



## Assessment of HIV/AIDS Sero-Positivity Rate in the State of Nagaland, North-East India

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### Abstract

The present study intends to find the positivity rate of HIV/AIDS of 11 districts of Nagaland. Data from 6 different sources viz. Sentinel Sero-surveillance among antenatal clinic attendees, Prevention of Parent to Child Transmission Centers, Blood Banks, Female Sex Workers, Injection Drug Users and Integrated Counseling and Testing Centers were taken. The available HIV Sentinel Surveillance, Computer Management Information System and programme data was tabulated and analyzed using Microsoft Excel sheet and SPSS 13.0 software. Among antenatal clinic attendees the mean HIV prevalence rate was maximum i.e. 2.91% and 1.68% in the respective years of 2002 and 2003. HIV sero-positivity among blood donors was 0.52%. The mean HIV prevalence among Female Sex Workers was 10.8% and 16.40% in the years 2005 and 2006 respectively. The average prevalence rate was highest (9.4%) among Injection Drug Users in the year 2003. These findings can inform the extent of HIV infection and its trend in Nagaland and subsequently help in formulating preventive strategies.

**Keywords:** HIV/AIDS, Sero-positivity, ANC, PPTCT, FSW, IDU, ICTC.

### Introduction

HIV/AIDS is not merely a public health challenge; it is a political, social and economic challenge as well. When India's first AIDS case was reported in 1986, there were around 20,000 reported cases of AIDS worldwide<sup>1</sup>. It was initially thought to be the problem of a few large Indian cities or urban agglomerate such as Chennai and Mumbai. But, with the passage of time, the epidemic has grown alarmingly and at present six states viz. Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland, and Tamil Nadu have a high prevalence rate of more than 1% among the general population. In 1998 the HIV Sentinel Surveillance (HSS) was started in India principally to monitor the trends of HIV/AIDS prevalence and accordingly take measures to build up the control activities in different geographical areas and population groups. According to the Annual Round of HIV Sentinel Surveillance of 2003 conducted by NACO with the help of National Institute of Health and Family Welfare (NIHFW)<sup>2</sup>. The estimated number of 5.1 million HIV infections in India consists of 3.48 million general population, 1.49 million STI patients, 70000 Female sex workers, 10000 intravenous drug users, and 55000 children. In North-East (NE) India, the HIV/AIDS epidemic driven by unsafe sex and injecting drug use (IDU) is highly concerning. Nagaland and Manipur are two of the hard-hit NE Indian states with the highest HIV/AIDS prevalence. Nagaland detected its first AIDS case in 1994. Here the increasing cases of HIV/AIDS are particularly based on IDU and unsafe sex. Reaching drug users who share needles with accurate information on how to avoid the disease is a major concern in the state. Although the prevalence of infection among IDUs has been a major concern, a more concerning fact about the present scenario is that, the

shift has been gradually increasing more towards the vulnerable population groups including women, young people, high risks groups and the bridge populations. Young people in the age group of 20-29 years have been identified as contributing the highest number of HIV/AIDS patients in Nagaland. Among them the highest mode of HIV transmission is through the sexual route. According to the fact sheets prepared by the Population Foundation of India in 2003<sup>3</sup>. The incidence of HIV/AIDS infection among STD clinic attendees and ante-natal (transmission from mother to baby) cases in rural Nagaland have also been increasing, posing a serious challenge for the health managers. Rising numbers of pregnant women, whose sexual behavior is not believed to be risky, are testing positive for HIV. Accurate information on how to avoid the always fatal disease and the elimination of the stigma against its victims can help the state stem the tide of the epidemic. It is of prime importance to get a clear picture of how the HIV/AIDS epidemic is growing at different states, regions and sub-regions of the country. In this backdrop, HSS data provides essential information to understand the trends and dynamics of HIV epidemic among different risk groups. It aids in refinement of strategies and prioritization of focus for prevention, care and treatment interventions under the National AIDS Control Programme (NACP)<sup>4</sup>.

