A REVIEW OF PPTCT OF HIV PROGRAMME SERVICE DELIVERY IN INDIA

CURRENT UNDERSTANDING AND FUTURE NEEDS

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INTRODUCTION

“Around 13,768 babies infected with HIV are born to an estimated 18,240 HIV-infected pregnant women in India”. (NACO Annual Report 2018-19).

MTCT of HIV, which can occur during childbirth, pregnancy, or by means of breastfeeding, amounts for approximately “4.7% of overall HIV transference in the country, (NACO Annual Report 2013-14)

The battle is to reach all pregnant women who use antenatal (ANC) services in all healthcare sectors and to encourage them to reach early in pregnancy, particularly in accordance with the WHO guidelines

Without any kind intervention procedure, transmission rates of HIV from MTC ranges between 15% to 45% and this rate can be decreased to as less as 5% with successful strategies during pregnancy, infancy and breastfeeding.

These interventions principally involve ART for the mother and a short course of ARV drugs for the infant along with measures to prevent HIV infection in the pregnant woman and proper breastfeeding practices.

The PPTCT program is endorsed in India by NACO (NACP) - prevention, regulation and reversal of the HIV epidemic. The initiative began in 2002 has now shown a remarkable improvement in HIV diagnosis, testing and treatment.

Previous policy - only single dose of nevirapine as the drug of choice, as this could minimize the risk of transmission to 12%-15%.

Subsequently, based on the WHO's guidelines NACO in September 2012, introduced the **triple-drug ARV regimen (option B)**, first in the four southern high prevalence states - Andhra Pradesh, Telangana, Tamil Nadu and Karnataka, later mushroomed to the entire country.

Basaed on compliance with the recommendations for all WLW HIV, NACO recommends initiating lifelong ART (triple drug regime) irrespective of CD4 counts or the WHO clinical staging to improve their health and prevent HIV transmission to the infant.

This study reports the growth and delivery of the national PPTCT program, its achievements and remaining challenges. A study of the development of PPTCT programs,was undertaken since 2010–2019 using current published literature, considering improvements in the HIV care guidelines of WHO, international HIV goals and priorities, programmatic innovations and the need for strategic collaborative partnership.

RESEARCH QUESTION?

What is
the present scenario
of the PPTCT program
pertaining to its service
delivery and where do we
stand?

OBJECTIVES:

- To assess the functioning of the PPTCT Program service delivery cascade through existing literature.
- To assess the counseling services provided to prevent the transmission.
- To assess the present condition of PPTCT/MTCT of HIV AIDS.
- To study the barriers to treatment access.

METHODOLOGY:

Document review of the existing literature on PPTCT services in India, millennium and sustainable development goals, UNGASS, UNAIDS, WHO fact sheets and estimations, NACO's annual reports as well as NACO's projections and fact sheets were conducted

Inclusion criteria for the study on PPTCT of HIV in India were to consider studies relevant for review if:

- The study should be related to HIV and the study population comprises of pregnant women or HIV-exposed children.
- The stated objective of the research was directly associated with the requirements of services provided in a PMTCT program, such as counseling and HIV testing, ARV, obstetric care, infant feeding.
- The stated objective of the research was directly linked to the planning, regulation, or monitoring of PMTCT services.
- The study was conducted in India.

