Report of the 2009 survey

HIV Sentinel Sero-Surveillance Survey in Sri Lanka

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Contents

Abbreviations used in this report

AIDS	Acquired immunodeficency syndrome
CP	Central province
DTCO	District tuberculosis control officer
DU	Drug User
ELISA	Enzyme-linked immunosorbent assasy
FSW	Female sex worker
HIV	Human immunodeficency virus
MOH	Medical officer of health
MSM	Men having Sex with Men
N & E P	North and East provinces
NCP	North Central province
NSACP	National STD/AIDS control programme
NWP	North Western province
Sab P	Sabaragamuwa province
SP	Southern province
STD	Sexually transmitted disease
TB	Tuberculosis patient
TW	Transport worker
UP	Uva province
WP	Western province

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1. Introduction

Good Surveillance does not necessarily ensure the making of right decisions, but it reduces the chances of making the wrong ones.

Alexander D. Langmuir (Langmuir 1963)

Surveillance, the eyes and ears of public health, provides information through which public health programes can act effectively and efficiently. Controlling and preventing diseases based on information collected through surveillance requires action.

The surveillance of Human Immunodeficiency Virus (HIV) infection is of great value in designing, implementing and monitoring of public health programmes for the prevention and control of HIV infection and the Acquired Immunodeficiency Syndrome (AIDS). There are number of different methods available for HIV surveillance. Of these behavioural surveillance, biological or sero-surveillance, HIV and AIDS case surveillance and use of other supplementary data such as Sexually Transmitted Infections (STI) and Tuberculosis surveillance have been recommended by WHO/UNAIDS.

High quality sentinel surveillance systems have frequent and timely data collection, conduct surveillance in appropriate populations, are consistent in the sites and groups that are measured over time and provide estimates that are representative of the population.

The National STD/AIDS Control Programme (NSACP) of Sri Lanka has been annually conducting HIV Sentinel sero-surveillance since 1993. This survey was initially designed on the guidelines prepared by World Health Organization (WHO) in 1989. The purpose of HIV sentinel survey is to track HIV infection levels through 'watch post' institutions. These sentinel institutions routinely draw blood for other purposes. The usual method of HIV testing for sentinel survey is known as Unlinked Anonymous Testing. This method involves the use of blood already collected for another purpose. Having performed the stipulated test, the labels of tubes are removed to delink from any identity and the HIV test is carried out. The purpose of unlinked anonymous testing is not to identify infected individuals or case finding. The objective is public health surveillance of HIV infection. The strengths and weaknesses of HIV sentinel surveys have been clearly described in 'the guidelines for

Second Generation HIV Surveillance' published by UNAIDS/WHO. The HIV sero-surveillance in Sri Lanka has been regularly reviewed and necessary modifications done based on the new evidence about the local HIV epidemic. Certain Sentinel groups were discontinued while others were newly added depending on the new evidence of the local epidemic. Enrolment of some sentinel groups was done in the field level rather than from clinic settings (sex workers, transport workers, armed forces and drug users).

In Sri Lanka, behavioural surveillance with regard to HIV commenced in 2006 and the first round of BSS has been completed in 2007. Next step would be conducting integrated behavioral and sero surveillance which will give a better correlation between risk behavior and the sero prevalence among the risk goups that will be surveyed.

All surveillance methods have their limitations. The HIV sentinel surveillance is no exception. However, the information generated by sero-survey complements to other data on the HIV epidemic and will be useful to improve the understanding of the HIV epidemic in Sri Lanka.

2. Methodology

Six subpopulation groups were included in the survey. These were female sex workers, Men who have sex with Men, drug users, STD clinic attendees, patients with tuberculosis and military service personnel. Female sex workers were included in the survey, from the beginning due to their multiple sexual partners and high risk behaviour patterns. STD clinic attendees represent clients of sex workers and their partners. The patients with tuberculosis do not represent a behaviour category. However, they are a good sentinel group to monitor HIV infections in a low prevalence situation due to the synergistic relationship between HIV and TB infections. Military (service) personnel were included in the survey since 2003 due to their reported high risk behaviours. Drug user group was newly added in 2006 survey due to their high risk behaviours with respect of acquiring HIV infection. Among reported HIV positives in Sri Lanka, 11% transmission can be attributed to homo/bi sexual mode. Thus in 2008 this group was added as a sentinel group. Main MSM networks which also participated in the BSS were contacted and consented to participate. Only two sentinel sites were assigned to conduct the survey for drug users and MSM due to limited availability of the MSM NGOs in

2008 and that was extended to four sites in 2009..However limited number of MSM participated in the survey.

Duration of the survey

The survey of 2009 was planned to be conducted over a period of 3 months from 15th August 2009. Most sentinel sites failed to cover sample sizes for primary sentinel groups namely FSW and TB patients. However, some sentinel sites extended the survey by two more weeks to get more blood samples.

Sentinel sites

All nine provinces were included as sentinel sites. (Annex IV). For a given sentinel site there were more than one sample collecting centres (Table 1). Over the years for the purpose of this survey, Northern province and the Eastern province were combined as one sentinel site (Northern & Eastern provinces). As the purpose of the sentinel surveillance is to examine trends of HIV prevalence,North and East provinces were combind as a one sentinel site in 2009 also.

Table 1. Sentinel sites and sample collecting centers for 2009 survey

Sentinel Sites	Sample-collecting centers
1. Western Province (WP)	Colombo, Colombo South, Colombo North, Negombo, Kalutara,Gampaha
2. Central Province (CP)	Kandy, Matale, Nuwara Eliya
3. Southern Province (SP)	Mahamodara, Balapitiya,Matara, Hambantota
4. Sabaragamuwa Province (Sab.P)	Ratnapura, Kegalle
5. North Western Province (NWP)	Kurunegala, Chilaw
6. North Central Province (NCP)	Anuradhapura, Polonnaruwa
7. Uva Province (UP)	Badulla, Mahiyangana, Kataragama
8. North-Eastern Province (N&E P)	Trincomalee, Batticaloa, Ampara, Mannar,Kalmunei,Vavuniya,Jaffna

Sampling method

Female sex workers were enrolled mainly from the field visits to brothels and other places where sex work take place. Blood samples were collected from all the sex workers present on the day of visit after obtaining consent for VDRL. Some sex workers were enrolled from the STD clinics. Specially designed card (pink in colour) containing necessary information was given to FSW to prevent double counting.

