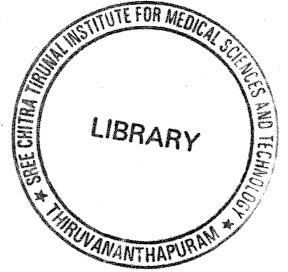


FIELD PROJECT REPORTS



By

KEISAM PURNAMALA DEVI
(MAE- FETP Scholar 2006-2007)



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*Submitted in partial fulfillment of the
requirements for the degree of*

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Of



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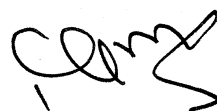
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CERTIFICATION

This is to certify that all the field projects submitted in this Bound Volume are original work carried out by **Dr. Keisam Purnamala Devi** during the two field postings of six months each under the guidance of faculty of National Institute of Epidemiology (ICMR), Chennai and the local supervisor specially nominated for this purpose. This is in partial fulfillment of the requirements for the degree of Master of Applied Epidemiology and has not been submitted earlier by her in part or whole for any other (publication or degree) purpose.

Date : 29-02-2008



DIRECTOR

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Section 1: First Field Posting

Situation Analysis Of Imphal East District, Manipur, India, 2006

1. Introduction

According to the report by the Registrar General of India, the leading causes of death are senility (23.5%), circulatory diseases (10.8%), causes peculiar to infancy (9.6%), and fevers (7.7%). In terms of morbidity, it is estimated that about 2-3% of the population suffers from some kind of illness everyday. These common communicable diseases include cholera, diarrhea, acute respiratory infections, malaria, tuberculosis, blindness, malnutrition, deficiency anemia, worm infestations, and water-borne diseases. Incidence and prevalence of such diseases are aggravated by an apparent neglect of preventive medicine in the country ¹.

In Manipur, waterborne diseases such as diarrhea and dysentery lead the morbidity, followed by airborne diseases such as acute respiratory infections. Pulmonary TB, whooping cough viral hepatitis, viral fever, measles and reproductive tract infections are other diseases that follow the morbidity pattern. HIV/AIDS is a new emerging serious health problem in the state Non communicable diseases such as cancer, blindness mental illness, hypertension, diabetes, accidents and injuries are also on the rise ².

I joined the MAE-FETP course at NIE, Chennai on 23rd January, 2006. Before Joining Master of Applied Epidemiology course, I worked as a Senior Medical Officer in Jawaharlal Nehru Hospital, Imphal East, a referral hospital of Manipur state and was directly related to the health system of the state.

As a field epidemiology training programme (FETP) scholar, I have worked as an epidemiology student under the Government of Manipur and placed under the Chief Medical Officer of Imphal East District for doing my field epidemiology training in terms of doing projects assigned from time to time by the National Institute of Epidemiology, Chennai

The key elements of situation analysis of Imphal East, Manipur are the natural geography, climate, demographic characteristics, socio-economic characteristics, laboratory resources, major public health priorities, organization of the health system in the context of Imphal East, important health related millennium development goal indicators.

2. Method

We visited different offices of health and other related departments at district and block level to explain our objectives and the importance of verification of records and collection of reports. We also discussed with them the organizational set up of health system. We also consulted with various reports published at state and district level by departments of health and family welfare other related departments. The reports included (i) Annual administrative report 2005-2006, Health Department Manipur, (ii) Census data 2001, (iii) Statistical abstract Manipur 2005, (iv) National Family Health Survey 2 report (v) Status reports of various health programmes (vi) Millennium development goals, India country profile, World bank and (vii) The World Health report, 2006.

3. Results

3.1 General presentation of the location

Imphal East district consists of two portions. The main portion lies between 93.9°E-94.3°E longitude and 24.65°N-25.06°N in the centre of Manipur, a boarder state of India. Geographically this state is very near to “Golden triangle”, notorious for the illicit drug “heroin”. So Imphal East is on the transit route of “heroin” trafficking from Myanmar to other states of India. The total area of this district is 709 sq. km with an altitude of 790 metres above mean sea level³. It has four sub-divisions: Keirao Bitra, Porompat, Sawombung and Jiribam (Figure 1). Jiribam is located separately in the western border of Manipur and 225 km away from Imphal proper. There are 204 villages and six towns in this district⁴. The climate is sub tropical temperate with an annual average rainfall of 1467.5 mm. In summer the maximum temperature goes up to 36°C and in winter it goes down up to sub 0°C⁵. However the

climate over Jiribam district is hotter than that of the main portion. In Imphal East, 72.57% population lived in rural areas. About 49.76% of the population was female. The district had an average population density of 557 per sq. km. with a decennial growth rate 24.88%⁴. The male literacy rate was 80.3% as compared to 60.5% for female⁶. People of different communities with different religions live harmoniously in this district. Weaving, cane works, and bamboo works were the small-scale household industries that have been established and promoted under various governmental schemes. Land, forests, and water bodies continue to be the main economic resources⁴

3.2 Population

The population of Imphal East for the year 2005, projected from the census report of 2001 was 431719 (Table-1). The productive age group i.e. 30-59 years constitutes 30.74% of the total population. However the adolescents and the young adults i.e.15-29 yrs, a proportion which also form a work force, constitute 29.82% of the population. Tribal constitutes about 6.26% of the population and 2.64% belong to schedule caste. The male population constitutes 50.24%⁷. A large proportion (40.65%) of the population lives below poverty line⁸.

3.3 Laboratory resources

Level-1: Peripheral laboratories (PHCs and CHCs): The laboratory diagnosis of (1) malaria, (2) Tuberculosis and (3) Typhidot test are available.

Level-2: District laboratories: No separate district level laboratory is in Imphal East as Jawaharlal Nehru Hospital (J.N. Hospital); a state referral hospital is in this district.

Level-3: State level laboratory: Laboratory at J.N. Hospital, Imphal is the state level laboratory as it has all the facilities for microbiology (culture, serology including HIV), pathology (biopsy, cytology, hematology, and clinical pathology), biochemistry and blood bank⁹. The laboratory tests for epidemic prone diseases done in J.N. Hospital are given below:

3.3.1 List of epidemic prone diagnostic tests available at J.N. Hospital, Imphal

Diseases	Confirmatory test
1. Tuberculosis	Demonstration of AFB & culture
2. Malaria	Thick & thin smear
3. Typhoid	Rapid diagnostic test & Bl. Culture
4. Cholera	Stool culture & Cholera toxin test
5. Gastro-enteritis	Chlorination test, colony test & rapid test for foecal contamination & water quality
6. Hepatitis	Serology for hepatitis ABC
7. HIV	Rapid, ELISA, Simple test
8. Syphilis	VDRL test
9. Non-communicable diseases	Blood sugar, HDL, LDL

The potential projects I can consider with the primary laboratory are:

Regular Surveillance and outbreak investigations of:

1. Malaria
2. Acute diarrhoeal diseases
3. Typhoid
4. Tuberculosis
5. Non communicable diseases
6. Blood borne diseases: HIV, hepatitis A, B and C.
7. STI.

3.4 Major public health priorities in Imphal East

HIV/AIDS, Tuberculosis and Malaria are the three major public health priorities of Imphal East.

3.4.1 HIV/AIDS

It is the leading major public health priority in the district. The cumulative district-wise distribution of HIV positive cases (Sero surveillance) since 1986 to June 2006 for Imphal East and Imphal West was 10802 with a sero-positivity rate of 18.9% and a district percentage of 60.7%¹⁰. HIV affects most productive age group of the population. The HIV/AIDS is a new emerging serious health problem ². HIV prevalence of HIV in the district was 28% among the IDUs in 2005. Manipur AIDS Control Society (MACS) with a network of non-government organizations (NGOs) is taking up National AIDS Control Programme to control and prevent HIV/AIDS in this district.

3.4.2 Tuberculosis

Tuberculosis (TB) is another major public health priority in Imphal East. The incidence is increasing in this district and control is also difficult due to emergence of drug resistant cases. The emerging trend of HIV infection has compounded the problem. Since the start of the Revised National Tuberculosis Control Programme (RNTCP) till 2005, out of 3325 sputum examined, 468 were found positive and 1478 TB cases were detected in this district¹². MACS, has implemented HIV/TB coordination programme.

3.4.3 Malaria

Malaria is another major health problem in this district. This district experienced resurgence of malaria since 1992. In 2005 out of 17475 blood samples screened in Imphal East, 168 were malarial parasite (MP) + ve of which 99 were plasmodium falciparum (PF) accounting 59% of the total +ve cases¹³. Under the Enhanced Malaria Control Programme, the state Health Department has opened 186 drug distribution centers (DDCs) in different parts of the district.

3.5 Organization of the health system in Imphal East

Manipur Health Service was established in June 1982. With this, the organizational structure of the district health system was also established. The mission

of this health system was “Health for all” i.e. all people should have an opportunity to enjoy good health.

The district level health administration was organized through the Chief Medical Officer as the head, who was assisted by nine district level Programme Officers: (1) District Malaria Officer, (2) District Surveillance Officer, (3) District Tuberculosis Officer, (4) District Leprosy Officer, (5) District Immunization Officer, (6) District AIDS Officer, (7) District Family Welfare Officer, (8) District Iodine Deficiency Officer and (9) District Blindness Control Officer (Table 3). The district health organization was responsible for implementation of the various health programmes under primary health care approach through a network of various health centers in the district. Delivery of health care and curative services was done through Primary Health Sub-Centers (PHSC), Primary Health Centers (PHC), Community Health Centers (CHC), at these levels. Sophisticated and specialized needs were referred to secondary and tertiary levels. Secondary health care and referral services were taken up at CHC and tertiary health care services were taken up at J.N. Hospital where specialist and super specialist were provided¹⁴.

PHC Medical Officer heads each PHC, covered a population of 32,670. A sub center was the basic unit of preventive activity and covered a population of 5,940. Health assistants, male and female, discharged the services at PHSC.

3.5.1 Health facilities in Imphal East

A state level Hospital	1
Community Health centre	2
PHC	11
PHSC	38
Dispensary	2

Imphal East district has adequate health institutions with a tertiary Hospital. Although the number of health institutions looks adequate, many institutions cannot function effectively for want of infrastructures and funds for maintenance. At the

district level some data were generated but some data pertaining to the indicators of millennium development goals were not generated and for this. In addition to this, analysis of the raw data was not done at the level of CHC and the district.

3.6. Indicators towards millennium development goals

In Goal 1, the indicator for prevalence of under weight children <five years of age is better than that of the state but less than that of the national level. The proportion of population below minimum level of dietary energy consumption is higher than state and national level. The percentage of children 6-59 month of age who received one dose of vitamin A in the past six months is lower than that of the state and national level. Other indicator pertaining to this Goal is not available. Most of the data for Goal 4 are not available but measles immunization under one was better than state and national level. For Goal 5 Proportion of births attended by skilled health personnel was lower that of the state and national level. The contraceptive prevalence rate was better than state level but lower than the national level. Other indicators pertaining to this goal are not available. For Goal 6, some of the data are not available. HIV prevalence among 15-24 years old pregnant women was higher than that of the state and national level. Malarial death is nil. The proportion of uncomplicated malaria getting correct treatment at the health facility and community levels, according to the national guidelines within 24 hour of onset of symptoms was same as that of the state level. Prevalence and death rate associated with tuberculosis is higher than that of the state and national level. Proportion of tuberculosis cases detected and cured under DOTS is higher than state and national level. Percentage of estimated new smear positive tuberculosis cases registered under the DOTS approach is higher than that of the state but lower than that of the national level. No data was available for Goal for Goal 7 and Goal 8 (Table 4)

4. Discussion

Situated in the centre of Manipur, Imphal East district had a sub tropical temperate climate with heavy rainfall during rainy season and is flood prone area during rainy season. Being a district of a poor state, Imphal East district depends on rainwater for its crops. This affected the agriculture of the non-industry based district and in turn the economy of the people.