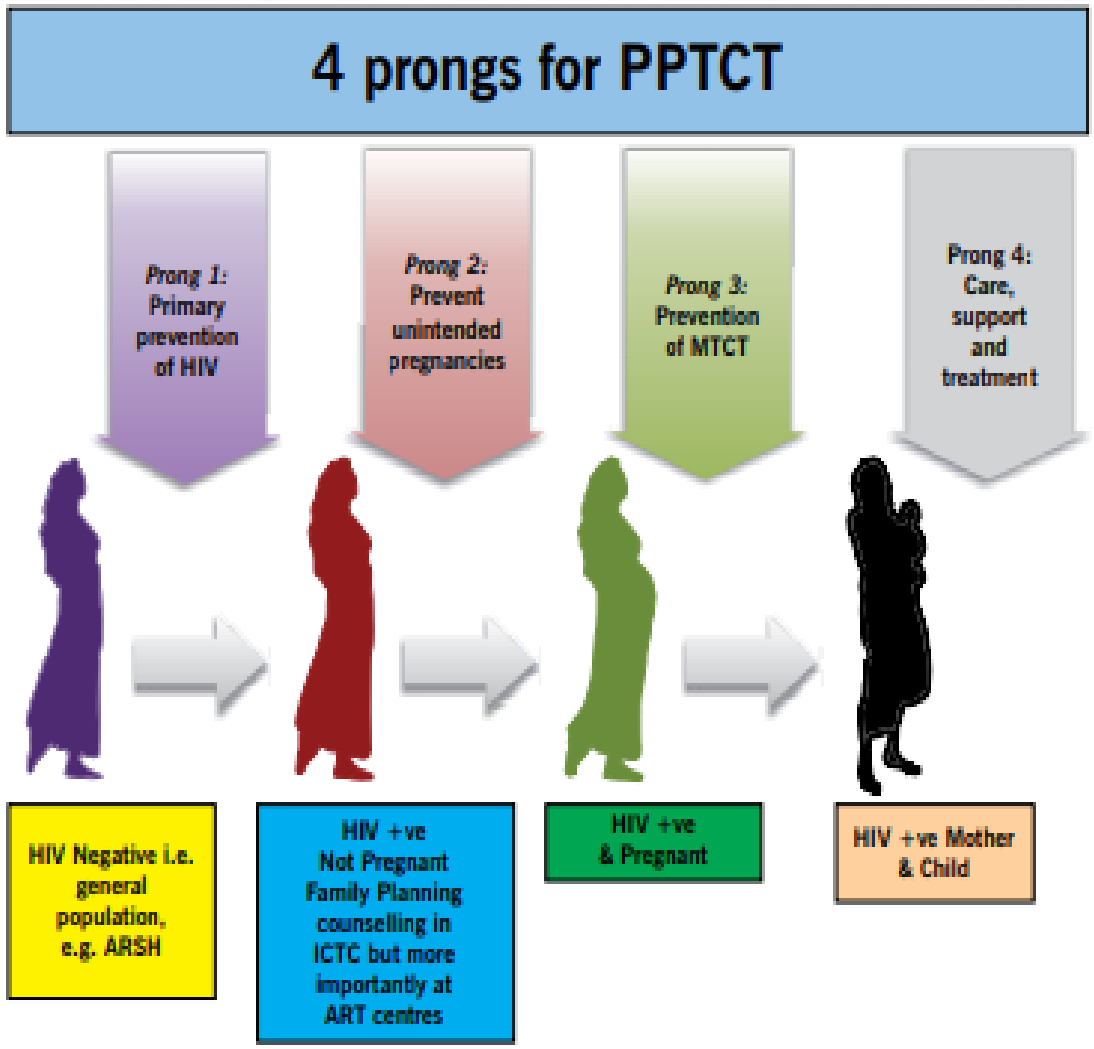
INTRODUCTION ABOUT PPTCT PROGRAM

India is one of the biggest victims and the mother and child among India's population are the most affected.

Under the aegis of NACO, the 'Prevention of Parent-to-Child HIV Transmission (PPTCT) Program' is a perfect example of the importance of medicine to scale down the rate of HIV in India and eventually eradicate it.

The elementary root source of HIV infection among children is the vertical transmission of HIV midst pregnancy, delivery, or breastfeeding. The possibility of infected mother transmitting HIV to her child in the absence of any intervention is between 20% and 45% and that can be reduced to less than 5 per cent with appropriate interventions in breastfed children.

Government of India is devoted in stamping out HIV and syphilis amongst newborns - universal screening of pregnant women for HIV - indispensable element of the ANC service package.



"The National PPTCT program recognizes four components important & integral to preventing HIV transmission among women and children. These are:

Prong 1: Primary prevention of HIV, principally amid women of childbearing age.

Prong 2: Preventing inadvertent pregnancies among women living with HIV.

Prong 3: Preventing HIV transference from pregnant women infected with HIV to their children.

Prong4: Offer care, support, and treatment to women living with HIV, her children, and family in women in childbearing age i.e. providing the overall package of PPTCT services

(Source - National Guidelines for PPTCT)

The PMTCT - promote safe birth and proper infant feeding practices, virologic surveillance to infants exposed to HIV post-birth & breastfeeding and ART for HIV prevention and successful treatment.

As on March 2019, 29,977 ICTCs in the country offer PPTCT assistance. The program aims to introduce HIV testing and treatment systematically, to cover all expected HIV positive pregnant women and to eradicate vertical HIV transmission.

NACO decided to implement EID service through all (fixed) SA-ICTCs across the country during fiscal year 2015-16. This serviceability is currently accessible over all SA-ICTCs (5,412)

The PMTC assistance are administered through the Integrated Counselling and Testing Centre's (ICT). Different types of HCTC's include:

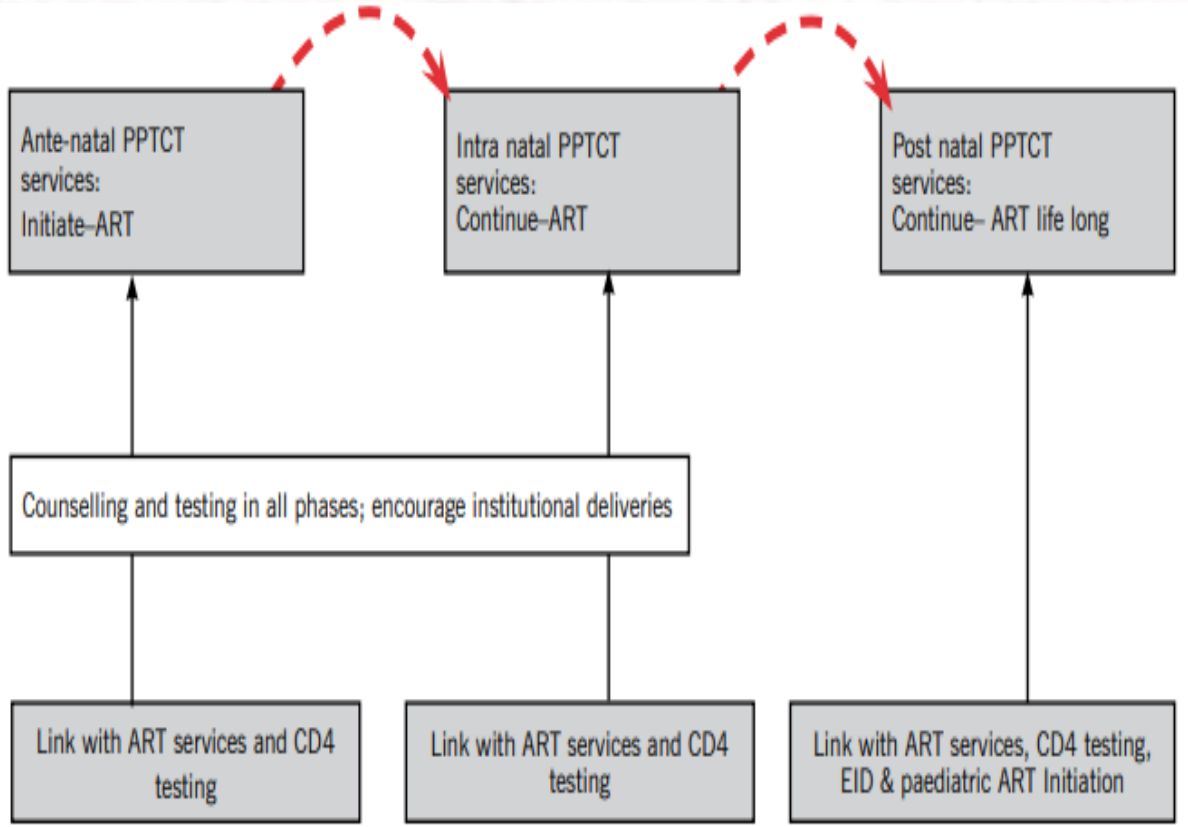
- Mobile ICTC,
- Public-Private Partnership ICTCs (PPP ICTCs),
- Facility Integrated Counselling and Testing Centre's (F-ICTCs)
- Case Based HIV Surveillance (CBS) including Village Health Nutrition Day (VHND)

