

Study of ELISA in Screening of Transfusion Transmitted Infections in a Tertiary Care Hospital, Mahasamund

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ABSTRACT

Background: Blood transfusion is a life-saving procedure widely performed across surgical, medical, and obstetric settings. However, it carries the risk of transmission of several infectious agents—collectively termed Transfusion Transmitted Infections (TTIs)—if pre-transfusion screening is inadequate. The Enzyme-Linked Immunosorbent Assay (ELISA) has emerged as the gold standard for mandatory TTI screening in blood banks across India, owing to its high sensitivity and specificity. This study was undertaken to determine the seroprevalence of TTIs among blood donors screened by ELISA at the Blood Bank, District Hospital, Mahasamund, Chhattisgarh, in 2025.

Methods: A retrospective observational study was conducted at the Blood Bank, District Hospital, Mahasamund, from January 2025 to December 2025. Reactive blood donor samples detected by ELISA for HIV, HBV, HCV, and VDRL were analysed. Donor demographic details and infection patterns were collected from blood bank records and analysed descriptively.

Results: A total of 50 reactive blood units were identified during the study period. HCV was the most common TTI (32%), followed by HBV (24%), VDRL-reactive syphilis (24%), and HIV (20%). Most reactive donors were males (94%), predominantly belonging to the 18–30 years age group (52%). Peak TTI detection was observed in August and October, with six cases each.

Conclusion: HCV represents the dominant TTI at this institution, warranting enhanced awareness and counselling for blood donors. The high proportion of reactive cases among young adult males underscores the need for targeted pre-donation education. Continued and rigorous ELISA-based screening remains indispensable for ensuring transfusion safety in resource-limited settings.

Key-words: ELISA; Transfusion Transmitted Infections; HIV; HBV; HCV; VDRL; Blood Bank; Seroprevalence; Mahasamund; Chhattisgarh

INTRODUCTION

Blood and blood products are indispensable components of modern healthcare, routinely used in the management of haematological malignancies, trauma, major surgical procedures, obstetric emergencies, and chronic anaemias.^[1] While transfusion therapy is life-saving, it is not without risk.^[2]

Transfusion Transmitted Infections (TTIs) represent a significant global public health challenge.^[3] The principal TTIs of clinical concern include Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and *Treponema pallidum* (syphilis, detected via VDRL/RPR serology).^[4] Globally, these infections account for substantial transfusion-associated morbidity and mortality, particularly in low- and middle-income countries where voluntary blood donation rates may be suboptimal.^[5]

In India, the Drugs and Cosmetics Act and the National Blood Policy mandate screening of all donated blood for HIV, HBV, HCV, malaria, and syphilis as the minimum standard.^[6] The adoption of the Enzyme-Linked

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Immunosorbent Assay (ELISA) as the mandated screening test has considerably improved the sensitivity and specificity of TTI detection compared to earlier rapid card-based methodologies.^[7] ELISA enables the detection of specific antigens (e.g., HBsAg for HBV, HCV antigen for HCV) and antibodies (anti-HIV, anti-HCV, anti-*Treponema*), affording a robust screening platform even in resource-limited blood banks.^[8]

Mahasamund is a district of Chhattisgarh, a state characterised by a predominantly tribal and rural population with variable health literacy and high burden of infectious diseases.^[9] The District Hospital Mahasamund functions as the apex tertiary care referral facility for the region, catering to a diverse patient population requiring elective and emergency transfusions.^[10] Understanding the local epidemiology of TTIs is critical for tailoring donor recruitment strategies, pre-donation counselling, and public health interventions.^[11] Despite the clinical and epidemiological importance of TTI surveillance, data from Chhattisgarh's district-level blood banks remain sparse in published literature.^[12]

This study was therefore undertaken to analyse the seroprevalence patterns and demographic characteristics of transfusion-transmitted infection (TTI)-reactive blood donors identified by ELISA at the Blood Bank, District Hospital Mahasamund, during January–December 2025, and to determine the overall seroprevalence of TTIs among the screened blood donors.