### Material and Methods

**HIV Sentinel Surveillance:** HIV Sentinel Surveillance (HSS) involves carrying out annual cross-sectional facility-based HIV Sero-prevalence surveys among selected population groups. Prior to 2003, the sentinel sites in India included primarily the antenatal clinics (ANC) and sexually transmitted disease (STD)

clinics. Since 2003, the HSS started tracking the trends and levels among core risk groups viz. female sex workers (FSWs), men who have sex with men (MSM) and injecting drug users (IDUs).

**Computer Management Information System:** Through the Computer Management Information System (CMIS) all the programme units under National AIDS Control Programme report the progress of services and interventions to State AIDS Control Societies and NACO. Most of the Programme components are monitored through the information coming through CMIS. Details of the information that is available through CMIS under different programme components are given below.

**ICTC Data on General Clients:** Integrated Counseling and Testing Centers (ICTC) formerly known as Voluntary Testing and Counseling Centers (VCTC) report the data related to the counseling and testing of general clients as well as pregnant women. The VCTC and PPTCT service was re-modeled into ICTC in India from October, 2007. NACO has been expanding Voluntary Counseling and Testing Centres since 1998. Significant progress has been made during 2003–04 with the technical support of the WHO and UNAIDS. General clients may be those who voluntarily come for HIV testing or those who are referred by a physician or service provider. Client-initiated/Voluntary/Direct walk-in clients refer to those who come for testing due to their own risk perception. Risk perception may be because of their own risk behaviour or behaviour of their spouses/partners. Provider-initiated/Referred clients are those who are referred for HIV testing by a physician/surgeon/NGO, etc.

**ICTC Data on Pregnant Women (PPTCT Data):** Prevention of Parent to Child Transmission (PPTCT) centers have been established in almost all the government hospitals up to Community Health Center (CHC) level. The pregnant women who visit government hospitals for antenatal clinics are referred to PPTCT centre for counseling on HIV and HIV testing. If a pregnant woman is found positive, she is followed up to promote institutional delivery and at the time of delivery, the pregnant woman and the baby are given a single dose of Nevirapine, to prevent the transmission of HIV from mother to child. All the PPTCT centres report this information to State AIDS Control Society (SACS) and NACO through CMIS.

**Blood Bank Data:** Under Blood Safety Programme, it is mandatory to screen every unit of blood donated for 5 Transfusion Transmissible Diseases (TTD) – HIV, Hepatitis B (Hbv), Hepatitis C (Hcv), Syphilis and Malaria. The programme promotes voluntary blood donation so that the risks associated with professional blood donors are eliminated. All the blood banks in the country are supported by NACO and they report to NACO on the blood units collected at each centre. Four sub-groups of blood donors are reported in the system – Voluntary male donors, Voluntary female donors, Replacement male donors and Replacement female donors.

**Data Collection and Analysis:** Extensive field visits were paid to each sentinel site and HIV testing centers of all the 11 districts of Nagaland during May–September 2010. All the HSS and programme data from ICTC, PPTCT and Blood Banks of each district from 2002-2009 were thoroughly scrutinized and entered into the CMIS database in accordance with the guidelines laid down by NACO. The Programme data (ICTC, PPTCT, Blood Bank) were tabulated on Microsoft Excel sheet and Individual level data from HSS (ANC, FSW, IDU) in SPSS format. Accordingly analysis was done using SPSS 13.0 software and Microsoft Excel. Here emphasis was to focus more on developing a comprehensive understanding of HIV/AIDS scenario in Nagaland state, rather than to develop an in-depth statistical analysis. Only descriptive statistical analysis was done to understand the current level of HIV/AIDS from the annual positivity data for the latest year available. Analyzing and describing each of these parameters will give a broad picture of the HIV epidemic scenario in all the district of Nagaland.