STD clinic attendees enrolled from STD clinics using data extraction form.Similarly patients with TB were enrolled consecutively from chest clinics and Chest hospital wards.

Collection of the samples from military service personnel was carried out by the Sri Lanka Army Medical Services from selected camps situated in three provinces namely Western Province, North Central Province and North-Eastern Province.

Drug Users were enrolled from the rehabilitation centres maintained by the National Dangerous Drugs Control Board (NDDCB) while MSM samples were collected by visiting MSM dance parties and droped in centers maintained by the MSM NGOs.

Sample size

Sample sizes were mainly based on WHO recommendations for HIV sero-surveillance surveys. The sample collection was discontinued once the stipulated sample sizes were completed. These predetermined sample sizes are given in table 2.

Table 2. Stipulated sample sizes for each sentinel group and site

Sentinel Group	**WP**	**CP**	**SP**	**Sab.P**	**NWP**	**NCP**	**UP**	**NEP**
1. FSW	400	250	250	250	250	250	250	250
2. STD	All attended during the survey period							
3. TB	250	250	250	250	250	250	250	250
4. Service personnel	400	-	-	-	-	400	-	400
5.MSM	250	250	250	-	-	250	-	-
6. Drug User	250	-	250	250	-	250	-	-

The following **working definitions** were used for survey.

1. Female Sex Workers (FSW) - Women who have practised commercial sex work during past one year. They were enrolled mainly by field visits. However, when this option was limited, sex workers who were seeking care at STD clinics were also enrolled for the survey. Both indirect and direct female sex workers were included in the survey irrespective of their age.

2. STD clinic attendees (STD)- Persons who attend a STD clinic seeking care at selected sentinel sites during the survey period. Both males and females were included. Both newly registered patients and those who came for follow up visits were included. All age groups over 18 months were included in the survey if they had attended for a STD related complaint. Those who came for routine pre-employment, or antenatal screening, were excluded from the STD clinic attendee category. Patients with previously diagnosed HIV infection were excluded from the survey unless they have come for a STD related complaint. This was to prevent artificially high HIV prevalence rates in the HIV care providing STD clinic settings.

3. TB patients (TB) - Both new and old TB patients who were registered in the TB register maintained by the District Tuberculosis Control Officer (DTCO) during the survey period were enrolled. Both pulmonary and extra-pulmonary TB cases were included. Lowest age group for TB patients was 18 months. Patients older than 49years were allowed if sample size could not be achieved during the survey period.

4. Service personnel (Service) - Currently serving army personnel in combat in selected army camps in each sentinel site were enrolled. Female officers and those who were engaged in full time office work were excluded. Age was limited to 18 to 49 years. To prevent double counting a beige colour card with relevant information was given to those enrolled.

5. MSM (Men having sex with Men) A man who has had oral or anal sex with another man in the previous year. MSM sample will be recruited with the help of NGOs and also people who attend STD clinics with the specified behavior during the survey period. Take all approach will be adopted in the NGO sites. A card (green colour)will be issued to all MSM survey participants to avoid double counting.

6. **Drug User (DU)**- Any man or woman who has used at least one drug in the previous six months for other than medically prescribed purposes.

Method of HIV testing

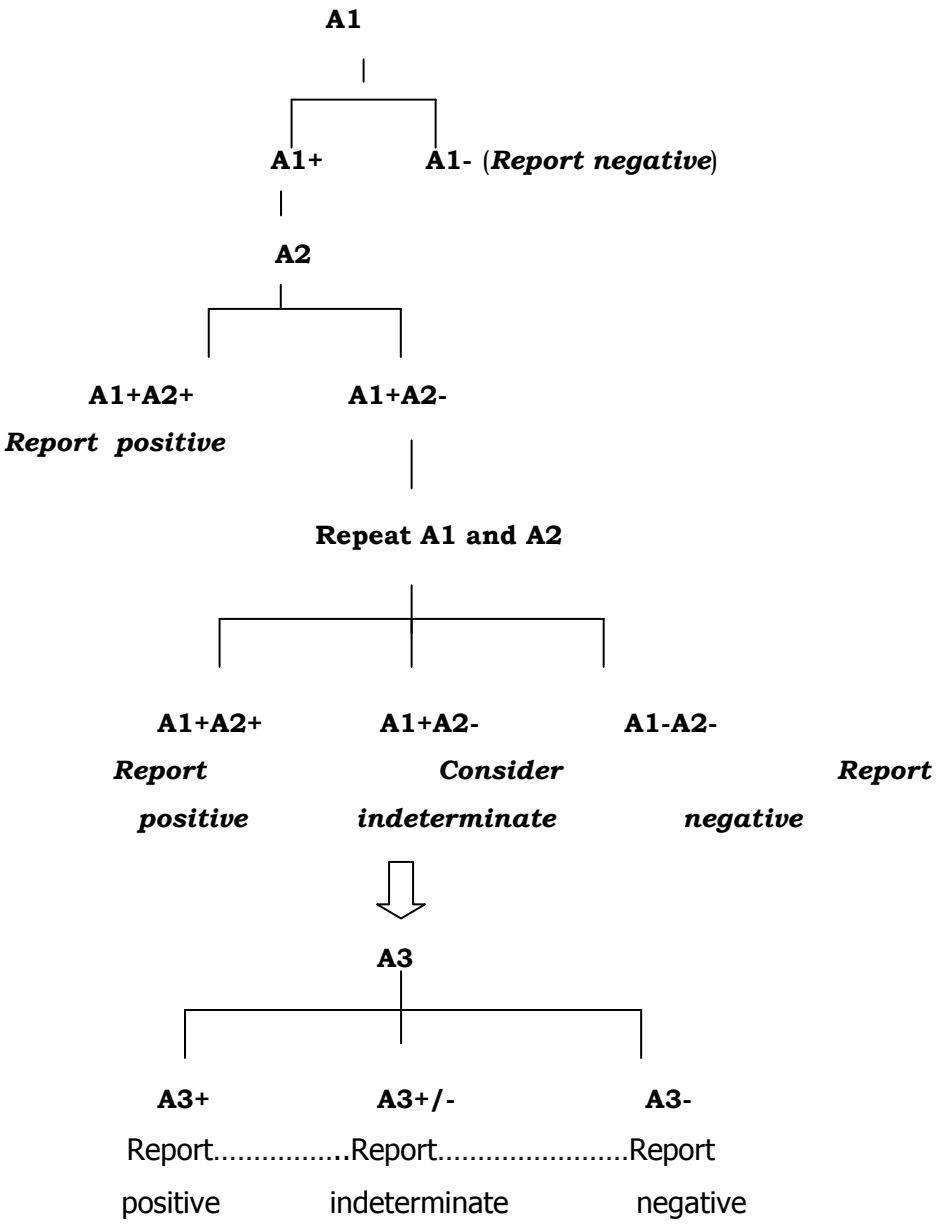
unlinked anonymous testing was the method of choice for HIV testing in the FSW,MSM, DU and Service personnel blood samples . Routinely collected blood was used only in STD clinic attendees and TB patients after provision of HIV information and HIV test was offered. In all other sentinel groups blood samples were collected for the VDRL test on obtaining informed consent. Once the VDRL tests were carried out, left over blood were used for HIV testing after removing individual identifying labels.

