
Regional Initiative
for the Elimination of Mother-to-Child Transmission of HIV
and Congenital Syphilis in Latin America and the Caribbean:

REGIONAL MONITORING STRATEGY

2nd Edition • 2013



**Pan American
Health
Organization**

Regional Office of the
World Health Organization



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Latin American Center for Perinatology
Women and Reproductive Health - CLAP/WR



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ACRONYMS

AFASS	Acceptable, feasible, affordable, sustainable, and safe
AIDS	Acquired Immune Deficiency Syndrome
AIS	AIDS Indicators Survey
ANC	Antenatal care (prenatal care)
ARVs	Antiretrovirals
ARVT	Antiretroviral therapy
CLAP/SMR	Centro Latinoamericano de Perinatología y Salud de la Mujer y Reproductiva / Latin American Center for Perinatology and Women's and Reproductive Health
CS	Congenital syphilis
DPT3	Trivalent diphtheria-pertussis-tetanus vaccine
ECS	Elimination of congenital syphilis
HIV	Human immunodeficiency virus
IM	Intramuscular
LAC	Latin America and the Caribbean
L&D	Labor and delivery
M&E	Monitoring and evaluation
MCH	Maternal and child health
MDG	Millennium Development Goal
MTCT	Mother-to-child transmission of HIV (vertical transmission)
NGO	Nongovernmental organization
NTT	Non-treponemal test
NVP	Nevirapine
PAHO	Pan American Health Organization
PCR	Polymerase chain reaction
PMTCT	Prevention of Mother-to-Child Transmission of HIV
PNC	Prenatal care (antenatal care)
RPR	Rapid plasma reagin
SA	Sensitivity analysis
SRH	Sexual and reproductive health
STI	Sexually transmitted infection
TM	Traditional midwife
TPHA	<i>Treponema pallidum</i> hemagglutination assay (test for syphilis)
TPPA	<i>Treponema pallidum</i> particle agglutination assay (test for syphilis)
TT	Treponemal test
UA	Universal Access
UN	United Nations
UNAIDS	United Nations Joint Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
UNICEF	United Nations Children's Fund
VDRL	Venereal disease research laboratory
WHO	World Health Organization

1. Introduction



In September 2010, at the 50th Directing Council of the Pan American Health Organization (PAHO), Member States approved the Strategy and Plan of Action for the Elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in the Americas by 2015 (1). PAHO and the United Nations Children’s Fund (UNICEF) have developed strategies for advancing towards the elimination of mother-to-child transmission of human immunodeficiency virus (HIV) and congenital syphilis (CS). PAHO has been monitoring progress as well as guiding and coordinating processes to validate country-level elimination once countries have reached and maintained the established goals. To date, great progress has been made in the Region of the Americas in implementing the Regional Initiative for the Elimination of the Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean (hereafter referred to as the “Regional Elimination Initiative”). Five countries have reported figures that meet the elimination targets for mother-to-child transmission of HIV, and as many as 11 may have reached it for CS (2).

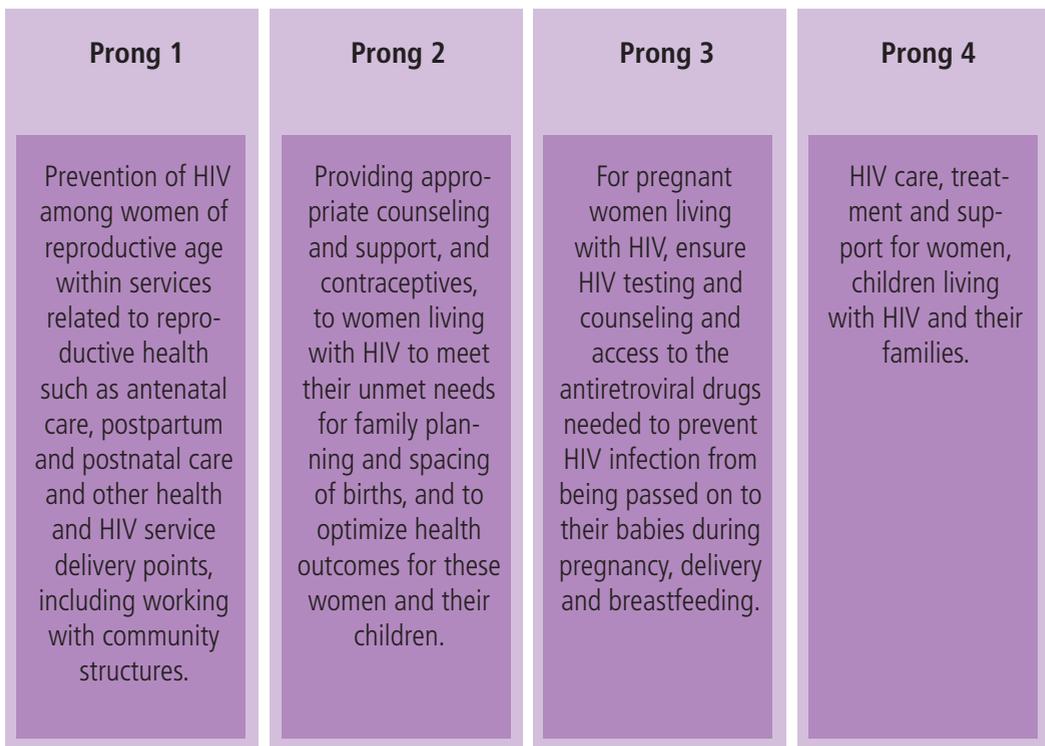
This integrated strategy specifies complete and coherent surveillance, with surveillance and monitoring and evaluation (M&E) systems in place at the country level—all of which allow for measuring progress made towards elimination. In order to support and guide the countries in these processes, the *Regional Monitoring Strategy* (3) was published in 2010, thus laying the foundation for validating elimination processes in the region.

At the global level, in 2011 the international community adopted two new documents:

1. The *Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive 2011–2015* (4) (hereafter referred to as the “Global Plan”), thus making a commitment to eliminating mother-to-child transmission of HIV (MTCT) by 2015.
 2. *Methods for surveillance and monitoring of congenital syphilis elimination within existing systems* (5).
-

With a view to achieving this goal of eliminating mother-to-child transmission of HIV by 2015, the Global Plan bases its strategy on a “broader four-pronged strategy” (Figure 1.1).

Figure 1.1 Four-pronged implementation framework of the *Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive 2011-2015*



“This Global Plan places new emphasis on improving health outcomes for mothers and children, This is a shift from the previous emphasis on expanding the coverage of service for preventing mother-to-child transmission. The new emphasis on outcomes requires a corresponding shift in the focus of monitoring and evaluating of efforts for prevention mother-to-child transmission of HIV (6).”

Furthermore, new scientific data have recently emerged that have called for making adaptations in the global recommendations on a more strategic use of antiretrovirals. Regarding to the prevention of mother-to-child transmission (PMTCT) of HIV, WHO has proposed Option B+¹ as an effective alternative for PMTCT that may offer greater benefits for maternal health; and in the general population, it may also prevent sexual transmission and new HIV infections and additionally provide important advantages in terms of programming and operations. It is anticipated that progress made along these lines will subsequently act as a catalyst for modifying policies and programs for both PMTCT and antiretroviral therapy (ART)(7).

The document *Methods for surveillance and monitoring of congenital syphilis elimination within existing systems* (5) integrates the four pillars announced in the Global Plan for the Elimination of Congenital Syphilis (8):

- I. Ensure sustained political commitment and advocacy.
- II. Increase access to, and quality of, maternal and newborn health services.
- III. Screen all pregnant women and treat all positives.
- IV. Surveillance, monitoring and evaluation systems.

In order to strengthen global surveillance and achieve comparable results between regions and countries, the WHO document recommends the use of three core indicators commonly defined for the elimination of congenital syphilis (ECS) by all regions and countries. Additionally recommends ECS-specific maternal and child health (MCH) indicators, selected routine MCH indicators as well as special study indicators to be obtained periodically (see Box 1.1) (5).

¹ Option B+ proposes providing the same triple ARV drugs to all HIV-infected pregnant women beginning in the antenatal clinic setting at the moment of their diagnosis regardless of CD4 count, but also continuing this therapy for all of these women for life. Source: World Health Organization (WHO). *Use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants: programmatic update*. Geneva: WHO; 2012. http://www.who.int/hiv/pub/mtct/programmatic_update2012/en/. Last accessed on 11 February, 2013.

Box 1.1 Summary of WHO Global indicators for monitoring and evaluation of efforts to eliminate congenital syphilis (5)**Core ECS indicators**

1. Testing of antenatal care attendees for syphilis at first visit.
2. Positive syphilis serology in pregnant women.
3. Treatment of syphilis-seropositive pregnant women.

Additional ECS-specific indicators

4. The rate of congenital syphilis.
5. Treatment of infants born to syphilis-seropositive women.
6. Treatment of sexual partners of syphilis-seropositive pregnant women.
7. The existence of a national congenital syphilis policy.
8. Antenatal care clinics routinely testing for syphilis.
9. Stock-out of syphilis testing materials.
10. Stock-out of long-acting intramuscular penicillin.

Routine MNCH indicators that are useful for ECS

11. Antenatal care coverage.
12. Early antenatal care.
13. Stillbirth rate.

Special study indicators

14. Estimated proportion of all syphilis-infected pregnant women who receive treatment by 24 weeks' gestation.
15. Proportion of stillbirths attributable to maternal syphilis.

Source: World Health Organization (WHO). Methods for surveillance and monitoring of congenital syphilis elimination within existing systems. Geneva: WHO; 2011.

As a result, the need to align the Regional Elimination Initiative with the strategy of the Global Plan and the reference document for the Elimination of Congenital Syphilis—coupled with the importance of recent innovations and scientific data, as well as lessons learned in the region from implementing and monitoring the Regional Elimination Initiative—all justify reviewing and updating the methodological document for the Regional Monitoring Strategy used by the Regional Elimination Initiative.

The present document constitutes the revised second edition of the aforementioned methodological document. Among the modifications, nine key indicators to monitor regional progress in eliminating mother to child transmission of HIV and congenital syphilis were introduced and classified according to the four prongs cited in Figure 1.1.

Like the previous edition, this document is targeted at the people in charge of National HIV/ Acquired Immune Deficiency Syndrome (AIDS) and Sexually transmitted infection (STI) Programs, those in charge of maternal and child health programs, and monitoring and evaluation (M&E) specialists in Latin America and the Caribbean (LAC). It provides a set of recommended core indicators that should be present in the countries' health information systems. A reference guide accompanies each indicator, which presents structured descriptions and an interpretation for that indicator, as well as detailed information on measurement, data source, and frequency. These common definitions and methods will allow for monitoring regional progress and making comparisons over time and among different countries.

This document:

1. provides the recommended set of indicators for monitoring regional progress made by the countries towards eliminating mother-to-child transmission (MTCT) of HIV and congenital syphilis (CS);
 2. facilitates the end use of data and indicators for program planning and evaluation;
 3. allows for comparisons of progress made towards the elimination goal both over time and among countries; and
 4. provides key elements for validating the elimination of MTCT of HIV and CS.
-

2. Monitoring the Regional Initiative



The main objective is to assess the progress made in eliminating congenital syphilis and mother-to-child transmission of HIV in the countries of Latin America and the Caribbean. Clarifying and standardizing a core nucleus of recommended indicators for the Regional Elimination Initiative will help strengthen information systems. This, in turn, will lead to full utilization of data and indicators in program planning and evaluation processes. This includes appropriate assessment of the magnitude of both syphilis and HIV among pregnant women, the magnitude of congenital syphilis, and the effectiveness of PMTCT interventions.

Common indicators will enable comparisons among countries and regions over time and as well as global alignment, thus contributing to increased visibility of advances made in the region in a globalized context. These will also show how the LAC region can take on a leadership role in terms of progress made towards eliminating mother-to-child transmission of HIV and CS.