Figure 1 Map of Imphal East district, Manipur, India 2006

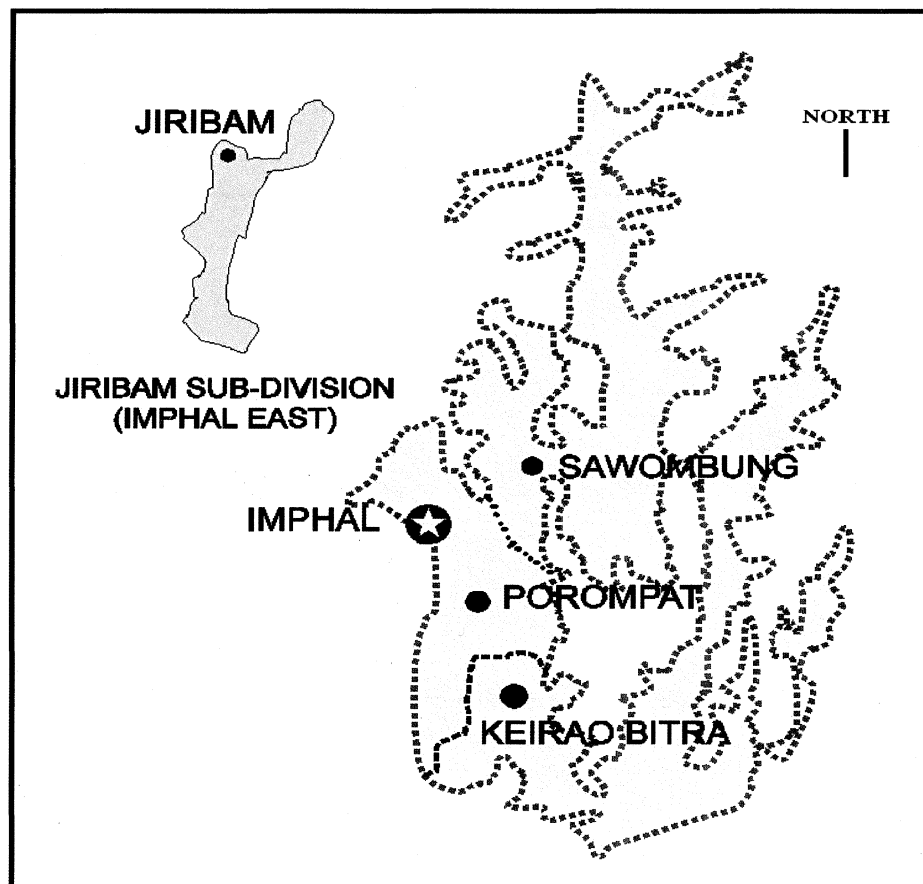


Table1: Characteristics of the population of Imphal East, Manipur, 2005, India¹

Population group	Population size	Proportion of the total
Population 0-4 years of age	41056	9.51
Population 5-14 years of age	98777	22.88
Population 15-29 years of age	128739	29.82
Population 30-44 years of age	86430	20.00
Population 45-59 years of age	46367	10.74
Population 60+ years of age	30350	7.03
Male population	216939	50.25
Female population	214780	49.75
Population above poverty line	256225	59.35
Population below poverty line	175494	40.65

Population group	Population size	Proportion of the total
General caste	Not available	
Schedule caste	11,397	2.64
Schedule tribe	27,026	6.26
Other backward classes	Not available	
Total	431719	

¹ The population of Imphal East for the year 2005 is a projection based on 2001 census. So it may or may not simulate with the actual population characteristics of Imphal East.

Table 2: Key public health priorities in Imphal East, Manipur 2005, India

Public health priority	Key elements	Ongoing prevention and control Programme
HIV/AIDS	• High prevalence of HIV/AIDS among IDUs (24.1% in 2005) • High prevalence of HIV among 15-24 yrs. pregnant women (2% in 2005)	1.Preventive: (a) IEC for general population (b) Institutional strengthening (c) Intersectoral collaboration (d) Prevention of parent to child transmission (PPCT) 2.Control: (a) Rapid Intervention and Care Project (b) Low cost anti-retroviral therapy
Tuberculosis	• Increased morbidity and mortality • Emergence of drug resistant cases • Co-morbidity of HIV/AIDS and TB	1. Prevention: • Immunization 2.Control: • DOTS • HIV/TB coordination programme
Malaria	• High rate of Plasmodium falciparum positive cases (59%) • Annual Parasite Index >1.4	1. Preventive strategy: • Information Education and Communication • Insecticide Treated bed net distribution • Selective vector control 2. Control strategy: • Early detection and prompt treatment • Opening of drug distribution centers 3. Early detection and management of Epidemics

Table 3: Flow chart showing organizational structure of Health System in Manipur, India 2006

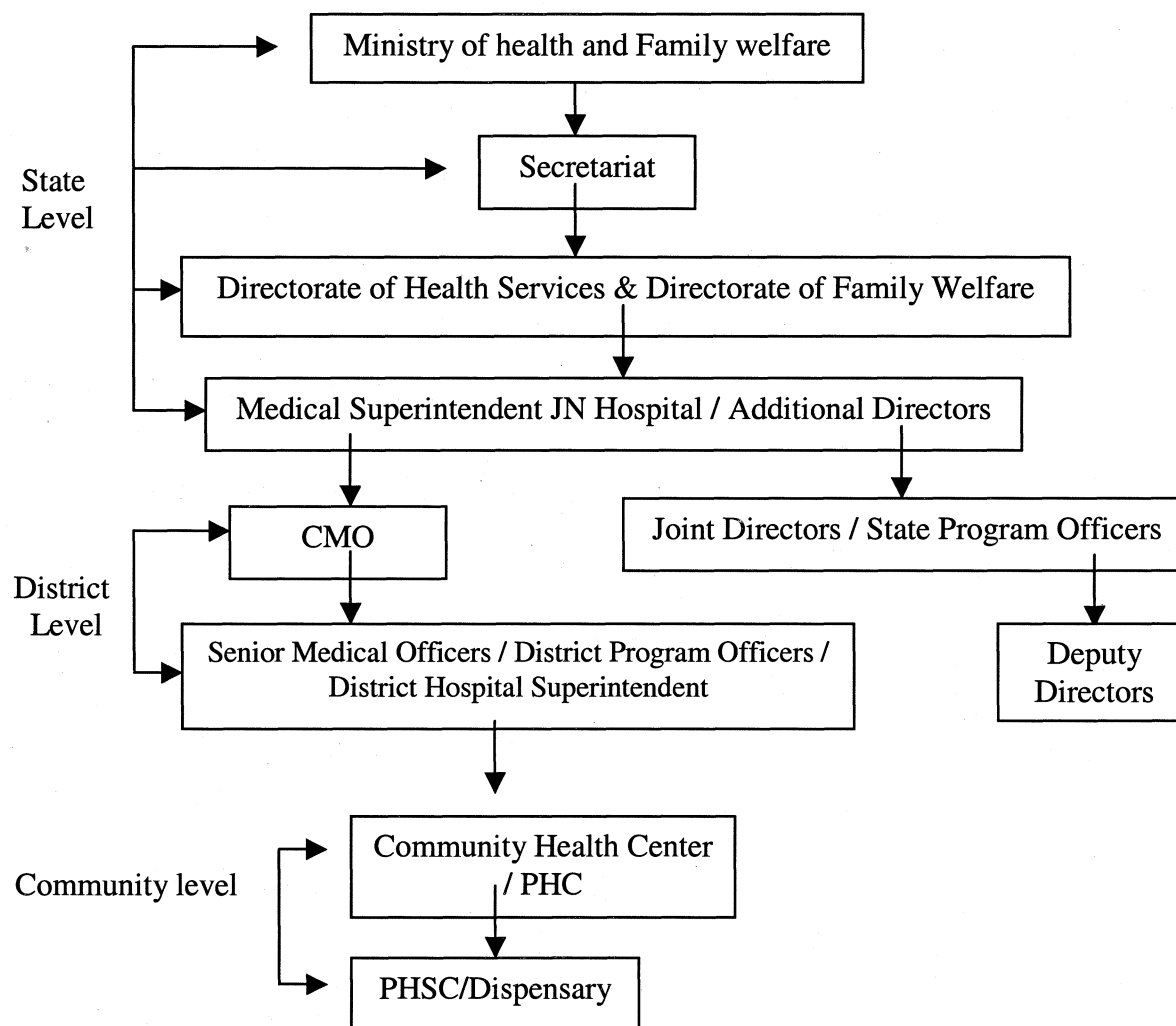


Table 4: Indicators of progress for the health related millennium development goals, Imphal East, Manipur, India, 2006

Goal	Indicator	Value of the indicator		
		In Imphal east district, 2006	In Manipur state, 2006	In India, 2006
Goal 1	Prevalence of underweight children < 5 years of age	14.24 *	9.76 (DSW, ICDS 2006)	47 †
	Proportion of population below minimum level of dietary energy consumption	40.65 ‡	40.86 (FCS, 2006)	29.9 (NCAER, 2001)
	Percentage of children 6-59 month of age who received one dose of vitamin A in the past six months	22% §	40% **	29.7% ††
	Proportion of infants under six months who are exclusively breastfed	Not available	93.4 ‡‡	55.2 (1999)
Goal 4	Under-five mortality rate	Not available	56% (98-99)	17 §§
	Infant mortality rate	Not available	14 (SRS-2006)	58 (SRS-2006))
	Measles immunization among children under one	76 ***	69 (DFWS-2006)	67 (SRS-2003)
Goal 5	Maternal mortality ratio	Not available	374 (2001)	167.8 (2003)

* Directorate of Social Welfare, Integrated Child Development Scheme((DSW, ICDS), 2006

† National Family Health Survey, II, 1998

‡ Directorate of Food & Civil Supply(FCS), Govt. of Manipur, 2006

§ Achievement for the year 2005-2006, District Family Welfare Office(DFWS), Imphal East.

** Immunization Target and Achievement, 2005-2006 in respect of Manipur State, Department of Family Welfare, Govt. of Manipur

†† Statistical Abstract Manipur 2005, Directorate of Economics & Statistics, Govt. of Manipur

‡‡ Directorate of Family Welfare Services 2006(DFWS), Govt. of Manipur

§§ Sample Registration System Statistical Report 2004, Register General Of India

*** Achievement for the year 2005-2006, District Family Welfare Office(DFWS), Imphal East.

	Proportion of births attended by skilled health personnel	52 (DFWS-2006)	64 (DFWS-2006)	59.9% (SRS, 2004)
	Contraceptive prevalence rate	46.7 (DFWS-2006)	38.7 (NFHS-2)	47 (2001)
	Percentage of women receiving antenatal care	Not available	80% (2005)	41.3% (2001)
Goal 6 (HIV)	HIV prevalence among 15-24 years old pregnant women	2 ^{†††}	1.35 (MACS-2006)	0.9 (2003)
	Condom use rate of the contraceptive prevalence rate	Not available	78 (MACS-2006)	32.2 (2004)
	Number of children orphaned by HIV/AIDS	Not available	Not available	1.2 million ^{†††}
	Percentage of people using a condom during most recent higher risk sexual encounter	Not available	67 (MACS-2006)	59 (2001)
	Percentage of STI clients who are diagnosed and treated according to guidelines	Not available	5 (MACS-2006)	89 (2003)
	Percentage of HIV-positive women receiving anti-retroviral treatment during pregnancy to prevent mother to child transmission of HIV	Not available	20.81 (MACS 2006)	84.5 (2003)

^{†††} Manipur State AIDS Control Society(MACS), 2006

^{†††} Estimates USAIDS, India, 2005

Goal 6 (Malaria)	Malaria death rate	0 ^{§§§}	0.002 (SMO-2006)	0.003 (2000)
	Proportion of people with uncomplicated malaria getting correct treatment at the health facility and community levels, according to the national guidelines, within 24 hours of the onset of symptoms	100 (SMO-2006)	100 (SMO-2006)	Not available
	Percentage of pregnant women who have taken chemoprophylaxis or drug treatment for malaria	Not available	Not available	Not available
	The proportion of households having at least one insecticide treated bed nets	Not available	Not available	Not available