1. **Stand-alone ICTCs:** Personnel (Counsellor & Lab Tech), centers perform confirmatory and confirmed HIV tests, located in Medical Colleges, District Hospitals, Taluk Hospitals, and CHC's.

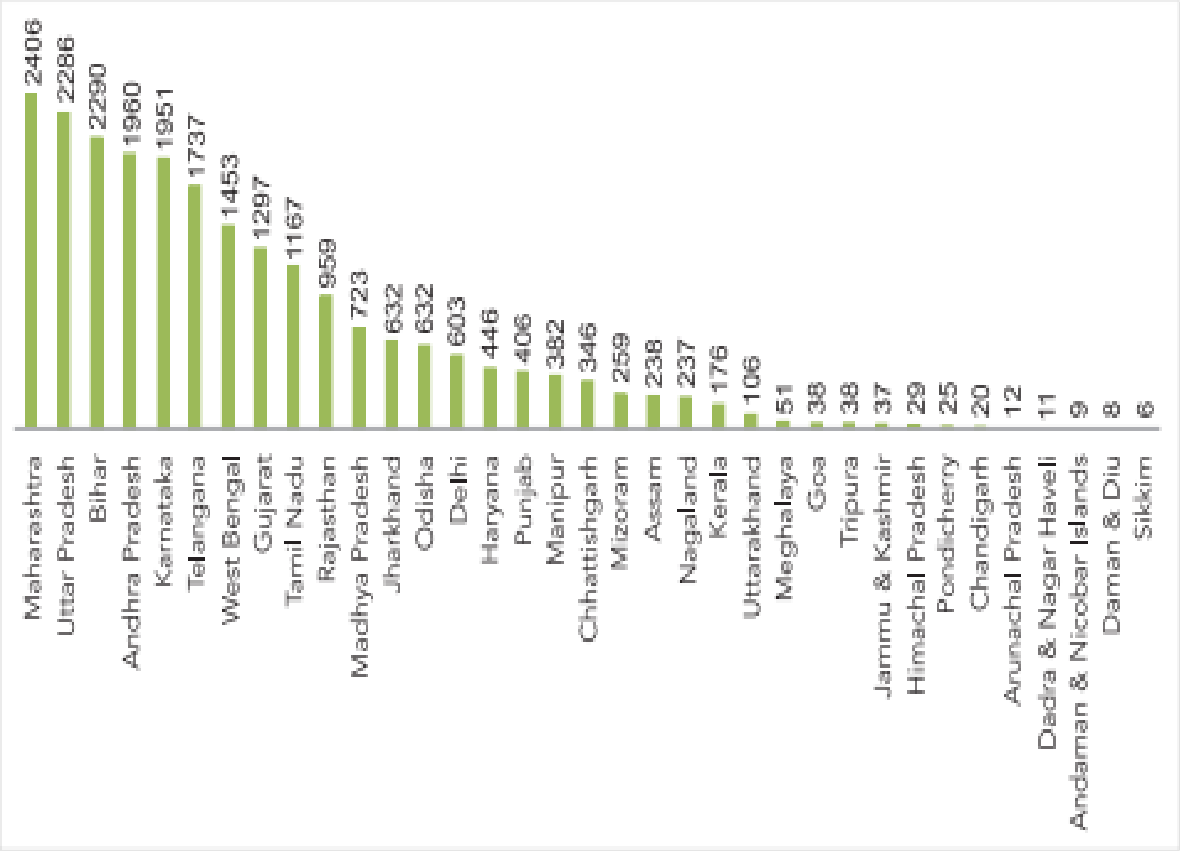
2. **Facility Integrated ICTC(F-ICTC):** Perform HIV screening tests with Whole Blood Finger Pricks, and a stand-alone ICTC is assigned to patient who shows a positive sign, present at PHCs, both private / NGO facilities.