Laboratory testing strategy for HIV antibodies

HIV antibody status was mainly determined based on the results of two screening assays (i.e. ELISA and Particle agglutination assay) and a confirmatory test carried out for indeterminate tests.. All samples tested positive with the first test were tested with the second screening test. If both tests were positive the sample was considered as positive. If the 1st test was positive and the 2nd test was negative or vise versa , then both screening tests were repeated (1st and 2nd test) and if both were positive it was considered as positive. If one test was positive and the other test was negative it was considered as indeterminate.

Since the prevalence of HIV is low in Sri Lanka, it was decided that indeterminate samples from screening tests should be tested again with a confirmatory test. The same methodology was used in the previous surveys.

Testing Algorithm used for the 2009 survey is given below.



Assay A1, A2 represents 2 different screening assays (ELISA and Particle agglutination tests). A3 represent a confirmatory test (Line Blot assay)

Staff training, Monitoring and supervision

The survey protocol was modified to suit changes in the 2009 survey. A training workshop was held in Colombo prior to the commencement of survey to familiarize health-care personnel and other relevant persons on this protocol. Monitoring and supervision were carried out to ensure uniformity at all sentinel sites.

Supervisory visits were carried out to some sample collecting centers during the survey period. Officers from Colombo conducted these visits. A standardized structured checklist was used to collect relevant information. Many supervisory visits to sentinel sites in North and East province, Uva and North Western Provinces were not possible due to logistical problems and adverse weather conditions .

3. Results

A total of 8120 blood samples were tested and 06 HIV antibody positive samples were detected in 2009 HIV sentinel sero-survey. Of these, 4 were from STD patients and 2 from MSM category. There were no HIV positives among female sex workers, Drug users , TB patients or service personnel. No indeterminate results were noted during 2009 survey.

Table 3. HIV test results by sentinel sites and sentinel groups

Sentinel Sites	Sentinel groups											
	STD		**FSW**		**TB**		**Service**		**DU**		**MSM**	
	No. tests	No. +ve	No. tests	No. +ve	No. tests	No. +ve	No. tests	No. +ve	No. tests	No. +ve	No. tests	No. +ve
WP	686	1 [0.2%]	339	0	272	0	400	0	273	0	108	2 [1.8 %]
CP	253	0	39	0	230	0	-	-	164	0	42	0
S.P	451	1 (0.2 %)	119	0	207	0	-	-	315	0	97	0
Sab.P	253	0	110	0	270	0	-	-	253	0	-	-
NWP	256	0	222	0	165	0	-	-	-	-	-	-
NCP	298	2 [0.7%]	162	0	164	0	580	0	-	-	138	0
UP	250	0	36	0	80	0	-	-	-	-	-	-
N & E P	299	0	5	0	159	0	400	0	-	-	-	-

Table 3 depicts the number of HIV antibody tests, number of HIV positive samples and sero-positivity rates amongst different sentinel groups at various sites. All sites enrolled stipulated sample sizes for STD clinic attendees. Of the 06 HIV positive samples, 4 were from STD patients whose sero-prevalence rates ranged from 0.2% to 0.7%. Western Province sentinel site comprised of 3 main STD clinics so the STD case load is comparatively large in that sentinel site.

Period prevalence of HIV among FSW was 0%. Only Western province was able to enroll adequate number of FSW for the survey. Northern & Eastern provinces

could enroll only few FSW. Uva and Central Provinces enrolled fewer than 100 FSWs.

Among TB patients, satisfactory numbers were enrolled only in 2 sentinel sites. Stipulated numbers have been enrolled for Service personnel in all 3 provinces. Similar to previous years none of the blood samples gave positive results.