MATERIALS AND METHODS

Study Design and Study Period- This retrospective, observational, descriptive study was conducted at the Blood Bank, District Hospital, Mahasamund, Chhattisgarh. Data were collected from blood bank registers for the period January 2025 to December 2025 (12 complete calendar months).

Study Setting- The Blood Bank, District Hospital, Mahasamund, is the sole government-run blood banking facility for the Mahasamund district, Chhattisgarh. It processes blood donations from replacement donors and voluntary camp donors serving the district population.

Inclusion Criteria- All blood units donated at the Blood Bank during the study period that were found reactive

(positive) for at least one TTI marker on ELISA screening were included.

Exclusion Criteria- Blood units with incomplete donor data or those not tested by ELISA were excluded.

Laboratory Methodology- All donated blood units underwent mandatory ELISA-based screening for the following four TTI markers as per NACO (National AIDS Control Organisation) and NBTC (National Blood Transfusion Council) guidelines:

HIV: Anti-HIV 1 & 2 antibody detection (3rd/4th generation ELISA)

HBV: Hepatitis B Surface Antigen (HBsAg) detection by ELISA

HCV: Anti-HCV antibody detection by ELISA

Syphilis (VDRL): Detection of reagin antibodies by VDRL/RPR assay

Reactive units were discarded as per standard blood bank protocol. Donors testing reactive were notified and referred for confirmatory testing and appropriate medical management.

Data Collection- Data were extracted from the blood bank TTI reactive register maintained at the Blood Bank, District Hospital, Mahasamund. Variables recorded included: date of donation, bag number, donor name, age, gender, reactive TTI marker, and blood group.

Statistical Analysis- Data were tabulated and analysed using descriptive statistics. Frequencies and percentages were calculated for categorical variables. Data were analysed month-wise and overall. No inferential statistical tests were applied given the retrospective and descriptive nature of the study.

Ethical Considerations- As a retrospective record-based study with no patient contact, formal ethical committee approval was not required.

RESULTS

A total of 50 blood units were found reactive for one or more TTI markers by ELISA during the study period of January to December 2025 at the Blood Bank, District Hospital, Mahasamund. Table 1 presents the month-wise distribution of reactive cases categorised by infection type. The highest number of reactive cases was recorded in August and October 2025 (6 cases each), followed by

March, June, September, November, and December (5 cases each). The lowest number was in February and July (2 cases each). Reactive cases were detected in all 12 months, indicating a year-round distribution.

Table 1: Month-wise Distribution of Transfusion Transmitted Infections (2025)

Month	Total Cases	HIV+	HBV+	HCV+	VDRL+
January 2025	3	1 (33.3%)	1 (33.3%)	1 (33.3%)	0
February 2025	2	0	0	0	2 (100%)
March 2025	5	1 (20%)	2 (40%)	2 (40%)	0
April 2025	3	1 (33.3%)	0	1 (33.3%)	1 (33.3%)
May 2025	3	0	0	1 (33.3%)	2 (66.7%)
June 2025	5	0	1 (20%)	4 (80%)	0
July 2025	2	0	0	2 (100%)	0
August 2025	6	1 (16.7%)	2 (33.3%)	0	3 (50%)
September 2025	5	1 (20%)	2 (40%)	2 (40%)	0
October 2025	6	2 (33.3%)	3 (50%)	1 (16.7%)	0
November 2025	5	2 (40%)	1 (20%)	0	2 (40%)
December 2025	5	1 (20%)	0	3 (60%)	1 (20%)
Total	50	10 (20%)	12 (24%)	16 (32%)	12 (24%)

HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; VDRL = Venereal Disease Research Laboratory (Syphilis)

Table 2 summarises the overall distribution of reactive cases by individual TTI. HCV (Hepatitis C Virus) was the most frequently detected TTI, accounting for 16 cases (32% of all reactive units). HBV (Hepatitis B Virus) and syphilis (VDRL-reactive) each accounted for 12 cases (24% each). HIV was the least prevalent, detected in 10 cases (20%).