3. **Screening Centre's:** Health facilities, which provide advice on counselling and HIV screening with WBFP tests in existing healthcare facilities.Only administer an HIV check and any patient foud positive is transferred to a Stand-Alone ICTC for evidence,stationed at PHC's and Sub-Centers.

Sequence of care for HIV infected pregnant women



State/UT Wise PMTCT need in India in 2017, HIV Estimations 2017 (Source- India HIV Estimations 2017 technical report)



Overview of the HIV/AIDS Epidemic:

- HIV/AIDS a main public health challenging problem all over the world has claimed more than 34 million lives.
- A 35% drop in new HIV infections and a 24% scale down in AIDS-related deaths between 2000 and 2015 - successful and efficient treatment, early diagnosis and public awareness campaigns.
- From January 2018 to March 2019, India is predicted to have had around 18240 HIV positive women who gave birth during this period & required prophylaxis for PMTCT of HIV, maximum in Maharashtra followed by Uttar Pradesh, Bihar, Andhra Pradesh, Karnataka, Telangana, West Bengal, Gujarat, Tamil Nadu, and Rajasthan - make up nearly 3/4 of the total country's PMTCT needs.

Transference of HIV – 2 from MTC turns up to low with not many reports on pediatric HIV – 2 infections from MCT. Incidentally MTCT of HIV can occur

- Antenatally (in utero) - 25-35% of the total transmission of infection,
- Intrapartum (during labor and delivery) - 70-75%, and
- Postpartum (breast-feeding). "Dunn et al in a meta-analysis estimated that the rate of transmission attributable to breastfeeding worldwide from HIV is 14% (95%CI 7% to 22%)

Joint Guidance from NACP and NRHM - compulsory HIV screening should be included in the routine prenatal care program, ensuring that pregnant women with HIV-diagnosis are paired with HIV-related health services, avoiding transference to their children.

- challenge to meet this in the risk group. As many as half of all women who are pregnant in India do not give birth in the institutional setting, especially in poor rural areas, and therefore, although hospitals offer HIV services, they can probably never access the HIV test.

Guidelines released by WHO in 2016 recommends that WLHIV who are on medication and are completely assisted to accommodate the care should only breastfeed their children for the beginning of 6 months of life, and then harbor, during breastfeeding for at least 12 months, and up to 24 months or longer, appropriate complementary food. (comparable to the general population).

HIV exposed infants are 75 % or less likely to die from an AIDS-related illness if administered with ART within the first 12 weeks of life - reasons WHO recommends that children born to HIV positive should be screened within 4 to 6 weeks of birth, generally referred to as the **'Early Infant Diagnosis**', and a second HIV test at 18 months, in addition to the preliminary examination, for the final diagnosis of child who is breastfeeding.

The treatment should be paired with the mothers which can be as follows:

- Breastfeeding: from birth to 6 weeks, nevirapine once daily to the infant.
- Replacement feeding: nevirapine (or zidovudine twice daily)once a day before 4 to 6 weeks from birth.

Elimination of HIV is defined as - downsizing the final HIV transmission rate to 5% or less amid breastfeeding women and to 2% or less among non-breastfeeding women by 2020. (World Health Organization)

National Health Policy (NHP 2017) and National Strategic Plan 2017-2024 reiterate the goal of achieving the elimination of AIDS through a well-designated road map. “The 2020 targets are:

(i) To attain a reduction in new HIV infections by 75% from the standard value of 2020

(ii) To attain the treatment target of 90-90-90,

(iii) To eliminate vertical transmission of HIV and Syphilis by 2020, and

(iv) To eliminate HIV/AIDS-related stigma & discrimination by 2020.

The social, mental and economic implications of HIV-positive women remain a challenge in India. Gender inequality and women's low status limit access to resources.

As India is a country that cultivates breastfeeding, and a significant number of infants are breastfeeding until the age of two - a challenging front for healthy HIV breastfeeding practices.

Development in the PMTCT of HIV:

Elimination brink for MTCT of HIV and syphilis. “These are Belarus, Cuba, Thailand and Malaysia, Anguilla, Antigua and Barbuda, Bermuda, Canada, etc.”. Armenia has progressively eliminated vertical HIV transmission, and the Republic of Moldova has eliminated vertical syphilis transmission.(UNAIDS (2018)

Improvement in the key planning areas are outlined below:

A) Preventing new HIV infections among women of reproductive age:

2 % between 2010 and 2015 and 6 % in adolescents and young women (15 to 24 years), an age group with the main risk of HIV.

This infection cycle is being tackled by various HIV prevention programs. For example SAMPARK in India, SheConquers in South Africa - with an aim to reduce the number of new HIV infections, youth pregnancy and sexual violence between young boys and girls, to increase and retain and young girls in schools and to increase economic opportunities for young girls, especially young women.

Also important are HIV and contraceptive learning

B) Preventing accidental pregnancies among WLW HIV:

Paramount factor for PMTCT is family planning, also a pregnancy-related complication in HIV positive women poses a greater risk than women who are not positive.

In 2015, the World Health Organization reported that a total of 4,700 maternal deaths were indirectly from diseases linked to AIDS.

Sub-Saharan Africa is the leading country in the world in the area of HIV pregnancies as well as in unmet need for contraceptives.