Figure 1

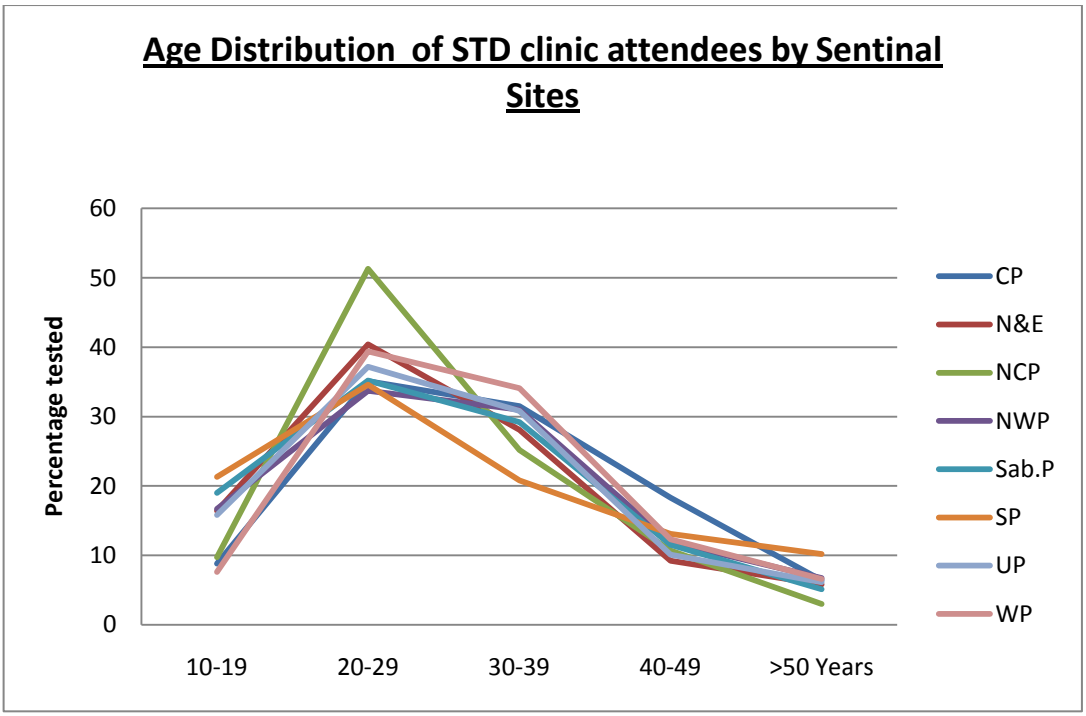
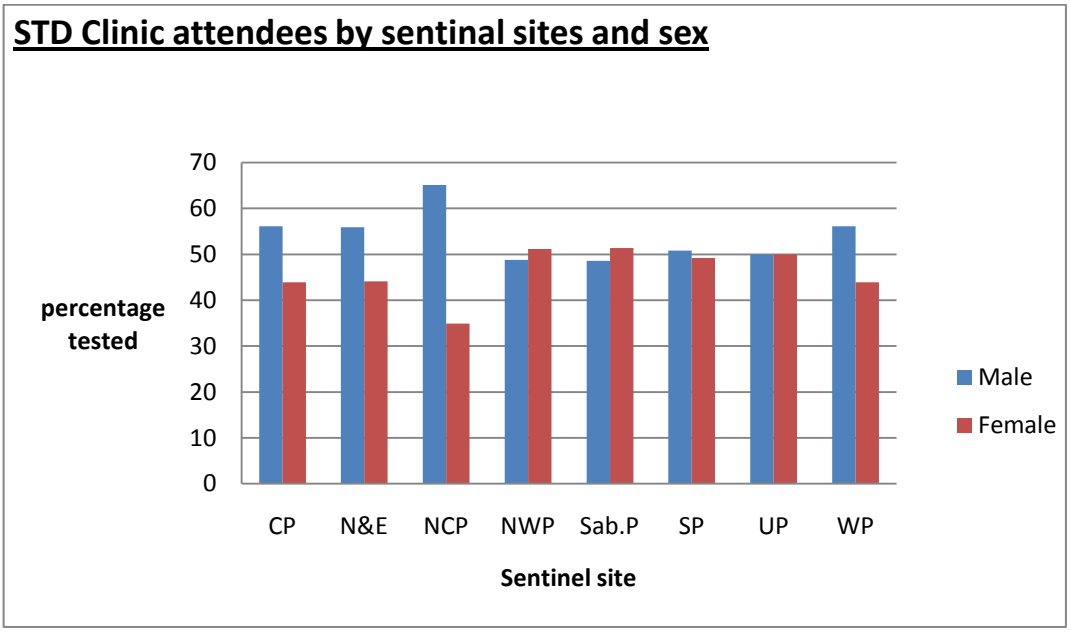


Figure 1 shows the distribution of STD clinic attendees enrolled in various sentinel sites by age group and sentinel sites. Majority of the sample was in 20-29 and 30-39 age groups in all sentinel sites. Mean age for the sample was 30.4 with a standard deviation of 11.4.

A total of 2,746 STD clinic attendees were tested and 4 found to be HIV positive making the prevalence rate ranging from 0.2 to 0.7%.

Figure 2



In all most all sentinel sites, a higher percentage of male STD clinic attendees were enrolled for the survey. In the NWP and Sabaragamuwa Province where reversal of the male to female ratio was observed . The difference between male and female STD clinic attendees in NCP is found to be 30%.

