Report on HIV Estimates and Projections 2009, Sri Lanka

March 2010

Acknowledgements

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All those who participated in the HIV estimation process and in the consensus meeting providing valuable inputs for more realistic HIV estimates are acknowledged with gratitude.

Financial assistance received by the WHO and UNAIDS for this activity is highly appreciated.

Abbreviations and Acronyms

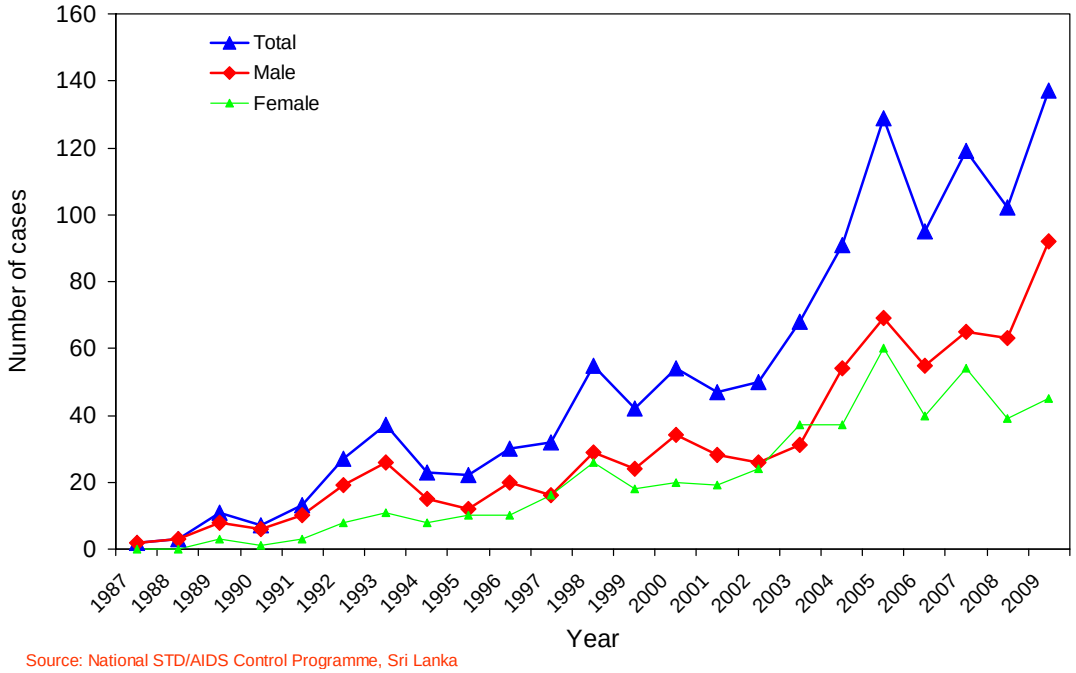
AIDS	Acquired Immunodeficiency Syndrome
AEM	Asia Epidemic Model
ANC	Antenatal Clinic
ART	Antiretroviral Therapy
BSS	Behavioral Surveillance Survey
DU	Drug user
EPP	Estimation and Projection Package
FSW	Female Sex Worker
HIV	Human Immunodeficiency Virus
IBBS	Integrated Biological and Behavioral Survey
IDU	Injecting Drug User
MSM	Males who have sex with males
NSAC	National STD and AIDS Centre
PMTCT	Prevention of Mother-to-Child transmission (of HIV)
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections

Contents

1. Introduction

The first HIV infection in Sri Lanka was reported in 1987. Since then, a total of 1196 HIV infections and AIDS cases have been cumulatively reported in the country. There has been a steady increase in the number of reported cases over the years, in part due to the increase in HIV testing facilities and the availability of antiretroviral treatment (Figure 1). The male to female ratio among reported AIDS cases is 1.4:1. Heterosexual transmission accounts for majority of the reported cases. To date, 202 persons have died of AIDS. So far, 43 children have been infected with the virus as a result of vertical transmission from their mothers. HIV is largely concentrated in urban areas; nearly 60% of reported cases are from the western province. The other most affected provinces are north western, central and southern provinces.

Figure 1. Reported HIV/AIDS cases by sex—Sri Lanka, 1987–2009



Source: National STD/AIDS Control Programme, Sri Lanka

Since 1993, the national STD/AIDS programme has been conducting annual HIV sero-surveillance among various sentinel populations. In the year 2008, unlinked anonymous sero-surveillance was initiated in two high-risk population groups (MSM, drug users). Of a total of 242 MSM included in the analysis, none was positive for HIV. None of the 256 drug users included in surveillance from Western Province was positive. In Southern province, only one of 256 drug users (0.4%) tested positive.