Collaboration of HIV services with family planning services, which is one of the main approaches for the elimination of HIV.

Components under basic services of NACO division includes:

1. **Early Infant Diagnosis (EID)**
2. **Quality Improvement Initiatives**

2.1. **Supervision and Monitoring Mechanism**:

2.2 **Quality assurance and EQAS**: Internal and External Quality Assurance Scheme (EQAS) - monitors the diagnostic services provided by ICTC's

2.3. **Supply Chain Management**: Inventory management also plays a role, tracked weekly, quarterly and annually.

PLHIV ART Linkage System (PALS): NACO has established the PALS system in India for HIV positive individuals, pregnant women, and their children to track, and monitor services offered to them.

2.5. **Community Based Screening Approach**: CBS is an effective tool for improving early diagnosis and targeting first time testers and people with limited use of health services, particularly those in high-value regions and HRG groups

RESULTS AND FINDINGS: -

Barriers to the uptake of PMTCT programs: The association between HIV and MTCT awareness and the use of related services. Factors associated with competent HIV knowledge includes higher education, higher income, urban living, HIV knowledge, HIV testing or knowledge of where to search for HIV.

- **Knowledge of HIV status**

For pregnant women to have access to proper treatment for themselves and their infants, knowledge about HIV status is critical.

- **Confusion over exclusive breastfeeding**

There is some ambiguity about the best way of breast-feeding among women who live with HIV.

- **Demographic and economic factors**

  Poor or inadequate education, economic dependency of women, and lack of support from partners especially to women who have HIV uninfected partners.

- **HIV stigma, discrimination, and PMTCT**

  Stigma and prejudice linked to HIV impact the decision of a pregnant woman to choose and support for PMTCT service. The snowballing effects of stigma worldwide - responsible for over 50 per cent of vertical HIV transmissions.

  Psychological challenges of an adult HIV diagnosis, such as a shock, a disease negation, depression or concern of side-effects management, and a lifetime engagement to care, etc. which ultimately hinders ARV uptake

  Trained peer support from fellow mothers has shown to have a positive influence on overcoming these issues, including anxiety and loneliness, maternal breakdowns and mental health.

- **Stigma in healthcare settings**

  Women living with HIV experience stigma, discrimination, and abuse even in healthcare settings, when they seek maternal healthcare. These included physical abuse, treatment without consent, non-confidential care, disapproval of care, delay in care, and facilities.

The International Community of Women Living with HIV reports about how HIV women are discriminated against by service providers by extra glove and bleach, when they negotiate with them and when they ask them not to approach suppliers, etc. Such activities generate anxiety and cause many women to avoid ongoing treatment and access to PMTCT services.

- **Hard to reach populations**

  Stigma and injustice in healthcare services, opposing policy environments gender inequality, and accessibility affordability to PMTCT services for women play an important role in treatment unacceptability.

- **Country and clinic resources**

  In resource-destitute settings, scarcity of the clinical as well as non-clinical personnel, the shortfall in counseling services, delays in care and procurement and logistics of medical equipment, all act as obstacles to PMTCT services. These factors generally lead to long waiting times for post-test counseling time, overcrowding, and many women, therefore, leave without getting their HIV test results.

  Bad management and tracking of PMTCT facilities by health staff

Inadequate resources for point of care testing together with poor knowledge among healthcare providers and mothers & caregivers hamper the importance of virologic testing, especially EID.

HIV treatments for mothers and children are tracked separately in many healthcare settings.

- **Cultural belief and gender dynamics**

- Patriarchal country like India, traditional gender roles and cultural beliefs portray men as the decision-makers of the family therefore the decision decisive of women's participation in HIV testing and wider SRH services often lies with them.

Where HIV and SRHR are available, they are mainly intended for married women and do not address the specific needs of any unmarried women, especially young women and girls. Gender differences often lead to discrimination based on perspectives on sexuality among service providers

- **Male involvement**

  Pregnancy is perceived as a 'women's affair' or stated as 'it's her responsibility', with a man's role in providing mainly financial support.

VMMC has demonstrated a reduction of 60 percent in female to male sexual HIV transmission.

Most men refuse to accompany their wife for PMTCT services because of fear that they would know their HIV status, which could ultimately lead to stigma, discrimination, domestic abuse or, if positive, abandonment of their wife. - need further HIV education and BCC services.

- **Prevention of HIV in women & reducing transference to children**
- **Management Goals:**

  The immediate concerns of HIV-positive women - support and counseling about their health, chances for fetal infection, prevention methods and revealing status to their partners.

  Main objective is to reduce the risk of infection to mother and fetus from vertical transmission of HIV-related diseases and their care, General goals concentrates on nutrition, social monitoring, professional guidance etc.

- **Antenatal Investigations**

  These especially include monitoring of disease progression by the CD4 count and viral load along with the routine antenatal investigations.

