**Review Article:**

# Lessons Learned from Implementing a Surveillance Program for Sexually Transmitted Infections (STI) in a Large Population

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**Abstract:**

Sexually transmitted infections (STIs) continue to pose a significant public health challenge globally, particularly in India, where the burden remains high. Despite efforts under the National AIDS Control Program (NACP) to integrate STI services into the healthcare system, challenges such as stigma, resource constraints, and inadequate case management persist. This paper aims to examine the current STI surveillance practices in India, explore the challenges faced in program implementation, and propose future strategies to enhance STI management. A systematic search was conducted across PubMed and Scopus using keywords related to "Lessons Learned from Implementing a Surveillance Program for Sexually Transmitted Infections (STI) in a Large Population." The search covered the years 2000 to 2024 and included studies published in English. The selected articles were analyzed qualitatively and quantitatively, with themes extracted based on evaluation frameworks and methods used for analysis. Data from Designated STI/RTI clinics and laboratory testing protocols were reviewed, along with program evaluation frameworks and supportive supervision mechanisms. Surveillance data from STI/RTI clinics revealed notable gaps in comprehensive case management, with limitations in laboratory testing capacity and high levels of stigma adversely affecting service delivery. However, the integration of a Computerized Management Information System (CMIS) under the NACP has improved data collection and monitoring. Collaborative efforts among public and private healthcare providers, non-governmental organizations (NGOs), and community organizations have been pivotal to program success, particularly in reaching high-risk populations. While significant progress has been made in STI surveillance, ongoing efforts are necessary to address stigma, enhance case management, and improve reporting systems. Future strategies, including the increased use of artificial intelligence (AI), public awareness campaigns through social media platforms, and stronger collaborations between public and private sectors, are essential for more effective STI management and prevention in India.

**Key words:**
Disease Prevention, Epidemiology, Health Education, Health Policy, Health Promotion

## Introduction:

STIs significantly burden public health, with implications for individual well-being and healthcare systems. Surveillance programs play a crucial role in understanding the epidemiology of STIs, identifying high-risk populations, and evaluating the impact of interventions. [1,2] Sexually transmitted infections (STIs) represent a persistent and pervasive global public health challenge. These infections, which include diseases such as chlamydiasis, gonorrhea, trichomoniasis, syphilis, and HIV, have far-reaching consequences, affecting the well-being of individuals, communities, and healthcare systems. STIs such as syphilis, gonorrhea and chancroid spread more rapidly in places where communities are disrupted, migrant labour is common and commercial sex networks are active.[3]

STIs can lead to serious health complications, including infertility, cervical cancer, and increased vulnerability to HIV transmission. Moreover, the economic burden of STIs, in terms of healthcare costs and lost productivity, is substantial.[2]

Efforts to combat the spread of STIs have been ongoing for decades, encompassing prevention, diagnosis, treatment, and surveillance. Among these, surveillance programs are instrumental in understanding the epidemiology of STIs, tracking their prevalence and trends, identifying high-risk populations, and evaluating the effectiveness of interventions.[3]

Surveillance data not only inform public health policies and strategies but also empower healthcare providers with the information necessary to deliver timely and targeted care.

Implementing an STI surveillance program in a large and diverse population is a multifaceted endeavour that brings with it a unique set of challenges and opportunities. This research paper seeks to examine the valuable lessons derived from the experience of establishing and operating such a surveillance program. The insights gained from this endeavour provide critical guidance for public health practitioners, policymakers, and researchers who are dedicated to enhancing STI prevention and control efforts. In the following sections, we explore the methods employed in setting up the surveillance program, the challenges encountered along the way, the successful strategies that emerged, and the lessons learned from these experiences. The goal of this research is to contribute to the collective knowledge base and provide practical recommendations for improving the effectiveness of STI surveillance in large populations.

In the surveillance program discussed, the focus is primarily on bacterial STDs such as syphilis, gonorrhea, and chlamyd-

ia, as well as HIV. However, this approach overlooks viral STDs, specifically Human Papillomavirus (HPV) infections, including anogenital warts, and Herpes Simplex Virus (HSV) infections, including genital herpes. These viral STDs are significant due to their substantial burden globally.

HPV is the most common sexually transmitted infection worldwide, with certain strains leading to anogenital warts and various cancers, including cervical cancer. Despite the availability of vaccines and screening methods that have substantially reduced the incidence of some HPV-related diseases, HPV infections remain prevalent and require ongoing monitoring and intervention.

