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Technical Report on the Mock Review of
**Elimination of Mother-to-Child
Transmission (eMTCT) of HIV and
Syphilis in Cambodia**

October 2021



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



**National Maternal and Child Health
Center (NMCHC)**

Technical Report on the Mock Review of Elimination of Mother-To Child Transmission of HIV and Syphilis, 2021

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Suggested citation. "NCHADS, & NMCHC (2021). Technical Report on the Mock Review of Elimination of Mother-to-child Transmission (eMTCT) of HIV and Syphilis in Cambodia. Phnom Penh, Cambodia, 2021."

This publication can also be found at <https://www.nchads.org>

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Acknowledgements

The virtual mock review of elimination of mother-to-child transmission (eMTCT) of HIV and syphilis in Cambodia was conducted under the leadership of the National Center for HIV/AIDS Dermatology and STDs (NCHADS) and the National Maternal and Child Health Center (NMCHC) in close collaboration and partnership with national and international partners, as well as communities of key populations and people living with HIV.

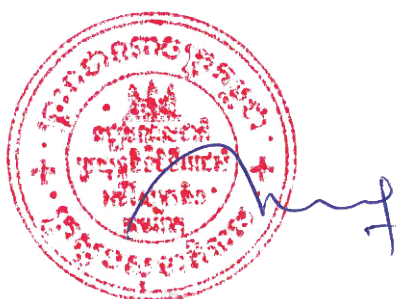
Special thanks to international experts and the reviewers of the mock review – Dr Julian Gold and Dr Tracey Mills (The Albion Centre Australia); Dr Ye Yu Shwe (UNAIDS Regional Support Team-Asia and the Pacific); Ms Liza Cabuang (NRL Australia); Ms Jennifer Ho (APCASO); Ms Harriet Doran Edmunds (Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine- ASHM); and Dr Sarah Huffam for their excellent contributions and recommendations.

We would like to acknowledge the valuable inputs from the chairs and the members of sub-technical working groups of – i) Programme ii) Data iii) Laboratory iv) Human rights, gender equality and community engagement components.

We are grateful for the extensive technical and coordination support from UNAIDS Cambodia (Dr Khin Cho Win Htin and Mr Ung Polin), WHO Cambodia (Dr Deng Serongkea), FHI-EpiC team, US-CDC, WHO Western Pacific Regional Office, and UNAIDS Regional Support team. The virtual mock review was made possible through the funding support from UNAIDS.

The findings and recommendations from the virtual mock review will be instrumental and pave our way towards achieving the elimination targets of HIV and syphilis in Cambodia.

Phnom Penh, 13 October 2021



Director of NCHADS
Dr Ly Penh Sun



Director of NMCHC
Dr Kim Rattana

Acronyms and abbreviations

Ab	Antibody
ANC	Antenatal care
ART	Antiretroviral Therapy ART
BIACM	Boosted Integrated Active Case Management
CAA	Community Action Approach
CamLIS	Cambodia Lab Management Information System
CBO	Community Based Organizations
CDHS	Cambodia Demographic and Health Survey
CHAI	Clinton Health Access Initiative
CHRC	Cambodian Human Rights Committee
CLM	Community-led Monitoring
CoC	Combined Oral Contraceptive
CPA	Complementary Package of Activity
CS	Congenital Syphilis
DBS	Dried Blood Spot
DHIS2	District Health Information Software 2
EID	Early Infant Diagnosis
EMTCT	Elimination of Mother-to-Child Transmission of HIV
EQA	External Quality Assessment
FEW	Female entertainment workers
FGD	Focus Group Discussion
FHC	Family Health Clinic
GBV	Gender-based Violence
HC	Health Centre
HEF	Health Equity Fund
HEI	HIV exposed infants
HR/GE/CS	Human Rights , Gender Equality , and engagement of Civil Society
HSP	Health Strategic Plan
HSSP	Health Sector Strategic Plan
HTS	HIV Testing
IPC	Institute Pasteur of Cambodia
JV VII	Jayavarman VII
KII	Key Informant Interview
KP	Key Populations
LTFU	Loss To Follow Up
MHD	Municipal Health Departments
MoH	Ministry of Health
MPA	Minimum Package of Activity
MPI	Master Patient Index

MSI	Marie-Stopes International
MSM	men who have sex with men
NCHADS	National Center for HIV/AIDS Dermatology and STDs
NGO	Non-governmental organization
NIPH	The National Institute for Public Health Laboratory
NMCHC	National Maternal and Child Health Center
NSP	National Strategic Plan
NVR	National Validation Report
OD	Operational Districts
OI	Opportunistic Infections
PAC	Pediatric AIDS Care
PCR	Polymerase Chain Reaction
PHD	Provincial Health Departments
PLHIV	people currently living with HIV .
PMTCT	Prevention of Mother-to-child Transmission
PoP	Progestogen-only Pill
PPTC	Pacific Pathology Training Centre
PS	Private Sector
PSP	Private Sector Providers
PT	Proficiency Testing Programs
PWID	People who inject drugs
QC	Quality Control
QMS	Quality Management Systems
RH	Referral Hospital
RHAC	Reproductive Health Association of Cambodia
RPR	Rapid Plasma Reagin
SEI	Syphilis exposed infants
SLIPTA	Stepwise Laboratory Improvement Process Towards Accreditation
SLMTA	Strengthening Laboratory Management Toward Accreditation
SOP	Standard Operating Procedures
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
TAT	Turnaround time
TG	Transgender women
TLD	Tenofovir, Lamivudine and Dolutegravir
TPHA	Treponema Pallidum Haemagglutination Test
TWG	Technical working groups
UNAIDS	The Joint United Nations Programme on HIV/AIDS
U-UIC	Universal unique identifier code
VCCT	Voluntary confidential counselling and testing
VHSG	Village Health Support Group
VL	Viral Load
VLS	Viral Load Suppression
VLT	Viral Load Testing
WHO	World Health Organization
WLHIV	Women Living with HIV

1. Executive summary

The Cambodian Prevention of Mother-to-child Transmission (PMTCT) program, jointly implemented by the National Center for HIV/AIDS Dermatology and STDs (NCHADS) and National Maternal and Child Health Center (NMCHC) was established in 2000. The National Roadmap for the elimination of Mother-to-Child Transmission of HIV (EMTCT) and Congenital Syphilis was adopted by the Ministry of Health in July 2018, which articulates a goal for the elimination of MTCT of HIV by 2025.¹ The National Strategic Plan for prevention of HIV, syphilis and hepatitis 2021 – 2025, outlines targets for each of HIV, Syphilis and Hepatitis B which align with the WHO impact criteria, and sets the stage for the WHO validation process for EMTCT of HIV and syphilis in Cambodia. The WHO validation requirements include key impact and progress indicators, and a set of standards for data quality, laboratory quality assurance, programmatic components, and human rights, gender equality, and civil society organisation engagement.

The goals of this virtual “mock review” are for the National PMTCT program to assess its progress towards EMTCT of HIV and syphilis using the WHO tools and indicators for validation of EMTCT, to identify challenges and what is needed to be done in order to meet the validation requirements in the required timeframes. The review was conducted from June – September 2021 by 4 component sub Technical Working Groups (TWG) focusing on Programme, Data, Laboratory, and Human Rights (HR), Gender Equality (GE), and engagement of Civil Society (CS). Each National component sub TWG was supported by an independent regional expert and an additional regional expert explored the role of the private sector in PMTCT. Specific and cross cutting findings, and consensus recommendations from each component were presented at a dissemination meeting where ‘in-principle’ agreement on ways forward were discussed.

The review was undertaken during the COVID – 19 pandemic, which imposed significant limitations on its reach. All meetings and interviews were conducted “virtually” and it was not possible to conduct onsite evaluations or evaluation of sub – National data.

This consolidated report follows the WHO National Validation Report (NVR) Template, with the addition of a section on recommendations for achieving readiness for EMTCT validation. The report includes the required sections on country context, and a description of health systems, including the structure of services for antenatal care (ANC) and maternity, HIV prevention and treatment and laboratory testing. Section 7 in the NVR Template (section 11 in this report): Specific areas relating to key findings, has been removed from the report as the information required in the template has been addressed elsewhere. Most relevant to the specific objectives of the mock review are sections 4 – 7 describing methodology, limitations, key findings and recommendations.

¹ < 5% MTCT

Key findings, challenges, and recommendationsKey findings are presented in section 6 in tables 1 – 7 with explanatory notes regarding the data inputs for the EMTCT indicators. Due to issues with data quality a number of inputs that require country specific data were not able to be included. The current estimates use the best available data inputs such as default or regional values and therefore may not accurately reflect the actual HIV MTCT rates, and the indicators for syphilis could not be reported.

Cambodia has made significant progress in PMTCT of HIV since early in the epidemic when in 1999 it is estimated 3,500 pregnant women were HIV infected, with a 40% MTCT rate. In 2020 there were less than 700 HIV infected pregnant women, who transmitted HIV to their offspring at a modelled rate of 11.8 %.² Subject to triangulation of this estimate with program data, the program is well on track to achieve the target of < 5% for breast feeding countries. The modelled annual rate of new paediatric infections of 22.6 / 100,000 live births is within the target of ≤ 50 / 100,000. ANC 1 coverage of 98.2 % is within the target of $\geq 95\%$, and at 94.7% HIV testing coverage of pregnant women is very close.

Urgent attention however is needed to ensure breast feeding mothers and HIV exposed infants (HEI) are properly managed; tested and followed up, as whilst 92% HEI had a test within 60 days of birth, only 64% received their first test within 3 days of birth as recommended, and just 35% of HEI were reported as having a second PCR DNA test as recommended in the guidelines.³ Nearly half of the 13 infants who had a positive PCR test did not have a confirmatory test on a second sample, and there were no HIV Ab tests reported at ≥ 18 months, as is required to complete follow up of HEI.

Whilst apparently just under the target of ≤ 50 / 100, 000 per live births, the accuracy of modelled estimates of congenital syphilis⁴ are hampered by lack of data collection on adequate treatment (with benzathine penicillin) of pregnant women on which they are reliant. Syphilis testing coverage of pregnant women (73.7%) needs to be improved, and there is no data on outcome of Syphilis exposed infants (SEI).

Broadly the review found a high level of commitment, and strong groundwork and policy framework for the path to EMTCT. Strengthening of leadership and especially coordination between NCHADS and NMCHC is required to bring together all stakeholders involved with the implementation of the program, including multi-sectorial partnerships, the Provincial Health Departments (PHD), inclusion of the private sector, engagement with key populations, and women living with HIV. Greater clarity of roles and responsibilities are needed with accountability mechanisms established.

Mobilisation of resources will be required to support implementation of the recommendations in the mock review to achieve requirements for EMTCT. Funding should be sought at the National level and advocated for from within provincial health budgets.

² Spectrum estimate

³ CHAI analysis: 203/572 born in 2020 had a second test in 2020

⁴ WHO estimation tool

Workforce allocation, distribution, clarification of roles and responsibilities and support for human resources needs review to ensure adequate staffing and motivation to do the work of PMTCT awareness raising, and coordination, tracking, follow up, linkage and retention of women and exposed infants in care.

Each component of the review highlighted the need for more training, monitoring and supervision, including; laboratory specimen collection and testing, clinical management and guideline updates, infant feeding counselling, confidentiality, legal and human rights issues, issues of gender equality and community engagement, data systems quality and better data use for program improvement..

Integration of data systems, and improved data availability and data quality are urgently required to enable the provision of the continuum of services at site level, monitoring and program management at sub National and National levels, and ultimately to effectively track mother-baby pairs and to provide the data for reporting of impact, process and other important indicators for validation of EMTCT.

The coordination of the care for PMTCT provided by multiple services needs to be more tightly synchronised, articulated and managed at the organisational level, and through improved workforce management, data systems, and attention to the social support needs of the clients. The weakest component, which requires urgent attention, is in the follow up and care of mothers and HEI.

Syphilis PMTCT interventions including screening, testing, treatment and follow up for mother and infant are less established than for HIV, and apart from screening, in contrast to HIV often incur user fees.⁵ Particular challenges include the suboptimal screening rates in some government affiliated sites, guaranteeing supply of consumables, and ensuring adequate treatment and post treatment follow up of infected mothers and high risk exposed infants.

Inclusion of the private sector in the National PMTCT program is critical to ensure best practice for Cambodian women and prevention of transmission to their babies, and is a requirement of the WHO process of validation of EMTCT. It is unclear at this stage how many women with HIV or syphilis access their care in the private sector, and what, if any, interventions for PMTCT take place. Further work is needed to engage with the private sector.

At the mock review dissemination meeting it was agreed that the way forward will require the establishment of an EMTCT National Validation Committee, and continuation of the TWG and dedicated sub TWG in each component.⁶ Multisectoral, government, NGO and private partners, along with community networks including PLHIV, women and key

⁵ There is a mechanism for exemption from fees via Health Equity Fund for the poor.

⁶ Combining HR/GE/CS with Programme may be useful to ensure these issues are foremost and central to the PMTCT program. The private sector also may most usefully sit within this group.

populations should be consulted and represented in working groups. An action plan to address the challenges to achieving EMTCT should be agreed upon, with clear delegation of roles, responsibilities, and staged reporting timelines.

Throughout the HIV epidemic response, and 20 years after initiation of the PMTCT program, Cambodia has demonstrated the commitment and ability to respond to the healthcare needs of the community and effect real change. In order to move from PMTCT to a goal of EMTCT a broad range of stakeholders will need to be formally included in the process to collaboratively address systemic issues related to the coordination and delivery of services. A key challenge will be how to motivate and support stakeholders to prioritize and retain focus on this goal, with limited funding and amongst competing priorities.

2. Country context

Geography

The Kingdom of Cambodia is situated in South East Asia, it occupies 181,035 sq km, and lies largely in the basin of the Mekong River.⁷

Demography⁸

According to the 2019 census Cambodia has a population of approximately 15.5 million including; 6.1 million (39.4%) urban dwelling (2.1 million in Phnom Penh) and 9.4 million (60.6%) living in rural areas. The median age is 25.3 years, and children aged 0 – 14 comprise 29.4% of the population, 61.7% are 15 – 59 years, and 8.9% are age 60 and above.

Most, 99.4% of the population were born in Cambodia, with 95.8 % speaking Khmer, 2.9% minority languages, 0.5% Vietnamese, and 0.6% Chinese as their mother tongue.

Cambodia has a rapidly growing economy and GDP has increased substantially in recent years, to USD 24.5 billion in 2018, of which 6.1% was invested in health. The country has made considerable strides in reducing poverty rates, improving maternal and child health, and access to primary education. Despite these gains, around 4.5 million people remain near-poor and vulnerable to falling back into poverty.⁹ Of recent importance is the impact of the Covid-19 pandemic which has led to a contraction of the Cambodian economy, the full impact remains to be seen.

Urbanisation continues as demonstrated by annual growth rates in Phnom Penh and Preah Sihanouk of 3.2% and 2.8% respectively. At the province level, whilst they have a lower population density, higher than average annual growth rates are also seen the northern and eastern provinces (Preah Vihear province 3.5%, Mondul Kiri 3.4%, Stung Treng 3.2%, Otdar Meanchey 3.1% and Ratanak Kiri 2.8%).

The overall adult literacy rates of those age 15 and over are 87.7% with a gender imbalance as follows: 90.9% for males, and 84.8% for females, including 80.2% for rural females. Approximately 40% of literate females have not completed primary school education, 31% completed primary school. Policies on universal primary education and elimination of

⁷ <https://www.britannica.com/summary/Cambodia> Accessed September 26 2021

⁸ General Population Census of the Kingdom of Cambodia 2019. National Report on Final Census Results. National Institute of Statistics. Ministry of Planning. October 2020. Accessed on 28/6/2020 at <https://www.nis.gov.kh/nis/Census2019/Final%20General%20Population%20Census%202019-English.pdf>

⁹ Cambodian Demographic and Development Indicators. UNAIDS 2020

illiteracy, have helped increase overall literacy rates and to shrink the gap in literacy rates between urban and rural areas. In recent years, the younger the age group, the higher the literacy rate and narrower the male – female gap.

