

# HIV/AIDS epidemic in West Bengal: An overview

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## ABSTRACT

**Background:** West Bengal is a low-prevalent state with high vulnerability for HIV. The state bears around 6% of HIV burden of India. With consistent effort on preventive, diagnostic, and curative services under National AIDS Control Program, HIV prevalence is gradually coming down. Our study objective is to determine the trend of HIV positivity among different groups/population attending Integrated Counseling and Testing Centres (ICTCs) over a period of 8 years and identify the group of population needing special attention. **Methods:** The study was conducted with available program data year-wise from 2008–2009 to 2014–2015 among different groups of population who attended ICTCs for HIV testing. Year-wise positivity was calculated and trend analysis was performed by linear regression method keeping year as regressor. Similar methodology was applied for different typologies among the high-risk groups (HRGs) and trend analysis was done using linear regression for the study period from 2012–2013 to 2014–2015. **Results:** HIV positivity among general male and non-pregnant individuals, HRG population, transgender (TG) population, and pregnant women showed a significant declining trend over the past 8 financial years, but the discordance rate remained almost the same. Regarding HIV positivity trend among different typologies of HRGs, trucker group showed a significant increase in HIV positivity over the past 3 years, whereas HIV positivity among other groups like female sex workers, men having sex with men, injecting drug users, and migrant labors did not undergo significant changes over the past 3 years. **Conclusion:** HIV-preventive services among truckers need to be emphasized. HIV screening services among the TG population should be further scaled up through more number of targeted interventions.

**Keywords:** High-risk groups, HIV positivity, ICTC, trend

## Background

India bears the third highest burden of HIV-infected individuals of the world, as far as HIV epidemic is concerned. As per HIV estimate 2015,<sup>[1]</sup> adult prevalence of HIV infection in India is 0.26%; among them, 0.3% is male prevalence and female prevalence is 0.22%. Among the states/UTs, in 2015, Manipur has shown the highest estimated adult HIV prevalence of 1.15%, followed by Mizoram (0.80%), Nagaland (0.78%), Andhra Pradesh and Telangana (0.66%), Karnataka (0.45%), Gujarat (0.42%), and Goa (0.40%). Besides these states, Maharashtra, Chandigarh, Tripura, and Tamil Nadu have shown estimated adult HIV prevalence greater than the national prevalence (0.26%), while Odisha, Bihar, Sikkim,

Delhi, Rajasthan, and West Bengal have shown an estimated adult HIV prevalence in the range of 0.21%–0.25%. This adult HIV prevalence in India is showing a gradual downward trend from 0.31% during 2009 to 0.26% during 2015. The total number of people living with HIV in India is estimated to be 21.17 lakhs (17.11–26.49 lakhs) in 2015 compared with 22.26 lakhs (18.00–27.85 lakhs) in 2007.

West Bengal is a low-prevalent state with high vulnerability. The state accounts for country's 6% load of HIV infection. The adult prevalence of HIV infection in West Bengal as per 2015 data is 0.21% with estimated load of 1.29 lakhs HIV-infected person. The overall prevalence has come down gradually over the years and in most of the cases prevalence among the key population has come down considerably in most of the groups.

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There are only few studies regarding HIV positivity trend in the states of India. Some studies have been found describing the trend of HIV epidemics in India. Therefore, this study aims at determining the trend of HIV positivity among different groups/population attending Integrated Counseling and Testing Centres (ICTCs). During this study, effort was made to portray the trend of prevalence of HIV infection as per programmatic data.

## Materials and Methods

### Study type and design

This is a retrospective record-based study carried out through analysis of secondary programmatic data.

### Study period

This study was carried out for a duration of 8 years (April 2008–March 2016).

### Study population

All the individuals tested for HIV at all the ICTCs present during different financial years in West Bengal. It was 142 during 2008–2009 and it scaled up to 256 during 2015–2016.

### Data source

Program data, that is, year-wise data of key population-wise testing figure and positive detection number were retrieved from computerized management information system and strategic information management system and computed in year-wise fashion.

