

# Control of Sexually Transmitted Infections, Reproductive Tract Infections, and HIV/AIDS in India: Current Status and the Way Forward

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## Abstract

Sexually transmitted infections (STIs) and reproductive tract infections (RTIs) form an important public health problem with a huge burden of disease and an adverse impact on reproductive health of people worldwide. Caused by a variety of infectious agents and manifesting as different clinical syndromes, STIs/RTIs remain highly prevalent in India too, reportedly up to 6% in general population (and maybe higher in reality due to secrecy maintained by many people around such diseases) and much more in certain vulnerable population groups. The situation has worsened further with the epidemic of human immunodeficiency virus (HIV) infection and resultant acquired immunodeficiency syndrome (AIDS). Similarities of unique host risk behaviors and socio-demographic factors associated with STIs, RTIs and HIV/AIDS call for an integrated approach for their control with multipronged intervention strategies. The National AIDS Control Programme, the National RTI/STI Control Programme, the National Strategy for Elimination of Parent-to-Child Transmission of Syphilis, the National Blood Policy, and other related health programs and policies have set out clear objectives and guiding principles for phased programmatic interventions, with focus on checking the spread of these infections through health education, behavior change, targeted interventions, early diagnosis, and prompt treatment. Freely available and easily accessible services for comprehensive care, support, and treatment of patients with these infections will help reduce the disease burden and improve their reproductive health as well as overall well-being. Increased decentralization of public health services; strengthening institutional capacities; setting up of designated STI/RTI clinics, anti-retroviral treatment (ART) clinics and integrated counseling and testing centers; availability of rapid test kits, color-coded drug kits for syndromic treatment and ART treatment; promotion of condoms; integrated counseling and testing; partner notification; involvement of non-governmental organizations; community mobilization; universal precautions and augmentation of voluntary blood donation; robust surveillance; evidence-based planning, and effective program implementation are major components for control of these infections. The present systematic review discusses the current situation, the key programmatic measures, and the way forward for control of STIs/RTIs and HIV/AIDS in India.

**Keywords:** AIDS, HIV, NACP, Reproductive tract infections, Sexually transmitted infections

## Introduction

Sexually transmitted infections (STIs) refer to infections that are commonly spread by sex, especially vaginal intercourse, anal

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sex, and oral sex. The term 'sexually transmitted infection' is generally preferred over the terms 'sexually transmitted disease' and 'venereal disease' as the former includes those who do not have symptomatic disease.<sup>1</sup> On the other hand, reproductive tract infections (RTIs) refer to infections that affect the reproductive tract. In females, RTIs can be in fallopian tubes, ovaries, uterus, vagina, cervix and/or vulva; in males, RTIs can be in testes, vas deferens, urethra, penis and/or scrotum. RTIs are generally categorized in three groups: (a) STIs (the most commonly occurring RTIs); (b) endogenous infections (caused by overgrowth of organisms normally present in the reproductive tract); and (c) iatrogenic infections, which are associated with improperly performed medical procedures.<sup>2</sup> STIs/RTIs are caused by a variety of infectious agents including bacteria, viruses, fungi, protozoa, and ectoparasites; and the problem has become more significant after the emergence of human immunodeficiency virus (HIV), which causes acquired immunodeficiency syndrome (AIDS) and is correlated strongly with many other STIs/RTIs.<sup>1,3</sup>

Most STIs/RTIs initially do not cause symptoms or their symptoms are often not recognizable, which poses a greater risk of spreading the infection to others. When symptomatic, these infections may manifest as different clinical syndromes such as urethral discharge, penile/vaginal ulcer, lower abdominal pain, chronic lower backache, infertility, painful sexual intercourse etc.<sup>4</sup> AIDS is considered as the end stage of HIV infection. The clinical spectrum of AIDS is heterogeneous and may present with recurrent secondary and opportunistic infections [particularly pneumonias, tuberculosis (TB), and fungal infections], generalized body wasting, non-specific systemic symptoms (such as prolonged fever, diarrhea, weight loss, swollen lymph nodes, neuro-psychiatric symptoms), and certain cancers.<sup>5</sup> STIs, RTIs and HIV/AIDS also frequently result in stigma, stereotyping, vulnerability, shame and gender-based violence, which tends to hinder health-seeking behavior and may lead to further complications and morbidities.<sup>6-8</sup>

### Global Burden of STIs, RTIs and HIV/AIDS

STIs/RTIs form an important public health problem with a huge burden of disease and an adverse impact on reproductive health of people worldwide; and the situation has worsened further with the epidemic of HIV/AIDS.<sup>4,9-12</sup>

The incidence and prevalence of STIs, RTIs and HIV/AIDS vary greatly by country, region, and gender, which may be due to different factors associated with these infections, including not only their pathogen characteristics but also other biological, behavioral, medical, social, and economic factors.<sup>13,14</sup> They affect the health and the lives of people, particularly the women, the adolescents, the children, and the adults in the productive age group.<sup>11,12</sup>