Figure 3

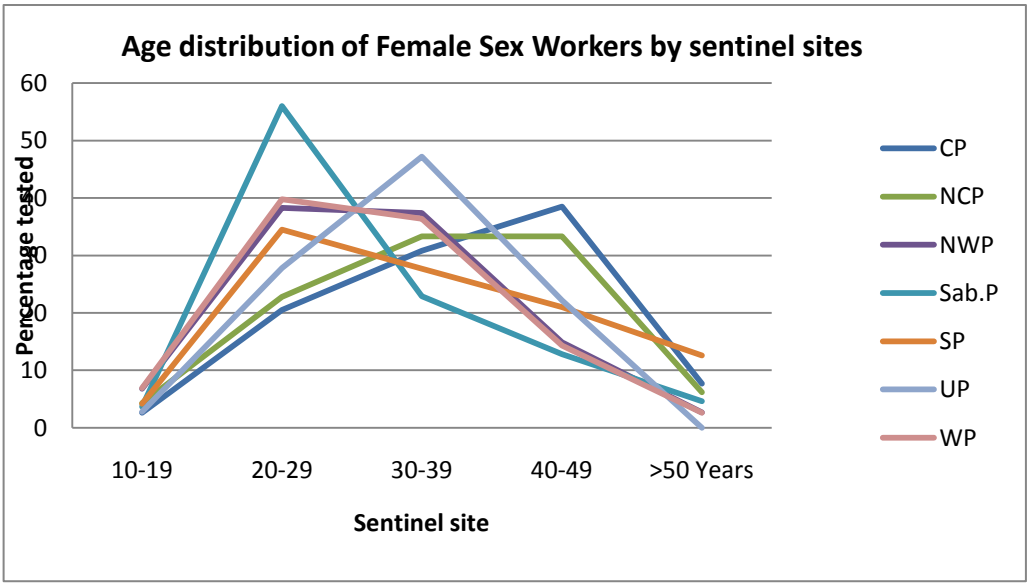
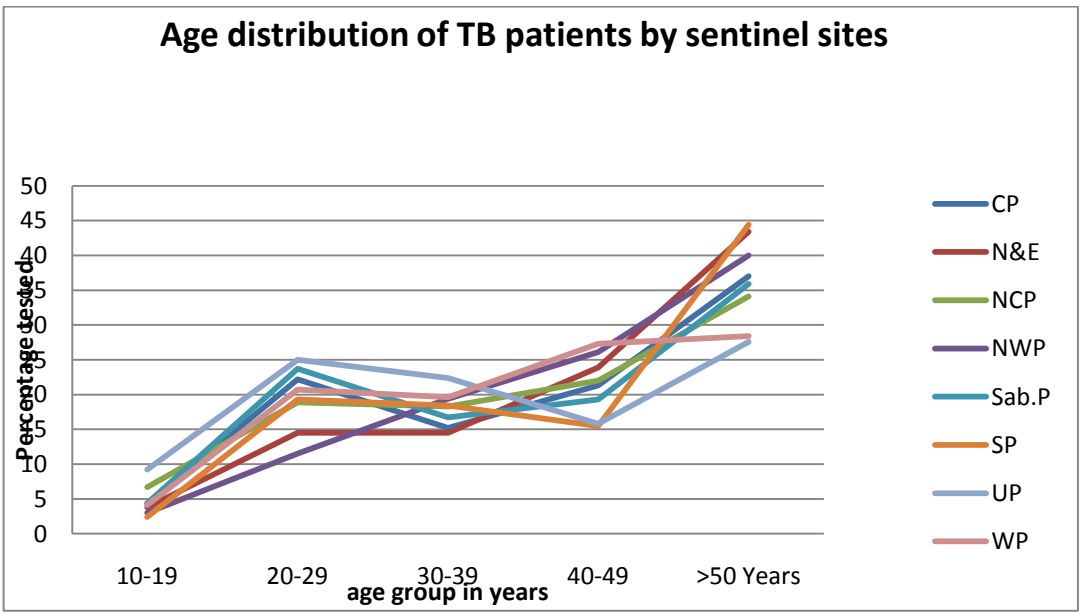


Figure 3 shows the distribution of female sex workers enrolled in the survey by age group and sentinel sites. Similar to the STD clinic attendees, majority of the sample

was in 20-29 and 30-39 age groups in all most all sentinel sites. Only 6 FSWs were recruited from the NEP. Thus presentation as a percentages was not done in this line graph.Mean age for the female sex worker sample was 32.6 years. Of the total 1042 female sex workers tested none became positive for HIV antibodies in the 2009 survey.

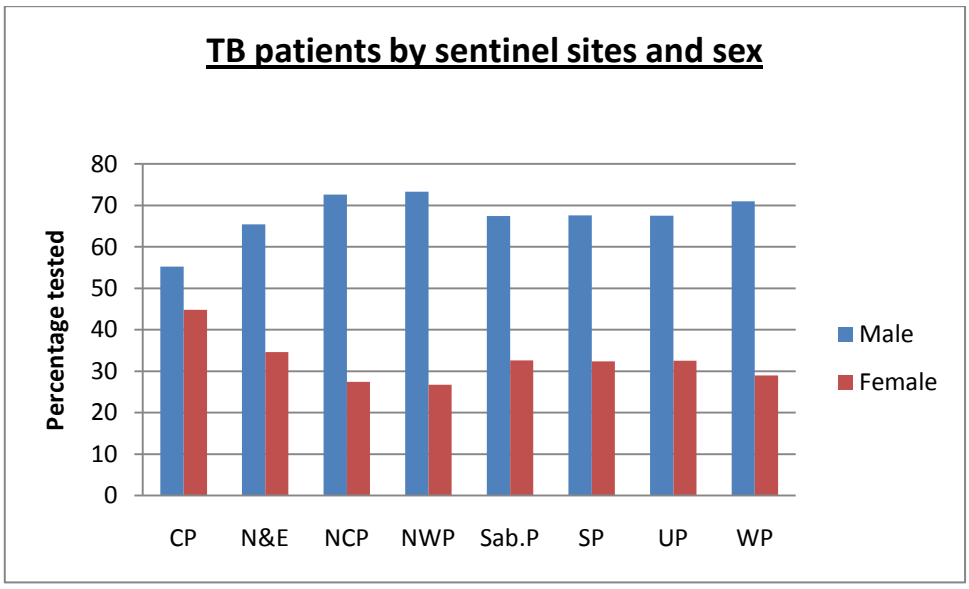
Figure 4



None of the sentinel sites were able to enroll adequate numbers of TB patients. In all sites more patients in the older age group were enrolled. Mean age for the sample was 42.9 years. Only 8 cases were below 15 years.