Similarly, HSV infections, which cause genital herpes, are widespread and contribute significantly to the STI burden. HSV can lead to recurrent painful lesions and complications, and it is associated with an increased risk of HIV transmission. The high prevalence of HSV emphasizes the need for its inclusion in surveillance programs to ensure comprehensive monitoring and effective public health strategies.

Addressing these viral STDs in surveillance efforts would provide a more holistic view of the STI landscape, allowing for better resource allocation, prevention, and treatment strategies. Incorporating these viral infections into surveillance programs could help identify trends, evaluate the effectiveness of interventions, and improve overall sexual health outcomes.

To effectively address the diverse landscape of sexually transmitted infections (STIs), the surveillance program must distinguish between the use of syndromic and etiological management approaches. The syndromic approach, which focuses on diagnosing and treating STIs based on clinical symptoms, is advantageous in resource-limited settings where immediate intervention is needed. However, it falls short in providing precise statistics on specific pathogens, such as ulcer-producing STIs (e.g., syphilis, chancroid) and discharge-producing STIs (e.g., gonorrhea, chlamydia). On the other hand, etiological management, which involves identifying the exact pathogen through laboratory tests, offers a more accurate understanding of the prevalence and burden of individual STIs. This method enables targeted treatment and better data collection, informing more effective public health strategies. To enhance the program's effectiveness, it is crucial to integrate both approaches, utilizing the syndromic approach for immediate management in constrained environments and etiological management for comprehensive surveillance and targeted interventions. This balanced strategy will improve the accuracy of STI burden assessments

and guide more effective public health responses.

STI surveillance is not merely a scientific undertaking but a critical public health initiative with profound implications for the health and well-being of individuals and communities. By examining the successes and hurdles faced in implementing such programs, we aim to promote a deeper understanding of the dynamics of STI surveillance programme in India, shed light on difficulties faced during implementation and suggest public health strategies for implementation in future. This article examines the experiences and insights gained from implementing an STI surveillance program in a large and diverse population.

**Methodology:**

**Search Strategy:**

A systematic search was performed across PubMed and Scopus using the keywords "Lessons Learned from Implementing a Surveillance Program for Sexually Transmitted Infections (STI) in a Large Population." The search was conducted for articles published between 2000 and 2024.

**Selection Criteria:**

Studies were included based on the following criteria:

- Published in English.
- Focused on surveillance programs for STIs.
- Provided relevant data on outcomes, methodologies, or lessons learned from implementing STI surveillance initiatives.

**Analysis Process:**

The selected articles were analyzed both qualitatively and quantitatively. Qualitative themes were extracted based on thematic analysis, identifying common challenges, successes, and recommendations across studies. Quantitative data were synthesized to identify trends, prevalence rates, and demographic patterns associated with STIs. This dual approach allowed for a comprehensive understanding of the impact and effectiveness of STI surveillance programs.

**Result/Findings:**

- **Importance of Community Engagement:** Effective surveillance programs require active participation from the community. Engaging community leaders and stakeholders helps build trust and ensures that the program is culturally sensitive. Programs that incorporated feedback from community members reported higher participation rates and more accurate data collection.
- **Utilization of Technology:** The use of digital platforms and mobile health (mHealth) technologies has significantly enhanced data collection and dissemination. Programs that integrated electronic health records and online reporting sys-

tems experienced improved efficiency and reduced delays in data reporting.

- **Challenges in Data Collection:** Many programs faced difficulties in collecting comprehensive data due to stigma associated with STIs and confidentiality concerns. Strategies such as anonymous surveys and outreach programs were effective in overcoming these barriers.
- **Training and Capacity Building:** Continuous training for healthcare providers on the importance of STI surveillance and effective data collection methods was crucial. Programs that invested in staff education demonstrated improved data quality and enhanced the overall effectiveness of the surveillance efforts.
- **Policy Implications:** Surveillance data informed public health policy, enabling targeted interventions. Programs that aligned their findings with national health priorities were more successful in securing funding and support for STI prevention initiatives.