As per the global estimates for 2012, annually there are 357

million new cases of four curable STIs (viz. trichomoniasis, chlamydia, gonorrhea, and syphilis) among people aged 15–49 years.<sup>15</sup> The estimated prevalence of some viral STIs is similarly high, such as 417 million cases with herpes simplex virus (HSV) type 2 infection and 291 million women with human papillomavirus (HPV) infection.<sup>11</sup> Among women, non-sexually transmitted RTIs are usually even more common. STIs/RTIs constitute one of the most important causes of maternal and perinatal morbidity and mortality, and serious complications may lead to chronic disability and death.<sup>4</sup> In 2016, there were 1.0 million AIDS deaths and 36.7 million people living with HIV (PLHIV) worldwide, with 1.8 million of them being newly infected.<sup>12</sup> The presence of an STI or an RTI greatly increases the risk of acquiring or transmitting HIV infection, and such a risk may be up to 2–3 times in some populations.<sup>11</sup>

### Burden of STIs, RTIs and HIV/AIDS in India

A significant proportion of these infections and diseases occur in developing countries; and in India too, STIs, RTIs and HIV/AIDS remain highly prevalent. The National AIDS Control Organization (NACO) under the Ministry of Health and Family Welfare (MoHFW), Government of India, has reported that the greatest incidences of STIs/RTIs in India are linked to syphilis, gonorrhea, chlamydia, trichomoniasis, HIV/AIDS, HPV infection, HSV infection, hepatitis B virus (HBV) infection, and hepatitis C virus (HCV) infection.<sup>15</sup>

Unprotected heterosexual transmission is the commonest route of transmission of these infections in India; it accounted for about 88.2 percent cases of HIV infection during 2011-12; the other routes of transmission include parent-to-child transmission (PTCT) (5.0 percent), injecting drug use (1.7 percent), unprotected penetrative sex between men (1.5 percent), and unsafe injection/transfusion of blood/blood-products (1.0 percent); and in 3.6 percent cases, the route of transmission remains unknown.<sup>16</sup> Accordingly, STIs, RTIs and HIV/AIDS are much more common in certain vulnerable population groups, which are categorized into the high-risk groups (HRGs), viz., commercial female sex workers (FSWs), men having sex with men (MSM), clients of FSWs/MSM, injecting drug users (IDUs), partners of IDUs, transsexuals/transgenders (TGs), and eunuchs; the bridge population groups, viz., long-distance drivers/truckers and single male migrants; people in conflict areas; and youth having unprotected heterosexual activities.<sup>17</sup> Various studies have also shown a much higher prevalence of asymptomatic infections among attendees of such specialized clinics as the designated STI/RTI clinics (DSRCs) and the integrated counseling and testing centers (ICTCs) in the country.<sup>17-20</sup>

A community based STI/RTI prevalence study conducted during 2002-03 by the Indian Council of Medical Research (ICMR) showed that 6 percent of the adult population

in India had one or more STIs/RTIs, which translated to about 30–35 million episodes of STIs/RTIs annually in the country;<sup>21</sup> these figures may be even higher in reality due to secrecy maintained by many people around such diseases. Moreover, the situation has deteriorated further with the epidemic of HIV infection and resultant AIDS.

The HIV situation in India is assessed and monitored through regular annual sentinel surveillance established since 1992. India is the third-largest country by the number of PLHIV (after South Africa and Nigeria). As per the India HIV Estimations Report 2015 (released jointly by NACO and National Institute of Medical Statistics, ICMR), the national adult (15–49 years) HIV prevalence in the country was estimated at 0.26 percent (0.30 percent among males and 0.22 percent among females) in 2015, which depicted a steadily declining trend from an estimated peak of 0.38 percent in 2001-03.<sup>22</sup> In that report, the estimated total number of PLHIV in India was 2.1 million; the estimated total number of newly infected cases was 86 thousand (with children aged <15 years accounting for 12 percent of it); and the estimated total number of AIDS-related deaths was 67,600 – all showing an overall declining trend over the past two decades. However, an insufficient declining trend or a rising trend in the newly infected cases and the AIDS-related deaths has also been reported in some of the States such as Assam, Chandigarh, Chhattisgarh, Gujarat,

Sikkim, Tripura and Uttar Pradesh in the same report.

