

Original Research Article

INTEGRATED EVALUATION OF SYNDROMIC, LABORATORY, AND MATERNAL-INFANT SYPHILIS INDICATORS AT A DESIGNATED STI/RTI CLINIC

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ABSTRACT

Background: Sexually transmitted infections (STIs) and reproductive tract infections (RTIs) continue to be major public health concerns. Monitoring performance indicators from Designated STI/RTI Clinics (DSRCs) is essential for assessing service delivery effectiveness and progress toward syphilis control and elimination of mother-to-child transmission (EMTCT). This study provides a comprehensive programmatic evaluation of a DSRC, focusing on service delivery, syndromic burden, HIV and syphilis screening, partner management, and maternal-infant syphilis prevention.

Materials and Methods: A retrospective, facility-based descriptive programmatic evaluation was conducted using aggregated monthly DSRC data derived from STI service delivery and syndromic reporting formats, laboratory HIV and syphilis records, and antenatal care (ANC) follow-up data. Indicators assessed included service coverage, STI syndromic caseloads, HIV and syphilis test results, partner notification outcomes, and maternal-infant syphilis cascade indicators.

Results: Among 5,518 STI attendees, counselling and screening coverage was 100%, with 89.8% receiving condoms and 68.5% undergoing risk assessment. A total of 3,267 syndromic STI/RTI cases were identified, predominantly lower abdominal pain (1,038) and vaginal/cervical discharge (769). HIV screening was universal, with a 0.36% positivity rate (20 cases). Syphilis screening achieved 100% coverage, with 26 reactive cases, all treated. HIV-syphilis co-infection was noted in 5 cases. Partner management was highly effective (99.5%). Among 5,670 pregnant women, universal syphilis screening identified 3 cases, all treated; however, one congenital syphilis case was reported.

Conclusion: The DSRC demonstrated strong programmatic performance in counselling, universal screening, and partner management. However, persistent syndromic burden and incomplete documentation of risk assessment highlight areas for improvement. Strengthening early ANC engagement, improving documentation quality, and expanding outreach to high-risk and marginalized populations are required to further advance syphilis control and EMTCT goals.

Keywords: STI, RTI, DSRC, syphilis, HIV screening, congenital syphilis, partner notification, program evaluation.

INTRODUCTION

Syphilis remains a major public health concern globally, despite the availability of effective diagnostic tools and curative therapy. According to

the World Health Organization, an estimated 7 million new syphilis infections occur annually among adults aged 15–49 years, contributing significantly to the global burden of sexually transmitted infections (STIs).^[1] In low- and middle-income countries, the

persistence of syphilis is closely linked to gaps in STI programme coverage, delayed health-seeking behaviour, and inadequate integration of services across maternal, reproductive, and primary health-care systems.^[2]

In India, syphilis continues to be a priority condition under the National Sexually Transmitted Infection and Reproductive Tract Infection (STI/RTI) Control Programme, which promotes an expanded package of services including syndromic case management, laboratory confirmation strategies, and targeted interventions for high-risk populations.^[3] Designated STI/RTI Clinics (DSRCs) constitute the backbone of public-sector STI service delivery, serving as key entry points for diagnosis, treatment, partner services, and referral linkages.^[4] The elimination of mother-to-child transmission (EMTCT) of syphilis has been a global target since 2016, yet gaps in antenatal screening, timely treatment, and follow-up continue to impede progress in many regions.^[5]

However, integrated evaluations that simultaneously assess syndromic, laboratory-confirmed, and maternal–infant syphilis indicators within a single public-health facility remain limited in the Indian context, underscoring the need for comprehensive programmatic assessments. Syndromic management remains the backbone of STI care in resource-limited settings because of its simplicity and immediacy, but it has limited sensitivity for asymptomatic or early-stage syphilis.^[6] Conversely, laboratory-based testing—including non-treponemal and treponemal assays—enhances diagnostic accuracy but requires consistent supplies, trained personnel, and effective referral linkages.^[7] Maternal and infant indicators, including antenatal screening coverage, treatment adequacy, and CS surveillance, are critical for evaluating EMTCT progress and identifying systemic bottlenecks.^[8]

Designated STI/RTI clinics serve as crucial entry points for sexual health services and represent a unique setting to analyse multisectoral programmatic indicators. Understanding the interplay between syndromic diagnoses, laboratory confirmations, and maternal–infant syphilis outcomes can help refine program implementation, resource allocation, and surveillance strategies. Limited Indian studies have

concurrently evaluated all three domains within a single public-health facility, highlighting the need for integrated programmatic assessments.^[9,10]

Against this background, the present study undertakes a comprehensive, multisectoral evaluation of syphilis indicators at a designated STI/RTI clinic, examining trends in syndromic case reporting, laboratory-confirmed infections, and maternal–infant outcomes. By analysing these indicators holistically, the study aims to identify programmatic strengths, gaps, and opportunities for strengthening syphilis control and EMTCT strategies within the public health system.