**Description:**

- **Surveillance of STI in Indian Context:** Surveillance refers to the ongoing, systematic collection, analysis, and interpretation of health-related data essential to planning, implementation, and evaluation of public health practice. The World Health Organization (WHO) estimates that 498.9 million treatable sexually transmitted infections (STIs) occur each year in the world. [4,5] According to studies, the prevalence of STIs like syphilis, gonorrhoea, and chlamydiasis in the general population in India ranges from 0-3.9%, but the burden of STIs is substantially higher among subpopulations engaging in high-risk behaviour. Reliable and consistent data on the level and trends of recently acquired STIs as well as the prevalence of STIs in various demographic groups who are at a higher risk of STI acquisition are necessary for an effective program management for STIs.[5] Computerized management information system (CMIS), the NACO-implemented National AIDS Control Program of India (NACP) gathers service statistics on STI syndromes and syphilis screening among STI and prenatal clinic attendance, which serves an important role in sentinel surveillance of STIs. The reporting units are the STI clinics of targeted intervention sites (TIs) and designated STI/RTI clinics (DSRCs). The DSRCs offer on-site assistance to high-risk populations such as transgender people, long-distance truckers, male migrants, female sex workers, men who have sex with men (MSM), and intravenous drug users (IVDU).
- **Targeted Intervention Sites (Tis) Approach:** In the HRGs special vulnerabilities, prevention strategies include five

elements — behaviour change, treatment for sexually transmitted infections (STI), monitoring access to and utilisation of condoms, ownership building and creating an enabling environment. The NACP program encourages peer-led interventions by community-based organisations or NGOs both in the rural and urban areas and focuses on clients of sex workers, partners of MSM and IDUs. All TIs are rights-based, they empower the communities. NGOs/ CBOs engaged in TIs are networked and linked to general healthcare facilities to ensure that HRGs access them without stigma or discrimination; they are also linked to Community Care Centres, Counselling and Testing Centres and ART centres. The prevention strategies are thus linked to care and treatment, and empower the community against stigma and discrimination. There are separate TI sites for female sex workers (FSWs), IVDUs and MSMs.

- **Laboratory Testing for STIs:** A network of healthcare facilities, including public clinics, private healthcare providers, and laboratories are involved in laboratory diagnosis of STIs. Standardized diagnostic tests, including nucleic acid amplification tests (NAATs) and serological assays, are employed for accuracy and consistency. Although laboratory investigations to identify the etiological agents have been the standard method for STI diagnosis, not all tests must be carried out in all laboratories, for all purposes. Equipment, reagents, infrastructure, and maintenance costs for STI laboratory diagnostics are often high.

In resource-limited settings, which are often encountered in India, the syndromic management approach advised by WHO and NACP, for the management of various STIs proves very useful. Implementation of STI management guidelines as envisaged under NACP is challenging and is tailored according to the availability of laboratory facilities and human resources.[6] NACP advises for the management of males with symptomatic urethral discharge and the management of both men and women with bacterial genital ulcer disease using syndromic approach, which includes the identification of the syndrome on the basis of the patient's symptoms and signs, and using the available flowcharts to treat it. The syndromic flowcharts are simple and easy to understand for healthcare providers and, once trained, even non-STI specialists can use them at primary health centres (PHCs) in rural or remote areas setting. Syndromic management also includes contact tracing and partner management and a return visit to ensure treatment compliance. It provides an opportunity to educate and counsel patients regarding safe sex practices.

Syndromic case management (SCM)

has been proven to have good efficacy. Yet, contrary to popular belief, this is not the case for the diagnosis and treatment of cervical infections caused by N. gonorrhoeae or C. trachomatis, apart from cases where an examination reveals cervical mucus, cervical erosions, and cervical friability, as well as a history of bleeding between periods and during sexual activity. In many cases, diagnosis can be challenging, and treatment outcomes can be suboptimal due to a lack of proper diagnosis. The surveillance programme for STIs under NACP has enabled the strengthening of laboratories, availability of trained staff, better transport facilities for samples to tertiary care surveillance labs, and availability of modern molecular diagnostic methods, which have collectively contributed to better diagnosis and management of STIs in India.[7]

Surveillance for STIs is an important part of NACP and helps to detect the co-existing burden of STIs among individuals suffering from HIV/AIDS. The syndromic management approach offers the advantage of quick care at the patient's initial point of contact for assessment and is affordable neither the patient, the service provider, nor the state incurs direct laboratory costs. In a specific environment or circumstance, the syndromic approach also permits standardization of diagnosis, treatment, and reporting. Instances including primary healthcare centres, family planning clinics, and private practitioners can provide care for patients with suspected STIs both in general STI clinics and in consultation rooms. The syndromic method inevitably runs the risk of over diagnosing and overtreating patients who might not be infected with all or some of the suspected causal organisms for the condition in issue. In surveillance programme for STIs, local clinical laboratories are encouraged to conduct the tests required to aid the clinical care of people with and at risk for STIs, in order to support the syndromic approach to diagnosis. In our surveillance programme, we intend to utilise the concept of economies of scale, which allows specimen processing at central laboratories after pooling the samples from peripherally located local laboratories.[8] It promises to be both prompter and more effective than efforts to conduct testing at local sites in some situations where specimen transport is not a constraint. Peripheral laboratories that support the primary health-care service levels, typically have insufficient laboratory resources and poor availability of trained human resources, who are well-versed in the laboratory diagnosis of STIs. Considering this fact, the samples collected for surveillance are transported to intermediate-level and apex-level laboratories for further processing. Interme-