In India, these infections have a heterogeneous distribution, with localized epidemics; however, the more worrisome observation made in this regard is a gradual shift in this distribution from the highest-risk group (FSW, MSM, IDU, and TG) to the bridge population (clients of FSW, truckers, migrants, partners of IDU, STD patients, etc.) to the general population. These infections are spreading in two ways – from urban to rural areas, and from individual practicing high-risk behavior to the general population – with the associated morbidity, mortality, and the social deprivation of important contributions made by such members in terms of economic, social, and cultural development.<sup>13,22,23</sup> The HIV prevalence among women is declining very slowly, posing persistent risk of infection in children. Moreover, about 80 percent of reported cases of HIV/AIDS are occurring in sexually active and economically productive age group of 15–44 years here.<sup>22</sup> So, there is an urgent need to address this public health problem more diligently, and to prevent and control these infections and their ill effects.

### Factors Attributing to Spread of STIs, RTIs and HIV/AIDS

Important factors attributing to the spread of these infections are listed in Table 1.

**Table 1. Factors Attributing to Spread of STIs, RTIs and HIV/AIDS**

<p>Existing infection with another STI, RTI or HIV</p> <p>Labor migration</p> <p>Low level of literacy/awareness</p> <p>Gender disparity</p> <p>Social stigma and late reporting</p> <p>Refusal to attend by some healthcare providers/facilities</p> <p>Social isolation, with creating more scare among others</p> <p>Discrimination at workplace and loss of employment</p> <p>Issues with treatment options available</p> <p>Non-availability of effective vaccines</p> <p>Therapeutic issues</p> <p>Misguidance and false assurance by quacks</p> <p>Unlicensed private blood banks</p> <p>Ethical and moral issues</p> <p>Unhygienic practices in beauty parlors, saloons, etc.</p> <p>Co-infection with TB (e.g. TB-HIV co-infection)</p> <p>Stakeholders' seriousness</p> <p>Difficulty in identification and coverage of HRGs</p> <p>Inadequate involvement of non-governmental organizations</p> <p>Issues in program implementation</p>
<p>AIDS – Acquired Immuno-Deficiency Syndrome; HIV – Human Immuno-deficiency Virus; HRGs – High-Risk Groups; RTIs – Reproductive Tract Infections; STIs – Sexually Transmitted Infections; TB – Tuberculosis</p>

There is a strong relationship between HIV/AIDS and other STIs/RTIs.<sup>1,3</sup> A high prevalence of STIs and RTIs, both among men and women, is reportedly associated with a high risk of HIV infection, and the people infected with HIV are also at a higher risk of having other STIs/RTIs.<sup>15</sup>

Migration is an important factor as the people who migrate and stay away from their families for long durations (such as those belonging to the labor class, staying alone and/or travel long distances like truck drivers) tend to indulge in risk practices and contract such infections.<sup>24</sup> Illiteracy and low literacy are generally associated with a low level of awareness on these infections and their preventive measures.<sup>25</sup> These infections and associated complications have been reported to be much more frequent among females than among their male counterparts, largely owing to issues of gender discrimination, gender-based violence, and differences in accessibility and utilization of pertinent health services.<sup>6,26</sup> Though the social stigma associated with the 'classical' STIs has decreased over the years (due to availability of better and convenient modalities for their treatments), the mindset of the community is still not very supportive for those having STIs/RTIs and HIV/AIDS; thus such patients usually report at late stages or as full-blown cases.

Many doctors, nurses and other healthcare providers and healthcare facilities refuse or avoid attending to such patients. Such socio-medical isolation of cases (particularly the PLHIV and the AIDS cases) tends to create more fear among the patients to seek treatment and more scare among others, leading to more chances of refusal for health services.<sup>27</sup> Similarly, a non-supportive environment at the workplace can also lead to harassment of such patients and loss of their employment.<sup>28,29</sup>

Even when these patients seek health services, particularly in private sector, many of the treatment options are too expensive while some options are still in trial stages. Several studies have reported various confusions and a lack of proper information about preventive and curative options available for these infections and diseases.<sup>30</sup> In fact, there is no effective vaccine available against HIV/AIDS and many other STIs/RTIs currently.<sup>31</sup> Though some of the STIs/RTIs are treatable and curable, others are only manageable; some infections including HIV/AIDS are still not curable but only manageable with a slow downhill course. The risks and adverse effects of many antimicrobials (including various antiretroviral drugs) are also critical in effective management of such cases. Due to this, many patients tend to approach unqualified practitioners and quacks that generally misguide and offer false assurances to them. Poor-quality, high-risk services given by the unlicensed small/medium private blood banks and the unhygienic practices prevalent in beauty parlors, saloons, etc., also pose significant risk of these infections to their clients.

Another critical factor is related to the ethical and moral issues in condom distribution, needle exchange, etc.