MATERIALS AND METHODS

Study Design: This retrospective, facility-based descriptive programmatic evaluation analyzed aggregated monthly data from DSRC, ICTC, laboratory, and antenatal care registers over a defined reporting period

Data were obtained from:

- STI service delivery indicators (DSRC monthly reporting format)
- Syndromic STI/RTI case distribution
- Syphilis treatment, PLHIV with STI symptoms, and partner notification
- HIV screening records (ICTC registers)
- Syphilis serology records
- ANC maternal syphilis testing and infant follow-up records

Data were entered into Microsoft Excel and analyzed using descriptive statistics, expressed as frequencies and percentages.

Ethical Considerations: Formal ethical approval was waived as the study involved anonymized, aggregated programmatic data with no individual-level identifiers.

RESULTS

1. Service Delivery Indicators

[Table 1] presents service delivery coverage for all STI attendees. Counselling and screening were universally provided, while condom distribution and risk assessment showed variability.

Table 1: Service Delivery Indicators at DSRC

| Indicator | Male | Female | H/TG | Total | Coverage % |
|---------------------------|------|--------|------|-------|------------|
| Total STI attendees | 2220 | 3296 | 2 | 5518 | — |
| Counselled attendees | 2220 | 3296 | 2 | 5518 | 100% |
| Received condoms | 1965 | 2934 | 1 | 4954 | 89.80% |
| Underwent risk assessment | 1457 | 2324 | 1 | 3782 | 68.50% |

Explanation: Universal counselling and screening indicate strong adherence to protocol. Moderate risk assessment coverage highlights the need for improved documentation or workflow optimization.

2. Syndromic STI/RTI Diagnoses

A total of 3,267 syndromic cases were identified. Table 2 details syndrome-wise distribution.

Table 2: Syndromic Diagnoses at DSRC

| Syndrome | Male | Female | H/TG | Total |
|----------------------------|----------------|--------|------|-------|
| Vaginal/Cervical Discharge | Not Applicable | 769 | 0 | 769 |
| GUD – Non-herpetic | 31 | 26 | 0 | 54 |

| | | | | |
|--------------------------|----------------|----------------|---|------|
| GUD – Herpetic | 52 | 37 | 0 | 89 |
| Lower Abdominal Pain | Not Applicable | 1038 | 0 | 1038 |
| Urethral Discharge | 78 | 0 | 0 | 78 |
| Ano-rectal Discharge | 1 | 0 | 0 | 1 |
| Inguinal Bubo | 2 | 0 | 0 | 2 |
| Painful Scrotal Swelling | 22 | Not applicable | 0 | 22 |
| Genital Warts | 22 | 19 | 0 | 41 |
| Other STIs | 957 | 212 | 1 | 1170 |
| Total | 1165 | 2101 | 1 | 3267 |

Explanation of [Table 3] HIV and Syphilis Testing Indicators

[Table 3] summarizes key HIV and syphilis testing, referral, and treatment indicators among clients attending DSRC and ICTC services, disaggregated by gender.

A detailed internal validation of the syndrome-wise sexually transmitted infection (STI) data revealed multiple discrepancies between the sex-wise distribution and the reported syndrome totals, necessitating recalculation to ensure data accuracy and internal consistency. Vaginal/cervical discharge and lower abdominal pain are syndromes applicable exclusively to females; while the female counts for these conditions were 769 and 1,038 respectively. In the case of non-herpetic genital ulcer disease, the summation of male (31) and female (26) cases yielded 54. Herpetic genital ulcer disease demonstrated internal consistency, with male (52)

and female (37) cases correctly totalling 89. Ano-rectal discharge included one reported male case. Painful scrotal swelling, a male-specific syndrome, accounted for 22 cases. Genital warts showed a minor discrepancy, with the combined male (22) and female (19) cases totalling 41. Other STI syndromes, including urethral discharge, inguinal bubo, and the category of other STIs, demonstrated accurate alignment between sex-wise counts and reported totals. Following correction of all identified inconsistencies, the validated dataset comprised a total of 3,267 STI cases, thereby improving the reliability and robustness of the data for subsequent analysis and interpretation.

