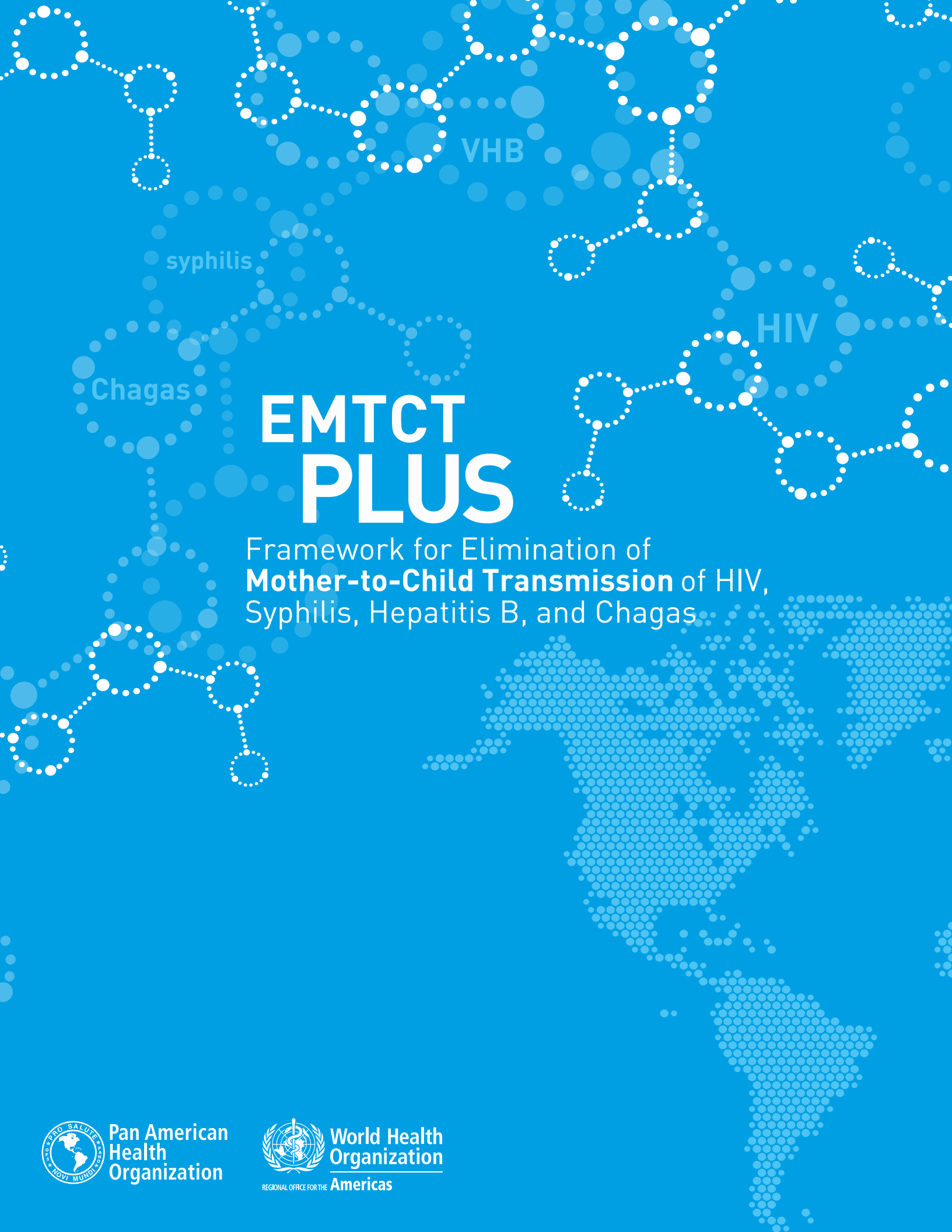

EMTCT PLUS

Framework for Elimination of **Mother-to-Child Transmission** of HIV, Syphilis, Hepatitis B, and Chagas

Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

EMTCT Plus:

Framework for elimination of mother-to-child transmission of HIV, Syphilis, Hepatitis B, and Chagas

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Table of Contents

1. Introduction

Since 2010, PAHO Member States have committed to the elimination of mother-to-child transmission (EMTCT) of HIV and syphilis in the Region, and targets were established for 2015 (Resolution CD50.R12). These commitments were renewed and expanded in 2016 through the approved *Plan of Action for the Prevention and Control of HIV and Sexually Transmitted Infections* (2016-2021), contributing to the end of AIDS and sexually transmitted infections (STIs) as a public health problem in the Americas (Resolution CD55.R5) [*1*]. The plan of action expands the EMTCT initiative (labeled "EMTCT Plus"), leveraging the maternal and child health (MCH) platform to include elimination of other preventable communicable diseases in the Americas, such as hepatitis B and Chagas disease (the latter in endemic countries).