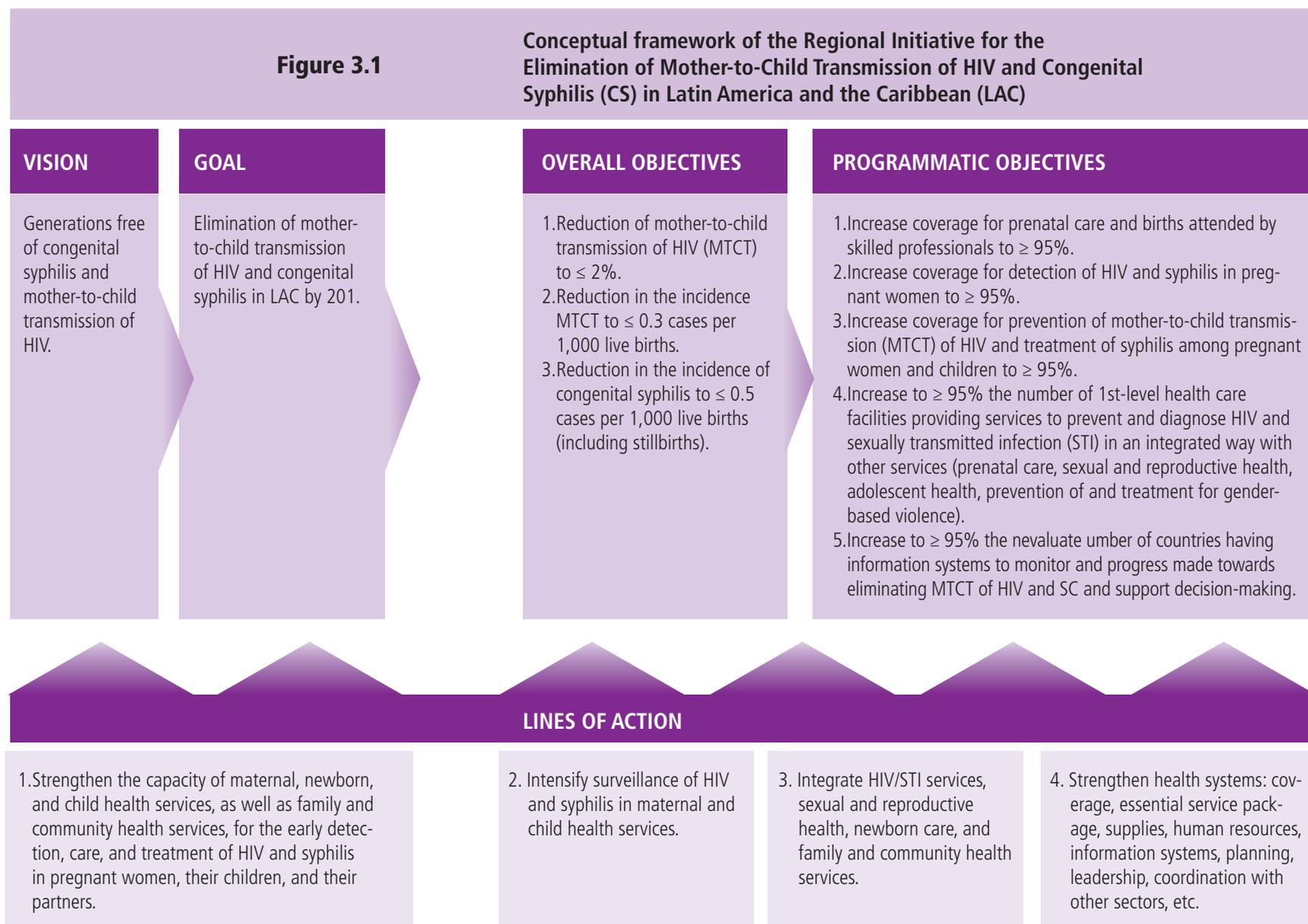
This Regional Monitoring Strategy lays the foundation for future validation processes in the region. PAHO will provide support to the countries in their monitoring efforts, along with guidance on how to present annual reports. On a yearly basis, PAHO will make efforts to collect regional data, assess the situation, and identify gaps and areas in need of improvement. Such elements as analysis, interpretation, and sharing lessons learned among countries at both the regional and subregional levels will be important for monitoring and evaluating progress made. They will also provide evidence for informed decision-making on how best to gear programs towards achieving the goals of the Regional Elimination Initiative.

3. Goals and indicators



The **overall goal** of the Regional Initiative for the Elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean is to eliminate mother-to-child transmission of HIV and congenital syphilis in Latin America and the Caribbean by 2015. The **impact indicators** are the following (see Figure 3.1):

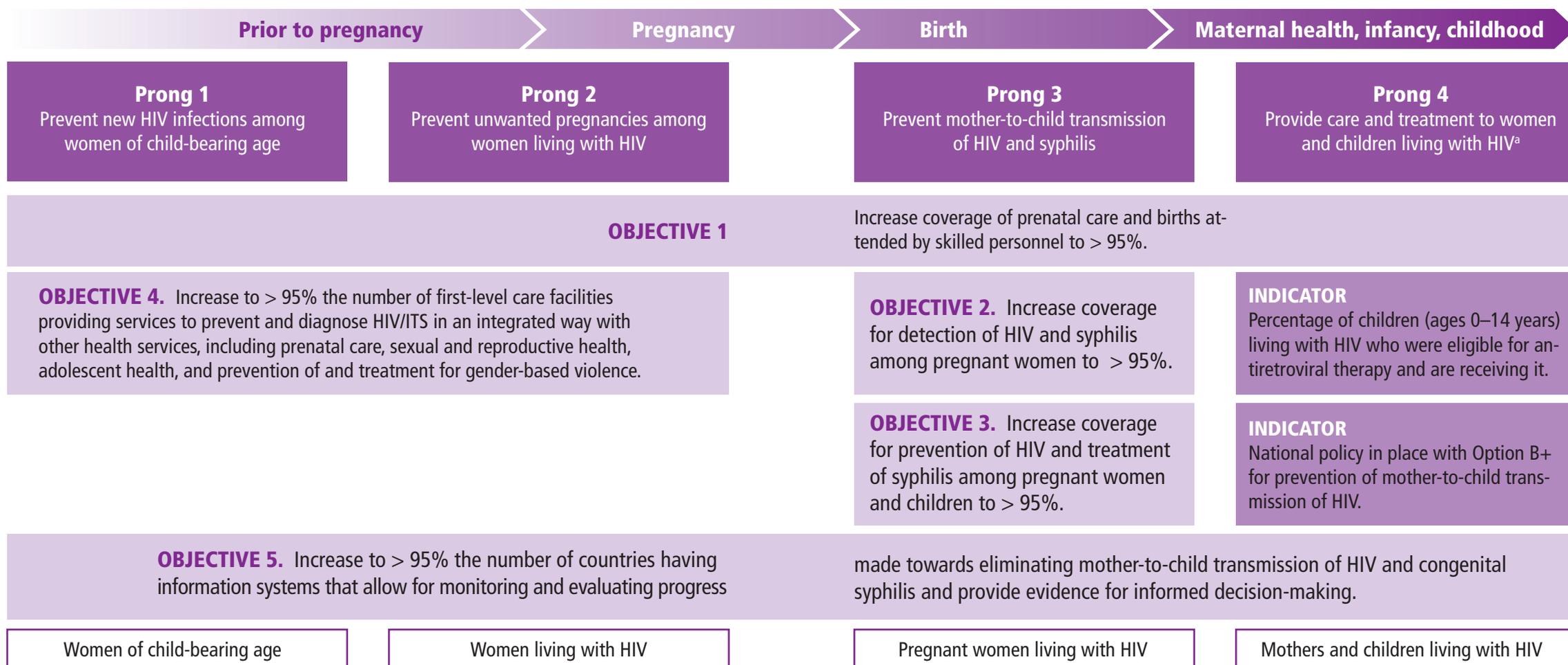
1. The rate of mother-to-child HIV transmission will be reduced to 2% or less.
2. Incidence of mother-to-child transmission of HIV will be reduced to 0.3 cases or less per 1,000 live births.
3. Incidence of congenital syphilis (including stillbirths) will be reduced to 0.5 cases or less per 1,000 live births.



A series of principal achievements will need to be fulfilled before the aforementioned targets can be met; these are known as “key programming objectives”. Figure 3.2 below shows how these programming objectives correlate with the four prongs of the Global Plan.

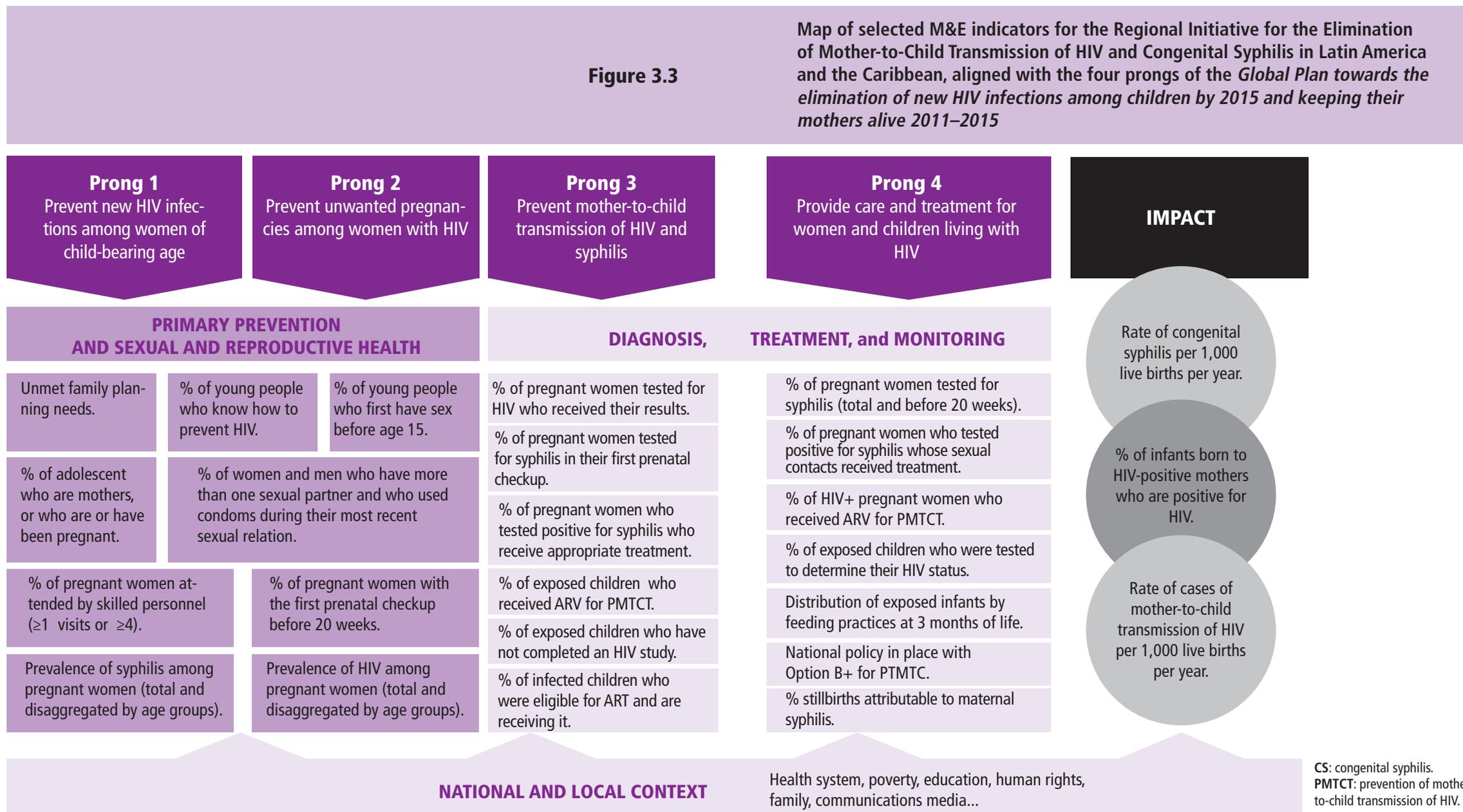
Figure 3.2 Correlation of the programming objectives of the Regional Initiative for the Elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean with the four prongs of the *Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive 2011–2015* and with the life cycle

^a There are new key indicators that monitor Prong 4. Also maternal, newborn, and child health programs all monitor care for women and children. Their results are also useful for monitoring progress made in eliminating mother-to-child transmission of HIV and congenital syphilis: for example, infant mortality and maternal mortality.



Aligning the Regional Elimination Initiative with the strategy contained in the *Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive 2011–2015* (4) and with the document *Methods for*

surveillance and monitoring of congenital syphilis elimination within existing systems (5), involves introducing 9 new key indicators. Figure 3.3 below maps the indicators. These are classified in relation to the four prongs of the Global Plan (5).



1. Impact indicators

The following Tables 3.1 and 3.2 summarize the impact indicators and the key monitoring indicators of the Regional Elimination Initiative.

Table 3.1 Impact indicators^a

Indicator	Numerator	Denominator	Comments
1. Impact indicators			
1.1 Rate of congenital syphilis per 1,000 live births per year	Number of reported cases of congenital syphilis (CS) according to the national case definition ^b in the defined year	Estimated number of live births within the same time frame	PAHO will calculate this indicator on the basis of the United Nations methodology for estimated live births
1.2 Reported rate of mother-to-child transmission of HIV: percentage of new infections among infants born to mothers living with HIV, who tested positive for HIV ^c	Number of infants born to mothers living with HIV, in a defined calendar year, who were diagnosed as positive	Reported number of infants born, in a defined calendar year, to mothers living with HIV	Among breastfed infants, testing should take place 6 weeks after breastfeeding stops
1.3 Annual rate of reported cases of mother-to-child transmission of HIV per 1,000 live births ^c	Number of children born, in a defined calendar year, to mothers living with HIV, who were diagnosed as positive	Estimated number of live births within the same defined calendar year	PAHO will calculate this indicator on the basis of the PAHO methodology for estimated live births. Among breastfed infants, testing should take place 6 weeks after breastfeeding stops

Notes:

^a The period suggested for monitoring these indicator per calendar year.

^b The national case definition should include stillbirths due to syphilis.

^c For calculations of indicators 1.2 and 1.3, data should be triangulated with other methodologies. Validating the elimination of mother-to-child transmission calls for the use of data from information systems based on registries and special studies. However, countries can also use other sources to corroborate the validity of their information, such as estimates using UNAIDS Spectrum/EPP.

2. Key monitoring indicators

There are 22 recommended essential indicators, which are summarized in Table 3.2. Furthermore, there is also an additional new indicator. The period recommended for monitoring progress at the regional level is by calendar year, with both the numerator and the denominator, whenever applicable, referring to that same defined year. However, countries can opt to evaluate shorter time periods, depending on their information systems.