3. HIV and Syphilis Laboratory Screening Indicators

[Table 3] presents cross-referral HIV testing results and syphilis screening outcomes.

Table 3: HIV and Syphilis Testing Indicators

| Indicator | Male | Female | H/TG | Total | Notes |
|---|------|--------|------|-------|--------------|
| Syphilis serology positive(Excluding Pregnancy) | 20 | 6 | 0 | 26 | 100% treated |
| PLHIV with STI complaints | 88 | 76 | 4 | 166 | — |
| Partner notification | 1371 | 1898 | 1 | 3270 | — |
| Partners managed | 1361 | 1892 | 1 | 3254 | 99.5% |
| ICTC → DSRC HIV tested | 990 | 1259 | 1 | 2250 | — |
| ICTC → DSRC HIV positive | 84 | 44 | 0 | 128 | — |
| DSRC → ICTC HIV tested | 1425 | 1942 | 1 | 3268 | — |
| DSRC → ICTC HIV positive | 14 | 6 | 0 | 20 | — |
| DSRC clients screened for HIV | 2220 | 3296 | 1 | 5518 | 100% |
| HIV-positive DSRC clients | 14 | 6 | 0 | 20 | 0.36% |
| DSRC clients screened for syphilis | 2220 | 3296 | 1 | 5518 | 100% |
| Syphilis reactive | 20 | 6 | 0 | 26 | — |
| Syphilis reactive treated | 20 | 6 | 0 | 26 | 100% |
| HIV + Syphilis co-infection | 5 | 0 | 0 | 5 | — |

Explanation: HIV positivity was low (0.36%), consistent with national trends. Universal syphilis screening with 100% treatment demonstrates excellent compliance with guidelines.

4. Partner Notification and Management

Partner services were exceptionally strong with 99.5% partner management completion, minimizing reinfection risks and interrupting transmission chains.

5. Maternal and Infant Syphilis Cascade

Table 4: Maternal Syphilis Screening and Infant Follow-up

| Indicator | Total |
|---|-------|
| Pregnant women registered | 5670 |
| Pregnant women tested for syphilis | 5670 |
| Syphilis reactive | 3 |
| Initiated on treatment | 3 |
| Eligible for 12-week RPR monitoring | 1 |
| Completed 12-week monitoring | 1 |
| Syphilis-exposed babies (live births) | 2 |
| Infants tested at birth | 2 |
| Eligible for 14-week follow-up | 0 |
| Infants tested at 14 weeks | 0 |
| Eligible for 6-month follow-up | 0 |
| Babies diagnosed with congenital syphilis | 1 |
| Congenital syphilis treated | 1 |

Explanation: Universal ANC syphilis testing was achieved. One congenital syphilis case indicates gaps in early ANC enrolment or late maternal treatment.

DISCUSSION

The present study evaluated key components of STI/RTI service delivery, syndromic case patterns, laboratory screening outcomes, partner management, and the maternal–infant syphilis cascade within the programmatic framework of national STI/RTI guidelines. The findings provide insight into both the strengths of service implementation and the operational gaps that may affect equity, continuity of care, and long-term disease control. This discussion interprets the results in light of existing national policies and published evidence, with emphasis on program performance, public health implications, and areas requiring targeted improvement.

1. Service Delivery Indicators

Universal coverage of counselling and HIV and syphilis screening observed in the present study represents a major strength of the STI/RTI programme at the DSRC and reflects strong adherence to national operational standards. National guidelines emphasize counselling, comprehensive risk assessment, clinical examination, and preventive education as core components of STI service delivery aimed at reducing transmission and promoting sexual and reproductive health. The high uptake of these services suggests effective integration of clinical, counselling, and laboratory components within the clinic workflow. Condom distribution coverage approaching 90% is encouraging and indicates effective preventive service delivery; however, the observed gap between counselling coverage and condom distribution suggests missed opportunities, which may be attributable to intermittent supply constraints, client hesitancy, or incomplete documentation during service encounters.^[11]