### Analysis tool

The data were computed and compiled in Excel sheet and presented as charts, diagrams, and line diagram. The data were further analyzed in Statistical Package for Social Science Software (version 17) to determine statistical significance. *P* value less than 0.05 was considered significant.

### Ethical consideration

Shared confidentiality was maintained while collecting and analyzing the data. All HIV screening was done with prior consent of the client/parent of the HIV-exposed babies as per the guidelines of National AIDS Control Organization.

### Operational case definition

#### High-risk group

This is a group of population who are at high risk to contract HIV infection. These are female sex workers (FSWs), men having sex with men (MSM), injection drug users (IDUs), transgender (TG), migrant labors, and long-distance truckers.

#### Core group

This is a group of population who are at high risk to contract HIV infection by virtue of their common behavioral pattern. They are FSWs, MSM, IDUs, and TG.

#### Bridge group

This group of population contracts HIV infection from core group and tends to spread the infection to the general population. This group acts as a bridge between the group harboring concentrated epidemic and general population. This includes migrant labor, long-distance truckers, and so on.

**Table 1: Distribution of hiv positivity among different groups of population**

Indicators	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
General client tested	123,822	149,869	221,819	296,122	324,426	387,421	430,543	490,608
General client positive	5517	6338	7116	7452	6864	6878	6696	6180
Positivity	4.46	4.23	3.21	2.52	2.12	1.78	1.56	1.26
Pw tested	214,614	269,595	327,503	446,030	475,760	577,285	880,359	898,667
Pw positive	291	356	429	536	478	449	475	372
Positivity	0.136	0.132	0.131	0.120	0.100	0.078	0.005	0.041
Male client tested	78,868	90,664	133,716	174,919	189,747	232,581	260,569	285,478
Male client positive	3383	3967	4470	4662	4316	4346	4300	4002
Male client positivity	4.29	4.38	3.34	2.67	2.27	1.87	1.65	1.40
Female general client tested	44,752	58,978	87,791	120,690	134,197	154,079	169,096	204,395
Female general client positive	2117	2354	2626	2765	2517	2493	2372	2144
Female general (nonpregnant client) positivity	4.73	3.99	2.99	2.29	1.88	1.62	1.40	1.05
Tg client tested	202	227	312	513	482	761	878	735
Tg client positive	17	17	20	25	31	39	24	34
Tg positivity	8.42	7.49	6.41	4.87	6.43	5.12	2.73	4.63
Number of spouse tested	2247	2089	2497	2545	2710	2786	2984	3100
Concordant	1143	1199	1567	1407	1357	1442	1679	1674
Discordance percentage	49.13	42.60	37.24	44.72	49.93	48.24	43.73	46.00
Hrg tested	12,687	17,213	22,887	31,593	31,742	25,191	32,453	31,709
Hrg positive	868	635	523	649	502	337	378	407
Hrg positivity	6.84	3.69	2.29	2.05	1.58	1.34	1.16	1.28

Pw: Pregnant women; tg: transgender; hrg: High-risk group

## Results

The data of 8 years show 2.19% positivity among general individuals and 0.083% positivity among pregnant women [Table 1].

The positivity among nonpregnant general individuals shows a declining trend as seen in Table 2. So far as HIV positivity among the pregnant women is concerned, it also shows a downhill trend over the years [Table 3]. A similar declining trend of positivity among both the sexes has been noted over the years [Table 4].

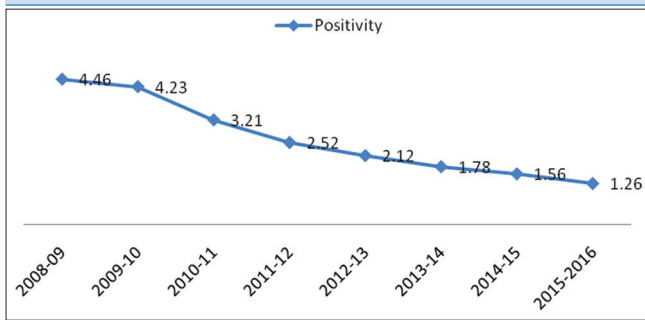
TG population tested for HIV in a minuscule percentage, that is, 0.17% among the general population tested. The positivity among TG does not show any downward or upward trend. This is most likely due to poor coverage of HIV testing among this population [Table 5].