## Results and Discussion

**Dimapur District:** The HIV/AIDS sero-positive status of Dimapur district as revealed in table-1 shows that during 2002-2008, out of 544 tested clients, only 0.91% was found HIV+ve in the year 2004 from the HSS-ANC site. While in 2006, HIV prevalence rose to over 1.47% compared to the previous years. Accordingly, the PPTCT data in table-1 shows that during 2005-2009, the lowest HIV positivity was found in the year 2007 (1.44% out of 2219 tested respondent) whereas it rose to 2.10% in the year 2008. The Blood bank data in table-2 shows that HIV sero-prevalence during the period of 2007-2009 went up from 0.2% to 0.3% in last one year. Of those 250 tested FSW cases, table-2 shows that 16.40% were found positive in 2006 which is more significant compared to other years. Exceptionally, HIV infection among IDUs in Dimapur district decreased from 8.4% to 3.2% between 2005 and 2006, but there is a rapid increase in HIV sero-prevalence (5.20%) among IDU in 2007. From the ICTC data as shown in table 3, it was found that the positivity rate of HIV/AIDS increased to over 10.9% in 2005. Again it decreased to 6.75% and 4.21% in the consequence years of 2006 and 2007 respectively but in 2008, the positivity rate increased to 10.35% which shows that the epidemic is rapidly gaining ground.

**Kohima District:** From table-1, it is seen that in Kohima the reported tested cases of HIV/AIDS from ANC site increased over the years and also the HIV incidence as measured by prevalence has increased from 1.13% in 2002 to 1.59% in 2005. In 2007, it decreased to 0.48% and again a rapid increase of 1.12% in 2008. The PPTCT data reveals that in 2006, HIV prevalence was highest (1.66%) and it was comparatively low in 2009 though it has increased from 1.08% to 1.25% in the respective years of 2007 and 2008. Table-2 shows that the blood bank data for the year 2005 and 2006 were not available; however, the rest of the data indicates a variation in the reported HIV prevalence during 2007-2009. Among IDUs as seen in

table-3, the prevalence of HIV infection was 4% in 2005 and 6% in 2006 and a concomitant decline was noted in 2007 (2%). From the ICTC data as shown in table-3, it is clear that the HIV prevalence declined from 4.3% in 2005 to just over 3.24% in 2008 but in 2009, it increased to 3.35%.

**Tuensang District:** The results of HIV/AIDS positivity rate of Tuensang district, table-1 reveals that the prevalence among the ANC attendees of sentinel sero-surveillance ranged between 8% and 3%. As depicted in table-1, HIV positivity rate recorded at PPTCT centers has increased from 1.75% in 2007 to 2.56% in 2009. Table-2 indicates that the prevalence among the blood donors from blood bank of the district ranged between 0.0% and 0.50% between 2007 and 2008. Among IDUs as seen in table 3, the positivity rate of HIV/AIDS has significantly reduced from 24.8% in 2003 to 2.80% in 2007 but there was no significant change in the HIV positivity rate from 2004-2006. The HIV positivity rate recorded at ICTC center (table-3) reveals that in 2005 the rate was highest (5.67%) comparatively to other time

periods (5.1% in 2006, 2.73% in 2007, 3.37% in 2008 and 3.67% in 2009).

**Mokokchung District:** From table-1, the ANC data of Mokokchung district shows that there was appreciable variation in the overall sero-positivity rates compared over the last seven years viz. 2002-2008. The sero-positivity for HIV/AIDS increased in 2004 (1.65%) after an initial decline in 2003 (0.2%) while no positive cases were found in 2007, meaning a thorough decline in their rate, however, in 2008 it increased to 1%. The PPTCT data (table-1), however, has shown a progressive decrease in HIV rates during 2006-2009. On the other hand, the HIV positivity rate recorded at blood bank as seen from table-2 has remained almost stable during the period from 2007-2009. While there is a continuous declining trend in the sero-positivity of HIV/AIDS, the same for both HSS-IDU and ICTC data (table-3) showed a decline from 2004 to 2007 followed by an increase in 2008 of ICTC data (3.6%). But, the highest sero-positivity (12.32%) was observed in the year 2005.