In 2009 HIV sentinel surveillance included female sex workers, men who have sex with men, drug users, tuberculosis patients, military personnel and STD clinic attendees. HIV sero-prevalence in STD clinic attendees was 0.15%. Zero HIV prevalence was observed in other groups surveyed. In 2009, 13,000 pregnant women tested in two large hospitals in Colombo; of these only 2 (0.015%) were found to be HIV-positive.

Each year a large number of blood units are screened for HIV by the National blood transfusion service. Over the years, the HIV seropositivity has ranged from a low of less than 1 per 100 000 population to a maximum of 5 per 100 000 population. Of a 305,066 blood units tested for HIV, 13 (0.004%) were positive in 2009.

An analysis of the trends in data on reported sexually transmitted infections shows that while bacterial STIs have declined over the years, there are recent increases in viral STIs. In 2006, the first behavioral surveillance survey (BSS) was conducted among sex workers, men who have sex with men (MSM), factory workers, three wheel drivers and drug users. Key findings of BSS were: proportion of men buying commercial sex ranged from 1.1% among factory workers to 12.2% among three wheel drivers and 15.5% among drug users; 0.8% of factory workers and 5.5% of drug users reported having male-to-male sex in the past year. Consistent condom use varied from a low of 46% among MSM with non regular partners to 80% among factory workers with commercial sex workers.

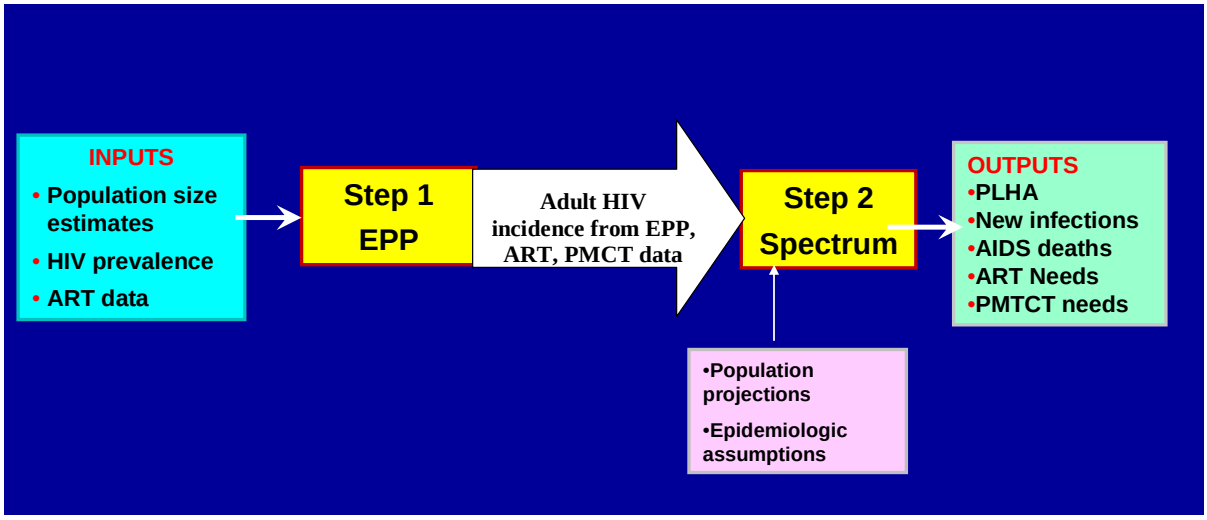
2. Methodology

Every 2-3 years, the NSACP in conjunction with national experts and partners undertakes an exercise to update HIV estimations and projections using the latest data and recent version of modelling software. The process for the 2009 estimations and projections began in April 2009 when a regional training workshop was organised by WHO/UNAIDS in Bangkok. The Sri Lanka team attending the training workshop produced draft estimates using 2007 surveillance data and updated EPP and Spectrum models. On 21-22 Marc 2010, the team of national experts including staff from the National STD/AIDS Control Programme with the assistance of international consultants reviewed and updated HIV estimates using EPP and Spectrum models. These estimates were endorsed by stakeholders on 22 March 2010.