^{§§§} Annual Report, Manipur State Malaria Office(SMO) – 2006

Goal	Indicator	Value of the indicator		
		In Imphal east district, 2006	In Manipur state, 2006	In India, 2006
Goal 6 (TB)	Prevalence and death rate associated with tuberculosis	Prevalence=.08% Death rate=3.7% (STB-2006****)	Prevalence=.08% Death rate=3.2% (STB-2006)	Prevalence=.06% Death rate=.005% (RNTCP-2004††††)
	Proportion of tuberculosis cases detected and cured under DOTS	0.2 (STB-2006)	0.17 (STB-2006)	0.1 (RNTCP-2004)
	Percentage of estimated new smear-positive tuberculosis cases registered under the DOTS approach	28 (STB-2006)	27 (STB-2006)	72 (RNTCP-2004)
Goal 7	Proportion of population with sustainable access to an improved water source, urban and rural	Not available	49.6% & 24.7% (NFHS,05-06)	86.0% (WHO, 2002††††)
	Proportion of urban population with access to improved sanitation	Not available	25.0% (98-99)	30% (WHO,2002)
Goal 8	Proportion of population with access to affordable essential drugs on a sustainable basis	Not available	Not available	Not available

**** State T.B. Cell, Manipur(STB), 2006

†††† Revised National Tuberculosis Control Programme(RNTCP), 2004

†††† World Health Organization, 2002

Table 5: Potential Topics for my various field assignments

Secondary data analysis	Secondary data analysis HIV in Imphal, Manipur, India, 2006
Programme evaluation	Needle syringe exchange programme in Imphal East district, Manipur, India, 2007
Surveillance system description and evaluation	Sentinel surveillance of HIV in Imphal, Manipur, India, 2007
Dissertation	Alcohol use and high-risk sexual behaviour among effeminate men in Imphal, Manipur, India 2007

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Secondary data analysis of HIV in Imphal (Imphal East and Imphal West), Manipur, India- 2006

1. Introduction

Globally, there are 39.5 million people living with HIV /AIDS in 2006. Of these, 94% are adults, 45% are women and 6% are children. An estimated 4.3 million people acquired the human immuno-deficiency virus (HIV) in 2006, including 3.8 million adults and 530,000 children. AIDS killed an estimated 2.9 million people during the same year. More than 25 million people have died of AIDS since 1981¹. An estimated 8.6 million (6–13 million) people were living with HIV in Asia in 2006, while approximately 630,000 died from AIDS-related illnesses¹.

India is experiencing a highly varied HIV epidemic which appears to be stable or diminishing in some parts while growing at a modest rate in others. Approximately 5.7 million (3.4–9.4 million) people were living with HIV in 2005. The total number of AIDS cases reported to India's National AIDS Control Organization (NACO), was 111,608 of which, 29% were women, and 37% were under the age of 30 years². These reports are not accurate reflections of the actual situation as large numbers of HIV cases go unreported. Overall, around 0.9% of India's population is living with HIV. The trend indicates that HIV infection is spreading in two ways; from urban to rural areas and from individuals practicing high risk behaviors to the general population. Data from antenatal clinic (ANC) indicate rising HIV prevalence among women, which in turn contributes to increasing HIV infection in children.^{3,4} The national HIV prevalence has risen dramatically since the start of the epidemic, but a study at the beginning of 2006 suggests that the HIV infection rate has fallen in southern India, the region that has been hit hardest by AIDS.⁵ In addition, NACO has released figures suggesting that the overall rate of new HIV infections in the country is slowing.⁶

The estimated cases of HIV positives among the general population in Manipur are around 40,000. This state is one of the six high prevalence states in India. The first HIV positive case in the state was reported in February 1990, from the blood sample of October 1989 among a cluster of injecting drug users. Being its proximity to the notorious drug producing "Golden Triangle" and on the transit route of trafficking the illicit drug "Heroin" from Myanmar to other states of India, prevalence

of drug use increased in early eighties. In the beginning, the main route of transmission of HIV infection in the state was through injection drug users (IDUs), accounting for a sero-positivity of 72.8% of HIV infection among them in 1998. Manipur AIDS Control Society (MACS) has taken up priority targeted intervention project called Rapid Intervention and Care Project (RIAC Project) for the high risk groups for HIV infection through non government organizations (NGOs). Due to successful intervention programmes, the sero-prevalence rate of HIV among IDUs in the state has come down to 24.1% in 2005. Still these rates are among highest in the world. The HIV/AIDS epidemic is no longer confined to the IDUs. The infection has now spread from the high risk groups to the general population and from urban to rural and interior areas⁷.

According to epidemiological analysis of HIV/AIDS, Manipur, during Sept 1986-June 06, out of 156,236 blood samples screened (Sero-surveillance and sentinel surveillance), 23,288 were found HIV sero-positive, sero-positivity rate being 149 per 1,000 samples screened by June 2006. Out of this, 5,074 (22%) were female. The number of deaths reported was 544⁸.

Voluntary Confidential Counseling and Testing Center (VCCTC) is a non-coercive, confidential, and cost effective approach that provides information, education and communication to motivate behavior change in HIV-positive individuals. HIV testing is carried out on voluntary basis with appropriate pre-test and post test counseling at VCCTC. We analyzed the data of HIV infection in Imphal from 2001-2005 to (1) know the epidemiological profiles of HIV infection in Imphal, (2) monitor the trends of HIV infection in different high risk groups.

2. Methods

2.1 Data collection procedure

We visited MACS office to collect data of HIV positives from the VCCTC records. We obtained a written permission from Project Director, MACS for analyzing the secondary data. There are two VCCTCs in the two districts viz. (1) VCCTC Jawaharlal Nehru Hospital, Imphal East and (2) VCCTC Regional Institute Medical Science College and Hospital, Imphal West.

We collected data of monthly VCCTC reports of HIV/AIDS cases for the last five years (2001-2005) for Imphal. In the VCCTC record files, HIV cases from all districts of Manipur were also included. So we included the cases from Imphal district only. We abstracted information about age, sex and risk groups of the HIV positive cases of Imphal. This information was not available from HIV negative individuals. We also collected information about the total number of persons tested.

2.2 Analysis

We analyzed secondary data of HIV positives from the VCCTCs of Imphal (Imphal East and Imphal West) from January 2001 to December 2005. We divided the number of HIV positive individuals with total number of individuals tested to obtain HIV sero-positivity. We analyzed the data to calculate proportion of HIV positive individuals according to (1) different age groups (2) sex and (3) common routes of transmission.

3. Results

Patients attended or are referred to the VCCTCs throughout the year. The referred patients included suspected cases from health facilities and high risk groups through NGOs participating RIAC Project. Sometimes patients attended VCCTC on their own, voluntarily for testing. The results were sent to the state nodal officer every month.

Table 1 shows Sero positivity of HIV infection in Imphal. During 2001-2005, a total of 17,850 individuals from Imphal were tested in the two VCCTCs and 4794 (27%) were found HIV positive. During 2001-05 the sero-positivity ranged between 23-37%. The sero-positivity showed a stable trend over last five years (Figure 1).

Figure 2 shows routes of transmission among HIV positive individuals during 2001-2005. IDUs and sexual route of transmissions were the main routes of transmission among the positive individuals.

Table 2 shows the age sex distribution of HIV positive individuals during 2001-05. Out of 4,794 HIV positive individuals 2,499 (52.1%) were in the age group 30-39 years whereas 8.3% were less than 14 years. 65% of the HIV positive

individuals were males. There were 1656 (35%) females out of a total of 4794 HIV positives during the study period. Throughout the study period, the sero-positivity was higher in males (Range 62%-70%) than females (Figure 3).

4. Discussion

Analysis of the VCCTC data of Imphal indicated a stable trend of HIV sero-positivity over last five years. The main route of transmission of HIV infection was through sexual route and injection drug use. The maximum affected age group was 30-39 years and minimum affected age group was 15-19 years. Males were the main driver of the infection throughout the study period.

The secondary data shows a comparable rate of transmission through sexual route and transmission through injection drug use. In 1990s, the main route of transmission of HIV infection in the state was mainly through injection drug use. The sero-prevalence rate was as high as 72% in 1997 among the IDUs⁷. But the secondary data from VCCTCs during last five years shows almost equal proportions of sexual route of transmission and intravenous drug use route of transmission. This is due to spread of the infection from high risk IDUs to the general population through their female sexual partners and children⁷.

The maximum age group affected was 30-39 years. HIV infection having a long incubation period, these individuals might have contacted the infection earlier when they were young and did not perceive the risk of getting the infection. The most productive age group 20 yrs to 50+ yrs constituted more than 90% of the HIV positives of the district. Males were affected more throughout the study period. This may be due to males being more outgoing and exposed to risk behavior.

Our secondary data analysis had certain limitations. HIV positivity based on data from VCCTC can not give the actual prevalence of HIV infection among risk groups as the tests are carried out among the individuals voluntarily doing HIV testing. However, data is useful in understanding the trend of the disease and extent of the disease in the district.

Secondly, we could not calculate sero-positivity rates among different risk groups as the data from HIV negative individuals was not recorded.

In conclusion, analysis of data from VCCTCs in Imphal supports the fact that HIV infection is spreading from IDUs to general population.

On the basis of secondary data analysis, we recommend to: (1) mention proper routes of transmission in the VCCTC records and (2) maintain records of positive cases with number of samples tested for each risk group of Imphal separately for future research.

Table 1: Sero positivity of HIV in Imphal district during 2001-2005

Year	Number of samples tested	Number. HIV positive	Sero positivity
2001	2,996	841	28%
2002	3760	929	25%
2003	3537	860	24%
2004	2869	1072	37%
2005	4688	1092	23%
Total	17850	4794	27%

Figure 1 Sero positivity of HIV in Imphal, Manipur during 2001-05

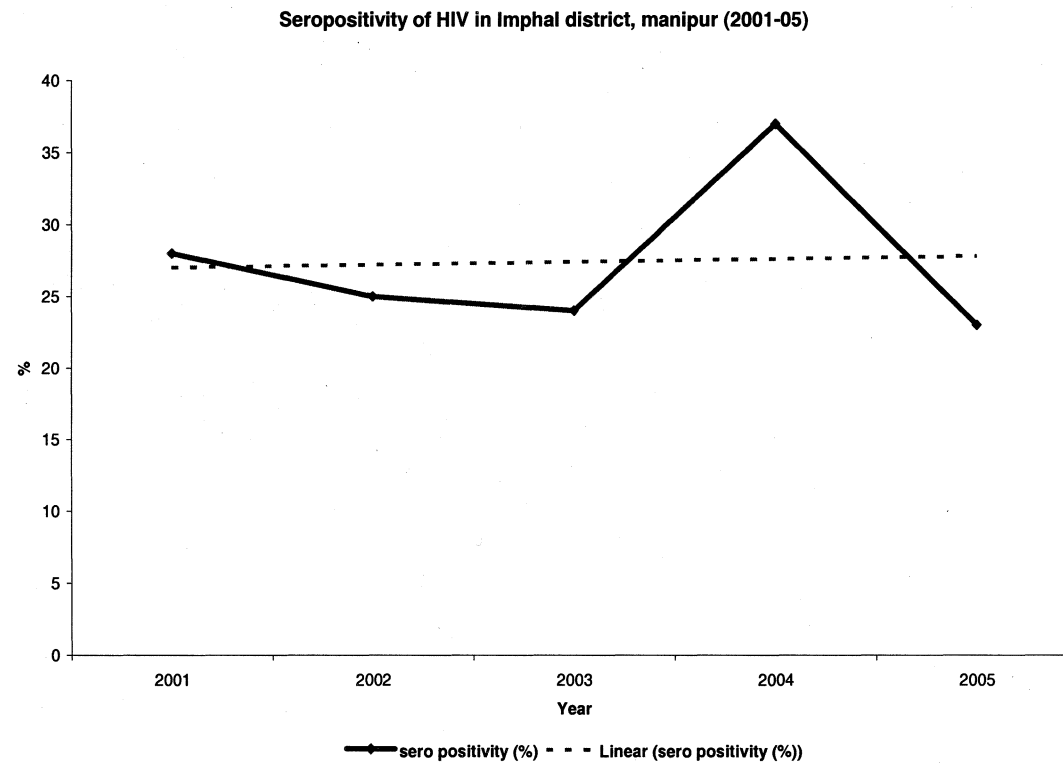


Figure 2: Sero positivity among injection drug users, sexual route of transmission and non-specific routes in Imphal, Manipur 2001-2005

