risk of developing serious health complications later. This technical note aims to provide Member States with a comprehensive framework to address HTLV-1 MTCT as a public health problem. The document outlines a series of evidence-based interventions, such as awareness campaigns, testing strategies, education, and interventions designed to reduce transmission risks. Additionally, it highlights successful practices from countries within the Region that are already implementing measures to control HTLV-1 and protect at-risk populations. The publication targets decision-makers in ministries of health, healthcare professionals, and other stakeholders involved in maternal and child health, HIV, hepatitis, and sexually transmitted infections programs. By integrating HTLV-1 prevention into existing elimination frameworks, the Region of the Americas can further consolidate its leadership in the global efforts to eliminate communicable diseases, ensuring that vulnerable populations are protected from the impacts of vertical transmission and its long-term health consequences.



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