Kingdom of Cambodia
National Religion King

Ministry of Health

National Road Map for the elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis (eMTCT) in Cambodia

July 2018

National Center for HIV/AIDS, Dermatology & STD (NCHADS)

National Maternal and Child Health Center (NMCHC)

Forward

At the UN General Assembly High Level Meeting on AIDS in New York in June 2011 and June 2016, Cambodia expressed its support to the global goals and targets in intensifying efforts to virtually eliminate new HIV infections by 2030. To achieve this ambitious goals and targets, the Ministry of Health (MoH) of the Kingdom of Cambodia through the National Center for HIV/AIDS, Dermatology and STD (NCHADS) and the National Maternal and Child Health Center (NMCHC) and partners initiated the National Roadmap for the elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis (eMTCT) to ensure Cambodia fully commits to improve systems for HIV program delivery, laboratory, data management as well as adheres to principles of human rights, gender equality, and community participation. The eMTCT roadmap draws on the HIV-HSSP, NSP-PMTCT, programmatic SoPs, and a rapid field assessment in Cambodia.

Prior to applying for international validation, NCHADS and NMCHC will work hand-in-hand at the national and sub-national levels to pre-qualify PMTCT coverage and quality of services through updating policies and guidelines, disseminating new PMTCT evidence, tracking and addressing programmatic and operational challenges, mobilizing human and financial resources for PMTCT program, and providing quality PMTCT mentoring.

The Ministry of Health (MoH) supports and endorses this eMTCT initiative that will provide valuable guidance for Cambodia towards achieving the elimination goals and targets. MoH expects that the National AIDS Authority (NAA), NCHADS, NMCHC, Provincial Health Departments (PHD) and all stakeholders will follow steps mapped out in this framework and continue working in close collaboration to ensure improved quality of HIV prevention, care and treatment in Cambodia.

Phnom Penh, 24 July 2018

For Minister of Health

Prof. ENG HUOT
SECRETARY OF STATE

Acknowledgments

The National Center for HIV/AIDS Dermatology and STDs (NCHADS) and the National Maternal and Child Health Center (NMCHC) and development partners collectively developed this roadmap as a resource for public health service providers, program managers, and coordinators to ensure Cambodia is on track to achieve the elimination of mother to child transmission of HIV and congenital syphilis by 2025.

We would like to acknowledge inputs from all partners involved in developing this document. Special thanks to NCHADS staff (Dr. Ouk Vichea, Mr. Mam Sovatha, Dr. Samreth Sovannarith, Mr. Mom Chandara, Dr. Ngauv Bora, Dr. Ky Sovathana), NMCHC staff (Dr. Kim Rattana, Mr. Chin Chourb), CHAI (Ms. Hul Sivantha, Ms. Caroline Barrett, Mr. Mao Ngeav), WHO (Dr. Sheryl Keller, Dr. Chay Sokun, Dr. Laurent Ferradini, Dr. Deng Serongkea), US-CDC (Dr. Lori Newman, Dr. Thomas Rush, Ms. Soch Kunthea), UNAIDS (Dr. Vladanka Andreeva, Dr. Muhammed Saleem, Mr. Ung Polin) and other TWG members for their contributions.

The elimination roadmap aligns with and builds upon the global WHO eMTCT validation criteria. Within the elimination framework, strategies and interventions specific to Cambodia are extracted from existing policy documents and guidelines. Additionally, mentorship and TWG meetings have been initiated to identify gaps, and mentor and monitor poor performing sites. We recognize and appreciate TWG members for working closely on the mentoring visits, convening on-going TWG meetings and supporting the monitoring and reporting of the elimination work.

Phnom Penh, 16 July 2018

Director of NCHADS

Dr.LY PENH SUN

Director of NMCHC

Prof. TUNG RATHAVY

Nomination of the eMTCT/PMTCT technical working group

The eMTCT/PMTCT Technical Working Group (TWG) has been formed by the Ministry of Health (MoH) to monitor and guide progress towards achieving validation of eMTCT in Cambodia. Members include the Directors and relevant units of NCHADS and NMCHC, National AIDS Authority, National Institute of Public Health, University of Health Sciences (UHS), World Health Organization (WHO), UNAIDS, PEPFAR, US-CDC**,** Clinton Health Access Initiative (CHAI), KHANA, and the Cambodia PLHIV Network (CPN+).

The TWG will develop a mechanism for monitoring and disseminating progress on key process indicators, and taking relevant mitigating actions, based on the approach recommended by the World Health Organization (WHO).[1] In addition, the TWG will ensure a functional follow-up system where all key stakeholders, especially the implementing partners, are able to ensure follow up and linkage to care for mother-infant pairs. Where necessary, additional indicators may be used to aid monitoring and reporting toward the validation process (see list of indicators in the WHO 2017 guidance).

To assist the eMTCT/PMTCT TWG in monitoring progress, four sub-working groups will be formed to oversee progress on program delivery, data quality/management, lab quality, and human rights, gender equality and civil society engagement. Members are in the following table:

Sub-Working Group	***Chaired by***	***Members***
Program delivery (Implementation)	Director of NCHADS and Director of NMCHC	- NCHADS (ACU, STIs, LMU, VCCT) - NMCHC (PMTCT, Reproductive Health) - National Pediatric Hospital - WHO, - US-CDC - CHAI, FHI360, AHF - RHAC, KHANA
Data quality	Director of NCHADS and Director of NMCHC	- NCHADS (DMU, Research Unit) - NMCHC - WHO, UNAIDS, PEPFAR
Laboratory quality	Director of NCHADS and Director of NMCHC	- NCHADS (Lab & LMU) - NMCHC - US-CDC - Institut Pasteur du Cambodge (IPC)
Human rights, gender equality and engagement of CSOs	NAA and CPN+	- Ministry of Women's Affairs, National AIDS Authority, NCHADS, NMCHC - UNAIDS, UNFPA, UN-WOMEN - Cambodia PLHIV Network, ARV Users Association, Health Action Coordinating Committee, KP networks LICHADO

The objectives and tasks of individual sub-working group, as recommended in WHO 2017 guidance, are as follows:

[1] EMTCT of HIV and syphilis: global guidance on criteria and processes for validation. Second edition. WHO June 2017. http://apps.who.int/iris/bitstream/10665/259517/1/9789241513272-eng.pdf

Teams	*Objectives*	*Tasks*
Program Delivery (Implementation)	To verify whether the services are sufficient in scope, accessibility and quality to sustain the eMTCT targets, and whether services are universally available and accessible for all, including socially marginalized and vulnerable populations	• To monitor the scaling-up of PMTCT integration under the Boosted-Integrated Active Case Management (B-IACM) program and the strengthening of the Linked Response (LR) strategy where B-IACM is not yet implemented • To review the programmatic components relevant to the elimination strategy (using WHO implementation tool, Annex 5), such as the primary prevention of HIV and syphilis, ANC services, HIV and syphilis testing, as well as treatment and care for PW living with HIV and syphilis, their infants and their male partners • To perform mentoring and monitoring visits in lowest performing sites / administrative units to identify gaps and improve the quality and coverage of PMTCT (following national guidelines) • To report regularly to the TWG about the progress of the scaling-up and quality of PMTCT activities
Data quality	To assess the reliability of the data generated by the country to evaluate achievement of the elimination targets, and to ascertain progress toward impact and coverage targets	• To regularly assess the quality of PMTCT data collected at sub-national and national levels using WHO data verification and impact assessment tool • To perform mentoring and monitoring visits in lowest performing sites / administrative units to improve the quality and completeness of data collection • To collect and compile data from all sites and regularly report to the TWG on data quality and progresses toward eMTCT targets
Laboratory quality	To verify the existence of an adequate laboratory network to provide the services needed to achieve and maintain a program for eMTCT of HIV and syphilis, and to ensure that the results generated by the laboratory network are accurate and reliable	• To regularly assess the quality of laboratory testing for PMTCT using WHO laboratory data assessment tool • To ensure proper supply for lab testing at each testing site involved in eMTCT (ANC/HC, maternity, HTS-ART) • To perform mentoring and monitoring visits in lowest performing sites / administrative units to assess and improve the quality of lab testing and network • To report regularly to the TWG on the quality and coverage of lab testing for eMTCT
Human rights, gender equality and engagement of CSOs	To verify that eMTCT targets have been achieved in a manner consistent with basic human rights and gender equality considerations, and that communities are meaningfully involved in the planning, delivery, and monitoring and evaluation of program and services	• To assess human rights and gender equality considerations along the eMTCT process using WHO human rights, gender equality and CSO engagement tool • To ensure the consistency of human rights, gender equity and meaningful communities involvement at the different levels of the eMTCT process • To perform mentoring and monitoring visits in lowest performing PMTCT sites to identify gaps and improve human rights, gender equity and involvement of the community in eMTCT service delivery • To regularly report to the TWG on the progress of human rights, gender equity and involvement of the community in eMTCT service delivery and policy making

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ART	Anti-Retroviral Therapy
B-IACM	Boosted-Integrated Active Case Management
Boosted CoPCT	Boosted Continuum of Prevention to Care and Treatment
CDHS	Cambodian Demographic Health Survey
CHAI	Clinton Health Access Initiative
CMS	Central Medical Store
CP	Community Participation
CSO	Civil Society Organization
eMTCT	elimination of Mother to Child Transmission
EQAS	External Quality Assessment Scheme
GE	Gender Equality
GFATM	Global Fund to Fight AIDS, TB and Malaria
GVAC	Global Validation Advisory Committee
GVC	Global Validation Committee
GVS	Global Validation Secretariat
HIV	Human Immunodeficiency Virus
HIV-HSSP	Strategic Plan for HIV/AIDS and STI Prevention and Control in the Health Sector
HR	Human Rights
HTC	HIV Testing and Counselling
HTS-ART	HIV Testing Services-Antiretroviral Treatment
KP	Key Populations at Risk for HIV
L&D	Labor & Delivery
LGBT	Lesbian, Gay, Bi-sexual and Transgender
LQMS	Laboratory Quality Management System

MAT	Maternity
NCHADS	National Center for HIV/AIDS, Dermatology and STD
NIS	National Institute of Statistics
NMCHC	National Maternal and Child Health Center
NSP-PMTCT	National Strategic Plan for Prevention of Mother-to-Child Transmission of HIV and Syphilis
NVC	National Validation Committee
NVT	National Validation Team
OD	Operational District
PD	Program Delivery
PMTCT	Prevention of Mother-to-Child Transmission
PT	Proficiency Testing
QA	Quality Assurance
QC	Quality Control
QI	Quality Improvement
QMS	Quality Management System
RTD	Rapid Diagnostic Testing
RVC	Regional Validation Committee
SI	Strategic Information
SoP	Standard Operating Procedure
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
TB	Tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization
WLHIV	Women Living with HIV

1. Executive summary

HIV prevalence among PW has fallen because of the success of Cambodia's HIV prevention efforts, and the substantial progress of Cambodia's prevention of mother-to-child transmission of HIV (PMTCT) program. The modeled rate of transmission has declined to 6.2% at 6 weeks in 2015 from an estimated 37% in 2007. However, the MTCT rate at the end of breastfeeding period, projected via latest SPECTRUM for 2017, is 13%. This is worrisome, and indicative of programmatic challenges identifying HIV+ PW, initiating them on ART, and providing prophylaxis, care, and testing to HIV-exposed infants (HEI).

Cambodia has set a goal to eliminate MTCT of HIV by 2025. Of the five process indicators by WHO to be elimination-certified, the first indicator of ≥95% ANC coverage, has already been achieved. Substantial progress has also been made towards the other four indicators. However, the data systems to validate elimination are not yet fully in place, systems have not yet been developed to ensure delivery of PMTCT services for women who receive ANC and maternity care in both public and private sector, laboratory systems need further strengthening, and human rights, gender equality and community engagement considerations have not yet been fully assessed. For these reasons, a pre-elimination strategy is needed from 2017-2020, prior to the full elimination strategy.

This roadmap seeks to outline the strategies to be pursued from 2017-2020 in order to strengthen program delivery, laboratory services, data management and human rights, gender equality and community engagement, and achieve validation requirements. To be validated by WHO as having achieved eMTCT, Cambodia must maintain targets of process indicators for at least two years and impact indicators at least one year before applying for validation. Indicators and targets for elimination or validation 2021-2025:

Impact indicators:

1. New pediatric infections due to MTCT of HIV per 100,000 live births ≤50 cases
2. MTCT rate of HIV in breastfeeding population <5%
3. Congenital syphilis per 100,000 live births ≤50 cases

Process indicators:

- Population-level ANC coverage (at least one visit) ≥95%
- PW who know their HIV status ≥95%
- Antiretroviral (ARV) coverage of HIV positive PW ≥95%
- Coverage of syphilis testing of PW ≥95%
- Treatment of syphilis-seropositive PW ≥95%

Maintaining targets will require robust implementation of strategies already outlined in several Cambodia policy documents – including the HIV Health Sector Strategic Plan (HIV HSSP), National Strategic Plan for PMTCT (NSP-PMTCT) National Reproductive Health Strategy, and clinical and programmatic guidelines and SoPs.

In addition, NCHADS and NMCHC initiated an assessment of sites with high, moderate and poor performance to understand and assess current program delivery, laboratory services, data management and human rights, gender equality and community engagement in late 2017 to further inform the strategies needed towards achieving the eMTCT's components. The assessment team adopted the latest WHO validation checklists to assess the extent to which current implementation of PMTCT program are in line with WHO validation criteria. The findings outlined specific areas for improvement and proposed action plans, which will serve as guidance to achieve an MTCT rate of <5% and full elimination validation by 2025.

NCHADS and NMCHC will monitor process indicators at two levels through national and sub-national dashboards. The sub-national dashboard will help NCHADS and NMCHC understand gaps and performance of services by provinces throughout the PMTCT cascade, while the national dashboard will track Cambodia's performance against the global criteria/targets. Targets will be reviewed on an annual basis, measured against the required validation targets. Where annual targets are not met, the TWG will work with the appropriate parties to take mitigating action. NCHADS, NMCHC, and the data management sub-working group will continue to work in close coordination to ensure data quality for all of the required global validation impact and process indicators, and to assess data for completeness, accuracy, consistency, and timeliness. Field monitoring visits will be made by both NCHADS and MNCHC to verify data sets, strengthen data quality and troubleshoot programmatic/operational challenges. The TWG will prepare an annual report to measure progress against each of (pre-validation and validation) using the reporting format for WHO validation.

2. Background

2.1. Situational analysis

HIV and Syphilis in Cambodia

HIV was first detected in Cambodia in 1991, and the first AIDS patient was diagnosed in 1993. Transmission was primarily through commercial sex workers to their clients; the HIV prevalence among direct sex workers peaked at 42.6% in 1998 and then declined in the wake of an aggressive 100% condom use policy and a decrease in the percentage of men engaging in commercial sex. HIV prevalence in Cambodia was estimated at 0.6% in 2016, falling from 2% in 1998 and most cases are among long-standing infections in persons stabilized on ART.[2] In 2015, an estimated 650 people were newly infected with HIV.[3]

In 1997, the crude HIV prevalence rate among PW attending government ANC sites was 3.2%. Beginning in 2001, it steadily declined, to 1.6% in 2003, 1.1% in 2006, and 0.4% in 2010.[4] In 2014, sentinel surveillance of ANC clients found prevalence to be only 0.28%, consistent with the overall decline in new HIV infections. Among over 300,000 clients screened annually in government ANC facilities, 0.11% were reactive on rapid tests in 2017. [5] In 2015, an estimated 45% of HIV cases in pregnancy were among women known to be HIV+ positive prior to pregnancy and already on ART[6], compared to 2017 about 77%.[7]

Cambodia's PMTCT program has made substantial progress over the last 10 years. As HIV prevalence among PW has fallen, mother-to-child transmission of HIV has similarly declined. The modeled rate of transmission has declined to 6.2% at 6 weeks in 2015 from an estimated 37% in 2007.[8] However, MTCT rate at the end of breastfeeding period, projected via latest SPECTRUM for 2017, is 13%,[9] which is concerning and is indicative of programmatic challenges identifying HIV+ PW, initiating them on ART, and providing care and testing to HIV-exposed infants (HEI).