The mean age at marriage is 27 and 24 for men and women respectively, and 6.3% of urban and 9.5% of rural women marry between 15 – 19 years of age.

Basic health indicators, including MCH indicators

Cambodia's infant mortality rate is 18 per 1,000 live births (16 in urban areas and 19 in rural areas). The under 5 mortality rate is 20/1000 live births. The maternal mortality rate is 141 per 100,000 live births.¹⁰ These health indicators have been steadily improving over recent years.

Life expectancy at birth is 76 years; 74 years for males and 77 years for females.

Non-communicable diseases now comprise 64% of deaths.¹¹

Brief description of the NVT and purpose of the mock review¹²

Cambodia's Prevention of Mother-to-child Transmission (PMTCT) program started in 1999 with the establishment of a PMTCT TWG co-chaired by the National Center for HIV/AIDS Dermatology and STDs (NCHADS) and National Maternal and Child Health Center (NMCHC). The Ministry of Health (MoH) approved the first PMTCT policy in 2000. A National Roadmap for the elimination of Mother-to-Child Transmission (EMTCT) of HIV and Congenital Syphilis was jointly developed by NCHADS and NMCHC, and was adopted by the Ministry of Health in July 2018. The objective of the roadmap is to guide Cambodia through the pre-elimination phase and set the stage for the WHO validation process for EMTCT of HIV and syphilis in Cambodia. The WHO validation requirements include impact and process indicators, and a set of standards for data quality, laboratory quality assurance, programmatic components, and human rights, gender equality, and civil society organisation engagement.

The purpose of this “mock review” is to assess the progress of EMTCT of HIV and syphilis in Cambodia using the WHO tools and indicators for validation of EMTCT, in order to take stock of progress and challenges and to make recommendations for timely and appropriate actions to further pave the path towards elimination of mother-to-child transmission of HIV and syphilis in Cambodia.

¹⁰ General Population Census of the Kingdom of Cambodia 2019. National Report on Final Census Results. National Institute of Statistics. Ministry of Planning. October 2020. Accessed on 28/6/2021 at <https://www.nis.gov.kh/nis/Census2019/Final%20General%20Population%20Census%202019-English.pdf>

¹¹ WHO NCD Country Profile 2018 https://www.who.int/nmh/countries/khm_en.pdf

¹² Concept Note – Mock review to understand the progress made in elimination of mother –to-child transmission (EMTCT) of HIV and syphilis in Cambodia.

¹³ Cambodian EMTCT Road Map, 2018

Specifically the objectives of the mock review are:

- a) In line with global EMTCT validation guidance; to assess progress and challenges on all four components of EMTCT validation - programme; data; laboratory; and human rights, gender equality, and engagement of civil society (HR/GE/CS).
- b) To provide cross-cutting and component specific recommendations based on the findings and discussions from the joint mock-review.

This report follows the WHO National Validation Report (NVR) Template with the addition of the final section on recommendations for achieving readiness for EMTCT validation

Epidemiological profile of HIV and/or syphilis prevalence and incidence trends in the general population and in ANC clinics ,^{14,15}

HIV in general population

In the 1990's Cambodia was recognised as having the fastest growing HIV epidemic in Asia with a peak prevalence of 1.7% in 1998.¹⁶ Since then the estimated HIV prevalence among adults (15-49 years) has incrementally decreased to 0.54% in 2020, with an estimated 75,000 (36,000 male, and 39,000 female) people currently living with HIV (PLHIV).

Cambodia's HIV epidemic has moved from a generalised epidemic, largely driven by sexual transmission through the sex industry and passed on to the wives of clients, and is now concentrated with higher prevalence among key populations, including people who inject drugs (PWID) (15.2%), transgender women (TG) (9.6%), men who have sex with men (MSM) (4%), and female entertainment workers (FEW) (3.2%) There are regional variations in HIV prevalence amongst key populations including higher representation in Phnom Penh, Siem Reap and Beantay Meanchey.

In the 10 years between 2010 and 2020 the proportion of new infections acquired by MSM rose from 8% to 43%, whilst amongst female entertainment workers (FEW) the proportion dropped from 19% to 9%, and in low risk women from 35% to 19%. Accordingly, in recent years there is a relatively higher proportion of new infections in males; with an estimated 790 and 350 new infections in males and females respectively in 2020.

Annual AIDS deaths were estimated to be 1200 in 2020.

Syphilis in general population

No data are available in the general population are available, however rates in high risk groups are referred to below.

¹⁴ 2021 Cambodia HIV estimates (2020 data) UNAIDS Cambodia presentation 16 March 2021

¹⁵ Cambodia country snapshot including key pop cascade 2019 UNAIDS

¹⁶ 5th NSP for a Comprehensive, Multi-Sectorial Response to HIV/AIDS 2019 - 2023

¹⁷ HIV Sentinel Surveillance. NCHADS. Quoted in PMTCT Strategy 2021 – 2025.

HIV in ANC population

The crude HIV prevalence among pregnant women attending government ANC sites was 3.2% in 1997, and remained in the range of 2.5 – 3.0% through 2001 after which it steadily declined, to 1.6% in 2003, 1.1% in 2006 and the most recent surveillance of ANC clients conducted in 2014 found prevalence to be 0.28%. Program data from ANC sites since have shown a further decrease to 0.18% in 2019 and 2020.¹⁷

All HIV infected women (and men) in Cambodia are offered free lifelong ART from the time of HIV diagnosis.

Estimates for diagnosis and treatment coverage in 2020; 82% of HIV infected women know their status, 82% are on ART, 80% are virally suppressed. Lost to follow up rates specific to pregnant women are not accessible.

Syphilis in ANC population

In 1996 seroprevalence of syphilis amongst ANC clients, testing RPR positive and confirmed by treponemal assay was 4.0%, decreasing to 1.3% by 2001. There has been no recent surveillance amongst ANC clients, but health facility data indicates a further decline until 2016 at which time an estimated 0.03% of ANC clients had active syphilis. Subsequently there has been a steady increase in prevalence, most recently 0.28% in 2020.¹⁸ The rise in prevalence likely reflects an increase in the general population driven by increases in key populations (including MSM who are often married to women); for example the rate of syphilis in female sex workers was 0.79% in 2016 compared to 0.4% in 2011.¹⁹

HIV and Syphilis in exposed infants:

With reductions in HIV prevalence among pregnant women (PW), the modelled mother-to-child transmission rate (MTCT) has declined from 21% in 2010 to 13.8% in 2019, and 11.8% in 2020. However, the estimated number of congenital syphilis cases has more than doubled, from 92 in 2016 to 228 in 2019, with case rate increasing from 25 cases/100,000 live births to 63 cases/100,000 live births.²⁰ Using the recent revised WHO estimation tool the modelled rate for 2020 was 176 cases, 48/100,000.²¹

¹⁸ PMTCT 2020 data report (based on TPHA rapid test reactive)

¹⁹ NMCHC PMTCT Database and NCHADS IBBS among FEW. Quoted in PMTCT Strategy 2021 – 2025.

²⁰ National Strategic Plan for PMTCT of HIV, Syphilis, and Hepatitis B 2021 – 2025 p7

²¹ Sheryl Keller NCMHC – personal communication

²² 2021 Cambodia HIV estimates (2020 data) UNAIDS Cambodia presentation. 16 March 2021

HIV and syphilis prevalence trends in the general population, by age group and sex

HIV Prevalence; 2020 estimates adults age 15 – 49 years; Adults 0.54%, Women 0.56%, Men 0.52%.²²

Syphilis Prevalence: Not available

HIV and syphilis prevalence trends in the antenatal population, by age group

HIV: While DOB and Age data is inconsistent and unvalidated, the available data signals a concern for an apparently high number of adolescent pregnancies, which requires data verification and follow up.

Syphilis: See above, there are no disaggregated data by age group.

Modes and drivers of HIV transmission

MSM comprise the dominant and increasing proportion of new HIV infections (see above). According to the most recent IBBS in 2019, 17% of MSM married and 4% widowed, divorced or separated. Given the high proportion of new infections among MSM they can be significant contributors to MTCT through infections to their female partners.

Other information, e.g. pregnancy trends and rates; overall prevalence of HIV and syphilis

Cambodia's total fertility rate is fairly stable and was 2.5 per woman in 2019 (2.2 in urban areas and 2.8 in rural areas).²³

Stillbirth trends and contributing factors²⁴

There was a huge shift from home delivery to delivery in a health facility with a trained provider between 2010 – 2015, which served to reduce the incidence of stillbirth. However it is apparent that rates of stillbirth have been increasing in recent years. The rates are as follows; 2008 - 2013 (CDHS data) 0.6%, after which HMIS data reports; 2014 0.37%, 2015 0.42%, 2016 0.47%, 2017 0.49%, 2018 0.57%, 2019 0.62%, 2020 0.65%.

²³ General Population Census of the Kingdom of Cambodia 2019. National Report on Final Census Results. National Institute of Statistics. Ministry of Planning. October 2020. Accessed on 28/6/2021 at <https://www.nis.gov.kh/nis/Census2019/Final%20General%20Population%20Census%202019-English.pdf>

²⁴ Personal communication Dr Sheryl Keller NMCHC: HMIS implemented in government facilities only. Complicated deliveries are disproportionately done in government hospitals (some private maternity providers transfer a woman if there are complications) so the HMIS percentage could be a bit higher than actual rates. However within the HMIS data the trend should be valid, so it can be concluded that there has been an increase in still birth over the past 5 years concurrent with the increase seen in maternal syphilis.

3. Description of the health systems present in the country

Provincial and district health services

The public sector is the main provider of preventive services and inpatient admissions, whereas the (growing) private sector tends to focus on outpatient consultations. The MoH leads and manages both the public and private sectors guided by the Health Strategic Plan 2016-2020 (HSP3).²⁵ Implementation is via its central departments and programs, Municipal/Provincial Health Departments (MHD/PHDs), and Operational Districts (ODs). Public health service delivery is provided through a network of 9 National hospitals, 25 Provincial referral hospitals (PH) and 68 District based referral hospitals (RH), and ~1300 health Centers (HC). Within each Province facilities are linked, and each OD has at least one RH which supports a network of commune-based HCs.

Health care delivery is organized via two levels of service provision available in all ODs:

1. Minimum Package of Activity (MPA) provided at the HCs, and
2. Complementary Package of Activity (CPA) provided at RHs, which are graded on infrastructure and services offered from the lowest level of 1 (HC) to the highest level of 3 (PHs) of Health.²⁶

HIV services are now incorporated as part of the MPA and CPA.

Non government providers

The ~ 8500 Private – for – profit sector is mainly concentrated in urban and economically advantaged areas. Private – not-for-profit health sector comprises ~180 local and international NGOs, most of which work at district and community level in collaboration with OD offices.²⁷ Within the NGO sector, 1 local (RHAC) and 1 International (MSI) provide direct SRH services through networks of SRH clinics.

Social protection schemes

Social protection schemes in Cambodia include financial contributory and non- contributory schemes. The National Social Security Fund provides employment benefits to workers, and the Identification of Poor Households Program aims to meet the needs of poor and vulnerable populations. Despite these and other mechanisms which reduce out of pocket expenses for beneficiaries, on average out of pocket expenses for healthcare in Cambodia remain high.

²⁵ Strategic Plan for HIV and STI Prevention and Control in the Health Sector (HSSP) 2021 - 2025

²⁶ Annual Health Congress Report, 2019, DPHI/Ministry

²⁷ Cambodia Health System Overview. UNAIDS.

Antenatal and Maternity Care Services ²⁸

There are currently 1,259 Health Centers (HC) and 125 Hospitals (government) providing antenatal care and maternity services. The HCs provide both ANC and delivery. Most of the district and provincial hospitals provide only delivery services for pregnant women as there is usually a HC in or near the hospital grounds that provide ANC services. The national hospitals provide both ANC and delivery. There were 308,237 deliveries in the public sector in 2020.

Facilities set their own user fees (which special community committees approve) so there is some variation but on average, ANC is about 1500 - 2000 riel (about US \$0.38-0.50) and normal delivery 20,000- 50,000 riel (US \$5- \$12.50). These fees will be at the lower end in poorer rural locations and higher in more affluent urban ones. In any location, women with a Health Equity Fund card (identified poor) receive these services for free. There is no limitation to access to government facilities by non-citizens.

HIV response

Since 2011 Cambodia has been in its third phase multi sectorial response strategy - Cambodia 3.0 – which focuses strategies to reach the 90-90-90 global Fast-Track targets by 2020, the 95-95-95 targets by 2025, virtual elimination of mother-to-child transmission of HIV and syphilis, as well as aiming to end AIDS as a public health threat by 2025.

The National AIDS Authority (NAA) leads Cambodia's multi-sectoral HIV response. Guided by the Fifth National Strategic Plan for a Comprehensive and Multi-Sectoral Response to HIV/AIDS 2019-2023 (NSP), the NAA addresses the broader elements of policy, legal, socio-economic, normative factors and sustainability that affect the national HIV response.²⁹

The National Center for HIV/AIDS, Dermatology, and STDs (NCHADS) leads the health sector response and is guided by the Strategic Plan for HIV and STI Prevention and Care in the Health Sector 2021-2025 (HSSP).³⁰ NCHADS develops guidance and standard operating procedures (SOP) for provision of HIV-related services along the HIV cascade.³¹

HIV Prevention strategies include tailored core and extended packages of services primarily delivered by NGO implementers via physical and virtual outreach. There are three modes for HIV testing; self-testing, community-based testing through outreach workers (OW), and facility-based testing at NGOs, public health facilities through 70 government voluntary confidential counselling and testing (VCCT) sites where positive screening tests are confirmed and referred for ART.

HIV treatment and care

There are 70 HIV treatment facilities located in the 25 provinces, including 12 sites in Phnom Penh. The majority are located at referral hospitals. Currently 41 facilities provide

²⁸ Personal Communication Dr Sheryl Keller NMCHC

²⁹ National Strategic Plan for a Comprehensive and Multi-Sectoral Response to HIV/AIDS 2019-2023

³⁰ Health Sector Strategic Plan for HIV and STI Prevention and Control, 2021-2025

³¹ https://www.nchads.org/documents_taxonomy/standard-operating-procedure-en/

ART to children, including two exclusively paediatric sites; one in Siem Reap and the National Paediatric Hospital in Phnom Penh. Clinical management including provision of ARV and viral load testing are provided according to the National Guidelines for Adults, and Paediatrics.^{32,33}

HIV cascade and ART coverage: The 2021 Cambodian HIV estimates of 2020 data report that 84% of Cambodian PLHIV know their status, 83% (99% of those who knew their status) were on ART, and 81% (97% of those on ART) were virally suppressed. Among children (0 – 14 years) 60% PLHIV know their status, 100% of whom are on ART, with 53% (88% of those on ART) virally suppressed. For male and female 15+ years the breakdown is as follows: women 82% know their status, 82% are on ART, 80% are virally suppressed, and men 87% know their status, 86% on ART, 84% are virally suppressed.³⁴

PMTCT response

Cambodia's Prevention of Mother-to-child Transmission (PMTCT) program started with the establishment of a PMTCT TWG co-chaired by NMCHC and NCHADS in 1999, and the first PMTCT policy in 2000. PMTCT programming is integrated into the wider health system, supported by multiple service providers including HIV, ANC, maternity, and paediatrics. A "Linked Response" strategy was introduced in 2007 bringing HIV screening to the HC level, from 2008 testing also included syphilis, and in 2012 a dual rapid finger prick test for both HIV and syphilis was phased in.