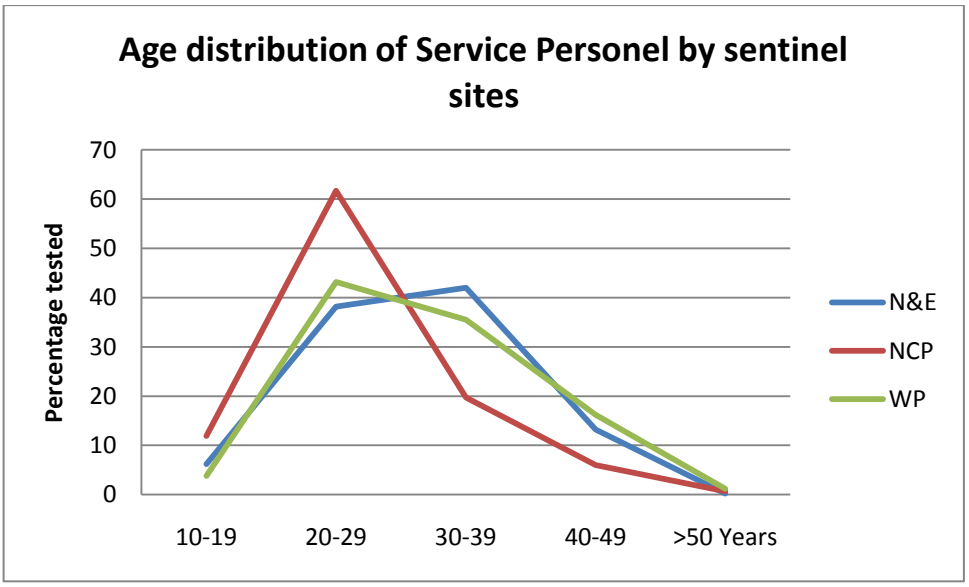
A total of 1547 patients were tested during the survey. None of the TB patients were HIVpositive in the 2009 survey.

Figure 5



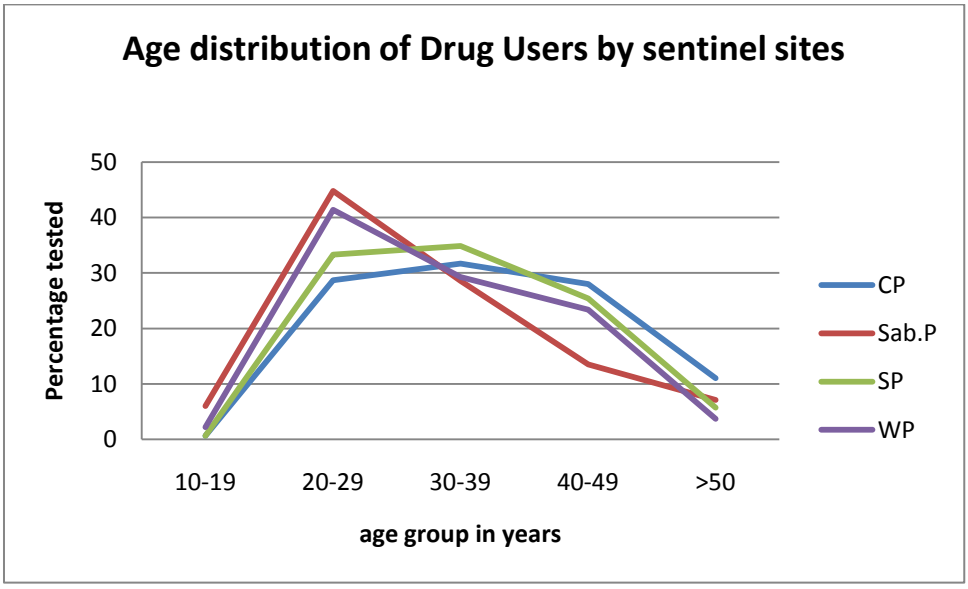
In all sentinel sites, a higher proportion of males was noted among TB patients (figure 5). This sex difference was most marked in the North western province (73.3% males Vs 26.7% females).

Figure 6



Only male army service personnel in combat duties were enrolled in the survey. Stipulated sample sizes were enrolled in all sites. More persons were in the 30-39 and 20-29 year age groups (figure 6). Mean age of the sample was 29.6 years (SD 7.8). Of the 1380 samples tested, there were no HIV antibody positive samples.

Figure 7



Drug users were enrolled from the rehabilitation camps in the WP , SP,CP and Sab.P sentinel sites. Majority of them were in 20-29 and 30-39 age groups(fig.7). Mean age for the drug users was 33.7 with a standard deviation of 9.4. None of the drug user samples found to be HIV positive.

Figure 8

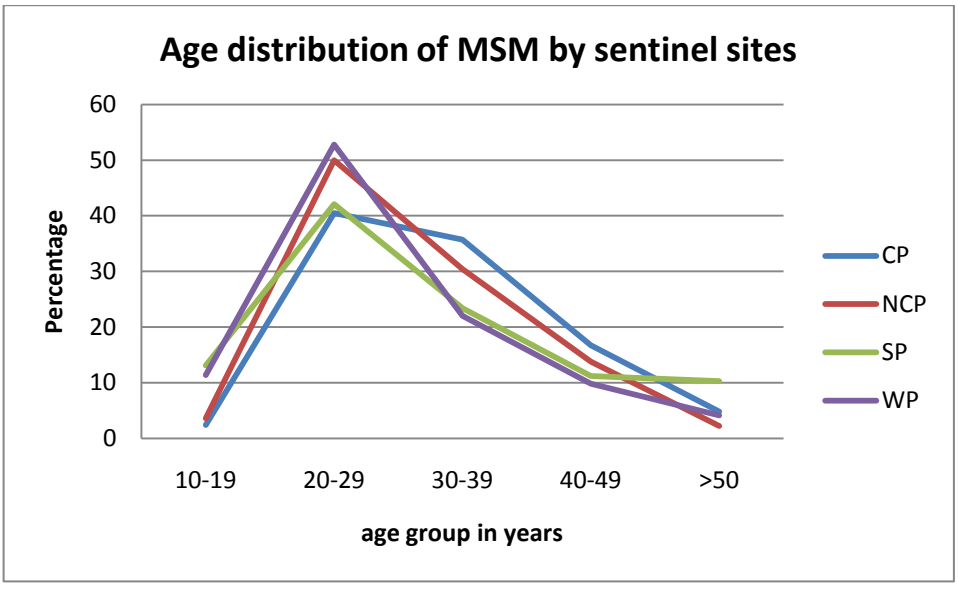


Figure 8 shows the distribution of MSM enrolled in four sentinel sites by age group Majority of the sample was in 20-29 age group in three sentinel sites. Mean age for the sample was 30.3 with a standard deviation of 9.9.