Table 3.2 Key and additional regional monitoring indicators for the Regional Initiative for the Elimination of the Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean

Indicator	Numerator	Denominator	Comments
2. Indicators related to primary prevention and sexual and reproductive health			
2.1 Unmet family planning need	Number of women (either married or living in a consensual union) who are pregnant or in postpartum amenorrhea, and whose pregnancies are unwanted—as well as women of child-bearing age who want to stop having children or delay motherhood for at least two years, who are undecided as to whether to have another child or when, and who are not using any contraceptive method	Number of women of child-bearing age (15–49) who are either married or in living in a consensual union	Goal 5, Target 5.B of the Millennium Development Goals (MDGs)
2.2 Percentage of adolescents (ages 15–19) who are mothers, or who are or have been pregnant	Number of adolescents ages 15–19 interviewed who stated that they have been pregnant at some point in time (that they have given birth at some point, are pregnant with their first child, or have had an abortion, miscarriage, or stillbirth)	Total number of adolescents ages 15–19 who were interviewed	
2.3 Percentage of young people ages 15–24 who correctly identified ways to prevent sexual transmission of HIV and rejected the main myths on its transmission	The number of interviewees ages 15–24 who responded correctly to questions on HIV transmission	Number of respondents ages 15–24	

Indicator	Numerator	Denominator	Comments
2.4 Percentage of young people ages 15–24 who had their first sexual relations before age 15	Number of respondents (ages 15–24) who stated that they had their first sexual relations before age 15	Number of respondents ages 15–24	
2.5 Percentage of women and men ages 15–49 who had sex with more than one partner over the past 12 months and who used condoms during their most recent sexual relations	Number surveyed (ages 15–49) who stated that they had more than one sexual partner over the past 12 months and who used a condom during their last sexual relations	Number of respondents (ages 15–49) who stated that they had more than one sexual partner over the past 12 months	
2.6 Percentage of pregnant women seen by skilled health workers during prenatal period	Number of pregnant women who have received prenatal care (PNC) by trained health workers during any given year, disaggregated by number of visits: <ul style="list-style-type: none"> • At least 1 visit • Four or more visits 	Estimated number of pregnant women / number of live births over the past 12 months	
2.7 Percentage of pregnant women who had their first prenatal care checkup before 20 gestational weeks	Number of pregnant women who had their first prenatal care checkup with trained health workers before 20 gestational weeks, during any given year	Estimated number of pregnant women / number of live births over the past 12 months	
2.8 Prevalence of HIV in pregnant women, total and disaggregated by age groups: <ul style="list-style-type: none"> • 15-24 • >24 	Number of pregnant women who tested positive for HIV, total and disaggregated by age groups: <ul style="list-style-type: none"> • 15-24 • >24 	Number of pregnant women tested for HIV during the same defined year	This indicator can be derived from sentinel surveillance studies or programmatic data
2.9 Prevalence of syphilis in pregnant women, total and disaggregated by age groups: <ul style="list-style-type: none"> • 15-24 • >24 	Number of pregnant women who tested positive for syphilis, total and disaggregated by age groups: <ul style="list-style-type: none"> • 15-24 • >24 	Number of pregnant women tested for syphilis during the same defined year	This indicator can be derived from sentinel surveillance studies or programmatic data

Indicator	Numerator	Denominator	Comments
3. Indicators related to diagnosis, treatment and monitoring			
3.1 Percentage of pregnant women tested for HIV who received their results during pregnancy, childbirth, or the postpartum period (< 72 hours after birth), including those who had previously tested positive for HIV	Number of pregnant women with a known HIV status, who were tested for HIV and received their results during pregnancy, childbirth, or the postpartum period (< 72 hours after birth), including those who had previously tested positive for HIV, during the past 12 months	Estimated number of pregnant women over the past 12 months	Universal Access indicator
3.2 Percentage of pregnant women tested for syphilis during pregnancy (total and disaggregated by gestational age: before 20 weeks)	Number of pregnant women tested for syphilis during pregnancy over the past 12 months, total and disaggregated by gestational age: before 20 weeks	Number of pregnant women seen in prenatal care services during the past 12 months	This is likewise a similar Universal Access indicator, with the following essential differences: <ul style="list-style-type: none"> •Data are not disaggregated by gestational age •Data refer only to women who are seen in prenatal care The numerator should only refer only to the first test performed, in order to avoid double-counting the number of women
3.3 Percentage of pregnant women tested for syphilis during the first prenatal care checkup	Number of women serologically tested for syphilis over the past 12 months during the first prenatal checkup	Number of pregnant women seen in prenatal care services over the past 12 months	Universal Access indicator
3.4 Percentage of pregnant women who tested positive for syphilis whose sexual contacts received appropriate treatment	Number of pregnant women with who tested positive for syphilis and whose sexual contacts were identified and treated	Number of pregnant women who tested positive for syphilis during pregnancy	

Indicator	Numerator	Denominator	Comments
3.5 Percentage of pregnant women who tested positive for syphilis who received appropriate treatment	Number of pregnant women who tested positive for syphilis during pregnancy and who received appropriate treatment	Number of pregnant women who tested positive for syphilis during pregnancy	Those who were neither tested nor treated are not included
3.6 Percentage of pregnant women living with HIV who received antiretrovirals to reduce the risk of mother-to-child transmission of HIV (Administration of a single dose of nevirapine [NVP] will not be included as a valid scheme for prevention of mother-to-child transmission of HIV)	Number of pregnant women living with HIV who received antiretrovirals (ARVs) during the past 12 months to reduce the risk of mother-to-child transmission of HIV (MTCT)	Estimated number, over the past 12 months, of pregnant women living with HIV	Universal Access indicator, disaggregated as follows ^a : Pregnant women are <ul style="list-style-type: none"> • Taking triple therapy, either <ul style="list-style-type: none"> » to care for their own health, or » to apply Option B+^b • Taking triple therapy as a prophylaxis for MTCT^c • Following another regimen
3.7 Percentage of infants born to mothers living with HIV who received antiretrovirals for prevention of mother-to-child transmission of HIV	Number of infants born to mothers living with HIV, over the past 12 months, who were started on antiretroviral (ARV) prophylaxis within 72 hours of birth, in order to reduce mother-to-child transmission of HIV (MTCT)	Estimated number of pregnant women living with HIV who gave birth over the past 12 months	Universal Access indicator

a. Administering a single dose of nevirapine (NVP) will not be included as a valid scheme for PMTCT.

b. Women who have received triple ART since the 14th gestational week and

a. who continue to receive ART during delivery and birth if they do not breastfeed, or

b. who continue to receive ART until one week after they stop breastfeeding (7,9).

c. Option B+ proposes starting the same triple therapy with ARVs in all pregnant women with HIV at the prenatal care clinic at the time of her diagnosis, regardless of her CD4 count, and continuing with her treatment for the rest of her life (7).

Indicator	Numerator	Denominator	Comments
3.8 Percentage of infants born to mothers living with HIV, who were tested to determine their HIV status	Number of infants born over the past 12 months to women living with HIV, who were tested for HIV through a <ul style="list-style-type: none"> • viral load or qualitative polymerase chain reaction (PCR) test during the first 2 months of life • viral load or qualitative PCR test after 2 months of life • initial antibody test between 9 and 12 months of life 	Estimated number of pregnant women living with HIV who gave birth over the past 12 months	This is likewise a similar Universal Access indicator
3.9 Percentage of infants born to mothers living with HIV, who were not tested to determine their HIV status	Number of infants born during the defined calendar year to women living with HIV, who were not tested to evaluate their HIV status due to their being lost to follow-up, to their death, or to their transfer to another facility		
3.10 Distribution of infants born to mothers living with HIV, by feeding practices at 3 months	Number of infants born to women living with HIV assessed whose infant feeding practice (as recorded at 3 months) were: <ul style="list-style-type: none"> • Exclusive breastfeeding • Replacement feeding (infant formula) • Mixed or other feeding 	The numerator only includes the first test performed, in order to avoid double-counting of children	Universal Access indicator
3.11 Percentage of children (ages 0–14 years) living with HIV who were eligible for antiretroviral therapy and are currently receiving it	The number of eligible children who are currently receiving antiretroviral therapy (ART) in accordance with the national approved treatment protocol (or WHO/UNAIDS criteria) at the end of the reporting period	Estimated number of children eligible for antiretroviral therapy	
3.12 National policy in place with Option B+ for prevention of mother-to-child transmission of HIV	Existence of a national policy that includes Option B+ for prevention of mother-to-child transmission of HIV (PMTCT) in the country where it is being implemented		Qualitative assessment "Yes/No" indicator
3.13 Percentage of stillbirths attributable to maternal syphilis	Number of stillbirths born to untreated syphilis-seropositive mothers	Number of stillbirths	For a definition of the term "stillborn," see footnote below ²

² A stillborn is defined as the birth of a fetus with no vital signs (absence of breathing, heartbeat, umbilical pulse, or voluntary muscular movement) at or after 20 gestational weeks. In cases where the gestational age is unknown, a fetal weight of ≥ 500 grams can serve as a measurement (Centers for Disease Control and Prevention. Case definitions for infectious conditions under public health surveillance. Centers for Disease Control and Prevention. MMWR Recomm Rep 1997;46:1-55).

Indicator	Numerator	Denominator	Comments
<i>4. Additional indicators</i>			
4.1 Percentage of infants born to mothers who tested positive for syphilis, who received adequate treatment	Number of infants born to mothers who tested positive for syphilis, who received at least one dose of long-acting penicillin	Number of live births to women who tested positive for syphilis	Additional indicator of the <i>Global Initiative for the Elimination of Congenital Syphilis</i>

Additional considerations for M&E systems

As a part of large-scale efforts to improve the health of young people, women, infants, and young children, this monitoring strategy concentrates on the component to prevent mother-to-child transmission of HIV and congenital syphilis. Monitoring and evaluating maternal and child health, sexual health, and adolescent health programs will provide a broader understanding of progress made in adolescent, women's, infant, and child health. In addition, there are different aspects of maternal and child health programs that must be working satisfactorily in order to achieve the desired results. In this document, essential key components have been selected; but they are not the only issues that countries would want to measure and monitor (for example, monitoring stock-outs of testing and/or treatment supplies in the countries, or the availability of critical HIV/syphilis commodities). A broader organizational framework for a functional national HIV/STI M&E system covers additional aspects that should be in place to successfully control HIV and STIs at the country and regional levels.

Furthermore, there is an established need to evaluate both operations and progress across different sectors: for instance, the Ministry of Health, Ministry of Education, Ministry of Social Welfare, different service delivery areas (e.g., prevention of mother-to-child transmission of HIV, antiretroviral therapy, palliative care), different levels of implementation (e.g., national level, service-delivery level), and different levels of providers (public and private). This monitoring strategy builds on the principle of evaluation and provides an example of integrated efforts and information aimed at controlling HIV and congenital syphilis.

4. Definitions and descriptions of the indicators



1. Impact indicators

1.1 Number of reported cases of congenital syphilis per 1,000 live births

What does it measure?

The incidence rate is the cumulative number of new cases of congenital syphilis (CS) within a defined time frame in relation to the number of live births occurring within the same time frame.

As a result, this indicator is a measurement of the risk faced by children born alive of developing congenital syphilis.

Rationale

This indicator captures the impact of programs aimed at eliminating congenital syphilis that seek to improve coverage of prenatal care as well as diagnosis and treatment of maternal syphilis.

Numerator

Number of reported cases of congenital syphilis according to the national case definition at any given time. The **national** case definition should include stillbirths due to syphilis. See Figures 4.1 and 4.2.

Figure 4.1. PAHO definition of congenital syphilis

Newborn, fetal death, or miscarriage in a woman with maternal syphilis who has not received appropriate treatment ^a

and/or

Child with venereal disease research laboratory (VDRL) or rapid plasma reagin (RPR) titers four times higher than the mother's (equivalent to two dilutions, i.e., 1/4 for the mother, 1/16 for the child)

and/or

Child with clinical manifestation(s) suggestive of congenital syphilis (see Figure 4.2) and a positive serology independent of the titer

and/or

Retained products of gestation or placenta bearing evidence of infection by *Treponema pallidum* in histological studies

^a See definition of adequate treatment in the following PAHO document: Pan American Health Organization. Clinical Guideline for the elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean. Montevideo: CLAP/WR; 2011.

[http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=20104&Itemid=.](http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=20104&Itemid=) Last accessed on 13 February, 2013.

Figure 4.2. Clinical manifestations suggestive of congenital syphilis

Clinical manifestations suggestive of early congenital syphilis (CS)
<ul style="list-style-type: none"> • Prematurity • Intrauterine growth retardation (IUGR) • Congenital pulmonary syphilis (pneumonia alba) • Hepatosplenomegaly • Generalized lymphadenopathy • Hematological manifestations: anemia, leukopenia, leukocytosis, thrombocytopenia • Mucocutaneous manifestations: purpura, palmoplantar pemphigus, maculopapular rash, flat condyloma, cracks, petechiae • Bone lesions, osteochondritis, periostitis • Renal manifestations: nephrotic syndrome • Manifestations of the central nervous system: aseptic meningitis, Parrot's pseudoparalysis • Ocular manifestations: corioretinitis, retinitis • Other findings: fever, syphilitic rhinitis, pancreatitis, jaundice, inflammation of the gastrointestinal tract, hypopituitarism, myocarditis • Hydrops fetalis (fetal hydrops)
Clinical manifestations suggestive of late congenital syphilis
<ul style="list-style-type: none"> • Hutchinson's teeth • Interstitial keratitis • Saddle-nose nasal deformity, frontal bossing • Rhagades, cutaneous gumma • Injuries to the central nervous system: mental retardation, hydrocephalus, seizures, deafness, blindness • Osteoarticular injuries: Clutton's joint, saber tibia, diaphyseal periosteal new bone formation due to gumma destruction, winged or scaphoid scapula • High arched palate, perforated hard palate, maxillary deformities, micrognathism (micrognathia, mandibular hypoplasia, or small jaw), mulberry molars

Denominator

Estimated number of live births within the same defined time frame.