diate-level laboratories are developed to offer STI diagnoses quickly and on-site. They assist district- and intermediate-level clinics and hospitals that provide primary healthcare services. Regional STD centres are located in tertiary healthcare facilities, well equipped with modern diagnostic modalities like Polymerase Chain Reaction (PCR), Nucleic Acid Amplification Test (NAAT), Immunofluorescent assays (IFAs), Enzyme-linked Immunoassays (ELISAs), Haemagglutination. These help in arriving at a diagnosis about the causative organism and help in tailoring the diagnostic and management guidelines for STI management under NACP.

- **Evolution of STI Surveillance in India:**

The National STD Control Programme was established in 1954-55 and has continuously evolved with time. In 1992, the National AIDS Control Organization was established. Subsequently, the STD control programme merged with National AIDS Control Programme (NACP). The current program's primary goals are to decrease STD cases and to stop STD-related short- and long-term morbidity and mortality.

The introduction of STD surveillance using syndrome-based reporting from peripheral health institutions and aetiological data from tertiary care STD clinics has become an integral part of NACP. High-risk groups, like those with high numbers of sexual encounters increasing the possibility of transmissions, such as sex workers, truckers, men who have sex with men (MSM), Intravenous Drug Users (IVDU), adolescents, migrant men and women are important, to keep an eye on the burden of STIs in the population, hence are key parts of a sentinel surveillance programme for STIs.[8]

Integrating STD services into the current health care system has been the key strategy for attaining successful management for patients with established infections, with a focus on integration at the primary health care (PHC) level. NACO advocates syndromic approach for case management at this level. There is currently disagreement over whether syndromic management in women is effective. One such trial, from India, was the only one to be found in recent studies, on the efficacy of syndromic care. Over 300 symptomatic women seeking care at a reproductive health clinic in New Delhi participated in this study. With 22% of women having an STI (chlamydiasis, trichomoniasis, or syphilis; none had gonorrhoea) detected in the laboratory, including 12% with Chlamydia trachomatis, the prevalence of STIs in this clinic population was comparatively high. [9,10] The recommended syn-

dromic flow charts succeeded admirably in the management of vaginal infections, as in other research. However, the STIs were inadequately treated, with only 5% of the women with chlamydiasis obtaining the necessary cure.[11] The provision of high-quality healthcare in the public sector is a current program priority. According to studies conducted at STD clinics, case management services, particularly counselling for prevention, are insufficient and subpar. Observations of STD consultations in Madras showed that only 30% of the consultations included condom use advice. Six percent of the clients received condom usage instructions, and one percent received condoms. Similar to this, just 15% and 28% of symptomatic men and women, respectively, who had sought medical attention from a facility in Tamil Nadu were told by the staff members what was causing their symptoms or what precautions needed to be taken to avoid the illness.

**Public Health Measures for STI Management**:

Cases presented to the clinicians comprise only the tip of the iceberg and it is of utmost importance to screen, diagnose and treat early, the hidden burden of cases in the community. Public Health Interventions done under the STI surveillance programme in collaboration with activities of NACP are important.[12]

- **Public Health Interventions under NACP for the prevention of STDs include:**

1. Promoting safe sex.
2. Awareness regarding use of condoms.
3. Promoting health-care-seeking behaviour.
4. Integrating STD control into primary health care and other healthcare services.
5. Providing specific services for populations at increased risk.
6. Comprehensive case management of STIs using syndromic approaches.
7. Prevention and care of congenital syphilis and neonatal conjunctivitis.
8. Early detection of asymptomatic and symptomatic infections.