**Table - 1**  
**HIV Positivity Rate of Nagaland: HSS – ANC and PPTCT**

	Year	Dimapur	Kohima	Tuensang	Mokokchung	Phek	Mon	Zunhebeto	Wokha	Kiphire	Peren	Longleng
HSS - ANC	2002	238 (1.26)	351 (1.13)	400 (8.0)	400 (1.25)	-	-	-	-	-	-	-
	2003	652 (1.00)	400 (1.5)	400 (4.2)	398 (0.2)	235 (2.12)	400 (1.25)	249 (0.08)	369 (0.8)	400 (4.00)	-	-
	2004	544 (0.91)	494 (2.0)	685 (5.69)	725 (1.65)	582 (0.17)	702 (0.56)	338 (1.77)	441 (0.68)	-	-	-
	2005	743 (1.21)	563 (1.59)	701 (6.27)	732 (0.9)	498 (1.20)	350 (2.29)	768 (0.78)	480 (1.45)	-	-	-
	2006	677 (1.47)	521 (1.15)	621 (4.66)	721 (0.97)	604 (0.16)	544 (0.36)	545 (1.46)	437 (0.68)	256 (1.17)	400 (2.25)	399 (0.00)
	2007	748 (1.06)	625 (0.48)	765 (5.0)	785 (0.00)	687 (1.16)	796 (0.25)	800 (1.00)	662 (0.60)	145 (0.69)	399 (0.50)	354 (0.00)
	2008	786 (1.15)	802 (1.12)	800 (3.0)	801 (1.00)	782 (1.02)	800 (0.38)	725 (2.00)	659 (0.46)	363 (1.65)	390 (1.03)	345 (0.29)
	2009	-	-	-	-	-	-	-	-	-	-	-
	2002	-	-	-	-	-	-	-	-	-	-	-
PPTCT	2003	-	-	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	-	-	-	-
	2005	1831 (1.53)	-	-	-	325 (0.62)	463 (0.0)	289 (1.73)	-	-	-	-
	2006	1263 (1.82)	1502 (1.66)	-	1454 (1.17)	494 (1.42)	438 (0.0)	450 (1.56)	896 (0.56)	-	275 (2.18)	-
	2007	2219 (1.44)	1484 (1.08)	1546 (1.75)	2098 (1.00)	746 (0.54)	1795 (1.20)	1548 (0.71)	1448 (0.55)	709 (2.96)	795 (0.75)	693 (0.00)
	2008	2667 (2.10)	2399 (1.25)	1323 (1.97)	2458 (0.98)	746 (0.80)	1589 (2.52)	1898 (0.47)	659 (0.46)	417 (0.72)	966 (0.52)	751 (0.13)
	2009	3459 (1.62)	2498 (0.96)	1448 (2.56)	2598 (0.65)	844 (1.90)	1572 (2.02)	1847 (0.38)	-	699 (0.86)	776 (0.52)	625 (0.64)

**Table - 2**  
**HIV Positivity Rate of Nagaland: Blood Bank and HSS - FSW**

	Year	Dimapur	Kohima	Tuensang	Mokokchung	Phek	Mon	Zunhebeto	Wokha	Kiphire	Peren	Longleng
<b>Blood Bank</b>	2002	-	-	-	-	-	-	-	-	-	-	-
	2003	-	-	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	-	-	-	-
	2005	-	-	-	-	-	-	-	-	-	-	-
	2006	-	-	-	-	-	-	-	-	-	-	-
	2007	2771 (0.2)	1242 (0.60)	236 (0.00)	633 (0.2)	128 (2.3)	74 (0.0)	121 (0.00)	55 (0.00)	-	-	-
	2008	3106 (0.3)	2008 (0.40)	434 (0.50)	665 (0.0)	84 (0.0)	80 (0.0)	237 (0.40)	32 (0.00)	-	-	-
	2009	3293 (0.2)	1575 (1.10)	447 (0.00)	612 (0.20)	181 (1.1)	54 (0.0)	255 (0.00)	202 (0.00)	-	-	-
<b>HSS - FSW</b>	2002	-	-	-	-	-	-	-	-	-	-	-
	2003	250 (4.4)	-	-	-	-	-	-	-	-	-	-
	2004	248 (4.4)	-	-	-	-	-	-	-	-	-	-
	2005	250 (10.8)	-	-	-	-	-	-	-	-	-	-
	2006	250 (16.40)	-	-	-	-	-	-	-	-	-	-
	2007	247 (8.91)	-	-	-	-	-	-	-	-	-	-
	2008	-	-	-	-	-	-	-	-	-	-	-
	2009	-	-	-	-	-	-	-	-	-	-	-