Frequency

Annually.

Data sources and measurement tools

The **numerator** is the number of reported cases of congenital syphilis according to the national case definition. In the majority of the countries in Latin America and the Caribbean, CS is a disease subject to compulsory notification.

The *denominator* is generated through a population estimate of the number of live births over the past 12 months. This can be obtained from national vital statistics offices. If there is not any specific national birth registry, the average number of annual births can be drawn from UN Population Division estimates (10) or from PAHO's technical health information system (11).

Additional considerations for countries

Whenever possible, countries should try to follow the above definition of a congenital syphilis case. This includes having registries for stillbirths.

Routine evaluation of the quality of CS surveillance and case reporting systems is recommended.

1.2 Reported rate of mother-to-child transmission of HIV: percentage of infants born to mothers living with HIV, who tested positive for HIV

What does it measure?

Progress made towards eliminating mother-to-child transmission of HIV by assessing, within any given year, the proportion of infants infected with HIV relative to all infants born to pregnant women living with HIV.

Rationale

PMTCT programs aim to significantly reduce the number of new pediatric HIV cases caused by mother-to-child transmission. The percentage of infants infected with HIV should decrease as the coverage of PMTCT interventions and the use of more effective regimens increases.

Numerator

Number of infants born to mothers living with HIV, who were diagnosed as positive based on virological or serological tests carried out before the age of 18 months.

HIV diagnosis can be made using virological or serological tests (in infants older than 18 months). If breastfeeding, infants should be tested using a virological test six (6) weeks after breastfeeding is stopped, within the established time frame.

Denominator

Reported number of infants born to mothers living with HIV within a defined calendar year.

Frequency

Annually or more frequently, depending on a country's monitoring needs.

Data will generally refer to the previous two (2) calendar years, to ensure diagnosis of all infants (according to the level of implementation of virological testing).

Data sources and measurement tools

Prenatal care records or other health facility registries.

This indicator attempts to identify infants born (within a given calendar year) to mothers living with HIV, who have been diagnosed as HIV positive.

Strengths and weaknesses

Countries should monitor the impact of PMTCT using actual data on the HIV status of infants born to mothers living with HIV, gathered during follow-up health care checkups on these infants. Nevertheless, it is particularly difficult to follow up on mother-baby pairs, especially at the national level. Due to the time lag in reporting and the wide range of health care facilities, infants who are lost to follow-up are relatively common. In countries where no confirmatory tests are available, or where these are not systematically carried out on children exposed to HIV, MTCT of HIV can be underestimated by this indicator.³ According to the recommendations, the percentage of infants lost to follow-up or with an undetermined diagnosis should be less than 10%.

Furthermore, the reported number of children born to mothers living with HIV can be much lower than the actual number existing in the country. This can occur in cases involving prenatal care systems with suboptimal coverage of HIV care and/or diagnosis among pregnant women.

1.3 Annual rate of reported cases of mother-to-child transmission of HIV per 1,000 live births

What does it measure?

The incidence rate is the cumulative number of new cases of mother-to-child transmission of HIV within a defined time frame, by the number of live births occurring within the same time frame.

³ Sensitivity analysis (SA) is recommended for cases lost to follow-up, in order to estimate the level of underreporting among positive cases.

As a result, this indicator is a measurement of the risk faced by children born alive of developing HIV through vertical transmission (MTCT). It seeks to measure the reduction in the absolute number of pediatric cases of HIV infection existing in a given population.

Rationale

The risk of developing HIV through mother-to-child transmission will depend as much on the incidence and prevalence of HIV in the population of women of child-bearing age, as on their fertility rate and the effectiveness of PMTCT programs.

Reported cases of children infected with HIV should decrease as coverage of PMTCT interventions and the use of more effective regimens increase.

This indicator captures the impact of sexual and reproductive health programs aimed at eliminating mother-to-child transmission of HIV, reducing the incidence of HIV, meeting unmet family planning needs, improving prenatal care coverage, and diagnosing and preventing MTCT of HIV.

Numerator

Number of children born to mothers living with HIV within a given calendar year, who were diagnosed as positive based on virological or serological tests carried out before the age of 18 months.

HIV diagnosis can be made using virological or serological tests (in infants older than 18 months). If breastfeeding, infants should be screened using a virological test 6 weeks after breastfeeding is stopped, within the established time frame.

Denominator

Estimated number of live births within the same defined calendar year.

Frequency

Annually.

Data sources and measurement tools

The *numerator* is obtained from HIV and prenatal care case-monitoring registries or from other health facility registries.

The *denominator* is generated through a population estimate of the number of live births over the past 12 months. This can be obtained from national vital statistics offices. If there is no specific national birth registry, the average number of annual births can be drawn from UN Population Division estimates (10) or from PAHO's technical health information system (11).

Strengths and weaknesses

Countries should monitor the impact of PMTCT using actual data on the HIV status of infants born to mothers living with HIV, which have been collected during the infants' routine checkups. Nevertheless, it is particularly difficult to follow up on mother-baby pairs, especially at the national level. Due to the time lag in reporting and the wide range of health care facilities, infants who are lost to follow-up are relatively common. In countries where no confirmatory tests are available, or where these are not systematically performed on children exposed to HIV, MTCT of HIV can be underestimated by this indicator.⁴ According to the recommendations, the percentage of infants and children lost to follow-up or with an undetermined diagnosis should be less than 10%.

Furthermore, the reported number of children born to mothers living with HIV can be much lower than the actual number existing in the country. This can occur in cases involving prenatal care systems with suboptimal coverage of HIV care and/or diagnosis among pregnant women.

2. Indicators of primary prevention and sexual and reproductive health

2.1 Unmet family planning need

What does it measure?

Progress made towards meeting the objective of providing universal access to reproductive health.

In concrete terms, this indicator refers to knowledge of efforts carried out to increase coverage of family planning services.

By definition, it means the number of child-bearing and sexually active women who do not want to have any more children or wish to delay their next pregnancy, but who are not using any contraceptive method, as a percentage of all women of child-bearing age (15–49) who are either married or living in a consensual union.

The concept of 'unmet need' shows the gap between a woman's reproductive intentions and her contraceptive behavior.

⁴ Sensitivity analysis (SA) is recommended for cases lost to follow-up, in order to estimate the level of underreporting among positive cases.

Rationale

Eliminating unmet family planning needs would reduce the number of unwanted pregnancies among women living with HIV, which in turn would reduce pediatric HIV infections as well as HIV-associated deaths in women during pregnancy, childbirth, and the postpartum period.⁵

Numerator

Number of women (either married or living in a consensual union) who are pregnant or in postpartum amenorrhea, and whose pregnancies are unwanted—as well as women of child-bearing age who want to stop having children or delay motherhood for at least two years, who are undecided as to whether to have another child or when, and who are not using any contraceptive method.

The numerator includes the following:

- All pregnant women (either married or living in a consensual union) whose pregnancies were unwanted or unplanned at the time of conception.
- All women in postpartum amenorrhea (either married or living in a consensual union) who did not use family planning and whose last delivery was unwanted or unplanned.
- All women of child-bearing age (15–49, who are either married or in living in a consensual union), who are not pregnant or in postpartum amenorrhea, and who do not want to have any more children or wish to postpone the birth of a child for at least two years, or who do not know whether they want another child or when, but who are not using any contraceptive method.

The numerator excludes women who are infertile. A woman is presumed to be infertile in the following instances:

- She has been married for the past five years or more but
 - has not given birth over the past five years,
 - is not currently pregnant,
 - has not used contraceptive methods over the past five years (or does not remember when she last used them, or who has never used any type of contraceptive method),
 - has a diagnosis of infertility, is in menopause, or has had a hysterectomy, and/or

⁵ For more information, please consult the following websites:

- United Nations (UN), Millennium Development Goals Indicators: The Official United Nations Site for the MDG Indicators. New York: UN; n.d. <http://unstats.un.org/unsd/mdg/Metadata.aspx>. Last accessed on 11 February, 2013

- United Nations (UN), Department of Economic and Social Affairs, Population Division. World Contraceptive use 2010: Unmet Need for Family Planning. New York: UN; n.d. <http://www.un.org/esa/population/publications/wcu2010/Metadata/UMN.html>. Last accessed on 11 February, 2013.

-
- if her last menstrual period occurred more than six months prior to the survey (for women who are not pregnant or in postpartum amenorrhea).

Married women or those living in a consensual union are assumed to be sexually active. If unmarried women are to be included in the calculation of unmet needs, the time of the most recent sexual activity must be determined. Unmarried women are currently considered at risk of pregnancy (and therefore, potentially included in the numerator) if they have had sex during the month prior to the survey.

Denominator

Number of women of child-bearing age (15–49) who are either married or in living in a consensual union.

Data sources and measurement tools

This is an indicator of Millennium Development Goal 5, Target 5.6 (MDG 5.6).

Unmet family planning need is measured on the basis of data from representative household surveys carried out at the national level. Examples include United Nations Population Division surveys, demographic and health surveys, and reproductive health surveys.

Strengths and weaknesses

The standard definition does not consider women who use a traditional contraceptive method as having an unmet family planning need. Because traditional methods can be much less effective than modern methods, additional analyses often make a distinction between traditional and modern methods, as well as report on unmet needs for effective contraceptives. The indicator for “prevalence of contraceptives” provides additional information on this indicator by focusing on women who are already using a contraceptive method.

Differences can exist in the exact definition being used. Given that estimates of unmet needs are affected by changes in the definition, caution is called for whenever trends are being interpreted. Strict comparisons of estimates based on different definitions should be avoided.

This indicator provides a measure of the magnitude of unmet family planning needs at specific times. By measuring unmet needs in a comparable way at different points in time, the trend will indicate progress made in fulfilling women’s needs. It is noteworthy, however, that although the prevalence of contraceptives is increasing, unmet family planning needs can sometimes fail to decrease or can even increase. This can happen when the demand for family planning has increased due to a reduction in the number of children a woman wants to have. Changes in spacing planned pregnancies or in the percentage of women who are at risk of pregnancy can also

influence how the demand for family planning evolves, regardless of trends in the prevalence of contraceptives.

2.2 Percentage of adolescents (ages 15–19) who are mothers, or who are or have been pregnant

What does it measure?

The percentage of adolescents ages 15–19 who have been pregnant at some point in time, based on selected core characteristics.

Rationale

For people of reproductive age, key services to prevent HIV and other sexually transmitted infections (STIs) include health education on low-risk sexual activity, information, and family planning services. For many countries, a very important objective is to delay the age at which young people have their first sexual relations.

Numerator

Number of adolescents ages 15–19 interviewed who stated that they have been pregnant at some point in time (that they have given birth at some point, are pregnant with their first child, or have had an abortion, miscarriage, or stillbirth).

Denominator

Total number of adolescents ages 15–19 who were interviewed.

Numerator and denominator disaggregated by:

- Age
- Area of residence
 - Urban
 - Rural
- Level of education
 - No education
 - Primary school completed or not
 - Secondary school completed or not
 - Higher education completed or not
- Socioeconomic level
 - Defined in terms of the assets or wealth present in the homes surveyed⁶

⁶ Each home is assigned a score that is generated through the methodology for analysis of the main components, depending on the availability of goods and services as well as housing characteristics. For residents of a given home, the score would be the value of the home in which they live. This makes it possible to create population quintiles—i.e., five groups with the same number of people in each one—of well-being or wealth.

- Specific population groups
 - Ethnic groups
 - Migrants
 - Displaced persons
 - Refugees

Data sources and measurement tools

Representative household surveys conducted at the national level, such as demographic and health surveys and surveys on reproductive health.

Strengths and weaknesses

For certain associated variables—e.g., the distribution of rural and urban populations—the composition of the sample can cause bias in the results of this indicator. Other factors that can influence results are the maternal mortality rate among this age group and the percentage of responses to the survey.

2.3 Percentage of young people ages 15–24 who correctly identified ways to prevent sexual transmission of HIV and rejected the main myths on its transmission

What does it measure?

Progress made towards universal knowledge of essential information on how HIV is transmitted.

Rationale

The HIV epidemic is mainly perpetuated through sexual transmission of the infection to successive generations of young people. Thorough knowledge of HIV and AIDS is an essential—although sometimes, insufficient—prerequisite for adopting behaviors that reduce the risk of HIV transmission.

Numerator

The number of interviewees ages 15–24 who responded correctly to the following five questions:

1. Can the risk of HIV transmission be reduced by having sex with a single uninfected partner who does not have any other partners?
 2. Can the risk of HIV transmission be reduced by using a condom each time a person has sex?
-

3. Can a seemingly healthy person have HIV?
4. Can HIV be contracted by mosquito bites?
5. Can HIV be contracted by sharing food with an infected person?