In 2013 Cambodia adopted the WHO- recommended Option B+, placing all HIV-positive pregnant women, regardless of CD4 count, on lifelong combined anti-retroviral therapy (ART). In 2020, the protocol for infants was refined to provide high-risk infants with dual NVP and AZT for 6 weeks and continue NVP alone for another 6 weeks with low risk infants continuing to receive 6 weeks of Nevirapine alone.^{35,36}

Specific strategies and guidance are detailed in the National Strategic Plan for Prevention of Mother-to-Child Transmission of HIV, Syphilis and Hepatitis B, 2021 – 2025,³⁷ and the National Guideline for the Prevention of Mother-to-Child Transmission of HIV, Syphilis and Hepatitis B, February 2021.³⁸

³² National HIV clinical Management guidelines for infants, children and adolescents in Cambodia, 2016 & 2020

³³ National HIV clinical management guidelines Kingdom of Cambodia MoH for adults and adolescents fifth edition 2020

³⁴ 2021 Cambodia HIV estimates (2020 data) Pres. UNAIDS Cambodia 16 March 2021

³⁵ Defined as: mother on ART for less than 4 weeks before delivery or with a viral load >1000 4 weeks before delivery or born to women diagnosed HIV positive at the delivery or during the post partum period. Source ART guideline for infants, children and adolescents, p 20

³⁶ See PMTCT Strategy 2021 – 2015 Ch2 for further summary of the Cambodian Response to PMTCT

³⁷ National Strategic Plan for Prevention of Mother-to-Child Transmission of HIV, Syphilis and Hepatitis B, 2021 – 2025

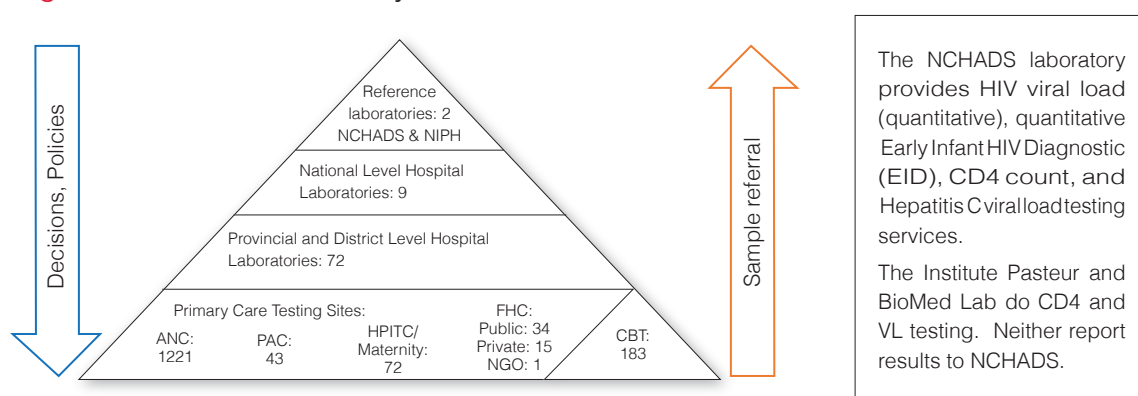
³⁸ National Guideline for the Prevention of Mother-to-Child Transmission of HIV, Syphilis and Hepatitis B, 6th Edition, 2021

Health-care needs and access for transient populations, including: internally displaced and stateless persons, refugees, migrant workers, immigrants, non-citizens and other marginalized populations

All public health services are available to non-citizens, however barriers including financial, logistics and geography make accessing and maintaining a continuum of care more difficult for marginalized populations.

Laboratory services (MCH, HIV, family planning, public and non-public)

Figure: Structure of laboratory services in Cambodia relevant to PMTCT



Dual HIV and Syphilis screening

Syphilis and HIV screening is routinely provided to high-risk populations in the community and at the ANC using finger-prick samples for rapid dual antibody testing (SD Bioline HIV/ Syphilis Duo).

HIV confirmatory testing

Patients with HIV “reactive” at screening are referred to VCCT directly or (for maternity wards) have a venous sample drawn which is sent to VCCT at provincial and district hospital level for confirmatory testing.

The VCCT performs Trinity Biotech Uni-Gold Recombigen HIV-1/2 (Uni-Gold - antibody test), and Chembio HIV 1/2 Stat-Pak (Stat-Pak – antibody test) according to the National HIV testing algorithm which also includes a rapid test for recent infection (RTRI).⁴⁰ Indeterminate HIV results from the VCCT are sent directly to the NCHADS laboratory for resolution.

³⁹ See Laboratory Component – mock review findings dissemination presentation

⁴⁰ National Consolidated Guidelines on HIV Testing Services in Cambodia. June 2017. NCHADS, MoH.+ 2019 amendment

Infant HIV diagnosis

NCHADS is the only laboratory that performs early infant HIV diagnosis on dry blood spot specimens (DBS) on infants less than 18 months of age – using Abbott RealTime HIV-1 Qualitative assay for cell – integrated DNA. If the DNA PCR test is positive, it is confirmed using a new sample. Sample collection is theoretically available at all hospitals delivery wards and paediatric AIDScare units. The National Guidelines require HIV Ab testing at 18 months of age or 6 weeks after cessation of breastfeeding whichever is later .

HIV monitoring

Investigations required for the management of patients on ART including viral load (VL), CD4 testing and HIV genotype are requested according to the National HIV clinical management guidelines;⁴¹

- Quantitative HIV VL testing is performed at the NCHADS laboratory and Siem Reap Provincial Hospital using Abbott RealTime HIV-1 Viral Load (Abbott m2000 platform). This is initially required 3 months after commencement of ART among PW and at 6 months for non-pregnant patients. Viral load is subsequently performed annually thereafter, or more frequently in the event of pregnancy, or suspected / actual viral load failure.
- Seven laboratories currently perform CD4 testing including NCHADS, Battambang, Takeo, Neak Leung/Prey Veng, Banteay Meanchey, Kampong Cham, Siem Reap (NIPH laboratory has previously performed CD4 tests).
- Other laboratory testing such as hematology or biochemistry tests are performed at RH laboratories.
- NCHADS forwards HIV genotype drug resistance testing to the Institute Pasteur of Cambodia (IPC) and about half of the specimens are sent to Korea for genotype.⁴²

Syphilis diagnosis

Testing algorithms for maternal syphilis and infants born to a syphilis infected mother are detailed within the National STI Guidelines.⁴³ Syphilis screening is performed using the SD BIOLINE HIV/Syphilis Duo test which detects antibodies to *Treponema pallidum*. Patients who screen reactive to syphilis are referred to one of approximately 40 Family Health Clinic (FHC) co-located in RH where FHC providers arrange for RPR qualitative or semi – quantitative testing at the RH laboratory.⁴⁴

Current guidelines recommend that after reactive screening at the ANC, treatment is offered to pregnant women only in the case of a subsequent positive RPR test, however this policy has been recently reviewed, and benzathine penicillin injection will be offered

⁴¹ National HIV clinical Management guidelines for infants, children and adolescents in Cambodia, 2020

⁴² Dr Mom Chandara NCHADS laboratory

⁴³ National Guidelines on Sexually Transmitted Infections and Reproductive Tract Infections Case Management. September 2019

⁴⁴ NCHADS Laboratory Rapid Plasmin Reagent (RPR) SOP – T- 011, Revision no 2 June 2021.

to pregnant women on the basis of a reactive *Treponema pallidum* test alone, whilst they are also referred to the FHC for RPR testing and follow up. The guideline requires RPR testing of exposed infants at a minimum of at birth, and at 3 months of age.

In practice however, testing of SEI is reportedly rarely performed, nor is follow up RPR testing in treated adults.

Case definitions used for (i) HIV diagnosis in adults and infants, (ii) congenital syphilis, (iii) syphilis diagnosis in adults and infants

Diagnosis of HIV and syphilis in adults and children are defined according to the diagnostic algorithms in the National Guidelines. HIV treatment is commenced at delivery on the basis of a positive screening test, women who do not go for confirmatory testing are counted for the purpose of the indicators for validation, however if they do go to VCCT and test negative, then will be excluded.

For the process indicator regarding syphilis treatment, this is counted if diagnosis was made on the rapid test alone.

Regarding HEI, whilst Table 4 details the number of HEI with one positive test, and in principle only those with a positive confirmatory test will be used in calculation and triangulation for the impact indicators. However, at the time of mock-review, HEI programme data cannot be used in triangulation of impact indicators as data is incomplete and not representative.

Congenital syphilis is defined as all still births, spontaneous abortions and live births occurring in women seropositive for syphilis who was not adequately treated during pregnancy.

⁴⁵ NSP for PMTCT of HIV, Syphilis, and Hepatitis B 2021 – 2025, M+ E plan.

4. Methodology and use of tools and checklists to evaluate key areas (data, programmes, laboratory, HR/GE/CS)

The mock review was conducted in line with the WHO global guidance for national validation for EMTCT. The design was a joint National exercise overseen by a TWG co-chaired by NCHADS and the NMCHC with engagement from UNAIDS (country and regional office), WHO (country and regional office), EpiC, CHAI, US-CDC, and community partners.^{46,47}

The mock review was conducted in 4 phases from June - September 2021, each phase including sub TWG in each of the 4 key components; data, laboratory, program, and HR/GE/CS, and an additional cross cutting exploration of the private sector. Each sub TWG co-chaired by NMCHC and NCHADS representatives conducted the review, with the support of independent regional experts allocated to each component.

- Phase 1 consisted of the conduct of the WHO self-assessment tool by the National Programs and sub – TWG.
- Phase 2 included regional experts in reviewing the self-assessment findings, with further explorations including virtual meetings, interviews and additional information and data.
- Phase 3 involved regional experts and the sub – TWG synthesising findings and developing a set of recommendations.
- Phase 4 consisted of a dissemination meeting with each of the 5 regional experts presenting the findings and recommendations, and agreement on a way forward.

The methodology section in the Concept Note and Overview of EMTCT mock review process provides a detailed overview of the mock review process.^{48,49} All component reviews included literature reviews of referenced Cambodian Policy and Guidelines and WHO guidelines and tools, including the checklists completed in 2017/18 which informed the 2018 National Road Map for EMTCT.⁵⁰

Further exploration conducted by each component sub TWG and regional experts is described in section 6 under the respective component's key findings and recommendations sections.

⁴⁶ Planning meeting for eMTCT mock – review, Presentation UNAIDS and WHO Cambodia April 27, 2021

⁴⁷ eMTCT mock review planning – discussion with lead and supporting partners, Presentation 25 May 2021

⁴⁸ Concept Note – Mock review to understand the progress made in elimination of mother –to-child transmission (EMTCT) of HIV and syphilis in Cambodia.

⁴⁹ Virtual Dissemination of Findings and Recommendations of eMTCT mock review. Overview of eMTCT mock review process UNAIDS and WHO Cambodia August 25, 2021

⁵⁰ See references section of this document

5. Limitations of evaluation methods

The mock review was undertaken during the COVID – 19 pandemic, at a time when Cambodia was grappling with a surge in cases. This necessarily imposed significant limitations on the reach of the review. All meetings were conducted virtually, as were interviews with key informants. There was no opportunity for evaluation of sub – national data or onsite observations, so the review is limited to the available National level data. This is particularly relevant as Cambodia has well developed comprehensive policy and guidelines for PMTCT. The identification of challenges to implementation on the ground and sustained commitment to translating policy to practice are key to achieving EMTCT.

6.0 Key findings ⁵¹

Country context for assessing the EMTCT programme

See Sections 2 - 5 for the Cambodian country context, and framework within the EMTCT program was assessed.

Report on the key elimination indicators

What systems and data sources were used for the EMTCT process and outcome data?⁵²

The WHO prescribed key elimination indicators include three impact indicators (1. MTCT rate of HIV as a percentage of exposed infants; 2. Annual rate of new paediatric HIV infections due to MCTC per 100,000 live births; and 3. Annual rate of congenital syphilis per 100,000 live births) and five process indicators (1. ANC coverage; 2. Coverage of HIV testing amongst pregnant women; 3. ART coverage of HIV positive pregnant women; 4. Coverage of syphilis testing among pregnant women; and 5. Adequate treatment of syphilis seropositive pregnant women). The impact indicators must be achieved for at least 1 year, and the process indicators for 2 years to achieve validation.

- See Tables 1 - 6 below which detail data on Cambodian EMTCT indicators for 2019 – 2020

Data inputs for EMTCT indicators

Data inputs for the spectrum data generally came from PMTCT database, and treatment related information (regimen, duration of treatment) can be construed at population level as this information has been/ is collected since ANC1 (over 95% ANC coverage) and verified again at the time of delivery. However, a number of inputs that would ideally use country-specific data are not available due to issues of data quality (availability, completeness, correctness and consistency). The default has been to use regional values (e.g treatment retention, dropout rate of postnatal prophylaxis, HIV-related fertility reductions, etc). This may compromise the accuracy of modelling estimates particularly when programme data on infant feeding practice, EID and final outcome of HIV-exposed infants are very incomplete.

⁵¹ See also WHO Validation of EMTCT of HIV and / or syphilis Tools and checklists for in country evaluation of the four required components: Data, HR, Lab, Programme and the final dissemination presentations for each component including the private sector

⁵² This also addresses section 7 in the NVR template: 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?

The lack of access to reliable programme data on the final outcome of HIV-exposed infants thwarted data triangulation efforts. There is a possibility that current estimates (with best available data inputs) may under or overestimate the MTCT rate and estimated new child infections. In addition, process indicators for syphilis treatment coverage cannot be reported due to the absence of data on adequate maternal treatment for prevention of congenital syphilis (with injection of benzathine penicillin) .

Table 1. EMTCT of HIV and syphilis impact and process indicators

EMTCT of HIV and syphilis impact and process indicators

(Include data sources for numerator and denominator, and add any other comments to help understand and interpret data source).

Impact indicators	Target	Current year numerator/denominator	Previous Year 1 numerator/denominator 2020	Previous Year 2 numerator/denominator 2019	Data sources	Comments
Annual # live births			326,107	365,485	Population Projections of Cambodia 2013 - 2023 ⁵³	
HIV mother-to-child transmission (MTCT) rate by birth cohort	<5% for breastfeeding (BF) countries	N/A	82/694 = 11.8%	102/738 = 13.8%	Cambodia HIV estimates 2021	Cannot be triangulated with program data.
Annual rate of new paediatric HIV infections per 100 000 live births	<50	N/A	82/362,107 = 22.6	102/365,485 = 27.9	Population Projections of Cambodia 2013 - 2023	
Annual rate of congenital syphilis cases (including syphilis-associated stillbirths) per 100 000 live births	<50	N/A	48	53	WHO congenital syphilis estimation tool	Data inputs on a adequately treated is limited and assumptions applied. Need to revise once data become available in coming years

⁵³ Population Projections of Cambodia 2013 - 2023, Ministry of Planning National Institute of Statistics

ANC1 coverage	>95%	N/A	400,071/ 407,206 = 98.2%	393,532/ 409,024 = 96.1%	PMTCT database	Numerator = programme data Denominator = estimated number of pregnant women (population projections of live births, adjusted for stillbirths and miscarriages)
HIV testing coverage of pregnant women	>95%	N/A	385,661/ 407,206 = 94.7%	388,520/ 409,624 = 94.8%	PMTCT database	Numerator = programme data Denominator = estimated number of pregnant women (population projections of live births, adjusted for stillbirths and miscarriages)
Syphilis testing coverage of pregnant women	>95%	N/A	278,058/ 376,941 = 73.7%	305,334/ 383,577 = 79.6%	PMTCT database	
ART coverage of HIV-positive	>95%	N/A	597/694 = 86%	586/738 = 79.4%	Cambodia HIV estimates 2021	Numerator = programme data (PMTCT database) Denominator = Spectrum estimates
pregnant women						
Adequate treatment coverage of syphilis-positive women	>95%	N/A	N/A	N/A		

Table 2. Achievements of lowest-performing subnational unit

Not included as the scope of the mock review was limited to National level data only

Table 3. Overall summary of HIV-exposed and HIV-infected infants 2020.