**Table - 3**  
**HIV Positivity Rate of Nagaland: HSS – IDU and ICTC**

	Year	Dimapur	Kohima	Tuensang	Mokokchung	Phek	Mon	Zunhebeto	Wokha	Kiphire	Peren	Longleng
<b>HSS – IDU</b>	2002	-	-	-	-	-	-	-	-	-	-	-
	2003	-	-	189 (24.8)	186 (2.6)	-	-	-	250 (0.8)	-	-	-
	2004	-	-	250 (8.8)	239 (7.0)	201 (1.00)	246 (0.4)	-	248 (0.4)	-	-	-
	2005	250 (8.4)	250 (4.00)	250 (10.8)	250 (4.8)	225 (0.89)	250 (2.0)	-	254 (0.39)	-	-	-
	2006	250 (3.2)	250 (6.00)	250 (5.2)	212 (1.42)	278 (1.08)	249 (0.4)	236 (0.85)	244 (0.82)	-	-	-
	2007	250 (5.20)	250 (2.00)	250 (2.80)	250 (1.17)	175 (1.71)	241 (0.0)	224 (0.89)	243 (1.23)	-	-	2 (0.00)
	2008	-	-	-	-	-	-	-	-	-	-	-
	2009	-	-	-	-	-	-	-	-	-	-	-
	<b>ICTC</b>	2002	-	-	-	-	-	-	-	-	-	-
2003		-	-	-	-	-	-	-	-	-	-	-
2004		-	-	-	-	-	-	-	-	-	-	-
2005		3320 (10.9)	3790 (4.3)	3596 (5.67)	2365 (12.32)	177 (5.21)	185 (1.08)	251 (0.80)	144 (2.77)	-	-	-
2006		5884 (6.75)	4478 (4.42)	5116 (5.1)	3274 (5.94)	369 (2.83)	347 (1.15)	506 (3.36)	340 (2.05)	-	366 (3.01)	-
2007		10174 (4.21))	4706 (3.8)	10709 (2.73)	6946 (2.7)	1437 (2.20)	5165 (0.34)	2726 (1.61)	3559 (0.34)	467 (1.92)	442 (0.90)	400 (0.00)
2008		5604 (10.35)	7966 (3.24)	6035 (3.37)	9210 (3.6)	1186 (2.86)	248 (2.66)	2460 (0.81)	2772 (0.83)	789 (3.54)	1186 (2.11)	1020 (0.29)
2009		10653 (7.28)	7877 (3.35)	7465 (3.67)	11423 (2.48)	3480 (0.92)	496 (2.49)	4809 (0.19)	4583 (0.33)	2520 (1.11)	2513 (0.76)	2269 (0.30)

**Phek District:** A continuous fluctuation of HIV positivity rate in Phek district was noticed from the HSS-ANC data as revealed in table-1, and it recorded a relatively low HIV prevalence of 0.16% in 2006. From the PPTCT data, table-1, the prevalence rate is highest (1.90%) in 2009 followed by the lowest prevalence rate 0.54 % in 2007. From the blood bank data in table-2, it is seen that the highest prevalence of HIV/AIDS was found in 2007 (2.3%) and the lowest prevalence in 2009 (1.1%); although there were 84 tested respondents in the year 2009 none were found to be HIV positive. Among IDU table-3 shows that the prevalence is 1.0% in 2004 followed by 0.89% in 2005, 1.08% in 2006 and 1.71% in 2007. The prevalence of HIV/AIDS was found to be highest in 2005 (5.21%) among the ICTC clients (table-3) and it showed a decreasing trend, but with a slight increase in the year 2008 (2.86%).