Co-infection with TB is another factor and the significance of the TB-HIV co-infection cannot be overemphasized. It is well known that TB shortens the survival of patients afflicted with HIV infection, may accelerate the progression of HIV, and is the cause of death in a significant proportion of people with AIDS.<sup>9,32</sup>

There has been a varying degree of seriousness among different stakeholders for efforts towards prevention and control of these infections, diseases and complications. Social beliefs, customs, and taboos prevalent in many sections of the society preclude holding proper discussions and taking optimum actions to prevent STIs, RTIs, and HIV/AIDS among the vulnerable populations. Identification of different HRGs and their coverage for strategic interventions is quite difficult in such a situation. There is a crucial need for more active involvement of non-governmental organizations (NGOs) in connecting the HRGs with the health system for availing of key health services to control spread of these infections. Despite launch of various health programs and schemes by the central government and the state governments to control these diseases, there remain issues in their program implementation, particularly at the administrative, personnel and financial management levels. This calls for a multi-system, inter-sectoral approach addressing all of these factors in order to control this public health problem in India.

### Control of STIs, RTIs and HIV/AIDS

Importantly, most of these infections and diseases are preventable; and many of them are treatable too. Similarities of unique host-risk behaviors and sociodemographic factors associated with STIs, RTIs and HIV/AIDS call for an integrated approach for their control with multipronged intervention strategies. Various initiatives have been taken by the Government of India, the state governments, and other organizations to tackle these issues.

India's National Health Policy (NHP) has been in vogue since 1983 and has been guiding the approach for the health sector, with revisions as per the changing contexts. In the recently revised NHP in 2017 (the 'NHP 2017'), the primary aim is to inform, clarify, strengthen and prioritize the government's role in shaping health system in all its dimensions.<sup>33</sup> The main objective of the NHP 2017 is to improve health status through concerted policy action in all sectors and expand preventive, promotive, curative, palliative and rehabilitative services provided through the public health sector with focus on quality. In general, the policy also seeks to address the social determinants of health through developmental action in all sectors. Specifically, for prevention and control of STIs, RTIs and HIV/AIDS, the policy not only emphasizes on continuation of

various preventive measures but also recommends focused interventions on the HRGs and prioritized geographies, with indication of specific quantitative goals and objectives to reduce the disease incidence and prevalence through various national health programs. Strengthening of the Reproductive, Maternal, Neonatal, Child and Adolescent Health (RMNCH+A) services, expansion of the scope of reproductive and sexual health, and control of various communicable diseases through health promotion and immunization have also been given due importance.<sup>33</sup>

Key national health programs and policies instituted in India for prevention and control of STIs, RTIs and HIV/AIDS include National AIDS Control Programme (NACP), National RTI/STI Control Programme, National Strategy for Elimination of Parent-to-Child Transmission of Syphilis, National Blood Policy, and certain other related health programs and policies. These programs and policies have set out clear objectives and guiding principles for phased programmatic interventions with focus on checking the spread of these infections through health education, behavior change, targeted interventions (TIs), early diagnosis, and prompt

treatment of these diseases. Freely available and easily accessible services for comprehensive care, support, and treatment of patients with these diseases are expected to help reduce the disease burden and improve their reproductive health as well as overall wellbeing. Increased decentralization of public health services; strengthening institutional capacities; setting up of DSRCs, anti-retroviral treatment (ART) clinics and ICTCs; availability of rapid test kits, color-coded drug kits for syndromic treatment and ART treatment; promotion of condoms; integrated counseling and testing; partner notification; involvement of NGOs; community mobilization; universal precautions and augmentation of voluntary blood donation; robust surveillance; evidence-based planning, and effective program implementation are major components for control of these diseases.

### Approaches to Prevention and Control of STIs, RTIs and HIV/AIDS

As shown in Table 2, there are four basic approaches to prevent and control the public health problem associated with these infections.<sup>15,34,35</sup>

**Table 2. Basic Approaches to Prevention and Control of STIs, RTIs and HIV/AIDS**

<p>(A) Prevention</p> <ul style="list-style-type: none"> <li>• Education</li> <li>• Prevention of blood-borne transmission</li> </ul> <p>(B) Specific therapy</p> <ul style="list-style-type: none"> <li>• ART for HIV infection/disease</li> <li>• Syndromic case management for clinical syndromes of STIs/RTIs</li> <li>• Occupational post-exposure prophylaxis</li> </ul> <p>(C) Specific prophylaxis</p> <p>(D) Primary health care</p>
<p>AIDS – Acquired Immuno-Deficiency Syndrome; ART – Anti-Retroviral Therapy; HIV – Human Immuno-deficiency Virus; RTIs – Reproductive Tract Infections; STIs – Sexually Transmitted Infections</p> <p>Source: National Guidelines on Prevention, Management and Control of Reproductive Tract Infections and Sexually Transmitted Infections. New Delhi: National AIDS Control Organization, Department of AIDS Control, Ministry of Health and Family Welfare, Government of India.<sup>15</sup></p>

To prevent STIs/RTIs and HIV infection, all members of the community must understand important facts related to their causation, risk factors, risk practices and measures to avoid getting infected. Appropriate methods to impart correct sexual health education and counseling are critical to remove myths and misconceptions about these diseases. Since the topics of sex and sexuality are culturally quite sensitive, many people (especially the adolescents and young people) are deprived of opportunities to get the appropriate information on sexual and reproductive health, including HIV/AIDS. In particular, they should be educated on how to prevent blood-borne transmission,

which is the most important route of transmission of most of these infections. Focused activities of the information, education and communication (IEC), the behavior change communication (BCC), and the social BCC may be performed through school-based education, peer-based programs, social marketing, etc.