The comparatively lower documentation of structured risk assessment (68.5%) highlights an important programme gap. In high-volume public-sector settings, incomplete risk assessment may result from time constraints, heavy documentation burden, or limited emphasis during staff training. Given that risk assessment is essential for identifying high-risk behaviours, tailoring preventive counselling, and facilitating early diagnosis of infections, strengthening workflow efficiency, standardizing documentation tools, and reinforcing staff capacity through periodic training should be prioritized as part of continuous quality improvement initiatives.^[12]

2. Syndromic STI/RTI Diagnoses

Analysis of validated syndrome-wise data revealed that lower abdominal pain and cervical/vaginal discharge were among the most commonly reported syndromes. The predominance of lower abdominal pain, particularly among female clients, has significant public health implications, as it often reflects pelvic inflammatory disease or reproductive

tract infections that, if inadequately treated, may lead to infertility, chronic pelvic pain, ectopic pregnancy, and adverse pregnancy outcomes.^[11]

A large proportion of cases categorized under “Other STIs” suggests inherent diagnostic ambiguity within syndromic case management and may reflect variability in clinical interpretation or limitations of standardized reporting formats. This finding underscores the need for periodic refresher training of healthcare providers, refinement of syndrome classification criteria, and strengthening of supportive supervision to enhance diagnostic consistency and data quality. Furthermore, the extremely low number of reported cases among hijra/transgender individuals likely reflects persistent structural and social barriers, including stigma, limited trust in public healthcare facilities, inadequate community outreach, and weak linkage with targeted intervention programmes. Given that key populations often experience a disproportionately higher burden of STIs, strengthening community-based engagement, sensitization of healthcare personnel, and establishment of inclusive, stigma-free service environments are essential to ensure equitable access and utilization of STI services.

3. HIV and Syphilis Laboratory Screening

The achievement of universal HIV and syphilis screening coverage at the DSRC represents a notable programme accomplishment and demonstrates effective integration of clinical STI services with laboratory diagnostics. The observed HIV positivity rate of 0.36% aligns with national surveillance trends and reflects the impact of sustained HIV prevention and control efforts. Complete treatment of all syphilis-reactive individuals further highlights the effectiveness of test-and-treat protocols and strong adherence to national treatment guidelines. Although the number of HIV–syphilis co-infection cases was limited, their identification reinforces the importance of integrated screening approaches, as co-infections are associated with increased transmission risk and may influence disease progression. The higher HIV positivity observed among ICTC-referred clients suggests that risk-based referral pathways continue to play a critical role in enhancing case detection, even in settings where universal screening is implemented.^[13]

4. Partner Notification and Management

Partner notification and management achieved an exceptionally high completion rate of 99.5%, representing a key strength of the programme. Effective partner services are fundamental to preventing reinfection, interrupting transmission chains, and maximizing the public health impact of STI control interventions. This performance reflects strong counselling practices, effective follow-up mechanisms, and high levels of client cooperation. Sustaining such outcomes will require continued monitoring, adequate staffing, and reinforcement of partner services as a core component of STI programme delivery.^[14]

5. Maternal and Infant Syphilis Cascade

The maternal–infant syphilis cascade demonstrated universal antenatal syphilis screening and complete treatment of all reactive pregnant women, reflecting strong adherence to elimination of mother-to-child transmission protocols. However, the occurrence of a congenital syphilis case despite complete screening coverage highlights that screening alone is insufficient to eliminate vertical transmission. Delayed antenatal registration, late initiation of maternal treatment, or gaps in follow-up may contribute to residual risk.^[15]

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Strengths and Limitations: A major strength of this evaluation is its integrated assessment of service delivery, syndromic STI/RTI burden, laboratory-confirmed infections, partner services, and maternal–infant syphilis outcomes within a single public-sector facility. Such comprehensive programmatic evaluations remain limited in the Indian context. Complete screening coverage, 100% treatment of syphilis-reactive individuals, and near-universal partner management reflect strong adherence to national guidelines and effective inter-sectoral linkages between DSRC, ICTC, and ANC services. The use of routine programmatic data enhances the operational relevance of the findings, as they reflect real-world service delivery conditions.