- **Healthcare Provider Reporting:** In the government sector healthcare system, RTI/STI management, ICTC, PPTCT, Blood Safety, and a number of other initiatives are supported by NACO and the SACS (State AIDS Control Society). However, teaching hospitals and medical schools, district hospitals, and in the case of the high-prevalence states, taluk hospitals are the main distribution points for these interventions through the health system. The role of private sector is less well defined and majority of the contribution to STI surveillance programme is by NGOs who work with high-risk groups

and serve as a chain between the patient and the surveillance programme.[13] Collaborative partnerships are formed by laboratories with healthcare providers to encourage the timely reporting of diagnosed STI cases.[14] This involved educating providers on reporting requirements and ensuring privacy and confidentiality.

- **Electronic Health Records (EHRs):** Integration with electronic health records systems facilitated the seamless flow of patient data into the surveillance database. Standardized data formats and electronic reporting tools were developed for healthcare facilities to facilitate data sharing. SOCH-Strengthening Overall Care for HIV beneficiaries is an initiative started by NACP that intends to create a beneficiary-centric web and mobile-based system, to track and record, beneficiary service and inventory transactions in the National HIV program to improve service delivery and beneficiary health outcome. SOCH aims to fully digitize five crucial elements of the National HIV Program including Prevention for Key Populations, Testing and Detection, Care and Treatment, Viral Load Suppression, and inventory. By digitizing these aspects, SOCH aims to improve the National HIV Program's efficiency and effectiveness.

**Challenges Faced during STI Surveillance:**

- **Confidentiality:** Addressing the stigma associated with STIs and ensuring the confidentiality of patient information poses significant challenges in the management of STIs.[15]
- **Stigma towards Lesbian, Gay, Bisexual, Transgender, Queer (LGBTQ+) community:** LGBTQ+ individuals may encounter stigma or discrimination from healthcare providers due to their sexual orientation or gender identity. This can lead to reluctance to seek care and disclose their sexual practices, potentially hindering accurate diagnoses and appropriate treatment. Gender identification differs from sexual orientation, and this demographic has a wide range of STI risk factors. In general, STIs and STI-related infections are more common in transgender and non-binary people than in the general population. Some healthcare providers may assume that all LGBTQ+ individuals engage in high-risk sexual behaviours, which can lead to assumptions about STD risk and treatment. In this population, STI testing and counselling should be customized to each person's anatomy and sexual preferences. There is a need for sensitization of doctors, nurses, counsellors and other professionals involved in the management of STIs to the LGBTQ+ community. [14,15,16]
- **Monitoring and Evaluation of the programme:** Balancing resource alloca-

tion for surveillance versus treatment and prevention interventions requires careful planning. Successful implementation of a programme requires meticulous planning in terms of allocation of resources. A rigorous monitoring and evaluation system should be planned for the STI/RTI program under NACP III to guarantee the quality of services at all levels. The district agency, with the help of the District Medical Officer, DAPCU, SACS, and TSU, monitors the STI/RTI service providers on the ground, by paying a visit to each one of them once every three months as part of the established supportive supervision system. A supportive supervision checklist is used to undertake direct field observations.

• **The elements of supportive supervision include** - A computerized management information system (CMIS) is used by DAPCU, SACS, and NACO to monitor STI/RTI service provision on a monthly basis. Each training session is evaluated using a pre-test and post-test questionnaire. A pre-and post-test questionnaire is used to monitor the quality of each training conducted. The tools for quality monitoring at each level are described in the programme guidelines. Supervisory checklists and quality indicators are given. Monitoring indicators for franchised private providers are given. The STI/RTI components are also monitored and evaluated using the total monitoring and evaluation budget provided at SACS. The key ways to assess the STI Programme are annual analyses of national monitoring indicators, annual evaluation of the standard of STI/RTI service delivery using a simulated patient study for a randomized sample of STI/RTI care providers. Every fifth-year the program is evaluated by an outside organization on pre-defined evaluation criteria. It helps to maintain the quality of services provided under the programme and also acts as a check to find any lacunae which require further improvements at the implementation level. [5,8,12,13,16]

**Risk-Assessment:**

It is important to assess the risks in men and women equally. Risk assessment is most effective when the questions are developed in local language and according to local needs and conditions. Assessing risk may be improved by tailoring questions to reflect local STI prevalence, making questions more culturally appropriate and devising ways to help clients assess their own risk (self-assessment). There is some evidence that self-risk assessment can provide information that is more accurate because it avoids the difficulties of face-to-face questioning on sexual behaviour. Self-assessment of risk requires the health care worker to provide the patient with sufficient information to allow the patient to

decide whether s/he is at risk. Often people suspect they are at risk but are reluctant to discuss their situations; and they need encouragement to ask any questions they may have.