The objective of the EMTCT Plus initiative is to achieve and sustain the elimination of mother-to-child transmission of HIV, syphilis, Chagas, and perinatal hepatitis B (HBV) as a public health threat. It embraces the principles and lines of action of the Strategy for Universal Access to Health and Universal Health Coverage [2], building upon the lessons learned from the PAHO 2010 *Strategy and Plan of Action for the EMTCT of HIV and Congenital Syphilis.*

a. Current epidemiology and response in the Region

One of the greatest public health success stories, globally and in particular in the Americas, has been the development and implementation of interventions to prevent mother-to-child transmission of HIV [3]. In 2015, an estimated 670,000 women aged 15 and over in Latin America and the Caribbean (LAC) were living with HIV, of whom an estimated 58% were receiving antiretroviral therapy (ART) (2015 data) [*4*]. ART coverage in pregnant women rose from 55% in 2010 to 88% in 2015, and the estimated mother-to-child transmission rate decreased from 15% to 8% over the same period. New HIV infections in children (0-14 years old) declined by 55% between 2010 and 2015 (from 4,700 [3,500-6,400] to 2,100 [1,600-2,900]), and an estimated 28,000 new HIV infections were averted in the same period.

In the case of syphilis, the prevalence among pregnant women in LAC varies significantly by country, ranging from 0.1% to 7.0% [5], with an estimated 63,000 infections in 2012 resulting in 14,000 adverse outcomes [6,7]. In 2015, PAHO estimated 22,800 cases of congenital syphilis and a rate of 1.7 cases per 1,000 live births in the Region. Screening for syphilis in pregnant women attending antenatal care reached 83% in 2015, and treatment of maternal syphilis stood at 84% [8,9]; however, there has been little progress over the past 5 years.

In the Americas, it is estimated that 2.8 million people (2.2-8.0 million), 2.1 million of them in LAC, live with chronic hepatitis B (HBV) infection, resulting in prevalence rates of 0.28% (0.22%-0.81%) and 0.33% (0.26%-0.95%) for the Region and LAC, respectively (2016 data). More than 13,000 deaths annually are estimated from HBV and related liver disease, including liver cancer. There were approximately 10,000 new chronic HBV infections in 2016, 56% due to perinatal transmission and the remainder to horizontal transmission in childhood. The Region is making important gains from decades-long universal HBV vaccination and catch-up campaigns [*10*], as all countries and territories include HBV vaccine in immunization schedules for children. In 2015, 89% of children under 1 year of age received the third dose of hepatitis B vaccine. Additionally, 36 of 52 (69%) countries/territories include an HBV birth dose, 22 of them as a universal vaccination policy (representing over 90% of the birth cohort of the Americas), and 14 countries and territories administer the birth dose exclusively to infants born to HBsAg-positive mothers. Birth-dose vaccination coverage in 19 reporting countries and territories with a universal birth-dose vaccination policy was 83% in 2015. Finally, several studies in the Region have shown decreases in HBsAg levels among children and young people in recent decades [*11-13*].

Approximately 65 million people in the Americas live in areas of exposure to Chagas disease and are at risk of contracting the disease. About 6 to 7 million people worldwide, a high proportion of whom reside in Latin America, are estimated to be infected with *Trypanosoma cruzi*. The prevalence of Chagas disease in pregnant women in Latin America ranges from 0.3% to 40%, depending on geographical area, and approximately 1.12 million women of childbearing age are estimated to be infected with the parasite (2010 estimate). The incidence of congenital *T. cruzi* infection is estimated to be at least 15,000 cases per year in Latin America. While other routes of transmission are decreasing in importance, congenital transmission has become proportionately more relevant, accounting for about one-third of new infections in 2010. As MCH services do not routinely screen mothers or newborns for Chagas in endemic areas, the disease in pregnancy and newborns may be underestimated. The rate of perinatal transmission is estimated to vary from 4% to 10% [*14,15*].

Since the early 1990s, the countries affected by Chagas disease have committed to providing a public health response with support from PAHO. This has generated a horizontal technical cooperation scheme among countries that has led to important achievements in Latin America: substantial reductions in transmission by domestic vectors including elimination of certain vector species, implementation of universal screening of blood donors for Chagas disease, increased coverage of and capacities for diagnosis and treatment of

congenital cases of Chagas, and increased coverage of diagnosis and access to treatment [*16*].

b. Linkages with global and regional strategies

The EMTCT Plus initiative spans the following global strategies and regional plans of action and targets (*Box 1*):