A total of 413 MSMs were tested. Of the 108 MSM enrolled from WP, two samples were found to be HIV positive making the HIV prevalence rate among MSM in WP 1.8%.

SUMMARY

Table 4. Summary of HIV positive cases found in HIV sentinel sero-survey 2009.
(Better to have a separate row for each site and sentinel group.)

No.	Sentinel site	Bleeding site	Sentinel group	Age	Sex	Sero-prevalence rate
1 2 3	Western P.	Colombo Colombo- North STD Clinic	STD MSM MSM	37 23 39	Male Male Male	0.2% 1.8%
4	Southern P.	Hambantota STD clinic	STD	34	Male	0.2%
5 6	North Central P.	Polonnaruwa STD clinic	STD STD	37 36	Male Female	0.7%

Of the 6 HIV antibody positive samples , 4 were from STD patients (1 females and 3 males) Highest sero-prevalence of 0.7% was found in NorthCentral province. Remaining 2 HIV positive samples were found among MSM samples from Western province thus making the sero prevalence rate 1.8%..

Table 5. VDRL test results by sentinel sites and sentinel groups

Sentinel Sites	STD		FSW		Service		DU		MSM	
	No. tested	No. +ve	No. tested	No. +ve	No. tested	No. +ve	No. tested	No. +ve	No. tested	No. +ve
WP	691	33 (4.78%)	351	16 (4.56 %)	400	0	273	2 (0.73%)	122	15 [12.3%]
CP	267	12 (4.49%)	41	0	-	-	164	1 (0.61%)	42	3 (7.14%)
S.P	352	4 (1.14%)	68	0	-	-	315	0	101	1 (0.99%)
Sab.P	253	6 (2.37%)	110	5 (4.55 %)	-	-	253	0	-	-
NWP	256	11 (4.3%)	222	5 (2.25 %)	-	-	-	-	-	-
NCP	298	12 [4.03%]	162	1 (0.62 %)	580	0	-	-	138	0
UP	250	16 (6.4%)	36	3 (8.33 %)	-	-	-	-	-	-
N & E P	275	16 (5.82%)	6	0	400	0	-	-	-	-

4. Discussion

The number of blood samples tested in 2009 HIV sentinel sero-survey was 8120. Of these, 6 samples gave positive HIV antibody test results.

There were no changes in the sentinel sites from the previous survey. However it should be noted that Jaffna STD clinic participated in this year's survey with lot of commitment. In terms of HIV spread, this area is generally considered to

be high risk due to its proximity to South Indian states where HIV prevalence is high. Volatile political environment and influx of tourists into the area may further worsen the situation.

Similar to the testing protocol for the 2008, confirmatory HIV testing was planned to be carried out for indeterminate samples from the screening tests. However, none of the samples fell into the indeterminate category. The enrolment of STD clinic attendees was satisfactory in all sentinel sites. Both male and female patients who attended public STD clinics during the survey period were taken as STD clinic attendees. Male STD clinic attendees are thought to be representing clients of sex workers. There were four STD clinic patients found to be HIV positive and the sero-prevalence rate ranged from 0.2 to 0.7% .

Female sex worker are an important risk group for HIV infection. It is well known that liaisons with males and sex workers are the main driving force of HIV epidemic in Asian countries. Both direct and indirect female sex workers were enrolled mainly from the community for HIV sero-survey. None of the sex workers became HIV positive in the current survey. Enrolment of adequate sample sizes for female sex workers was a recurrent problem for many sentinel sites. Only the Western province was able to enrol adequate sample for 2009 survey.

Patients with tuberculosis were traditionally included in sero-surveys due to its synergistic nature with HIV infection. HIV fuels the tuberculosis epidemic, increasing both the risk of reactivation of mycobacterium tuberculosis infection and the risk of rapidly progressive tuberculosis developing soon after infection or re-infection. Worldover HIV testing being offered to TB patients, partly because TB clinics are recognised as good entry points for the provision of antiretroviral treatment.Thus In the 2009 survey HIV test results were extracted from the chest clincs for the survey period.

The enrolment of Service personnel were consistently satisfactory. There were no HIV positive samples in this group. Drug users were added to the sentinel survey from 2006. Intravenous drug use is directly linked to the HIV transmission. IVDU prevalence is very low in Sri Lanka and to monitor the drug user behavior as a proxy measure it was decided to add drug users for the sentinel surveillance since 2006. None of the drug user samples became positive for HIV antibodies.

Enrollement of MSM category continue to be a problem even in the presence of several MSM NGOs.It was extremely difficult to contact NGOs catering to high social

class MSMs and only MSMs in the lower socio economic group was able to tap for the survey. Different strategy should be explored in future surveys to increase the survey participation of MSM members. They are very important sentinel group to monitor the sero prevalence in a low HIV prevalent country.

HIV sentinel survey conducted in 2009 neither show a clear trend for all the sentinel groups surveyed nor showed a marked change in HIV sero-prevalence among the sentinel groups surveyed except for the MSM category. Still these results are compatible with a low level HIV prevalence in the country. A properly conducted behavioural surveillance system would be more sensitive to issues related to HIV epidemic in this situation. The first round of behavioural survey was completed in 2007.

Acknowledgement

The National STD/AIDS Control Programme wishes to thank the World Health Organization for funding the survey.