In 2014, 95.5% of PW received ANC from a trained provider at least once.[10] In 2016, 85.6% of ANC clients and 88.5% of delivery clients in government facilities knew their HIV status.[11] UNAIDS estimates that in 2016, 75% of HIV+ PW received ART.[12] The number of HIV infected PW is expected to decline from 954 in 2015 to 766 by 2020 and below 500 by 2025.[13]

Despite the progress made, there are still barriers with identification, testing and treatment of HIV+ PW and their infants which need to be addressed in order to eliminate MTCT of HIV. While 83.5% of infected PW were estimated to have received ART in 2015, 17.3% remained unidentified and 4% were identified only at the time of delivery.[14]

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[2] UNAIDS estimate, http://www.unaids.org/en/regionscountries/countries/cambodia.
[3] NCHADS Health Sector Strategic Plan 2016-2020; UNAIDS AEM modeling exercise using 2015 data.
[4] Cited in NSP-PMTCT 2016-2020.
[5] PMTCT database 2015 & 2017.
[6] Numerator from PMTCT database and denominator from Spectrum estimate of 954 total HIV+ pregnant women in 2015
[7] PMTCT database 2017.
[8] Numerator from PMTCT database and denominator from Spectrum estimate of 954 total HIV+ pregnant women in 2015.
[9] Spectrum file provided by UNAIDS, November 2017.
[10] Cambodia Demographic and Health Survey (CDHS) 2014.
[11] PMTCT database, NMCHC.
[12] http://www.unaids.org/en/regionscountries/countries/cambodia
[13] Cambodia GARPR 2016.
[14] CHDS 2014

Among women delivering in government health facilities between 2015 and 2017, there was a decline in percentage of PW with unknown HIV status who delivered in public health facilities, from 28% to 19%.[15] However, in both years only about half of these women received an HIV test, with those delivering in a referral hospital more likely to receive a test than those delivering in a health center. In addition, in 2015 a third of the women who screened reactive at L&D did not receive confirmatory tests, compared to 2017 it was still at 6%, which is still concerning. ibid

Treatment coverage of HIV+ positive PW and HEI also needs to be improved. In 2015, 75.5% of HIV+ pregnant women were estimated to have received ART during pregnancy (or 79.9% if including those who were initiated at the time of delivery).[16] As with identification, there is a disparity in initiation rates between referral hospitals and health centers, at 100% and 41% respectively. Lastly, treatment of HEI is lagging behind, with only 69.8% and 75% of infants receiving 6 weeks of prophylaxis in 2015 and 2017, respectively. [17]

Syphilis sero-prevalence among ANC clients, as detected by rapid test (SD Bioline) and confirmed by rapid plasma regain (RPR), was 4.0% in 1996 and decreased to 1.3% by 2001.[18] There has been no surveillance study of syphilis among ANC clients since 2001, but health facility data show that only 0.04% of PW screened by rapid test in 2017 were reactive.

In 2017, coverage of syphilis testing in pregnancy has lagged behind that of HIV testing of 63% of PW screened for syphilis through rapid test compared to 93% of ANC clients knowing their HIV status.[19] A dual HIV/syphilis rapid test was adopted by NCHADS and NMCHC in 2017 and is expected to improve syphilis screening rates.

There also remain issues with the diagnosis and correct treatment of syphilis infections among PW and newborns. In 2017, of the 154 PW who screened reactive , only about 75% received a confirmatory RPR test.[20] In addition, stock-outs of benzathine penicillin and provider reluctance to provide it (due to unwillingness to inject infants and fears about penicillin allergic reactions) led in many cases to treatment of both PW and syphilis-exposed infants with erythromycin, which is not the recommended treatment for syphilis. There is also a lack of information on follow-up care for syphilis-exposed infants.

Regarding early infant diagnosis of HIV, DNA-PCR testing and OI & HIV prophylaxis are provided at Pediatric AIDs Care (PAC) clinics and some maternal clinics. To-date, there are currently only 34 PAC clinics in 21 out of 25 provinces throughout the country. Based on the 2016 national guideline on Diagnosis and Antiretroviral Treatment of HIV Infection in Infants, Children and Adolescents in Cambodia, HEI should receive a DNA-PCR test and start ARV and cotrimoxazole prophylaxis as soon as they are born. However, at-birth testing is not implemented nationwide. In addition, enrollment in PAC is often not timely. In 2017, only 35% of infants born to HIV-positive women received a virological test for HIV within 2 months of birth.[21]

Private sector service delivery

In Cambodia, while health services are primarily accessed through the public health facilities, utilization of maternity services through private sector has become more significant, with more than 14% of PW

[15] NMCHC PMTCT database 2015 & 2017
[16] NMCHC PMTCT database 2015
[17] NMCHC PMTCT database 2015 & 2017
[18] NCHADS 2001 STI Sentinel Surveillance Survey.
[19] NMCHC PMTCT database. Cambodia: NMCHC; 2016 & 2017.
[20] NMCHC PMTCT databased. Cambodia; 2017.
[21] Exposed Infant Database, NCHADS 2017.

choosing to deliver at private clinics.[22] In order to achieve elimination, Cambodia must demonstrate that high-quality services for eMTCT are provided in the private sector, that data is available, and that all requirements for validation are met.

Mechanisms for regulation of the private medical sector are just beginning to be established in Cambodia, and there is currently no requirement for private providers to administer HIV/syphilis testing (or to refer clients to the public health facility to receive such testing). With the exception of some NGO clinics, there is also a lack of data on services provided in the private sector (both for-profit and not-for-profit clinics). Even where data on private sector ANC is provided (e.g. from the Reproductive Health Association of Cambodia (RHAC) clinics), there is currently no way to incorporate this data into the PMTCT database without risk of double-counting, since women often receive ANC from both public and private sources during the course of their pregnancies.

National strategic plans and policies

The decline in the number of new HIV infections is driven by comprehensive interventions initiated by the Royal Government of Cambodia to reduce MTCT of HIV. The first national PMTCT strategy developed for the period 2008 – 2015, focused on expanding the availability of PMTCT services and improving uptake. During this period, the Cambodia 3.0 initiative was launched to eliminate mother-to-child transmission (eMTCT) of HIV and congenital syphilis. Due to budget challenges and the need to streamline services and find efficiencies within the national program, the Boosted Linked Response strategy, which promotes strong cooperation between HIV and sexual and reproductive health services, was introduced in 2013 to further improve health outcomes for mothers and children and reach the virtual elimination of MTCT of HIV and congenital syphilis.

The continued commitment to eMTCT of HIV in Cambodia is evident in its HIV-Health Sector Strategic Plan (HIV-HSSP 2016-2020), which sets targets to achieve virtual elimination of new HIV and syphilis infections, and National Strategic Plan for PMTCT (NSP-PMTCT), which provides detailed approaches and strategies for elimination of MTCT of HIV and syphilis. These include improving the detection of new infections among PW, ensuring that mother-baby pairs receive the full package of PMTCT services, and accelerating enrolment and initiation on life-saving ART when needed. These strategies are supplemented by several SOPs, including the Boosted Integrated Active Case Management (B-IACM)/Partner Notification, Tracing and HIV Testing (PNTT) approach, and the Identify-Reach-Intensify-Retain (IRIR) operational strategy at the operational district (OD) level.

Given Cambodia's commitment to PMTCT, the country is well positioned to meet the national goals of <5% MTCT of HIV and syphilis by 2020. However, attaining the standards necessary for validation of elimination per WHO criteria by 2025 will require additional efforts. The validation process will require a collaborative effort at all levels and involve a cross-section of stakeholders: national, regional and global, national AIDS and STI program managers, maternal and child health program managers, M&E staff, policy makers, technical staff, and national/international partners.

2.2. Rationale for pre-elimination

Currently, among the required process indicators for reaching elimination outlined by the WHO, the first indicator of ≥95% ANC coverage, has already been achieved. Substantial progress has also been made

[22] CDHS 2014.

towards the second and third, which require ≥95% testing and treatment coverage for HIV and syphilis. However, reaching them will require new involvement of the private sector, where an increasing proportion of deliveries now take place (14.3% in 2014).[23] In addition, the needed data systems to validate elimination are not yet fully in place, systems have not yet been developed to ensure delivery of PMTCT services for women who receive maternity care in both public and private sector, laboratory systems need further strengthening, and human rights, gender equality and community engagement considerations have not yet been fully assessed.

For these reasons, a pre-elimination strategy is needed from 2017-2020, prior to the full elimination strategy. This roadmap seeks to outline the strategies to be pursued during the pre-elimination phase in order to strengthen program delivery, laboratory services, data management and human rights, gender equality and community engagement and achieve validation requirements.

2.3. WHO validation criteria

The World Health Organization published in 2014 and updated in 2017 the minimum global targets and additional requirements which must be met to achieve eMTCT of HIV and syphilis. The WHO has selected impact and progress indicators and set targets to monitor achievement of eMTCT at population level. Targets for each indicator are specified below:

	Minimum targets toward achieving elimination	
	HIV	**Syphilis**
Impact criteria	• Case rate of new pediatric HIV infection due to mother-to-child transmission (MTCT) of HIV ≤ 50 new pediatric infections per 100,000 live births • MTCT rate of HIV of <5% in breastfeeding populations OR MTCT rate of HIV of <2% in non-breastfeeding populations	• Case rate of congenital syphilis ≤ 50 cases of per 100,000 live births
Process criteria	• Antenatal coverage (at least one visit) of ≥ 95% • Coverage of pregnant women who know their status of ≥ 95% • Antiretroviral treatment coverage of HIV-positive pregnant women of ≥ 95%	• Antenatal coverage (at least one visit) of ≥ 95% • Coverage of syphilis testing of pregnant women of ≥ 95% • Treatment of syphilis-seropositive pregnant women ≥ 95%

Figure 1: Minimum targets toward achieving elimination, WHO 2017

In addition to the meeting the above targets, WHO specifies that there must be:

[23] CDHS 2014.

1. National-level evidence of achievement of the eMTCT validation process indicator targets for two years and achievement of validation impact indicator targets for one year before applying for validation.
2. Evidence that eMTCT of HIV and syphilis has been achieved in at least one of the lowest-performing sub-national administrative units and among key populations, where important for eMTCT, to ensure the validation process reflects equity in health service coverage. The lowest-performing sub-national administrative units are those known to perform poorly on relevant health indicators (e.g. those with the highest disease burden, lowest levels of service coverage, or an estimated MTCT rate of HIV and congenital syphilis rate that may not meet the global eMTCT validation targets).
3. Existence of an adequate "validation standard" national monitoring and surveillance system that can capture process and progress from both the public and private health sectors and detect the great majority of cases of MTCT of HIV and syphilis.
4. Validation criteria must have been met in a manner consistent with basic human rights considerations, gender equality and equal community engagement.

Additional WHO validation requirements

Additional requirements set standards for data quality, laboratory quality assurance, programmatic components and human rights, gender equality, and community engagement which must be met for validation. WHO has developed assessments to evaluate progress in each of these areas and encourages countries to review and evaluate their progress against the standards.

In the program delivery checklist, core services including comprehensive ANC services, HIV and syphilis testing and treatment, and care for infected PW, their infants and their male partners, are to be evaluated.[24] To ensure adequate access to these core services, WHO recommends that each country address barriers related to leadership and governance, financing, human resources, medical products and technologies, and strategic information. The program delivery checklist provided by WHO and used in Cambodia's baseline assessment is available at the WHO website. The main purposes of the checklist are to a) review the programmatic components relevant to the elimination strategy, such as ANC services, HIV and syphilis testing and treatment programs, as well as treatment and care for infected PW, their infants and their male partners; and b) verify whether the services are sufficient in scope, accessibility and quality to sustain the eMTCT targets.[25]

eMTCT surveillance data and data quality are the cornerstones of eMTCT validation. **In the data management checklist,** criteria for data collection processes and quality are included to assist reviewers in evaluating country-level eMTCT data. At each level of data assessment, data quality dimensions should be considered as these contribute to the achievement and sustainability of eMTCT processes and indicators (Table 2).

[24] Global guidance on criteria and process for validation of eMTCT of HIV and syphilis, WHO 2017.
[25] Global guidance on criteria and process for validation of eMTCT of HIV and syphilis, WHO 2017.

Table 1: Data quality dimensions

Attribute	Definition
Accuracy	Measures what it is intended to measure and minimizes errors
Reliability	Generated based on consistent application of standardized protocols and procedures
Precision	Collected with sufficient detail to accurately reflect group and subgroup characteristics
Completeness	Represents the complete domain of eligible persons or events
Sensitivity	Detects a high proportion of cases
Timeliness	Up to date, generated without much delay, and available when needed
Integrity	Generated by a system protected from deliberate bias or manipulation
Confidentiality	Clients are assured that their personal information is not disclosed inappropriately, and that data in hard copy and electronic form are treated with appropriate levels of security.

(Source: Global guidance on criteria and process for validation of eMTCT of HIV and syphilis, WHO 2017)

The lab checklist, in line with the WHO's validation criteria, seeks to ensure the quality of lab services and that standard laboratory service is maintained across the country, ranging from the rural health centers to tertiary level for both public and private health facilities. Strong laboratory capacity is necessary to:

- Ensure that health facilities can collect samples for diagnosis and treatment monitoring;
- Ensure that the laboratory network is generating reliable diagnosis and monitoring results.

The overall scope of this checklist is to ensure all point-of-care tests and other labs maintain:

- **Laboratory quality management,** which includes an assessment of the general organization and functioning of the national HIV/syphilis laboratory program. In line with existing WHO laboratory guidance, leadership and governance, including the policy framework, structure and coordination, management and supervision of the laboratory network for eMTCT will be assessed. It also assesses service delivery, including organization of services, roles and responsibilities; and quality control (QC) of HIV and syphilis testing among PW. Other aspects assessed are supply chain management, including availability of HIV and syphilis testing materials during pregnancy, labor and delivery, and postpartum, especially if breastfeeding.
- **Quality of tests**, which includes an assessment of tests to evaluate whether they have acceptable and operational characteristics as specified by WHO and other global normative bodies. This assessment includes areas such as the existence of national HIV and syphilis testing algorithms appropriate for prenatal testing, and choice of sufficiently well-performing tests that are appropriate for the country's clinical settings where antenatal services take place.
- **Quality of testing**, which includes an assessment of staff competency in general through professional licensure as technologists, and staff proficiency in performing the tests selected.

- **Laboratory data management**, which includes an assessment of the laboratory information management, specifically focused on a functional laboratory information system for eMTCT of HIV and syphilis.

The human rights, gender equality and community engagement checklist determines if Cambodia meets the fundamental sexual and reproductive health and rights (SRHR) for all women and key populations at risk of HIV infection, including:

- non-criminalization of HIV/syphilis transmission in law and policy, and in practice;
- ensuring voluntary HIV and syphilis testing and treatment in law and policy, and in practice;
- ensuring informed consent in law and policy, and in practice;
- ensuring the elimination of forced, coerced, and otherwise involuntary sterilization, contraception, and abortion in law and policy, and in practice;
- ensuring confidentiality and privacy of HIV and health information in law and policy, and in practice;
- ensuring gender equality and non-discrimination in law and policy, and in practice;
- ensuring accountability, community engagement, and participation of people affected by HIV and other key populations;
- ensuring availability, accessibility, acceptability, and quality of services in law and policy, and in practice; and
- ensuring access to justice, remedies, and redress in law and policy, and in practice.