**Mon District:** The prevalence of HIV/AIDS in Mon district (table-1) shows an up and down trend of positivity rate among the ANC attendees during the time period of 2003-2008, where the positivity rate was highest in the year 2005 (2.29%). Moreover, there were 463 and 438 respondent tested in 2005 and 2006 respectively, none of whom were found to be HIV positive among the PPTCT clients. The other PPTCT results (table-1) shows maximum 2.52% HIV patients' sero-positive in the year of 2008 followed by 2.02% in 2009 while the least 1.20% was found in 2007. During 2007-2009, the positivity rate was nil among blood donors (table-2). Of the total 250 tested IDUs, 2.0% were found HIV sero-positive in 2005. The positivity rate was stable (0.4%) among the IDUs (table-3) between the years 2004 and 2007 as none of them were found to be HIV positive. The ICTC data reveals that, the HIV/AIDS prevalence rate is 0.34% in 2007 and there were major variations with high prevalence in some of the years as depicted in table-3.

**Zunhebeto District:** For Zunhebeto District, as observed from the results of HSS-ANC in table-1, it is evident that the positivity rates were comparatively low in the year 2003 (0.08%) and 2005 (0.78%) where as more than 1% positivity rate was found during the rest years. The PPTCT data in table-1 reveals that the HIV prevalence declined from nearly 1.73% in 2005 to just over 0.38% in 2009. None of the blood donors were sero-positive in the year 2007 and 2009; whereas, 0.40% sero positivity was observed among the blood donors in 2008 (table-2). Table-3 indicates that during 2006 and 2007, a total number of 236 and 224 IDUs were tested and the positivity rate was recorded as 0.85% and 0.89% respectively. The trend in relation to ICTC data (table-3) shows maximum prevalence in the year 2006 (3.36%) and the minimum prevalence in the year 2009 (0.19%).

**Wokha District:** Table-1 reveals that the HIV prevalence percentage among ANC attendees has increased from 0.68% in 2004 to 1.45% in 2005 and after that it showed a decreasing trend up to 0.46% in 2008. During 2006-2008, the proportion of those found sero-positive out of those being tested for HIV has

decreased from 0.56% in 2006 to 0.46% in 2008. The positivity rates were nil among the blood donors as recorded in the blood bank data of table-2 between the years 2007-2009. In table-3, it is seen that out of 243 respondents, the positivity rate (1.23%) was much higher in 2007 among the IDUs and it was the minimal (0.39%) in the 2005. Moreover, the prevalence ranges from 2.77% in 2005 to 0.34% in 2007 among the ICTC clients as depicted in table-3.

**Kiphire District:** The results of Kiphire district from table-1 shows a much higher prevalence of 4% among the ANC attendees in 2003 and after that the positivity rate decreased up to 0.69% in 2007 and again a sudden increase of 1.65% has been seen in 2008. The PPTCT data (table-1) from 2007-2009 shows a significant decline in HIV/AIDS positivity; where the lowest prevalence was 0.72% in 2008. Table-3 shows the HIV/AIDS positivity rates as 1.92%, 3.54% and 1.11% among the ICTC clients during 2007, 2008 and 2009 respectively.

**Peren District:** Here, from table-1, it is seen that the HIV/AIDS positivity rate from the HSS-ANC site had increased to 2.25% in 2006 but it again decreased to 0.50% in 2007. The PPTCT data from table-1 indicates a decreased sero-positivity rate of HIV/AIDS i.e. from 2.18% in 2006 to 0.75% in 2007, and also the positivity rate has remained almost stable during 2008-2009. The ICTC data from table-3 reveals a declining trend of 4% - 0.76% of HIV positivity from 2007 to 2009.

**Longleng District:** Table-1 shows that the prevalence rate of HIV/AIDS for the year 2006 and 2007 among the ANC clients were nil, whereas the prevalence rate was 0.29% in the year 2008. The same table shows zero prevalence among the PPTCT clients in the year 2007. However, the positivity rate has slightly increased from 0.13% in 2008 to 0.64% in 2009. The HSS-IDU data from table-3 reveals that out of 2 tested respondents none were found to be HIV positive. Among the ICTC clients, the positivity rate has increased from .29% to .30% between the year 2008 and 2009 (table-3).