The staff of the STD clinics and Chest clinics who participated in the sentinel surveillance are acknowledged for their co-operation in carrying out the survey.

The NSACP appreciates the support given by Medical Service Unit of the Sri Lanka Army, the National dangerous drugs control board and MSM NGOs.
Last but not least, all the participants of this survey is acknowledged with special thanks.

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Annex 1

Results of HIV Sentinel survey 1993-2009 for Female sex workers

Number tested and number positive (rate)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2009
Colombo (WP)	1/200 (0.5%)	0/200	0/200	0/100	0/110	0/407	0/654	0/286	0/243	0/424	1/405 (0.2%)	1/439 (0.2%)	0/325	1/381 (0.3%)	0/421	0/339
Kandy (CP)	0/100 0/100	0/100	0/80	0/41	0/82	0/86	0/105	0/70	0/55	1/147 (0.7%)	0/88	1/97 (1%)	0/66	0/106	0//58	0/39
Galle (SP)	0/23 0/8	0/26	0/79	0/95	0/100	0/191	0/291	0/279	0/211	0/242	0/245	0/209	0/116	0/175	0/144	0/119
Rathnapura (Sab.P)	0/7 0/46	0/27	0/101	0/57	0/47	0/174	0/245	0/341	1/213 (0.5%)	0/118	0/188	0/212	0/225	0/179	0/150	0/110
Anuradhapura (NCP)	-	0/100	0/100	0/100	0/100	0/250	0/290	0/342	0/250	0/192	0/170	0/216	0/182	1/227 (0.4%)	0/180	0/162
Kurunegala (NWP)	-	0/30	1/187 (0.5%)	1/100 (1%)	0/67	0/41	0/40	0/593	1/187 (0.5%)	1/320 (0.3%)	0/277	1/219 (0.5%)	0/133	0/108	0/203	0/222
Badulla (UP)	-	-	-	0/17	0/43	-	-	0/251	0/250	0/105	0/84	0/86	0/89	0/40	0/62	0/36
N&E P	-	-	-	-	-	-	-	-	-	-	0/13	0/19	0	0	0	0/6

- Not included in the survey

Annex II

Results of HIV Sentinel survey 1993-2009 for STD Clinic Attendees

Number tested and number positive (rate)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2009
Colombo (WP)	0/205 0/200	0/376	0/400	0/200	1/400 (0.25%)	1/1385 (0.07%)	0/1849	2/1448 (0.1%)	1/1702 (0.05%)	3/1577 (0.2%)	2/602 (0.3%)	1/621 (0.2%)	0/531	2/515 (0.4%)	1/656 (0.1%)	1/687 (0.1%)
Kandy (CP)	0/100 0/100	0/200	0/200	0/100	0/200	0/250	0/556	2/749 (0.3%)	0/700	0/775	0/445	0/302	0/248	3/283 (1.1)	3/250 (1.2%)	0/253
Galle (SP)	0/198 0/133	0/98	0/200	0/100	0/200	0/449	0/494	0/595	0/801	0/668	2/410 (0.5%)	0/250	0/249	0/250	1/320 (0.3%)	1/451 (0.2%)
Rathnapura (Sab.P)	0/50 0/79	0/43	0/103	0/100	0/185	0/250	0/286	2/375 (0.5%)	0/412	0/372	0/275	0/250	0/284	0/264	0/183	0/256
Anuradhapura (NCP)	-	0/96	0/174	0/100	0/100	0/275	0/313	0/349	1/268 (0.4%)	0/488	0/407	1/357 (0.3%)	0/278	0/260	0/351	2/296 (0.7%)
Kurunegala (NWP)	-	0/79	1/234 (0.4%)	1/113 (0.9%)	0/100	0/250	2/251 (0.8%)	0/668	1/680 (0.2%)	1/951 (0.1%)	3/296 (1%)	0/328	0/308	1/305 (0.4%)	0/263	0/256
Badulla (UP)	-	-	-	0/34	0/62	-	-	0/276	1/374 (0.3%)	1/326 (0.3%)	1/250 (0.4%)	0/250	0/248	1/250 (0.4%)	0/216	0/250
N&E P	-	-	-	-	-	-	-	-	-	0/79	0/134	0/244	1/126 [0.9%]	1/89 (1.1%)	0/222	0/299

- Not included in the survey

Annex III

Results of HIV Sentinel survey 1993-2009 for TB patients

Number tested and number positive (rate)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2009
Colombo (WP)	1/303	0/200	0/155	0/200	0/100	0/250	0/413	0/223	0/276	0/287	1/282 (0.3%)	0/256	1/259 [0.4%]	1/238 (0.4%)	0/227	0/272
Kandy (CP)	1/100 (1%)	0/49	0/54	0/93	0/100	0/250	0/242	0/269	1/363 (0.3%)	0/324	0/282	0/304	0/258	0/234	0/204	0/230
Galle (SP)	0/166	0/29	0/63	0/52	0/100	-	0/177	0/174	0/250	0/289	0/143	0/152	1/109 [0.9%]	0/221	0/120	0/207
Rathnapura (Sab.P)	0/65	0/31	0/57	0/88	0/100	-	-	0/94	-	0/242	0/254	0/212	0/196	0/248	0/173	0/270
Anuradhapura (NCP)	-	0/76	0/74	0/26	0/100	-	-	0/165	-	0/194	0/220	0/275	0/234	0/129	1/121 (0.8%)	0/164
Kurunegala (NWP)	-	0/35	0/134	0/47	0/61	-	-	0/75	-	0/199	0/167	0/216	0/256	0/162	0/179	0/165
Badulla (UP)	-	-	-	0/39	0/67	-	-	0/111	-	0/187	0/152	0/77	0/152	0/59	0/143	0/80
N&E P	-	-	-	-	-	-	-		-	0/2	0/66	0/164	0/64	0/41	0/66	0/159

- Not included in the survey

AnnexIV

Sentinal Sites and Sample Collection Centres for the Sentinel Survey 2009