Resurgence of syphilis among blood donors in a single institute in Eastern India: a looming threat to public health and transfusion services

Suvro Sankha Datta,[a,*] Aniruddha Hazra,[a] Najla Haneefa Basheela,[a] Sanjay Bhattacharya,[b] and Soumyadip Chatterji[c]

[a]Department of Transfusion Medicine, Tata Medical Center, Newtown, Rajarhat, Kolkata, 700160, India
[b]Department of Microbiology, Tata Medical Center, Newtown, Rajarhat, Kolkata, 700160, India
[c]Department of Infectious Diseases, Tata Medical Center, Newtown, Rajarhat, Kolkata, 700160, India

The Lancet Regional Health - Southeast Asia 2025;36: 100572

Published Online xxx
https://doi.org/10.1016/j.lansea.2025.100572

Comment

Sexually transmitted infections (STIs) such as syphilis impose major health and economic burdens globally. Understanding the trend of such infections in a given population is important for the efficient planning and implementation of disease control programs.[1] Blood transfusion services are uniquely positioned to contribute to the population surveillance studies by providing snapshots of the immunity status against any emerging infections in the ethnic populations they serve.[2] Globally, the incidence of syphilis has been observed to have dramatically increased recently.[3] In India, the National AIDS Control Programme (NACP) data has shown syphilis prevalence ranging from 0·01% to 0·77% in antenatal clinic attendees.[4] Although the incidence of transfusion-transmitted syphilis is extremely rare nowadays, the World Health Organization (WHO) states that syphilis testing should be a mandatory requirement for blood donation, as it serves as a surrogate marker for high–risk activities.[5] Hence, blood donors are screened for syphilis and up to four other infectious diseases in India. In this commentary, we report the rising incidence of syphilis sero-reactivity among blood donors at a tertiary care centre in eastern India over a 12-year period. Since these donors are healthy and symptom-free, we believe that this poses an immediate public health risk if it remains unreported.

All donors were non-remunerated, non-directed for whole blood donations and aged between 18 and 65 years. The donor selection included mandatory administration of a health history questionnaire and a brief physical examination in accordance with national guidelines.[6] Any disclosure of a high-risk behaviour or history of STI in the past leads to disqualification for blood donation and deferral of the donor. Syphilis testing was performed with the Syphicheck modified TPHA (*Treponema pallidum* haemagglutination assay) device (Syphicheck-WB, Viola Diagnostic Systems, India). Donations with a positive result were further tested on an RPR (rapid plasma reagin) test (Carbogen, Coral Clinical System, India) to determine whether the donor has a recent infection. The same diagnostic kits were consistently used throughout the study period for detecting both acute and chronic syphilis infections. Negative RPR results indicate a likely past infection or one in a very early or very late infection stage.[7] Donors found reactive for syphilis were permanently barred from giving blood after post-donation counselling and referred to sexual health clinics for appropriate management. Blood and blood products from these donors were discarded.

During the twelve-year period (2013–2024), on average (median), 10,770 donations were made annually. The median age of the donors was 32·5 years, and the majority were males (84·8%). There were 134,233 donations in this period, and 300 individuals tested positive for syphilis (0·22%). The data show syphilis prevalence trending gradually upward over the course of the past 6 years (2019–2024), along with a marked increase from 130 per 100,000 donations in 2019 to 450 per 100,000 donations in 2024 [Fig. 1]. Approximately 65% of these donors also tested positive in RPP with a median titre of 8. Syphilis-reactive donors tended to be younger (median age 26·5 years) compared to all donors and predominantly of the male gender (97·3%).

The aetiology of the increase in syphilis is unclear but is likely multifactorial. Numerous factors have been attributed to this rise, including increased use of dating apps, casual sexual encounters, reduced surveillance, and neglected management of STIs during the COVID-19 pandemic.[8] However, irrespective of the underlying cause of the increase, identifying the resurgence of any infection is fundamental to public health and can guide prevention efforts. In this case, early detection may prevent vertical transmission of syphilis from an infected female blood donor, which is known to have serious consequences on newborns.[9] Furthermore, the evolving mutations such as A965T and G1058C in 16S rRNA and A2058G and A2059G in 23S rRNA may lead to near-universal resistance of *T. pallidum* complicating the treatment strategies.[10]

*Corresponding author.
E-mail addresses: suvro.datta@gmail.com, suvrosankha.datta@tmckolkata.com (S.S. Datta).