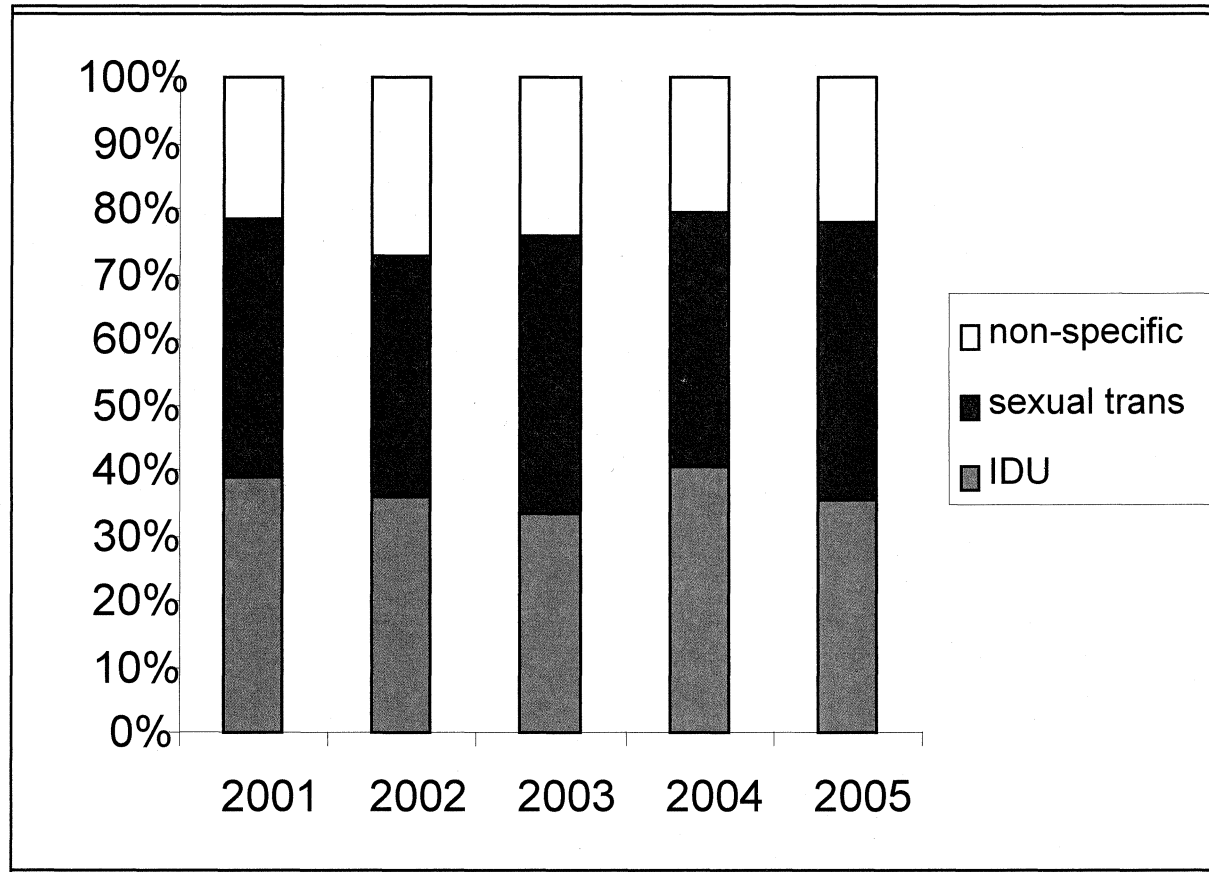
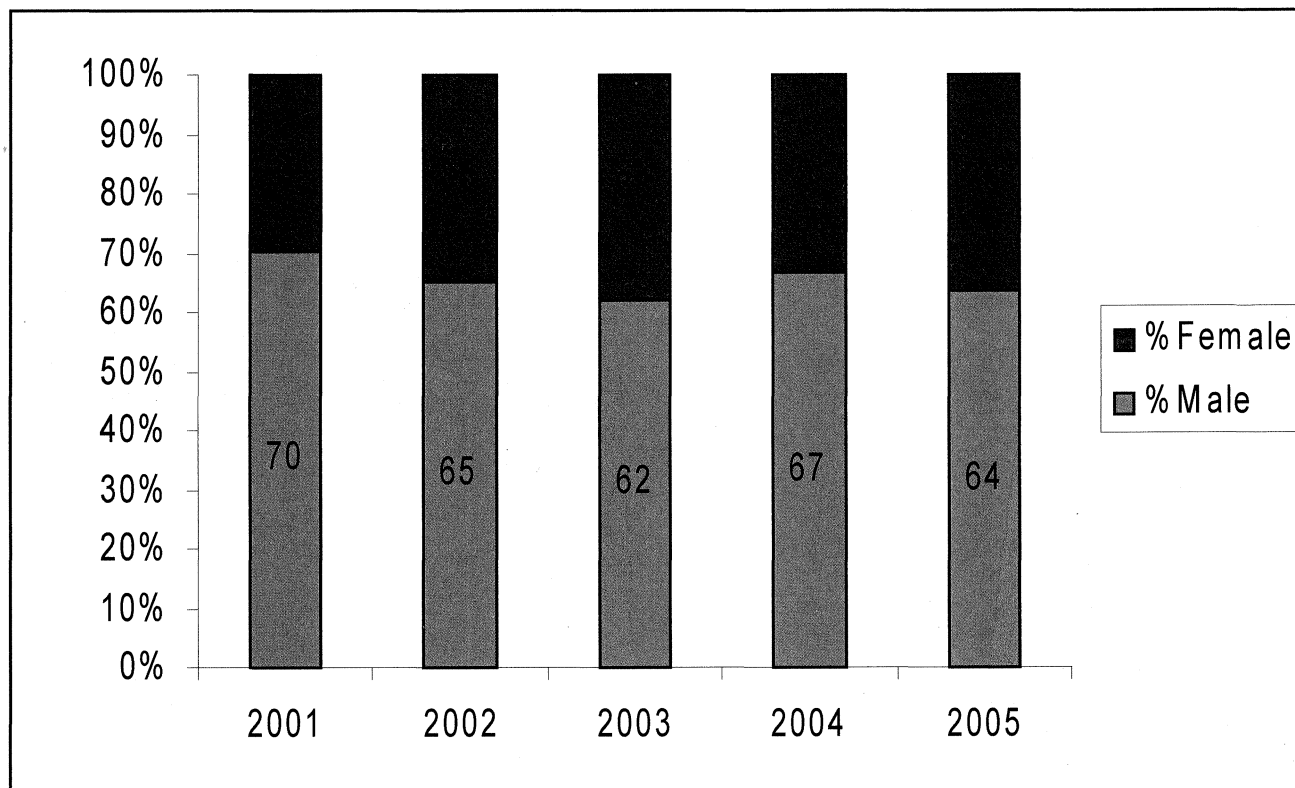


Table 2: Age sex distribution of HIV sero-positivity of Imphal from 2001 to 2005

Age group (Years)	Male	%	Female	%	Total	%
<14	226	4.7	174	3.6	400	8.3
15-19	8	0.2	19	0.4	27	0.6
20-24	119	2.5	134	2.8	253	5.3
25-29	519	11	381	7.9	900	18.8
30-39	1768	37	731	15	2499	52.1
40-49	42	0.9	179	3.7	221	12.6
50+	75	1.6	38	0.8	113	2.4
Total	3138	65	1656	35	4794	100

Figure 3: Year wise Sex distribution of HIV sero positivity in Imphal from 2001 to 2005



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Section 2: Second Field Posting

Evaluation of Needle Syringe Exchange Programme in Imphal East district, Manipur, India-2007

1. Introduction

In 2004, WHO estimated that the number of injection drug users (IDUs) worldwide is approximately 13.2 million. Of these IDUs, 78% live in developing and transitional countries (Eastern Europe and Central Asia, 3.1 million; South and South-east Asia, 3.3 million; East-Asia and Pacific 2.3 million). Estimates of HIV prevalence among IDU of over 20% was reported for at least one site in 25 countries and territories¹.

National AIDS Control Organization (NACO), India, estimated that about 100,000 injection drug users live in the country. However as per United Nations, the number could be as high as one million. About 10% of HIV-positive people in India have contracted the virus through injection drug use².

In Manipur the estimated number of IDUs during 2005-06 was 37,996. This state has the largest problem of HIV infection associated with injecting drug use in India. Due to its proximity to "Golden triangle" many of the youths of this state became addicted to the illicit drug heroin since early eighties. Most of the IDUs shared injection equipments among themselves and thus, injection drug use became the main route of transmission of HIV infection in this state. The sero-positivity among the IDUs was as high as 72.78% in 1998. Manipur AIDS Control Society (MACS) implemented a targeted intervention called "Rapid Intervention and Care (RIAC) Project" under NACO guidelines on 7th Nov. 1998. It is a package of two components: (1) targeted intervention (TI) for the high risk groups and (2) care for the people living with HIV/AIDS (PLWHA). RIAC Project comprises of education, counseling, Needle Syringe Exchange Programme (NSEP), voluntary HIV testing, condom promotion, home care programme for reducing the spread of HIV infection from the IDUs to their sexual partners and for providing care to PLWHA (People Living With HIV/AIDS). Manipur is the first state in India to adopt the strategy based on harm reduction or harm minimization. It is the strategy for prevention of adverse consequences of illicit drug use without necessarily reducing their

consumption. As a part of this strategy, various options /services are offered to the IDUs, by which he/she can prevent himself/herself from HIV/AIDS before he/she is ready to go for abstinence. These services could be giving clean needle syringes, condom promotion, substitution therapy, home detoxification, advice on safer sex etc. Basically it is to change the behavior of the IDUs so that he is motivated and empowered to change to less risky behavior and not confined to merely giving some syringes, condoms etc. After the implementation of RIAC Project, prevalence rate of HIV infection among IDUs showed a decreasing trend from 72% in 1997 to 24.1% in 2005. Though the sero prevalence rate has been brought down considerably, it is still the highest reported rate among IDUs in the world.³

In Imphal East district, the RIAC project is being implemented, in collaboration with 11 non-government organizations (NGOs) with a target of intervening 6100 IDUs in 2005-2006. Needle syringe exchange programme is based on the strategy of “harm reduction” or “harm minimization”. In this programme, the IDUs are given risk reduction education. They are encouraged to follow safe drug use, safe injection practices and safe sexual practices. Safer injection practice is necessary to avoid: (1) sharing, lending or borrowing of injection equipments which can spread HIV/AIDS and other blood born diseases, (2) poor injection technique or dirty equipments, which can damage veins and cause infection and (3) mixing drugs of unknown purity and person’s intolerance which can lead to overdose⁵.

We evaluated the activities of the NSEP in Imphal East district, Manipur, India 2006. The objectives of this evaluation were to (1) describe the performances of the programme in terms of input, process, output, and outcome, (2) know the IDUs’ knowledge, attitude and practice related with HIV infection and (3) formulate recommendations on leading issues the programme is facing.

2. Methods

2.1 Description of the Programme

We reviewed in detail the operational manual for Integrated Rapid Intervention and Care (RIAC) Project, Manipur, (RIAC Guideline Booklet, 2003) and Minimum Standard of Services (MSS) for Targeted Intervention (TI) Projects under Manipur AIDS

Control Society (MACS). We discussed with the Deputy Director (Intervention), MACS, about the survey and obtained a written permission from him for the programme evaluation.