In each of the sub-areas, Cambodia will seek to meet the following standards:

- *Human rights in SRHR:* Women, including PW, will be able to fully exercise their rights in relation to autonomy in decision-making; informed consent; respect of privacy and confidentiality; and freedom from violence, abuse, and coercive practices in accordance to the United Nations (UN) and regional human rights standards and mechanisms.
- *Gender equality:* Cambodia highly considers gender equality in SRHR programing, as it is widely recognized that gender norms and practices greatly influence women's and children's health outcomes in multiple ways. Promoting and ensuring gender equality can make available opportunities for women and girls to access health information and services, make decisions about their sexuality and reproduction, and protect themselves against HIV and STIs.[26]
- *Community engagement*: Women living with HIV and their partners as well as other relevant key populations at risk of HIV will be involved in decision-making process, policy dialogues, program development and management, advocacy, and service delivery. Their engagement and participation will contribute to better and more effective programming.
- *Removing human rights barriers:* The national programs will seek to mitigate key barriers which are historically rooted in Cambodian society through stepped-up provider and patient education. Those barriers include lack of informed consent throughout HIV testing process, forced or coerced abortion, limited information on contraception and sterilization, lack of confidentiality and privacy, lack of equitable service delivery and non-discrimination, lack of availability, accessibility, acceptability and quality of services, limited community participation and community engagement and potential for gender-based violence related to HIV or syphilis testing or treatment. All tools and checklists are available at WHO website.[27]

[26] Global guidance on criteria and process for validation of eMTCT of HIV and syphilis, WHO 2017.
[27] WHO tools and checklists for in-country evaluation of four required components, http://www.who.int/reproductivehealth/publications/emtct-hiv-syphilis/en/.

2.4. Validation committees and process

Once Cambodia is confident that we have met the criteria for validation of eMTCT, the Ministry of Health, the National Validation Committee (NVC) along with the Regional Validation Team (RVT), will designate a National Validation Committee to coordinate data collection and verification and writing of the national report for validation. The committee members should include independent and multidisciplinary experts such as epidemiologists and statisticians, public health practitioners including national managers and program officers for maternal and child health, HIV and sexually transmitted infections (STI), laboratory scientists, representative of civil society and non-governmental organizations including and women, and men living with HIV, and community members, experts on HIV and other STIs, and human rights expert. WHO, UNICEF, UNAIDS, and the other partners should mobilize resources to support operational costs for the validation, including travel costs of the RVT members.

The NVC takes overall responsibility for the national validation process and will: 1) gather evidence and prepare and submit the national validation report, 2) coordinate internal validation processes, and 3) ensure strong communication with the MOH. *(The NVC can accomplish the tasks listed above directly. Alternatively, it can choose to convene a national validation team (NVT) as a subset of the NVC membership to perform these functions).*

According to WHO, countries can apply for validation of eMTCT of HIV and syphilis when they determine that they have [1] met the impact targets for one year, [2] met the process targets for two years, and [3] eMTCT has been achieved in at least one of the lowest-performing sub-national administrative units. At that time, MOH can submit a validation request to the WHO regional secretariat.

Based on WHO 2018 update, the validation procedure is comprised of five steps: country validation, regional validation, global validation, official validation, and maintenance of validation.[28]

[28] WHO 2018 update, Asia Pacific Regional Validation Mechanism for Elimination of Mother-to-Child Transmission of HIV and Syphilis.

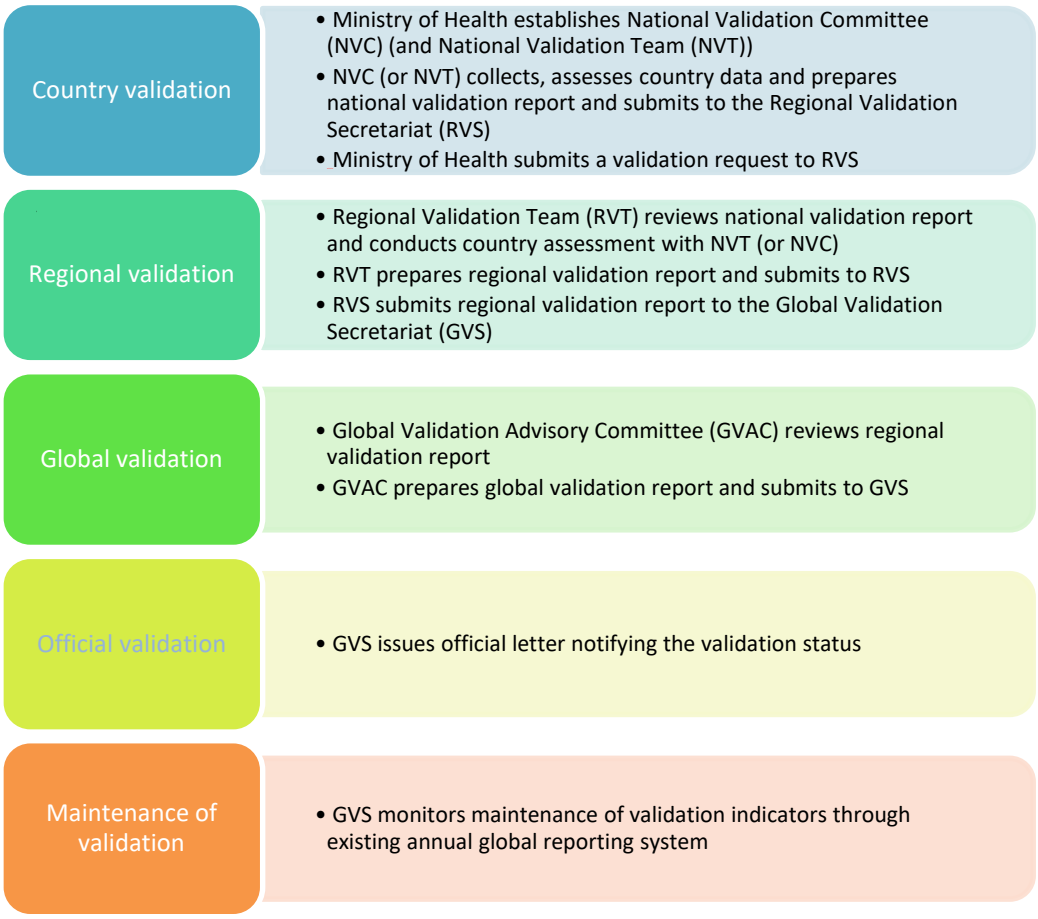

Figure 2: Procedure for applying for validation of elimination

During country validation, the NVT will collect data and prepare a report for review by a RVC. The RVC will assign a regional validation team to work with the NVT to review the quality of reported data and conduct an in-country validation visit and submit the regional validation report to be reviewed by the RVC. Once approved by the RVC, the request will be reported to the global validation advisory committee (GVAC). The GVAC advises WHO on validation and country recommendations.

Official Validation is provided by the global secretariat with recommendations for maintaining validation status. Regional and global validation committee functions will be performed by WHO Regional Offices and Headquarters, in partnership with UNAIDS, UNFPA, UNICEF and other partners. Subsequently, WHO headquarters will monitor maintenance of eMTCT of HIV and syphilis annually through routine global reporting mechanisms already in place.[29]

[29] WHO 2018 update, Asia Pacific Regional Validation Mechanism for Elimination of Mother-to-Child Transmission of HIV and Syphilis.

3. Objective of the roadmap

The objective of this roadmap is to guide Cambodia through the pre-elimination phase and set the stage for the validation process for eMTCT of HIV and syphilis in Cambodia by 2025, by mapping out the steps needed to ensure that requirements for program delivery, data systems, laboratory systems, and protections for human rights, gender equality, and community engagement are achieved.

This roadmap supplements the existing NSP-PMTCT 2016-2020 and related protocols/SOPs, which already provide clinical and programmatic guidance for testing, diagnosis, and treatment of HIV and syphilis in pregnancy, and contain detailed measures to be taken to improve program performance to reach an MTCT rate of <5% by 2020 which is sustained through 2025.

Building on the integrated approach for dual elimination of HIV and syphilis, several WHO regions have begun to move towards triple elimination by including hepatitis B into the eMTCT framework. Cambodia also aims to pursue elimination of hepatitis B in the second phase of this work in 2021-2025. Hepatitis B vaccine was added to the Cambodian immunization schedule in 2002, with a dose at birth followed by three boosters in the first year of life. Coverage for the birth dose in 2014 was 82.6%.[30] The Health Management Information System (HMIS) gives an estimate of 87% coverage for the first half of 2016.[31].

3.1. Core indicators and targets

Table 3 illustrates the country achievement in 2017 and targets by year from 2018 through 2025 for eMTCT of HIV and syphilis. Those for the period 2017-2020 are harmonized, where applicable, with the M&E Frameworks of the HIV-HSSP and NSP-PMTCT. If these goals are achieved, it is expected that this three-year *pre-validation* strategy (2018-2020) will sufficiently prepare Cambodia to launch a full *validation* strategy (2021-2025) and achieve certified elimination of MTCT of HIV and syphilis by 2025.

[30] CDHS 2009.

[31] This is only an estimate as the actual denominator is not known, and is currently based on population projections made after the 2008.

Table 2: Cambodia's core indicators for pre-validation and validation phases

Pre-validation phase

Indicators and Targets for Pre-elimination 2017-2020	2017 (BL)[32]	2018	2019	2020
Impact Indicators				
New pediatric infections due to mother-to-child transmission (MTCT) of HIV per 100,000 live births				≤50 cases
MTCT rate of HIV in breastfeeding population				<5%
Congenital syphilis per 100,000 live births				≤50 cases
Process Indicators				
Population-level ANC coverage (at least one visit)	96%*	>95%	>95%	>95%
PW who know their HIV status	93%**	86%	88%	90%
Antiretroviral (ARV) coverage of estimated HIV positive PW	77%	>90%	>90%	>90%
ANC clients screened for syphilis	63%	86%	88%	90%
Treatment of syphilis-seropositive PW	97%	>95%	>95%	>95%

(Adjusted CDHS; ** National estimation of PW by NIS is generally low, see annex 5.b)*

Validation phase

Indicators and Targets for Elimination 2021-2025	2021	2022	2023	2024	2025
Impact Indicators					
New pediatric infections due to mother-to-child transmission (MTCT) of HIV per 100,000 live births	≤50 cases	≤50 cases	≤50 cases	≤50 cases	≤50 cases
MTCT rate of HIV in breastfeeding population	<5%	<5%	<5%	<5%	<5%
Congenital syphilis per 100,000 live births	≤50 cases	≤50 cases	≤50 cases	≤50 cases	≤50 cases
Process Indicators					
Population-level ANC coverage (at least one visit)	≥95%	≥95%	≥95%	≥95%	≥95%
PW who know their HIV status	≥95%	≥95%	≥95%	≥95%	≥95%
Antiretroviral (ARV) coverage of HIV positive PW	≥95%	≥95%	≥95%	≥95%	≥95%
Coverage of syphilis testing of PW	≥95%	≥95%	≥95%	≥95%	≥95%
Treatment of syphilis-seropositive PW	≥95%	≥95%	≥95%	≥95%	≥95%

(Sources: HSSP-HIV 2016-2020; PMTCT strategy 2016-2020; NMCHC annual report 2017)

3.2. Framework for achieving eMTCT goals

Figure 3 shows the ideal components of an eMTCT program which need to be achieved in order to reach elimination. Components were identified from key documents such as the HIV-HSSP, NSP-PMTCT and National Reproductive Health Strategy, and clinical and programmatic guidelines and SoPs.[33]

To inform the strategies needed for achieving these components, NCHADS and NMCHC initiated an assessment of sites with high, moderate and poor performance to understand and assess current

[32] 2017 Baseline - **see annex 5.a** for detail analysis and data sources.

[33] Referenced SOPs include I-BACM, Community Action, B-CoC, B-LR, B-IACM/PNTT, HIV Testing Services, the Safe Motherhood Protocol, the 2010 Guide for implementation of Positive Prevention among PLHIV in Cambodia and the CBPCS, along with their corresponding activities at national and community levels **("Cambodia Programmatic SOPs")**

capacities across program delivery, laboratory services, data management, and human rights, gender equality, and community engagement (See annex 1 for the field assessment concept note). The key findings are outlined in Section 4; proposed strategies and action plan generated, which will serve as guidance to achieve an MTCT rate of <5% and to achieve full elimination or validation by 2025, are outlined in Section 5 of this roadmap.[34]

Framework for achieving eMTCT goals for both pre-validation and validation phases	
Strategies	**Sources**
1. Improving service delivery and outcomes across the PMTCT cascade by:	HIV-HSSP, NSP-PMTCT and Cambodia Programmatic SoPs[35]
Identifying all HIV & syphilis positive pregnant and breastfeeding women & HIV-exposed infants, through universal access to testing for PW, retesting during the breastfeeding period, and testing of their infants and their sexual partners in both the public and private sectors.	
Linking all HIV positive PW to care and initiating them on ART early in pregnancy	
Providing appropriate treatment to syphilis seropositive PW	
2. Addressing cross-cutting and health systems issues in:	Findings from eMTCT field assessment (section 4)
program delivery	
laboratory services	
data management	
human rights, gender equality, and community engagement	
3. Securing preventive mechanisms which reduce new infections by:	HIV-HSSP, NSP-PMTCT and Cambodia Programmatic SoPs[ibid]
Preventing HIV and syphilis infection in women of reproductive age, including in HIV-negative pregnant and breastfeeding women and their sexual partners.	
Promoting a healthy reproductive life, including prevention of unintended pregnancies and support for safer conception, among women living with HIV and seropositive syphilis and key populations.	

Figure 3: Framework of eMTCT

[34] MoH. Strategic plan for HIV/AIDS & STD prevention and control in the Health Sector in Cambodia 2016-2020. Cambodia : NCHADS ; 2016.
[35] I-BACM, Community Action, B-CoC, B-LR, B-IACM/PNTT, CBPCS, HIV Testing Services, the Safe Motherhood Protocol, the 2010 Guide for implementation of Positive Prevention among PLHIV.

4. Process of gap identification and findings

A critical step in achieving validation is the assessment of current progress and gaps on impact and process indicators, and the development of strategies for improvement. In late 2017, the Cambodia eMTCT TWG conducted assessments at good, moderate, and poor performing sites to determine progress to date and to identify challenges. A desk review of evaluation tools was conducted and the WHO checklists for evaluation of the four WHO-recommended lenses were adopted for these assessments.

Assessment trips were conducted at six sites, from three out of 25 provinces. Sites included health centers and hospitals at different levels of the health system. Four teams consisting of representatives from partner organizations and government conducted the assessments. Results were used to establish current performance gaps, best practices, and areas in need of support, and then to identify appropriate strategies to improve performance in anticipation of achieving elimination. Assessment findings and the strategies developed are presented in the subsequent sections (*See Annex 1 for further details on the assessment process*).

4.1. Program delivery findings

Program delivery for HIV and syphilis diagnosis and treatment is prescribed in national SoPs and policies, in accordance with WHO global HIV treatment and testing guidelines. NCHADS and NMCHC oversee the programs and compliance through vertical structures at national, sub-national, and service delivery levels. They update and train staff and integrate and upgrade services in order to continue to expand access to HIV and syphilis testing and treatment. Donor resources available for program delivery, primarily through the Global Fund, and are expected to cover through 2020. All HIV and syphilis testing and treatment services are currently provided free of charge.

However, while structures and policies are in place at the national level for program delivery, at the sub-national and service delivery levels, there are several limitations which hinder implementation. At these levels, limited knowledge of eMTCT / PMTCT documents and guidelines and poor availability and use of data, coupled with a lack of adequately trained staff and leadership, and undermine delivery of services. In addition, there have been limited mechanisms initiated for service providers to report or document challenges. As a result, there are inefficiencies in service delivery across the cascade.