# of HIV-exposed infants	# of HIV-exposed infants with final infection status	# HIV-infected	# HIV-uninfected	# with missing or unknown HIV status
572	N/A (data available only for 1st and 2nd PCR test)	13 CHAI analysis – 7/13 had confirmatory testing	N/A	
Estimated HIV MTCT rate Not calculated since the data is incomplete	Comments: Data is incomplete and reported data is based on NCHADS lab database which is the most complete and validated source of data at the time of mock review			

Table 4. For HIV-exposed and -infected infants

# with 1 polymerase chain reaction (PCR) (+) N/A	# Antibody (Ab)+ @ 18 months N/A	Comments Data is not available at the time of the mock-review
# with >1 PCR (+) N/A	# Antibody (Ab)+ @ 18 months	Comments Data is not available at the time of the mock- review

Table 5. For HIV-exposed and - uninfected infants (EID report 2020)

# with 1 PCR (+) and subsequent negative testing 0	# with 1 PCR (-) 338	# with >2 PCR (-) 106	# with 1 PCR (-) and antibody (Ab) (-) @ 18 months N/A There is no reliable data source to analyse and antibody test results of HEI were not collected or recorded in ART database.	Overall # (%) with Ab (-) @ 18 months (of all those considered uninfected)
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Table 6. Syphilis data table

	2019 (include numerator and denominator)	2020 (include numerator and denominator)	
Prevalence of syphilis in pregnant women	390/ 305,334 = 0.13%	782/ 278,058 =0.28%	Numerator is TPHA rapid test reactive Denominator is of pregnant women tested (note up to 1/3 of reactive cases do not have an RPR)
Number of congenital syphilis (CS) cases	N/A	N/A	
Number of CS stillbirths	N/A	N/A	
Number of CS live births	N/A	N/A	
Number of CS cases in untreated mothers	N/A	N/A	
Number of CS cases in mothers treated late in pregnancy (less than 30 days prior to delivery)	N/A	N/A	

Summary of available programmatic data

HIV positive pregnant women: PMTCT 2020 data report

1. 280,748 (239,711 plus 41,037 tested at delivery) / 308,237 = 91.1% had known HIV status at time of delivery.
2. A total of 600 pregnant women are known to be HIV positive with 601 HEI.
 - 596 /600 (99%) had attended least 1 ANC visit.
 - 565/600 HIV+ women were diagnosed prior to delivery, and 35/600 women screened HIV reactive at delivery.
 - 550/600 HIV+ women were established on ART including; 471 already on ART and 79 who started during the pregnancy.
 - 73/79 (92%) who started ART during the pregnancy were on ART > 4 weeks, and 6/79 on ART for < 4 weeks prior to delivery.
 - 15/565 women already diagnosed HIV+ (but not on ART during pregnancy) started ART at the time of labour and delivery.
3. Of the 68,194 women whose HIV status was recorded as “not known” when they presented for delivery, 41,037 (60%) were screened; 35 (0.08%) women screened HIV positive and 32/35 commenced ART.
4. Overall 544/600 (91%) HIV positive pregnant women were diagnosed and on ART by 4 weeks prior to delivery and would be considered lower risk for MTCT, whilst a further 53 (9%) started within 4 weeks, just prior, or at/after delivery.
5. It could be postulated that if all of the 68,194 whose HIV status was “not known” at delivery were tested a further 14 HIV + cases may have been identified (assuming the same rate of HIV positivity as those who were tested).

HIV exposed infants: PMTCT and NCHADS 2020 data reports

6. Of 601 HEI, including one set of twins, 583 (97%) are reported as receiving ARV, including 44 for 12 weeks, 466 for 6 weeks, and 73 single dose NVP (at JVH hospital). As the delivery ward is the source of this data in the PMTCT report, it documents the planned intervention rather than the course of ART actually taken.
7. The PMTCT 2020 data report that 73 HEI had a PCR test at birth.
8. The NCHADS ART database cross sectional HEI data for 2020 reports 229 HEI, of whom 98 were tested at birth, including one who tested HIV positive. At 6 week testing which was performed on 11/229, no positives were recorded, and there are no available data for further PCR or HIV Ab testing.⁵⁴ Essentially less than half the number of HEI reported on in the PMTCT database are captured by the NCHADS ART database, and therefore the outcome of the HEI is not determinable.

9. The CHAI analysis of the NCHADS laboratory data reports that of a total of 572 unique HEI born and tested in 2020, 366 (64%) were tested within 0 – 3 days of birth, and total of 531 (92%) within 60 days. A second test was performed in 203 (35%) in 2020 at a median age of 72 days (range 27 – 238). However from 2018 – 2020, 58 tests were not included in the analysis as they had missing date of birth and collection date, (it is not clear how many would have been from 2020). Overall in 2020, 13/572 (2.27%) infants tested positive, 7 of whom had a confirmatory test.⁵⁵
10. The 2020 PMTCT report documents 582/600 HIV positive mothers received counselling on infant feeding after delivery, of which just 180/582 “want to feed their babies exclusive breast milk” and 402/ 582 intended to use infant formula. There are no data regarding actual infant feeding practices that took place subsequently.

Syphilis PMTCT 2020 data

11. In 575 stillbirths reported; 568 had been screened for syphilis during the pregnancy, including 14 who screened positive. Of mothers not previously screened, 14/16 were screened, all were negative.⁵⁶
12. Regarding spontaneous abortion > 20 weeks, 402 were reported however the reported syphilis testing data is inconsistent.

⁵⁴ The lower reported numbers of HEI relates to the issue that some sites are using the ART database to generate reports whilst others manually report

⁵⁵ Analysis of Early Infant Diagnosis (EID) Scale Up In Cambodia for 2020. Prepared by CHAI July 2021

⁵⁶ The figures do not quite tally in the report – 575 still births, if 568 already screened would leave 7 not screened.

Table 7. Review of issues around human rights, gender equity and civil society engagement

Issue	Yes	No	If yes, does this affect the decision to validate for elimination? Why? What are the suggested recommendations for the country?
Is there criminalization of vertical transmission?		N	
Is there mandatory or coerced testing and/or treatment for HIV and syphilis?		N	HIV and syphilis testing is offered and encouraged at the ANC, however there are no laws that enforce testing and treatment.
Is there lack of informed consent?	-	-	N/A - informed consent by policy is required but there are no mechanisms in place to monitor this.
Is there forced and coerced abortion, contraception and/or sterilization?	Y		A case of involuntary sterilisation was documented in a CSO-led report published in March 2016 (Asia Catalyst) at a hospital (Chey Voruman VII) in Siem Reap, and it also came from a key informant interview during the mock review; no follow-up monitoring has been conducted.. Urgent follow up is required from NMCHC and the Ministry of Health.
Is there a lack of confidentiality and privacy?	Y		There is no mechanism in place to monitor this; however, one key informant shared a situation in which her HIV test result was shared first with her mother rather than her.
Is there lack of equality and non-discrimination?	-	-	N/A no monitoring system is in place to gather data for the purpose of validation in aspect of equality and non-discrimination in particular among key populations; however, there are laws and policies in place for the most part. A gap in policy is the lack of legal protection guaranteeing equality and non-discrimination of key populations.
Is there lack of equality and non-discrimination?	-	-	N/A no monitoring system is in place to gather data for the purpose of validation in aspect of equality and non-discrimination in particular among key populations; however, there are laws and policies in place for the most part. A gap in policy is the lack of legal protection guaranteeing equality and non-discrimination of key populations.

Is there lack of availability, accessibility, acceptability and quality of sexual and reproductive health (SRH) and ANC services?	Y		The quality of SRH, ART and ANC services is impacted by the disconnect of these services in terms of location and systemic coordination. There is limited system support to ensure patients move from one service to another and so patients are lost to follow up. There are social support mechanisms for financial assistance to access care, however the effectiveness of these systems are not clear - clients may be reluctant to disclose their HIV status in order to access them, they may not have time to go to separate appointments, and it is reported that the level of assistance in some cases is not enough to cover transport costs for far distance etc. ART clinics should proactively offer HIV + women of child bearing age access SRH information and consumables.
Is there a lack of accountability and absence of participation and community engagement?	Y		Community "engagement" in PMTCT/ EMTCT is limited to consultations for the most part; there are no specific roles, opportunities, nor funding made available to support their engagement. However, there is some level of community engagement in delivery of HIV testing and ART services, including outreach workers and counsellors at ART clinics.
Are there laws to protect women from gender-based violence?	Y		There are policies in place; however, GBV strategies and interventions are not integrated into PMTCT strategies. There are no mechanisms in place to monitor GBV issues relating to women and girls accessing SRH and ANC services.
Is there a lack of access to justice, remedies and redress?		N	There is a Cambodia Human Right Commission which is the mechanism for access to justice, remedies and redress; however, there's limited awareness of the mechanism amongst the community members, and hence is not commonly accessed.

Intention to transmit HIV to other people is a criminal act (Articles 18 and 50 of the Law on prevention and control of HIV/AIDS, 2002). Other than that exposure, non-disclosure and transmission of HIV and syphilis are not criminalised.

6.1 Data component findings

This section details the methodology (data verification and impact assessment, including sources of data, modelling and triangulation) and the findings of the data component review.⁵⁷

Methodology: Tools, checklist and exercises conducted by the Data regional expert and sub TWG included the following;

- WHO self-assessment tool (National level)
- Interviews with sub-national service providers at three sites (Battambang –PMTCT coordinator, Calmette Hospital – PMTCT focal point , Kampong Cham – PMTCT coordinator)
- PMTCT database and data quality checking excel tools
- NCHADS databases – including ART, laboratory, FHC, VCCT, BIACM recording forms and databases
- Mock line-listing exercise (50 entries) and mapping of data availability and completeness for tracking mother-baby pairs
- AEM-Spectrum modelling and estimation, Congenital Syphilis estimation tool
- Sample case-based longitudinal data review (examine pregnant women by age group and treatment duration)
- HIV recency data among pregnancy women (n=72) and tracking data on pregnant women identified with recent HIV infection

Findings:

The review found that the method of calculation of each of the key indicators to be appropriate. However, as described above, the lack of programmatic data precluded triangulation to estimate MTCT transmission rates.

The reviewers identified the following good practices with regards to data management:

1. Standardized recording forms and registry formats indicated in latest PMTCT guidelines.
2. NMCHC online database and data quality checking tools.
3. NCHADS early infant diagnosis (EID) data analysis from lab database is performed on a 6 monthly basis by CHAI.
4. NCHADS databases collect individual level data of mother-baby pairs (though data is incomplete at the time of mock review).
5. Recency testing performed among all newly diagnosed HIV+ individuals including pregnant women.

⁵⁷ See also Section 4. Methodology, and Section 6.0 Report on the key elimination indicators; What systems and data sources were used for the EMTCT process and outcome data?

The reviewers found overall that, despite data being collected and available for most key indicators, the data systems are fragmented and do not allow meaningful analysis to inform programme gaps along PMTCT service cascade. There are significant data inconsistencies across databases. Quarterly reporting renders the data of little utility for case management.

For example; the number of HEI identified in 2020 ranges from 601 in the PMTCT database, to 484 recorded in the NCHADS quarterly reports, 229 in the NCHADS electronic database, and 572 in the CHAI analysis of the laboratory database.

The following is a summary list of issues and challenges identified in the Data review:

8. Accuracy, validity and internal consistency of data assessed through mock line listing exercise, self-assessment tool and review of available data sources indicates the needs to improve the timeliness of reporting and data systems, including the interface and linkages between and within the point of care of EMTCT services.
9. Gaps in linkages and follow-up of pregnant women and exposed babies throughout the EMTCT cascade. Line-listing data is lacking/incomplete for both HIV and syphilis. Systematic tracking of mother-baby pair is not yet established (tracking tools are incomplete and limitations at site level).
10. For mother-baby pairs tracking data for syphilis, most key indicators are lacking except for syphilis testing.
11. Major data gaps were identified in many key areas including; early infant diagnosis (EID) and outcome of HEI (incomplete), mode of delivery (not collected), infant feeding practice and duration of breastfeeding (incomplete), retention on treatment during pregnancy and breastfeeding (incomplete), viral load testing and suppression (VLT/S) among pregnant women and breastfeeding mothers (incomplete).
12. Lack of universal unique identifier code (U-UIC) for HIV positive pregnant women and breastfeeding mothers that is interoperable across continuum of care of mother-baby pair.
13. Issues with paper-based data recording such as timely reporting, data aggregation and analysis, and incomplete electronic databases, and data use for programme management & decision making.
14. Challenges in data collection, recording & reporting at the site level.
15. Limited data triangulation efforts between NMCHC and NCHADS -e.g. referral from ANC reactive rapid test vs. VCCT records (recorded as pregnant women/ANC).
16. Inconclusive data due to data quality issues:
 - data sample drawn from ART database to examine pregnant women by age group and treatment duration raised some cause for concern such as possible adolescent pregnancies particularly among those with vertically acquired HIV (cannot verify due to issues with data accuracy)
 - Certain proportion of women who seek service just before or during delivery are known positive and loss to follow up.
17. No data on pregnant women seeking services from private sector providers.

6.2 Programme component findings

This section details methodology and findings of the review of programmes and services; Tools, checklist, and consultation conducted by the Programme regional expert and sub TWG;

- WHO self-assessment tool (National level and sub national HIV and PMTCT services at two provinces).
- Six virtual meetings of Sub TWG program component.
- A virtual meeting with cross-component regional experts, UN and technical partners.
- Interviews with sub-national level service providers at three sites.
- Five key informant interviews – NCHADS /NMCHC (2 focal staff); Key CSO/Community Rep/AUA/CPN+/NGO (4 people), Key CSO/KP network/NGO (3); 2 sites of Service provider ART/NMCH/STI (12).

Overall findings of the Programme review

1. High commitment from MoH on EMTCT (Her Excellency Undersecretary of State Ministry of Health is the focal point for EMTCT). Sub-TWG for EMTCT is co-chaired by Directors of NMCHC and NCHADS and includes relevant partners and stakeholders.
2. PMTCT services are accessible locally, however, referrals to sometimes distant sites are required to meet pregnant women/Exposed Infant Diagnosis needs which results in gaps in diagnosis and care, and lost to follow up of women and exposed infants.
3. Policies, guidelines, and the strategic plan have been updated but some guidelines/policies are not fully implemented due to challenges associated with human resources, capacities, and stock management of drugs/diagnostics.
4. There is limited funding to support EMTCT especially at sub-national level for EMTCT roadmap implementation.
5. Attention to syphilis is much lower than HIV and there is little active case follow-up. Stock outs have been reported of HIV-Syphilis Duo (dual test), RPR test kits and benzathine penicillin.
6. Incomplete line listing data of mother/baby pair to inform the EMTCT program for real time monitoring and follow up.
7. No information of private health providers involved and responsible for PMTCT.
8. The necessary multi-sectoral, institutional (beyond NCHADS and NMCHC) response is hampered by lack of clear roles, responsibilities and accountabilities to support EMTCT. A comprehensive response should involve health promotion, social welfare support, access to HEF/ID Poor registration, commune council and community involvement. There is no entity coordinating across those many domains and there is no monitoring program that identifies where the gaps are and addresses them immediately to the benefit of the mother-infant.

Good practices identified in the Programme review:

Leadership & Governance

1. High commitment from MoH on EMTCT (Her Excellency Undersecretary of State Ministry of Health is the focal point for EMTCT).
2. PMTCT TWG co-chaired and led by both Directors of NMCHC and NCHADS with membership from other partners. At sub-national level, chaired by the PHD Director.
3. There are guidelines, NSP & protocols for EMTCT, including; Roadmap EMTCT 2018, updated MTCT NSP (2021), HIV Treatment Guidelines (2020), and STI treatment Guidelines (2019).
4. There are no legal barriers or restricted access to PMTCT services.
5. HIV testing is voluntary.
6. There are NGOs networks and inter- programmatic support for PMTCT.

Finance

7. Domestic funding supports ARV/OI treatment for pregnant women and for ARV for Exposed Infants Prophylaxis;
8. HIV testing and PMTCT services are free for pregnant women and baby;
9. Government's "1000 days package" of USD190 support ANC-postnatal care for pregnant women with IDPoor from the period of ANC until 2 years after birth: (4ANC, delivery, and 10 post-natal visits);
10. There is an exemption mechanism for HEF, IDPoor that allows individual enrolment vs need to be part of family enrolment;
11. ID Poor availability for individual PLHIVs approved and implementation is being discussed.