2.2 Overall method

In a two-step process, EPP was used in conjunction with the Spectrum program to produce HIV estimations and projections. In the first step, surveillance and programme data were entered into EPP. EPP provides a fit to the prevalence data using appropriate adjustments and calibrations, and generates adult HIV incidence curve. The Spectrum program reads the HIV incidence data from EPP and then applies a more demographically correct population model to generate the total PLHA, incidence, AIDS deaths, ART needs and other output indicators (Figure 2).

Figure 2: Overall methodology for HIV/estimations and projections



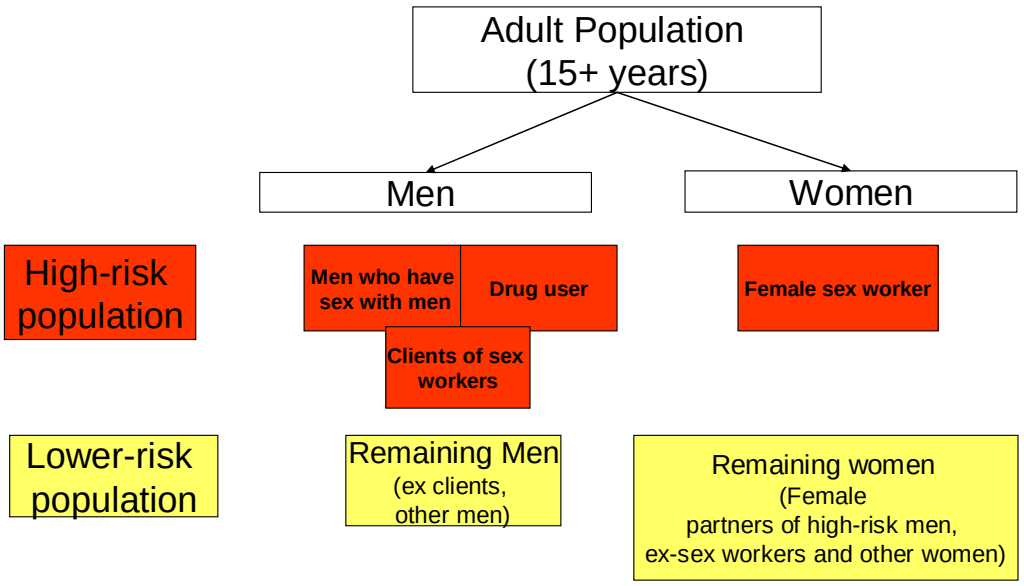
Step 1 Using EPP to generate adult HIV incidence

2.2.1 Constructing the national epidemic

According to available data, the HIV epidemic in Sri Lanka is primarily concentrated among high-risk populations. The following default epidemic structure for concentrated epidemic in EPP 2009 was used:

-Sex workers
-MSM
-Drug users
-Clients of sex workers
-Remaining male population
-Remaining female population

Figure 3: Population groups, by sex and risk of HIV transmission, Sri Lanka



2.2.2 Defining the size of population sub-groups

The following assumptions were made regarding size and duration of risk behaviour for each population subgroup:

Female sex workers: According to the recent mapping studies conducted in Colombo and Anuradhapura, there is consensus that the national estimate for FSW population is likely to range from 35,000 to 47,000 (average: 41,000). The duration for which sex workers engage in sex work was assumed to be 7 years based on data from neighbouring Asian countries and information from NGOs working with sex workers. .

Men who have sex with Men**:** According to the recent mapping studies conducted in Colombo and Anuradhpura, the national estimate for "visible" MSM population is likely to range from 24,000 to 37,000 (average: 30,500). Based on data from other Asian countries, it was decided that MSM remain sexually active for approximately 20 years.

***Drug user**:* Based on data available from the national dangerous drugs control board, there are an estimated 45,000 heroin users in the country. Of these, less than 2% are estimated to be injecting drug uses; 95% of drug users are considered to be male. It was assumed that the drug users engage in high-risk behaviour for approximately 10 years.

Clients of sex workers: In the 2006 BSS, the reported percentage of males having paid sex with sex workers in the past 12 months ranged from 15% among drug users, 11% among three-wheel drivers and 1.1% among factory workers. A weighted average of 3.5% was used to reflect the percentage of males in the general population having commercial sex in the past 12 months. The population size of male clients (261,000) was derived by applying 3.5% rate to the adult male population (aged 15-49 years). In the absence of actual data from Sri Lanka, it was assumed that the clients engage in high-risk behaviour for approximately 7 years (similar to other Asian countries).