- *Sustainable Development Goals* (SDGs), in particular Goal 3 to ensure health and well-being for all, including reproductive, maternal, and child health; communicable and noncommunicable diseases; universal health coverage; and access for all to safe, effective, quality, and affordable medicines and vaccines. Three relevant targets of Goal 3 are as follows: 1) ending epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combating hepatitis, water-borne diseases, and other communicable diseases by 2030; 2) ensuring universal access to sexual and reproductive health care services, including services related to family planning, information, and education, and integrating reproductive health into national strategies and programs by 2030; and 3) reducing the global maternal mortality ratio to less than 70 per 100,000 live births by 2030 [*17*].
- *The Global Strategy for Women's, Children's and Adolescents' Health* (2016-2030) envisions a world in which all women, children, and adolescents in all settings realize their rights to physical and mental health and well-being, have social and economic opportunities, and are able to participate fully in shaping sustainable and prosperous societies. This global strategy supports the three targets of SDG Goal 3 [*18*].
- *The WHO Global Health Sector Strategies on HIV, STIs, and Viral Hepatitis 2016-2021* outline the pathway towards ending AIDS and eliminating STIs and viral hepatitis as major public health threats by 2030. The strategies define impact and service coverage targets for 2020 and 2030, including elimination of mother-to-child transmission of HIV, hepatitis B, and syphilis, to be achieved through recommended actions undertaken by WHO and its Member States [*19-21*].
- *The PAHO Plan of Action for the Prevention and Control of Viral Hepatitis (2015)* focuses on developing and implementing coordinated public health policies and interventions aimed at eliminating hepatitis B and C in PAHO Member States by 2030. It includes expansion of HBV vaccination coverage, such as timely birth doses and third doses for infants and expanded "catch-up" vaccinations for adults and youth at higher risk of infection. As of 2015, 8 out of 35 Member States (26%) had set the goal of elimination of hepatitis B [22].
- *The PAHO Plan of Action for the Elimination of Neglected Infectious Diseases and Post-Elimination Actions (2016-2022)* addresses the elimination of 13 diseases in the Americas, including Chagas [23]. In addition, the *PAHO Strategy and Plan of Action for Chagas Disease Prevention, Control, and Care (2010)* includes the specific objective of supporting implementation

of secondary prevention of congenital Chagas. It recognizes that reducing mother-to-child transmission of Chagas requires *T. cruzi* screening for pregnant women as part of universal prenatal care as well as monitoring, diagnosing, and treating all newborns of infected mothers [*24*].

- *The Plan of Action on Immunization (2016-2020)* recommends that all countries in the Region achieve at least 95% of the third dose of HBV vaccine in infancy. This plan of action is also aligned with the 2009 WHO position paper on hepatitis B vaccines, which encourages all countries to include a birth dose of hepatitis B vaccine for all newborns within the first 24 hours. By the end of 2016, 22 countries and territories in the Region had done so [*25-27*].

Box 1.
Targets of the regional plans of action*

Rate of mother-to-child transmission (MTCT) of HIV:

Target: 2% or less by 2020 [Baseline: 8% (2015)]

Incidence of congenital syphilis (cases/1,000 live births)

Target: 0.5 or less by 2020 [Baseline: 1.7 (2015)]

Number of countries with goal of elimination of mother-to-child transmission of hepatitis B

Target: 5 by 2019 [Baseline: 1 (2012)]

Number of countries that maintain high HBV coverage (95% or above) as part of the routine childhood vaccination schedule (below 1 year of age)

Target: 25 by 2019 [Baseline: 17 (2015)]

Number of countries that have included immunization of newborns against HBV within the first 24 hours in their vaccination programs

Target: 25 by 2019 [Baseline: 22 (2015)]

Number of endemic countries and territories where the entire endemic country or territory, or the endemic territorial subdivision, has a domestic infestation index of less than 1%

Target: 21 by 2022 [Baseline: 17 (2016)]

Number of endemic countries that have achieved the goal of elimination of Chagas disease and have developed and put in place measures to prevent disease resurgence or reintroduction

Target: 16 by 2022 [Baseline: 9 (2016)]

**Based on PAHO regional plans of action*

2. Vision, Goal, and Targets of the EMTCT Plus Initiative

The vision of the EMTCT Plus initiative is to have a generation free of HIV, congenital syphilis, hepatitis B, and Chagas disease.

The overarching goal of the regional initiative is to eliminate mother-to-child transmission of HIV, syphilis, Chagas, and/or perinatal hepatitis B in the Americas by 2020. Elimination targets are 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 1,000 live births;**
- **Reduction of HBsAg prevalence among 4- to 6-year-old children to 0.1% or less;**
- **≥90% of children cured of Chagas infection with post-treatment negative serology.**

In order to achieve and sustain these goals, the following programmatic objectives must be met and maintained:

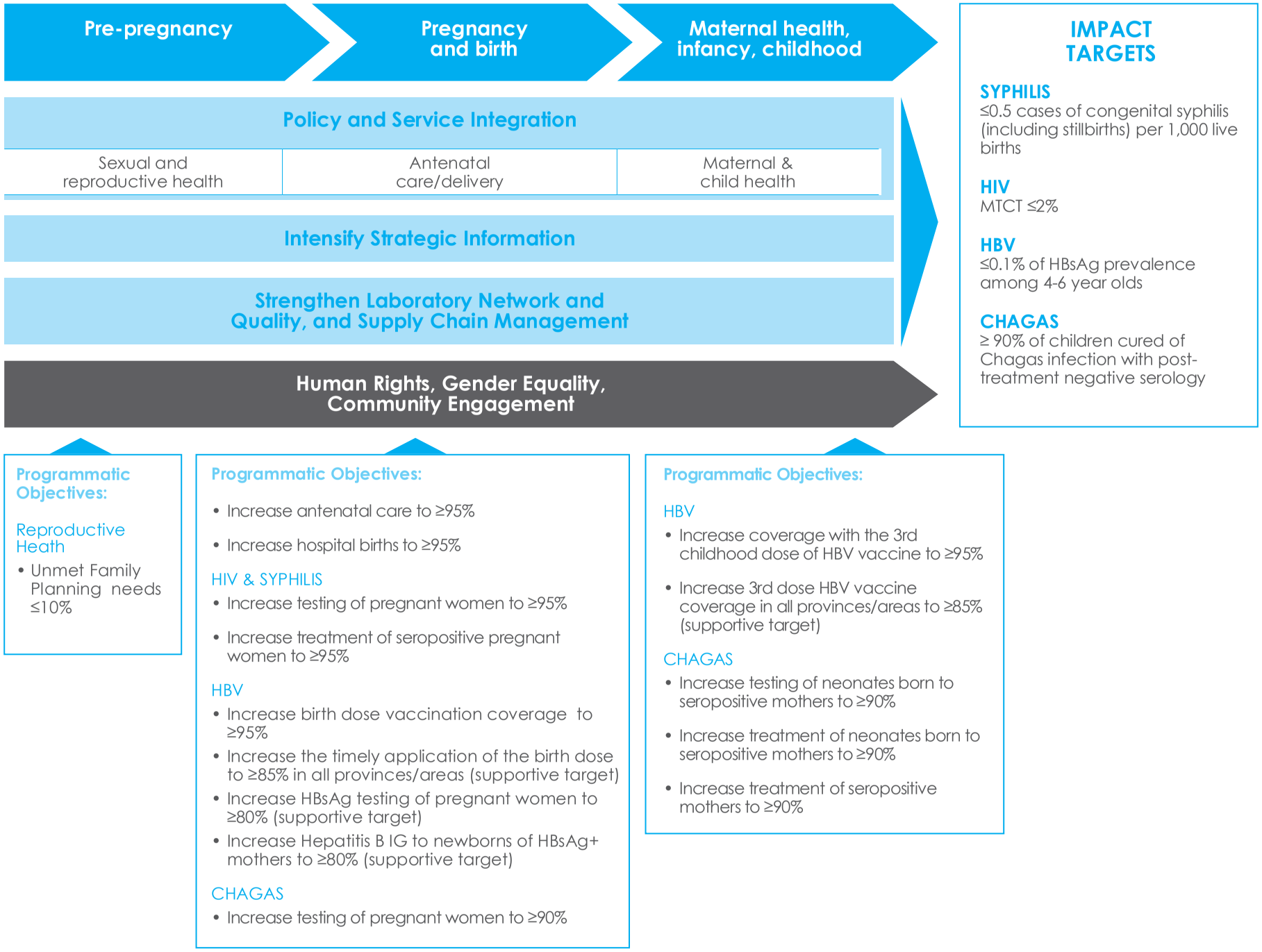
Sexual and Reproductive Health / Mother-Child Health	• Decrease unmet family planning needs to 10% or less among women (15-49 years old) • Increase coverage of antenatal care and hospital deliveries to 95% or more
HIV and syphilis	• Increase coverage of HIV and syphilis screening among pregnant women to 95% or more • Increase coverage of adequate HIV and syphilis treatment among pregnant women to 95% or more
Hepatitis B	• Increase coverage of timely birth-dose vaccination against HBV (≤24 hours) to 95% or more • Increase coverage of third-dose vaccination against HBV in childhood to 95% or more • Increase coverage of timely birth-dose and third-dose vaccination for hepatitis B in all provinces or areas to more than 85% (*supporting target*) • Increase HBsAg testing coverage among pregnant women to 80% or more (supporting target) • Increase provision of HBV-specific immunoglobulin (HBIG) to neonates with HBV-infected mothers to 80% or more (*supporting target*)
Chagas	• Increase testing of pregnant women to 90% or more • Increase testing of neonates with seropositive mothers to 90% or more • Increase treatment of seropositive mothers to 90% or more