Human resources

12. Staff are assigned at national and sub national levels for PMTCT at NCHADS and NMCHC;
13. Staff are trained on PMTCT, HIV management, same day HIV treatment etc.

Laboratory products and services

14. Dual rapid tests are universally available at ANC for maternal screening;
15. Confirmatory testing for HIV diagnosis is available at VCCT, and for syphilis at the FHC.

Strategic information

16. National EMTCT indicators are aligned with global targets.

Service delivery

17. ANC and delivery services are available at HC level across the country;
18. HIV, PMTCT, STI, SRH services are available across the country (70 Adult HIV treatment sites, 41 Paediatric sites and 45 STI clinics);
19. The 2020 PMTCT data report at the time of delivery of 600 HIV positive mothers, 596 (99%) had attended at least 1 ANC visit;
20. Pregnant women living with HIV receive test and treat for lifelong HIV treatment, including management of late diagnoses and infant exposure prophylaxis;
21. PMTCT program promotes breastfeeding with counselling provided at delivery;
22. No stock-out of condoms or other contraceptives at RH;
23. There are updated guidelines for HIV management, Family Planning, breastfeeding, partner testing and EID, prophylaxis and syphilis treatment for pregnant women and infants;
24. There are mechanisms to facilitate & refer for services and address LTFU (CAA/B-IACM 56 OD/Group of Champion).

The reviewers noted progress on the gaps identified in the previous review which informed the EMTCT 2018 roadmap, however many issues identified at that time remain, as described in the following table

Issues and challenges identified in the Programme review:

Leadership and coordination:

1. A committee to guide the validation process for EMTCT is yet to be established;
2. There is a need to strengthen the high level leadership of the PMTCT program including coordination between NCHADS and NMCHC, and a broader inclusion of other sector partners involved in the PMTCT program;
3. There is a lack of coordination across the many domains of the PMTCT program delivery at sub-national level, which is needed to identify and address gaps in the implementation of the program;
4. The Community Action Approach (CAA) has very limited outreach activity to support HIV positive pregnant women's passage through the PMTCT journey;
5. There is no involvement of Village Health Support Group (VHSG) in PMTCT community awareness or individual support;
6. The Group of Champion for BIACM has become less active since a reduction in financial support.

Data management:

7. Data is collected and systems are in place however suboptimal data quality and fragmentation of information systems render them inadequate to a) monitor and inform the programme along the continuum of services for the mother baby pairs, and b) enable service providers to track clients and ensure appropriate prevention and clinical management is provided.

Pre- conception PMTCT measures

8. Limited contraceptive options are available at ART clinics (condoms only, despite PMTCT guideline describing a range of contraceptives that would be freely available),
9. Lack of clarity regarding how proactively ART clinicians discuss reproductive options with HIV positive women;
10. Adolescent care; NCHADS data suggest there may be a higher than average rate of adolescent pregnancy including young women who themselves were infected as a result of MTCT and should be receiving care at the PAC or ART sites;
11. Whilst parental consent is not legally required for adolescents to access care if it is "in the best interests of the minor" it is not clear if this is consistently understood and applied;
12. PEP post rape – this is theoretically available at ART clinics although is rarely promoted, accessed or recorded ;
13. Syphilis testing amongst HIV positive women is not routinely offered at the ART sites;
14. There is lack of awareness of PMTCT amongst the general population, including MSM who may infect their female partners;
15. Reports of reluctance by FEW to use contraception due to fear weight gain and of not achieving subsequent pregnancy;
16. Anecdotally, some women do not acknowledge their HIV status or take ART, as they are concealing this from their current spouse.

Diagnosis of HIV and Syphilis

17. PMTCT data indicate that a few women who screen positive do not proceed to the VCCT for confirmatory testing for HIV, and more do not go to the FHC for syphilis quantitative RPR.
18. Whilst VCCT and ART are free of charge, RPR testing and treatment of syphilis can incur fees.

Management of HIV and syphilis in pregnancy

19. VL testing is not being performed as per the National guideline direction that it should be done early in pregnancy in women known to be HIV positive, and at 3 months after commencement of ART in newly diagnosed women;
20. Cambodian guidelines are not yet updated to include the WHO recommendation that VL should be performed again at 34 – 36 weeks gestation (or at the latest at delivery) and conduct VL test at 3 months after delivery and every 6 month therefore after during the postnatal period for breastfeeding women⁵⁸
21. Adequate treatment of maternal syphilis is not able to be assessed as reporting doesn't distinguish between syphilis treatments.
22. There have been shortages of benzathine penicillin, and reluctance by clinicians to prescribe for fear of anaphylaxis;
23. Providers are not yet trained on updated guidelines including benzathine penicillin treatment on the basis of the result of the syphilis screening test alone (rather than waiting for the RPR).

Delivery

24. Mode of delivery is not recorded, Caesarean section is routine (inconsistent with National Guidelines) at JVII hospital
25. Of 68,194 women whose HIV status was recorded as "not known" when they presented to delivery, 41,037 (60%) were screened.

Management of HEI (601 in 2020 PMTCT database)

26. PMTCT 2020 data 78/601 HEI received HIV DNA DBS testing at birth, issues to be explored include staff competency / availability of sample collection at the site, with some infants being referred to PAC site with LTFU in the interim.
27. HEI ART prophylaxis plan is documented by PMTCT at delivery, however adherence is not recorded;
28. Follow up for 6 week Dried Blood Spot PCR DNA testing is suboptimal (35%) , as is Ab screening at 18 months;
29. Infant feeding: Nearly 70% of women at the time of delivery, post infant feeding counselling, indicate an intention the time of delivery to formula feed, contrary to National Guideline recommendations. There is no financial or logistical support for replacement feeding in the public sector however JVII hospital, and a few NGOs are said to provide formula for free.⁵⁹

⁵⁸ WHO consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: recommendations for a public health approach. July 2021. Page 157.

⁵⁹ The National Guidelines for PMTCT (based on WHO guidance 2016) provide guidance) for counselling for infant feeding in the context of HIV. Counsellors should encourage HIV positive women, wherever possible to breast feed their infants exclusively for the first 6 months and then to continue BF along with complimentary foods until at least 12 months of age, and up to 24 months or longer. The guidelines provide information on the risks and requirements for safe formula feeding.

Breastfeeding mothers

30. Cambodian PMTCT, HTS and HIV management guidelines are not yet updated to include the WHO recommendation that for all breastfeeding women VL testing should be conducted 3 months after delivery, and every six months thereafter.⁶⁰

Management of Syphilis Exposed Infant

31. No data – however in the event of clinical suspicion or high risk for congenital syphilis the recommended treatment is for intravenous penicillin for 10 – 15 days, the alternative is daily intramuscular penicillin for 10 days. Fees apply but exemption for poor women if they have an ID poor card.
32. STI guidelines detail follow up schedule however this is not referred to in the PMTCT guidelines (which details other aspects of treatment) – this needs to be aligned.

⁶⁰ WHO consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: recommendations for a public health approach. July 2021. Page 157.

6.3 Laboratory component findings

This section details the methodology and findings of the laboratory component review including EQA, HIV and syphilis testing in pregnant women, EID.

Methodology; Tools, checklist, and consultation conducted by the Laboratory regional expert and sub TWG included;

- WHO self-assessment tool (National level)
- Five meetings in total
- Virtual visits of the laboratory not requested – email preferred (in the context of COVID-19)
- Individualized data and requests – KCM, BTB, CAL & NCHADS
- Laboratory testing and management SOP and guidelines
- Key personnel: staff at KCM, BTB, CAL & NCHADS
- Laboratory information systems were not included in the review
- Private Testing Services were not examined.

The reviewers found that within the laboratory, processes are generally progressing well. Whilst the mock review was more limited for the broader laboratory network – from testing in primary care and specimen collection through to delivery of test results, there were areas of concern identified which require further investigation and attention.

Laboratory component review findings:

1. Within the laboratory
For the laboratories, most of the documents requested by the reviewers were available (SOPs, laboratory checklists) and evidence provided of controlled storage of materials, and a working Quality Management Systems (QMS) is in place. The laboratories participate and have recorded excellent performance in Proficiency Testing Programs (PT or EQA), and there is evidence of staff training.
Most SOP and documentation was considered satisfactory although the reviewers noted that whilst TPHA testing is referred to in an SOP and is potentially available it is not included in the testing algorithms,⁶¹ and that HIV viral load testing frequency for pregnant women is not included in the HTS guidelines.
2. Stock management:
Test kits for the PMTCT program are selected by the MoH according to the National guidelines, and are available via the MoH Central Medical Supply. Some reagents and test kits are purchased by the hospitals directly. There were no stockouts reported for HIV testing, although stockouts of SD Duo, RPR tests were reported by each of the surveyed testing sites, and some have been reported as expired (and QC testing was being undertaken for suitability).

⁶¹ However as ST Duo includes specific T.pallidum Ab testing the role for TPHA would be limited

3. Turnaround time (TAT):

TAT was not directly examined in the review, however this is monitored by CHAI analysis of EID, the 2021 report detailed that for HEI diagnosis the TAT for 47% of HIV DNA PCR results was greater than 2 weeks from sample collection to results (this does not include the time for results to be delivered to the provider / patient). For further information see the CHAI report with detailed analysis and recommendations ⁶¹

4. Quality management processes:

The National Institute for Public Health Laboratory (NIPH) attained ISO 15189 accreditation in 2019. NCHADS is working to implement ISO 15189. This review found that the responses and evidence (e.g. SOP, maintenance records) received from NCHADS indicate that this work is on-track and that they are well placed to meet the requirements when they proceed to apply for accreditation. The other three sites (Kampong Cham Battambang, Calmette) included in the mock review are currently not accredited under ISO 15189, however, each provided evidence of some forms of review (either an audit report or LQMS certificate) that indicates commitment to Quality Management Processes.

Concerningly it was not apparent that there were consistent processes in place for quality management, training and competency testing for specimen collection, and testing at the primary care level (ANC, VCCT, Health Provider Initiated Testing Counseling (HPITC)/maternity wards/Family Health Clinic (FHC), Pediatric AIDS Care (PAC)) where the bulk of the screening and confirmatory testing for HIV and syphilis is performed.

It is the responsibility of each testing site to review the feedback from the proficiency programs and that the findings and feedback be relayed to the rest of the laboratory staff in an informative manner - e.g. in the form of regular department or laboratory meetings or as a specific training session. There is currently no process in place to monitor when and to what extent this occurs.

There were some reports of confusion about the difference between External Quality Assessment (EQA) and Quality Control (QC) including the purpose and usefulness of each program.

5. Mechanisms for assessing laboratory proficiency and quality in HIV testing:

The three testing sites and NCHADS indicated participation in the HIV proficiency program provided by NIPH. The performance of these laboratories for HIV testing is excellent. At least one laboratory provided evidence for corrective action forms, including how issues are resolved.

6. Mechanisms for assessing laboratory proficiency and quality in Syphilis testing:

All testing sites that participated in the mock review participate in the Syphilis proficiency program provided by the Pacific Pathology Training Centre (PPTC) from New Zealand. Some errors were reported in the Proficiency report. The evidence provided shows these identified errors are most likely put into a corrective action form and are then resolved as a requirement of the Quality Management System.

⁶² Analysis of Early Infant Diagnosis (EID) Scale Up in Cambodia for 2020

7. Participation and Performance in External Quality Assurance Programs
According to provided documents, HIV External Quality Assurance (EQA) programs were available to all VCCT sites but not all Healthcare Centers (HC).
8. Laboratory information systems
The reviewers were not able to conduct a review of the whole sample process from registering the sample at the point of receipt in the laboratory to the final interpretation of results to the clinician in order to adequately audit the laboratory information systems. However the laboratory information systems were noted to be fragmented; they include an NCHADS laboratory database, the CamLIS system at hospital level laboratories, data (paper based) from the primary care testing site is uploaded to the PMTCT database, and there is no linkage to the NCHADS ART database.

6.4 Human rights, gender equality and civil society engagement (HR/GE/CS) component findings

Tools, checklist, and consultation conducted by the Laboratory regional expert and sub TWG included;

- WHO self-assessment tool (National level);
- Review of National legal and policy documents in relation to HIV EMTCT in context of HR, GE and CS;
- Six virtual meetings with TWG for community, gender equality and human rights component;
- A virtual meeting with cross-component regional experts, UN and technical partners;
- Seven key informant interviews - government (2); community/direct beneficiaries (4); technical partner (1);
- Ten stakeholders focus group discussions – four key CSO and KP partners (14); two technical partners (4); two health workers (8); two direct beneficiaries (11);
- A virtual consultation with CSO and community groups on preliminary findings and recommendations.

The following good practices were identified, with regards to the (HR/GE/CS) in relationship to the PMTCT program in Cambodia:

1. Commitment from government, with leaderships from MoH, NMCHC, and NCHADS to EMTCT;
2. Openness of the national programmes and engagement of stakeholders helpful for honest discussions and reflections;
3. Legal frameworks and policies in place; guidelines and strategic plans; including EMTCT roadmap; developed and some were updated;
4. No criminalization laws for non-disclosure, potential and perceived exposure to HIV and syphilis
5. Laws and policies exist to ensure voluntary and informed consent for HIV and syphilis testing and treatment; sterilization, contraception and/or abortion; as well as ensure confidentiality and privacy of HIV status
6. Five years national actions plan to prevent and respond to violence against women; with national protocol on GBV trained to healthcare providers in particular those who are in charge of delivering health services to GBV survivors
7. HIV community and KP consulted and input into National HIV Strategy, PMTCT Strategic Plan and EMTCT Roadmap; and engaged in annual review of EMTCT roadmap implementation
8. HIV community, NGO and CSO engagement in the implementation and delivering of HIV testing and ART services
9. Community Action Approach – PLHIV counsellors working in all ART clinics

10. Few reports of discriminatory attitude from the healthcare providers based on KII/FGD;
11. Specific provision in national guidelines to ensure availability and accessibility in particular for vulnerable and poor women with some support to address financial barriers in accessing services through 1000 days packages (ANC, delivery and PNC).
12. National redress mechanism exists (Cambodian Human Rights Committee), though not specifically for women living with HIV.

The reviewers found however that very limited, if any progress had been made in the HR/GE/CS space regarding PMTCT since the review which informed the development of the 2018 EMTCT Road Map.

