

HIV status of three mining districts of a tribal state in India: Evidence from ICTC data

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ABSTRACT

Background: Integrated Counselling and Testing Centre (ICTC) diagnose HIV and STIs early, modifies behavior, reduces vulnerability, and data helps in understanding transmission. Despite having low HIV prevalence, Jharkhand is vulnerable. Post Covid19, HIV has increased. This study examined the prevalence of HIV at ICTC facilities in three mine rich districts of Jharkhand and HIV prevalence as per age, geography, regional, and consequences were examined. **Methods:** Secondary data analysis was done for 2019–2022 accessible data of ICTC. Totally, 51,062 individual data were examined. Data analysis comprised parametricity testing while data was entered on Excel spreadsheet. Data were summarized using central tendency assessments and Chi-square tests. Logistic regression assessed HIV-positive outcomes and independent variables. *P*-value < 0.05 was statistically significant. SPSS 29.0 was used for data analysis. **Results:** Over three years, we recorded 51,508 occurrences, 69% of which were female (35241). Both male and female participants had mean ages of 35.93 ± 14.92 and 27.89 ± 10.67 years, respectively. We found 1.19% HIV prevalence (504/42818) in the ICTC test data. The odds ratio (OR) for HIV positivity was greater in males (3.49, 95% CI: 2.92-4.18) compared to females. HIV prevalence in District Giridih was 4.2% (3.42%-5.26%) with a high risk of HIV positivity (OR 4.24, 95% CI 3.42-5.26). A drop in HIV testing occurred during the COVID-19 lockdown. **Conclusions:** Since females are flooding ICTC, more targeted interventions, especially for younger women, are needed. Despite their lower numbers, men are at higher risk for HIV.

Keywords: Coal capital, HIV, ICTC data set, Jharkhand, mining districts

Introduction

Integrated Counseling and Testing Centers (ICTC) is a key component in the basic services division (BSD) of National

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AIDS Control Organization (NACO). It plays an important role in detection of HIV-infected individuals and its prevention and further treatment and care of people living with HIV (PLHIV) in the programme. Along with helping to overcome the barriers to voluntary counseling and testing (VCT) which includes, low perceived risk for HIV infection, negative perceptions of testing services, treatment facilities, lengthy - and post-test counseling, and shortage of counselors.^[1]

In India, the ICTC services are provided through Standalone ICTC (SA-ICTC), Facility-integrated ICTC (F-ICTC) and Mobile

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ICTC. Number of standalone ICTCs are 4486, Facility-integrated ICTCs at 24 × 7 PHCs are 4071 and ICTCs under public–private partnership model are 902.^[1]

According to UNAIDS, in 2021, the global burden of HIV accounts was approximately 38.4 million people. Out of which 36.7 million and 1.7 million were adults and children (<15 years old), respectively. Among 36.7 million affected adults 54% were women and girls.^[2]

India is having the third highest burden of HIV-infected people after South Africa and Nigeria. It has a total burden of 2.4 million people infected with HIV in which 2.33 million are adults and 70,000 are children.^[2,3]

As per the data given by the AIDS Control Society in October 2021, Jharkhand has 26,972 people affected by HIV. Among these 16,184 were males and 10,788 were females. Hazaribagh district has the highest prevalence of HIV, with 3,126 affected individuals, followed by Jamshedpur with prevalence of 1,822 and Ranchi with a prevalence of 1,522. The overall disease burden in Jharkhand has gradually increased.^[4]

The National AIDS Control Programme (NACP) which was started in 1992 under the Ministry of Health and Family Welfare (MoHFW), by the National AIDS Control Organization (NACO) is considered as the most successful public health programme in India. Over time, four phases of the NACP have been implemented, every phase for a duration of 5 years with an aim to improve coverage of detection, prevention, care, and treatment services provided to PLHIV.^[5]

HIV counseling and testing services were started in India in the year 1997 under the National AIDS Control Programme (NACP). In 2021, 33.8 thousand Integrated Counseling and Testing Centers are present across the country. They are mostly located in government hospitals.^[6]

Under NACP-III; pre-test, post-test, and follow-up counseling services provided by Voluntary Counseling and Testing Centers (VCTC) and facilities for the prevention of Vertical transmission, i.e. Prevention of Parent to Child Transmission (PPTCT) of HIV is integrated to provide services to the population under the same roof. This changed model was renamed as Integrated Counseling and Testing Centres (ICTC).^[7]

ICTC provides a gateway for Early detection, promoting behavioral changes, reducing vulnerability, including provisions for basic information on modes of transmission. It also acts as a link for the prevention of HIV in high-risk individuals and providing care and treatment services to the affected individuals. ICTC services are available throughout all public and private health facilities at all levels of the health system in India.^[8]

ICTC has a primary role in the identification of HIV-positive cases and ensuring the quality of life to HIV-positive people.^[1]

It serves to decrease ignorance, social stigma, and discrimination by use of information, education, and communication (IEC) Technique along with the increased efficiency and accountability of the working staff of ICTCs.^[9]

Though, Jharkhand is a low-prevalent state but considered as one of the highly vulnerable states. The overall burden of disease has gradually increased over the years.