2.2 Evaluation of the programme

We prepared a logic model for Needle Syringe Exchange Programme evaluation (Table-1). We discussed different operational issues of the Needle Syringe Exchange Programme in Imphal East district with the stakeholders and compared the programme implementation with objectives, standards and recommendations. We collected both qualitative and quantitative information from Deputy Director (Intervention), NGO Advisor of RIAC project, Project managers of different NGOs, peer educators and IDUs. For qualitative information we developed semi structured questionnaires for stake holders of RIAC Project at different levels and IDUs. We conducted a survey of NGOs in Imphal East district carrying out Needle syringe Exchange Programme.

We selected ten NGOs (n=10) out of 11 NGOs of Imphal East carrying out NSEP for programme evaluation. We interviewed 37 peer educators working in 14 DICs of these NGOs about their knowledge of HIV/AIDS and STD infections, examined whether they know the skills for safe injection practices and safe sex practices.

For IDUs, we developed pre-tested questionnaires. We translated the questionnaires into Manipuri, the local language of the state. Due to logistic reasons, we selected a convenient sample of IDUs registered with the five NGOs. We selected five DICs of the selected NGOs for collecting information on knowledge, attitude and practice of the IDUs. We interviewed 48 IDU from the selected DICs clients during March - May 2007.

We took informed consent from the IDUs before administering the questionnaires.

2.3 Indicators used

We considered the NGOs, peer educators and IDU clients of RIAC project of Imphal East district to evaluate the Needle Syringe Exchange Programme in terms of input, process, output and outcome indicators.

2.3.1 Input indicators

Input indicators included proportion of NGOs with adequate stock of needles and syringes, distilled water/bleach, and materials for information, education and communication on HIV/AIDS and condoms for one month, proportion of DICs with adequate infrastructures, proportion of DICs with peer educators in position, proportion peer educators (ex or current drug users) knowing safer drug use and safer sex practices and proportion of peer educators knowing the routes of transmission of HIV/AIDS/STD infections and their preventive measures.

2.3.2 Process indicator

Process indicator included proportion of peer educators motivating the IDUs to choose options for getting rid of drugs, proportion of NGOs with more than 60% of syringe return rate and proportion of NGOs having more than 32% of their clients using condoms regularly.

2.3.3 Output indicator

Output indicator included knowledge attitude and practice of IDUs.

2.3.4 Outcome indicator

Outcome indicator included prevalence of HIV infection among the recent IDUs.

3. Results

3.1 Description of the Programme

In Imphal East district proper (without Jiribam district), ten out of 11 NGOs were carrying out RIAC Project during 2006. IDUs who agree to undergo behavioral change to adopt safer drug and safer sexual practices are accepted as clients to participate at the NSEP programme under a NGO.⁴ The NGOs have drop in centers (DICs) for the IDUs, where they come for exchange of syringes and needles, have recreational activities and one to one interaction with the staffs of RIAC project. As per National AIDS Control Programme guidelines NGOs having 300-500 targeted intervention (TI) clients had one drop-in-centre (DIC) and those having 800-1000 TI clients had two DICs. Altogether, there were 14 DICs for the ten NGOs. Each DIC should have at least four rooms, one for examination of patients, one for dressing, one for staffs and one for recreation room (Minimum Standard of Services for targeted intervention).

Peer educators (PE) are non regular staff members of NGOs who work on incentives. Their main function is to distribute needles and syringes to their peers and encourage them for safer injection practices and safer sex practices. Peer educators are ex or current drug users conversant with the objectives and methodology of RIAC project and are replaced from time to time depending on their performance.

In the programme, IDUs are given risk reduction education. They are encouraged to follow safe drug use, safe injection practices and safe sexual practices. For safe injection practices the IDU clients are provided sterile needle and syringes on "One for One" basis i.e. they should return the used syringes when they come to take a new syringe. When they come to take syringe any staff of the NGO motivates them for safer drug use and safer sex practices. The targeted syringe return rate is 60-80% for a NGO. The IDUs are motivated not to share the injection equipments with one another and if in case they had to share, they are advised to clean the used contaminated syringes by 2*2*2 method of cleaning. In this method the used needle and syringe is to rinse with distilled water two times, and then rinse with bleach two times followed by rinsing with distilled

water two times, each time with vigorous shaking. The peer educators have to contact at least six clients a week and motivate safe drug use and safe sex practices, keep diaries about the drug use patterns and condom use patterns of the IDUs.

The NGOs send programme performance report to MACS monthly and quarterly. The recommended number for peer educators are four, six, eight and ten for every NGO having 300, 500, 800 and 1000 targeted intervention population. The monthly requirements of needles and syringes are as follows: (1) for NGO having a targeted intervention IDUs of 300 clients, at least 300-500 syringes per month, (2) for NGO having targeted intervention IDUs of 500 clients, at least 500-700 syringes per month and (3) for NGO having targeted intervention IDUs of 1000 clients, at least 700-1000 syringes per month. The IDUs should return the used syringe when they come to take new syringe. The targeted syringe return rate for NGO is 60-80%.

3.2 Evaluation of the programme

3.2.1 Input

Out of the ten NGOs, seven (70%) had adequate supply of needles and syringes, bleach and distill water for one month. Five of the 14 DICs (36%) had adequate infrastructure. Ten DICs (71%) had all the peer educators in position. Of the 37 peer educators interviewed, all (100%) knew safer injection practices and safer sex practices, 34 (92%) knew the routes of transmission of HIV/AIDS/STD and knew that correct and consistent use of condom can prevent HIV and STIs.

3.2.2 Process

Out of 37 peer educators interviewed, 34 (93%) motivated IDUs to choose the option for getting rid of drugs. Six NGOs out of ten (60%) achieved syringe returned rate above 60%. Three NGOs (30%) achieved in promoting to use condom regularly to more than 32% of their clients.

3.2.3 Output

Out of 48 IDUs interviewed, 39 (81%) knew safe injection practices. All the IDUs (100%) had heard about HIV/AIDS. 29 (60%) knew routes of transmission of HIV/AIDS/STD and prevention measures. 40 (83%) told that they would not hesitate to disclose the HIV testing results to their friends and relatives if found positive whereas 8 (17%) did not want to disclose their HIV status to their friends and relatives due to fear of stigma and discrimination. Before the participation in NSEP, 30 (63%) IDUs shared injection equipments. Even after the participation in NSEP, 18 (38%) IDUs still shared injection equipments due to urge and fear of being caught by organizations against drug use. Among the IDUs who shared injection equipments, only 5 (28%) clients cleaned the needles and syringes with distilled water and bleach in 2*2*2 method of cleaning. 35 (72.9%) IDUs reported that they have tested for HIV. 12 (34%) of the 35 IDUs were positive for HIV. 14 of the 48 (29%) IDUs used condoms consistently and correctly. Among the 12 HIV positives 7 (58%) IDUs used condoms consistently and correctly.

3.2.4 Outcome

Incidence of HIV among the recent IDUs of Imphal was 22.8% in 2006

4. Discussion

Most of the NGOs conducting the programme had the required inputs for implementation of the programme. Two third NGOs had adequate stock of syringes and needles, number of peer educators. In spite of the adequate inputs, the syringe return rate for many of the NGOs was less than the target of 60-80%. About a third of the IDUs still shared the syringes and most of these IDUs did not clean the syringes with distill water and bleach. In NSEP, besides safe injection practices, IDUs are also encouraged in safer sexual practices. Achievement on condom promotion was poor, only one third of the NGOs could promote more than 32% of their clients to use condoms regularly.

Peer educators, who have a direct link with the IDUs, play an important role in the success of the programme. They motivate the IDUs for behavior change and adopt them safe injection practices. The findings of the evaluation indicate the need to strengthen the programme. The peer educators need to be encouraged to intensify motivating the IDUs for safe injection and safe sexual practices. Since peer educators work on incentives and changing from time to time, it may be advisable to train them in counseling skills besides educating about the programme related issues.

The perspective of the evaluation was developmental because we could not interview all the peer educators and sufficient number of IDUs due to logistic regions. Searching IDUs for personal contact amidst the prevailing law and order scenario and strict interference of certain organizations to this population had been a daunting job for field investigation. The biggest hurdle was to work amidst the threat imposed by certain groups to the IDUs to surrender. We selected IDUs who came to the DICs and not from the community due to logistic regions. The information provided by these groups of IDUs might not be generalizable.

Based on the results of the evaluation of NSEP in Imphal East, we recommend (1) encouraging peer educators to intensify motivating of IDUs for safe injection and safer sexual practices (2) filling the vacancies of peer educators.

**1: Logic frame indicating input, process, output, and outcome indicators of Needle Syringe
Exchange Programme, Imphal East, Manipur, India, 2006**

Levels	Programme elements	Indicators	Data	Evaluation design
Input	Proportion of NGOs with adequate stock of IEC materials supply of needles/syringes and condoms	Number of NGOs with adequate stock of IEC materials supply of needles/syringes and condoms	NGOs	Survey of NGO
		Total number of NGOs surveyed		
	Proportion of DICs having adequate infrastructures	DICs having adequate infrastructures	DICs	Inspection of DIC
		Total number of DICs evaluated		
	Proportion of DICs having peer educators in position	Number of DICs having peer educators in position	DICs	Survey of DIC
		Total number of DICs surveyed		
	Proportion of DICs having peer educators in position	Number of DICs having peer educators in position	DICs	Survey of DIC
		Total number of DICs surveyed		
	Proportion of peer educators knowing routes of transmission of HIV/AIDS and STD and their preventive measures	Number of PE knowing routes of transmission of HIV/AIDS/STD and their preventive measures	Peer educators	Interview with peer educators
		Total number of PE interviewed		
Process	Proportion of PE motivating IDUs to choose option for getting rid of drugs	Number of PE motivating IDUs to choose option for getting rid of drugs	Peer educators	Interview with peer educators
		Total number of PE interviewed		
	Proportion of NGOs with more than 60% syringes return rate	Number of NGOs with more than 60% syringes return rate	MACS	Review of records
		Total number of NGOs surveyed		
Output	Proportion of IDUs knowing safe injection practices	IDUs knowing safe injection practices	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Percentage of IDUs knowing HIV/AIDS/STD	Number of IDUs knowing HIV/AIDS/STD	IDUs	Interview with IDUs
		Total number of IDUs interviewed		

Levels	Programme elements	Indicators	Data	Evaluation design
	Proportion of IDUs who did not hesitate to disclose HIV testing results if found positive	Number of IDUs who did not hesitate to disclose HIV testing results if found positive	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Proportion of IDUs who shared injection needles and syringes before participating in NSEP	Number of IDUs who shared injection needles and syringes before participating in NSEP	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Proportion of IDUs who shared even after participation of NSEP	Number of IDUs who shared even after participation of NSEP	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Proportion of IDUs who cleaned N/S with D/W & bleach in 2*2*2 among those who shared	of IDUs who cleaned N/S with D/W & bleach in 2*2*2 among those who shared	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Proportion of IDUs who tested for HIV	Number of IDUs who tested for HIV	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Proportion of IDUs who are found HIV positive	Number of IDUs who are found HIV positive	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Proportion of IDUs who used condoms consistently & correctly among the participants	Number of IDUs who used condoms consistently & correctly	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
	Proportion of IDUs who use condoms correctly & correctly among the HIV positives	Number of IDUs who use condoms correctly & correctly among the HIV positives	IDUs	Interview with IDUs
		Total number of IDUs interviewed		
Outcome	Incidence of HIV positives among recent IDUs	Sentinel surveillance report	MACS	Review of records

Table-1 Indicators of the Needle Syringe Exchange Programme evaluation, Imphal, Manipur, India. 2007

Component	Indicators	N/n	%
Input	Proportion of NGOs with adequate supply of needles/ syringes and condoms IEC materials for one month	7/10	70
	Proportion of DIC with adequate infrastructures	5/14	36
	Proportion of DIC with PE in position	10/14	71
	Proportion of PE knowing routes of transmission of HIV/AIDS/STD and also knowing preventive measures	34/37	92
	Proportion of Peer educators knowing safe injection practices, and safe sex practice	37/37	100
Process	Proportion NGOs giving risk reduction education at least 5 times a year per client	4/10	40
	Proportion PE motivating IDUs to choose option for getting rid of drugs	34/37	93
	Proportion of NGOs achieving syringe return rate >60%	6/10	60
	Proportion of NGOs having more than 32% of clients using condoms regularly	3/10	30
Output	Percentage of IDUs knowing safe injection practices	39/48	81
	Percentage of IDUs knowing HIV/AIDS/STD	29/48	60
	Proportion of IDUs who did not hesitate to disclose HIV testing results if found positive	40/48	83
	Proportion of IDUs who shared injection needles and syringes before participation of NSEP	30/48	62

	Proportion of IDUs who shared even after participation of NSEP	18/48	38
	Proportion of IDUs who cleaned N/S with D/W & bleach in 2*2*2	5/18	28
	Proportion of IDUs who tested for HIV	35/48	73
	Proportion of IDUs who are found HIV positive	12/35	34
	Proportion of IDUs who used condoms consistently & correctly	14/48	29
	Proportion of IDUs who use condoms correctly & consistently among the HIV positives	5/12	42
Outcome	Sero-prevalence of HIV among recent IDUs	57/250	22.8 *

* HIV Sentinel surveillance report 2006, Manipur state AIDS Control Programme, Manipur, India

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Evaluation of HIV sentinel surveillance in Imphal, Manipur, India, 2007

1. Introduction

In India, 5.2 million people are infected with HIV/AIDS by the end of July 2005. The total number of AIDS cases reported to India's National AIDS Control Organization (NACO), was 111,608. Of this number, 32,567 (29%) were women, and 37% were under the age of 30 years. These reports are not accurate reflections of the actual situation as large numbers of AIDS cases go unreported. Overall, around 0.9% of India's population is living with HIV. While this may seem a low rate, India's population is vast, so the actual number of people living with HIV is remarkably high. There are so many people living in India that a mere increase in the HIV prevalence would increase the estimated number of people living with HIV by over half a million^{1,2}.