Table 2: Distribution of TTI-Reactive Cases by Type of Infection

Infection	No. of Cases	Percentage (%)	Remarks
HCV (Hepatitis C Virus)	16	32	Most prevalent TTI
HBV (Hepatitis B Virus)	12	24	Equal to VDRL
VDRL (Syphilis)	12	24	Equal with HBV
HIV (Human Immunodeficiency Virus)	10	20	Least prevalent
Total	50	100	

Data represent absolute numbers and percentages of total reactive cases (n = 50)

Table 3 presents the gender distribution of TTI-reactive donors. An overwhelming majority of reactive donors were male (47 cases, 94%). Only 3 female donors (6%) were found reactive during the study period. This likely reflects the general pattern of blood donation in India, where males constitute the predominant donor pool, particularly in replacement donation settings.

Table 3: Gender Distribution of TTI-Reactive Donors

Gender	Number of Cases	Percentage (%)
Male	47	94
Female	3	6
Total	50	100

Table 4 categorises reactive cases into age groups. The 18–30 years age group contributed the highest proportion of reactive cases (26 cases, 52%), followed by 31–45 years (17 cases, 34%), 46–60 years (5 cases, 10%),

elderly above 60 years (1 case, 2%), and one paediatric case aged 12 years (2%). The overall age range was 12 to 62 years, with young adults constituting the dominant risk group.

Table 4: Age-Group Distribution of TTI-Reactive Donors

Age Group	No. of Cases	Percentage (%)	Category
< 18 years	1	2	Paediatric
18 – 30 years	26	52	Young adults (peak group)
31 – 45 years	17	34	Middle-aged adults
46 – 60 years	5	10	Older adults
> 60 years	1	2	Elderly
Total	50	100	

Table 5 presents the blood group distribution among reactive donors. Blood group O+ was the most common among reactive donors (19 cases, 38%), followed by B+ (13 cases, 26%), A+ (12 cases, 24%), and AB+ (6 cases,

12%). All reactive cases were Rh-positive. The distribution broadly reflects the general blood group prevalence in the Indian population.

Table 5: Blood Group Distribution of TTI-Reactive Donors

Blood Group	Number of Cases	Percentage (%)
O+	19	38
A+	12	24
B+	13	26
AB+	6	12
Total	50	100

DISCUSSION

This study presents the first systematic analysis of TTI seroprevalence among blood donors at the Blood Bank, District Hospital Mahasamund, Chhattisgarh, utilising ELISA-based screening over a full calendar year (2025). A total of 50 reactive blood units were detected, providing valuable insights into local infection patterns relevant for public health planning and blood safety improvement.^[13] The combined TTI reactive rate at this blood bank provides a useful benchmark for regional comparison. Studies from comparable district-level and tertiary care institutions across Central and Eastern India have reported similar or higher reactive rates, reflecting the ongoing burden of infectious diseases in these populations.^[14] The present study's findings are consistent with national-level data indicating that HCV, HBV, and syphilis continue to pose significant transfusion safety challenges.^[15]

The most notable finding of this study is the predominance of HCV (32%) as the leading TTI at this institution. This is in contrast to older national-level data from India, where HBV traditionally ranked highest among blood-borne TTIs.^[16] However, more recent multi-centre studies—particularly from Central India, Chhattisgarh, and tribal belt regions—have reported rising HCV seropositivity.^[17] Potential explanations include shared needles among intravenous drug users, unsafe injection practices in informal healthcare settings, previous blood transfusions with inadequately screened blood, and the absence of an effective vaccine for HCV (unlike HBV, for which a highly effective vaccine exists and is included in India's Universal Immunisation Programme).^[18] The high HCV burden at Mahasamund warrants prioritisation of HCV counselling during pre-donation screening and referral of reactive donors for confirmatory anti-HCV testing and linkage to care.^[19]