## Conclusion

The present study recorded the mean HIV prevalence rate among ANC attendees of sentinel sero-surveillance site as the maximum i.e. 2.91% and 1.68% in the respective years of 2002 and 2003, figure-1. However, there has been no increase in the successive years in the rate of HIV prevalence among ANC attendees as revealed by sentinel surveillance in Nagaland. In comparison the prevalence among ANC attendees in West Bengal was 0.41% in 2004, 0.86% in 2005 and 0.40% in 2006<sup>5</sup> and also the HIV prevalence among antenatal women was 0.49% in Punjab for the year 2002 as reported by NACO<sup>6</sup>. As could be observed from the results, the prevalence is greater than 1% in our study. In 2006, prevalence among mothers attending PPTCT centers in West Bengal was 0.17%, whereas in the present study the maximum prevalence rate was found to be 1.48% in the same year. Results from this study have

indicated that HIV sero-positivity among blood donors which is 0.52% is more than that of 0.03% as reported in Haryana<sup>7</sup> but, less than the HIV sero-positivity of 1.28% as found amongst the blood donors in Lucknow<sup>8</sup>. The mean HIV prevalence amongst the FSWs is highest in the state of Maharashtra at 17.91% during 2007-2008. This is followed closely by the states of Manipur, Andhra Pradesh and Mizoram where the mean HIV prevalence among FSWs is at the estimated levels of 13.07%, 9.74% and 7.20% respectively<sup>9</sup>. On the other hand, our study reveals that the mean HIV prevalence among FSWs in Nagaland stands at 10.8% and 16.40% in the years 2005 and 2006 respectively. The highest HIV prevalence amongst IDUs was reported in Amritsar at 30.40% followed by two other sites viz. Churachandrapur and Chennai at 28% and 27.2%<sup>9</sup>. It is observed in the present study that the average prevalence rate was highest (9.4%) among IDUs in the year 2003 followed by the second highest prevalence rate of 4.46% in 2005. Injecting drug use is the principal driver of the HIV epidemic in northeastern states of India particularly in Nagaland. Approximately 25% of the IDUs reside in the northeastern states. Interestingly, HIV prevalence in Nagaland which was first detected through IDUs has shown a decrease in the transmission route which stood at 6% 2009-2010 and now stands at 5.65% through needle – syringe infection. In West Bengal, Maharashtra (Mumbai), Kerala, Delhi, Punjab and Chandigarh twenty districts have shown 5% or more HIV prevalence among IDUs in 2008-2009<sup>9</sup>. In our study, an attempt was also made to observe the trends of sero-positivity from data available from ICTC of various districts of Nagaland. The trends suggest that the sero-positivity for HIV amongst clients attending ICTCs is consistently reducing in all the district of

Nagaland from 2005-2007. But in 2008, the positivity rate was exceptionally higher and again in 2009, the sero-positivity rate amongst ICTC clients of Nagaland shows a declining trend indicating slowing down of HIV transmission.

The data from blood banks is relatively less useful since the characteristic of the individuals whose blood is tested is not available except for sex and whether the person is a voluntary or replacement blood donor. It is hence really difficult to determine which population group is represented in the Blood Bank. The blood bank data is also not a good measure to analyse trends in HIV positivity because - (1) the data for the previous years is grossly incomplete and (2) the methods of organizing camps might have changed over a period of time, which is not captured by the database. However, it still gives a vague idea of the positivity levels among general population.

Concerning the sexual route of transmission, stressed must be given on incorporation of life skills in schools and colleges. Since the society is still very apprehensive of talking about sex, there is the need for young people to have adequate information about going into pre-marital sex. And since it cannot be stopped, proper steps must be taken like start normalizing condoms, facts of life need to be understood and taught in the right perspective and not misuse or abuse it, etc. Officially Nagaland does not have any brothels or red light areas but commercial sex workers are very much prevalent in the state particularly in Dimapur. The fact is that, young girls and college students are sometimes seen in this trade. It endangers their lives, their families and the society at large. The highest numbers of women in the age group of 21–25 years are into sex work.