For specific therapy of these infections, it is required to have adequate clinical and laboratory evidence of such infections/diseases. However, many-a-times, such patients have mixed infections manifesting as typical clinical syndromes and their complications. The choice of appropriate antimicrobials in a geographical domain would depend on the disease

epidemiology, the prevalent local etiological organisms, their drug susceptibility and resistance, the availability of drugs, and the accepted strategy for management of such cases there. ART is the cornerstone of management of patients with HIV infection/disease. Prompt diagnosis, counseling, referral and treatment with use of highly active ART (HAART) have resulted in marked decline in the incidence of most AIDS-defining conditions and associated morbidity and mortality.<sup>17,36</sup> The National Guidelines on Prevention, Management and Control of RTIs and STIs suggest syndromic case management for various clinical syndromes of STIs/RTIs, with emphasis mostly on single-dose regimens and directly observed therapy for better treatment adherence and outcomes.<sup>15</sup> Occupational post-exposure prophylaxis plays a pivotal role in preventing the infection and protecting the healthcare personnel and other individuals working in medical, public safety, sanitation, and laboratory settings as they are at risk of occupational exposure to such infectious agents as HIV, HBV, HCV, tetanus, etc. The NHP 2017 envisages supporting care and treatment for PLHIV through inclusion of first-, second- and third-line antiretroviral, anti-Hepatitis C and other costly drugs into the essential medical list.<sup>33</sup>

Specific prophylaxis of STIs/RTIs and HIV/AIDS includes pre-exposure prophylaxis and post-exposure prophylaxis. It may comprise single or multiple activities such as use of specific antimicrobials, universal precautions, use of condoms/other barrier methods, needle exchange program, opioid substitution therapy (OST), etc., as per the situational needs and the local strategic policies and guidelines. Empirical treatment guidelines for such specific prophylaxis have been issued by the Government of India for the at-risk and the exposed adults, adolescents and children.<sup>15</sup>

Primary healthcare for these infections and diseases is based on provision of client-centered, demand-driven, high quality, integrated services through public, private and NGO-run health facilities. The primary healthcare needs of the infected persons vary with the stage of the infection. They include counseling, prompt investigation and diagnosis, medical treatment, psychosocial support, regular follow-up, and home-based and outreach services.<sup>37,38</sup>

### Measures to Control STIs, RTIs and HIV/AIDS in India

Every country and every government needs to have a solution to deal with these infections of considerable public health importance. Although some of these infections are known for a very long time (such as the first-generation/'classical' diseases, viz., syphilis, gonorrhoea, chancroid, lymphogranuloma venereum and donovanosis date back to hundreds of years), the measures for their treatment and control were largely related to social isolation and deprivation as these infections were often associated

with shame and stigma.<sup>39,40</sup> The second-generation diseases (referred to as the 'newer' diseases, including clinical syndromes associated with STIs/RTIs) added to this burden, which prompted thinking beyond just social measures and led to use of antimicrobials for treatment of these infections. However, the emergence of HIV infection and associated complications (including AIDS, opportunistic infections, cancers, etc.) has given a broader dimension to control these infections and diseases, with consideration of various social determinants of health and use of multipronged approach to control HIV/AIDS and other STIs/RTIs.<sup>1,4,41</sup>

Historically, in India, after detection of the first case of HIV in Chennai in 1986, the Government of India recognized the seriousness of the problem and set up an 'AIDS Task Force' under the ICMR and constituted a high-powered 'National AIDS Committee' under the chair of the Secretary, MoHFW. In 1987, the Government of India formulated the 'National AIDS Control Project' to control the spread of the virus and coordinate national response by focusing on public awareness through intensive communication programs, introduction of blood screening, and conducting surveillance activities in high-prevalence states. In 1989, a 'Medium Term Plan' for HIV/AIDS control was developed with external funding and launched in 1990 in four states (Maharashtra, Manipur, Tamil Nadu and West Bengal) and four metropolitan cities (Chennai, Delhi, Kolkata and Mumbai); it focused on facilitated targeted IEC campaigns, establishment of surveillance system, and safe blood supply.<sup>42</sup>