HBV and syphilis each accounted for 24% of all reactive cases. The persistence of HBV despite widespread vaccination coverage indicates the presence of a substantial unvaccinated or incompletely vaccinated adult cohort in the region, particularly among individuals born before the Universal Immunisation Programme achieved high coverage.^[20] Additionally, HBV may be transmitted perinatally, sexually, or through contaminated medical equipment—all routes of exposure relevant in a district hospital catchment area.^[21] VDRL reactivity (syphilis) at 24% is higher than values reported from urban tertiary centres but consistent with patterns seen in rural and tribal areas of Central India, where access to sexual health services remains limited.^[22] It is pertinent to note that VDRL is a non-treponemal test and may yield biological false-positives; however, in the blood bank context, any reactivity mandates the discard of the unit as a precautionary measure.^[23]

HIV accounted for 20% of reactive cases—a figure that, while lower than HCV and HBV in absolute terms, remains epidemiologically significant. The prevalence of HIV among blood donors at district hospitals in Chhattisgarh, a state with a higher-than-average HIV prevalence in certain pockets, reflects the importance of sustained ELISA-based screening and integration of blood bank TTI data with NACO surveillance systems.^[24] All HIV-reactive donors were referred to the Integrated Counselling and Testing Centre (ICTC) for confirmatory Western Blot testing and linkage to ART services.^[25]

The strong male predominance (94%) among reactive donors is consistent with the national trend of male-dominated blood donation, particularly in replacement donation, where family members (predominantly male) donate in response to a hospitalised patient's needs. This donor profile carries inherent risk, as replacement donors are generally considered higher risk than voluntary non-remunerated donors.^[26] The high proportion of young adult males (18–30 years, 52%) in the reactive group is consistent with epidemiological data indicating that this age group bears the greatest burden of HIV, HCV, and syphilis due to higher rates of risk behaviours (unprotected sexual activity, substance use, tattooing).^[27] The detection of a reactive case in a 12-year-old child is noteworthy and raises concerns about possible perinatal or transfusion-acquired infection, warranting careful clinical evaluation.^[28]

Peak reactive case detection in August and October may reflect seasonal variation in donor attendance and the type of donors presenting during those months. Festive periods and post-harvest seasons in rural Central India are associated with increased hospitalisation rates (trauma, agricultural injuries), driving higher replacement donation activity.^[29] Epidemiological variation in TTI transmission risk is also plausible across seasons. These trends should be tracked prospectively in future studies to determine their clinical and policy significance.^[30]

The implementation of ELISA for TTI screening at district blood banks represents a critical advancement over rapid card-based tests in terms of sensitivity and specificity. ELISA enables detection of both antigen and antibody markers, improving the ability to detect early-window-period infections (particularly for HIV and HCV with newer combined Ag/Ab assays).^[31] The mandatory adoption of ELISA under NBTC guidelines has been a pivotal policy measure in reducing transfusion-transmitted disease incidence nationally.^[32] This study reinforces the value of ELISA as the cornerstone of blood safety screening at this institution.^[33]

LIMITATIONS

This study has several limitations. Being a single-centre retrospective study, the findings may not be generalisable to the entire district or state population. The total number of blood donations during the study period was not available; therefore, the true seroprevalence rate could not be calculated and only absolute reactive cases were analysed. Confirmatory testing results such as Western Blot for HIV, HCV PCR, and TPHA for syphilis were not systematically recorded for all reactive donors, limiting differentiation between true positivity and false positivity. In addition, the study was limited to one calendar year (2025), making long-term trend analysis difficult. Information regarding donor category, including voluntary, replacement, or autologous donors, was also unavailable, restricting detailed risk stratification.