The first three questions should not be altered. Questions 4 and 5 refer to local myths and can be replaced with the most common myths of the country in question. Examples include, “Can you get HIV by hugging an infected person or by shaking hands?” and “Can you get HIV through supernatural means?”

Score should be taken for each question (based on the same denominator), in addition to the score for the entire indicator.

Denominator

Number of respondents ages 15–24.

Dissaggregated by:

- Sex
- Age: 15–19, 20–24

Frequency of measurement

Preferably every two years, but at least every 3–5 years.

Data sources and measurement tools

Demographic baseline surveys, such as the Demographic and Health Survey, AIDS Indicators Survey (AIS), multiple-indicator surveys by clusters, or other representative surveys.

Strengths and weaknesses

This indicator depends on youth population surveys. Both the quality and levels of the surveys’ representivity can differ from one country to another, as well as over time within the same country.

Rejecting the main myths on HIV transmission is as important as having the correct knowledge on the true modes of transmission. This indicator is particularly useful in countries where knowledge of HIV is limited, in that it facilitates measurement of progress made over time. However, it is important in other countries as well, in that it can help ensure that already-existing proficiency levels remain high.

2.4 Percentage of young people ages 15–24 who had their first sexual relations before age 15

What does it measure?

Progress made to increase the age at which young women and men ages 15–24 have their first sexual relations.

Rationale

In many countries, an important objective is to delay the age at which young people have their first sexual relations. Evidence shows that a person's postponing her or his first sexual relations reduces the risk of infection per sexual act, at least among women.

Numerator

Number of respondents (ages 15–24) who stated that they had their first sexual relations before age 15.

Denominator

Number of respondents ages 15–24.

Dissaggregated by:

- Sex
- Age: 15–19, 20–24, 25–49

Data sources and measurement tools

Demographic baseline surveys such as the Demographic and Health Survey, AIDS Indicators Survey (AIS), multiple-indicator surveys by clusters, or other representative surveys.

Frequency of measurement

Every 3–5 years.

Strengths and weaknesses

The advantage of using the age of first sexual relations as stated by the young people themselves (instead of the average) is that it makes calculation simpler and facilitates comparisons over time. The denominator is easy to define because all members of the survey sample contribute to that measurement.

It is difficult to monitor changes in this indicator over a brief period of time, because the only individuals who can influence the numerator are those who enter the group: that is, those who are younger than 15 at the beginning of the period being evaluated. If the indicator is evaluated every 2–3 years, it may be better to focus on changes occurring at the levels of the 15–17-year-old group. If evaluation takes place every 5 years, this allows for studying the 15–19-year-olds.

In countries where HIV prevention programs promote virginity or postponing one's first sexual relations, this can result in bias either in the survey questions or in the answers given by the young people. An instance of the latter is their giving deliberately false declarations on the age of their first sexual relations.

2.5 Percentage of women and men ages 15–49 who had sex with more than one partner over the past 12 months and who used condoms during their most recent sexual relations

What does it measure?

Progress made to prevent exposure to HIV through unprotected sexual relations between people who have multiple sexual partners.

Rationale

Condom use is an important protective measure against HIV, especially between people with multiple sexual partners.

Numerator

Number surveyed (ages 15–49) who stated that they had more than one sexual partner over the past 12 months and who used a condom during their last sexual relations.

Denominator

Number of respondents (ages 15–49) who stated that they had more than one sexual partner over the past 12 months.

Dissaggregated by:

- Sex
- Age: 15–19, 20–24, 25–49

Frequency of measurement

Every 3–5 years.

Data sources and measurement tools

Demographic baseline surveys such as the Demographic and Health Survey, AIDS Indicators Survey (AIS), multiple-indicator surveys by clusters, or other representative surveys.

Strengths and weaknesses

This indicator shows the degree of condom use among people with a probability of having high-risk sex (e.g., who change partners habitually).

However, the meaning of the value of any given indicator will depend on the degree to which people engage in sexual relations. As a result, those who interpret levels and trends should proceed with caution and utilize data that show the percentages of people who had more than one sexual partner during the past year.

Condoms are most effective when their use is systematic, but not when condom use is only occasional. The current indicator does not report on the degree of systematic condom use, although the trend toward condom use during the most recent sexual act usually reflects a trend toward systematic condom use. However, memory biases can occur when using the alternative method of asking whether a person sometimes, always, or never used a condom during sexual relations with occasional partners over a given period.

2.6 Percentage of pregnant women seen by skilled health workers during prenatal period

What does it measure?

Progress made by the countries in expanding prenatal care (PNC) coverage for pregnant women.

Rationale

Prenatal care coverage is an indicator of access to and utilization of care during pregnancy. At least 4 PNC checkups are recommended during pregnancy as an indicator of the quality of care. Four checkups also make an impact on reducing maternal and infant mortality.

Numerator

Number of pregnant women who have received PNC by trained health workers during any given year, disaggregated by number of visits:

- at least one visit
 - four or more visits
-

Prenatal/antenatal care (PNC or ANC) is defined as those health care services aimed at checking and monitoring pregnancy and providing ambulatory care for associated morbidity. PNC does not include either direct vaccination activities or health care services provided immediately before delivery.

The qualified health care assistant (sometimes known as the skilled assistant) is defined as an accredited health professional—e.g., midwife, physician, or nurse—who has received education and training to acquire the necessary skills and be able to adequately perform procedures related to pregnancy and normal uncomplicated labor, childbirth, and postpartum care. Such personnel must also be able to identify, manage, and provide referrals for cases involving complications in pregnant women, new mothers, and their newborns. This definition excludes traditional midwives (TMs), be they trained or untrained, from the category of skilled health workers.

Denominator

Estimated number of pregnant women over the past 12 months, obtained from the number of live births in the past 12 months.

Frequency

Annual or more frequently, depending on the country's monitoring needs.

Data sources and measurement tools

Both are based on the core indicator used by both WHO and PAHO (*“Percentage of women who received prenatal care and from qualified childbirth assistants for pregnancy-associated reasons, at least once during pregnancy, in relation to all women who gave birth to a live child within a given period of time”*).

The **numerator** can be calculated on the basis of national program registries aggregated from health facility records.

The **denominator** is generated by a population estimate of the number of live births over the past 12 months. This can be obtained from national vital statistics offices. If there is no specific national birth registry, the average number of annual births can be drawn from UN Population Division estimates (10) or from PAHO's technical health information system (11).

Strengths and weaknesses

The main purpose of this prenatal care indicator is to provide information on the proportion of women who use prenatal health care services that include a quality component based on at least 4 checkups.

However, it does not measure the time of the first checkup, which is fundamental for preventing mother-to-child transmission of HIV and congenital syphilis.

Estimating the number of pregnant women using live births may underestimate the total number of pregnancies in a given year, for it does not count stillbirths and miscarriages for the final figure. Although in theory all births should be included, in practice only live births are used, owing to difficulty in obtaining information on non-live births. The exclusion of non-live births such as stillbirths, spontaneous and induced abortions, and ectopic and molar pregnancies underestimates the need for prenatal care in the population.

Additional considerations for countries

Countries might consider disaggregating this indicator by gestational age, geographical characteristics (urban/rural, main regions, states/provinces) and socio-economic status (such as the woman's educational level and her income quintile) in order to monitor social inequalities and health determinants.

2.7 Percentage of pregnant women who had their first prenatal care checkup before 20 gestational weeks

What does it measure?

Progress made by the countries in having women seek prenatal care (PNC) early in their pregnancy.

Rationale

Prenatal care coverage is an indicator of both access to and utilization of care during pregnancy. To achieve the objectives of the Regional Elimination Initiative, early screening, prophylaxis, and/or treatment of syphilis and HIV need to be available for pregnant women. Prenatal care services should make efforts to have women come for PNC in the early stages of their pregnancy.

Numerator

Number of pregnant women who had their first prenatal care checkup with trained health workers before 20 gestational weeks, during any given year.

Prenatal/antenatal care is defined as those health care services aimed at checking and monitoring pregnancy and providing ambulatory assistance for associated morbidity. PNC does not include either direct vaccination activities or health care services provided immediately before delivery.

The skilled health care assistant (sometimes known as the skilled assistant) is defined as an accredited health professional—midwife, physician, or nurse—who has received the education and training to acquire the necessary skills and be able to adequately perform procedures related to pregnancy and normal uncomplicated labor, childbirth, and postpartum care. Such personnel must be able to identify, manage, and provide referrals for complications in pregnant women, new mothers, and their newborns. This definition excludes traditional midwives, be they trained or untrained, from the category of skilled health workers.

Denominator

Estimated number of pregnant women over the past 12 months, obtained from the number of live births in the past 12 months.

Frequency

Annually.

Data sources and measurement tools

Both are based on the core indicator used by both WHO and PAHO (“Percentage of women who used prenatal care from qualified childbirth assistants for pregnancy-associated reasons, at least once during pregnancy, in relation to all women who gave birth to a live child within a given period of time”). However, the latter does not take into account gestational age.

The numerator can be calculated on the basis of national program registries from aggregated from health facility records.

The denominator is generated by a population estimate of the number of live births over the past 12 months. This can be obtained from national vital statistics offices. If there is no specific national birth registry, the average number of annual births can be drawn from UN Population Division estimates (10) or from PAHO’s technical health information system (11).

Strengths and weaknesses

The main purpose of this prenatal care indicator, which concerns the first prenatal checkup before 20 gestational weeks, is to provide information on the proportion of women who seek prenatal care services at the beginning of their pregnancy. This indicator is fundamental for measuring how well prenatal care services are functioning in terms of eliminating mother-to-child transmission of HIV and congenital syphilis.

However, the figure calculated does not capture all prenatal coverage (which includes at least 4 checkups). Evidence proves that prenatal care with at least 4 checkups has an impact on reducing maternal and child mortality.

Estimating the number of pregnant women using live births may underestimate the total number of pregnancies in a given year, for it does not count stillbirths and miscarriages for the final figure. Although in theory all births should be included, in practice only live births are used, owing to difficulty in obtaining information on non-live births. The exclusion of non-live births such as stillbirths, spontaneous and induced abortions, and ectopic and molar pregnancies underestimates the need for prenatal care in the population.

Additional considerations for countries

Countries might consider disaggregating this indicator by gestational age, geographical characteristics (urban/rural, main regions, states/provinces) and socio-economic status (such as the woman's educational level and her income quintile) in order to monitor social inequalities and health determinants.

2.8 Prevalence of HIV in pregnant women (total and disaggregated by age groups)

What does it measure?

The prevalence of HIV among pregnant women who are seen in prenatal care services.

Rationale

To assess progress made towards controlling HIV infection among women of child-bearing age. This indicator should reflect efforts made in the area of primary HIV prevention among young women and other women of child-bearing age. It is calculated by using data collected on pregnant women who are seen in prenatal care services in HIV sentinel surveillance sites.

Numerator

Number of pregnant women who tested positive for HIV, total and disaggregated by age groups:

- 15-24
 - >24
-

Denominator

Number of pregnant women tested for HIV during the same defined year.

Frequency

Annually or every 2 years.

Data sources and measurement tools

Preferably, both the numerator and the denominator will be derived from sentinel surveillance studies. In situations where PMTCT program coverage is high, including HIV testing, program data (taken from national program registries aggregated from health facility records) constitutes a possible alternative.

Strengths and weaknesses

This indicator will be most useful when analyzed over time. Thus, consistency in both the sites and methods used is important in that it allows for appropriate comparisons.

The sample of pregnant women from which HIV prevalence is drawn is not necessarily representative of all pregnant women, but rather only of those who opt for prenatal care. Thus, the higher the coverage for prenatal care and HIV testing (in the case of program data), the more reliable this indicator will be.

Additional considerations for countries

This indicator is used as a proxy for HIV incidence (especially it takes into account only women ages 15–24). The incidence of HIV infection is the preferred indicator for monitoring the clinical course of the HIV epidemic and the impact of interventions in widespread epidemics.⁷ In countries where a woman's first sexual intercourse occurs at an older age and/or where contraceptive levels are high, HIV prevalence among pregnant women ages 15–24 will differ from that of women in other age groups.

Countries might consider disaggregating this indicator by gestational age, geographical characteristics (urban/rural, main regions, states/provinces) and socio-economic status (such as the woman's educational level and her income quintile) in order to monitor social inequalities and health determinants.

⁷ More information can be obtained from the following document: World Health Organization (WHO). Reproductive health indicators: guidelines for their generation, interpretation and analysis for global monitoring. Geneva: WHO; 2006. http://whqlibdoc.who.int/publications/2006/924156315X_eng.pdf. Last accessed on 11 February, 2013.

2.9 Prevalence of syphilis in pregnant women (total and disaggregated by age groups)

What does it measure?

The prevalence of syphilis in pregnant women who are seen in prenatal care services.

Rationale

To assess progress made towards controlling syphilis infection among women of child-bearing age.

This indicator should reflect efforts made in the area of primary syphilis prevention in young women and other women of child-bearing age. It can be a marker for the prevalence of syphilis in the community. It is calculated using data on pregnant women who are seen in prenatal care services in HIV/STI sentinel surveillance sites.

Numerator

Number of pregnant women who tested positive for syphilis,⁸ total and disaggregated by age groups:

- 15-24
- >24

Denominator

Number of pregnant women tested for syphilis during the same defined year.

Frequency

Annually or every 2 years.