The national HIV prevalence has risen dramatically since the start of the epidemic, but a study at the beginning of 2006 suggests that the HIV infection rate has fallen in southern India, the region that has been hit hardest by AIDS³. As per NACO estimates the overall rate of new HIV infections in the country is declining. Researchers claim that this decline is the result of successful prevention campaigns, which have led to an increase in condom use.

In Manipur, AIDS has emerged as a new and serious health emergency. The first HIV positive case in Manipur was reported in February 1990 from the blood samples of October 1989 among a cluster of Injecting Drug Users (IDUs). It is estimated that there are 40,000 HIV positive cases in the general population in the state. Manipur is one of the six high HIV prevalence states in India with a prevalence rate among pregnant women attending ANC being 1.4 % (Sentinel Surveillance 2006). Manipur with hardly 0.2% of India's population is contributing nearly 8% of the total HIV positive cases in the country. More and more interior and hill areas are affected. However, due to successful

targeted intervention project, called Rapid Intervention and Care Project (RIAC), HIV prevalence rate among the IDUs showed a declining trend from 1998 onwards with a sero-prevalence rate of 72.78 in 1998 to 24% in 2005.⁴

The objectives of this evaluation were to: (i) describe HIV sentinel surveillance system in Imphal, Manipur, (ii) evaluate the system in terms of acceptability, flexibility, representativeness, cost, timeliness, simplicity and utility, (iii) determine whether HIV sentinel surveillance in Imphal met the NACO guidelines and (iv) suggest recommendations.

2. Methods

2.1 Description of HIV sentinel surveillance

We interviewed the key stake holders involved in the HIV surveillance, reviewed the operational manual, records and routine procedures followed in the sentinel surveillance including use of case definition, data transmission, data management and analysis. NACO guidelines were used.⁵

2.2 Evaluation of the system

We used the following indicators to assess various attributes of the surveillance system of HIV (Table 1):

2.2.1 Acceptability

We considered proportion of sentinel sites sending blood samples to testing centers weekly and proportion of testing centers reporting testing results to the state nodal officer weekly.

2.2.2 Flexibility

We considered proportion of Medical officers i/c willing to participate the in sentinel surveillance. We also considered proportion of medical officers willing to add surveillance of Hepatitis C in HIV sentinel surveillance in Manipur.

2.2.3 Representativeness

To assess the representativeness, we calculated the rural and urban distribution of blood samples collected from different sentinel sites.

2.2.4 Timeliness

We used two indicators for timeliness of sentinel surveillance. First we found out the time interval between surveillance period and feedback to the district. Secondly, we considered the frequency of the sentinel units submitting sentinel data.

2.2.5 Simplicity

We reviewed the surveillance flowchart to detect opportunities for simplifications.

2.2.6 Cost

Cost incurred for the sentinel surveillance activities and utilization of funds and logistics were reviewed to identify any obstacle comprising sentinel activities.

2.3 Methods used for evaluation

The evaluation included interviews using semi structured questionnaire of all the functionaries of the sentinel sites who participated in the sentinel surveillance conducted during September to November 2006. We reviewed the sentinel surveillance records and reports during the period 2003-2006 available at the designated sentinel sites and at Manipur state AIDS control Society for evaluation of representativeness, timeliness, simplicity, acceptability and cost of surveillance system. For flexibility, we conducted a survey of Medical officer i/c of sentinel sites.

3. Results

3.1 Description of HIV sentinel surveillance

HIV sentinel surveillance in Imphal district comprises of health facility based annual sentinel sero-surveillance done at a particular period in different population

subgroups which represent different risk level of acquiring HIV infection. Sentinel sites are chosen where blood is already drawn for some other purpose and a part of it could be separated and tested for HIV in an unlinked anonymous manner. For the purpose of selecting sentinel sites, population is divided into three categories according to the risk for HIV infection: (1) Low risk group represented by pregnant mothers attending ante-natal clinics (ANC), (2) high risk group represented by Commercial sex workers, Men having sex with men and injection drug users and (2) bridge population represented by STD patients, migrant workers etc. The age is restricted to 15-19 years for all groups.

3.2 Working definition for sentinel surveillance

1. **Pregnant women:** Consecutive first ANC attendee pregnant women were selected for surveillance till the required sample is reached
2. **STD patients:** Samples were taken from those having genital ulcers, urethral discharge, cervical discharge and ano-genital warts.
3. **IDUs:** Those who used injecting form of drug at least once during the last three months.
4. **FSWs:** Those who sold their sex at least once during the last one month.
5. **MSM:** Those who have sex with men at least once during the last six months.
6. All risk group categories must be within the age of 15-49 years.

HIV sentinel surveillance was started in the district since 1994 with four sites (2 ANC clinics, 1 drug de-addiction centre and 1 STD clinic). All the four sites were in urban areas. In 2002, one ANC site in rural areas (ANC, Jiribam) was added. In 2003, four new sites were added including two ANC sites in rural areas (ANC, Wangoi and ANC, Khumbong), one site for FSWs (Meitei Leima Sinnai Sang, FSW-MLSS, a non government organization for targeted intervention for female sex workers) and one clinic for MSM (Social Awareness Services Organization-men having sex with men, SASO-MSM-a non-government organization for targeted intervention for MSM). Thus in 2006,

the sentinel surveillance was conducted in nine sites including five ante-natal clinics (two in urban areas and three in rural areas), three sites representing high risk groups (one for commercial sex worker, one for men having sex with men and third at drug de-addiction center for injection drug users) and one clinic for sexually transmitted diseases representing the bridge population.

Sample size for each of high risk groups i.e. STD patients, FSWs, MSM and IDUs was 250. For low risk group represented by pregnant women, sample size was 400. For STD patients, 150 samples were from newly diagnosed consecutive male and female patients attending the STD clinic of Jawaharlal Nehru Hospital and 100 samples were collected from patients attending the gynecology out-patient department with STD of the same Hospital.

3.3 HIV testing strategy

The testing strategy in sentinel surveillance of HIV was 2 E/R (Elisa/Rapid). All sera samples were tested for HIV antibodies with one ELISA of high sensitivity. Any serum found reactive on the first assay was retested with a Rapid test of high specificity, based on a different antigen preparation and/or different test principle, from the first test. Serum that was reactive in both the tests was interpreted as “antibody positive”.

3.4 Data structure and analysis

All the individual proforma filled up with testing results are sent to MACS after checking for completion. The data is entered to the offline web based data entry system and then uploaded to the online National Institute of Health and Family Welfare (NIHFW) web site. Data was also analyzed at MACS and aggregated at state level to calculate median and confidence interval (95%) using NIHFW software. Site wise trends were obtained along with socio-demographic variables. Data were also given to National Institute of Medical Statistics (NIMS) for HIV estimation (Flow chart 1).

3.5 Quality control

Training of the functionaries of the sentinel sites is given at the state level every year before beginning of the sentinel period. The sentinel surveillance is carried out with at least two supervisory visits from the state level to the sentinel sites. The web based data entry process is utilized for data error checks and timely submission of the reports. The external quality control in the laboratories is also ensured by referring all the positive sera and 5% of the negative sera from state level testing center (JN Hospital testing Laboratory) to national level testing center (Regional Institute of Medical Science and College testing laboratory) and from national level testing laboratory to the state level testing laboratories.

3.6 Feedback

Results of sentinel surveillance were not disseminated to staffs of sentinel sites and testing centers and health care providers of the district. But the NGOs who are stakeholders of National AIDS Control Programme, working for control and prevention of HIV/AIDS collected the sentinel surveillance report from MACS.

3.7 Evaluation of the sentinel surveillance system

3.7.1 Representativeness

Distribution of blood samples collected from different ANC sites is shown in fig. 1. Among the sentinel sites for high risk groups like IDUs, MSM and FSW, rural population accounted for 40%, 12% and 33% of the samples collected. In STD clinics, only 36% of the samples were from individuals residing in rural areas.

3.7.2 Acceptability

Eight out of nine sentinel sites (89%) sent serum samples to their designated testing centers weekly. One sentinel site was irregular in sending the samples weekly, though it could send the required samples within the predetermined time. The two testing centers sent testing reports to the state nodal officer weekly (100%).

3.7.2 Timeliness

The sentinel sites sent the sera samples to testing centers weekly. The testing centers sent the results to state nodal officer weekly. Analysis of the data took fifteen days. The feedback of the report of the sentinel sites from the state level was usually obtained after two months of the surveillance period.

3.7.3 Flexibility

Seven of the nine Medical Officers (78%) told that the system could be utilized to incorporate surveillance of Hepatitis B and C.

3.7.4 Simplicity

The activities of the sentinel surveillance were implemented directly by the state level to the sentinel sites. The functionaries of the sentinel sites found all the aspects of the system simple.

3.7.5 Utility

HIV sentinel surveillance data is used to assess the changing trends of HIV prevalence as well as rapidity of the spread in different groups and areas. The data is useful in prioritizing target population groups needing interventions and to understand the nature of the epidemic. In absence of any active surveillance, data from sentinel surveillance is also helpful to estimate the number of people currently infected and number expected to develop AIDS in future.

3.7.6 Cost

Most of the logistics and equipments required by the sentinel sites were supplied by the state level (MACS). The fund provided to the sentinel sites, were for the review meeting, traveling cost, remuneration to the functionaries and any emergent cause during the surveillance period (Table 2).

4. Discussion

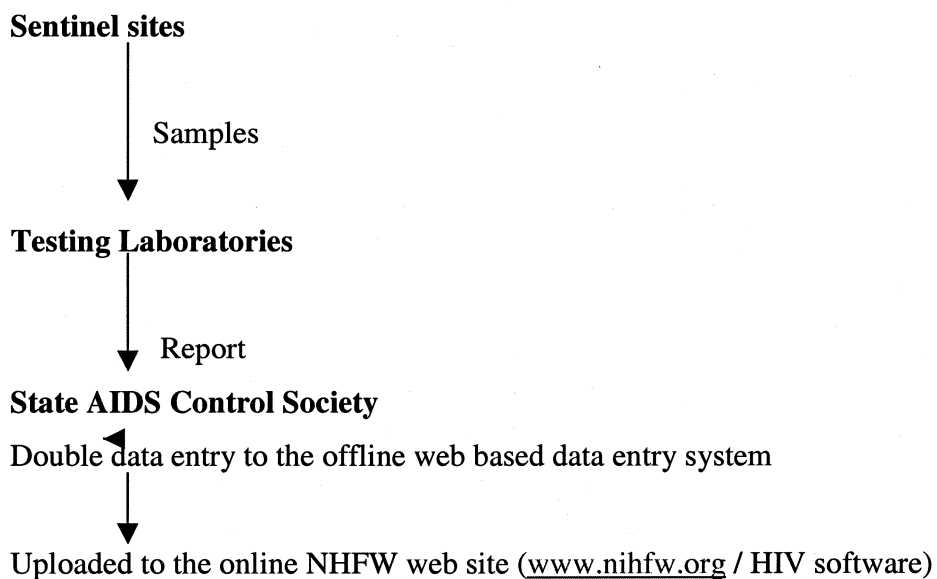
Sentinel surveillance, monitors trends in HIV infection over time, by group and by place. Although the existing sentinel surveillance system helped to generate a public response target prevention activities and plan responses at the state level, the district was completely by-passed with regards to planning, implementation and data processing of the surveillance.