CONCLUSIONS

This retrospective study of ELISA-based TTI screening at the Blood Bank, District Hospital Mahasamund (January–December 2025) identified 50 reactive blood units across all 12 months of the study period. HCV emerged as the

most prevalent TTI (32%), followed by HBV and VDRL-reactive syphilis (24% each), and HIV (20%). Reactive cases were predominantly male (94%) and belonged to the 18–30 years age group (52%), underscoring the heightened vulnerability of young adult males. These findings have important public health implications. Specifically, they support: (a) scaling up HCV awareness and testing in the community; (b) strengthening adult HBV immunisation catch-up campaigns; (c) improving sexual health services to reduce syphilis transmission; (d) transitioning from replacement to voluntary non-remunerated donation to improve donor risk profiles; and (e) continued investment in ELISA infrastructure and quality assurance at district blood banks.

This study adds to the limited published evidence on TTI epidemiology from district-level blood banks in Chhattisgarh and provides a baseline for future longitudinal surveillance. ELISA remains an indispensable tool for ensuring transfusion safety in this resource-limited setting.

CONTRIBUTION OF AUTHORS

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REFERENCES

- [1] Chinwe AAO. Hematology and blood transfusion: An indispensable pillar of medical laboratory science. *J Clin Haematol.*, 2026; 7(1): 19-20.
- [2] World Health Organization. Blood safety and availability. WHO Fact Sheet. 2025. Available from: <https://www.who.int/news-room/fact-sheets/detail/blood-safety-and-availability>.

- [3] Golia S, Krishnappa V, Basha A, et al. Seroprevalence of transfusion-transmitted infections among blood donors in India: A systematic review and meta-analysis. *Vox Sang.*, 2025; 120: 958-968.
- [4] World Health Organization. Screening donated blood for transfusion-transmissible infections: Recommendations. WHO Guidelines. 2009. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK142989/>.
- [5] Golia S, Krishnappa V, Basha A, et al. Seroprevalence of transfusion-transmitted infections among blood donors in India: A systematic review and meta-analysis. *Vox Sang.*, 2025; 120: 958-68.
- [6] Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India. Blood transfusion services: National blood policy. DGHS. 2002. Available from: <https://dghs.mohfw.gov.in/bts.php>.
- [7] Bhatia P, Garg K, Kaur P, et al. Performance and diagnostic usefulness of commercially available enzyme linked immunosorbent assay and rapid kits for detection of HIV, HBV and HCV in India. *Virol J.*, 2013; 10: 45.
- [8] Makroo RN, Chowdhry M, Bhatia A, et al. Donor notification and counseling: Experiences and challenges from a private multi-speciality hospital in South India. *Asian J Transfus Sci.*, 2021; 15(2): 145-151.
- [9] Pathak VK, Singh S, Upadhyay RP, et al. Tribal population in India: A public health challenge and road to future. *J Family Med Prim Care*, 2020; 9(2): 508-12.
- [10] Garg S, Bhatt D, Beniwal P, et al. Burden and pattern of illnesses among the tribal communities in Central India: A report from a community health programme. *Indian J Med Res.*, 2015; 141(5): 663-71.
- [11] Mukherjee S, Bhattacharyya A, Mullick S, et al. Seroprevalence of transfusion transmitted infections in healthy blood donors: A 5-year tertiary care hospital experience. *Transfus Apher Sci.*, 2017; 56(5): 698-703.
- [12] National AIDS Control Organisation (NACO). Blood transfusion services: HIV seropositivity trends among blood donors. NACO Annual Report, 2021.
- [13] Golia S, Krishnappa V, Basha A, et al. Seroprevalence of transfusion-transmitted infections among blood donors in India: A systematic review and meta-analysis. *Vox Sang.*, 2025; 120: 958-68.