High-risk groups (HRGs) are those who are supposed to harbor HIV as concentrated epidemic, but over the years HIV positivity among this population has started to decline [Table 6].

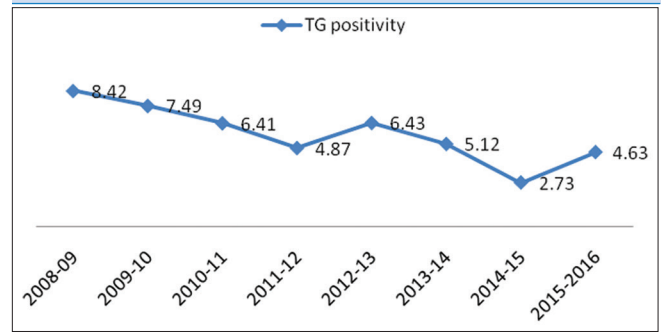
Discordance among sexual partner/spouse is an important issue in the perspective of new HIV infection transmission. When one partner is tested positive and other is tested negative for HIV, it is called discordant couple. The percentage of discordance among the general clients remained almost stationery throughout the past 8 years [Table 7].

Among the HRGs, typology-wise HIV testing pattern and positivity outcome have also been taken into account for the past 3 financial years [Tables 8 and 9].

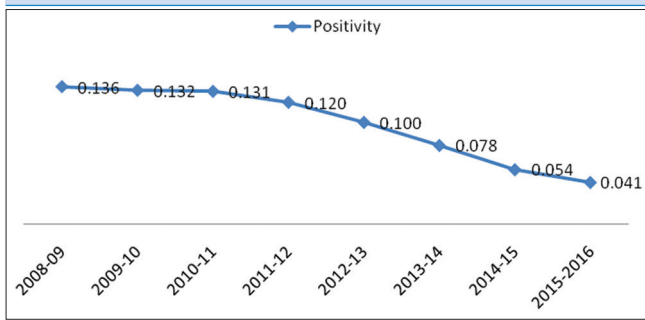
**Table 2: Year-wise HIV positivity trend among general individuals**



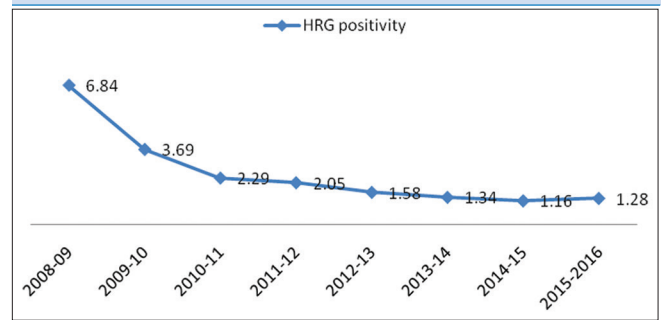
**Table 5: Year-wise HIV positivity trend among transgender population**



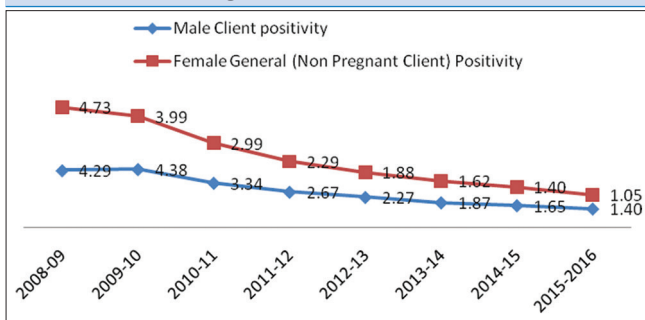
**Table 3: Year-wise HIV positivity trend among pregnant women**