- **Strategies to prevent perinatal HIV transmission**

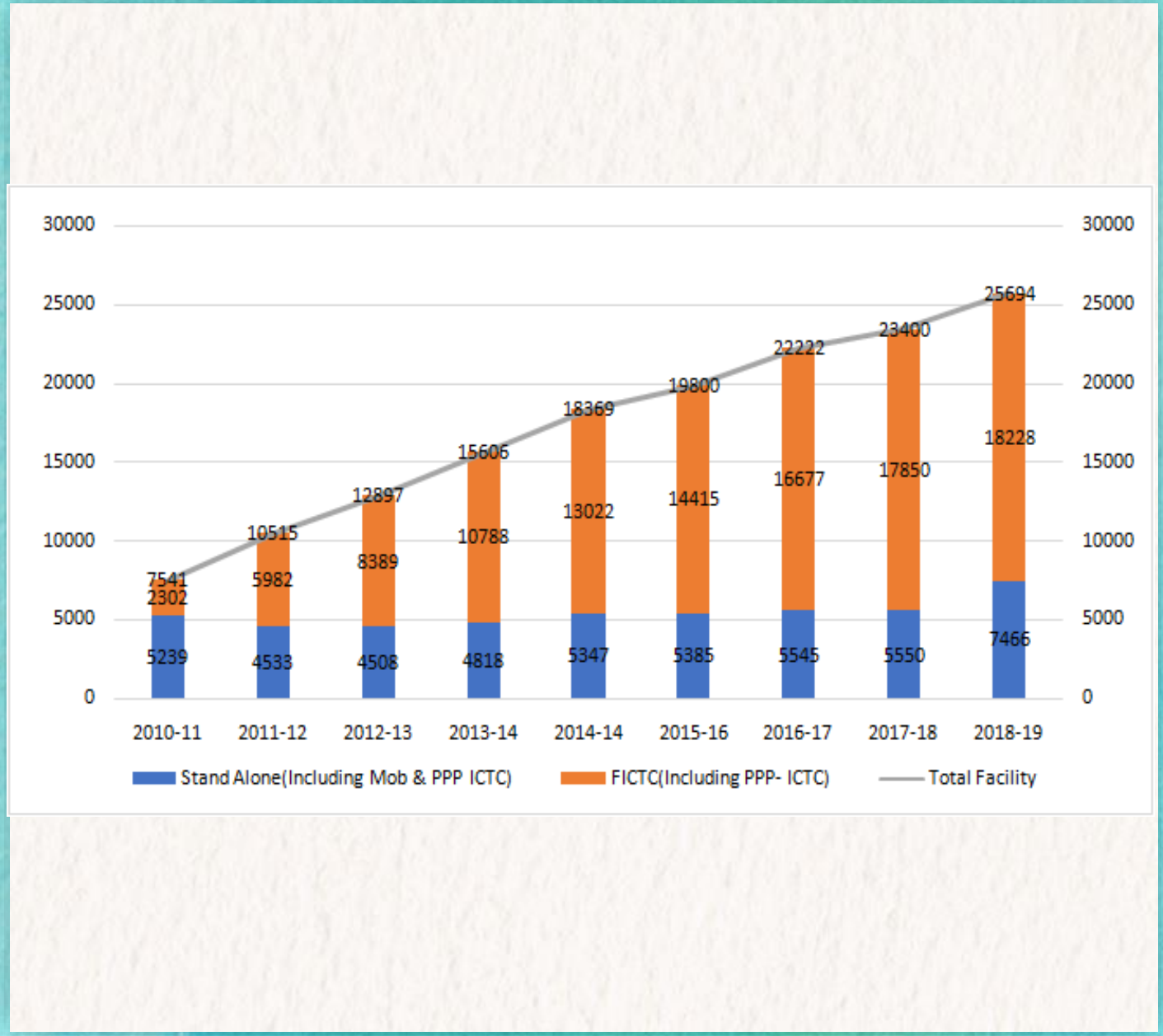
  Earlier – only way - probably by ending pregnancy because of limited treatment options to prevent vertical transmission. Although this opinion still stands today, most HIV-positive mothers in the country prefer to continue pregnancy due to improvements in medications, healthcare, social restrictions and maternity care.

  The strategies for preventing vertical transmission can be broadly grouped into:

- Antenatal ART– Correction of risk factors
- Intrapartum ART- Optimizing obstetric practice
- Postnatal ART- Breastfeeding / Substitutes
- Antiretroviral Therapy (ART)-Ability of ART to reduce maternal viral load and thus to reduce the fetal viral exposure. The highly active ART in resource-rich countries reduced vertical transmission rates to approximately 1–2%. However, due to the lack of HAART availability, simpler and lower-cost ART schemes are provided for low- and medium-income countries

Scale-up of ICTC'S and FICTC'S during the period from (2010-2019

The number of ICTC's in India is growing, clearly illustrating partnership between general health services and counseling and testing services, an increase in their regional distribution below block level, increased accessibil ity and sustainability management.



Financial Years	No of Women Tested in Lakhs	HIV Positivity	Lifelong ART	HIV Exposed Live Births	ARV Prophylaxis	Early Infant Diagnosis (DNA PCR Test)- 6 Weeks to 6 Months
2018-19	274	18240	16604(91%)	13768	11870(86.2%)	7491
2017-18	207.7	14342	13276(93%)	11409	9926(87%)	2485
2016-17	165.6	14350	13059(91%)	10715	9429(88%)	3472
2015-16	53.2	5856	5711(97.5%)	4202	4088(97%)	4011
2014-15	42.49	8624	7934(92%)			
2013-14	97.52	12008	10085(84%)			
2012-13	57.09	9451	9108(96%)			
2011-12	70.87	13213	11074(84%)			

Table Showing Improvement In Pregnant Women Testing and Administration of Lifelong ART from 2011-2019

"From January 2018 to March 2019, around 274 Lakhs of pregnant women were tested** for HIV, and a total of 18,240 (11,839 new cases & 6,401 known cases*) HIV positive cases were reported, out of which, 91% (16,604) were initiated lifelong ART*. During Jan 2018 to Mar 2019, around 13,768 HIV exposed live birth were reported, out of which 11,870 (86.2%) babies have received ARV prophylaxis".