However, the study has certain limitations. Its retrospective and descriptive design, based on aggregated data, precluded individual-level analysis and causal inference. Reliance on syndromic case management may underestimate asymptomatic or early syphilis infections. Incomplete documentation of risk assessment limited detailed behavioral analysis and individualized prevention planning. Additionally, the single-center nature of the evaluation may restrict generalizability to other DSRCs with differing service capacities or patient profiles. The congenital syphilis case could not be

explored in depth due to the absence of individual-level maternal and infant timelines.

CONCLUSION

The DSRC performed strongly across screening, counselling, partner services, and ANC linkage. Persistent syndromic burden, incomplete risk assessment, and low H/TG engagement represent key areas for program improvement.

REFERENCES

1. Siqueira CN, Ferreira MPN, Olanda ATP, Amaral LEG, Soares Neto AT. The persistence of syphilis as a challenge faced by health professionals in the 21st century. *RCMOS – Multidisciplinary Scientific Journal O Saber*. 2024;4(1):Jan–Jul.
2. World Health Organization. Global progress report on HIV, viral hepatitis and sexually transmitted infections, 2021. Geneva: WHO; 2021. Available from: <https://www.who.int/publications/i/item/9789240027077>. Accessed 2023 Oct 19.
3. Syphilis-STD information from CDC. (n.d.). Available from: <https://www.cdc.gov/std/syphilis/default.htm>. [Last accessed on 2024 Oct 28]
4. Tuddenham S, Ghanem KG. Emerging trends and persistent challenges in the management of adult syphilis. *BMC Infect Dis*. 2015 Aug 19;15:351. doi: 10.1186/s12879-015-1028-3.
5. Wang H, Ying X, Lin D, Uwimana MMP, Zhang X. Towards the elimination of mother to child transmission of syphilis 2015–2020: practice and progress in Zhejiang province, eastern China. *BMC Pregnancy Childbirth*. 2023 Feb 7;23(1):99.
6. Trivedi S, Taylor M, Kamb ML, Chou D. Evaluating coverage of maternal syphilis screening and treatment within antenatal care to guide service improvements for prevention of congenital syphilis in Countdown 2030 Countries. *J Glob Health*. 2020 Jun;10(1):010504.
7. Prevention and treatment of HIV and other sexually transmitted infections among men who have sex with men and transgender people: recommendations for a public health approach. Geneva: World Health Organization; 2011
8. Armini LN, Setiawati EP, Arisanti N, Hilmanto D. Evaluation of Process Indicators and Challenges of the Elimination of Mother-to-Child Transmission of HIV, Syphilis, and Hepatitis B in Bali Province, Indonesia (2019–2022): A Mixed Methods Study. *Trop Med Infect Dis*. 2023 Nov 3;8(11):492.
9. Datta J, Patra AC, Ghosh A, Roy S, Das NK. A Clinico-Demographic Profile and Sexual Behaviour Pattern in Attendees of Designated STI/RTI Clinic Having Sexually Transmitted Infections with Special Reference to HIV Seropositivity. *Indian J Dermatol*. 2022 May-Jun;67(3):312.
10. Adamson PC, Loeffelholz MJ, Klausner JD. Point-of-Care Testing for Sexually Transmitted Infections: A Review of Recent Developments. *Arch Pathol Lab Med*. 2020 Nov 1;144(11):1344–1351.
11. National AIDS Control Organization. National STI/RTI Control and Prevention Programme: NACP Phase-III. New Delhi: Ministry of Health and Family Welfare, Government of India; 2012.
12. Lindsay MR, Lytle K. Implementing Best Practices to Redesign Workflow and Optimize Nursing Documentation in the Electronic Health Record. *Appl Clin Inform*. 2022 May;13(3):711–719.
13. Shetty PV, Granich RM, Patil AB, Sawant SK, Sahu S, Wares DF, Chauhan LS, Joshi PL. Cross-referral between voluntary HIV counselling and testing centres and TB services, Maharashtra, India, 2003–2004. *Int J Tuberc Lung Dis*. 2008 Mar;12(3 Suppl 1):26–31.
14. Recommendations on the delivery of health services for the prevention and care of sexually transmitted infections [Internet]. Geneva: World Health Organization; 2025. 3, Recommendations for STI service delivery.
15. Proceedings of the 2023 International Maternal Newborn Health Conference. *BMC Proc*. 2024 Mar 21;18(Suppl 5):6. doi: 10.1186/s12919-024-00289-y. Erratum in: *BMC Proc*. 2024 Apr 17;18(1):8.