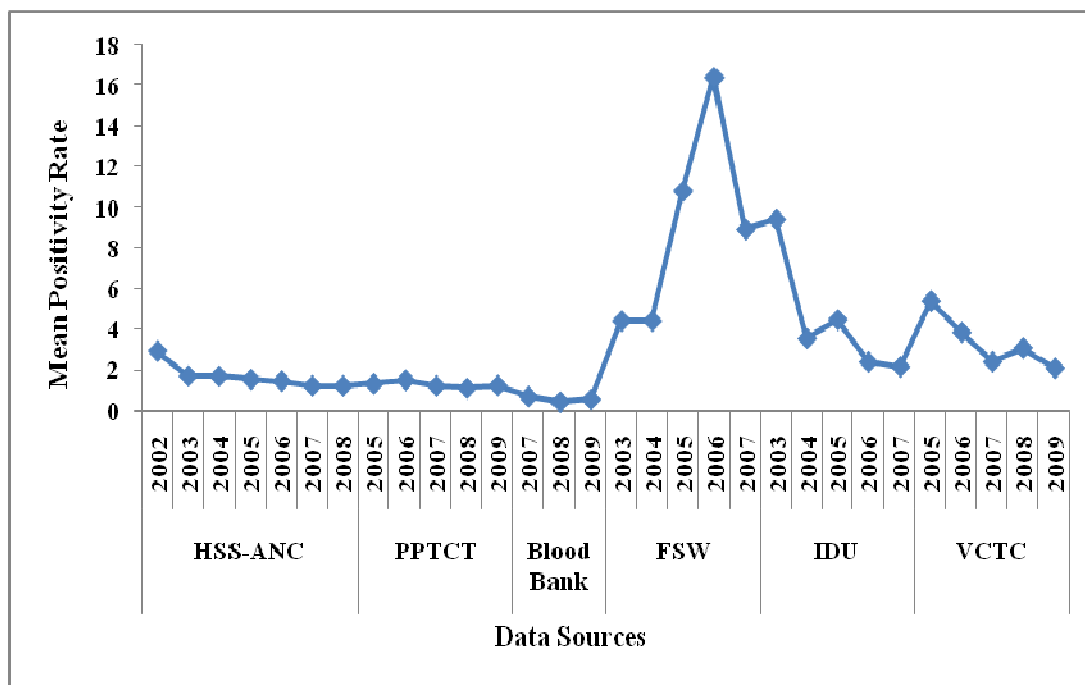


Figure - 1  
 Trend of HIV/AIDS in Nagaland (2002-2009)

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## References

1. Dasgupta S., Halt and Reverse the HIV Epidemic: Millennium Development Goal and NACP-III, *Ind. J. Pub Health*, **51(1)**, 3-6 (2007)
2. National Institute of Health & Family Welfare, *Report on Annual HIV Sentinel Surveillance*, National AIDS Control Organization (NACO), Ministry of Health & Family Welfare, New Delhi, India (2003)
3. Population Foundation of India, *HIV/AIDS in India - The Hard-hit States – Nagaland* (2003) [<http://www.prb.org/pdf/Nagaland.pdf>]
4. *HIV Sentinel Surveillance*, NACO, [[http://www.naco.gov.in/NACO/National\\_AIDS\\_Control\\_Program/10711/](http://www.naco.gov.in/NACO/National_AIDS_Control_Program/10711/)]
5. Shukla R.S. and Bhuyan K.K., Can Data on HIV Seroreactivity among Blood Donors Provide an Insight into HIV Prevalence in the General Population?, *Ind. J. Pub Health*, **51(1)**, 14-21 (2007)
6. Benjamin A.I., Singh S., Sengupta P. and Dhanoa J., HIV Seroprevalence and Knowledge, Behaviour and Practices Regarding HIV/AIDS in Specific Population Groups in Ludhiana, Punjab, *Ind. J. Pub Health*, **51(1)**, 33-38 (2007)
7. Arora D.R., Gupta V. and Arora B., Surveillance of HIV infection in Haryana, *Ind J Comm Med.*, **25(1)**, 19-21 (2000)
8. Choudhary N., Ayagiri A. and Ray V.L., True HIV Seroprevalence in Indian Blood Donors, *Trans Med.*, **10(1)**, 1-4 (2000)
9. United Nations General Assembly Special Session (UNGASS), *Country Progress Report, India* (2010) [[http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/2010progressreportsubmittedbycountries/india\\_2010\\_country\\_progress\\_report\\_en.pdf](http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/2010progressreportsubmittedbycountries/india_2010_country_progress_report_en.pdf)]