3. The EMTCT Plus Conceptual Framework

In 2015, Cuba became the first country in the world to be validated by WHO for having attained the goal of dual elimination [*28*], followed in 2016 by four countries and territories (Thailand, Belarus, Anguilla, and Montserrat). Also in 2016, Armenia and the Republic of Moldova reached the global elimination targets for HIV and syphilis, respectively [29]. In addition, several other countries and territories in the Caribbean have applied to be validated and are currently under the evaluation process. Key elements identified as substantially contributing to EMTCT of HIV and syphilis are 1) a strong political commitment at the highest levels associated with robust interprogrammatic planning and implementation of the national plan for dual elimination; 2) integration of PMTCT into MCH services; 3) quality follow-up and monitoring of mothers and children through strong health information systems able to capture programmatic targets in a timely manner; and 4) accessible quality-assured diagnostic services for HIV and syphilis and, when appropriate, use of point-of-care technology [*30*]. Furthermore, public health approaches promoted by WHO based on the principles of simplification, standardization, decentralization, equity, patient and community participation, and optimal use of available human resources have guided the planning and implementation of the successful EMTCT strategy in the Region *[31]*. The EMTCT Plus initiative is built upon these lessons learned.

Prevention of perinatal HBV, as well as prevention of MTCT of HIV, syphilis, and Chagas, requires sequential interventions targeted to women prior to and during pregnancy and to mothers and their infants. The **conceptual framework** of the EMTCT Plus initiative builds on that used for the dual MTCT elimination of HIV and syphilis, and it is composed of **three lines of action** complying with the principles of human rights, gender equality, and community engagement (*Figure 1*).

Figure 1. Conceptual framework for EMTCT Plus



Box 2.
The World Health Organization's six functional aspects or "building blocks" that make up a health system [*32*]

- Effective l**eadership and governance** ensure that strategic policy frameworks exist and are combined with capable oversight, coalition building, regulation, and accountability.
- A good **health financing** system raises adequate funds for health in ways that ensure access to services and protection from financial catastrophe or impoverishment caused by medical expenses. It provides incentives for providers and users to be efficient.
- A well-performing **health workforce** is one that is competent and works in ways that are responsive, fair, and efficient to achieve the best health outcomes possible given available resources and circumstances.
- Quality **health services** deliver effective, safe, high-quality health interventions to those who need them, with minimum waste of resources.
- A well-functioning **health information system** ensures the production, analysis, dissemination, and use of reliable and timely information on health determinants, health system performance, and health status.
- A well-functioning health system ensures equitable access to **essential medical products, vaccines, and technologies** of assured quality, safety, efficacy, and cost-effectiveness and their scientifically sound and cost-effective use.

The lines of action of the framework are mutually complementary and jointly define the provision of a comprehensive set of interventions needed to prevent new infections. Each line of action incorporates the World Health Organization (WHO) health system "building blocks" (see Box 2) to strengthen the provision of effective health services along the cascade of care towards elimination of these infectious diseases.

Line of action 1: Integrate HIV/STI/HBV/Chagas interventions within sexual and reproductive health, antenatal care, maternal and child health, and family and community health policies, programs, and services

Achievement and maintenance of the EMTCT targets requires the availability of a range of quality, comprehensive, and integrated health services and guided and supported plans, policies, and programs, including:

- Sexual and reproductive health (SRH) services free of stigma and discrimination that promote primary prevention of HIV, syphilis, HBV, and Chagas (in endemic countries);
- ANC that includes routine early screening for HIV and syphilis, counseling on HBV vaccination and HBV testing when these services are incorporated in national policies, screening for Chagas in endemic areas, and appropriate care, referral, and follow-up of pregnant women and sexual partners who test positive;
- Maternal health care services that include adequate intervention at birth and follow-up and care for exposed infants, mothers, and families.

Annex 1 highlights a list of interventions within the scope of an integrated provision of care strategy as part of the EMTCT Plus initiative. Principles guiding interventions proposed in the context of EMTCT Plus must be (a) evidence-based, (b) consistent with national/regional health priorities as described in national health plans and program-specific strategies, and (c) targeted to address gaps in the coverage of interventions across the continuum of care and improve the quality of their delivery. In addition, EMTCT of HIV, syphilis, Chagas, and perinatal HBV could benefit from the provision of one-stop or point-of-care (e.g., single visits for multiple health needs) services and reductions in the number of health care visits, which would improve linkages between communities and health facilities and strengthen referral systems. Decentralization and integration of service procedures and technologies into primary health care services can also promote adherence to and retention in care.

Furthermore, achievement and maintenance of the targets require a substantial increase in service coverage, with strong efforts to include those most vulnerable to acquiring and transmitting these infectious agents, who are often excluded from mainstream health care.

An integrated and standardized focus that includes comprehensive primary health care services and a community-based approach from early antenatal visits to postnatal care has the potential to substantially improve overall mother and neonatal child health.