- [14] Pathak S, Agarwal N, Garg S. Prevalence and trends of transfusion transmitted infections among blood donors in a tertiary care hospital of Assam. *Sci Rep.*, 2025; 15: 1-9.
- [15] Golia S, Krishnappa V, Basha A, et al. Seroprevalence of transfusion-transmitted infections among blood donors in India: A systematic review and meta-analysis. *Vox Sang.*, 2025; 120: 958-68.
- [16] Arora D, Arora B, Khetarpal A. Seroprevalence of HIV, HBV, HCV and syphilis in blood donors in Southern Haryana. *Indian J Pathol Microbiol.*, 2010; 53:308-09.
- [17] Mitra K, Ghosh JB, Bhattacharya S. Seroprevalence of Hepatitis C virus among blood donors in a tribal-preponderant region of India. *Cureus*, 2024; 16(7): e64301.
- [18] Prasad L, Bhatt M, Bhatt AB, et al. Hepatitis C virus infection and risk factors for HCV positivity in injecting and non-injecting drug users attending a de-addiction centre in northern India. *Indian J Med Res.*, 2015; 142(5): 589-95.
- [19] Khatri GR. Donor notification and counseling: Experience and challenges. *Transfus Apher Sci.*, 2013; 49(3): 559-63.
- [20] Singh N, Thappa DM. Hepatitis B vaccine in national immunization schedule: A preventive step in India. *Indian J Dermatol Venereol Leprol.*, 2011; 77: 672-75.
- [21] Bora T, Bora P, Chutia H. Hepatitis B vaccination coverage rates among under-five children in India: A systematic review and meta-analysis protocol. *Front Pediatr.*, 2025; 13: 1632476.
- [22] Makroo RN, Bhatia A, Gupta R, et al. Seroprevalence of syphilis by VDRL test and biological false positive reactions in different patient populations. *Indian J Sex Transm Dis AIDS.*, 2020; 41(1): 50-55.
- [23] Singh P, Singh A, Garg K. Post-COVID-19 biologically false-positive VDRL: A case report. *Indian Dermatol Online J.*, 2022; 13(2): 246-48.
- [24] Assessment of Integrated Counselling and Testing Centers (ICTC) in Chhattisgarh, India. *J HIV AIDS.*, 2017; 3(1): 137.
- [25] National AIDS Control Organisation (NACO), Ministry of Health and Family Welfare. Blood transfusion services- HIV sero-reactivity among blood donors. NACO, 2022. Available from: <https://naco.mohfw.gov.in/blood-transfusion-services>.
- [26] Golia S, Krishnappa V, Basha A, et al. Seroprevalence of transfusion-transmitted infections among blood donors in India: A systematic review and meta-analysis. *Vox Sang.*, 2025; 120: 958-68.
- [27] Phukan S, Singh A, Chakrabarty S, et al. Prevalence and trends of hepatitis B virus, hepatitis C virus, human immunodeficiency virus 1, 2 and syphilis infections among blood donors in a regional transfusion center in Punjab, India: A 3 years study. *Asian J Transfus Sci.*, 2020; 14(2): 114-19.
- [28] Singh H, Dulhani N, Kumar N, et al. Rural epidemiology of HIV positive tribal patients from Chhattisgarh in India. *J Infect Dev Ctries*, 2010; 4(3): 176-81.
- [29] Sharma RR, Cheema A, Monga P, et al. Trends of infectious disease markers among healthy blood donors in Northern India: A ten-year study. *Transfus Apher Sci.*, 2022; 61(5): 103419.
- [30] Pathak S, Agarwal N, Garg S. Prevalence and trends of transfusion transmitted infections among blood donors in a tertiary care hospital of Assam. *Sci Rep.*, 2025; 15: 1-10.
- [31] Datta S, Khillan K, Ranjan V, et al. Nucleic acid amplification test: Bridging the gap in blood safety and re-evaluation of blood screening for cryptic transfusion-transmitted infection among Indian donors. *Indian J Med Res.*, 2019; 149(3): 389-95.
- [32] Pathak V, Singh R, Tiwari N. Added value of nucleic acid testing in blood banks: A 15-year retrospective study from India. *Cureus*. 2025. Available from: <https://www.cureus.com/articles/407138>.
- [33] World Health Organization. Screening donated blood for transfusion-transmissible infections: Recommendations. WHO Guidelines, 2009.

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