Data sources and measurement tools

Both the numerator and the denominator will be derived from sentinel surveillance studies. In situations where PMTCT program coverage is high, including testing pregnant women for syphilis, programmatic data (drawn from national program registries aggregated from health facility records) is a possible alternative for this indicator.

⁸ According to the national diagnostic algorithm.

Strengths and weaknesses

The sample from which syphilis prevalence among pregnant women is drawn is not necessarily representative of all pregnant women, but rather only of women who opt for prenatal care. In this context, studies that aim to determine the under-registration and underreporting of syphilis cases among pregnant women diagnosed in prenatal care services may help to interpret both the prevalence indicator and its quality.⁹ This indicator will be most useful when analyzed over time. Thus, consistency in both the sites and methods used is important in that it allows for appropriate comparisons.

Additional considerations for countries

At both the national and international levels, this indicator serves as proxy for the burden of sexually-transmitted infections (STIs) in the general population, and also as a marker for progress made towards reducing the burden of STIs. When disaggregated, the age group of 15–24-year-olds can give an idea of the incidence of new syphilis cases, since the majority of the young women in this age group are just beginning their sexual activity. Noteworthy is the fact that people generally believe that women who go to prenatal care services constitute a low-risk population, since STIs are a leading cause of infertility in developing countries. However, the group of non-pregnant women also includes those who are not sexually active and who consequently are not at risk of contracting STIs. As a result, one should be very cautious when drawing conclusions as to the prevalence of syphilis in the general population based on surveys taken from samples of pregnant women who seek prenatal care.¹⁰

Testing for syphilis in ideal situations calls for using a combination of tests, both non-treponemal (rapid plasma reagin [RPR] or venereal disease research laboratory [VDRL]) and treponemal (*Treponema pallidum* hemagglutination assay [TPHA] and *Treponema pallidum* particle agglutination [TPPA], rapid testing). In many clinical contexts, only one test will be used: for example, the rapid test. However, positivity determined from these rapid tests or from any treponemal test cannot distinguish between an older and possibly already-treated infection and a more recent or current infection. Thus, this indicator can show important variations according to the type of diagnostic algorithm that the country uses.

⁹ For more information on the methodology used in these studies, see the following PAHO document (available in Spanish only): Organización Panamericana de la Salud / Organización Mundial de la Salud (OPS/OMS). Metodología para estudios de subnotificación de sífilis en embarazadas. Washington, DC: OPS/OMS; 2005.

http://new.paho.org/clap/index.php?option=com_docman&task=doc_download&gid=121&Itemid=219. Last accessed on 11 February, 2013.

¹⁰ For more information, see the following document: World Health Organization (WHO). Reproductive health indicators: guidelines for their generation, interpretation and analysis for global monitoring. Geneva: WHO; 2006. http://whqlibdoc.who.int/publications/2006/924156315X_eng.pdf. Last accessed on 11 February, 2013.

Countries might consider disaggregating this indicator by gestational age, geographical characteristics (urban/rural, main regions, states/provinces) and socioeconomic status (such as the woman's educational level and her income quintile) in order to monitor social inequalities and health determinants.

3. Diagnosis, treatment, and monitoring indicators

3.1 Percentage of pregnant women tested for HIV who received their results during pregnancy, childbirth, or the postpartum period (< 72 hours after birth), including those who had previously tested positive for HIV

What does it measure?

Efforts made over the past 12 months to identify the HIV serostatus of pregnant women.

Rationale

Identification of a pregnant woman's HIV status provides an entry point for other PMTCT services and is necessary for tailoring prevention, care, and treatment to her needs.

Numerator

Number of pregnant women with a known HIV status, who were tested for HIV and received their results during pregnancy, childbirth, or the postpartum period (< 72 hours after birth), including those who had previously tested positive for HIV.

This is compiled from the number of women of unknown HIV status during prenatal care, labor, and delivery (L&D), and postpartum services (< 72 hours after birth), who underwent testing for HIV, and who know their results—as well as women with a known HIV infection who have sought prenatal care for a new pregnancy during the past 12 months.

The numerator is the sum of categories a–d below:

- a. pregnant women who underwent HIV testing and received their results during prenatal care;
- b. pregnant women seeking assistance with L&D with an unknown HIV status who had an HIV test during L&D and received their results;
- c. women of whose HIV status is unknown, who sought medical assistance during the postpartum period (< 72 hours after delivery), who underwent HIV testing, and who received their results; and
- d. pregnant women with a known HIV infection who sought prenatal care for a new pregnancy.

Disaggregated by:

- women with a known HIV infection who are seen in prenatal care;
- women tested and newly identified as living with HIV; and
- women who were tested and found to be HIV negative.

Denominator

Estimated number of pregnant women over the past 12 months.

Frequency

Annually or more frequently, depending of country's monitoring needs.

Data sources and measurement tools

This is a Universal Access indicator (*“Percentage of pregnant women who were tested for HIV and received their results”*).

The **numerator** is calculated using national program registries aggregated from health facility records for prenatal care, L&D, and postpartum care.

Health facility registries should record all known cases of HIV infection among pregnant women seeking prenatal care for a new pregnancy, so that these women can receive PMTCT services.

Efforts should be made to include all health facilities run by the public and private sectors, as well as by nongovernmental organizations (NGOs), that provide testing and counseling services for pregnant women.

The *denominator* is generated by a population estimate of the number of live births over the past 12 months. This can be obtained from national vital statistics offices. If there is no specific national birth registry, the average number of annual births can be drawn from UN Population Division estimates (10) or from PAHO's technical health information system (11).

Strengths and weaknesses

This indicator enables a country to monitor trends on offers for and provision of HIV testing among pregnant women receiving prenatal care.

However, this indicator does not capture the reasons why women drop out during the testing and counseling process. Neither does it measure the quality of the testing or counseling, nor the number of women who received pre-test or post-test counseling.

There is a risk of double counting with this indicator, since a pregnant woman can be tested more than once during prenatal care, labor and delivery, or postpartum care. This is particularly true where women get re-tested in different facilities, are seen in PNC or L&D services without documentation of their previous results, or get re-tested after a previous negative test result during the pregnancy. While it is not feasible to totally avoid double-counting, countries should ensure that a data collection and reporting system is in place to minimize it: e.g., by using patient-held and facility-held PNC records to document that testing took place—as well as to document test results.

Estimating the number of pregnant women by using the number of live births can underestimate the total number of pregnancies in any given year. Although in theory it would be necessary to include all births, in practice only live births are used, given the difficulty in obtaining information on miscarriages and stillborn infants. Excluding stillbirths, miscarriages, abortions, and tubal and molar pregnancies results in underestimating the need for prenatal care in the population.

Additional considerations for countries

For additional analyses and trends in testing and counseling uptake, countries may wish to disaggregate testing and counseling by prenatal care, L&D, and postpartum care, as well as by the level of the health facility, for determining trends in testing uptake at different levels of the health care system.

3.2 Percentage of pregnant women tested for syphilis during pregnancy (total and disaggregated by gestational age: before 20 weeks)

What does it measure?

Efforts made by prenatal health care services over the past 12 months to test pregnant women for syphilis at any time during their pregnancy and in the first 20 weeks of pregnancy.

Rationale

Testing pregnant women for syphilis provides an entry point for prevention and treatment services. *Treponema pallidum* is present in the blood during the early stages of the disease and can be transmitted to the fetus, especially between gestational weeks 16–28—although earlier transmission has been described. Therefore, the intention of this indicator is to measure the number of women screened at any time during their pregnancy and before 20 weeks of pregnancy. PAHO strongly recommends initial screening before 20 weeks (during first-trimester prenatal care) to minimize transplacental transmission—and then repeating the test during the third trimester, and again at delivery or in postpartum services (< 72 hours after delivery). In the presence of risk factors, tests could be repeated even more frequently.

Numerator

Number of pregnant women tested for syphilis during pregnancy using serological test over the past 12 months, total and disaggregated by gestational age: before 20 weeks.

The numerator refers only to initial testing. Hence, double-counting of women should be avoided.

Denominator

Number of pregnant women seen in prenatal care services during the past 12 months.

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

Both the numerator and the denominator are calculated using national program registries aggregated from prenatal care records at health facilities.

Strengths and weaknesses

There is a risk of double counting with this indicator, as a pregnant woman can be tested more than once during prenatal care, L&D, or postpartum care. This is particularly true when women undergo re-testing in different facilities, come to PNC or L&D services without documentation of their previous results, or undergo re-testing after a previous negative test result during the pregnancy. While it is not feasible to totally avoid double-counting, countries should ensure that a data collection and reporting system is in place to minimize it: e.g., by using patient-held and facility-held PNC records to document that testing took place—as well as to document test results.

3.3 Percentage of pregnant women tested for syphilis during the first prenatal care checkup

What does it measure?

Efforts made by prenatal care services over the past 12 months to test pregnant women for syphilis during the first checkup.

Rationale

Testing pregnant women for syphilis provides an entry point for prevention and treatment services. PAHO strongly recommends that initial screening take place before 20 gestational weeks. The reason for this is that prenatal care services can fail to capture women before the first trimester. Therefore, PNC services should include testing for syphilis during the first prenatal care checkup, or as soon as possible.

Numerator

Number of women serologically tested for syphilis over the past 12 months during the first prenatal checkup.

The numerator refers only to initial testing. Hence, double-counting of women should be avoided.

Denominator

Number of pregnant women seen in prenatal care services over the past 12 months.

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

Both the numerator and the denominator are calculated using national program registries aggregated from prenatal care records at health facilities.

Strengths and weaknesses

This indicator measures the performance of prenatal care services, but not necessarily efforts made to capture women at the early stages of their pregnancy.

There is a risk of multiple counting with this indicator, as a pregnant woman can be tested more than once and in different settings during prenatal care. While it is not feasible to totally avoid double-counting, countries should ensure that a data collection and reporting system is in place to minimize it: e.g., by using patient-held and facility-held PNC records to document that testing took place—as well as to document test results.

In cases where the countries do not have the capacity to differentiate between the first prenatal checkup and subsequent checkups, a broader optional indicator is available for use that shows the percentage of pregnant women in prenatal health care services who had a syphilis test done during pregnancy, regardless of gestational age (see optional indicator 4.2, “*Percentage of pregnant women tested for syphilis during pregnancy*”).

3.4 Percentage of pregnant women who tested positive for syphilis whose sexual contacts received appropriate treatment

What does it measure?

Progress made in preventing mother-to-child transmission of syphilis by administering penicillin G to all sexual contacts of pregnant women who have tested positive for syphilis.

Rationale

Treating pregnant women's sexual partners is an important component for preventing vertical transmission (MTCT) of congenital syphilis, given that failure to treat sexual partners is the most common source of re-infection among pregnant women. Testing and treating male partners is an important tool for increasing male involvement as well as a critical entry point for ongoing and family care, as a part of comprehensive care and treatment programs and efforts made to reduce the overall burden of syphilis in the population.

Numerator

The number of pregnant women who tested positive for syphilis and whose sexual contacts were identified and treated.

This numerator calls for providing counseling for each pregnant woman and identifying all her sexual contacts. Only if all her reported sexual partners are being treated, can that woman be included in this numerator.

Denominator

Number of pregnant women who tested positive for syphilis during pregnancy.

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

The *numerator* is calculated using national program registries aggregated from health facility records.

Treatment for syphilis can be administered to pregnant women who tested positive and to their partner(s) in different sites (prenatal care services or sexual and reproductive health clinics). The health facility that is treating the pregnant woman is also responsible for ensuring the diagnosis, treatment, and monitoring of her sexual partner(s). It is also recommended that this information be recorded in the pregnant woman's clinical history.

The *denominator* is calculated using national program registries aggregated from health facility records. If an estimate is needed, this will be made by multiplying the total number of women who gave birth over the past 12 months (which can be obtained from estimates of the number of births made by central statistics offices or from UN Population Division estimates) by the most recent national estimate of syphilis prevalence in pregnant women.

Strengths and weaknesses

This indicator allows countries to monitor efforts to increase the involvement, testing, and treatment of the male partners of pregnant women who are receiving prenatal care services.

Data for this indicator may be difficult to gather, given that not all sites may be collecting data on testing and treating men.

Additional considerations for countries

Measuring this indicator may require additional investment and resources to revise data collection tools and summary reporting forms.

3.5 Percentage of pregnant women who tested positive for syphilis who received appropriate treatment

What does it measure?

Progress made both in preventing mother-to-child transmission of syphilis and in providing maternal health care by administering long-acting penicillin to pregnant women who tested positive for syphilis.

Rationale

Pregnant women with untreated syphilis (maternal or gestational syphilis) can transmit the infection to the fetus either *in utero* or through direct contact with lesions during childbirth; congenital syphilis is the result of this and is the most prevalent form of neonatal infection in the world. Untreated syphilis is associated with stillbirth or miscarriage, low birth weight, and serious neonatal infection—all of which are associated with an increased risk of perinatal death. There are different kinds of diagnostic tests, some of which provide results in minutes and allow for both diagnosis and treatment during the same visit.

Appropriate treatment for syphilis in pregnancy consists of at least one dose of intramuscular (IM) penicillin G. This should be administered as soon as possible after receiving a positive result from screening tests. Providing this treatment is a programmatic indicator that reflects treatment coverage among those identified as seropositive for syphilis.

Numerator

Number of pregnant women who tested positive for syphilis during pregnancy and who received appropriate treatment.

Denominator

Number of pregnant women who tested positive for syphilis during pregnancy.

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

This is a Universal Access indicator.