Greater coverage of EMTCT of HIV, syphilis, HBV, and Chagas at the primary care level could be combined with provision of point-of-care services and reductions in health care visits. In this sense, community screening through outreach teams (non-laboratory personnel) as an alternative model to expand antenatal screening for these infections and reach pregnant women unaware of their serostatus needs to be considered.

Proposed actions at the country level:

- Ensure high-level commitment to EMTCT of HIV, syphilis, and Chagas (where appropriate) as well as perinatal HBV, which should be reflected in national health plans and legislation (when appropriate);
- Ensure that policies, norms, standards, and guidelines for the prevention, diagnosis, management, and care of HIV, syphilis, Chagas, and perinatal HBV are developed/updated and linked to the MCH platform;
- Update national immunization schedules to include HBV vaccination for all neonates within 24 hours of birth;
- Establish interprogrammatic coordination and consider using a health systems perspective in planning, implementing, and monitoring the EMTCT Plus national plan of action;
- Ensure adequate human resources and training for integrated service delivery, considering task shifting as needed;
- Ensure adequate financial resources for integrated service delivery, including appropriate procurement and a robust supply chain management system;

- Consider innovative delivery systems for provision of services in hard-to-access settings;
- Promote high levels of coverage of early antenatal care (before 20 weeks of gestation);
- Ensure the availability of quality comprehensive and integrated health services, including SRH, ANC, and MCH services with the capacity to provide adequate and timely diagnosis, care, treatment, and follow-up;
- Promote reduction of stigma, discrimination, and gender-based violence faced by women living with HIV, syphilis, HBV, and Chagas infection.

The Pan American Health Organization and its partners should:

- Provide Member States with technical cooperation for the implementation of EMTCT Plus as reflected in national health plans;
- Support Member States in the adaptation and use of PAHO/WHO policies, technical guidelines, and tools related to EMTCT Plus;
- Support Member States by providing technical cooperation to improve human resources capacity for provision of integrated service delivery, including task shifting as needed;
- Support Member States in estimating and allocating the national resources required for implementation of EMTCT Plus;
- Support Member States in determining appropriate health care service delivery models based on epidemiological considerations as well as structural and health system factors at the country level;
- Provide technical cooperation to Member States to ensure access to quality, safe, and effective medicines and supplies through the PAHO Strategic Fund.

Line of action 2: Intensify strategic information on HIV, syphilis, HBV, and Chagas in maternal and child health services

This line of action highlights the need to strengthen monitoring and evaluation and surveillance systems across programmatic areas, including primary prevention, antenatal care, diagnosis and treatment, linkage and retention to care, and follow-up. The main purpose of this line is to support countries in generating information to monitor how their program is performing, to determine whether targets are being reached, and to identify gaps and challenges.

Various structures at the global and the regional and national levels have been established to monitor progress in HIV and congenital syphilis elimination while guiding and coordinating progress to validate country-level elimination once countries have reached and maintained the established goals that could be adapted to the inclusion of HBV and Chagas into the initiative. In addition, there are tools for the assessment of the structure of programs, the availability and accessibility of services, the adequacy of laboratory networks, and compliance with basic human rights and gender equality and community engagement principles. These tools allow

confirmation and documentation of the achievement of EMTCT targets for HIV and syphilis, which will require updating and adaptation to include MTCT of Chagas and perinatal HBV.

Proposed actions at the country level:

- Define national baselines and targets for the achievement of one or more diseases within the EMTCT Plus initiative;
- Consider implementing a method to estimate the prevalence of HBsAg among children aged 4-6 using mathematical models or integrated population-based surveys;
- Review and update national surveillance protocols and tools to ensure that all essential data elements for the monitoring of EMTCT Plus can be collected;
- Review and harmonize surveillance case definitions and align them with international definitions;
- Ensure that adequate systems are in place for timely collection, collation, analysis, and dissemination of local-, regional-, and national-level information and that this information is used for strategic planning;
- Introduce or strengthen national systems for monitoring of fetal death and its causes;
- Strengthen routine program monitoring at all levels to improve program and service delivery;
- Develop mechanisms for case finding and case investigation;
- Actively explore opportunities to include monitoring of primary prevention indicators in existing population-based surveys;
- Foster partnerships with private-sector organizations to facilitate data reporting;
- Document through standardized protocols and procedures the epidemiological process that will bring the country to elimination levels.