***Remaining male and female adult population*:** The total adult male and female population size for 2009 was obtained from the Census Bureau population projections of Sri Lanka. (Source: http://www.statistics.gov.lk/home.asp). The remaining male and female population was derived by subtracting the high-risk populations from the total male and female population (Remaining male=7,199,5000; Remaining female=7,49,500)

2.2.3 Entering HIV surveillance data

Site-wise sentinel surveillance data were entered from 1993 to 2009 for each population subgroup. HIV prevalence among ANC attendees was used as a proxy for low-risk "remaining female population". For sex worker clients, HIV prevalence among male STI patients was used.

2.2.4 Entering ART data

The total number of patients on first line and second line ART in the public sector was entered, by year up to December 2009. These data were interpolated for future years based on targets set for 2015. CD4<200 was used as the threshold for starting treatment. It was decided to use the default value of 86% of patients surviving at one year after start of treatment. The distribution of patients on treatment by risk group was done using the distribution of reported AIDS cases by modes of transmission.

2.2.5 Calibrating HIV prevalence levels

To account for bias in surveillance data, HIV prevalence data were calibrated for some population groups. Based on HIV-positvity among female STI patients, HIV prevalence among FSW was calibrated upwards to reflect the peak prevalence of 0.6% in 2005. Similarly, based on HIV positivty rate among male STI patients, HIV prevalence among clients of sex workers was calibrated upwards to reflect the peak prevalence of 0.4% in 2005.

2.2.6 Fitting the data to the model for each sub population

For each population subgroup, a model was fitted for all data adjusting various parameters, like t_0 (start year of epidemic), r (rate of growth of the epidemic), f_0 (fraction of new entrants to the population going into the at-risk category), and phi (behaviour change parameter).

Step 2 Using Spectrum to produce final outputs

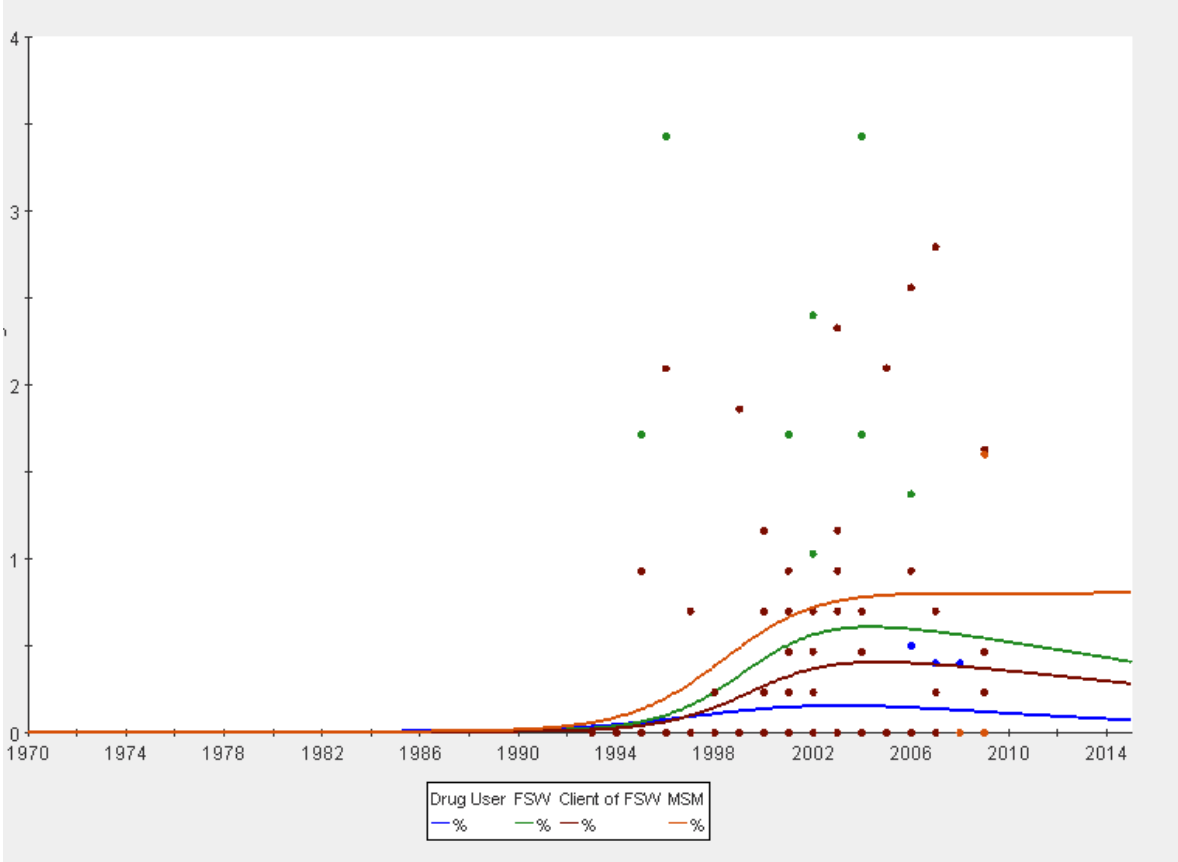
The adult HIV incidence data were read into Spectrum from EPP. Data on the numbers of adults and children on treatment were entered from start year to 2009. These data were interpolated for future years based on targets set for 2015. Similarly, data were entered and interpolated for number of pregnant women receiving single, dual and triple ARV prophylaxis regimens.