This study was planned with the focus on the number of people attending ICTC centers within the three mining districts of Jharkhand namely Giridih, Dhanbad, and Bokaro to evaluate the number of people being diagnosed as positive with HIV infection.

The study was planned with an objective to:-

1. Review the number of people attending ICTC and diagnosed as HIV positive, among different age groups, and regions.
2. Determine the prevalence or burden of HIV infection in a particular region.
3. Compare the disease prevalence in different age groups and regions.

Methods

Study design—This study utilized an observational design, employing data analysis as its primary method.

Setting—The study focused on individuals who accessed services at ICTC centers in three districts of Jharkhand: Dhanbad, Giridih, and Bokaro.

Study size—The analysis encompassed a three-year period, specifically from 2020 to 2022, by assessing the available data. The data of 51,062 individuals were analyzed.

Variables—All entries on the SOCH portal consisted of Name, Age, Sex, Locality, Date, Anti-Retroviral Treatment status as linked or not linked, etc., and their HIV results as positive, negative, or pending.

Data source—The study utilized two primary data sources: The computerized and systematically organized data from the SOCH portal, and the manual registers that are maintained at the ICTC centers. The registers stored personal and miscellaneous data obtained during people's enrollment at the centers.^[10]

Bias—The study employed methods to enhance both internal and external validity. In order to maintain internal validity, rigorous methods for collecting data were developed, hence reducing potential bias and verifying the accuracy of the data.

A preliminary investigation was undertaken on a smaller subset of the same group prior to the comprehensive analysis. This preliminary investigation aimed to enhance the data-gathering tools, evaluate the practicality of the selected analyses, and

detect any possible concerns with the study’s structure that were resolved prior to examining the bigger dataset.

Statistical methods—The process of data analysis consisted of evaluating the parametricity of the data and entering it into Excel spreadsheets. The measures of central tendency were used to summarize the data, while applicable tests such as Chi-square were employed to demonstrate connections between different parameters. Logistic regression was employed to analyze variables in which HIV positive served as the dependent variable and other variables were considered independent. The study was conducted using SPSS software version 29.0, and a *P*-value below 0.05 was deemed to be statistically significant.

The study received ethical approval from the Institutional Ethics Committee prior to commencing.

Results

In our study, the total number of cases reported over the three years was 51,508, in which the majority (69%) were female (35,241). The mean age of the male and female participants was 35.93 ± 14.92 and 27.89 ± 10.67 years, respectively.

Table 1 shows the gender-wise breakup of the study participants with respect to year of enrolment (2020 to 2022),

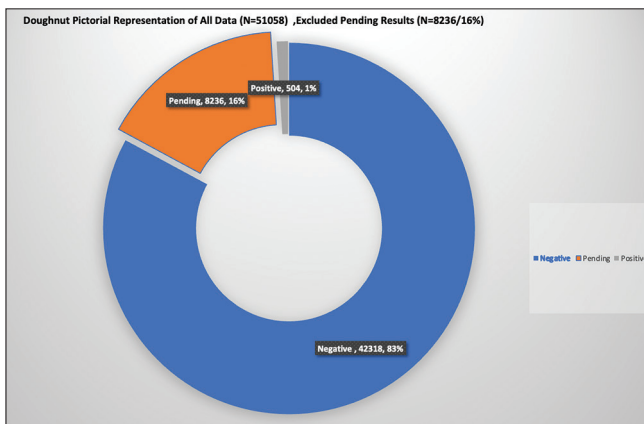


Figure 1: A tree diagram for excluding pending results and excluding 2019

age category, ART site, and ART status. The majority of cases belong to the female and 19–35 years of age category. Dhanbad had the highest number of ICTC testing done (66% approx). We found there is poor ART linked status as 60.60% are pending post-test counseling and 16.1% have pending results in ART linkage. The process of ART linkages is higher in females, however, pre- and post-test done is very poor in females. Also, loss to follow-up is reported higher in males in this study. The majority of the population is in follow-up, pending post-test counseling, or awaiting results. In our study, 35,241 of the participants were female and out of that 23,430 (66.5%) were pregnant.

After excluding HIV pending results for analysis in our study we found the prevalence of HIV is 1.19%, (504/42,818) in the ICTC test done [Figure 1].