The *numerator* is calculated using national program registries aggregated from health facility records. During pregnancy, syphilis treatment can be provided to women who have tested positive at various sites (prenatal care facilities, sexual and reproductive health clinics). Women should not be counted in this numerator if they have been neither tested nor treated.

Note that there is a risk of double-counting where treatment is provided at different points in time and/or in different health facilities. Countries should therefore ensure that a data collection and reporting system is in place to minimize the potential for double-counting.

The *denominator* is calculated using national program registries aggregated from health facility records. If an estimate is needed, this can be made by multiplying the total number of women who gave birth over the past 12 months (which can be obtained from estimates of the number of births made by central statistics offices or from UN Population Division estimates) by the most recent national estimate of syphilis prevalence in pregnant women.

Strengths and weaknesses

This indicator allows countries to monitor the coverage of early treatment in pregnant women who have tested positive for syphilis, in order to reduce the risk of transmission to their children and to care for the women's own health.

This indicator does not measure the quality of aftercare: e.g., penicillin allergy management. Also, all women who are treated need to be re-evaluated with quantitative serologic tests every 1–3 months in order to assess treatment failures, re-infection, or neurosyphilis (the latter requiring a lumbar puncture).

Additional considerations for countries

A population-based indicator may be calculated using the number of pregnant women who tested positive for syphilis and received appropriate treatment, divided by the expected number of pregnant women who have syphilis. The expected number of pregnant women can be estimated by multiplying the estimated number of pregnant women over the past 12 months by the most recent national estimate of syphilis prevalence in pregnant women.

3.6 Percentage of pregnant women living with HIV who received antiretrovirals to reduce the risk of mother-to-child transmission of HIV

What does it measure?

Progress made in preventing mother-to-child transmission of HIV (MTCT) by providing antiretroviral (ARV) prophylaxis to infants exposed to HIV.

Pregnant women living with HIV who are eligible for ARV therapy and are on a regimen of ARV treatment will also benefit from its prophylactic effect by preventing MTCT. As a result, they are included in this indicator.

Rationale

The risk of mother-to-child transmission can be significantly reduced when the mother is given antiretrovirals through complementary activities (either as treatment or as prophylaxis), when the infant is administered antiretroviral prophylaxis, and when safe delivery practices and safer infant-feeding practices are implemented.

Numerator

Number of pregnant women living with HIV who received antiretrovirals (ARVs) during the past 12 months to reduce the risk of mother-to-child transmission of HIV (MTCT).

The numerator can be disaggregated as follows:

- a. Prospective mothers in treatment with triple therapy
 - To preserve their own health
 - To apply Option B+: it proposes initiating triple therapy with ARVs in all pregnant women who tested positive for HIV at the prenatal care clinic at the time of their diagnosis, regardless of their CD4 count, and continuing their treatment for the rest of their life (7).
-

- b. Preventing mother-to-child transmission of HIV by administering triple therapy, treating women who have receiving triple ARV therapy since gestational week 14, and continuing triple therapy during delivery and birth if not breastfeeding—or if breastfeeding, until one week after breastfeeding stops (7,9).
- c. Providing any other ARV regimen.

Pregnant women living with HIV who are being treated by any of the above-listed treatment categories meet the criteria for this numerator. It should be taken into account that administering a single dose of NVP will not be included as a valid scheme for PMTCT.

Denominator

Estimated number, over the past 12 months, of pregnant women living with HIV.

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

This is an indicator of the United Nations General Assembly Special Session on HIV/AIDS (UNGASS on HIV/AIDS) as well as a Universal Access (UA) indicator.

The *numerator* is calculated from national program records aggregated from health facility records. Antiretroviral drugs can be provided to HIV-infected women at various sites (PNC, L&D, and HIV care and treatment sites) during pregnancy, at labor, and shortly after delivery. The numerator can be calculated by counting at the point of ARV provision, or at the end-point of labor and delivery.

Efforts should be made to include publicly, privately, and NGO-run health facilities that are providing ARVs to pregnant women living with HIV for purposes of PMTCT.

The *denominator* can be calculated using two methods:

- a. By multiplying the total number of women who gave birth over the past 12 months (which can be obtained from birth estimates from central statistics offices or from UN Population Division estimates) by the most recent national estimate of HIV prevalence in pregnant women (which can be derived from HIV sentinel surveillance sites in prenatal care facilities). If data exists on the number of live births, it should be adjusted to derive a better proxy by using the number of live births and estimates of HIV prevalence in women.

- b. By using a projection model such as the one provided by UNAIDS Spectrum/EPP software, using as output “the number of pregnant woman needing PMTCT” as a proxy. This method is recommended for countries with widespread epidemics.

Strengths and weaknesses

This indicator enables countries to monitor antiretroviral coverage in pregnant women living with HIV, in order to reduce the risk of their transmitting HIV to the child.

When disaggregated, this indicator can monitor the most effective schemes for providing increased access to ARVs for PMTCT in countries that are expanding their services to provide newer categories of ARV regimens.

This indicator measures the ARVs delivered, but not the ARVs consumed. As a result, it does not enable determination of adherence to the complete ARV regimen; nor does it enable distinguishing among the various ARV regimens and treatments used for prophylaxis before and during childbirth. The clinical guidelines published by the Regional Elimination Initiative¹¹ provide a listing of all recommended ARV regimens.

Additional considerations for countries

It is recommended that countries follow up and then report the real percentage of distribution (or an estimated figure, if real data is not available) of the different regimens administered. This will enable them to model the potential impact of ARVs on PMTCT, based on the effectiveness of those regimens.

Countries may wish to include additional disaggregated elements, in order to take into consideration early provision of antiretrovirals for PMTCT (categories for assessing the beginning of ARV prophylaxis might be as follows: beginning between gestational weeks 14 and 28, then after week 28, or finally during delivery) This can provide information on barriers to overcome for maximizing the effectiveness of ARVs used for PMTCT.

An additional indicator of the quality of care provided by prenatal services can be derived by using as a denominator the actual number of pregnant women who received prenatal care and who tested positive for HIV. The goal would be to reach a figure of 100%, or close to it.

¹¹ For more information, consult the following document: Pan American Health Organization. Clinical Guideline for the elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean. Montevideo: CLAP/WR; 2011.

http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=20104&Itemid=. Last accessed on 13 February, 2013.

3.7 Percentage of infants born to mothers living with HIV who received antiretrovirals for prevention of mother-to-child transmission of HIV

What does it measure?

Progress made in the preventing mother-to-child transmission of HIV by providing antiretroviral prophylaxis to infants exposed to HIV.

Rationale

The risk of mother-to-child transmission can be significantly reduced by providing the mother with antiretrovirals in complementary actions (either as treatment or as prophylaxis), by providing the infant with antiretroviral prophylaxis, and by implementing safe delivery practices and safer infant-feeding practices.

This indicator allows countries to monitor the coverage of antiretroviral regimens dispensed or initiated among infants exposed to HIV, in order to reduce the risk of the mother transmitting the HIV virus to her baby.

Numerator

The number of infants born to women living with HIV, over the past 12 months, who were started on antiretroviral prophylaxis within 72 hours of birth,¹² in order to reduce mother-to-child transmission of HIV (MTCT).

Denominator

Estimated number of pregnant women living with HIV who gave birth over the past 12 months (as a proxy for the estimated number of infants born to women living with HIV).

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

This is a Universal Access indicator (*"The percentage of children born to women living with HIV who received some type of ARV prophylaxis for PMTCT"*).

¹² See ARV regimens and duration in the PAHO clinical guidelines: Pan American Health Organization. Clinical Guideline for the elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean. Montevideo: CLAP/WR; 2011.

http://new.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=20104&Itemid=. Last accessed on 13 February, 2013.

The **numerator** is calculated using national program registries aggregated from health facility records.

Antiretroviral drugs can be provided to infants exposed to HIV shortly after delivery. ARVs can be administered at L&D facilities for the infants born there, at outpatient postnatal care facilities, at pediatric clinics in the case of infants born at home and brought to the facility within 72 hours, at HIV/ART clinics, or at other sites, depending on the country context.

Three methods can be considered for calculating the numerator:

- *Counting at the point of ARV provision:* In settings with low rates of delivery at health facilities, data for the numerator should be compiled from sites where ARVs are dispensed and where data is recorded. There is a risk of double-counting where ARVs are provided during more than one visit, or at different health facilities. Countries should have data collection and reporting systems in place to minimize the potential for double-counting.
- *Counting at the end-point of labor and delivery:* In settings where a high proportion of women give birth in health facilities, countries can estimate the numerator using only the L&D register, by counting the number of infants exposed to HIV who received a specific ARV regimen prior to discharge from the L&D ward. This may be the most reliable and accurate method for calculating this indicator in settings where a high proportion of women deliver at health facilities, given that the facilities count the ARV regimen dispensed at the time they administer it to the infant.
- *Counting at postnatal or child health sites:* Countries can register and aggregate the number of infants exposed to HIV who received a specific ARV regimen within 72 hours of birth. This is recorded at postnatal or child health clinics with high attendance rates and where the child's exposure status and any ARV regimen administered are likely to be known (e.g., from postnatal records or from stand-alone or integrated registries of infants exposed to HIV).

Efforts should be made to include all public, private, and NGO-run health facilities that are providing ARVs to infants exposed to HIV for purposes of PMTCT.

The **denominator** can be estimated using two methods:

- a. By multiplying the total number of women who gave birth over the past 12 months (which can be obtained from estimates of births from central sta-
-

tistics office or from UN Population Division estimates) by the most recent national estimate of HIV prevalence in pregnant women (which can be derived from HIV sentinel surveillance sites in prenatal care facilities). If data exists on the number of live births, it should be adjusted to derive a better proxy using the number of live births and estimates of HIV prevalence in women.

- b. By using a projection model such as the one provided by UNAIDS Spectrum/EPP software, using the output “*the number of pregnant women needing PMTCT*” as a proxy. This method is recommended for countries with widespread epidemics.

Strengths and weaknesses

The indicator measures the extent to which antiretroviral therapy (ART) was initiated for infants for prophylactic purposes. However, it measures the ARVs delivered, but not the ARVs consumed. As a result, it is impossible to determine either adherence to the ARV regimen, or whether the entire ARV treatment was completed. Countries are encouraged to monitor the quality of infant prophylaxis by registering how many children completed their regimens up to 4–6 weeks of life.

3.8 Percentage of infants born to mothers living with HIV, who were tested to determine their HIV status

What does it measure?

The extent to which infants born to women living with HIV were tested to determine their HIV status

Rationale

Infants infected with HIV during pregnancy, delivery, or early postpartum often die before there is any recognition of their having HIV infection. PAHO/WHO recommends that national programs establish the capacity to provide early virological HIV testing for infants, in order to guide clinical decision-making at the earliest possible stage. Where virological testing is not available, PAHO/WHO recommends initial antibody testing when the infant is 9–12 months old, in order to identify negative cases.

Numerator

Number of infants born over the past 12 months to women living with HIV, who were tested for HIV through a

- viral load or qualitative PCR test during the first 2 months of life
- viral load or qualitative PCR test after 2 months of life
- initial antibody test between 9 and 12 months of life

Infants should be counted only once. The numerator should only include the initial test and not any subsequent tests.

Denominator

Estimated number of pregnant women living with HIV who gave birth over the past 12 months.

This is a proxy for the number of infants born to women living with HIV.

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

This is likewise a similar Universal Access indicator (*“Percentage of infants born to HIV-infected women receiving a virological test for HIV within two months of birth.”*).

The **numerator** is calculated from national program registries aggregated from health facility records.

The number of infants who were tested—not the number of tests carried out—should be counted, since many infants may be tested several times.

Data should be aggregated from the appropriate health facility records. The registry used may vary depending on the country context. For example, where follow-up takes place for infants exposed to HIV in specific care and treatment settings, countries can aggregate information from any of those sites. Where testing for infants exposed to HIV takes place in pediatric care settings, countries may also aggregate and report information from those sites. Where possible, double-counting should be minimized when aggregating data to produce national-level information.

Efforts should be made to include all publicly, privately, and NGO-run health facilities that are providing HIV testing for infants exposed to HIV.

The *denominator* can be estimated using two methods:

- a. By multiplying the total number of women who gave birth during the past 12 months (which can be obtained from birth estimates from central statistics offices or from UN Population Division estimates) by the most recent national estimate of HIV prevalence in pregnant women (which can be derived from HIV sentinel surveillance sites in prenatal care facilities). If data exists on the number of live births, they should be adjusted to derive a better proxy.
- b. By using a projection model such as the one provided by UNAIDS Spectrum/EPP software, using the output “*the number of pregnant woman needing PMTCT*” as a proxy. This method is recommended for countries with widespread epidemics.

Strengths and weaknesses

This indicator allows countries to monitor progress made in providing HIV testing to infants exposed to HIV, a critical tool for appropriate follow-up care and treatment.

Ideally, the indicator captures infants born to mothers known to be living with HIV. However, in some settings it may not be feasible to exclude infants who were tested for HIV using virological or antibody tests through initial testing done by health providers in pediatric wards, malnutrition centers, and other sites where infants may be identified as exposed to HIV or having developed it.

A low value of the indicator could indicate weaknesses in the health system, including poor country-level management of the supply of HIV test kits, poor data collection, and mismanagement of testing samples.

3.9 Percentage of infants born to mothers living with HIV, who were not tested to determine their HIV status

What does it measure?