3. Results

3.1 HIV prevalence in population subgroups

Figures 4 shows HIV prevalence trends among DU, FSW/clients and MSM. Notably, HIV prevalence is decreasing/or stable among all high-risk groups.

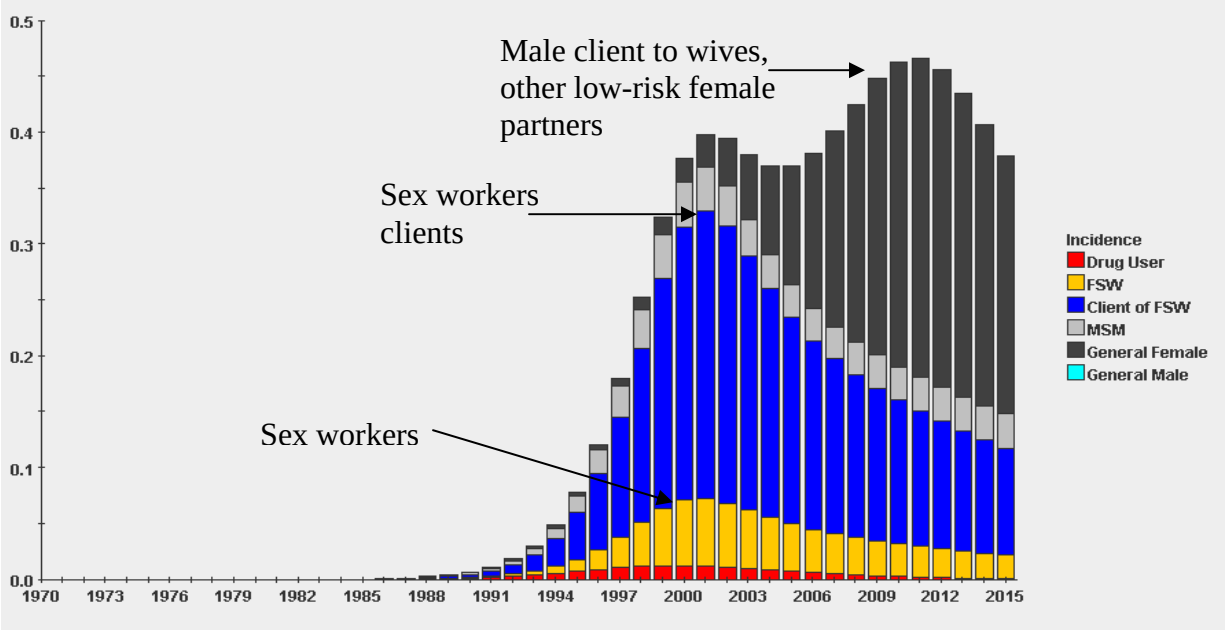
Figure 4. Trends in HIV prevalence among high-risk population groups, Sri Lanka



3.2 HIV incidence in population subgroups: Figure 5 shows trends in distribution of new HIV infections by subpopulation group. In the absence of significant IDU population, sex workers and the clients were the first groups to be affected. HIV incidence in FSW and clients peaked around 2000. Lately, following the infection of a large number of male clients of sex worker, HIV incidence is showing an increase in the low-risk female population due to transmission from male clients to their low-risk female partners. MSM account for approximately 10% of the new infections. Several countries in the Region—Thailand, India and Myanmar are also showing high and/or increasing HIV prevalence

among MSM and therefore this group will require continuing surveillance as well as targeted for prevention interventions.