While HIV and syphilis dual tests and ARVs are widely available across the country, incorrect testing practices are sometimes followed. There is also poor understanding of follow-up and testing at the end of the breastfeeding period. The availability of EID testing is limited and funding for sample transport is occasionally a challenge at some sites. Treatment for syphilis in particular is a challenge due to stock outs of benzathine penicillin and a lack of follow-up mechanisms for syphilis-exposed infants and for syphilis-reactive PW.

An additional challenge is that supervision of the sub-national and service delivery levels by national level is limited to only government health facilities. Within the private sector, where a greater proportion of PW have begun to seek services (>14% according to CDHS 2014), there is no relationship (i.e. supervision, reporting) between government and private ANC and maternity service providers.

Lastly, limited understanding of funds available at the provincial level also results in under spending of available funds.

Table 3: Summary of gaps in program delivery

AREAS	NATIONAL LEVEL	SUB-NATIONAL AND SERVICE DELIVERY LEVELS
LEADERSHIP AND GOVERNANCE	*Unfortunately, supervision or on-site coaching visits are only available at the government health facilities.* *Policy/guidance highlights HIV rather than syphilis.* *Quality and coverage of services provided in the private sector are poorly understood.*	*Poor quality of supervision from PHD to OD, and from OD to HC for ANC and PMTCT services.* *Limited knowledge on syphilis testing & treatment on the part of service providers.*
POLICY	*No major gaps found.*	*Service providers have limited access to eMTCT/PMTCT documents and guidelines on testing and clinical management for both HIV and syphilis in adults and pediatrics.*
FINANCING	*Majority of funding for Cambodia is from international donors and this is not guaranteed after 2020.* *Majority of funding is earmarked for TA and not service delivery*. *No funds to support syphilis study nationwide, resulting in a lack of understanding of the epidemiology and cascade of care for syphilis.*	*Limited financial literacy on GF financial management guidelines by staff at the provincial level results in unspent funds.*
HUMAN RESOURCES	*Staff workload and commitment/motivation is an ongoing concern.*	*Human resource limitations impede staff supervision and mentorship, data management, stock monitoring, and specialized service delivery for vulnerable groups.* *Staff responsible for PMTCT often have an unclear scope of work, leading to confusion and gaps.*
SERVICE DELIVERY	*Issues related to sample collection and delivering test results, limited BIACM sites, limited skills dealing with vulnerable groups and key populations, and challenges in providing free family planning (FP) services were raised.*	*Poor referral and follow-up mechanisms limit accessibility, efficiency, and timeliness of services.* *Follow up and testing of HEI after the conclusion of breastfeeding is poorly tracked.* *EID testing is only available at the central lab and DBS sample collection*

		for birth testing is not being done at maternity wards, leading to poor rates of at-birth testing. *There is no effective feedback/follow-up mechanism for syphilis reactive cases.* *Sub-optimal treatment (using erythromycin) of syphilis cases is widely reported.* *HIV/syphilis dual tests are used for non-PW; this might lead to potential stock-out of dual tests.*
MEDICAL PRODUCTS AND TECHNOLOGIES		*Stock-out of syphilis tests (single tests) and benzathine penicillin were reported in 2016.*
STRATEGIC INFORMATION	*Have limited access to private MAT data/report.*	*Very limited awareness of eMTCT/PMTCT indicators and components is observed at the sub-national and service delivery levels.* *Have limited access to private MAT data/report.*

4.2. Data management findings

At national level, data collection mechanisms and processes are directed by NCHADS which provides trainings for all relevant staff and conducts data consistency checks. NCHADS also performs data verification quarterly, and reviews and updates reporting tools as treatment guidelines change. The EID database system deployed in 34 of 36 pediatric sites is used by data management officers to log information regarding testing and follow up of exposed infants. NMCHC reviews its Health Information System for completion and timeliness every month. Quality checks of databases are occasionally run by NCHADS and NMCHC.

HIV positive women & HEI are assigned an ART code, which is meant to be used consistently across ART sites in the public system to minimize double counting.

However, there are still challenges in access and utilization of PMTCT data. Because data is not submitted by the private sector and due to a lack of unique identifiers, surveillance of congenital syphilis and ANC/maternity data is difficult. At NMCHC, there is no data verification SoP for PMTCT. Limited knowledge on data quality assurance at both national and sub-national and service delivery levels results in challenges interpreting some data in a timely manner. Where processes are in places, there is a lack of staff adequately trained to ensure data quality.

Table 4: Summary of gaps in data management

AREAS	NATIONAL LEVEL	SUB-NATIONAL AND SERVICE DELIVERY LEVELS
DATA COLLECTION MECHANISMS AND PROCESSES	*There are insufficient systems for surveillance of congenital syphilis and ANC/maternity data due to a lack of unique identifiers.* *NCHADS & NMCHC found > 90% sub-national reports were submitted after the default deadlines* *The national programs have limited access to private sector data.*	*Most sites did not have guidance/instructions for reporting readily available.*
DATA VERIFICATION	*There is no Data Quality Assurance (DQA) SoP for the PMTCT program, and insufficient training on data entry, verification, and utilization.* *DQA processes are not well documented by NCHADS and NMCHC.*	*Mechanisms are not in place to review report quality. OD/PHD cannot access HIS to verify consistency between data in hard copy vs HIS. HC chief does not routinely check data consistency between HC vs PMTCT monthly report. There are no records/report on data reviews at each level.* *There is insufficient staff designated for review, collation, and analysis of reports. High workloads at OD, and PHD had limit staff from effectively reviewing data.* *Not all focal staff (especially new staff) are trained on current data management.*
DATA QUALITY	*Robustness of HIS facility reporting for HIV, EID, and PMTCT cannot be determined.*	*There are no written procedures to address late, incomplete, inaccurate, or missing reports.* *Reports contain inconsistent/incorrect data and are submitted late.* *There is a lack of systematic feedback mechanisms for reporting on data quality and analysis.*

OTHERS	*An in-depth assessment of EID data quality is recommended, with a triangulation of data from NCHADS laboratory, NCHADS DMU, and NMCHC/PMTCT data.* *A more in-depth review of existing DQA processes is needed to better understand completeness, accuracy, and timeliness.*

4.3. Laboratory services findings

Cambodia's HIV laboratory network has scaled up significantly since the introduction of viral load testing at NCHADS in 2013. In 2017, the NCHADS laboratory conducted 52,350 viral load tests from 66 adult ART sites, [36] which is equal to 89% of Cambodia's minimum testing needs (one test annually per patient). NCHADS laboratory unit also conducted 998 DNA-PCR tests from 39 Pediatric ART sites, which represents 25% of HEI tested within 3 days of birth.[37] In 2017, Cambodia also launched a third-line program with a process for referring samples for HIV genotyping through a partnership with Institut Pasteur du Cambodge (IPC).

For diagnosing HIV, Cambodia uses a three-test algorithm in line with WHO guidance for HIV testing in low-prevalence settings, and RDT + RPR confirmatory test for syphilis, also in line with WHO guidance. Efficient training and mentoring are the responsibility of the NCHADS laboratory Unit, VCCT Unit, and PMTCT staff.

The Laboratory SOP, 2016 PMTCT guidelines, National Consolidated Guidelines on HIV Testing Services in Cambodia 2017, and PMTCT 2016-2020 strategic plan are all meant to be stored at each facility, although this is often not the case. Essential components of the national laboratory network, such as specimen collection, sample transportation, referral linkage, and quality assurance, and guidelines/job aides distribution still need to be strengthened.

Table 5 : Core laboratory services related to MTCT of HIV and syphilis

Types of Testing	**Population**	**Testing frequency**	**Testing access / process**
HIV and syphilis dual RDT (Alere)	PW (ANC and L&D clients)	Once during pregnancy (ideally at ANC)	RDTs available to be performed at all health facilities in Cambodia (all health centers, ANC clinics, hospitals, etc.), plus NGOs and community –based / mobile testing services
	STI patients & KP	Every 3-6 months[38]	
HIV RDT (Determine ½)	PW partners, general	At risk of exposure or	RDTs available to be performed at all health facilities in Cambodia (all health centers,

[36] NCHADS Laboratory Unit, 2017 EID and VL tests report
[37] This number is based on extrapolation from 2017 NCHADS laboratory data. If we use 2016 PMTCT program data, the estimate is 62%.
[38] NCHADS. 2017 Consolidated guidelines on HIV testing services in Cambodia.

	population	positive risk assessment	hospitals, etc.), plus NGOs and community – based / mobile testing services
HIV confirmatory tests (Stat-Pak & Uni Gold)	Anyone who screens reactive on A1	As soon as possible after A1 reactive	Patients who screen reactive on A1 referred to: HTS-ART unit at referral/provincial hospital; and national reference lab (NCHADS lab).
Syphilis confirmatory test (Rapid Plasma Reagin – RPR)	Anyone who screens reactive on syphilis RDT	As soon as possible after reactive on RDT	Currently RPR is only available at Family Health Clinic (FHC). Patient must attend FHC to receive test. Reports of occasional stock-outs of RPR tests at FHC.
DNA-PCR	HIV-exposed Infant (HEI)	At birth and six weeks, six weeks after totally stopping breastmilk, additional tests if child develops symptoms of HIV infection[39]	All maternity units at referral, provincial and national hospitals are meant to be able to collect DBS sample; some gaps are observed. All PAC-ART sites can collect DBS sample. Samples are transported to NCHADS lab for DNA-PCR test.
Viral load test	All PLHIV	3 months for PW; 6 months and 12 months after ART initiation, then every 12 months for all PLHIV.[40]	All ART sites collect samples and send for testing to either NCHADS or Siem Reap lab.
CD4 test[41]	All PLHIV	Upon initiation of ART, at 6M and 12M, and if virological failure	All ART sites collect samples. Tests performed at hub reference labs and NCHADS lab.
HIV genotyping[42]	Patients with confirmed failure of 2L therapy	Upon recommendation by Cambodia 3L TWG	Sample collected using same process as viral load sample collection, then transported by NCHADS to Institut Pasteur du Cambodge

[39] NCHADS. National guidelines on diagnosis and ART of HIV infection in infants, children and adolescents in Cambodia.
[40] NCHADS. 2016 National HIV clinical management guidelines, figure 11-2, p.68.
[41] NCHADS. National HIV clinical management guideline, figure 11-1, p.67. Cambodia: NCHADS; 2016.
[42] NCHADS. Cambodia Third 90 Program. Cambodia: NCHADS; 2017.

Algorithms for HIV and syphilis diagnoses for MTCT

Use of the HIV/syphilis dual RDT for PW and key populations began in Cambodia in 2017. All government facilities have begun screening PW using the dual test at ANC visits, delivery settings, maternity wards, and STI clinics.

- **Diagnosing HIV in adults**: Cambodia uses a three-test algorithm to diagnose HIV in adults and non-breastfeeding infants > 9 months, in line with WHO guidelines for diagnosing HIV in low-prevalence settings. For PW, STI patients and KP, the HIV/syphilis dual test serves as the first assay (A1) in the three-test algorithm; for all other clients Determine ½ test serves as A1.[43] Confirmatory tests are Stat-Pak (A2) and Uni-Gold (A3).
- **Diagnosing HIV in young infants:** Cambodia uses HIV DNA-PCR testing to diagnose HIV in young infants. HIV-exposed infants are assessed for their risk of exposure and then initiated on either dual or single ARV prophylaxis for 6 or12 weeks.[44]
- **Diagnosing syphilis in adults:** HIV/syphilis dual RDT is used to screen PW. Reactive clients receive a confirmatory RPR test. Syphilis testing and treatment protocol is being finalized and expected to be ready in 2018.
- **Diagnosing congenital syphilis in young infants**: Cambodia has had no formal diagnostic criteria for congenital syphilis and congenital syphilis rates have not been monitored. The NSP-PMTCT M&E framework uses the following criteria in line with WHO guidelines: still births, spontaneous abortion occurring after 20th week of pregnancy, and live births occurring in a woman seropositive for syphilis who was not adequately treated during pregnancy.

For full information on the diagnosis algorithms for HIV and syphilis in adults and children, please refer to the 2016 National HIV Clinical Management Guidelines for Adults, Adolescents, and Children.

Laboratory quality control and management

Quality assurance of the laboratory network will be essential to achieving validation. The NCHADS national laboratory team currently employs external quality assessment (EQA) and internal quality control (IQC) tests as parts of its routine activities to monitor laboratory control standards at point-of-care sites. The National Institution of Public Health (NIPH) laboratory sends out Proficiency Testing (PT) samples two times per year to the country referral laboratory, and four times per year for IQC. Mentoring and supervision visits are implemented through joint monitoring visits with partners.

Table 6: Summary of gaps in laboratory services

AREA	NATIONAL LEVEL	SUB-NATIONAL AND SERVICE DELIVERY LEVELS
LABORATORY QUALITY MANAGEMENT	*Lack of coordination among national program, sub-national level, and sites to distribute key tests and supplies in HIV and syphilis management*	*Shortage of essential tests (RPR) and drugs (Benzathine Penicillin 2.4 IU) for syphilis confirmatory testing and syphilis treatment for mothers was reported. Syphilis-positive pregnant women*

[43] NCHADS. Consolidated guidelines on HIV testing services in Cambodia. Cambodia: NCHADS; 2017.
[44] NCHADS. Consolidated guidelines on HIV testing services in Cambodia. Cambodia: NCHADS; 2017.

	Lack of Lab Quality Management System (LQMS) and accreditation in the structure of national lab system.	*frequently receive suboptimal syphilis treatment (erythromycin instead of BP).* *Optimal syphilis treatment for SEI is not widely implemented. There is no monitoring system to track the outcomes of syphilis-exposed infants.* *Lack of lab policy, guideline, SOP, algorithm, job aides at site level.* *No quality assurance system (QAS) is applied at public rapid testing sites and no mechanism to conduct quality assurance at private testing sites.*
QUALITY OF TESTS	*Lack of policy for batch testing upon receiving diagnostic assays* *Lack of Quality Management System (QMS) validation the assays.* *No calibration of equipment and lab tool*	*Stock out and shortage of HIV and syphilis tests were reported by staff.* *Use of expired tests, poor RDT storage practices, and poor adherence to FEFO (First Expired, First Out) at some sites was observed.* *Lack of formal / rationale forecasting methodology was observed, which has led to emergency stock situations.*
QUALITY OF TESTING	*Lack of LQMS trainings, refresher training, mentoring, supervisions.* *National program had very limited Quality Assurance activities at rapid testing sites. Lack of External Quality Assessment (EQA) participation and Internal Quality Control application at most of the rapid testing sites.* *Lack of plan and protocol for corrective action at rapid testing sites*	*Lack of capacity in LQMS to perform quality testing including sample handling and testing and volume of sample.* *Testers at one site misidentified the optimal time to read RDT result. Health care workers were observed using inconsistent methods and quantity of blood sample collection. Poor waste management.* *No supervision or corrective actions are routinely done to improve the capacity of testers.*
LABORATORY DATA MANAGEMENT	*There is not national surveillance system that incorporates the Laboratory Information system (LIS)*	*Lack of electronic system to track mother-infant pairs for HIV and syphilis.* *There is no electronic and no back up data management system accessible to lab staff at sites, which impedes the use of testing data for decision-making and leaves the program at risk of data loss.*

4.4. Human right, gender equity, and community participation findings

Cambodia has committed to promoting access to prevention, care and treatment for people infected with and affected by HIV according to human rights principles. The 2002 Cambodia *Law on the Prevention and Control of HIV/AIDS* affirms the rights of PLHIV and indicates that they shall receive primary health services free of charge in all public health facilities.[45]

Guidelines and SOPs for new case detection, retention in care, and treatment follow rights-based principles, are designed to ensure that at-risk individuals consent before being tested for HIV, and aim to secure a supportive environment that links HIV infected individuals to treatment, care and support services.[46] The 2016 policy decision to "treat all" PLHIV regardless of CD4 count has rapidly expanded the number of people on ART.[47]

However, despite the commitment to upholding human rights in HIV prevention, care, and treatment services, there are still limitations which impact the availability and accessibility of PMTCT services among PW, especially those who are young women or adolescents, unmarried women, members of KP (including LGBT), indigenous people, and people living with disabilities. The limitations include a poor understanding of non-discrimination and gender equality in service delivery, and a lack of specially-trained providers for KP.