The odds ratio (OR) for males compared to females is 3.49 (95% CI: 2.92-4.18), (*P*-value <0.00), indicating a high statistical significance.

Age group 18-35 years have a low risk (OR 0.43;95% CI: 0.28-0.64, *P* < 0.00) of HIV while the age group from 36 to 50 years age have the highest risk (OR 2.51; 95% CI: 1.67-3.77, *P* < 0.00).

District Giridih had the highest prevalence of HIV i.e. 4.2% (3.42%–5.26%) with a high risk for HIV prevalence of OR 4.24 (95% CI 3.42–5.26, *P* < 0.00) [Table 2].

A decrease in testing in numbers was noted during the first and second wave of COVID-19 in the region [Figure 2].

Discussion

Our study is an observational type based on data collected from records of the ICTC center for the year 2020–2022 on the study population attending ICTC center in the selected districts of Jharkhand to estimate the prevalence of HIV infection gender and age wise. Total number of population attending ICTC during 2020–2022 was 51,058. We have only taken the data of HIV positive and negative (42,818) in our analysis while excluding the pending results (8,240) from our study.

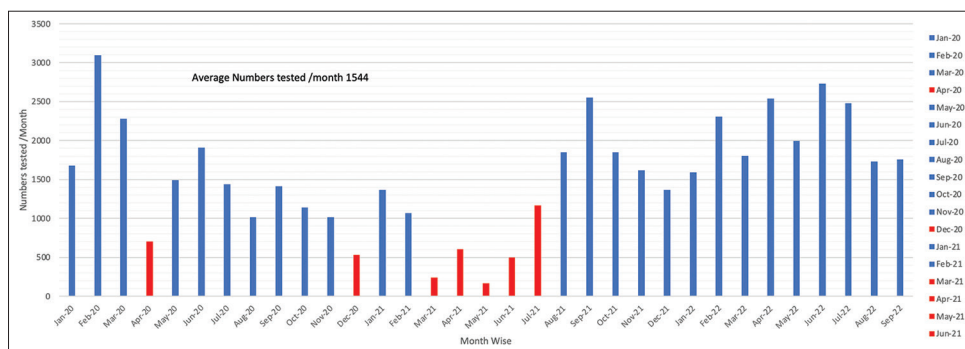


Figure 2: Trend of testing in ICTC centers during the study period

Among these, 12,605 (29.43%) were males and 30,217 (70.57%) were females, similar to Nayak *et al.*,^[11] reporting 61.6% females and 38.4% males.

In our study, the prevalence of HIV came to be 1.19% which is very high, as the prevalence of HIV in Jharkhand is 0.22%^[12] and in India is 0.21% as per WHO HIV Country Profile estimates 2023 and Summary of the HIV/AIDS Epidemic in India, 2021.^[13,14] This might be due to regional differences and COVID-induced interruption in services. The prevalence of

HIV in our study is similar to the prevalence of HIV in states like Bihar, Gujrat, Tamil Nadu, Uttar Pradesh, and Telangana.^[13]

The prevalence of HIV is four times higher in male (2.41%) as compared to females (0.69%) in our study. This finding is similar to other studies which reports 1.5 to 3 times the prevalence of HIV in males as compared to females.^[15] The most common reason could be for this that there is still high stigma for HIV and females are not supported and male not willing to get tested. These patterns have been noted globally as noted by a cohort study done on two simultaneous populations residing in China and in the US by Ma, Yudiayang *et al.*^[16]

However, the prevalence of HIV in males and females reported in the projected summary of the HIV/AIDS epidemic in India, 2021 are 0.22% and 0.19%, respectively.^[13]

In our study, the highest HIV prevalence, i.e. 3.96% is seen in the age group of 36–50 years followed by 1.96% seen in the age group of 51–65 years. Similar findings have been reported by the study done by Astha *et al.*^[15] and Dandona *et al.*^[17] Data from worldwide and African research consistently indicate a greater prevalence of HIV infection in males, especially in younger age groups Birdthistle *et al.*,^[18] Vose *et al.*^[19] While the total prevalence of HIV in India has decreased over time, the rate of decline among females has been comparatively slower Shri *et al.*^[3] Our study findings are worrisome as they indicate that a greater number of females are actively seeking HIV testing in comparison to males. However, a larger percentage of guys are testing positive for HIV. This disparity shows a need for specific measures to improve HIV prevention and testing practices for women in India.