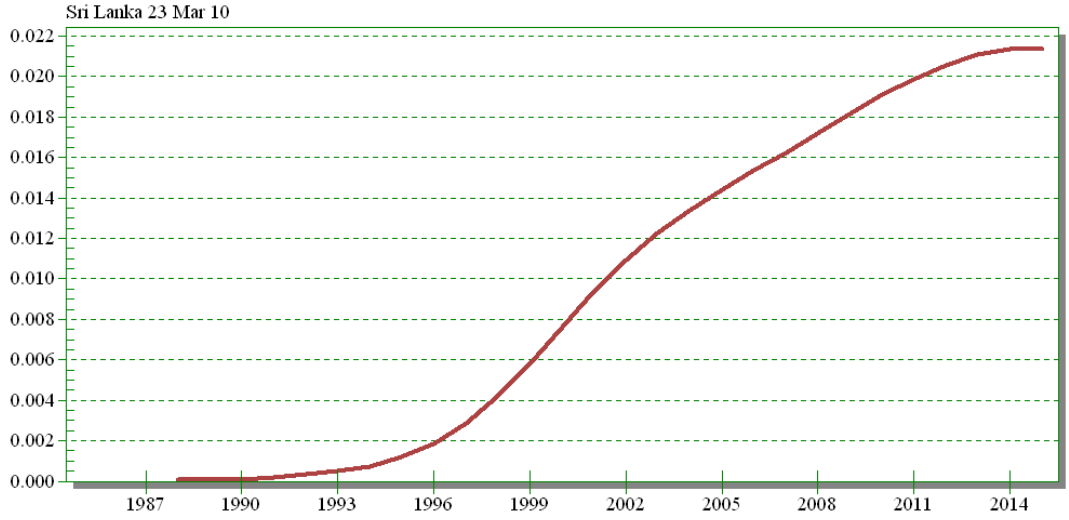
Figure 5. Trends in the distribution of new HIV infections by population subgroup



3.3 Impact of HIV epidemic

The following section presents the main results/outputs from Spectrum programme. In 2009, approximately 3,000 people are living with HIV, including children. The adult HIV prevalence is 0.02%. Trends in HIV prevalence show a low and gradual increase over the last 20 years and is likely to reach a peak around 2012 (Figure 6).

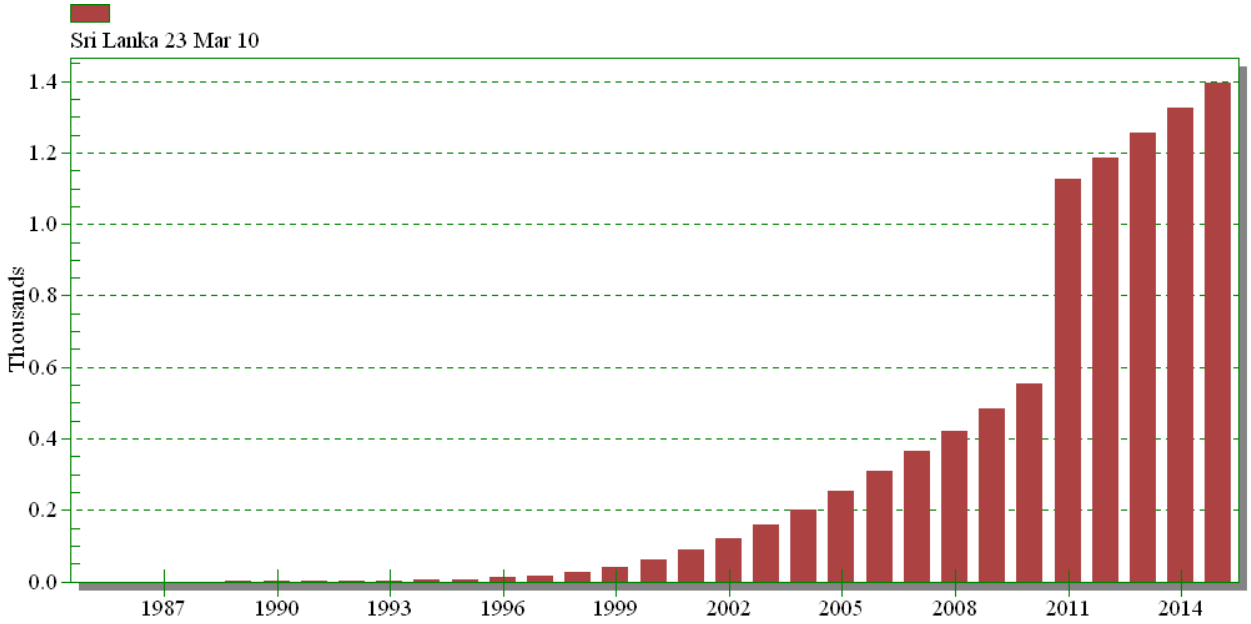
Figure 6. Trends in adult HIV prevalence (15+ years)