However, the efforts gained momentum with wider activities (such as condom promotion and strengthening of clinical services for STIs and HIV/AIDS) only in 1992 when the first phase of NACP (NACP-I) was formally launched in a project mode to slow down spread of HIV infection and reduce morbidity, mortality and impact of AIDS in the country. During the NACP-I (1992–1999), the National AIDS Control Board was formed to strengthen the management capacity to deal with the problem and the NACO was set up as an autonomous organization to implement the program. This phase focused on awareness generation, setting up surveillance system for monitoring HIV epidemic, measures to ensure access to safe blood, and preventive services for HRG populations. As a result, the program achieved an increase in the awareness levels about HIV/AIDS from almost nil to 70–80% in urban areas and 30 percent in rural areas. Modernization and strengthening of blood banks was done and their licensing system was introduced, along with gradual phasing out of professional blood donors. Social marketing also supported in making good-quality condoms available, leading to significant increase in their usage.<sup>42</sup>

The second phase of NACP (NACP-II) was launched in November 1999 as a fully centrally sponsored scheme, with policy and strategic shifts to reduce the spread of

HIV infection in the country and increase India's capacity to respond to HIV/AIDS on a long-term basis. This phase (1999–2007) focused on behavior change, decentralization, and involvement of NGOs. The State AIDS Control Societies (SACS) were made in all states/UTs. The TIs for HRGs were scaled up in high-prevalence states during this phase. Preventive interventions for general community included IEC activities, awareness campaigns, voluntary confidential counseling and testing centers, reduction of transmission through blood transfusion and occupational exposure, and prevention of mother-to-child transmission. Strategies for capacity strengthening included those for institutional strengthening (through sentinel surveillance, training, monitoring and evaluation, research, etc.) and for inter-sectoral collaboration (through procurement arrangements, involvement of other systems of medicine, monitoring and evaluation, financial management system, etc.). The 'National AIDS Prevention and Control Policy' and the 'National Blood Control Policy' were adopted in 2002 and the initiation of ART was done in 2004 to provide anti-retroviral drugs to the HIV-infected patients free of cost. In 2006, the 'National Council on AIDS' was constituted under the chair of the Prime Minister of India. The 'National Policy on Paediatric ART' was also made in that year.<sup>42</sup>

The third phase of NACP (NACP-III) was started in July 2007 with the goal to halt and reverse the HIV epidemic in India by integrating programs for prevention, care, support, and treatment. This phase (2007–2012) witnessed the program as scientifically more evolved (with policies, programs, schemes, operational guidelines, rules, norms and more funds). A four-pronged strategy was used during this phase: (a) prevention of new infection in HRGs (by saturation of coverage with TIs) and general population (by scaled up interventions); (b) providing greater care, support and treatment to larger number of PLHIVs; (c) strengthening the infrastructure, systems and human resources in prevention, care, support and treatment programs at district, state and national levels; and (d) strengthening a nationwide Strategic Information Management System (SIMS) for collection, sharing and analysis of information and taking decision based on the same.<sup>42</sup> In a review of this phase of the program, it was reported that most of the targets under NACP were achieved and even surpassed, with remarkable gains made in ART services, upscaling of ICTCs and detecting PLHIV.<sup>43</sup> The review revealed containment and decline of the HIV epidemic in the country, mainly attributed to an increase in the use of condoms in sex work, as a result of pertinent TIs and IEC activities. However, it also noted the emerging vulnerabilities including migration and IDUs, and the increasing treatment needs in the wake of the diagnostic services becoming more readily available and the patients recognizing the role of such treatment.

The fourth phase of NACP (NACP-IV) was rolled out in April 2012 with the goal to accelerate the reversal of HIV

epidemic through an integrated response by providing care, support and treatment to all eligible population along with focused prevention services for the HRGs and the vulnerable, marginalized and hard-to-reach populations. For this phase (2012–2017), an inclusive, participatory and widely consultative approach has been followed, which is built on the NACP-III's globally acclaimed and successful planning and implementation efforts. An integrated approach to prevent, treat and manage cases of STIs/RTIs and HIV/AIDS through ICTCs, DSRCs, antenatal clinics and TIs has been adopted, with institutional strengthening and more involvement of key stakeholders including NGOs. The program also supported the 'Getting to Zero' themes of the World AIDS Days during 2011–2015 as per the 'UNAIDS 2011–2015 global strategy', which envisaged (a) zero new HIV infections, (b) zero discrimination, and (c) zero AIDS-related deaths.<sup>42,44</sup>

Various activities under these programs for control of STIs, RTIs and HIV/AIDS have yielded mixed results, with some targets achieved successfully while others not achieved due to different reasons and constraints. Some of these activities are discussed in further details here.