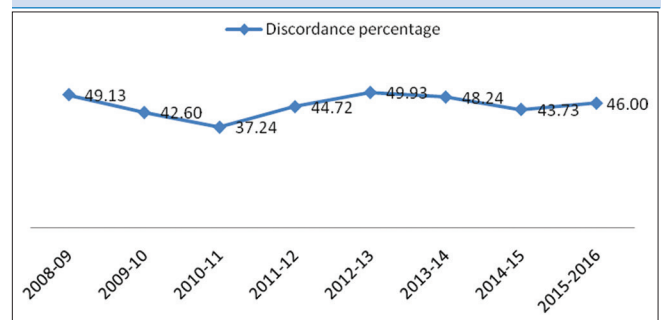
**Table 6: Year-wise HIV positivity trend among High Risk Group population**



**Table 4: Year-wise sex-wise HIV positivity trend among general individuals**



**Table 7: Year-wise discordance rate among general individuals**

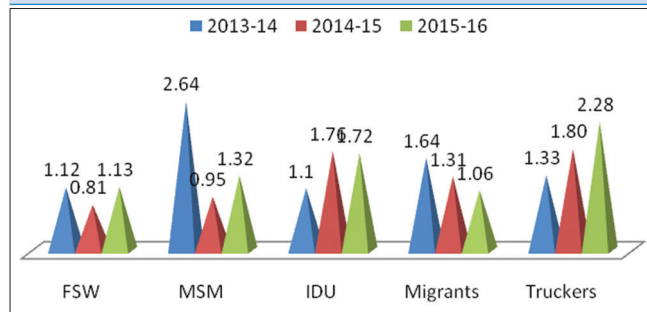


**Table 8: Distribution of HIV positivity among different typologies of high-risk group**

Subgroup of HRGs	Typology of HRG	2013-2014			2014-2015			2015-2016		
		Tested	Positive	Percentage of positivity	Tested	Positive	Percentage of positivity	Tested	Positive	Percentage of positivity
Core group	FSW	13,830	155	1.12	15,014	121	0.81	14,351	162	1.13
	MSM	1135	30	2.64	1679	16	0.95	1739	23	1.32
	IDU	997	11	1.1	1081	19	1.76	987	17	1.72
Bridge group	Migrants	5846	96	1.64	10,770	141	1.31	11,174	119	1.06
	Truckers	3383	45	1.33	2722	49	1.80	2853	65	2.28

HRG: High-risk group; FSW: Female sex worker; MSM: Men having sex with men; IDU: Injection drug user

**Table 9: Distribution of typology-wise high-risk group positivity**



**Table 10: Statistical analysis of annual trend of HIV positivity among the different groups**

	General client	PW	Male	Female	TG	Discordant	HRG
2008-2009	4.46	0.14	4.29	4.73	8.42	49.13	6.84
2009-2010	4.23	0.13	4.38	3.99	7.49	42.60	3.69
2010-2011	3.21	0.13	3.34	2.99	6.41	37.24	2.29
2011-2012	2.52	0.12	2.67	2.29	4.87	44.72	2.05
2012-2013	2.12	0.10	2.27	1.88	6.43	49.93	1.58
2013-2014	1.78	0.08	1.87	1.62	5.12	48.24	1.34
2014-2015	1.56	0.05	1.65	1.40	2.73	43.73	1.16
2015-2016	1.26	0.04	1.40	1.05	4.63	46.00	1.28
Beta	-0.48	-0.01	-0.46	-0.51	-0.63	0.26	-0.65
SE	0.05	0.00	0.04	0.06	0.16	0.68	0.18
Adjuster R <sup>2</sup>	0.94	0.91	0.94	0.92	0.68	-0.14	0.64
P	<0.001	<0.001	<0.001	0.000	0.007	0.72	0.01

PW: Pregnant women; TG: Transgender; HRG: High-risk group; SE: Standard error

**Table 11: Statistical analysis of annual trend of HIV positivity among different typologies of high-risk groups**

	FSW	MSM	IDU	Migrant	Truckers
2013-2014	1.12	2.64	1.1	1.64	1.33
2014-2015	0.81	0.95	1.76	1.31	1.80
2015-2016	1.13	1.32	1.72	1.06	2.28
Beta	0.00	-0.66	0.31	-0.29	0.475
SE	0.18	0.59	0.20	0.02	0.00
Adjuster R <sup>2</sup>	-1.00	0.10	0.40	0.99	0.99
P	0.98	0.47	0.37	0.05	0.00

FSW: Female sex worker; MSM: Men having sex with men; IDU: Injection drug user; SE: Standard error

Table 10 shows that HIV positivity among all the group of population has decreased over the years and this decline

is statistically significant. There is no significant change in discordance rate over the years [Table 11].