The HIV/AIDS epidemic in Sri Lanka has been mostly concentrated among men; however, the proportion of HIV-infected females has been increasing over the years. Currently the male to female ratio of is 1.8:1. Apart from female sex workers, women who are likely to be infected are largely the married partners of current and former sex worker clients, and men who have sex with men. Applying the fertility rate to these women it is possible to estimate the number of women who are pregnant and HIV infected. The estimated number of pregnant women who carry the HIV virus amounts to about 40 in 2009. As most of these women are unaware of their HIV status and therefore unable to receive ARV prophylaxis, many of these women will pass HIV on to their newborn children. The estimated number of children needing treatment in 2009 is 25.

In Sri Lanka, ART is provided mainly by the public sector. Currently, approximately 207 patients (including 11 children) are on treatment. Estimates of the number of people needing ART in a given year are based on the national ART guideline recommendations. According to the national ART guidelines, patients with CD4 <200 should receive ART. However, it is likely that the NSACP will revise its guidelines to start treatment earlier at an earlier time i.e., CD4<350 cmm in 2011 in congruence with the global treatment guidelines. As people get on treatment earlier and survive longer, the need for ART will increase in the coming years (Figure 7).

Figure 7. Number of adults with advanced HIV infection in need of anti retroviral treatment



3.4 Summary tables

The following tables present key output indicators for adults and children using the methods described above.

Table 1. Overall estimated summary (Adults+Children)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total number of people living with HIV	2,495	2,673	2,853	3,039	3,196	3,341	3,465	3,537	3,578
Males	1,786	1,813	1,827	1,823	1,811	1,785	1,759	1,719	1,676
Females	709	861	1,027	1,217	1,385	1,556	1,706	1,818	1,902
HIV Prevalence (15-49 years)	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03
Total number of new HIV infections	292	325	338	353	348	366	349	303	275
Males	149	143	136	122	127	129	125	107	98
Females	144	182	201	232	221	237	225	196	177
Total number of Annual AIDS deaths	119	133	143	152	175	205	208	213	216
Males	97	106	111	115	127	144	139	136	131
Females	23	27	32	37	48	61	68	77	85

Table 2. Estimated HIV prevalence, new infections, mortality and ART needs for adults (15+ population)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number Living with HIV/AIDS									
Total	2,471	2,644	2,818	2,997	3,146	3,282	3,397	3,460	3,492
Males	1,774	1,798	1,809	1,801	1,786	1,756	1,725	1,681	1,632
Females	697	846	1,009	1,196	1,360	1,527	1,672	1,780	1,860
Adult prevalence	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
New HIV infections									
Total	284	315	326	339	332	348	330	282	254
Males	144	138	130	115	119	120	115	96	87
Females	139	177	196	225	213	228	215	186	167
Annual AIDS deaths									
Total	115	129	138	146	168	196	198	202	205
Males	95	104	109	111	124	140	135	130	125
Females	21	25	29	34	44	57	64	72	80
Total need for ART									
Total	365	423	485	552	1,127	1,187	1,255	1,326	1,397
Male	284	323	361	399	798	805	810	815	818
Female	81	100	124	153	328	382	444	511	579

Table 3. Estimated HIV prevalence, mortality and care and treatment needs for children and (0-14 years population) pregnant women

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number living with HIV/AIDS									
Total	24	29	35	42	50	59	68	77	86
Males	12	15	18	21	25	30	34	39	43
Females	12	14	17	21	25	29	33	38	42
New HIV infections									
Total	9	10	12	14	16	18	19	21	22
Males	4	5	6	7	8	9	10	11	11
Females	4	5	6	7	8	9	10	10	11
Annual AIDS deaths									
Total	4	5	6	6	8	9	10	11	11
Males	2	2	3	3	4	4	5	5	6
Females	2	2	3	3	4	4	5	5	6
Children needing ART									
Total	16	20	25	37	44	51	57	64	70
Male	8	10	12	18	22	26	29	32	35
Female	8	10	12	18	22	25	28	32	35
PMTCT needs									
Number of HIV+ve pregnant women	31	36	43	50	57	64	69	74	77
Mothers needing PMTCT	26	31	36	42	49	54	59	63	65

4. Key Limitations

Three years ago, in 2007, the Workbook method in conjunction with Spectrum was used to make HIV estimates. This year, the estimations and projections package (EPP) was used for the first time in conjunction with Spectrum for HIV estimations and projections. Therefore, it is not appropriate to directly compare current estimates with the past estimates.