The following is a summary list of issues and challenges identified in the HR/GE/CS component:

1. HIV Law that criminalizes “intention to transmit HIV” is unclear and could create potential risk to criminalization of non-disclosure (without intention to transmit) and to heighten GBV and social, economic and political inequalities faced by women and girls. Flow on effects could result in an increase in overall HIV transmission.
2. There are no specific laws, regulations and policies with provision for equality and non-discrimination against key populations (except for HIV law for protection of PLHIV), or guaranteeing equal and universal access to SRH services;
3. Health outcomes of mothers and their HEI as related to their ability to access quality and available health services are impacted by separation of VCCT, FHC, SRHR, ART, ANC, and PMTCT services and referrals;
4. HIV counselling in ANC clinics and in other hospital clinical settings (e.g. TB clinic), including obtaining informed consent for voluntary HIV testing and disclosure of results should follow the same protocol as in VCCT clinics, unless the person being counselled expressly agreed to be counselled and consented together as a couple. Post-counselling, including disclosure of HIV results, should be conducted individually. This should be properly recorded. There is evidence to suggest these procedures are not always followed in the ANC;
5. There exists a lack of routine and systematic monitoring, documenting, and reporting mechanisms for violations of rights, as related to informed consent, confidentiality, privacy, voluntary HIV and SRHR services, stigma and discrimination, and GBV cases;
6. Limited access and use of redress (CHRC) mechanism due to lack of awareness and understanding of its role in addressing complaints;
7. Access to HIV and SRH services for minors without parental/legal guardians’ consents are legally and informally available however there are lack of a formal and clear policy; since parental/guardian consent is required for a minor to access HIV testing, with exception of ‘best interest’ consideration which is not clearly defined in the HIV law and HTS SOP.
8. Gap in the effectiveness of partners notification system, in particular within the MSM communities and amongst MSMs with both male and female partners which may impact on PMTCT;
9. Inconsistency of PMTCT information, including quality of counselling received by community and women living with HIV from health providers impacts their ability to make informed decisions. This should be examined for gaps in compliance with National PMTCT guidelines and trainings by the hospitals, and regular refresher courses for healthcare providers undertaken;

10. A hospital in Siem Reap (JVII) was reported to have performed an involuntary sterilization of WLHIV at the time of performing routine Caesarean section for PMTCT (contrary to the National Guidelines). It is a priority to clarify whether this practice is continuing, and if so, address the issue urgently.
11. Community awareness and understanding of PMTCT is limited; and integration of PMTCT and related information into HIV communication and information strategies is lacking.
12. There has been limited progress on operationalization of community engagement strategies and workplan in the National EMTCT Roadmap and PMTCT Strategy – there is a need for more resources and proactive approaches from all stakeholders, including PLHIV and KP communities;
13. Limited consideration and integration of GBV issues and strategies in the development of PMTCT Strategy and Roadmap and limited capacity of community to support integration of GBV issues and strategies. Ensuring PEP and emergency contraception for rape victims should be part of the overall EMTCT strategy.
14. Lack of strategies and limited stakeholder support and resources for engagement of WLHIV network/organisation and female KP; and support SRH needs for sero-discordant couples;
15. There is a lack of understanding of the effectiveness of various financial support programmes in meeting the needs of women living with HIV and their HIV-exposed babies;
16. Healthcare providers' capacity is overstretched, while PLHIV/KP counselors' role limited and has not been reviewed in the last 10 years (e.g. community and ART clinics only with counseling and treatment adherence support and patient follow-up)

6.5 The Private sector component findings

The mock review TWG elected to appoint a regional expert to work with each component group to better understand the role of the private sector in PMTCT and requirements for validation for EMTCT. The expert attended individual component meetings, interviewed in-country experts, as well as reviewing Cambodian and WHO PMTCT and EMTCT supporting documents, and relevant grey literature.

The qualifying requirements to meet validation for EMTCT with regards to private sector involvement are as follows:

1. Existence of an adequate “validation standard” national monitoring and surveillance system that can capture process data from both the public and private health sectors and detect the great majority of cases of MTCT of HIV and/or syphilis.
2. Evidence that high-quality services for PMTCT of HIV and syphilis occur in both the public and non-public health sector.
3. Service coverage for EMTCT process indicators reach EMTCT targets in both the public and private sector, and that data on performance of these service indicators be available to validation teams for assessment.
4. Sound understanding of what proportion of ANC and delivery services are public vs non public and if services are similar in each system.
5. Evaluation of EMTCT in the private sector, including ANC, and HIV and syphilis testing and treatment practices with respect to access, delivery, payment, and how it compares to the public sector, should be included as part of the program assessment.
6. Completion of checklist by both public and private providers.

There is limited recent data available from private ANC and maternity facilities across the country. s. Prior DHS data, most recently from 2014, reported that approximately 8.5% of women seek ANC services in the non-public sector, and about 14% for delivery. However almost half of the women who sought ANC care in the private sector also received ANC care in the public sector – and so for the purposes of HIV and syphilis diagnosis should be tested at their first public ANC visit. The percentage of women getting ANC only in the private sector was 4.6% or 5.6% for all non-public sources (private sector plus “other” etc).⁶³

Seven years later it is unclear how many women now seek ANC and delivery services in the private sector, and whether HIV positive women seek non-public services more or less than the general population. Spectrum estimates of HIV infected pregnant women for 2020 are 694, the PMTCT database records 600, so potentially some of that gap may be accounted for by women attending the private sector? ?

⁶³ Sheryl Keller NMCHC Advisor

Little is known regarding PMTCT testing and treatment practices performed in private facilities for pregnant women and their infants. In addition, there is a large semi private facility in Phnom Penh supported by a charitable institution which whilst it reports to the MoH does not routinely follow the National PMTCT guidelines (routine Caesarean section, doesn't test for syphilis, provides infant formula).

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Little is known regarding PMTCT testing and treatment practices performed in private facilities for pregnant women and their infants. In addition, there is a large semi private facility in Phnom Penh supported by a charitable institution which whilst it reports to the MoH does not routinely follow the National PMTCT guidelines (routine Caesarean section, doesn't test for syphilis, provides infant formula).

The following gaps were identified with regards to PMTCT in the private sector:

1. No PMTCT guidelines nor training have been provided to profit private sector providers (PSP).
2. Limited knowledge on what PMTCT initiatives (if any) are used by PSP, or the clinical skills they have in PMTCT practices.
3. Currently no assessment has been made on ANC EMTCT service coverage in non-public settings.
4. There is no comprehensive list of providers delivering ANC & maternity services in non-public settings.
5. No evaluation was identified regarding ANC services in PS.
6. No PSP have completed the WHO checklist
7. No PSP are on the PMTCT TWG
8. Key informant interviews suggest that pregnant women from key population groups may access PSP as it offers greater privacy for pregnant women concerned with HIV diagnosis.
9. There is no "validation standard" national monitoring and surveillance system that captures process data from PSP.
10. Currently there are no unique patient identifiers for ANC in the public or private sector.
11. There is no specific data on the number HIV or syphilis positive pregnant women using PSP for ANC/maternity services.
12. No data systems capture service delivery and outcome data from PSP

The review concluded that there is currently not enough evidence available from the PS to meet validation requirements. However, the DPHI has developed a reporting template for licenced PSP providers that captures indicators on HIV status and HIV & syphilis testing. Due for release early 2022. Unique identifiers for PSP will showcase PS services and data. If some PS data can be collected in the next two years, it can be showcased to meet validation requirements. Good examples to look at are Malaysia, Maldives and Thailand validation reports where they have showcased some private sector involvement

Key challenges and bottlenecks to private sector involvement in EMTCT include:

1. Current lack of legal framework to engage PSP that enables MoH to regulate quality and require reporting.
2. No current surveillance system to collect/capture data from PSP.
3. Currently no ability to collect sufficient data from PSP to meet validation requirements.
4. PMTCT initiatives are not a requirement for PSP registration or licensure.

7.0 Recommendations and next steps

At the mock review dissemination meeting it was agreed that the way forward will require:

1. Establishment of a National Validation Committee with the WHO terms of reference;⁶⁴
2. Dedicated component sub TWG which include
 - Co-chairs by NMCHC and NCHADS and
 - members from key partners, national level and sub National level –including management and service providers representatives;
3. Inclusion of the following stakeholders in sub TWG or working groups as appropriate:
 - Community networks – PLHIV especially women, key populations
 - National AIDS Authority
 - Multisectoral current and potential partners; e.g. social welfare, HEF/IDPoor, health promotion, commune council, NGO, Cambodian Red Cross
 - Private sector representatives
4. Develop an action plan; with clear responsibilities and timelines, based on the recommendations in the mock review and further informed by the experience / input of the above representatives.
5. The action plan to support cross component issues including delegating working groups within and across component sub TWG to progress specific issues.
6. Regular monitoring and assessment of progress and challenges using WHO assessment tools, 2018 Roadmap, and recommendations of this review.

Consideration should be given to integrating the Private sector, and Human Rights, Gender equality and community engagement, and programme components into one sub TWG in order for Human Rights, Gender equality and community engagement related issues to be placed at the foremost and center of any progress or changes in the PMTCT program implementation. The large brief of this combined sub TWG will necessarily require cross component collaboration with data and/or laboratory groups to progress certain areas.

Overall findings and Recommendations

The following section identifies cross cutting issues, overall challenges and recommendations.

Sections 7.1 – 7.5 detail specific findings and recommendations for each component.

Cambodia has made significant progress in PMTCT of HIV since early in the epidemic when in 1999 it is estimated 3500 pregnant women were HIV infected, with a 40% MTCT rate. In 2020 modelling suggests that less than 700 HIV infected pregnant women transmitted

⁶⁴ Governance for the validation of elimination of mother -to -child transmission of HIV and syphilis, WHO 2020. Annex 1 – sample terms of reference for a national validation committee

HIV to their offspring at a rate of 11.8 %.

Leadership and coordination:

Broadly the review found a high level of commitment, and strong groundwork and policy framework for the path to EMTCT.

Full implementation requires strengthening of the leadership of the PMTCT program to foster better cooperation and coordination between NCHADS and NMCHC, and with the PHD and OD management and service providers at sub National level.

Multi-sectoral stakeholder partnerships need to be strengthened and included in PMTCT programming including;

- Providers supporting social welfare,
- Community networks including engagement of women living with HIV and KP, and
- Private sector.

Across the PMTCT program there needs to be greater clarity of roles and responsibilities at each level of governance, and accountability mechanisms, with regular monitoring and feedback to responsible staff in collaborating programmes (eg NMCHC, FHC, VCCT and ART clinic staff).

Facilitation and resourcing of the use of internet technology for virtual meetings may enable more regular contributions from relevant stakeholders, and address the issues raised in a timely and inclusive way. Virtual platforms may also be employed for monitoring, training and skills development.

Funding:

Funding is required to reinvigorate the PMTCT program and

- Implement the recommendations in the mock review;
- Achieve the targets and requirements for validation of EMTCT and
- Maintain EMTCT once achieved.

In addition to advocating for funding at the National level, the partnerships with the Provincial Health Departments (PHD) may explore options to ensure domestic funds and resources are sufficiently allocated in the provincial health budget for PMTCT program implementation. Inclusion of EMTCT in the Fast Track Cities program may provide opportunity for direct access to non-health government officials and advocacy for provincial and municipal funding for EMTCT.

Integrated data systems:

Linkage and adaptation of reporting systems are urgently needed, to ensure quality integrated data systems including “live” tracking of mother baby pairs. These are integral to support the provision of services at site level, monitoring and program management at sub National and National level, and ultimately to provide the data required for reporting of impact, process and other important indicators to support validation of EMTCT.

Human resources:

Human resources, particularly in areas of coordinating care and service provision need to be reviewed. Adequate, and well supported staffing with clear roles, responsibility and accountability are necessary to ensure tracking, linkage and retention of women living with HIV and pregnant women with syphilis and their exposed infants in care. The workforce review should include clinicians, CAA, PMTCT coordinators, BIACM, Group of Champions, VHSG, NGOs in community education and outreach support. Inclusion of service providers in policy and guideline development will foster better engagement and smoother implementation.

Training, monitoring and supervision:

Each component of the review highlighted the need for the PMTCT program to include more training, skills development, monitoring and supervision in their respective areas, including but not limited to;

- Laboratory specimen collection and testing,
- Clinical management and guideline updates,
- Contraceptive and infant feeding counselling,
- Confidentiality, legal and human rights issues, gender and
- Data systems quality.

It is anticipated that additional training needs will be identified through partner stakeholder engagement.

Fragmentation of services and access to care across the continuum of PMTCT:

Addressing the current system challenges in data monitoring, reporting and program management is necessary to progress from prevention to elimination.

It is apparent that the fragmented nature of care across the services required for PMTCT poses challenges at every level.

- To reduce the number of and impacts for exposed infants, the system must address barriers for mothers including complexity, time commitments, travel and cost of accessing services. Each step poses a risk for loss to follow up, and incomplete / inadequate care.
- The coordination of service providers and treatment facilities is necessarily more complex with the inclusion of syphilis and now hepatitis B for the goal of triple EMTC. The greatest impact appears to be with regards to exposed infants, who have low documented rates of testing and follow up.
- EMTC cannot be achieved without reliable data on the actual rates of transmission.

Poor, migrant, and other marginalised women are more vulnerable to LTFU across the range of services. The reviewers were informed that not all women who need financial support are eligible or enrolled as ID poor and are HEF beneficiaries. Further investigation and work with relevant stakeholders are required to ensure that vulnerable pregnant women and their exposed infants are able access support they need, to minimise risk MTCT.

Syphilis:

The EMTCT roadmap for HIV and syphilis was built on an already well established HIV PMTCT program. HIV confirmatory testing and treatment are free of charge, whilst the parallel introduction of PMTC of syphilis (apart from screening) is at cost to the individual unless it is covered by HEF. This may suggest a difference in perceived commitment by the programs (and donors), or at least pose some confusion. It is also likely that there is lower health literacy around syphilis in the general community which poses additional barriers for the individual mother to prioritise their own resources for treatment and follow up for themselves and their infant.

Coordinated systems for screening, testing, treatment and follow up for Syphilis for mother and infant are less established than for HIV. Specifically work is needed in the following areas;

- Initiate screening in facilities which have not yet implemented dual testing,
- Conduct training on implementation of the National guidelines regarding treatment of pregnant women on the basis of reactive screening, interpretation of quantitative RPR and follow up of women and their exposed infants.
- The PMTCT program needs to establish where benzathine penicillin will be stocked and train clinicians in assessment for penicillin allergy, management of anaphylaxis, and administration of benzathine penicillin.
- Data systems need to be adapted to enable reporting of adequate treatment (with benzathine penicillin) in pregnant women.

Exposed infants:

It was evident that testing, follow up (and reporting) of the exposed infant is the weakest area in the PMTCT programme, and needs to be addressed urgently through the implementation of the National 2018 Roadmap, Strategy and Guidelines, and the recommendations in this report.

Private Sector:

The available information to the mock review does not address:

- How many women with HIV attend private providers for ANC and maternity care,
- What HIV, syphilis testing, or PMTCT measures are in place in the private sector (If any).

Inclusion of the private sector in the PMTCT program is critical to ensure best practice for the women and prevention of transmission to their infants, and is a requirement of the WHO process of validation of EMTCT.

This will require progressing the strategy and plans outlined in the HSSP 2021 – 2025, and implementation of the recommendations in the private sector component section of this report.

Survey:

There is a survey planned by the NMCHC (funded by GFATM) which is intended to address knowledge gaps and build understanding of reproductive healthcare seeking behaviour (including in the private sector), fertility rates, and infant feeding practices amongst HIV positive women. This is specifically designed to explore the gap between estimated HIV pregnant women and those identified in government services.