The main objective of the *Ti program* under the NACP is to improve the health-seeking behavior of the HRGs (viz., FSW, MSM, TG and IDU) and the bridge populations (viz., truckers and migrants) and reduce their vulnerability and risk for HIV infection and other STIs. TIs are largely implemented through NGOs and community-based organizations (CBOs). The services provided through TIs include IEC/BCC activities, condom promotion, safe needle and syringe for IDU, STI care, and referrals for HIV and syphilis testing, ART and OST. However, of late, there have occurred declines in the coverage of total number of HRG population (from 1.2 million in 2012-13 to 1.08 million in March 2016) and the number of TIs (from 1873 in 2014 to 1677 in March 2016); it was largely owing to unsatisfactory performance of some TIs (which were then closed and not replaced) and less funds available to NACO and SACS.<sup>45</sup>

The *Link Worker Scheme* (LWS) was launched under the NACP to address HIV prevention and care needs of the high risk and vulnerable groups in rural areas. The target population covered under this scheme is quite broad including the key populations, migrants, spouses of risk groups, spouses of truckers, pregnant women, TB patients, truckers, youth with STI symptoms, and PLHIV. Its implementation is largely by community-based interventions through link workers and CBOs in partnership with various Development Partners. Of late, the scheme has been transitioned from the external donors' support to domestic funding by the Government of India. Key services offered under the LWS include providing information on HIV, condom promotion and distribution, and referrals to counseling, testing and STI services. While the scheme

has an important role to play, reviews have shown that the yield of LWS in terms of testing uptake has remained very low, as reportedly only a small proportion of people were referred for HIV testing, actually reached the ICTCs, tested upon, and got their test results.<sup>45</sup>

The *HIV Counseling and Testing Services* provide for monitoring the trend of HIV infection in a population; testing of blood, organ or tissue for ensuring safety of recipients; identification of individuals with HIV infection on voluntary testing basis; and extending access to counseling facilities. In 2006-07, voluntary counseling, testing and prevention of PTCT (PPTCT) services were merged to form ICTCs to expand coverage. Key services provided include ICTC, PPTCT, referrals for ART, care and support for treatment of opportunistic infections and STIs, HIV-TB collaborative activities, and activities for condom promotion. The National Paediatric AIDS Initiative and the National AIDS Telephone Helpline (1097) are some other initiatives under these services. To enhance the access to HIV counseling and testing (HCT), ICTCs have been decentralized to district, sub-district and community levels through Stand-alone ICTCs, Public Private Partnership (PPP) ICTCs, Facility-integrated ICTCs, and mobile ICTCs. Up-scaling of these ICTCs and their integration with National Health Mission (NHM) has yielded remarkable success; for example, during 2015-16, 99 percent of the ICTC attendees were tested for HIV and 98 percent received the test reports after post-test counseling.<sup>45</sup>

The *National RTI/STI Control Programme* has been launched with the primary objective of ensuring early diagnosis and treatment of various STIs and RTIs and thereby controlling the spread of HIV/AIDS. The program is being implemented through integrated services for treatment of STIs/RTIs at all levels of healthcare in general health services (with coordination between NACO and Department of Family Welfare) and through NACO-supported DSRCs. A syndromic case-management approach has been adopted with use of pre-packed STI/RTI color-coded kits for managing STIs/RTIs cases. The program also offers other services including laboratory services, referrals, orientation/trainings, counseling, provision of good-quality condoms, and certain other initiatives (for generating demand for these services and scaling up these services to HRG population under TI Projects). Functional integration of this program with the RMNCH+A program of NHM has drawn synergies and helped both programs mutually, including development of joint STI/RTI operational guidelines for implementing the program across various healthcare facilities.<sup>45</sup>

Congenital syphilis is a serious but preventable disease and untreated maternal syphilis will have a significant adverse outcome including birth of a congenital syphilitic baby. Effective screening of all pregnant women for syphilis and treatment of those infected including their partner and

newborn can lead to elimination of this dreaded disease. After recognizing these facts, the *National Strategy for Elimination of PTCT (E-PTCT) of Syphilis* (also called as the National Strategy for Elimination of Congenital Syphilis) was adopted and launched jointly by the NACO (under MoHFW, Government of India) and the WHO (Country Office for India) in February 2015.<sup>46</sup> It is being implemented under the National RTI/STI Control Programme. In December 2015, strategies were strengthened for achieving the goal of E-PTCT of HIV and syphilis by 2020. However, a review of the strategy has revealed critical gaps in reaching the goal of E-PTCT of syphilis owing to saturation of syphilis testing of pregnant women and other programmatic limitations.<sup>45</sup>

The *Blood Safety Programme* implemented through NACO and supporting network aims to ensure provision of safe and quality blood and thereby reduce the transfusion-associated HIV transmission (to less than 0.5 percent). The services provided under this program include ensuring regular, voluntary, non-remunerated blood donation; establishment of blood storage centers in primary health care system; promotion of awareness and building capacity; and the quality assurance services (such as institutionalization of blood transfusion councils, prohibition of professional blood donors, licensing of blood banks, establishment of zonal blood testing centers, etc.). Another important component is the adoption of the National Blood Safety Policy, which mandates testing of blood for HIV, HBV, HCV, syphilis and malaria.