While current laws aim to provide opportunities for redress, the mechanisms for these are not well known or do not exist. There has also been limited community engagement due to a lack of functioning networks of WLHIV and policies to facilitate their participation. A summary of the gaps in human rights, gender equality, and community engagement identified during the facility assessments is provided below.

Table 7: Summary of gaps in human rights, gender equality and community engagement

AREA	NATIONAL LEVEL	SUB-NATIONAL AND SERVICE DELIVERY LEVELS
AVAILABILITY		*PMTCT service availability is limited by hours, lack of friendly services for adolescents, KP, and women with disabilities, poor provider understanding of gender equality and non-discrimination related.*
ACCESSIBILITY	*There are no specific provisions within the PMTCT strategy to ensure accessibility and acceptability of service for young women of reproductive age, unmarried women, sex workers, LGBT persons, indigenous women ad women living with disabilities.*	*Services are available free of charge for HIV+ PW but challenges such as transportation fees limit availability for the poor.*
LAWS	*There are no laws, regulations and policies on adolescents' rights to decision*	*Limited provision and awareness of laws related to HIV, human rights and*

[45] The law on the prevention and control of HIV/AIDS (2002), KRAM No. NS/RKM/0702/015. http://www.naa.org.kh/files/en/G127E.pdf
[46] NCHADS. Consolidated guidelines on HIV testing services in Cambodia. Cambodia: NCHADS; 2017.
[47] NCHADS. National guidelines on diagnosis and antiretrovial treatment on HIV infection in infants, children and adolescents in Cambodia. Cambodia: NCHADS; 2016.

	making in receiving treatment and health services and HIV testing and treatment without parental consent. *There are no laws or policies that guarantee equality and non-discrimination for key populations.*	*gender equality in the context of PMTCT.*
ACCOUNTABILITY		*There is a lack of awareness for and mechanisms for documentation, reporting and redress for human rights violations, including discrimination in health care settings.*
COMMUNITY ENGAGEMENT	*PLHIV and KP have not yet been formally engaged in the PMTCT program.* *WLHIV networks could be strengthened to better enable meaningful engagement in the PMTCT program.*	

5. Strategies to address identified gaps towards achieving the eMTCT goal

In order to address the challenges identified through the facility assessments, strategies have been identified across each of the four programmatic areas. These strategies will be published and disseminated at all levels to ensure implementation under the supervision of MoH, NCHADS and NMCHC during 2018-2025.

5.1. Program delivery

The Program Delivery Sub-Working Group will work with NCHADS, NMCHC, and MOH to improve program delivery by improving the overall leadership of the PMTCT program, funding availability, and the quality of services provided. Through expansion of the eMTCT TWG, a broader group of stakeholders, key to the PMTCT response, will be engaged going forward.

There will need to be a concerted effort to identify and orient key focal persons at all levels of the health system to the roadmap and existing PMTCT polices and guidelines. A renewed effort will be made to disseminate existing policies, strategies, operational guidelines, and job aides at all levels of the health system. PMTCT will be integrated into routine supervisory visits to service delivery points. The PMTCT training curriculum will be updated to provide guidance on delivering service in accordance with human rights principles, including for key populations, adolescents, women with disabilities, and other vulnerable groups.

The sub-working group will adapt the WHO program delivery checklist for routine annual assessments to address barriers identified above, and will recommend a process for the TWG to conduct such annual assessments.

To improve service delivery in the private sector, the sub-working group will explore with MOH a mechanism to obtain aggregated reports from private ANC/MAT clinics. The sub-working group will also support the national program to advocate for access to private ANC/MAT clinics to provide training and mentorship on eMTCT.

Importantly, the additional strategies being proposed within this document to further strengthen PMTCT will need to be costed to ensure that funding is available for their implementation through 2025.

5.2. Data management

To fill the gaps identified, strategies to improve data will focus on improving the availability and accessibility of data and providing guidance on processes for data collection, verification, quality assurance and management at all levels. The data management sub-working group will lead the development of SOPs and define key roles and responsibilities for focal persons. In addition, the eMTCT TWG should routinize review of PMTCT data and conduct impact assessments and develop and introduce new reporting tools as needed where routine M&E systems are insufficient.

5.3. Laboratory services

The NCHADS laboratory team will continue to build capacity of lab personnel at all levels, in collaboration with partners.

Laboratory and logistics teams of NCHADS and NMCHC will work together to update supply chain and stock management SOPs in order to address stock-out problems at health facilities. At NMCHC, the newly revised NMCHC PMTCT database monitors stock levels as well as tests performed, and communicates stock reports and requests directly to CMS. Training on stock management tools and processes will be routinely refreshed through field visits. NCHADS and MNCHC will ensure that tests are procured, stored, and used according to SOPs.

Routine lot testing/validation test kits to verify test performance and strengthen LQMS to reach accreditation standard will also be performed using the internal laboratory quality management system, which complies with the approved testing algorithm. Tools and checklists for quality standard management will be employed by sub-committees responsible for Lab.

The External Quality Assessment Scheme (EQAS) standard operating procedure, as developed in 2009 by NCHADS in collaboration with NIPH and partners, will continue to be implemented. In early 2017, the EQAS including proficiency testing (PT) was reinforced in the consolidated guidelines for HIV testing service; this uses inter-laboratory comparison is to ensure the correct test results and to avoid misdiagnosis of HIV status. PT involves the testing of unknown samples at regular intervals by the testing sites while EQAS ensures the performance of HTS sites - that results are reproducible, and errors are detected (by external laboratories).[48] For Cambodia to achieve eMTCT, continued participation in EQAS schemes is mandatory in order to evaluate testing competence; assess performance of specific HTS providers; evaluate the reliability of HIV testing procedures; ensure accurate HIV test results; and provide information for self-evaluation of providers.

[48] NCHADS. Consolidated guidelines of HIV testing services in Cambodia. Cambodia: NCHADS; 2017.

Finally, a review of NCHADS laboratory data was unable to determine average turnaround time for DNA-PCR samples; this is because the lab does not collect data on the time between when the result is dispatched from the lab and when it reaches the site (or the patient). Further investigation of turnaround time is thus recommended in order to determine if the current method of sample transportation and results return is sufficient, given the high risk of mortality among HIV+ infants in the first months of life.

5.4. Human rights, gender equity and community participation

In order to fill the human rights gaps identified, this sub-working group will need to focus on improving the availability and accessibility of PMTCT services, especially for key populations, through the revision of SOPs to include provisions for non-discriminatory and rights-based service delivery. This must be coupled with capacity building for health care providers in these areas. Existing legal structures and mechanisms should also be revised to support such implementation, with enforcement fostered through awareness building among clients, service providers, and law enforcement, along with improvements in case documentation, reporting, management, and redress for violations. Lastly, active engagement of the community, including PLHIV and key populations, should also be facilitated to ensure their needs and preferences are met and that there is increased accountability for providers who violate human rights principles.

6. M&E and reporting

6.1. Core monitoring indicators

Process indicators will be monitored at two levels through national and sub-national dashboards (See annex 5.) The sub-national dashboard will help NCHADS and NMCHC to understand gaps and performance of services by provinces throughout the cascade, while the national dashboard will track Cambodia's performance against the global criteria/targets.

Based on validation indicators by WHO, NCHADS and NMCHC will select and define sources of data for core monitoring indicators and produce a simple Excel tool (with user guide) that the national programs and TWG can use to monitor the progress throughout the pre-validation and validation processes. Targets should be reviewed on an annual basis, measured against the required validation targets. Where annual targets are not met, the TWG will work with the appropriate parties to take mitigating action. NCHADS, NMCHC, and the data management sub-working group will continue to work in close coordination to ensure data quality for all of the required global validation impact and process indicators, and to assess data for completeness, accuracy, consistency, and timeliness (See annex 2).

NCHADS, NMCHC, and the TWG will also work closely with MoH to improve reporting of HIV and syphilis screening data by private maternity clinics.

6.2. Data sources and analysis

In mid-2017, an initial list of poor performing provinces was identified to help NCHADS and NMCHC understand gaps in implementation and plan mentoring and supervisory support more efficiently. WHO guidelines recommend that "poor-performing" sub-national administrative units include regions that perform poorly on

relevant health indicators, regions with the highest disease burden, regions with marginalized populations, and regions where some or all of the impact and process indicators have not been met.

Performance of each district/province on WHO-recommended indicators was calculated, and provinces were ranked as poor/red, moderate/yellow, or good/green. Program data was used from NMCHC (ANC and maternity site reports) and NCHADS (ART site reports, Family Health Clinic reports, and EID reports), while population-level data was used from the Cambodia National Institute of Statistics (NIS) and CDHS. The Cambodia 2014 DHS survey was used to estimate the national coverage of ANC services, as it is not possible to capture this from program data alone due to challenges with double-counting. For the purpose of monitoring, ANC coverage will also be analyzed using adjusted CDHS reports of 2014 & 2019 and presented in TWG (detail adjustment method is built in the national dashboard - excel spreadsheet). Since Cambodia has limited access to data regarding ANC and delivery services at private clinics, the poor performing sites analysis only captured data from public health facilities.

From 2017, several core indicators will be used in computing the performance of individual province during the pre-elimination phase. These indicators will be monitored throughout pre- and elimination phases.

The core and additional indicators used to analyze poor performance by provinces from 2017 onwards are:

- ANC coverage: % PW with at least one ANC visit
- HIV testing coverage: % PW with known HIV status at ANC clinics
- HIV testing coverage: % PW with known HIV status at MAT clinics
- HIV treatment coverage in PW: % HIV+ PW receiving ART
- Early infant diagnosis: % HIV-exposed infants who received virological tests for HIV within two months of birth
- Early infant diagnosis: % HIV-exposed infants who receive an HIV rapid test at 18 months / or six weeks after the cessation of breastfeeding
- Syphilis testing coverage: % PW who receive a syphilis test during their pregnancy, and during labor and delivery
- Syphilis treatment coverage: % of confirmed syphilis-positive PW treated with benzathine penicillin

NCHADS and NMCHC will work with key partners to ensure that all relevant sub-national units, remote or marginalized populations, and provinces with high disease burden are included in the site selection process for both validation and ongoing monitoring.

NCHADS and NMCHC will also ensure the accurate assessment of intervention coverage and documentation of cases of MTCT of HIV or syphilis in a timely manner. The assessment will capture service coverage and outcome data from both the public and private health sectors, and minimize sources of error, using WHO checklist and program tool. Additionally, operational research will be conducted among selected poor performing sites/health facilities to understand implementation gaps.

Field monitoring visits will be made by both NCHADS and MNCHC to verify data sets, strengthen data quality, and troubleshoot programmatic/operational challenges. Additionally, NCHADS and MNCHC will keep track of the site performance, using the national and sub-national dashboards (see annex 5) and publish the reports through ongoing annual reports. Facility selection for ongoing monitoring will be made based on several criteria: geographical diversity, province/OD with high disease burden, inclusion of at least one poor performing site, sites with low-/non-reporting, patient diversity, and diversity in levels of service delivery.[49]

[49] Global guidance on criteria and process for validation of eMTCT of HIV and syphilis, WHO 2017.

6.3. Reporting

The TWG will prepare an annual report to measure progress against each of required indicator, using the reporting format for WHO validation (Annex 4). Data summaries will be distributed and published on the NCHADS website at www.nchads.org.

Table 8: Reporting throughout the pre-validation and validation phases

Types of Reports	Purpose	Frequency	Organizer	Template
Data/M&E	Track progress on performance indicators	Annually	eMTCT TWG	Country template (Monitoring dashboard)
Narrative	Understand and address any programmatic or operational challenges	Optional - Annually	eMTCT TWG	Adopting WHO validation report
Pre-validation	Submit to NVC	Once – end of the phase	eMTCT TWG	WHO validation report
Validation	Submit to RVC	Once – end of the phase	eMTCT TWG & NVC	WHO validation report

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Annexes

Annex 1: Program assessment concept note

Cambodia eMTCT of HIV and Syphilis Roadmap
November 2017
Program Assessment Objectives and Design

Cambodia is currently in the process of applying for the validation of the elimination of mother to child transmission of HIV and syphilis. This is an exciting step forward in controlling the HIV/AIDS epidemic in the country. Through current efforts we have seen the MTCT rate drop from 37% in 2007 to 13% 2016. Similarly, new infections have fallen by a relative 80% from 2007 to 2017, from 551 new infections per year to 113 new infections per year, respectively.[50]

As part of the validation process, Cambodia must also have the following systems in place:

1. An adequate "validation standard" national monitoring and surveillance system that can capture process and process data from both the public and private health sectors;
2. A program of sufficient quality to ensure sufficient scope, accessibility, and quality of services to sustain eMTCT targets;
3. A laboratory system that includes a laboratory quality management system, trained personnel, and external quality assessment (EQA); and
4. A commitment to human rights, gender equality, and community engagement such that the interventions to reach the targets have been met in a manner consistent with international, regional, and national standards.

A critical step in establishing whether the above systems are satisfactory and meet current WHO standards is the completion of a WHO baseline program assessment. The WHO has provided several tools to conduct this baseline assessment, which ideally should be used at *national, sub-national and site levels* to establish current program performance across the above program areas. Cambodia will be conducting a series of program assessments from November 2017, and will use the information from these assessments to establish current performance gaps, best practices, and follow-up areas of support.

Proposed schedule for initial provincial visits
Note: both of below proposed trips are designed with provinces geographically close to one another, to allow the team to visit all three provinces within 5 days.

Date	Provinces selected	Performance level (public facility-based)	Justifications for province selection	Assessment teams
22, 25-29 Dec	Option 1: Phnom Penh, Prey Veng, Tbong Khmum	Good, moderate, poor, respectively	Each represents different levels of site performance	PD, SI, Lab & HR

[50] Spectrum Cambodia 2017 File, provided by UNAIDS

	Option 2: Phnom Penh, Steung Treng, Mondulkiri	Good, poor, poor, respectively	If looking for problems in the poorest sites. Not many cases, esp. EID.	PD, SI, Lab & HR

Provincial and Site Level Selection Methodology

Purposeful sampling will be used to select provinces and sites that will be interviewed for this assessment. The following key indicators will be used to select 2-3 poor-performing provinces, and 1 strong performing province to establish best practices.

- HIV
  - Percentage of estimated PW who know their HIV status
  - Percentage of HIV-positive PW who received antiretrovirals to reduce the risk of MTCT
  - Percentage of infants born to HIV-positive women receiving a virological test for HIV within 2 months of birth
- Syphilis
  - Percentage of estimated PW who were tested for syphilis at 1st ANC visit
  - Treatment coverage of syphilis positive PW

Team Structure

The assessment will be conducted at three different levels (national, OD or provincial level, and facility level) and include different stakeholders. The assessment team will be composed of partner organizations and ministry personnel, and ideally will include one member of each of the 4 sub-groups. The leaders of each sub-group are expected to consolidate the results of their findings and present these to the TWG.