The Pan American Health Organization and its partners should:

- Provide technical cooperation for Member States to strengthen routine program monitoring at all levels for the improvement of its implementation and service delivery
- Provide technical cooperation for Member States to define national baselines and targets for the achievement of one or more diseases within the EMTCT Plus initiative;
- Provide technical cooperation for Member States on the review of national surveillance protocols and tools to ensure that all essential data elements for the monitoring of EMTCT Plus can be collected;
- Ensure technical support for adoption of international case definitions;
- Provide technical cooperation for Member States on the analysis and use of

EMTCT-related monitoring data for strategic planning and improvements in program and service delivery;

- Provide technical cooperation for Member States on the development, implementation, or inclusion of primary prevention indicators in population-based surveys;
- Provide guidance for Member States on documenting the epidemiological process that will bring the country to elimination levels through standardized protocols and procedures.

Line of action 3: Improve the laboratory network and quality and supply chain management

A national reference laboratory system that ensures high-quality services and provides support to lower-level laboratories is critical for implementation of the elimination strategy. It is essential that tests are available at the most appropriate level of services and that high-quality testing—regardless of level—is assured. Clearly defined national guidance outlining the roles and responsibilities of different levels of laboratories, as well as development of and adherence to standard operating procedures that are appropriate to the level of the laboratory, is also essential. Additionally, laboratories must adhere to standard operating procedures, including internal and external quality assurance and proficiency testing.

Reliable and affordable supplies of commodities are also critical for the operational efficacy and success of the EMTCT Plus framework. They affect the quality of services, and their availability and cost can influence uptake of services. An effective commodity management system must be in place to ensure accessibility of drugs and commodities, both at the service delivery level and in referral services.

Proposed actions at the country level:

- Strengthen the national laboratory network to provide quality-assured diagnostics for HIV, syphilis, HBV, and Chagas disease;
- Develop and/or update guidelines defining roles and responsibilities of laboratories at different levels and standard operational procedures appropriate to each level;
- Review and optimize testing practices to minimize the time needed for diagnoses and introduce point-of-care testing where feasible and appropriate;
- Review testing practices to ensure adequate screening algorithms;
- Update infant diagnosis practices to ensure early and efficient diagnoses;
- Strengthen procurement systems to ensure uninterrupted availability of testing supplies;
- Ensure accuracy of test results (including performance evaluations of HBV rapid tests) through establishment of effective oversight measures, including appointment of quality officers, oversight, proficiency testing, and other

quality control measures, at all levels of the laboratory network and at the point of care (non-laboratory settings);

- Implement training of laboratory staff in appropriate testing procedures, including adhering to internal and external quality assurance and proficiency testing.

The Pan American Health Organization and its partners should:

- Support Member States in developing and/or updating laboratory guidelines, diagnostic algorithms, and standard operational procedures;
- Provide technical cooperation for strengthening procurement systems to ensure uninterrupted availability of testing supplies;
- Support Member States in introducing proficiency testing and other quality control measures at all levels of the laboratory network and at the point of care (non-laboratory settings).

Cross-cutting actions: Human rights, gender equality, and community engagement

The EMTCT Plus framework reflects the unwavering commitment of PAHO/WHO to the principles of *human rights, gender equality, and community engagement*. Integration of human rights into the framework implies the guarantee of freedom of choice and protection of autonomy, confidentiality, and informed consent equally—and to all—at all times.

Gender equality considerations are particularly pertinent in the context of mother-to-child transmission of HIV and syphilis, since gender norms and practices can significantly shape the enjoyment of sexual and reproductive health and rights of women and health outcomes for their children. Promoting and ensuring gender equality can significantly influence the opportunities of women and girls to access necessary information and services, make decisions about their sexuality and reproduction, and protect themselves against STIs.

In addition, engaging affected people has many benefits and helps to ensure that women access and remain in care and obtain the treatment they need to keep themselves and their children well. This involvement should be multidimensional and should include the policy-making process, program development and implementation, advocacy, and service delivery.

Annex 1. EMTCT Plus interventions at different levels of the health system

ADOLESCENCE AND PRE-PREGNANCY

- Information, education, and communication campaigns within EMTCT Plus on prevention of infections
- Family planning, including facilitated access for female and male adolescents without legal barriers, and promotion of male involvement
- Offering of HIV and syphilis testing, implementation of partner testing, notification, and assurance of linkage to care
- Prevention of and protection from gender-based violence
- Prevention and management of STIs
- Vaccination of adolescents not previously vaccinated as part of the official immunization schedule
- Diagnosis and treatment of *T. cruzi*-infected girls and women of childbearing age

PREGNANCY

- Increased early access to antenatal care
- Management of unintended pregnancies
- Appropriate provision of ANC packages, including promotion of male involvement
- Prevention of and protection from gender-based violence
- Routine serological screening for HIV and syphilis as well as Chagas disease and hepatitis B (HBsAg) when part of national policy
- Counseling on the importance of timely HBV birth-dose vaccinations for newborns
- Vaccination against hepatitis B if women did not complete the schedule and in high-risk situations (e.g., more than one sexual partner during the previous 6 months, sexually transmitted disease diagnosis, injection drug use, partner positive for HBsAg)
- Treatment and follow-up of seropositive pregnant women with:
  - HIV: antiretroviral therapy
  - Syphilis: benzathine penicillin G[a]
  - HBV+: referral for evaluation and treatment eligibility[b]
  - HBV+/HIV+: antiretroviral therapy including tenofovir and lamivudine (or emtricitabine)[c]
- Follow-up of Chagas-seropositive pregnant women