The *promotion of condom use* is of paramount importance as it not only prevents transmission of HIV infection and other STIs/RTIs (due to unprotected and multi-partner sexual contacts) but also protects against unwanted pregnancies (particularly in FSW, and adolescent and young females). It is being implemented through NACO with governmental and non-governmental support including the Condom Social Marketing Programme. This particular activity alone has led to a significant success with containment and reduction in the HIV epidemic in India.<sup>45</sup>

The *Care, Support and Treatment for PLH (the CST Programme)* comprises provision of prevention and treatment of opportunistic infections, ART, psychosocial support, home-based care, positive prevention and impact mitigation services. Universal access of second- and third-line ART for adults and adolescents, ART Plus Scheme (to provide second- and third-line ART), and setting up of Comprehensive Care and Support Centers for referral and mentoring are other initiatives under this program.

Other key activities for control of STIs/RTIs and HIV/AIDS also include IEC/BCC activities, laboratory services, mainstreaming with convergence of NACP with NHM, surveillance (including HIV sentinel surveillance), data management (including that through SIMS), financial management of programs, etc.

## Program Appraisal and the Way Forward

In its mid-appraisal report on NACP-IV, NACO reported remarkable success in India's AIDS response with reduction in new infections and deaths and improvement in access to prevention services for key population and treatment services for PLHIV.<sup>45</sup> The report highlighted a continued steady decline in the adult HIV prevalence at national level from an estimated peak of 0.38 percent in 2001-03 through 0.34 percent in 2007 and 0.28 percent in 2012 to 0.26 percent in 2015. The target of the number of STI episodes managed with syndromic management was also achieved well in time, in addition to many other targets of NACP-IV. However, a declining coverage of key and bridge population through TIs was reported as a cause of concern. Key challenges recognized in this regard included less effective design for addressing the changing dynamics of communities, lack of budgeting and contracting flexibilities, budget cuts and fund flow uncertainties, decreased focus on community mobilization and enabling environment, issues with key population size estimates, and decline in the coverage of key population in the recent years. Critical gaps in reaching the goal of elimination of parent to child transmission of syphilis were also highlighted as the key challenge facing the STI/RTI program. The report recognized a need to strengthen STI program management through involvement of apex centers, rational use of counselors, ensuring timely and adequate supply of essential commodities etc., and target efforts towards elimination of parent to child transmission of syphilis, and implementation of quality control for syphilis testing.

The UNAIDS has adopted a new strategy – *the UNAIDS 2016-2021 strategy* – to end the AIDS epidemic as a public health threat by 2030 globally.<sup>47</sup> This strategy is in alignment with the Sustainable Development Goals and envisages acting on a fast track to achieve various targets set for 2020 and 2030. Under this strategy, the global target of 2020 (also called as the target of 90:90:90) for HIV/AIDS is an important target that stipulates achieving the following by 2020: (a) 90 percent of all PLHIV know their HIV status; (b) 90 percent of all people diagnosed with HIV infection receive sustained ART; and (c) 90 percent of all people receiving ART will have viral suppression. The strategy also puts emphasis on innovations to produce more effective and affordable treatment for common co-infections such as TB, other STIs and hepatitis.

Taking a lead from the UNAIDS 2016–2021 global strategy, and considering the current key challenges based on the appraisals of NACP's various phases, the Government of India has recognized the need for further refinement in its approach, program priorities, thrust areas, and implementation strategies to tackle this public health issue through the next phase of the NACP. With a view to reach everyone in a comprehensive integrated way and to

move towards wellness, the NHP 2017 is a step towards this effect.<sup>33</sup> This revised policy has assigned specific quantitative targets aimed at reduction of disease prevalence/incidence, for health status and program impact, health system performance and system strengthening. In line with the UNAIDS 2016–2021 strategy, India has also adopted the target of 90:90:90 for HIV/AIDS in the country. Along with emphasis on preventive measures, the NHP 2017 calls for more focused interventions on the HRGs. It advocates augmentation of support, care and treatment of PLHIV through inclusion of first-, second- and third-line drugs for ART and other related costly drugs into the essential medical list. The revised policy also envisages addressing the issue of TB-HIV co-infection through more active case detection, greater involvement of private sector and supplementing the preventive and promotive actions at workplace and in living conditions. Effects and impact of the revised policy on the health situation in general and the control of STIs, RTIs and HIV/AIDS in particular in the country remain to be seen.

To conclude, STIs, RTIs and HIV/AIDS constitute a significant public health problem even today in India. Although key national health programs and policies for control of these infections have shown remarkable achievements, continued efforts and innovations are needed to maintain the control and curb this problem in the country.

**Conflict of Interest:** None

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