The results presented in this report are the best estimates that are possible with the available information in the country. These results should be, however, interpreted and used in the light of some limitations pertaining to the tools/models and input data.

Limitations of tools/models: EPP uses HIV prevalence data and programme data and various statistical parameters to estimate and project HIV burden. The combination of EPP and Spectrum cannot explore the impact of prevention program among key sub-populations. For this, one would need to undertake a more detailed analysis of both HIV prevalence and risk behaviour trends. In other countries, with larger epidemics, this has been done with a variety of other methods, including simple spreadsheets and/or more complex models such as the Asia Epidemic Model (AEM). However, there are no experiences to date using AEM in countries withlow level epidemics.

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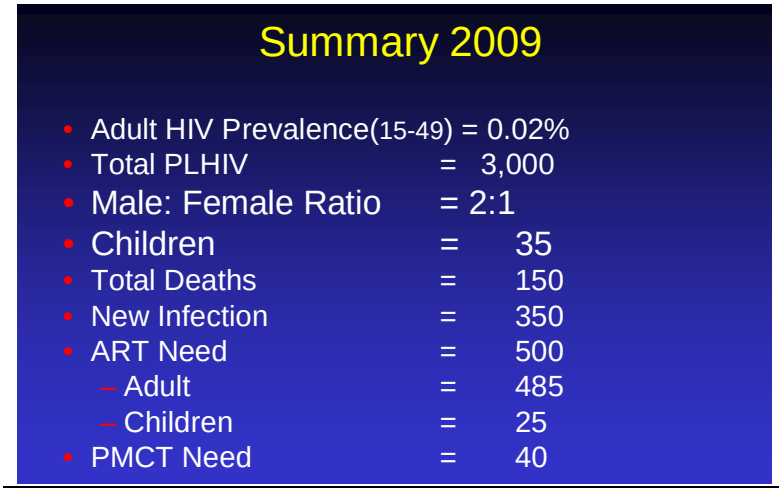
Limitations of input data: The population size for high-risk population used in the 2009 estimations are based on the best available data and consensus among experts. However, the current size estimates were based on mapping from two highest burden districts only and may be revised when mapping data from more districts are available. Moreover, there were no data available on the size of clients of sex workers. As there are no surveys in general male population, a weighted average of percentage of males having paid sex in different male “risk-populations” was used to derive the percent of adult men who have paid sex. Moreover, HIV prevalence curves for MSM are generated based on limited data from MSM for two years only. Improved surveillance among MSM over time through better sampling strategy may yield more representative data. Finally, better data are needed to calibrate the HIV prevalence data among different population groups.

5. Summary

- The HIV epidemic in Sri Lanka continues to remain at a very low level. The estimated HIV prevalence among adult population is 0.02%. Even among the high risk groups, HIV prevalence is consistently below <1%.
- In 2009, an estimated 3,000 people are living with HIV/AIDS.
- Modelling of HIV data show that HIV prevalence in Sri Lanka has gradually increased at a very low rate over the last 20 years. It is likely to reach a peak in 2012, and stabilise, thereafter.
- In the absence of an IDU epidemic, there are two distinct waves of the epidemic. The first group to be affected were the sex workers and their male clients. Subsequently, transmission from male clients to their wives/other female partners resulted in lower-risk female population being increasingly infected.
- Currently, there are an estimated 350 new HIV infections each year. Nearly half of these new infections are among sex workers and their clients; MSM account for nearly 10% of all new infections.
- The number of AIDS deaths has shown an upward trend over the years. Currently, there are approximately 150 AIDS deaths each year.
- Roughly 500 (including old and new persons needing treatment) people in Sri Lanka are currently in need of antiretroviral care and this number will continue to increase over the next years as under the new criteria for treatment, people will need to be started on ART earlier and they will survive longer.
- Roughly 40 HIV-positive women will give birth annually. Approximately 25 children are in need of ART in 2009.

Summary of HIV Burden, 2009



Annexure 1: Working Group Members participated in the HIV Estimates workshop 23rd of March 2010

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