⁶⁵ Sheryl Keller NMCHC personal communication

7.1 Data management:

Specific recommendations from the data component of the mock review are as follows:

Focus areas for improvement		Recommended key actions	
	Policy/coordination	Immediate	Short term
1	Need to strengthen coordination between NCHADS/NMCHC, and sustain multi-sectoral collaboration at both national and sub national levels	Revisit the coordination plan/ mechanism between NCHADS and NMCHC with clearly defined roles and responsibilities at each level of governance	<ul style="list-style-type: none"> - Review and improve the coordination plan - Identify modus operandi, roles and responsibilities of the staff and clear division of labour at each level that ensure effective ways of working between two programmes with ultimate aim to efficiently track mother-baby pairs for improved programme outcomes
2	Insufficient feedback/ follow-up mechanism for data quality assurance and data quality improvement	Accountability mechanism put in place to make sure that the system set up is enforced by regular monitoring, feedback and implementation by responsible staff at field level by each collaborating programme (eg MNCH, FHC, VCCT and ART clinic staff)	SOP updated for accountability mechanism for tracking mother-baby pairs, and follow up actual implementation of revised guidelines to improve data quality
3	Needs to enhance the existing coordination platform (i.e. PMTCT working group)	<p>At national level – use and strengthen the existing platform - PMTCT working group and 1) develop Data sub-TWG for PMTCT and identify focal person/ overall lead from both NCHADS and NMCHC</p> <p>2) identify SMART action plan 3) implement the agreed upon activities and report progress back to the PMTCT working group</p> <p>At provincial and OD level, under leadership of PHD and ODD – strengthen role of focal person/PMTCT coordinator to ensure effective implementation and reporting of PMTCT services; strengthen existing mechanisms at each level of administration to make sure a clear communication channel and delegation</p>	Form national validation team that includes sub-TWG for four components of EMTCT, and national validation committee

		of duty for case monitoring, data tracking, feedback and accountability mechanism along the PMTCT service cascade (i.e. from pregnant women testing to infant outcome and linkages to care)	
4	Need to improve data availability of key indicators/sub-set of key indicators that are not yet collected	Update policy, guidelines and SOP (e.g., reporting compliance from private sector, VL testing frequency among pregnant women (2021 March WHO guideline) and DTG-based regimen for pregnant women newly initiated ART) to improve data availability/completeness	Update SOP for routine data collection, monitoring, reporting and feedback corresponding to revised guidelines
	Data System	Immediate	Short term
1	<p>Fragmented data system and limited interoperability</p> <ul style="list-style-type: none"> ➤ Gaps in tracking of pregnant women between NMCHC ANC clinics, FHC clinics and ART clinics ➤ Lack of Unique Identifier Code for pregnant women that is interoperable across the PMTCT service cascade 	<ul style="list-style-type: none"> ➤ Building on the current Master Patient Index (MPI) project, NCHADS to take technical lead in monitoring of service cascade of mother-baby pairs for both HIV and Syphilis. ➤ Initiate and institutionalize Universal Unique Identifier Code (U-UIC) for pregnant women that is interoperable across the PMTCT cascade (e.g., PMRS, National ID, or UIC based on initials and birth date) 	<ul style="list-style-type: none"> ➤ Initiate DHIS2 based PMTCT tracker (that can be part of MPI or linked to MPI) (or) make MPI work to respond to PMTCT service cascade for both HIV and syphilis (expand/add interface to include key indicators that are collected by NMCHC and FHC clinics) ➤ Integrated data management guidelines for PMTCT of HIV and syphilis outlining scope of work, data collection process and tools, roles and responsibilities of staff engaged

2	<p>Data quality and completeness</p> <ul style="list-style-type: none"> ➤ Data system do not sufficiently capture some key milestones in the PMTCT cascade ➤ Insufficient monitoring, feedback and accountability mechanism for data quality assurance Limited data triangulation efforts between NMCHC and NCHADS -e,g referral from ANC reactive rapid test vs. VCCT records (recorded as pregnant women/ ANC attendees) 	<ul style="list-style-type: none"> ➤ Review key variables of PMTCT service indicators that are currently existing and that are not in the databases (PMTCT, VCCT, STI, BIACM and ART) and incorporate required data fields ➤ Built-in system intelligence (e.g. skip patterns, mandatory fields, limitation/rules set up for data entry) in the databases that could help solve some of the quality and completeness issues ➤ Set up an accountable monitoring and feedback mechanism with clear operational procedures, roles and responsibilities of data workforce ➤ Capacity building and system strengthening responding to understaffed and capacity issues 	<ul style="list-style-type: none"> ➤ Initiate and sustain periodic data validation and quality check at national, provincial and operational district levels ➤ Regular data triangulation exercise between major databases such as PMTCT, STI and ART databases
3	<p>Lack of data tracking along the continuum of care of syphilis for mother-baby pair</p>	<p>Database revised to include key variables such as syphilis exposed infants, treatment status, type of treatment, and syphilis exposed infants with stillbirth or neonatal deaths</p>	<p>Options –</p> <ul style="list-style-type: none"> ➤ Develop/integrate web-based longitudinal case-based data tracking system with interoperability to other relevant databases ➤ Use 115 disease notification system plus BIACM

4	<p>Lack/insufficient reporting from FHC and limited data quality due to –</p> <ul style="list-style-type: none"> ➤ Resource limitation (paper-based data recording forms that are not updated, no infant forms, no electronic database, often understaffed) <p>Unclear roles and responsibilities, Limited accountability mechanism and system in place for tracking,</p>	<ul style="list-style-type: none"> ➤ Review and update the paper-based recording forms including infant forms at FHC ➤ Integrate STI data into electronic database ➤ Review staffing and staff capacity at FHC and identify clear roles and responsibilities of the workforce to enhance data collection, reporting and feedback 	<p>Improve interface in STI database and integration with PMTCT tracker database</p>
5	<p>Lack of data on pregnant women seeking services from private sector (PS)</p> <ul style="list-style-type: none"> ➤ private sectors are not required to report PMTCT service data for HIV and syphilis to Ministry of Health ➤ Voluntary reporting and no systematic data collection from PS 	<p>Set up mechanisms to collect and ensure reporting compliance from private sector on pregnant women who receive antenatal care, ANC testing for HIV & Syphilis, referral for confirmatory test and treatment, deliveries & follow-up of infants</p> <ul style="list-style-type: none"> ➤ Conduct an assessment on pregnant women and women living with HIV receiving ANC and delivery services in PS as a qualitative component of the planned RH survey ➤ Conduct service provider survey with key stakeholders of PS that provides ANC and delivery services 	<ul style="list-style-type: none"> ➤ Initiate, sustain and improve data collection through the reporting template developed by DPHI and connect to PMTCT tracker database ➤ Training of service providers/ data personnel at the private sector for quality and timely reporting of EMTCT indicators

	Human resource + capacity	Immediate	Short term
1	Limited capacity and resources available at the field level for regular data collection, follow-up and monitoring	<ul style="list-style-type: none"> ➤ Conduct resource mapping on current staffing, capacity and commodities of data workforce ➤ Conduct trainings/ refresher trainings for field data collection staff in data collection, recording & reporting with supportive supervision 	Database training for field staff and data management staff on web-based electronic databases and PMTCT tracker, etc.
	Others	Immediate	Short term
1	Limited capacity and resources available at the field level for regular data collection, follow-up and monitoring	<ul style="list-style-type: none"> ➤ Conduct resource mapping on current staffing, capacity and commodities of data workforce ➤ Conduct trainings/ refresher trainings for field data collection staff in data collection, recording & reporting with supportive supervision 	Database training for field staff and data management staff on web-based electronic databases and PMTCT tracker, etc.
	Others	Immediate	Short term
1	Lack of information on key populations and marginalized populations access to PMTCT services (prevention database do not have information on pregnancy status of entertainment workers (EW))	<p>Consider adding variables to understand the contraceptive needs, family planning and pregnancy status among EW.</p> <p>Working in tandem with Human rights, gender equality and community engagement sub-TWG to improve data inputs</p>	Integrate key indicators for EMTCT as part of community led monitoring framework and activities

7.2 Laboratory

Specific recommendations from the laboratory component of the mock review are as follows;

1. Laboratory Network

- Define roles & responsibilities for NCHADS and NMCHC (data access, training, policy, resources)
- Review the LIS and interaction with other EMTCT databases – including sample tracking of patients from initial screening through to diagnosis and treatment
- Identify and rectify the conditions that result in extended turnaround times for infant sampling & EID testing, including specimen collection, sample quality, labelling, transport etc.
- Identify issues with supply chain, explore using the LIS to identify number of tests used to improve forecasting
- Expand training (sample collection, program services), and access to QMS (± EQA/QC) to primary care screening and testing sites
- Conduct limited but frequent mini-audits of each stage of the laboratory network to ensure consistency of service delivery
- Use modified or simplified SLMTA/SLIPTA checklists to review all service levels at regular intervals (e.g. every 2 years)
- Understand (±integrate) private sector testing services (training, QMS etc)
- Explore the potential for Point of Care EID testing with existing instrument and testing infrastructure (and laboratory information systems) for both pregnant women and EID > 9 months of age.

2. Within Laboratory:

- Define the scientific chain of authority for reporting - identify staff that are trained and competent in the testing and reporting processes, including deputizing and backup arrangements.
- Improve documentation to align with guidelines and practice (e.g. use of TPHA, separate algorithms for adult and infant testing)
- Incorporate EQA/QC result discussion with wider laboratory staff, improve understanding of the difference between EQA (or proficiency testing) and QC.
- Train laboratory staff to improve understanding of PMTCT and how quality and timely ANC and EID testing is integral to EMTCT
- Develop a validation & monitoring protocol for expired kits, for extenuating circumstances

7.3 Human rights, gender equality and civil society engagement component

Specific recommendations from the HR/GE/CS component of the mock review are as follows:

1. Operationalise and resource the community engagement workplan within the EMTCT Roadmap
 - Review of progress-to-date, updating existing strategies, integration of strategies and framework for GBV, identifying priority activities, timelines, and indicators to measure progress.
 - Develop strategies, support capacity building and provide financial resources, to increase engagement of WLHIV and female KP in all aspects of PMTCT service deliveries
 - Expand and professionalise roles and functions of community peer counsellors to support linkages and coordination between VCCT clinics, FHC, ART centers, ANC clinics, referral hospital delivery sites, and PMTCT services, including providing post-natal support and proper follow-up of HIV-exposed infants
2. Establish community-based monitoring system, and increase community awareness
 - For documenting, reporting and monitoring of quality of services, including situation of stockouts, and rights violations as related to informed consent, confidentiality, privacy, voluntary HIV and SRHR services, stigma and discrimination, and GBV cases.
 - Assessment of patient satisfaction feedback and its implementation, and identify strategies for its scale up to SRHR/STI, ANC and PMTCT and other HIV related services
 - Collaborate with community and CBOs in developing initiatives, including communication strategies for increasing community awareness on CLM and redress of rights violations, including stigma and discrimination in healthcare settings
3. Review and update laws, policies and prosecutorial guidelines:
 - Rights-based and evidence-informed
 - To protect minors access to HIV and STI services without parental consent when those are considered in their best interest
 - To clearly establish circumstances in which criminal charges could be brought under "intention to transmit HIV", ensure non-criminalization of overall HIV transmission.
 - To ensure protection and guarantee of equality and non-discrimination of key populations and their access to equitable health care and services

4. Increase community awareness of PMTCT
 - Immediate integration of PMTCT information in all HIV prevention interventions and activities, including communication materials, and in ART clinics for both men and women
 - Ensure quality and accurate PMTCT information sharing for informed decision making
 - Inclusion of contraception and pre-pregnancy planning information and services in ART clinics for both men and women
 - Address the needs of sero-discordant couples and their sexual and reproductive health needs
5. Strengthen intimate partners' notification system
 - Consultations with KP communities and HIV-focused CBOs, including MSM and PWID communities, in assessing and identifying unmet needs of their communities
 - Collaborations and engagements of KP communities and HIV CBOs in strengthening intimate partners' notification system
6. Assess the effectiveness of the existing government financial support programmes in meeting the needs of WLHIV and their babies

7.4 Private sector

Specific recommendations from the HR/GE/CS component of the mock review are as follows:

Recommendations – Key actions by end 2021

1. Conduct study/survey to map the accurate number of PSP delivering ANC and Maternity services in Cambodia.
2. Disseminate PMTCT guidelines to PSP and foster relationships to strengthen PS engagement in EMTCT initiatives.
3. National Programs to request access to MSC and RHAC and SHCH reports.
4. Follow up on agreed actions with Jayavarman 7 Hospital to follow National Guidelines and institute ANC screening for syphilis.
5. Request access to PS Maternity Hospital reports from Hospital Department, MoH.
6. Request an agreed number of PSP to complete WHO self-assessment tool/checklist (choose sites in which public sector programs are also being assessed).
7. Engage PS in National PMTCT/EMTCT strategy discussions to ensure multi-sectoral approach involving collaboration between PS and Government.

Recommendations - Key actions by 2022/2023

1. Liaise with Professional Councils and develop a professional development course on PMTCT for PS ANC/Maternity service providers. Make this a mandatory CE requirement under new law.
2. Information sharing: Help facilitate the sharing of best practices and links to care between Public and PSP.
3. Once new Health law is passed, Issue Ministerial decree making reporting on PMTCT indicators a mandatory condition for licensure and registration of ANC/delivery providers (due to be finalized early 2022).

7.5 PMTCT Programme

Specific recommendations regarding PMTCT program and services are as follows:

Leadership and coordination:

11. Establish an entity body / focal person with the specific role for cross sector coordination of services at National and sub – National levels
2. Include HIV /Syphilis of pregnant women, mother and baby pairs in B-IACM case management and strengthen the role of PMTCT coordinator to support case management at sub national OD level.
3. Integrate syphilis into the B-IACM system
4. Explore the feasibility of involving VHSG with linkages to HC and RH to support community engagement and promotion of PMTCT and retention in care.
5. Strengthen the existing mechanism of CAA/B-IACM in collaboration with other parties to support, facilitate and keep track on returning migrant Pregnant women /WLHIV to access PMTCT and HIV services as needed.
6. Work with relevant partners to strengthen support, and to access IDPoor and Health Equity Fund for pregnant women
7. Consider developing a clear and comprehensive document for service providers and pregnant women on “safe motherhood” including all the key messages on PMTCT.

Legal

8. Clarify legal issues regarding consent and access to care for adolescents, and include in training for staff across the PMTCT services

Pre – conception

9. Raise the profile of PMTCT in the general community; consider recruitment of VHSG, NGO, Health Promotion and CAA. Build capacity to integrate PMTCT in health promotion activities.
10. Raise the profile of PMTCT in key populations – via building capacity of HIV prevention outreach workers.
11. Include information on PEP and emergency contraception in context of rape in health promotion activities
12. Implement the FP initiatives at ART sites outlined in the National Guideline for PMTCT 2021 including:
 - Training doctors and counsellors on PMTCT and family planning counselling for all HIV+ women of reproductive age
 - Upskill doctors on prescribing hormonal contraceptives for HIV+ women at ART clinics, including long acting methods.
 - Sustainable supply of CoC, PoP and injectables free of charge at the ART clinics
 - Work with ART sites to develop local referral pathways for access to long acting contraceptive methods: implanon, IUD etc.

13. Investigate and address adolescent reproductive health and education needs at the ART and PAC sites, revisit the Adolescent Transition and Retention in Care SoP, and ensure it is appropriate and translated into practice.
14. Include assessment of STI risk, and promotion of syphilis testing in HIV+ women at ART sites
15. Consider the development and scale up of "one stop shop" service for HIV / STI/ FP, look at lessons learned from Chhouk Sar Clinic
16. Promote PMTCT and effective contraceptive counselling for EWs during HIV prevention outreach

Diagnosis

17. Ensure funding, forecasting, and effective procurement for dual test, and RPR test kits
18. Enforce agreements to adhere to National PMTCT policies including routine dual HIV and Syphilis screening in affiliated services

Treatment Guidelines and policy

19. HIV treatment guidelines and VL testing algorithm – update based on WHO 2021 recommendations for VL testing of women early in pregnancy, at 34 – 36 weeks, and at 3 and 6 months after delivery in breastfeeding women. Provide clinician training and monitor implementation.
20. STI treatment guidelines - conduct training on implementation of guidelines regarding treatment of pregnant women on the basis of reactive syphilis screening, interpretation of quantitative RPR and follow up of women and their exposed infants.
21. Syphilis management – establish where benzathine penicillin will be administered, and who will be responsible for administration, ensure adequate stock, and referral pathways for access.
22. Train the relevant clinicians in assessment for penicillin allergy, management of anaphylaxis, and administration of benzathine penicillin – include group training and simulations. Provide ongoing monitoring, supervision and support.

Infant feeding

23. Strengthen capacity of the PMTCT staff in the correct understanding of the National Guidelines and their conveyance of accurate information regarding mitigation of risk of HIV transmission during breast feeding by maintaining maternal viral suppression, and adherence to infant ART prophylaxis, and to give clear advice regarding the infant mortality benefits of breast feeding over formula.
24. Find / make available / referral mechanism to access appropriate counselling and infant formula should it be required

Exposed infants - ***URGENT**

25. Work with the relevant partners to ensure that PMTCT care coordination follows HEI through until 18 month testing is complete

DBS PCR DNA testing

26. Work with relevant stakeholders, including laboratory, and clinical sites to understand and address issues at each step including:
- Birth – ensure staff capacity, consumables at RH maternity , aim to test HEI at delivery and reduce the number of HEI referred to PAC
 - Adequacy of the samples taken, and accuracy of specimen labelling and referral form completion
 - Specimen transport and time taken to be received in the laboratory.
 - Results received and communicated to the mother, stressing importance of follow up testing.
 - Follow up – HC visit at 6 weeks for vaccination should be a prompt for referral for DBS testing

HEI clinical follow up – provision and monitoring adherence to ART

27. Assess whether the PAC is the best place for routine HEI follow up, as only a minority of ART sites offer PAC, and whether ART site may be more accessible?