**Future Public Health Strategies under STI Surveillance Programme:**

- **Public Awareness Campaigns using social media:** Involvement of the masses is the backbone of the long-term success of any program. STIs being a forbidden and a taboo topic, public awareness measures play a more important role in the successful implementation of the programme. Implementing targeted awareness campaigns reduces stigma and encourages individuals to seek testing and treatment. The use of social media to improve the utilization of preventive measures in sexual disease transmission is novel and can be an important first step in reaching masses of youth online and a way to maximize approaches to technology-based interventions. Because there is ample evidence that condom use in youth declines with age and fluctuates with other factors such as relationship status. Facebook, Instagram, Twitter and other social media platforms may provide a simple, easy-to-implement mode, and adopt an approach to prevent condom use decline in the short-term. It may be valuable to consider whether clinics providing sexual health services to youth might benefit from having a presence on social media platforms and whether having such a presence can intensify, supplement, or extend the efficacy of their own sexual health promotion effort.[16]
- **Enhanced Collaboration among the public and private sector:** Existing literature suggests that enhanced partnerships among healthcare providers, community organizations, and researchers enhance data collection and analysis. Improved quality of collected data and a greater number of individuals assessed provide better insight into the strength and lacunae of the programme and can thus help to make decisions that are better in terms of long-term outcomes and achieving the goals of the programme.[17]
- **Integration of Artificial Intelligence software and Real-time Reporting:** The Future will see an increasing use of artificial intelligence in medical sciences. Faster analysis of medical images, molecular databases, and reports by AI software can help in faster diagnosis and decreased turnaround time of investigations in the future. Personalized risk assessment based on the sexual history of individuals can prove to be helpful in the management of STIs. Contact Tracing using artificial intelligence using mobile applications can be made easy. Analysis of large databases can be done with the help of AI and can

prove to be of immense value to large-scale public health surveillance programmes including STI surveillance programme. AI-powered chatbots and virtual assistants can provide information, support, and even help in deciding the need for seeking treatment among underserved and stigmatized populations and can thus help in increasing access to healthcare for the needy.[18]

**Discussion:**

We discuss the surveillance and management of sexually transmitted infections (STIs) in India, highlighting the need for comprehensive data collection and analysis to effectively address this public health issue. We emphasize the challenges faced, and the evolution of STI surveillance programs, and outlined future strategies for improvement.

Surveillance of STIs is crucial due to the high burden of sexually transmitted infections in India, especially among high-risk populations. The National AIDS Control Program (NACP) employs a Computerized Management Information System (CMIS) to collect data from STI clinics, helping to monitor and manage STIs. Laboratory testing for STIs, including nucleic acid amplification tests (NAATs), is essential for accurate diagnosis, but resource limitations often necessitate syndromic management, particularly in remote areas. Laboratory tests in STI/RTI clinics for HRG population (FSW, MSM and IDU) are offered, such as syphilis screening once in six months. HRGs are referred to Designated STI/RTI clinic if further tests are required.

The integration of STI services into the healthcare system and syndromic management at the primary healthcare level have been key strategies under the STI surveillance of NACP. However, challenges remain, including insufficient case management services, stigma associated with STIs, and inadequate reporting of cases.

Public health measures under NACP aim to promote safe sex, raise awareness about condom use, and encourage healthcare-seeking behaviour. Collaboration between public and private sectors is crucial, with non-governmental organizations (NGOs) playing a significant role, especially among high-risk populations.

Public awareness campaigns through social media can help reduce stigma and improve prevention efforts. Enhanced collaboration among healthcare providers, community organizations, and researchers can lead to improved data collection and analysis. Additionally, the integration of artificial intelligence (AI) software and real-time reporting can streamline diagnosis, personalized risk assessment, and contact tracing, ultimately enhancing access to healthcare, especially for marginalized

populations.

In summary, STI surveillance in India is a complex situation, marked by both progress and challenges. Future strategies involving public awareness, collaboration, and AI integration hold promise for more effective STI management and prevention.

**Conclusion:**

The implementation of an STI surveillance program in a large population provides valuable lessons for public health practitioners and policymakers. While challenges exist, including stigma and resource allocation, successful strategies such as collaboration and real-time reporting can lead to more effective STI control and prevention efforts. Continued investment in surveillance programs is crucial for reducing the burden of STIs and improving overall public health.

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