A network of nine sentinel sites and two testing centers maintained a standard sentinel surveillance of HIV infection as per India's National AIDS Control Programme (NACO) guideline. Since the sero-prevalence observed among different population groups during the sentinel surveillance is used for assessing the trend of HIV, representativeness of the sentinel sites is crucial. In Imphal, the low risk group was well represented with three of the five sites in rural areas. However, there was poor representation of rural population among the sites for high risk groups like IDUs, FSWs and MSM as well as in STD clinics. Most of the NGOs working among these high risk groups are based in urban areas. There is a need to include more sites in rural areas covering these high risk groups.

HIV sentinel surveillance system was simple and acceptable. NACO guidelines for external quality assurance were ensured during the surveillance. Several of the stakeholders however mentioned that the system could be utilized to estimate the prevalence of other common blood-borne infections like hepatitis B and C among high risk groups.

Based on our evaluation, we recommend including sentinel sites for high risk groups in rural areas of the district. The possibility of using the system for assessing the prevalence of hepatitis B and C among high risk groups could also be explored.

**Flow chart 1: showing flow of sentinel surveillance activities,
Imphal, Manipur, 2006**



Data is also analyzed at State AIDS Control Society and aggregated at state level.

SACS sent data to NIMS also for HIV estimation

Table 1: Logic frame indicating surveillance attribute indicators of HIV sentinel surveillance, Imphal, Manipur, 2006

	Indicators	Data needed	Source of data	Design
▪ Acceptability	▪ Proportion of sentinel sites sending samples to the testing centers	▪ Number of sentinel sites sending samples to testing centers	▪ Testing centers	▪ Review of records
		▪ Total number of centers in operation	▪ State AIDS Control Society records	
	▪ Proportion of testing centers reporting prevalence data to the State Nodal Officer	▪ Number of testing centers reporting data	▪ State AIDS Control Society records	▪ Review of records
		▪ Total number of testing centers in operation	▪ State AIDS Control Society records	
▪ Flexibility	▪ Proportion of Medical Officers in sentinel sites willing to participate in HIV surveillance	▪ Proportion of Medical Officers willing to participate sentinel surveillance	▪ Interview of Medical Officers	▪ Qualitative interview
		▪ Total number of Medical Officers working in the district sentinel sites		
	▪ Compatibility of the system with the surveillance of other diseases	▪ Proportion of medical officers opinionated to include hepatitis-B and C surveillance	▪ Interview of Medical Officers	▪ Qualitative interview
		▪ Total number of Medical Officers interviewed		
▪ Representativeness	▪ For each group, proportion of blood samples from urban and rural population	• Proportion of serum samples collected from urban and rural population for low, high risk groups and bridge population.	▪ Surveillance data	▪ Review of records
				▪ Literature review
▪ Cost	▪ Cost incurred for the sentinel surveillance activities	▪ Cost of testing ▪ Remuneration of centers ▪ Costs at the district level	▪ State HIV surveillance officer	▪ Qualitative interview ▪ NACO guideline

Figure 1 Representativeness of the sentinel population in sentinel surveillance Imphal, 2006

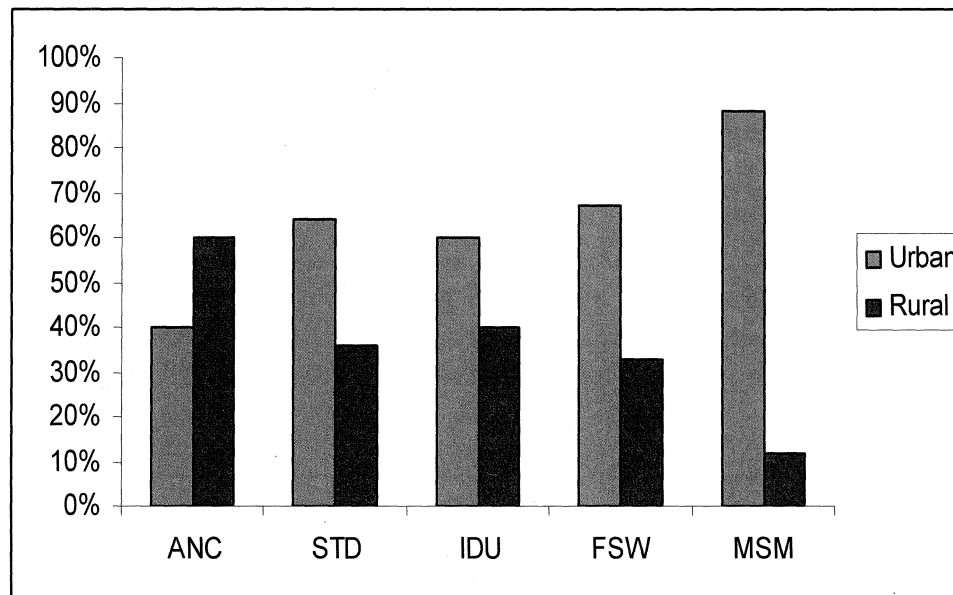


Table 2 Cost of Sentinel surveillance per sentinel sites

Items	Expenditure
Honorarium for personnel at sentinel sites, HIV testing Laboratory and secretarial assistance	Rs.10000
Consumables (HIV test kits, VDRL kits, gloves, disposable Syringes, storage of vials, labels Plastic apron, test tubes, stationary etc.	Rs.40000
Expenditure on transportation of blood samples & TA/DA and other contingency expenditure	Rs.10000
Cost per sentinel site	Rs.60,000
Cost at District level	Rs5,40,000

References:

1. An overview of spread and prevalence of HIV/AIDS in India, NACO
2. HIV/AIDS facts and figures- WHO, <http://www.who.int/hiv/facts/en>
3. Kumar R., Jha P. et al. (2006), Trends in HIV-1 in young adults in south India from 2000 to 2004: a prevalence study, The Lancet vol. 367: 1164-1172
4. Status Report, National AIDS Control Programme, Manipur 2005-2006.
5. HIV Sentinel Surveillance 2006, National Guidelines, National Institute of Health and Family Welfare, New Delhi-110067
6. HIV sentinel Surveillance, Manipur, 2006

Section 3: Outbreak investigations

An outbreak of chickenpox in Ruda Academy Hostel-2, Thoubal district, Manipur, India, 2007

1. Introduction

Chickenpox or varicella is highly contagious disease with 90% secondary attack rate. It affects 100% of population at some time or other during life. Chickenpox generally, is considered as a disease of young school going pre-adolescent children. In the last 20 years there has been an increase in cases of chickenpox at older age with majority of cases occurring between 15-24 years indicating a shift to right of the peak age. Many countries like USA, UK, Singapore, as well as developing countries like Thailand, Philippines and some parts of India like Kerala have reported 15-24 yrs. as the commonly affected age group due to chickenpox.¹ The disease is usually severe among adults compared to children, complications like pneumonitis, encephalitis are more common among them.

On 24th April 2007, the Chief Medical Officer reported three cases of chicken pox in Ruda Academy Hostel No. 2, Thoubal District, Manipur, India. On 27th April, 2007, Field Epidemiology Training Programme scholar of National Institute of Epidemiology, Chennai initiated an outbreak investigation with the help of District Surveillance Unit, Thoubal. The objectives of the investigation were to (1) estimate the magnitude of the outbreak, (2) improve the management of the cases and (3) propose control measures for preventing further spread.

2. Methods

Descriptive epidemiology

Ruda Academy is an English medium private school in Thoubal District, Manipur. It has two Hostels: Ruda Academy Hostel-1 and Ruda Academy Hostel-2. We took permission from the Principal of Ruda Academy for outbreak investigation of

chickenpox in Ruda Academy Hostel -2. We measured the areas of the rooms as they were very crowded.

We actively searched for chickenpox cases in the Hostel. We defined a case of chickenpox as an acute illness with generalized vesicular rash over the body among the boarders of Ruda Academy Hostel-2, Thoubal during 21st March to 2nd May 2007. We enquired if there were cases of chickenpox in Ruda Academy in previous years. There was no case of chickenpox in the last few years in that Hostel-2. We collected information about age, sex, date of onset, vaccination status, symptoms, signs, post chickenpox complications and outcome for each patient. Complications and deaths were considered as a sequel of chickenpox if these occurred within 30 days of onset. We calculated median age of the patients. We calculated the attack rate of chickenpox by rooms, age group, sex using demographic data obtained from the Hostel register. We examined the dynamics of the outbreak by constructing an epidemic curve.

3. Results

Ruda Academy Hostel-2 had three crowded rooms. In that Hostel-2, male students (aged up to ten years) as well as female students stayed together in the same room. The areas of rooms were 276sq.ft, 320sq.ft and 276sq.ft respectively (Fig.1). Twenty six students stayed in room number one. Thirty seven students stayed in room number two and 20 students in room number three.

3.1 Descriptive epidemiology

The index case was a resident of room number one (Figure 1). He went home two weeks prior to the development of illness, where his elder brother suffered from chicken pox. On 21st March 2007, vesicular rashes appeared on his body and face. He had fever also. We identified 37 cases (Table 1) in a population of 83 students. The overall attack rate (AR) was 45% (Table 2). The attack rate was highest among the students of room number one (AR=62%), followed by that of room number two (AR=46) and least among the students of room number three (20%). Case fatality ratio was zero. The median age of

the cases was nine years (Range: 5-15 years). Attack rate was highest among the age group 10-11yrs (AR=58%) and least among the age group 14-15 yrs (20%). The AR among male students was higher (63%) than that of female students (31%). The dynamic of the outbreak in epidemic curve (figure-2) indicated that there were generations of cases with peak during the 4th week of April 2007. The epidemic curve suggested person to person transmission. The incubation period was calculated as eight to 16 days. None of the residents (cases as well as non cases) was vaccinated. History of fever was reported by 36 (97%) of cases. Itching, cough and headache were reported by 35 (94.6%), 20 (54.05%) and 8 (21.6%) of cases (Table-3). There was no severe complication. All of them recovered uneventfully.