During the consecutive 3 financial years, there has been no significant change in HIV prevalence of the four groups involved in high-risk behavior. Trucker is the only group which showed A significant increase in positivity over the 3 financial years.

## Discussion

As per the result, it is evident that HIV epidemic in West Bengal is in declining mode except in some targeted population. Overall, HIV prevalence among pregnant women which is a surrogate marker of HIV prevalence among the general population has come down consistently over the years though HIV prevalence as HIV Sentinel Surveillance (HSS) shows higher prevalence when compared with programmatic data. HSS 2010–2011<sup>[2]</sup> demonstrated 0.13% HIV prevalence among pregnant women which further came down to a level of 0.11% during HSS 2014–2015,<sup>[3]</sup> but the programmatic data show less than one-third prevalence when compared with HSS data. It was also evident from program data that with gradual saturation of HIV testing coverage, positivity was found to come down. This could be attributed to scaling up of HIV testing services from urban to rural areas corroborating the fact that HIV is predominantly an urban disease.

HIV positivity among nonpregnant general individuals had also come down over the years. The decline was notably faster among the female population when compared with male counterparts.

TG population is known to be involved in anal sexual practice which is more potent route of HIV transmission than vaginal sex. Consequently, HIV prevalence among TG population was considerably higher than general population. The positivity trend varied from 8.42% to 2.73% during the past 9 years, but this decline was statistically significant. It was noteworthy that a little number of TG population had been tested so far and targeted intervention project hardly covered this population earlier. Most of the HIV testing happened either as self-referral or after being referred from MSM catering nongovernmental organizations (NGOs) or nontargeted intervention NGOs.

HIV positivity among the HRG population had also come down considerably over the years. The maximum decline was noted from 2008–2009 to 2012–2013.

Among the different typologies of HRG population, decreasing HIV positivity was noted among the migrant workers though it was not statistically significant decline. For truckers, it showed statistically significant increasing trend. For FSW population, it had almost become stationery during the past 3 years, but HIV positivity among the MSM population did not show any kind of increasing or decreasing trend. High positivity was noted among truckers and IDU population. The positivity among TG population was the highest till date. As per 2010–2011 HSS,<sup>[2]</sup> the positivity among MSM, truckers, migrant labor, FSW, and IDU was 5.09%, 3.71%, 1.61%, 2.04%, and 2.72%, respectively. This was more or less in keeping with program data. Consistent decline was a predictor of quality targeted intervention program among the FSW population. The other groups needed more rigorous intervention to contain the epidemic.

Another issue that needed to be discussed was the issue of discordance among the sexual partner or spouse. This had been almost stationery over the years. This discordant couple were needed to be followed up like HRGs and they are at high risk and could contract HIV at any time unless protection was properly taken.

This kind of study of trend of HIV epidemic is very rare in India.<sup>[4-8]</sup> Some studies at international level can be found. For example, a similar study had been conducted in Japan in 2015.<sup>[9]</sup> Another study based on HIV trend among MSM population was conducted in China.<sup>[10]</sup> No such study could be found in eastern India and especially low-prevalent states. This is also necessary to understand the effectiveness of the ongoing program and the areas to put emphasis.

## Recommendations

- HIV testing coverage among the priority population needs to be scaled up further to minimize the gap between estimated HIV-positive and detected so far
- TG population is a key population and dedicated targeted interventions are needed to cater them to bring them under the ambit of HIV testing and preventive services
- The reach of trucker's program should increase and intervention program may be strengthened further to get better outcome
- Discordant couple counseling and periodic testing of hitherto negative spouse or partner can contribute to HIV prevention program a lot.

## Limitations

Necessary data are only available for different typologies of HRGs for only consecutive 3 years. The quantum of TG population who underwent HIV testing is very low. These are the two major limitations of this study.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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