Syphilis exposed infants

28. Ensure training of clinicians in risk assessment and clinical evaluation of SEI, and of treatment and follow up.
29. Ensure there is adequate financial support for testing, treatment and follow up of SEI according to the National STI guidelines

8. References

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3. NAA. National Strategic Plan for a Comprehensive, Multi-Sectoral Response to HIV/AIDS 5th Edition, 2019-2023
4. National Strategic Plan for Prevention of Mother-to-Child Transmission of HIV, Syphilis and Hepatitis B, 2021 – 2025
5. Strategic plan for HIV and STI prevention and care in the Health Sector, 2021 - 2025
6. National Guideline for the Prevention of Mother-to-Child Transmission of HIV, Syphilis and Hepatitis B 6th Edition, 2021
7. National Guidelines on Sexually Transmitted Infections and Reproductive Tract Infections Case Management. September 2019
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9. Conceptual framework on Community Action Approach to implement B-IACM, 2017
10. National HIV clinical Management guidelines for infants, children and adolescents in Cambodia, 2016 & 2020
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Concept, Planning, Terms of Reference for the eMTCT mock review

12. Concept note_eMTCT mock review
13. Planning meeting for eMTCT mock-review. UNAIDS and WHO Cambodia. April 27, 2021
14. eMTCT mock review planning_ discussion with lead supporting partners. May 25, 2021
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16. TOR_eMTCT mock review_TWG_sub TWG (4 components)
17. TOR_ regional experts (4 components: data, HR, Lab, Program + writer)
18. Virtual Dissemination of Findings and Recommendations of eMTCTmock review Overview of eMTCT mock review process,. UNAIDS and WHO Cambodia August 25,2021

WHO guidelines, eMTCT validation guidelines, tools, checklist templates

19. WHO consolidated guidelines, 2016
20. WHO programmatic update Diagnosis and ART for EID, 2018
21. WHO update HIV prevention, infant diagnosis, antiretroviral, initiation and monitoring, guidelines, 2021
22. WHO guidelines on Syphilis screening and treatment for pregnant women 2017
23. Governance for the monitoring and evaluation validation of elimination of mother-to-child transmission of HIV and Syphilis, June 2020
24. Global guidance on criteria and processes for validation: elimination of mother-to-child transmission of HIV and syphilis 2nd Edition, 2017.
25. Checklist preliminary assessment eMTCT
26. eMTCT validation of EMTCT of HIV and / or syphilis Tools and checklists for in country evaluation of the four required components: data, HR, Lab, Programme

Cambodian National data and reports

27. Cambodian demographic and health survey 2014
28. General population census of the Kingdom of Cambodia. National Institute of Statistics, Ministry of Planning 2019
29. Cambodian Demographic and Development Indicators. UNAIDS 2020
30. 2021 Cambodia HIV estimates (2020 data) UNAIDS Cambodia presentation. 16 March 2021
31. Cambodia country snapshot including key pop cascade 2019 UNAIDS
32. PMTCT 2020 data report
33. The people living with HIV Stigma Index 2.0. CPN+ 2019

9. Stakeholders and participants

List of stakeholders participated in the virtual mock review (Program component)

	Name	Position	Affiliation
1	Dr Ly Penh Sun	Director	National Center for HIV/AIDS, Dermatology and STDs (NCHADS)
2	Dr Ouk Vichea	Deputy Director	NCHADS
3	Dr Samreth Sovannarith	Deputy Director	NCHADS
4	Dr Ngauv Bora	Head of Technical Bureau	NCHADS
5	Dr Kaoeun Chetra,	Deputy head of Technical Bureau	NCHADS
6	Mr. Kong Udom,	B-IACM National Coordinator	NCHADS
7	Dr Kim Rattna	Director	National Maternal and Child Health Center (NMCHC)
8	Dr Chhorn Samnang	Local Technical Assistant, PMTCT Program	NMCHC
9	Dr Steve Wignall	Project Director	EpiC project/FHI360
10	Mr. Keo Vannak	PrEP and STI technical officer	EpiC project/FHI360
11	Mr. Sereyvisith Sokhan	Regional Technical Coordinator	EpiC project/FHI360
12	Lim Kim Seng	Regional Technical Coordinator	EpiC project/FHI360
13	Ms. Leap Srey Luch	Technical Consultant	EpiC project/FHI360
14	Dr Soch Kunthea	HIV program implementation lead	US - CDC
15	Dr Noy Prophea	HIV program manager	Catholic Relief Services
16	Mr Sorng Sophat	Senior Project Coordinator	CRS
17	Ms. Hul Sivantha	HIV, viral Hepatitis manager	CHAI
18	Mr. Soeum Vansak	HIV analyst	CHAI
19	Mr. Kevin Yi	Senior Associate	CHAI
20	Cheu Rachana	HIV analyst	CHAI

21	Mr. Seum Sophal	Program Manager	Cambodian People living with HIV Network (CPN+)
22	Mr Chhorn Ann	Program Manager, CWPDP	CWPDP
23	Mrs Ouk Somalay	Chair of EW Network	EW Network
24	Dr Vet sreng	HIV Program manager	RHAC
25	Mrs. Hor Sinthary	PMTCT/NMCH Coordinator, Battambang province	NMCHC
26	Mrs Che Chakriya	Head of Family Health Clinic (STI), Battambang province	NCHADS
27	Mrs. Nam Chanmony	PMTCT/NMHC focal point at Calmette hospital	NMCHC
28	Mrs. Leang chharvy	PMTCT/ Phnom Penh Municipal Health Department	NMCHC
29	Dr Sieng Sovatevy	PAST - Phnom Penh Municipal Health Department	NCHADS
30	Dr Heang Srey	Head of Family Health Clinic, Pochen Tong RH, Phnom Penh	NCHADS
31	Mrs. Chhay Ly	PMTCT/NMCH Coordinator in Kampong Cham province	NMCHC
32	Mrs. Kheav Mouykea	PAST Kampong Cham province	NCHADS
33	Mr Hong Ratha	Head of Family Health Clinic in Kampong Cham province	NCHADS
34	Dr. Khin Cho Win Htin	Country director (a.i)	UNAIDS Cambodia
35	Mr. Ung Polin	Community Support Advisor	UNAIDS Cambodia
36	Dr. Ye Yu Shwe	Data regional expert and Regional Programme Adviser	UNAIDS Asia Pacific Regional Office
37	Harriet Doran Edmunds	Senior International Project Officer	Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM)
38	Ms. Liza Cabuang	Lab regional expert	NRL Australia
39	Dr Sarah Huffam	Specialist in Infectious Diseases and Sexual Health	
40	Prof. Julian Gold	Senior Staff Specialist, Director, WHO collaborating Centre	The Albion Centre, Australia

41	Dr. Tracey Mills	South Eastern Sydney LHD	The Albion Centre, Australia
42	Dr. Deng Serongkea	Technical Officer for HIV, TB, and Hepatitis programs	WHO Cambodia
43	Dr Chheang Kannitha	Technical officer MCH	WHO Cambodia
44	Dr ISHIKAWA, Naoko	Coordinator, HIS- WHO- WPRO	WHO WPRO
45	Dr Chan Polin	Medical officer HSI-WHO -WPRO	WJP WPRO
46	Mrs. LE Linh-Vi	Epidemiologist HSI- WHO WPRO	WHO WPRO

List of stakeholders participated in the virtual mock review (Laboratory component)

	Name	Position	Affiliation
1.	Mr. Mom Chandara	Chief of laboratory	NCHADS
2.	Dr. Chhorn Samnang	Local Technical Assistant, PMTCT Program	NMCHC
3.	Mrs. Ieng Sokhary	M&E Officer, PMTCT Program	NMCHC
4.	Dr. Steve Wignall	Project Director	EpiC project/FHI360
5.	Mr. Keo Vannak	PrEP and STI technical officer	EpiC project/FHI360
6.	Dr. Deng Serongkea	Technical Officer for HIV, TB, and Hepatitis programs	WHO Cambodia
7.	Dr. Soch Kunthea	HIV program implementation lead, US	US-CDC
8.	Mr. Huot Uong	Lab system analyst	US-CDC
9.	Mr. Sarin Eng	Lab system analyst	US-CDC
10.	Mr. Soeum Vansak	HIV analyst	CHAI
11.	Ms. Hul Sivantha	HIV, viral Hepatitis manager	CHAI
12.	Dr. Khin Cho Win Htin	Country director a.i	UNAIDS Cambodia
13.	Ms. Liza Cabuang	Lab regional expert	NRL Australia
14.	Mr. Kevin Yi	Sr. Associate	CHAI
15.	Mr. Ung Polin	Community Support Advisor	UNAIDS Cambodia

16.	Dr. Ye Yu Shwe	Data regional expert and Regional Programme Adviser	UNAIDS Asia Pacific Regional Office
17.	Mrs. Pich Sopanha	Lab technician	NCHADS
18.	Cheu Rachana	HIV analyst	CHAI
19.	Dr Sarah Huffam	Specialist in Infectious Diseases and Sexual Health	

List of stakeholders participated in the virtual mock review (Data component)

	Name	Position	Affiliation
1.	Dr Samreth Sovannarith	Deputy Director	NCHADS
2.	Mr Yen Sophon	Technical officer, DMU	NCHADS
3.	Dr. Sheryl Keller	International Technical Assistant	NMCHC
4.	Dr. Chhorn Samnang	Local Technical Assistant, PMTCT Program	NMCHC
5.	Dr. Ye Yu Shwe	Data regional expert and Regional Programme Adviser	UNAIDS Asia Pacific Regional Office
6.	Dr. Steve Wignall	Project Director	EpiC project/FHI360
7.	Mr. Nhim Dalen	Senior Technical Advisor, Strategic Information	EpiC project/FHI360
8.	Mr Tep Romaing	Senior Technical Officer, Strategic Information	EpiC project/FHI360
9.	Mr. Keo Vannak	PrEP and STI technical officer	EpiC project/FHI360
10.	Mrs. Nam Chanmony	PMTCT/MCH focal point, Calmette Hospital, Phnom Penh	NMCHC
11.	Mrs. Chhay Ly	PMTCT coordinator, Kampong Chan Province	NMCHC
12.	Mrs. Hor Sinthary	PMTCT coordinator, Battam Bang Province	NMCHC
13.	Dr. Deng Serongkea	Technical Officer for HIV, TB, and Hepatitis programs	WHO Cambodia
14.	Dr. Soch Kunthea	HIV program implementation lead	US-CDC

15	Dr. Khin Cho Win Htin	Country Director (a.i)	UNAIDS Cambodia
16	Mr. Ung Polin	Community Support Advisor	UNAIDS Cambodia
17	Ms. Liza Cabuang	Lab regional expert	NRL Australia
18	Ms. Harriet Doran Edmunds	Private sector regional expert	Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM)
19.	Dr. Sarah Huffam	Specialist in Infectious Diseases and Sexual Health	
20	Dr Naoko Ishikawa	Coordinator, HIS- WHO- WPRO	WHO WPRO
21	Dr Polin Chan	Medical officer HSI-WHO -WPRO	WHO WPRO
22	Ms. Linh-Vi Le	Epidemiologist HSI- WHO WPRO	WHO WPRO
23	Mr Chhim Srean	Consultant, Epidemiologist	Institute Pasteur of Cambodia, Phnom Penh

List of stakeholders participated in the virtual mock review (human rights, gender equality and community engagement component)

	Name	Position	Affiliation
1	H.E Dr Tia Phalla	Vice Chair	National AIDS Authority (NAA)
2	Dr Ngauv Bora	Chief of Technical Bureau	National Center for HIV/AIDS, Dermatology and STDs (NCHADS)
3	Ms Yos Socheata		National Maternal and Child Health Center (NMCHC)
4	Dr Chhorn Samnang	Local Technical Assistant for PMTCT Program	NMCHC
5	Mr Hout Sereyrath	Director of Department of Communications and Resource Mobilization	NAA
6	Dr Ky Sovathana		NCHADS
7	Dr Steve Wignall	Project Director	EpiC project/FHI360
8	Mr Srun Rachana	Gender Adviser	EpiC project/FHI360
9	Mr So Kimhai	Prevention Technical Adviser	EpiC project/FHI360
10	Mr Phal Sophat	Stigma and Discrimination Technical Adviser	EpiC project/FHI360

11	Mrs Nith Sopha	HIV Testing Services Technical Advisor	EpiC project/FHI360
12	Mrs Hor Sakphea	Gender Specialist	EQHA project/FHI360
13	Dr Chan Polin	Medical officer HSI-WHO -WPRO	WHO Regional Office
14	Dr Deng Serongkea	Technical Officer for HIV, STI, TB and Hepatitis	WHO Cambodia Office
15	Dr Cheang Kannitha	Technical Officer for Maternal and Child Health	WHO Cambodia Office
16	Ms. Aing Sokreoun	Gender Analyst	UNFPA
17	Ms Sovann Rotvatey		UNWomen
18	Mr. Seng Porsrourn	Program Manager	KHANA
19	Mr. Phorng Chanthorn	Partnership and Advocacy Coordinator	KHANA
20	Mr. Eang Songheang	Communication Officer	KHANA
21	Dr Veth Sreng	Program Manager	RHAC
22	Dr Noy Prorphea	Program Manager	CRS
23	Mr Tim Vora	Executive Director	HACC
24	Mr Khun Rathana	Community System Strengthening Coordinator	HACC
25	Mr Kem Vichet	Program Manager	MHC
26	Mr Chhorn Ann	Program Manager	CWPD
27	Mr Cheav Aphyra	Provincial Coordinator	CWPD
28	Mrs Pech Polet	Executive Director	WNU
29	Mr Seum Sophal	Program Manager	CPN+
30	Mrs Han Sieng Horn	Executive Director	AUA
31	Mr Un Chenda	Program Manager	KORSANG
32	Ms Ly Pisey	National Coordinator	RoCK
33	Vichhika	Community Representative	DFoNPAM
34	Ampok	Community Representative	DFoNPAM
35	Sophi	Community Representative	DFoNPAM
36	Yeng Channa	Community Representative	DFoNPAM
37	Duong Keo	Community Representative	DFoNPAM
38	Mr Ung Polin	Community Adviser	UNAIDS Cambodia
39	Mrs Jennifer Ho	Regional expert/Deputy Director	APCASO

Section 7 in the NVR Template – included for reference, however all sections are covered elsewhere

This section is required in the NVT, most of the information has already been covered, so the reader is referred the relevant section.

- **National HIV EMTCT policies and programme**
- **National syphilis EMTCT policies and programme**

See section 3: Description of Health systems, includes reference to HIV, Syphilis and PMTCT policies and programme

- **National breastfeeding policy, in general and for HIV-infected women. Choices women are given and if they are counselled on the risks and benefits of breastfeeding with and without formula.**

See section - 6.5 Private Sector findings

- **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?

See section 6.5 Private Sector component findings

- **Equity of EMTCT services**
- Are women living with HIV involved in national planning and evaluation of EMTCT services?

See Section 6.4 – CEHR/GE/CS findings: HIV community and KP consulted and input into National HIV Strategy, PMTCT Strategic Plan and EMTCT Roadmap; and engaged in annual review of EMTCT roadmap implementation.

- 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?

See Section 6.4 – HR/GE/CS findings

- 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?

See Section 6.4 – HR/GE/CS findings

- **Consistency of achievements across geographical areas**

Not identified for this evaluation as it undertook very limited exploration at sub National level

- How was the lowest-performing subnational unit identified? – N/A
- Report specific indicators in that lowest-performing subnational unit - N/A

- If indicators in the lowest-performing subnational unit do not meet validation criteria, what evidence is there that the programme is actively seeking to address inequities? N/A
- Completeness and representativeness of data used in EMTCT indicators
 - How are coverage and impact indicators determined? Programme data must be used to model the reliability of the annual HIV and congenital syphilis rate impact indicator.

See start of section 6 and tables 1 – 6 columns – Data sources, and Comments, and section 6.1 – Data component review findings

- 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.

See start of section 6 and tables 1 – 6 columns – Data sources, and Comments