(ANNUAL REPORT NACO- 18-19)

Scale-up of Pregnant Women Tested and positivity in ICTCs during the period from 2010-2019

"Around 1.4 million children's HIV infections were prevented by the PPTCT program between 2010 and 2018". (WHO)

DISCUSSION & CONCLUSION

The cost-effectiveness of PMTCT programs, and the barriers, particularly in counseling and testing of HIV. The number of drops out from the program particularly among women diagnosed with HIV should be considered before they are able to access ARV - the inadequate and insufficient knowledge of women's access to HIV testing facilities and the interest of healthcare providers holds a major stake.

One way of overcoming it is by integrating the PPTCT program with other services such as RCH etc. Also, the program should be implemented at all the healthcare delivery settings starting from grass root level up to big private settings. The key emphasis should be on

A. on the provision of treatment and HIV testing facilities
B. increasing their access by treating discrimination in health care facilities, training and sensitization
C. raising awareness and expertise, with the goal of providing universal access to PMTCT 's services for the eradication of pediatric HIV in India.

Building a bridge between public and private facilities could increase PMTCT resources for infected women 's accessibility

Working with the broader NRHM for HIV screening services - promising opportunity

Testing methods - switch from voluntary, patient-initiated testing to routine provider-initiated testing that involves pre-test counseling, a rapid HIV test, individual post-test counselling, community motivation and encouragement for spousal participation.

Addressing records and the gaps in service delivery, mobilizing traditional and opinion leaders, and constructing robust relationships with the government will offer a continuous and sustainable scale-up in the capacity and uptake of services.

A lot is required to further advance the 90-90-90 goals , especially improving HIV testing, ART treatment as well as the retention of PLHIV, as the overall coverage of the ART system in India is still just around 56 percent, against the global goal of putting 82% PLHIV on ART

The major challenges still prevail with states like Bihar, Jharkhand, Uttar Pradesh, and Telangana where the PMTCT coverage is still significantly lower than the national average where more robust actions are required. Under the new ‘Prevention Coalition Framework’ several collaborative coordinated initiatives are going on with the prevention of infection as the top agenda.

Improvement of accessibility - government of India is the integration of the HIV program with the TB program. The national AIDS and TB Response shall have a catalytic impact, because of improved communication and cooperation with health care practitioners' systems and the private health sector.

As Hippocrates said wisely, “Healing is a matter of time, but it is sometimes also a matter of opportunity.”

RECOMMENDATIONS:

Empowering women - creating awareness and increasing knowledge about HIV will make them self-confident enough to encounter the social, sexual, and gender norms that make them vulnerable to HIV - an extremely important element in AIDS campaign to address the issue of equality, human rights, knowledge propagating and positive behavior.

Studies on performance-based schemes of healthcare workers showed that a set of incentives could help in introducing and scaling up of effective PPTCT program.- Performance Improvement Model should be used in low and middle-income settings. Considering India's epidemic heterogeneity, trends and patterns should be monitored.

The power of choice of treatment - ultimately lie with the patient. In India, where varied and multiple factors play a role at patients' end for availing the treatment, services programs should be formulated keeping in mind individual healthcare settings and environment. In such situation, a **“Cafeteria Approach Strategy” or 'Offer and Accept Program’** wherein the patient is made aware of the interventions and the ultimate choice lies with him/her is what will be much favorable and would give better results as compared to **‘Prescribe and Take Protocol'.**

Most important concept should be to avoid diseases that are largely preventable. A significant burden of mortality and morbidity is thus reduced, and thus a major social stigma is reduced

EID should become an important focus for the rapid development of point of care, particularly as the escalated programs are now being introduced

Above all, there is a need to shift the mindset that reproductive health is mainly the domain of women, through BCC, and address stigma issues. More emphasis should be given on promoting, motivating, and aiding couple testing and male involvement in PMTCT programs for ultimately paving the way for an AIDS free India.

eHealth
More than just an electronic record

Course Offered By – The University of Sydney

- **COURSE DESCRIPTION:**

- This MOOC course focuses on the overall effect of eHealth on integrated treatment and service delivery and aims at educating a large community of health care professionals, physicians, students, management, administrative staff and researchers.

- It discusses the breadth of technology implementations in healthcare, current and evolving developments and illustrates eHealth practice both locally and internationally.

- Length - self-paced 5-week duration, the study time commitment - 3 hours per week. Two assessable components in the course: assignment 1 in Module 2 carrying 40% weightage, where we were asked to share our critical thinking, experience and research on using a health-related app carrying and assignment 2 in Module 5 with 60% weightage where we were asked to reflect a case-based example.

- **Course Type –** MOOC

- **Course Language –** English

COURSE METHODOLOGY:

- Pre-recorded videos on various topics related to eHealth.
- MCQs at the end of each video related to the content of that video.
- Case Studies were shared that instilled an in-depth knowledge.
- Discussion questions – platform to share our viewpoints related to the topic, also gained much in-depth insights through the views and ideas shared by other students as well.
- Readings
- **OBJECTIVES:**

1) Multidisciplinary approach to educate health professionals, physicians, students, executives, administrators and researchers for the global audience to explore the effect of online health care has had on care assimilation.