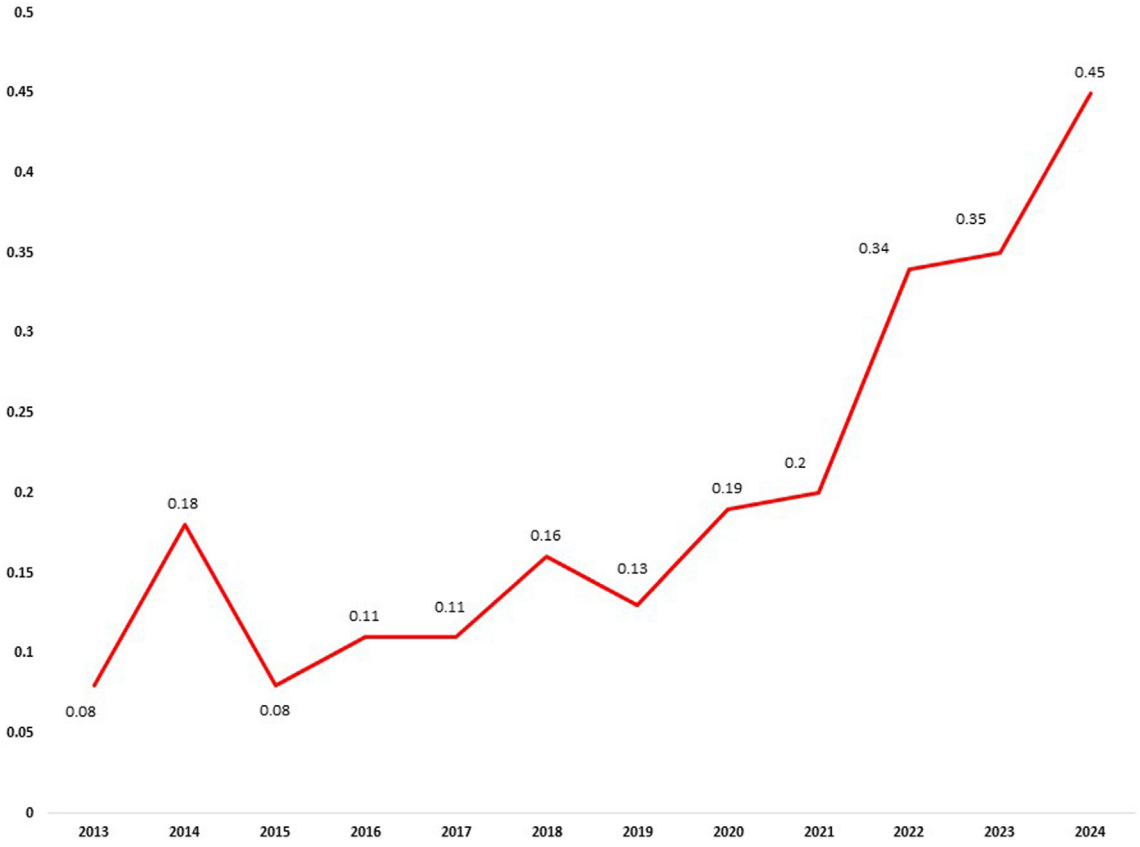

Fig. 1: Rate of increase in the number of donors with syphilis using the number from 2019 as the benchmark for determining the trend.

T. pallidum is sensitive to temperature; therefore, it is inactivated when the storage temperature declines to 4 °C or below. Additionally, the platelet storage bags kept at 22–24 °C permit gas exchange, exposing the treponemes to elevated oxygen concentrations that they cannot tolerate. However, a recent meta-analysis showed that a residual risk might still persist up to 7 days of storage.[11] Moreover, there is a renewed interest in using whole blood in trauma resuscitation, which may be transfused soon after collection with a limited storage, increasing the risk of transmission. Last but not least, experts in clinical microbiology, infectious diseases, transfusion medicine, and public health must be aware of the growing syphilis incidence in India and evolving blood transfusion practices in order to implement effective management, screening, and prevention strategies.

Contributors
SSD conceptualized the paper. AH and NHB were involved in data curation, formal analysis, and the manuscript preparation. SB and SC supervised the project and paper. SSD and SC were involved in the clinical care of patients. All contributors reviewed and approved the final draft of the manuscript.

Data sharing statement
The raw data supporting the conclusions of this article will be made available by the authors on reasonable request.

Declaration of interests
None.

Appendix A. Supplementary data
Supplementary data related to this article can be found at https://doi.org/10.1016/j.lansea.2025.100572.

References

1 WHO, *A tool for strengthening STI surveillance at the country level, World Health Organization*. World Health Organization; 2015.
2 Bloch EM, Busch MP, Corash LM, et al. Leveraging donor populations to study the epidemiology and pathogenesis of transfusion-transmitted and emerging infectious diseases. *Transfus Med Rev*. 2023;37:150769. https://doi.org/10.1016/j.tmrv.2023.150769.
3 Ghanem KG, Ram S, Rice PA. The modern epidemic of syphilis. *N Engl J Med*. 2020;382:845–854.
4 HIV Sentinel Surveillance Plus 2021 Antenatal Clinic Attendees, *Technical Report*. New Delhi: NACO: Ministry of Health and Family Welfare, Government of India; 2022.
5 Conti G, Notari EP, Dodd RY, et al. Syphilis seroprevalence and incidence in US blood donors from 2020 to 2022. *Transfusion*. 2024;64:325–333.
6 National standards for blood centres & blood transfusion services, National blood transfusion council. Ministry of Health & Family Welfare, Government of India. Available in: http://nbtc.naco.gov.in/page/bloodbankstandard/. Accessed December 20, 2024.

7 Papp JR, Park IU, Fakile Y, Pereira L, Pillay A, Bolan GA. CDC laboratory recommendations for syphilis testing, United States, 2024. *MMWR Recomm Rep*. 2024;73:1–32.

8 Rubin R. Syphilis has surged for reasons that go beyond the pathogen that causes it. *JAMA*. 2024;332:92–95.

9 Stafford IA, Workowski KA, Bachmann LH. Syphilis complicating pregnancy and congenital syphilis. *N Engl J Med*. 2024;390:242–253.

10 Lieberman NAP, Reid TB, Cannon CA, et al. Near-universal resistance to macrolides of Treponema pallidum in North America. *N Engl J Med*. 2024;390:2127–2128.

11 D'aes T, Van de Sande D, De Buck E, Zachée P, Compernolle V, Vandekerckhove P. Does cold storage of blood before transfusion prevent the transmission of syphilis? A systematic review and meta-analysis. *Vox Sang*. 2024;119:219–231.