The result of efforts made to ensure follow-up care and to obtain a definitive diagnosis for infants exposed to HIV.

Rationale

Infants born to mothers living with HIV can die prior to diagnosing their HIV infection. PAHO/WHO recommends that national programs build their capacity to offer virological testing for HIV early on for such infants, in order to guide clinical decision-making at the earliest possible stage. Where virological tests are not available, countries are encouraged to conduct initial antibody testing when the infant is 9–12 months old, in order to identify negative cases.

Having such services available is essential for ensuring adequate monitoring of mothers living with HIV and their exposed infants; it allows for timely diagnosis of the infants' HIV status and their continuous care. In addition, countries should have information systems that monitor the performance of these services.

Numerator

The number of infants born during the defined calendar year to women living with HIV, who were not tested to evaluate their HIV status due to their being lost to follow-up, to their death, or to their transfer to another facility.

Denominator

The number of infants born during the defined calendar year to women living with HIV.

Frequency

Annually or more frequently, depending on each country's monitoring needs.

Data sources and measurement tools

Prenatal care records or other health facility registries.

The *numerator* is calculated based on national program registries aggregated from health facility records.

Data should be aggregated from the corresponding health facility records. The registry utilized can vary depending on the country context. For example, where monitoring of infants exposed to HIV takes place in specific care and treatment facilities, countries can add information recorded at any of those sites; but where testing of infants exposed to HIV takes place in pediatric care facilities, countries can also aggregate and report information from those sites. Whenever possible, the potential for double-counting should be minimized when recording data, to avoid an erroneous count when aggregating the information at the national level.

Efforts should be made to include all publicly, privately, and NGO-run health facilities that administer HIV testing for infants exposed to HIV.

Strengths and weaknesses

This indicator has one limitation, which consists in the fact that the reported number of infants born to women living with HIV can be much lower than the real number existing in the country, in cases where HIV care or diagnostic coverage in prenatal care systems is suboptimal.

When this indicator, “*Percentage of children born to mothers living with HIV who were not tested to determine their HIV status,*” presents values lower than 10%, it supports the validity of the impact indicator on mother-to-child transmission of HIV.

3.10 Distribution of infants born to mothers living with HIV, by feeding practices at 3 months of life

What does it measure?

Infant-feeding practices of infants exposed to HIV, at 3 months of age, using 24-hour recall.

Infant feeding practices are measured at the time of the first DPT3 (trivalent diphtheria-pertussis-tetanus) vaccination visit, at or around 3 months of age, or the closest visit thereafter.

Rationale

HIV can be transmitted through breast milk, even in settings where 100% of pregnant women who need them are receiving antiretrovirals for purposes of PMTCT. Mixed feeding (giving both breast milk and other foods and liquids) increases the risk of HIV transmission. Consequently, the current WHO/PAHO recommendation is to give exclusive replacement feeding (i.e., infant formula) for the first 6 months of life, unless this is not acceptable, feasible, affordable, sustainable, and safe (AFASS). In the latter case, mothers should be given ARV to reduce the risk of transmission and also exclusively breastfeed for the first 6 months, whereupon it no longer recommends exclusive breastfeeding or giving only formula, because infants and young children need complementary foods.

Coverage for DPT3 vaccination close to the recommended age of 14 weeks is high in most Latin American and Caribbean countries. Therefore, given that most children see a health professional for this, it is a good idea to obtain information on them at that time, which is roughly halfway between birth and the point at which exclusive breastfeeding would stop.

Numerator

- a. Number of infants exposed to HIV who were exclusively breastfeeding at or around the age of 3 months.
 - **Exclusive breastfeeding:** Up to the age of 6 months, the infant receives only breast milk and no other liquid or solids, not even water—with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines. Breast milk is also defined as milk from a wet nurse or milk expressed from the child’s mother.
- b. Number of infants exposed to HIV who received replacement feeding at or around the age of 3 months.
 - *Exclusive replacement feeding with breast milk substitutes or infant formula:* This involves feeding an infant who is not receiving any breast milk at all with a diet that contributes all the necessary nutrients, until such time as the child can eat what the rest of the family is eating. During the first 6 months of life, commercially prepared formula should be given as an adequate substitute for breast milk, since home-modified animal milk is no longer recommended for infants under 6 months old, except as an emergency measure. Replacement feeding does not include any breastfeeding.
- c. Number of infants exposed to HIV who received mixed feeding at or around the age of 3 months.
 - *Mixed feeding:* This means feeding infants up to 6 months old both breast milk and other foods or liquids.

Denominator

The same for all three indicators: Number of HIV exposed infants whose feeding practice has been assessed at the age of 3 months (DPT3 visit). Infants will be aged around 3 months or more.

Frequency

Annually or more frequently, depending on each country’s monitoring needs.

Data sources and measurement tools

This is a Universal Access indicator (“*Distribution of feeding practices [exclusive breastfeeding, replacement feeding, mixed feeding/other] for infants born to HIV-infected women at DPT3 visit*”).

The **numerators** are calculated using national program registries aggregated from health facility records, or from a special evaluation of a sample of clinical records.

Ideally, data should be aggregated from appropriate sites and records, such as a stand-alone or integrated registries of infants exposed to HIV, depending on where the services were provided and where data was recorded. During each visit, the health care provider should ask about infant feeding practices followed over the past 24 hours, asking, “What did you give your infant to eat or drink yesterday and last night?” After each response, the health provider should ask, “Anything else?” The response will be recorded as one of the following: exclusively breastfeeding, replacement feeding or mixed feeding. Despite the fact that this information is collected and recorded at every visit on the child’s health card, providers need only record it in the registry once, during the first DPT3 vaccination visit. This record will be used for compilation and reporting at the national level.

The *denominator* is calculated from the total number of infants exposed to HIV whose feeding practices were assessed. Those who were not seen in health facilities are not included in the denominator.

Efforts should be made to include all publicly, privately, and NGO-run health facilities that provide follow-up services to infants exposed to HIV.

Strengths and weaknesses

These indicators measure the important progress countries have made vis-à-vis the adoption of safer feeding practices for exposed infants born to women living with HIV. They can also be used to indicate the quality of counseling on infant feeding (with low rates of mixed feeding likely to indicate adequate counseling and support).

However, it bears mentioning that the indicators say nothing about the quality of the replacement food given to the infant, or the impact of the feeding practices on child survival.

One of the pitfalls of this indicator, which should reflect the actual national distribution of infant-feeding practices for infants exposed to HIV, lies in the fact that it does not include infants exposed to HIV who may have already died, infants whose exposure status is unknown, infants exposed to HIV whose mothers did not take them to a health facility for their DPT3, or for another reason occurring at or around the time the infant is 3 months old.

Additional considerations for countries

To fully understand the extent and type of infant-feeding practices, countries might consider carrying out special studies on women living with HIV who opt for replacement feeding and exclusive breastfeeding. These studies also examine the

reasons why women who opted for either breastfeeding or replacement feeding are practicing or are not exclusively practicing the chosen option, and whether AFASS criteria were present.

3.11 Percentage of children (ages 0–14 years) living with HIV who were eligible for antiretroviral therapy and are currently receiving it

What does it measure?

Progress made towards providing antiretroviral therapy (ART) to all children who meet the requirements for receiving the treatment.

Rationale

As the HIV pandemic advances, a greater number of people are reaching advanced phases of HIV infection. Evidence proves that antiretroviral therapy can reduce mortality among people living with HIV. Efforts are being made to make ART more accessible in low- and middle-income countries. Combination antiretroviral therapy should be offered jointly with comprehensive health care and support services, including assistance to family caregivers.

Numerator

The number of eligible children who are currently receiving combination antiretroviral therapy in accordance with the national approved treatment protocol (or WHO/UNAIDS criteria) at the end of the reporting period.

Denominator

Estimated number of children eligible for antiretroviral therapy.

Disaggregated by:

- Sex
- Age: < 1 year, 1–4 years, 5–14 years

Frequency

Data should be continuously compiled in each health facility and periodically broken down, preferably monthly or quarterly.

Data sources and measurement tools

This is a Universal Access (UA) indicator.

The **numerator** can be derived from health facility records on antiretroviral therapy, or from drug supply management systems.

Children excluded from the numerator are those who are not receiving treatment, those who have died, those who have dropped out of treatment, or those who have been lost to follow-up.

Antiretroviral therapy is not included when administered only for purposes of preventing the mother-to-child transmission or for post-exposure prophylaxis.

Public- and private-sector patients who are being given antiretroviral therapy should be included in this numerator whenever data are available.

The **denominator** can be calculated using models used to estimate HIV prevalence: for example, UNAIDS Spectrum/EPP.

Strengths and weaknesses

The indicator makes it possible to monitor trends in coverage but does not claim to distinguish among the different forms of antiretroviral therapy, or to measure the cost, quality, or effectiveness of the treatment administered. Different forms of ART will vary both within countries and among them and will probably change over time.

The proportion of people who need antiretroviral therapy will vary in accordance with the stage of the HIV epidemic, as well as the cumulative coverage and effectiveness of ART in adults and children.

The degree of utilization of ART will depend on such factors as their cost in relation to local income levels, infrastructure, quality of service delivery, availability and response of counseling and voluntary testing services, public perception of its effectiveness, and possible treatment side effects.

3.12 National policy in place with Option B+ for prevention of mother-to-child transmission of HIV

What does it measure?

Whether the country has a policy in place to implement Option B+ for the prevention of mother-to-child transmission of HIV (PMTCT).

Rationale

Recent developments indicate that adopting a single universal regimen to treat

pregnant women living with HIV and preventing mother-to-child transmission of the virus can offer substantial clinical and programmatic advantages. This simplification would help maximize the effectiveness of PMTCT programs, thanks to greater alignment and linkage with antiretroviral therapy (ART) programs at all levels of service delivery (7).

Option B+ proposes starting the same triple therapy with antiretrovirals in all pregnant women living with HIV seen at prenatal care services at the very moment of diagnosis, regardless of their CD4 count, and continuing with this treatment for the rest of their life (7). The main advantages of Option B+ are, among others, the following:

- greater simplification and fewer requirements for PMTCT programs (eliminating the need to take CD4 counts at the time of diagnosis to determine whether the pregnant women meet eligibility criteria for ART);
- harmonization with ART programs;
- possible benefits for women's health, by providing earlier treatment and reducing the risk of interrupting and restarting ART;
- prevention of MTCT in future pregnancies, from the very moment of conception;
- continuous prevention of sexual transmission of the virus to couples with different HIV statuses; and
- communicating a simpler message to communities: once started, ART is life-long.

Qualitative indicator

This indicator requires a simple “yes-no” response. If “yes,” the policy has been adopted at the national level and is being implemented.

Data sources and measurement tools

Data is reported by the countries themselves, with key information provided at the national level along with a detailed and documented review of PMTCT programs.

Strengths and weaknesses

This indicator is not related to the quality of national plans or how well they are being implemented. However, the very existence of these plans demonstrates a country's intention to offer PMTCT services in accordance with international standards.

3.13 Percentage of stillbirths attributable to maternal syphilis

What does it measure?

- The impact of the strategy to eliminate congenital syphilis on the reduction in syphilis-associated mortality.
-

- Progress towards eliminating mother-to-child transmission of syphilis by evaluating the percentage of stillborn infants whose death can be attributed to maternal syphilis.

Rationale

Stillborn infants are a complication that occurs in approximately 25% of all syphilis infections during pregnancy that are either untreated or inadequately treated (5). By measuring this important complication of maternal syphilis infection, global and local programs can estimate their impact on reducing overall mortality.

Numerator

The number of stillbirths born to untreated syphilis-seropositive mothers.

Denominator

Number of stillborn infants.

Frequency

Every 2–3 years.

Data sources and measurement tools

Prenatal care or other health facility records, national vital statistics offices, mortality records from mother and infant care programs, sentinel surveillance sites, or special studies.

Additional considerations for countries

This is an additional impact indicator recommended in the WHO *Global Strategy for the Elimination of Congenital Syphilis* (5,8). It establishes the objective for this indicator as reducing fetal deaths attributed to maternal syphilis to < 2%.

A stillborn infant is defined as a fetus delivered without vital signs (absence of breathing, heartbeat, umbilical pulse, or voluntary muscular movement) at ≥ 20 gestational weeks. In the event that gestational age is unknown, a fetal weight of ≥ 500 grams will be used as a criterion.

In all cases involving stillborn infants, the cause of the death should be evaluated (the mother should be tested for syphilis, malaria, dystocia, etc.).

4. Additional indicators

4.1 Percentage of infants born to mothers who tested positive for syphilis, who received adequate treatment

What does it measure?

Optional indicator that measures the percentage of infants treated with penicillin who were born to mothers who tested positive for syphilis.

Rationale

Treating infants at risk for syphilis is a marker for the quality of and access to prenatal health care services, as well as for the quality of basic services delivered to newborns. Furthermore, it is a measure of the effectiveness of efforts made to prevent congenital syphilis.

Numerator

Number of infants born to mothers who tested positive for syphilis, who received at least one dose of long-acting penicillin.

Denominator

Number of live births to women who tested positive for syphilis.

Frequency

Annually.

Data sources and measurement tools

Data can be obtained from national programme records, sentinel surveillance data, seroprevalence surveys, or other special studies.

Additional considerations for countries

This is an optional indicator of the WHO Global Strategy for the Elimination of Congenital Syphilis (5,8).

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