Conclusions

Data analysis uncovers a troubling pattern: A substantial decrease in male participation in HIV testing. This discrepancy continues to exist throughout the region, impeding the ability to accurately estimate the incidence of HIV and causing delays in males' access to treatment. The significant decline in testing during the

Table 1: Description of various variables as per the ICTC data set

Variables	Female	Male	Total
Year			
2020	12,196 (68.9)	5,505 (31.1)	1,7701
2021	10,188 (71.0)	4,152 (29.0)	14,340
2022	12,857 (67.6)	6,160 (32.4)	19,017
Age			
<18	1,299 (60.5)	848 (39.5)	2,147
19-35	29,010 (76.9)	8,721 (23.1)	37,731
36-50	2,930 (45.5)	3,511 (54.5)	6,441
51-65	1,430 (43.5)	1,860 (56.5)	3,290
>65	572 (39.5)	877 (60.5)	1,449
Total	35,241 (69.0)	15,817 (31.0)	51,058
ART Site			
Dhanbad	23,521 (69.6)	10,268 (30.4)	33,789
Bokaro	9,383 (69.1)	4,205 (30.9)	13,588
Giridih	2,337 (63.5)	1,344 (36.5)	3,681
ART status			
ART Linked	136 (39.4)	209 (60.6)	345
ART Pending linkage	36 (50.0)	36 (50.0)	72
ART Referred	8 (29.6)	19 (70.4)	27
Follow up	9,124 (79.8)	2,311 (20.2)	11,435
Pending Post Test Counseling	20,907 (67.6)	10,029 (32.4)	30,938
Pending Results	5,023 (61.0)	3,212 (39.0)	8,235
Post Test Done	4 (80.0)	1 (20.0)	5
Pre Test	3 (100.0)	0 (0.0)	3
Total	35241 (69.0)	15817 (31.0)	51058

n (%) pattern followed for the values

Table 2: HIV positive in the data set along with the Logistic regression and ORs

	HIV Positive 504	HIV Negative 42,318	OR (95% CI)	P
Gender				
Female	207	30,010	1	
Male	297	12,308	3.49* (2.92-4.18)	<0.00
Age category				
<18 years	27	1,713	1	1
18–35 years	215	31,736	0.43* (0.28–0.64)	<0.00
36–50 years	196	4,945	2.51* (1.67–3.77)	<0.00
51–65 years	53	2702	1.24 (0.78–1.98)	0.36
>65 years	13	1,222	0.67 (0.34–1.31)	0.24
District Wise (Geographical Mapping- District wise OR Urban/Rural)				
Dhanbad	257	25,946	1	1
Bokaro	117	13,281	0.88 (0.71–1.10)	<0.29
Giridih	130	3,091	4.24* (3.42–5.26)	<0.00

*Indicates statistical significance

COVID-19 lockdown highlights the vulnerability of healthcare access for some populations during emergencies. Moreover, women in the reproductive age bracket are disproportionately susceptible to HIV infection. It is crucial to implement culturally appropriate and focused interventions that are precisely tailored to address the requirements of the population in order to effectively control the transmission of HIV in this area.

Limitations

Limited data as it is record based, As this study is based on secondary data, and incomplete or inaccurate entries will influence the results. Pending status shows the working efficiency of the ICTC center, delay in results can lead to lost to follow up or delay in diagnosis. It also affects the proportion of people with results status known in our study thus indirectly affecting the results and may leading to high burden of PLHIV. Factors responsible for high prevalence needs to be addressed. The testing for HIV has increased in study sites which could be a possible reason for reporting such a high burden of HIV. A short time period of two years is not a large enough time frame to have an accurate time trend.

Strengths

Very few studies have been done in Jharkhand on HIV/ICTC. The credibility of our findings is bolstered by the analysis of a sizable dataset of records sourced from a reliable and authentic source. Furthermore, the inclusion of their distinct features enriches the data with valuable heterogeneity, offering a more nuanced perspective on HIV prevalence in Jharkhand. This comprehensive approach strengthens the foundation for future research and interventions tailored to the specific needs of diverse communities within the region.

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Contribution

Role of various authors were as following—RKR, UKO-Conceptualisation, Data Curation, writing original draft, formal analysis. RS, SR, RR-Review. JR, RS, SR, RS-Data curation, Validation, Review., RRJ, RS, DK-Review and Methodology. RRJ, JR, RR, SR-Review. SR, RKR, UKO-Resources and Software. RKR, RS, RR-Data curation and analysis. RRJ, RS, RR-Review. DK, RKR RS-Investigation, Methods, Project Administration, review and Editing. *The final editing was done by all the authors. Lastly, all authors read and approved the final manuscript for publication.*

Data sharing statement

All data can be made available till 3 years on request.

Research involving human participants and/or animals

Though this article does not contain any studies with the direct involvement of human participants or animals performed by any

of the authors, all procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent

The data used in this study is deidentified from National Aids Control Organization data base. Study was done after approval from IEC of SNMMCH vide letter number 08/IEC/SNMMC/20/07/2022.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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