Proposed interview targets

- National-level: 3 interviews (NCHADS-1, NMCHC-1, NIPH-1)
- Sub-national level:
  - Policy makers /program managers at provincial level: 6 interviews (1 PASP/Lab Coordinator and 1 MCH/PMTCT Coordinator at each of 3 provinces)
  - Policy makers /program managers at OD level: 6 interviews (1 OD Coordinator and 1 CMA/CMC at each of 3 ODs)
- Public service delivery:
  - National hospitals: 5 interviews (2 at NMCHC - ANC & MAT; 1 at NMCHC FHC; 2 at PP ART site - 1 onsite lab staff and 1 ART team lead)
  - OD hospital: 6 interviews (1 ART team lead and 1 MAT/ANC lead in each of 3 OD hospitals)
  - Health Center: 1 midwife (and pharmacists?) at each of 3 HCs

Tool Overview

The assessment structure has been provided by the WHO. These tools have been entered into an Excel format, which should be used for recording responses. Every facility/department interviewed at the sub-national, national, and site level should have a separate file saved. This file will need to be sent to NCHADS, NMCHC, and CHAI, who together will coordinate the analysis process.

Final Assessment Report Overview

The final assessment report will provide answers to original objectives stated in Section 1, with the intent to establish current performance gaps, best practices, and key action items and recommendations across

the four program areas. This report should serve as a guiding document to support the improvement of underlying program delivery, strategic information, labs, and human rights environments in anticipation of achieving elimination of HIV and syphilis. The final report will have both quantitative and qualitative components which will evaluate participant responses to the checklist questions. The quantitative component will look at the proportion of checklist items that were satisfactorily addressed and answered, and the qualitative responses will aim to dive into the key reasons as to why an unsatisfactory response was received. Key recommendations and action items will be established from these results to prepare Cambodia for elimination of MTCT of HIV and syphilis.

Annex 2: Detailed workplan

No.	Barriers	Levels			Strategies/Activities	Led by	2018		2019		2020	
		N	SN	SD			H1	H2	H1	H2	H1	H2
I	**Program Delivery**											
a. Policies, strategies, guidelines related to HIV and syphilis:												
1	PMTCT strategies are well documented and disseminated. However, a clear roadmap highlighting the gaps needed to achieve validation is still needed.	√			Publish the roadmap, then disseminate at all levels and among wider audiences.	NCHADS & NMCHC						
2	HIV law/policies/regulations exist, however limited syphilis policies/regulations are updated/initiated to guide implementation at service delivery level.	√			Should syphilis testing and treatment policies be updated and widely disseminated at all levels?	NCHADS						
b. Representation from stakeholders for eMTCT:												
3	No/limited representatives from other relevant institutions (i.e. blood bank, NIPH, and other relevant civil societies) in eMTCT as a whole.	√			Extend TWG membership to all concerned institutions/partners.	NCHADS & NMCHC						
		√			Alternatively, keep the TWG focused on the core HIV partners and consider twice-yearly stakeholder forum that engages broader group.	NCHADS & NMCHC						
4	Limited involvement of NGOs in BIACM and PMTCT work.		√	√	Provincial BIACM should be reviewing its membership and the scope, and consider expanding members to as many NGOs/non-BIACM sites as possible.	PHD						
c. Capacity strengthening:												
5	Oversight by the national program is restricted to public health facilities, with no supervisory or reporting relationship to private health facilities.	√			Work with MoH/NMCHC to create a mechanism which allows national programs to obtain data from private ANC/MAT clinics	NCHADS & NMCHC						
6	Some service providers lack skill in supporting /counseling KPs to disclose their HIV status when accessing PMTCT or other health services	√			National programs to involve NGOs in facilitating training for service providers and ensure that relevant KP-sensitive topics are included in trainings.	NCHADS, NMCHC & CPN+						
7	Poor supervision from PHD to OD, and from OD to HC for ANC and PMTCT services, esp. at health centers and maternity level.		√	√	Review and optimize the tools, checklists, and processes for PHD and OD site supervisory visits on PMTCT; ensure that PMTCT service is integrated into	NMCHC, NCHADS, PHD						

8	No supervision for finger pricks testing and on-site coaching of dual tests.		√	√	regular supervisory visits at these levels and monitored regularly.							
9	Limited knowledge on syphilis testing & treatment at the provincial level.		√	√	Need more (refresher) training at this level (can be combined with other HIV trainings).	PHD						
10	No clear annual training calendar available at sites.		√	√	National programs should develop a training plan (including ToT) and share the calendar to the provincial level. Trainers at the national programs should follow-up if the trainers share knowledge/key updates among their supervisors and other team members.	NCHADS, NMCHC & PHD						
d. Financial instability:												
11	External funding keeps decreasing. certain external funding focuses on TA, not for PMTCT at service delivery (i.e. at-birth testing for providers, syphilis training,…).	√			Advocate with MoEF to increase national funding on HIV/PMTCT services.	NAA, MoH, CPN+, NCHADS & NMCHC						
				√	Advocate with each provincial governor, ministries to integrate eMTCT of HIV and syphilis in commune development and investment plan.	PHD, OD & CPN+						
12	Limited financial literacy on GF financial guidelines by staff at the provincial level led to unspent/attainable many activities.		√	√	National programs to provide/update clear orientation and instruction of GF financial guidelines (can be combined with annual workshop).	NCHADS & NMCHC						
13	Limited financial support/contribution from NGO due to reduced CSO support in promoting PMTCT access might lead to high rate of LTFU.		√	√	Government and counterparts (including NGOs supporting CAF/BIACM) will include plan for referral supports for HIV positive PW.	PHD						
e. Quality of testing and treatment:												
14	Very limited at-birth testing training done at maternity wards. Some staff reported because of no testing kits, other reported trained staff moved out.		√	√	National programs and PHD should ensure sufficient trainings, supply (DNA CPR tests and DBS papers) and effective follow-up system exist at all maternity sites.	NCHADS, NMCHC & PHD						
15	Quality of services on syphilis treatment, infant testing and follow-up, and HIV/syphilis surveillance system.	√			More quality on-site coaching/training and ToT training, esp. at the service delivery, to be available on routine basis.	NCHADS, NMCHC & PHD						
16	Defining reasonable turnaround time is still a challenge. Some sites/levels define/perceive it differently.	√			Routine detailed analysis and dissemination of result of turnaround time for testing and treatment should be done, eps. for all levels.	NCHADS						

17	HIV testing for exposed infants is not yet widely available and easily accessible. EID testing is only available at only national lab, and samples can only be collected at maternity units that are co-located at a hospital with an ART site.	√			Reinforce EID testing guideline, improve referral & follow-up mechanism, sample transportation and continue keeping tracks of challenges and best practices (Training and supervision trip).	NCHADS, & NMCHC						
18	Limited understanding about plan to include follow up and diagnosis for infants exposed to syphilis and HIV at the time EIs stop having breast milk.		√	√	National programs to reinforce HIV testing algorithm for pediatrics to all sub-national and service delivery levels (either training or mentoring).	NCHADS						
19	Incorrect testing process and practices. And dual tests have been used for non-PW; this might lead to potential stock-out of dual tests.		√	√	National programs and PHD should reinforce the guidelines for HIV and syphilis testing. More trainings and follow-up visit should be made to VCCT staff at the provincial level (either training or mentoring)..	NCHADS, NMCHC & PHD						
20	Syphilis exposed infants (SEI) are not screened. It is assumed that those SEI are generally infected. Healthcare providers only assess treatment history in mothers.	√			Expand HTS training, and compliance of the guideline at esp. the service delivery level.	NCHADS, PHD & NMCHC						
21	Limited measures to prevent or address loss to follow up of PW who tested positive for HIV or syphilis and exposed infants. Only some sites where BIACM implements have systems in place to address it.	√			Integrating syphilis into BIACM, and expand BIACM to all provinces/ODs - explore involvement of MCH/PMTCT coordinators at all level. (i.e. revise follow-up sheet, regular monitoring, ..).	NCHADS						
22	Low accessibility to confirming syphilis status among PW is very low; RPR is carried out and only available at Family Health Clinics (FHC).	√			Addressing referral challenges happened in between FHC and HC through improved follow-up system at PHD.	FHC						
		√			Active case management to be carried out, as facilitated by MCH/PMTCT coordinators.	PMTCT coor. & BIACM Coor.						
23	Poor referral and follow-up mechanisms in facilitating optimal accessibility, efficiency and timeliness of services.		√	√	Improving the coverage of BIACM and communication & reporting mechanisms between ANC/MAT clinics and adults and pediatrics ART clinics.	NCHADS & NMCHC						
f. Limited human resources:												
24	Some unit/sites report under staffing, while others are not highly motivated/committed to do their jobs due to limited financial compensation/poor salary.	√			Staff scope of work should be reviewed and prevalent to salary increment system, patient portfolio and working hours (including payment for result and depending on individual service delivery management).	NCHADS, NMCHC, service delivery & PHD						

		√			Re-introduce/re-inforce payment for result to other sites.	NCHADS							
25	Some sites lack formal HIV providers, thus borrowing and training non-HIV staff for temporary use are very common.	√			More HIV personnel should be recruited, in reference to patient-provider ratio.	NCHADS, NMCHC, service delivery & PHD							
26	Limited human resources (to conduct supervision, supervise data management & M&E, and support/ monitor stock of tests & drugs) and skills to work with vulnerable groups.		√	√	A good quality assessment with a simple checklist/tool to identify problems at the site level, and prioritize focused supervision to the poor performing site (same as PD acti#7).	NCHADS, NMCHC & PHD							
27	Unclear scope of work of staff dealing with PMTCT tasks led to poor quality of work (i.e. limited counselling, patient follow-up, ..).		√	√	National programs should advise the revision of staff's scope of work at provincial, OD and HC levels (same as PD acti#24).	NMCHC							
II	**Data Management**												
a. Data quality Assurance													
1	A need to strengthen documentation of DQA processes.	√			NMCHC colleagues to discuss what areas of DQA needing more robust documentation.	NMCHC							
2	Insufficient systems for surveillance of congenital syphilis. [FHC: no unique identifiers, but numbers are very small. If PMRS or other health ID is introduced, this would assist with deduplication].	√			Plan for CS surveillance and discuss how this could be strengthened to meet eMTCT validation standards.	NCHADS							
		√			STI/syphilis guideline will be available for use in 2018.	NCHADS							
3	It is currently unclear how robust is the quality of HIS facility reporting for both HIV and PMTCT. Assessments of facility level data quality for HIS data are needed.	√			Develop protocol/plan for on-site DQA .	NCHADS & NMCHC							
4	An in-depth assessment of EID data quality is needed, which should include a triangulation of data from different sources. [combined in operational research]	√			Analysis of EID data results and data quality.	NCHADS							
5	A more in-depth review of existing DQA data is needed to better understand aspects such as completeness, timeliness, etc. [operational research?]	√			Share the most recent DQA reports available with the eMTCT data quality sub-group. eMTCT data quality sub-group can then review these data to see if additional activities are needed.	NCHADS & NMCHC							
6	A more in-depth understanding of the role of the private sector is needed to better understand where PW in Cambodia get ANC and delivery services. Is an analysis of vital statistics data able to shed insight into this issue?	√			Add this topic to the eMTCT TWG agenda for broader discussion about how to approach this.	NCHADS & NMCHC							

7	[It is unclear if a]PMTCT impact assessment is needed in Cambodia.	√			eMTCT TWG to review history of PMTCT impact assessment in Cambodia and discuss if this is needed and if so, how it could be done.	NCHADS & NMCHC						
8	Lack of information about delivery, ANC and PMTCT in the private sector.		√	√	A rapid assessment on the delivery and ANC services at private sector is needed. If the result is significant (>10%), then eMTCT TWG should advocate with MoH, where (quarterly) aggregated reports from private ANC & MAT clinics should be included as parts of their license conditions.	NCHADS & MNCHC						
9	No effective feedback/follow-up mechanism for syphilis reactive cases.		√	√	Clear guidance on follow-up mechanisms of syphilis should be initiated by the national program and handed over to PHD to follow-up.	NCHADS, NMCHC & PHD						
10	Very limited awareness on eMTCT indicators and components among all interviewed participants at these levels.		√	√	National programs should develop and disseminate eMTCT tools (including translated checklist) and roadmap to all relevant stakeholders, especially at the sub-national level.	NCHADS, NMCHC & PHD						
11	Insufficient training on data entry and utilization at esp. NMCHC.	√			Training on data entry and utilization.	NMCHC						
12	NCHADS & NMCHC found > 90% sub-national reports were submitted behind the default deadlines. Ultimately, national programs could not produce consolidated report as planned.	√			Capacity building and regular technical supervision visit needed especially for poor performance site with documentation of progress.	NCHADS & NMCHC						
13	20% correct & 50% on time reports, PHD's rough estimation		√	√		NCHADS, NMCHC &PHD						
	100 % on time report, 96 % correct from FHC		√	√		PHD &OD						
	Small inconsistency of data in ANC report		√	√		PHD &OD						
	Data of delivery case from hard copies are different from HIS		√	√		NCHADS, NMCHC, PHD &OD						
14	ANC/MAT: double counting is an issue because currently no unique identifier used, and aggregate reporting.	√			A national health ID and a line-listed database in order to minimize double counting. This is currently a long-term activity that involves engagement across the health sector.	NCHADS & NMCHC						
15	Data verification: consistency check is not done routinely.	√			At least one consistency check will be done as part of CoAg plan, plus EID data matching to PMTCT data in HIS.	NCHADS & NMCHC						
16	HC chief did not check data consistency between HC1 vs PMTCT monthly report.			√	Data consistency from HC1 and PMTCT monthly report should be checked by HV chief.	NMCHC						

17	Possible data discrepancy exists between hard copy report vs HIS, when the correction was made after submission and if done only in one source (example: HIS).		√	√	Ensure mechanism to correct data errors in both data sources.	NCHADS & NMCHC						
b. Data collection mechanism and processes													
18	No DQA-SoP for PMTCT program.	√			SoP for DQA for PMTCT program is needed. If possible, it should be simple table to score each issue of lateness, incompleteness, inaccuracy and missing to identify area of weakness for action taken accordingly.	NCHADS						
19	Written national guidelines for reporting: Most of the sites did not have guidance/instructions to fill in and for reporting ready available on the desk.		√	√	Guidance & instruction should keep on the desk and easy to access and reviewing. Ensuring guidance/instructions are well received at sub national level and at services delivery.							
20	No official consensus MTCT rate agreed for Cambodia since the last couple years. Both NCHADS & NMCHC hardly find MTCT rate which is recognized nationally .	√			WHO and UNAIDS to lead discussion on how MTCT rate is defined and generated the agreed rate for Cambodia every year.	UNAIDS & WHO						
21	No national monitoring dashboard which keeps track core indicators of eMTCT.	√			Initiate the monitoring dashboard with assigned focal points to update/report the progress on annual basis.	NMCHC & NMCHC						
22	Systematic feedback mechanisms to reporting levels on quality and analysis: There is no guidance for feedback mechanism. Current practice, feedback mechanism were made from focal people to their respective PHD to ODs and OD to RH MCH/ART/FHC and HCs.		√	√	Include feedback mechanism in SOP to be developed. Lessons learned (strength and weakness) from current practice should be taken into account when developing SOP.	NCHADS & NMCHC						
23	PMTCT and HIV: Data management guideline outlining staff scope of work, data collection process and tools are not routinely updated and disseminated.	√			SoP to be updated and sufficiently disseminated. Where possible, a brief manual summarizing new changes should be well disseminated at sub-national and service delivery level and be available on the websites.	NMCHC						
24	Monitoring indicators capturing infant testing at the end of breastfeeding period is not yet available.	√			Indicator(s) related to mother and infant pairs during the breastfeeding period should be added to current tool.	NCHADS						
		√		`	Mother-infant pair tool to be introduced at ANC, MAT, ART & peds ART clinics.	NMCHC						

25	No fund to support syphilis study nationwide.		√	√	Syphilis study to test the acceptability of the syphilis follow-up sheet (throughout the cascade) led by PMTCT coordinators in 26 provinces is needed.	NCHADS, NMCHC & PHD							
27	No operational research conducted among selected poor performing sites/health facilities to understand implementation gaps.	√			Operational research is needed to understand implementation gaps.	NCHADS & MNCHC							
28	Lack of a common unique health identifier means that total deduplication of data by client is not possible.	√			Long-term action: continue to be engaged with broader MOH efforts to develop and adopt a unique identifier.	NCHADS & NMCHC							
c. Mechanism in place for review report quality:													
29	Focal person at OD/PHD cannot accessed HIS to verify consistency between data in hard copy vs HIS. (Only chief of technical bureau can access HIS).		√		Focal person at OD/PHD who do data review should have access to HIS for checking data consistency.	NCHADS & NMCHC							
30	There are no records of the report on data reviews at each level available.		√	√	Data verifying should be documented at each level to monitor the improvement progress and for action.	NCHADS & NMCHC							
31	Written procedures to address late, incomplete, inaccuracy or missing reports: There is no written procedure yet. Following current practice, corrections of data errors are allowed within 15 days of next month.		√	√	National programs already plan to include the procedure in SoP to be developed. If possible, it should be simple table to score each issue of lateness, incompleteness, inaccuracy and missing to identify area of weakness for action taken accordingly.	NCHADS & NMCHC							
32	Sufficient staff designated for review, collation and analysis of reports: Over workload at OD, PHD may affect quality of data review.		√	√	Defined roles & responsibility for focal person at each level of reporting for data verification & reporting checking.	NCHADS & NMCHC							
33	Staff training on data management process and tool: Not all focal staff (especially new staff) were trained on current guidance/ instructions.		√	√	Monitoring list to ensure focal staff at health facilities, OD,PHD are all trained.	NCHADS & NMCHC							
			√	√	Refresher trainings and regular onsite coaching is needed from national level.	NCHADS & NMCHC							
III	**Laboratory**												
1	Lack of qualified materials for transporting samples and poor transportation system.	√	√	√	Special sample transportation box and qualified transportation system needed.	NCHADS, MNCHC & PHD							
		√	√	√	Policy to enforce staff responsibility and commitment for all lab-related services, esp. sample transportation.								