2) Evaluating the present and emerging fashion of the technology application.

OUTCOMES:

1) The fundamentals of eHealth, how it functions and where is it progressing.

2) What kind of health data are we gathering and how health care can become innovative in the future.

3) How new advances and technology allow the health customers to engage in their own health care, i.e. how people's wellbeing has become their own. and

4) How eHealth can improve the harmonization, efficacy and what are the barriers to access ehealth care.

KEY LEARNINGS FROM COURSE

Module 1- What is eHealth?

- Gained insight about the fundamentals of eHealth and where it is progressing.
- The way we use technology to support communication between health professionals and consumers - is an expanding area of eHealth. It reduces both practitioners' and healthcare consumers' travel times in rural practice. Health in the hands of consumers is the fastest growing and revolutionizing area of eHealth. This includes the use of applications, sites, wearables and social media.

- Helps us to deliver coordinated care in a smoother manner improving the overall quality.

- Three pillars to eHealth:

➢ First - Health in the Hands of consumers - increasing use of wearable devices, apps and social media to monitor and record and present information on our health and wellness.
➢ Second - The effect of new technologies on how health professionals interact with patients, as well as with each other.
➢ Third - Recording data in the quantified or measurable self - how we store data in conventional medical records to how we store data associated with devices and apps.

.**Module 2 - Health in our Hands**

- Gave knowledge about how new technologies are helping consumers participating in healthcare. The key practice of this area is how technologies racing ahead of the evaluation and understanding of the impact of mobile health on health outcomes.

- Applications(apps), wearable devices, online health information, and social media all are being used to encourage healthy behaviors and to monitor existing conditions - potential to transform healthcare delivery.

- Approximately, one in ten households in Australia now already owning wearable fitness devices and this is growing at a rapid pace
- The real benefit of keeping the health in the hands of customers is in the behavior change perspective.
- The use of apps, mobile devices, sensors, etc. - mHealth or Mobile Health and it represents a significant and ever-changing component of eHealth
- Data collected from personal devices is set to rapidly increase the potential to remotely monitor treatment.
- An article by IMS Healthcare in 2015, stated that there are: “More than 165,000 mHealth Apps available all over the world”.
- A survey in 2015 by the international consulting company Accenture found that more than 40% of patients globally either already wear or are willing to wear technology to track fitness and vital signs.
- Today, there has been a shift from healthcare to health and wellness.
- Health records are most likely to be owned by institutions, governments, or privately own service entities. Control to data by individual patients is not yet accepted as a model for a health record system.

Module 3 - Data and the Quantified Self

Offered insights into the type of health data we are gathering today and how health care can be transformed.

- The use of health data has great significance for how healthcare is delivered and how we manage our health. The whole healthcare industry - a huge transformation, whereby access and use of a huge amount of data are becoming more and more accessible.
- The digitalization of paper records is useful.
- The Australian government adopted a system that they call the PCEHR, the Personally Controlled Electronic Health Record. It's now being renamed to the MyHealthRecord.
- Predictive and precision medicine - Genome analysis adds a new data thickness to individual health data.
- Sweden is currently rolling out a national eHealth system giving patients access to their health records and online communication for all health needs.

Module 4 - Interacting with Health Professionals Using New Technologies

Focuses on how eHealth strengthens communication, productivity and barriers to health care.

- The use of technology in facilitating communication is how virtual consultations can be incorporated into collaborated eHealth programs and new models of care, for example, telemedicine, telehealth, mobile health, teleconferencing, and video conferencing.
- An online triaging and referral system are currently available through the Australian Government's "Health direct" website.
- According to the Physiotherapist, Karen Finnin, the most critical aspect of successful online treatment is to look at all self-treatment therapy options.
- According to Neurologist Dr. Jelle Demeestre, the most critical element in a telehealth diagnostic education program is to collect and share diagnostic data.

Module 5 - eHealth in Professional Practice

Focuses on the implementation of eHealth concepts and technology in medical practice.

- Breast Reader Assessment Strategy (BREAST) is funded by the Cancer Institute of New South Wales, the National Breast Cancer Foundation, and the Federal government. It explores to improve the performance of radiologists when they're reading and analyzing mammograms.

- Commercially legal drones are already making deliveries in the US, Australia, and New Zealand including pharmaceuticals.
- The Garvan Institute in Australia is currently using the strategy in which an app that turns personal mobiles into supercomputers to contribute to cancer research to further its cancer research.
- In the future, there would be electronic tattoos that can monitor the health and pay for healthcare.

CONCLUSION:

The word eHealth includes several aspects, including health, technology and trade. Technology is regarded both as a process / feature / service implementation tool as well as the basic symbol of eHealth. The opportunity to share health data electronically and eHealth records will continue to enhance the quality and safety of patient care while allowing tangible and meaningful changes. EHRs help providers better regulate patient care and ultimately improve the quality of healthcare.

Adopting such technology reduces documentation and paperwork, reduces duplication of testing, etc. and provides accurate streamlined coding & billing. However, the privacy and security of patient data is a big issue which needs more attention to facilitate better and safe sharing to the patient as well as other healthcare providers.

Awareness of the socio-economic impact of eHealth is limited, and findings from the analysis are often difficult to transfer to other settings.


Thank you!