CHILDBIRTH

- *T. cruzi* parasitological and serological screening of newborns with infected mothers
- HBV-specific immunoglobulin (HBIG) (100 IU) within 12 hours of birth (HBsAg+ women)
- Hepatitis B birth-dose vaccination: monovalent, first 24 hours
- Infants born to mothers with HIV: dual prophylaxis (AZT twice daily/NVP once daily) for first 6 weeks of life

POSTNATAL PERIOD: MOTHERS

- Easy access to family planning after delivery
- Treatment of *T. cruzi*-seropositive mothers after pregnancy (benznidazole and nifurtimox[d])
- Women tested for HBsAg: negative result = HBV vaccination (if part of national policy); positive result = referral for treatment evaluation and eligibility[b]
- HIV-positive women: ensure access to care and treatment adherence

POSTNATAL PERIOD: NEWBORNS

- HIV-exposed infants:
  - ◊ Early infant testing: PCR 4-6 weeks, with second sample if positive
  - ◊ HIV serology (rapid diagnostic tests) at 9 months (excluding HIV infection)
  - ◊ Comprehensive care of children infected with HIV
- Infants with congenital syphilis and syphilis-exposed infants[e]: treat and follow up with clinical and serological monitoring until negative[f]
- HBV-exposed infants (mother's known serology = HBsAg+): evaluate 1-3 months after completing vaccination scheme (HBsAg)
- Complete hepatitis B vaccine series (combination vaccine) in 1 year: 2, 4, and 6 months (*minimum 4-week interval between doses*)
- *T. cruzi* serology of newborns with infected mothers (at 8 months)
- Treatment of *T. cruzi*-seropositive children before 1 year of age (benznidazol or nifurtimox)[d] and clinical and serological monitoring until negative
- Immediate treatment of all newborns with positive parasitology for *T.cruzi.*

CROSS-CUTTING INTERVENTIONS

- Health information, education, and communication campaigns
- Support for social mobilization and community engagement
- Chagas disease: accelerate actions to interrupt domiciliary transmission by he principal vectors
- Chagas disease: consider serological testing of siblings of infants infected with *T. cruzi* (cluster approach)
- Syphilis and HIV: notify, test, and treat sexual partner(s)
- HBV: vaccinate children and adolescents not previously vaccinated (catch-up vaccination) as part of the official immunization schedule
- HBV testing (HBsAg) of sexual partners, children and other family members, and close household contacts with HBV infection (vaccination of those who are HBsAg negative and those not previously vaccinated)

[a]Benzathine penicillin G 2.4 million units once intramuscularly for early syphilis OR benzathine penicillin G 2.4 million units intramuscularly once weekly for 3 consecutive weeks for late syphilis or unknown stage of syphilis.
[b]All adults, adolescents, and children with chronic hepatitis B (CHB) and clinical evidence of compensated or decompensated cirrhosis (or cirrhosis based on APRI score >2 in adults). Treatment is also recommended for adults with CHB who do not have clinical evidence of cirrhosis but are more than 30 years of age (in particular) and have persistently abnormal ALT levels and evidence of high-level HBV replication (HBV DNA >20,000 IU/mL), regardless of HBeAg status. When antiviral therapy is indicated, nucleos(t)ide analogues, which have a high barrier to drug resistance (tenofovir or entecavir), are recommended.
[c]In HBV/HIV-coinfected adults, adolescents, and children aged 3 years or older, tenofovir + lamivudine (or emtricitabine) + efavirenz as a fixed-dose combination is recommended as the preferred option to initiate ART.
[d]The recommended dose of benznidazole in infants, as in adults, is 5-7 mg/kg per day; doses of benznidazole up to 10 mg/kg per day can be used in neonates and infants aged <1 year. Recommended doses of nifurtimox in neonates and infants are 10-15 mg/kg per day. The recommended duration of treatment is 60 days and should not be <30 days.
[e]Infants who are clinically normal but whose mothers had untreated syphilis, inadequately treated syphilis (including treatment within 30 days of delivery), or syphilis that was treated with non-penicillin regimens (the WHO STI guideline suggests aqueous benzyl penicillin or procaine penicillin).
[f]Aqueous benzyl penicillin 100,000-150,000 U/kg per day intravenously for 10-15 days OR procaine penicillin 50,000 U/kg per day single dose intramuscularly for 10-15 days, and testing for syphilis every 3 months up to 18 months of age.

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