2	Lack of policy for batch testing upon receiving diagnostic assays and the frequency of validation theses assays.	√			Apply with more robust validation methods: develop SOP and policy for batch testing.							
3	Poor coordination/communication at national, sub-national and service delivery levels to distribute supplies to sites leading to shortage of key ART drug for infants, BP for syphilis positive mothers and infants and RPR tests.	√	√	√	Strengthen coordination/communication and staff's responsibilities at national, provincial, district and service delivery levels.	NCHADS & NMCHC						
4	Syrups for infant prophylaxis are often not in stock at referral hospitals if there are no HEI currently under care.	√			Review standard of stock: Reservation of key ARV drugs, esp. syrup should be at MAT clinics, provincial hospital and NMCHC although there is no enrollment record in the past 12 months. Ensure forecasting tool works well at all service delivery sites.	NCHADS & NMCHC						
5	Global shortage of benzathine penicillin affects eMTCT plan in Cambodia. Often syphilis cases are reportedly treated using another alternative medication (erythromycine for 14 days). However, it is worrisome for its effectiveness among SEI. Additionally, it is uncertain if SEI are properly cured due to the fact that follow-up mechanism is not widely implemented.	√			As RPR test and BP are available at CMS, the STI program should monitor closely between site level and logistics management to ensure the site has requested on time and have those drugs available at sites (FHC).	NCHADS						
6	Stock-out of syphilis tests (single tests) and benzathine penicillin in 2016.		√	√								
7	Lack of Lab Quality Management System (LQMS) in place: structure, training, data management, validation, LIS, surveillance, calibration and electrical system to track mother-infant pair for HIV and syphilis.	√	√	√	Develop a timeline plan to reach a national standard for provincial & referral hospital labs and ISO of HIV and syphilis for only main labs.	NCHADS, NIPH, DP						
8	Lack of quality management and accreditation embedded in the structure of national lab system.	√			Introduce LQMS/QA-HTS to service delivery at site level, perform on-site mentoring in a systematic way to strengthen the LQMS/QA-HTS at main labs.	NCHADS, NIPH, DP						
9	Lack of Lab Quality Management Training, refresher training, supervision to all public and private testing sites.	√	√	√								
10	Lack of SLIPTA (QMS) validation recently.	√	√	√								
11	Lack of LIS and national surveillance system incorporate the LIS.	√	√	√								
12	Lack of calibration of equipment and lab tool.	√	√	√								
13	lack of computer-based data storage and electrical system and equipment functionality monitored.			√								

14	Lack of recording system allow for linking of HIV and Syphilis test results of the mother with result of her infants.	√	√	√									
15	Lack of data management: system in place, system link of HIV and Syphilis test results of mother with results of HEI/SEIs.			√									
16	Very limited QA program at rapid testing sites: EQA participation, IQC, logistics management, storage & disposal, HTS algorithm & job aide, and protocol for corrective action.	√			Develop SoP for QA-HTS implementation (emphasize the process and ToR of national, PHD, OD and site levels) and the correction action.	NCHADS, NIPH, NMCHC, PHD, OD, DP							
17	Lack of EQA participation for testing sites outside the laboratories.	√	√	√	Rapid scale-up of EQA program through training and mentorship.	NCHADS, NIPH, NMCHC, PHD, OD, DP							
18	Lack of QA-IQC implementation in all testing sites across country <5% (56/1200HC).	√	√	√									
19	Lack of forecasting, sensitivity/specificity, quantity, shelf-life-policy of FEFO, emergency/unexpected need.		√	√									
20	Lack of storage &disposal policy.		√	√									
21	lack of SOP &algorithms, job aides or testing guideline available; none of QC and the policy of its use.		√	√									
22	Lack of appropriate sample and PT/IQC include with each run. Some sites do not have proper blood sample for tests. One site reported <20µl, only two drops of chase buffer are used on dual test. The timer is not available on site, most sites do not read results in recommended time (in 5 mins and btw 15-60min for all types of test and >20min.			√									
23	Lack of proper storage at some sites; flooding on the floor where is refrigerator is located. The room is messy and dirty. Reagents were kept in the drawer without monitoring temperature.			√									
24	.Lack of protocol for corrective actions	√	√	√									
25	Lack of information of forecasting, stock management and storage condition as well as the waste management			√									

26	Lack of following the instruction: use the expired date tests.			√									
IV	**Human Rights, Gender Equality and Community Engagement**												
a. Limited quality of services													
1	Free of charge services are available for HIV+PW, but transportation cost remain a challenge for service access among poor HIV+PW.	√			Seek transportation cost support of poor HIV+ PW in need of free PMTCT services i.e. inclusion in Health Equity Fund or Pre/Post ID poor for transportation and other related costs.	NAA, PHD and CPN+							
2	Limited quality of services (discrimination, limited service hours, unfriendly services for adolescent and KP, poor understanding and awareness on gender equality and non-discrimination in PMTCT, including non-discrimination against children and key populations.		√	√	1) Update PMTCT training curriculum to include sections on gender, non-discrimination, and friendly services, and roll out the training to PMTCT service providers.	NMCHC							
					2) Work to ensure services are operated during working hours and flexible hours would be made to promote and improve service uptake.								
3	Limited awareness on non-criminalization of unintentional HIV, and syphilis transmission among both healthcare service providers and PLHIV community.		√	√	1) Reinforce dissemination of HIV/AIDS law and non-criminalization of syphilis transmission in trainings and on-site coaching activities for healthcare providers.	NAA, NCHADS, NMCHC, CPN+ and Partners							
					2) Integrate dissemination of HIV/AIDS in works of PLHIV network based at health facilities and in the community.								
4	Very big concerns in infant feeding counselling and assistance for women with disabilities.		√	√	National programs to reinforce/ensure appropriate counselling messages and methods provided to women, including disable women.	NMCHC, CPN+ and Partners							
b. Lack of existence or limited provision and awareness of laws and policies to address human rights and gender equality in context of PMTCT													
5	Sexual violence remains among sero-discordant couples. Victims usually end up accepting their perpetrators because of traditional way of reconciliation facilitated by the local authority.		√	√	Increase awareness raising on HIV/AIDS law in particular on intentional HIV transmission among PLHIV and local authorities as well as law enforcement officials and also with consequent impact of this disease toward community as well.	NAA, NCHADS, NMCHC, MOWA, CPN+ and Partners							
6	Discrimination against PLHIV and their families still exist.			√	1) Zero discrimination campaign should be run.	NAA, NCHADS, NMCHC, CPN+ and Partners							
					2) Raise awareness and reinforce implementation of HIV/AIDS law.								

7	Very limited access to information whether laws, regulations and policies or judicial precedents on ensuring availability, accessibility, acceptability and quality of PMTCT services are available in country.	√	√	√	National programs to extend TWG membership to **these special groups** into all stages of programming.	NCHADS & NMCHC							
8	Lack of consideration for the removal of the HIV-specific criminal penalties for disease transmission and lack of development of guidelines for court officials on the very limited circumstances of intentional and malicious conduct in which prosecutions of people living with HIV for disease transmission should be considered.	√			1) Update the HIV/AIDS law and its implementing guideline with consideration of the removal of the HIV-specific criminal penalties for disease transmission.	NAA, CPN+							
					2) develop guidelines for court officials on the very limited circumstances of intentional and malicious conduct in which prosecutions of people living with HIV for disease transmission should be considered.								
9	No existence of laws, regulations and policies recognizing and protecting adolescent's rights in making decision whether or not to receive health/treatment services, including HIV testing and treatment services without parental/guardian consent/or sharing information to parents/guardian.	√			Review HIV/AIDS law and any other related regulation and policies to ensure provision of adolescents' access to HIV testing, PMTCT and other SRH services without parents consents.	NAA, NCHADS, NMCHC, CPN+ and Partners							
10	Lack of laws or judicial precedents, regulations and policies that guarantee equality and non-discrimination based on syphilis status.	√			Relevant regulations will be developed, Or, actions can be included somewhere in the guidelines and ensure that it is widely disseminated.	NCHADS							
11	Lack of existence of laws, regulations and policies that guarantee equality and non-discrimination, which include specific provisions on key populations in particular MSM, transgender women, people who use/inject drugs.	√			Update HIV/AIDS to include provision of equality and non-discrimination for KPs.	NAA, CPN+							
12	Lack of laws, regulations, policies, monitoring and reporting to ensure accountability and community engagement and participation of PLHIV and KP in particular in PMTCT program.	√			1) Include section on accountability and community engagement and participation of PLHIV and KP on PMTCT program strategies,	NMCHC and NCHADS							
	Accountability, community engagement and participation of people affected by HIV and other key populations, to some extent, are limited.				2) Establish mechanism for or integrate monitoring and reporting on these particular issues in existing mechanism.								
13	Laws, regulations and policies criminalize behaviors or acts of sex work and drug use, limiting their access to services.	√			1) Advocate for decriminalization of sex works and drug use,	NAA							
					2) Harmonize laws, regulations and policies to ensure conducive environment for KP.								
c. Lack of documentation, reporting and redress mechanism as well as initiatives for addressing human rights violation													

14	Violation/discrimination against WLHIV at healthcare, including PMTCT settings exist (including violation of informed consent, mandatory testing, involuntary sterilization, discrimination, disrespect of privacy and confidentiality). However, there is no reporting mechanism or systematic and routine documentation/report, and no sanctions or reparations for violations of rights in context of PMTCT programs).	√			1) Improve cases documentation and establish systematic monitoring, reporting and resolving mechanism addressing discrimination at healthcare setting, 2) Develop regulations, policies, strategies to guide non-discriminatory and right-based services provided by healthcare providers, 3) Build capacity of healthcare providers for knowledge and skills to ensure non-discriminatory and friendly services with privacy and confidentiality are strictly ensured.	NAA, NCHADS, NMCHC, CPN+ and Partners							
15	Lack of functioning network of WLHIV to meaningfully engage in PMTCT program.	√			Support for reactivation of the WLHIV network or WLHIV unit with existing PLHIV network.	NCHADS & CSO						
16	Lack of clear definition of CSO/community engagement in PMTCT planning, reporting and accountability assessment; and even though engagement of PLHIV and KP in HIV response as a whole, but seems limited involvement in the development and evaluation of regulations, policies and plans for PMTCT program.	√			Engage PLHIV and KP as well as related CSO in development, implementation, and monitoring of policies, strategies and programs related to PMTCT.	NCHADS, NMCHC, CPN+ and other KP networks						
17	No specific provisions in PMTCT strategy and lack of initiatives in place to ensure the accessibility and acceptability of services for young women at reproductive age, unmarried women, sex workers, LBT person, indigenous women and women living with disabilities.	√			1) Revisit PMTCT strategy to include provision on accessibility and acceptability of services for young women at reproductive age, unmarried women, sex workers, LBT person, indigenous women and women living with disabilities, 2) develop initiative in place to ensure access to services for these populations (young women at reproductive age, unmarried women, sex workers, LBT person, indigenous women and women living with disabilities).	NCHADS and NMCHC						
18	Lack of laws, regulations and policies or judicial precedents ensuring access to justice, remedies and redress, including pro bono legal services for PLHIV and KP.	√			1) work with legal aid NGOs to ensure access to legal service for PLHIV and KPs, including paralegal one.	NAA, CPN+ and other KP networks						
19	The mechanism for human rights violation is in place, but lack of awareness, fear of reporting, and lack of actions when they report.	√			1) Legal literacy, raise awareness and build confidence of PLHIV and KP to report on rights violation, 2) Ensure function and timely actions of human rights institution (i.e. CHRC, CCHR) in responding and addressing human rights issues.	NAA, CPN+ and KP networks						

Annex 3: Poor performing provinces (public facility-based analysis, in 2017)

	HIV					Syphilis	
Indicators	**PMTCT 1: ANC Coverage : % of PW attending ANC at least once**	**PMTCT 2 : Percentage of estimated PW who know their HIV status**		**PMTCT 3 : Percentage of HIV-positive PW who received antiretroviral to reduce the risk of MTCT**	**PMTCT 4 : Percentage of infants born to HIV-positive women receiving a virological test for HIV within 2 months of birth**	**PMTCT 5 : Testing Coverage : % of coverage of syphilis testing at 1st ANC visit**	**PMTCT 6: Treatment Coverage : % of treatment coverage of syphilis positive PW**
Numerator	# PW attending ANC1 (Source: PMTCT DBV 3)	# of PW received their test results (Source: PMTCT DBV 3)	# mother voluntarily tested for HIV during L&D (Source: PMTCT DBV 3)	#PW initiated before or during this pregnancy + # of HIV-positive mothers newly initiated at delivery (Source: PMTCT DBV 3)	# HEI who receive a virological test <2 months after birth (Source: NCHADS)	# of PW who received rapid syphilis screening and received result (Source: PMTCT DBV 3)	# of PW receiving syphilis correct treatment (Source: NCHADS)
Denominator	Est. total # PW (Source: NIS estimates)	AT ANC clinic: # of ANC 1 MINUS # PW-ANC 1 with known HIV status (Source: PMTCT DBV 3)	AT MAT clinic: # PW with unknown HIV status (Source: PMTCT DBV 3)	# HIV+ PW delivering in public facilities + # PW testing positive in public facilities (Source: PMTCT DBV 3)	# of HIV-exposed babies born from HIV-infected mothers MINUS # of stillbirth and neonatal death (Source: PMTCT DBV 3)	#of ANC1 clients (Source: PMTCT DBV 3)	# of PW who receive RPR positive (Source: NCHADS)
Banteay Meanchey	118.26%	97.79%	86.52%	65.96%	112.90%	83.62%	100.00%
Battambang	130.05%	99.52%	84.96%	77.42%	6.76%	96.92%	100.00%
Kampong Cham	155.97%	80.30%	76.47%	111.76%	174.29%	56.08%	100.00%
Kampong Chhnang	138.35%	91.91%	33.63%	92.31%	100.00%	71.18%	0.00%
Kampong Speu	143.86%	76.61%	50.52%	86.67%	100.00%	51.65%	100.00%
Kampong Thom	139.19%	78.79%	31.64%	100.00%	160.00%	66.85%	100.00%
Kampot	141.20%	90.72%	52.64%	86.96%	60.00%	66.33%	0.00%
Kandal	100.65%	77.45%	76.33%	75.00%	127.78%	47.34%	0.00%
Koh Kong	112.09%	83.30%	71.43%	90.48%	23.53%	63.19%	0.00%