4. Discussion

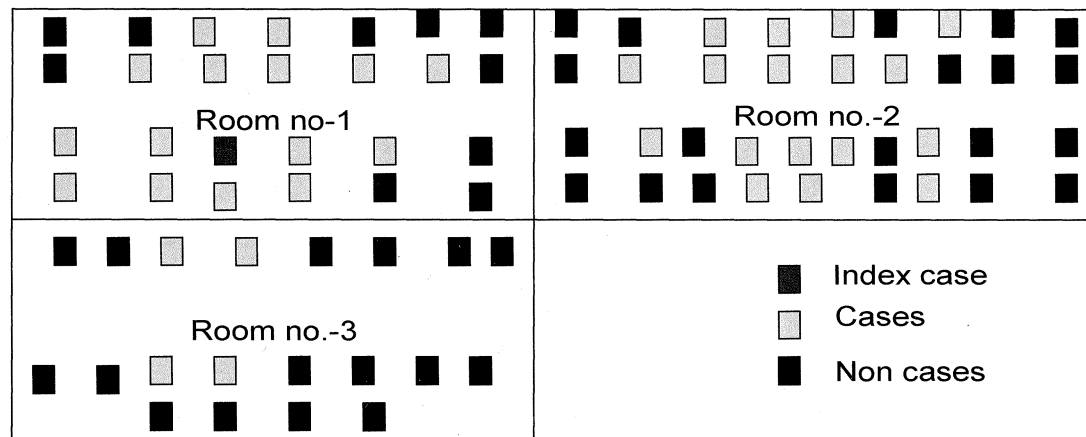
In Ruda Academy Hostel-2, students stayed in each room were more than the accepted standard of person floor space ratio² (Figure-1). A chickenpox outbreak affected the boarders of Ruda Academy Hostel-2, Thoubal district, Manipur between March 2007 and May 2007. The residents of all rooms were affected. The attack rate was highest among the occupants of room number one. AR was also highest among the age group 10-11 years and least among age group 14-15 years. There were no severe complications. We identified chicken pox cases in this outbreak investigation by using vesicular rash with or without fever. We could not confirm the diagnosis serologically. The results of the investigation indicated that outbreak occurred in a crowded Hostel. Strengthening outbreak surveillance and raising awareness about epidemic prone diseases and effective clinical case management should be the priority area to prevent future outbreaks.

On the basis of the result of the investigation, we formulated the following recommendations. First, increase awareness about epidemic prone diseases among school health authorities so that such events are reported to the nearest health authorities at the earliest. Second: Avoid overcrowding in hostels.

**Table 1: Line listing of chicken pox cases, Ruda Academy, Thoubal district,
Manipur, India, 2007**

ID	D.O.O	Age in yrs	Sex	V. Rash	Fever	Itching	Cough	Headache
1	21.03.07	7	M	Y	Y	Y	N	N
2	08.04.07	8	M	Y	Y	Y	N	N
3	08.04.07	9	M	Y	Y	Y	N	N
4	16.04.07	12	F	Y	Y	Y	Y	Y
5	24.04.07	13	F	Y	Y	Y	Y	Y
6	24.04.07	13	F	Y	Y	Y	Y	Y
7	25.04.07	9	M	Y	Y	Y	N	N
8	25.04.07	7	M	Y	Y	N	N	N
9	25.04.07	10	M	Y	Y	Y	Y	N
10	25.04.07	8	M	Y	Y	Y	N	N
11	25.04.07	9	F	Y	Y	Y	N	N
12	25.04.07	7	M	Y	N	Y	N	N
13	25.04.07	8	M	Y	Y	Y	Y	N
14	25.04.07	8	M	Y	Y	Y	N	N
15	25.04.07	9	F	Y	Y	Y	Y	N
16	25.04.07	9	M	Y	Y	Y	N	N
17	25.04.07	10	M	Y	Y	Y	Y	N
18	25.04.07	8	M	Y	Y	Y	N	N
19	25.04.07	7	M	Y	Y	N	N	N
20	25.04.07	9	F	Y	Y	Y	Y	N
21	25.04.07	6	M	Y	Y	Y	Y	N
22	25.04.07	15	F	Y	Y	Y	Y	Y
23	25.04.07	8	F	Y	Y	Y	N	N
24	25.04.07	8	F	Y	Y	Y	N	N
25	25.04.07	8	M	Y	Y	Y	N	N
26	26.04.07	9	M	Y	Y	Y	Y	N
27	26.04.07	9	M	Y	Y	Y	N	N
28	26.04.07	10	M	Y	Y	Y	Y	N
29	26.04.07	11	F	Y	Y	Y	Y	N
30	27.04.07	7	M	Y	Y	Y	N	N
31	27.04.07	11	F	Y	Y	Y	Y	N
32	27.04.07	8	M	Y	Y	Y	N	N
33	28.04.07	13	F	Y	Y	Y	Y	Y
34	28.04.07	10	M	Y	Y	Y	Y	N
35	28.04.07	15	F	Y	Y	Y	Y	Y
36	28.04.07	14	F	Y	Y	Y	Y	Y
37	02.05.07	14	F	Y	Y	Y	Y	Y

Figure 1: Spot map of chickenpox outbreak in Ruda Academy Hostel No-2, Thoubal district, Manipur, 2007



**Table 2: Distribution of chicken pox cases by rooms, Ruda Academy Hostel- 2,
Thoubal district, Manipur, India, 2007**

Room Number	Number of cases	Number of boarders	Attack rate (%)
1	16	26	62
2	17	37	46
3	4	20	20
Total	37	83	45

**Table3. Attack rate of chicken pox by age and sex, Ruda Academy Hostel 2,
Thoubal district, Manipur, India, 2007**

Age group in years	Number of cases	Population	Attack rate (%)
4-5	0	1	0
6-7	6	11	55
8-9	16	31	52
10-11	7	12	58
12-13	4	8	50
14-15	4	20	20
Male	22	35	63
Female	15	48	31
Total	37	83	45

Figure 2: Distribution of chicken pox cases by date of onset of rash, Ruda Academy Hostel 2

Thoubal district, Manipur 2007

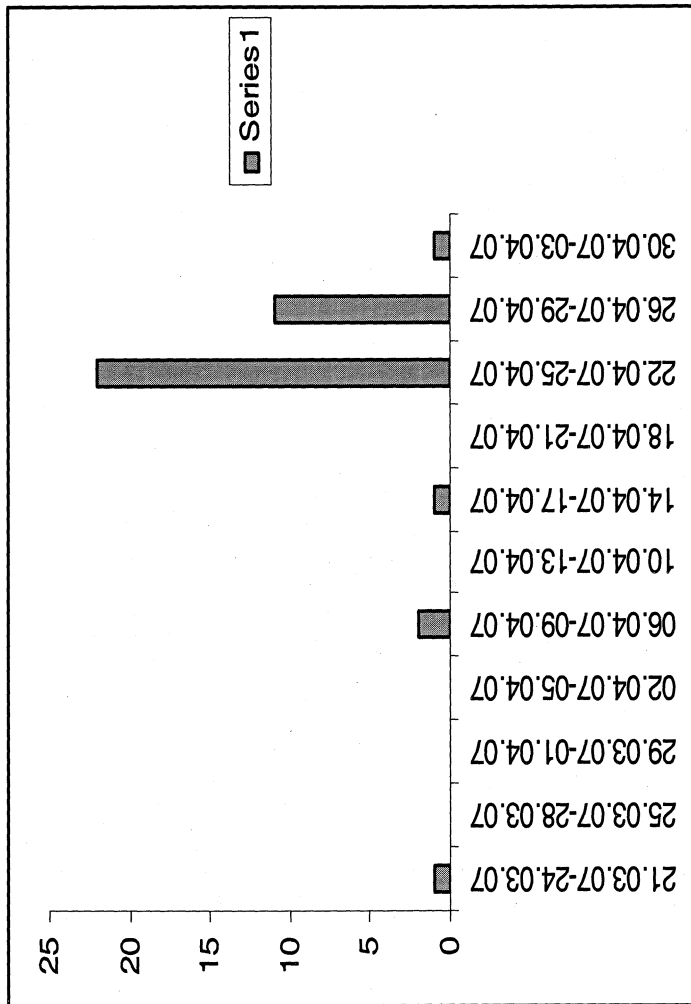


Table 4: Signs and symptoms of cases, Ruda Academy Hostel 2, Thoubal, 2007

Signs and symptoms	Number	%
Vesicular rash	37	100
Fever	36	97
Itching	35	95
Cough	20	54
Headache	8	22

Reference:

1. Varicella vaccine: Dr Nitin Shah, Hon. Pediatrician- UHC, LTMG Hospital, Mumbai. Treasurer, Indian Academy of Pediatrics, 1998-2001
2. Park's Social and Preventive Medicine, Housing 526-529

Section 4: Journal critique

Scientific study critique

General information: *Cassia Occidentalis* may cause hepatomyoencephalopathy in children

Title of the paper: *Cassia occidentalis* poisoning as the probable cause of hepatomyoencephalopathy in children in western Uttar Pradesh

Authors: V .M .Vashishtha, Amod Kumar, T Jacob John & N.C. Nayak.

Reference: Indian J Med Res 125, June 2007, pp 756-762

Reviewer: Dr. K. Purnamala Devi

Date: 12-01-08

General comments:

This outbreak investigation is justified because of the recurrent outbreaks of acute encephalopathy illness affecting children in many districts of Uttar Pradesh. Moreover it has high case fatality ratio. However, the global disease burden is not mentioned. Introduction is not clear. Some elements misplaced from methods and results to introduction. Outbreak investigation is not done systematically. Use of passive voice is common. Descriptive epidemiology as per time place and person is missing. Numbers are not rounded up. The public health impact of the disease should have been defined in population attributable fraction. Good writing and systematic case building is present but not consistent and another recommendation should be included regarding further research to establish the etiology of the outbreak.

Section by Section

Area	Checklist items	Grading from 1 (strongly disagree) to 5 (strongly agree)					Explanations
		1	2	3	4	5	
Overall assessment of the paper	The background provides a description of the public issue at the global and local levels and logically introduces the need to answer a specific research question.			√			The background does not provide global level of the public health issue. Local disease burden described but not clear.
	The methods section provides sufficient information on the methods used, including the type of study, the sampling strategy, the case definitions, the data collection and the data analysis.				√		The type of study and analytical study is well described. Systematic outbreak investigation is missing including time place and person analysis.
	The results reports sound scientific results that meet the study's objective and the research question. They are presented with sufficient details and adequate statistical information (e.g., Confidence Intervals).				√		The results are tabulated with adequate statistical information meet the study objective.
	The discussion summarizes and interprets the results, discusses the findings in view of what is already known, frames what the results of the study can support, defines the limitation of the work and suggests next steps in terms of (1) intervention and (2) research.		√				The discussion does not summarize and interpret the results. The limitations of the study are not well defined. However, recommendation is limited regarding future research for confirmation of the etiology.

Area	Checklist items	Grading from 1 (strongly disagree) to 5 (strongly agree)					Explanations
		1	2	3	4	5	
Methods	The study design is adequate to meet the objective.				√		Type of study is mentioned.
	The study population is well defined and relevant to the research question				√		Study population is well defined.
	Definitions are specified, sound and based upon standardized criteria when available.			√			Case definition is specified but not based on standardized criteria.
	Sampling methods are statistically sound and adapted.				√		The method adopted for taking the sample is mentioned.
	The sample size was estimated beforehand appropriately.				√		All 18 subjects taken for study are mentioned.
	The study is exempt from bias.			√			There may be recall bias.
	The data that were collected are well described and relevant.				√		Data are well described and relevant.
	The data collected was of sufficient quality.			√			The data collected were not of sufficient quality. Quality control measures in the generation of the data were not mentioned.
	The analysis is thought beforehand and appropriate.				√		The analysis is not appropriate, missing time place and person distribution. The child ate Cassia pods very recently may be a confounding factor rather than causal.

Area	Checklist items	Grading from 1 (strongly disagree) to 5 (strongly agree)					Explanations
		1	2	3	4	5	
	The indicators generated are appropriate and well calculated.				√		The indicators are well calculated and appropriate.
	The statistical tests used are appropriate and well computed.				√		The statistical tests are well computed.
	Appropriate attention has been given to human subject protection issues.	√					No mention has been made regarding human subject protection.
Writing	The content is well distributed by chapters and sections.					√	Yes ,the content is well distributed
	The language is simple and clear. The word count is < 3000.				√		The language is simple and clear, the word count is less than 3000 words.
	The writing is sequential, going from one point to the next.	√					The writing is not sequential.
	The active voice is used throughout.		√				Active voice is not used throughout.
	The vocabulary is precise, consistent and standardized.			√			The vocabulary is not precise and inconsistent
Tables and figures	There are no more than five tables and or figures. All are needed.		√				The first table is not needed and tables of time, place and person distribution missing.
	The choice of graph or table to display information is judicious.		√				Choice of tables and figure are not judicious and not at the end of the manuscript.
	The tables are clear, exact and the totals add up.			√			Tables are exact, clear and correct but not rounded up.
	The graphs are effective, appropriate and understandable.		√				Graphs not shown