Kratie	122.05%	82.15%	66.79%	111.11%	0.00%	47.23%	0.00%
Mondul Kiri	88.79%	75.90%	60.98%	80.00%	0.00%	72.57%	0.00%
Phnom Penh	54.97%	71.42%	53.43%	89.60%	0.00%	54.84%	100.00%
Preah Vihear	87.50%	77.47%	29.15%	87.50%	0.00%	52.85%	0.00%
Prey Veng	158.67%	88.04%	69.86%	70.00%	0.00%	72.22%	0.00%
Pursat	115.44%	99.57%	77.89%	76.92%	0.00%	62.20%	0.00%
Rattanak Kiri	108.82%	62.48%	19.35%	77.78%	0.00%	50.75%	0.00%
Siem Reap	111.60%	93.79%	96.38%	52.27%	65.00%	60.57%	100.00%
Preah Sihanouk	109.24%	62.48%	76.70%	88.89%	0.00%	54.84%	100.00%
Stung Treng	87.68%	74.52%	70.76%	55.56%	250.00%	68.85%	0.00%
Svay Rieng	123.21%	83.99%	8.47%	62.50%	0.00%	46.70%	0.00%
Takeo	157.51%	86.80%	61.20%	89.19%	0.00%	81.18%	0.00%
Otdar Meanchey	94.37%	78.77%	71.34%	44.44%	0.00%	45.22%	0.00%
Kep	118.81%	92.72%	0.00%	100.00%	0.00%	84.10%	0.00%
Pailin	82.60%	100.58%	90.60%	75.00%	108.33%	100.31%	0.00%
Tbong Khmum	130.07%	88.81%	32.97%	93.75%	0.00%	54.94%	0.00%
Cambodia	103.87%	83.92%	55.85%	83.42%	29.37%	62.89%	100.00%

Summary by performance levels:

Green	20	4	1	4	8	2	9
Yellow	1	4	1	3	0	0	0
Red	5	18	24	19	18	24	17

Annex 4: Outline of suggested content of national validation report

Content[51]

[1] Executive summary

[2] Country context

- Geography
- Demography
- Basic health indicators, including MCH indicators
- Brief description of the NVT and goals of the review
- Epidemiological profile of HIV and syphilis prevalence and incidence trends in the general population and in ANC clinics
- HIV and syphilis prevalence trends in the general population, by age group and sex
- HIV and syphilis prevalence trends in the antenatal population, by age group
- Modes and drivers of HIV transmission
- Other information, e.g. pregnancy trends and rates; overall prevalence of HIV and syphilis
- Stillbirth trends and contributing factors

[3] Description of the health systems present in the country. This should include specifics on

- Provincial and district health services;
- Health-care needs and access for transient populations, including: internally displaced and stateless persons, refugees, migrant workers, immigrants, non-citizens and other marginalized populations;
- Laboratory services (MCH, HIV, family planning, public and non-public);
- Case definitions used for (i) HIV diagnosis in adults and infants, (ii) congenital syphilis, (iii) syphilis diagnosis in adults.

[4] Methodology and use of tools and checklists to evaluate key areas:

- Data verification and impact assessment, including sources of data, modeling and triangulation;
- Assessment of programs and services;
- Laboratory assessment, including EQA, HIV and syphilis testing in PW, EID;
- Assessment of human rights, gender equality and civil society engagement.

[5] Limitations of evaluation methods

[6] Key findings

- Country context for assessing the eMTCT program
- Report on the key elimination indicators. What systems and data sources were used for the eMTCT process and outcome data?

[51] Global guidance on criteria and process for validation of eMTCT of HIV and syphilis, WHO 2017.

- Overall achievements, national level, subnational levels
- Assessment of strengths for sustaining eMTCT
- Potential risks to sustaining eMTCT.

[7] Describe the following:

- National HIV eMTCT policies and program
- National syphilis eMTCT policies and program
- National breastfeeding policy, in general and for HIV-infected women. Choices women are given and if they are counseled on the risks and benefits of breastfeeding with and without formula. Are HIV-infected women offered universal lifelong ART?
- Are women living with HIV offered universal lifelong ART? Evidence for maintenance on treatment.
- Status of eMTCT services

– What proportion of ANC and delivery services are public versus non-public, and are services similar in each system?

- Equity of eMTCT services

– Are women living with HIV involved in national planning and evaluation of eMTCT services?

– Are there laws and policies that force HIV and syphilis testing and treatment?

– Are there laws and policies in place that criminalize HIV transmission?

– Is stigma in facilities addressed?

– Are there reports of human rights abuses, e.g. Forced testing, forced birth control/ sterilization or forced termination of pregnancy, and is there due diligence to identify and address such abuse?

- Consistency of achievements across geographical areas

– How was the lowest-performing subnational unit identified?

– Report specific indicators in that lowest-performing subnational unit

– If indicators in the lowest-performing subnational unit do not meet validation criteria, what evidence is there that the program is actively seeking to address inequities?

- Completeness and representativeness of data used in eMTCT indicators

– How are coverage and impact indicators determined? Program data must be used to model the reliability of the annual HIV and congenital syphilis rate impact indicator.

- Description of data inputs used for any model-based estimates of eMTCT of HIV and syphilis impact indicators, including how these inputs were measured to ensure that they are population based.

- In addition to the above report components, there are several data tables that are required. See online national validation report (country report) and regional validation report templates at: http://www.who.int/reproductivehealth/publications/rtis/9789241505888/en/.

Annex 5: How to compute core process & impact indicators

a. National monitoring dashboard – process indicators

Process Indicator #	Indicator Names	Numerator / Denominator	Data Sources and formulas	Achievement by years									WHO Validation Criteria
				Baseline 2017	2018	2019	2020	2021	2022	2023	2024	2025	
PMTCT 1	**% of PW attending ANC at least once** (Comparing results by Adjusted CDHS to PMTCT/NIS)		**CDHS (adjusted)**	96.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**>= 95%**
			PMTCT / NIS	100.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	#DIV/0!	#DIV/0!	**>= 95%**
	# PW attending ANC 1 (NMCHC ANC report: indicator 1.1)	Numerator	PMTCT database version 3	370262	0	0	0	0	0	0	0	0	
	Est. total # PW (NIS estimates)	Denominator	NIS	368398	367601	365485	362107	357673	352448	346643	0	0	
PMTCT 2	**% of estimated PW who know their HIV status**		**PMTCT / NIS**	93.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	#DIV/0!	#DIV/0!	**>= 95%**
	# PW tested during ANC + PW ANC 1 with known HIV+ status + # PW tested at L&D (NMCHC MAT report, indicators #1.5.1 + #3.1.1.1 + #3.1.2.1)	Numerator	PMTCT database version 3	343537	0	0	0	0	0	0	0	0	
	Est. total # PW (NIS estimates)	Denominator	NIS	368398	367601	365485	362107	357673	352448	346643	0	0	
Additional Indicator (Comparing Option A to B)	**OPTION A: % of HIV-positive PW who received antiretroviral to reduce the risk of MTCT** (Comparing results by PMTCT/PMTCT to PMTCT/SPECTRUM)		**PMTCT / PMTCT**	83.42%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**>= 95%**
			PMTCT / SPECTRUM	76.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**>= 95%**

	#PW initiated before or during this pregnancy (3.1.1.1.2) + # of HIV-positive mothers newly initiated at delivery (3.1.1.1.3.1.) + (3.1.2.1.1.1.1.1.)	Numerator	PMTCT database version 3	760	0	0	0	0	0	0	0	0	
	# HIV+ PW delivering in public facilities (indicator #3.1.1.1) + # PW testing positive in public facilities (1.5.1.1.1.1.)	Denominator	PMTCT database version 3	911	0	0	0	0	0	0	0	0	
	# est. HIV+ PW (Spectrum)	Denominator	Spectrum Estimate	990	980	970	960	950	940	930	920	910	
	OPTION B: % of HIV-positive PW who received antiretroviral to reduce the risk of MTCT (Comparing results by ART/PMTCT to ART/SPECTRUM)		**ART / PMTCT**	49.95%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**>= 95%**
			ART / SPECTRUM	45.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**>= 95%**
	. # PW on ART - old & new cases (NCHADS ART)	Numerator	NCHADS ART report	455	0	0	0	0	0	0	0	0	
	# HIV+ PW delivering in public facilities (indicator #3.1.1.1) + # PW testing positive at public ANC (1.5.1.1.1.1.)	Denominator	PMTCT database version 3	911	0	0	0	0	0	0	0	0	
	# est. HIV+ PW (Spectrum)	Denominator	Spectrum Estimate	990	980	970	960	950	940	930	920	910	
PMTCT 3	**%of infants born to HIV-positive women receiving a virological test for HIV within 2 months of birth**		**EID / SPECTRUM**	35.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**>= 90%**
	# HEI who receive a virological test <2 months after birth (DMU Exposed Infant Database)	Numerator	NCHADS EID	210	0	0	0	0	0	0	0	0	
	# of HIV+ PW giving birth in the last 12 months (Spectrum)	Denominator	Spectrum Estimate	590	580	570	560	550	540	530	520	510	
PMTCT 4	**% of coverage of syphilis testing at 1st ANC visit** (Comparing results by PMTCT/NIS to PMTCT/PMTCT)		**PMTCT / NIS**	63.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	#DIV/0!	#DIV/0!	**>= 95%**
			PMTCT / PMTCT	62.89%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**>= 95%**

	# of PW who received rapid syphilis screening and received result (NMCHC indicator#1.6) + women with stillbirth tested at delivery (indicator 4.2.2.1) + women with spontaneous abortion > 20 weeks and tested (indicator 4.1.2.2.1)	Numerator	PMTCT database version 3	232843	0	0	0	0	0	0	0	0	
	Estimated # of PW in the last 12 months	Denominator	NIS	368398	367601	365485	362107	357673	352448	346643	0	0	
	# of ANC 1 clients (NMCHC indicator#1.1)	Denominator	PMTCT database version 3	370262	0	0	0	0	0	0	0	0	

PMTCT 5	**% of treatment coverage of syphilis positive PW** (Comparing results by NCHADS/NCHADS to PMTCT/PMTCT)		**NCHADS / NCHADS**	100.00%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**>= 95%**
			PMTCT / PMTCT	97.33%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	**>= 95%**
	# of PW receiving syphilis treatment (NMCHC indicator 1.6.1.1.1.1.)	Numerator	PMTCT database version 3	73	0	0	0	0	0	0	0	0	
	# of PW who receive RPR positive (NMCHC indicator 1.6.1.1.1.)	Denominator	PMTCT database version 3	75	0	0	0	0	0	0	0	0	
	# of PW receiving syphilis treatment (DMU FH clinic report)	Numerator	NCHADS FH clinic report	48	0	0	0	0	0	0	0	0	
	# of PW who receive RPR positive (DMU FH clinic report)	Denominator	NCHADS FH clinic report	48	0	0	0	0	0	0	0	0	

b. Sub-national monitoring dashboard – process indicators

	HIV							Syphilis			
Indicators	**PMTCT 1: ANC Coverage : % of PW attending ANC at least once** (Comparing results by Adjusted CDHS to PMTCT/NIS)		**PMTCT 2: Percentage of estimated PW who know their HIV status** (Comparing results by ANC to MAT)		**PMTCT 3: Percentage of HIV-positive PW who received antiretroviral to reduce the risk of MTCT** (Comparing results by PMTCT/PMTCT to NCHADS/PMTCT)		**Additional: Percentage of infants born to HIV-positive women receiving a virological test for HIV within 2 months of birth**	**PMTCT 4: Testing Coverage : % of coverage of syphilis testing at ANC, during L&D** (Comparing results by PMTCT/PMTCT to PMTCT/NIS)		**PMTCT 5: Treatment Coverage : % of treatment coverage of syphilis positive PW** (Comparing results by NCHADS/NCHADS to PMTCT/PMTCT)	
Numerator	# PW attending ANC1 (Source: PMTCT DBV 3)	Adjusted CDHS	# of PW received their test results (Source: PMTCT DBV 3)	# mother voluntarily tested for HIV during L&D (Source: PMTCT DBV 3)	#PW initiated before or during this pregnancy + # of HIV-positive mothers newly initiated at delivery (Source: PMTCT DBV 3)	# PW on ART before delivery (Source: NCHADS)	# HEI who receive a virological test <2 months after birth (Source: NCHADS)	# of PW who received rapid syphilis screening and received result (Source: PMTCT DBV 3)	# of PW who received rapid syphilis screening and received result + women with stillbirth tested at delivery + women with spontaneous abortion > 20 weeks and tested (Source: PMTCT DBV 3)	# of PW receiving syphilis correct treatment (Source: NCHADS)	# of PW receiving syphilis treatment (Source: PMTCT DBV 3)
Denominator	Est. total # PW (Source: NIS estimates)	Adjusted CDHS	AT ANC clinic: # of ANC 1 MINUS # PW-ANC 1 with known HIV status (Source: PMTCT DBV 3)	AT MAT clinic: # PW with unknown HIV status (Source: PMTCT DBV 3)	# HIV+ PW delivering in public facilities + # PW testing positive in public facilities (Source: PMTCT DBV 3)	# HIV+ PW delivering in public facilities + # PW testing positive in public facilities (Source: PMTCT DBV 3)	# of HIV-exposed babies born from HIV-infected mothers MINUS # of stillbirth and neonatal death (Source: PMTCT DBV 3)	#of ANC1 clients (Source: PMTCT DBV 3)	Est. total # PW (Source: NIS estimates)	# of PW who receive RPR positive (Source: NCHADS)	# of PW who receive RPR positive (Source: PMTCT DBV 3)
Banteay Meanchey											
Battambang											
Kampong Cham											
Kampong Chhnang											
Kampong Speu											
Kampong Thom											
Kampot											

Kandal											
Koh Kong											
Kratie											
Mondul Kiri											
Phnom Penh											
Preah Vihear											
Prey Veng											
Pursat											
Rattanak Kiri											
Siem Reap											
Preah Sihanouk											
Stung Treng											
Svay Rieng											
Takeo											
Otdar Meanchey											
Kep											
Pailin											
Tbong Khmum											
Cambodia											

Summary by performance levels: **[Thresholds - performance (Green means >=95%; Yellow means >=90%;<95%; Red means <90%)]**

Green											
Yellow											
Red											

c. National monitoring dashboard – impact indicators

	Name of Indicators	Data sources	WHO validation criteria	RESULTS								
				2017	2018	2019	2020	2021	2022	2023	2024	2025
New pediatric infections due to mother-to-child transmission (MTCT) of HIV per 100000 live births (# of new infections/# of births)*100,000)			**<=50 cases**									
Numerator	# New HIV infection by year	UNAIDS projection										
Denominator	# annual births	NIS (proxy - # of PW estimated last year)										
MTCT rate of HIV in breastfeeding population			**<5%**									
Numerator	# new HIV infection by year	UNAIDS projection										
Denominator	# HIV+ PW by year	UNAIDS projection										
Congenital syphilis per 10000 live births (option A or B)		**Option A**	**<=50 cases**									
Numerator	# new Congenital Syphilis infection by year	Program data (NCHADS-DMU - FH clinics)										
Denominator	# annual births	NIS (proxy - # of PW estimated last year)										
		OR										
		Option B	**<=50 cases**									
		Program data (NMCHC-PMTCT database)										
		NIS (proxy - # of PW estimated last year)										