

**Kingdom of Cambodia
Nation Religion King**



MINISTRY OF HEALTH

ESTIMATIONS AND PROJECTIONS OF HIV/AIDS AT SUB-NATIONAL LEVEL IN CAMBODIA 2016-2020

December 15, 2016



National Center for HIV/AIDS, Dermatology and STD (NCHADS)

SUPPORTED BY UNAIDS
(JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS)

FOREWORD

Cambodia has successfully conducted four rounds of HIV/AIDS estimation and projection (2000, 2003, 2007, and 2011). The projection and estimations of HIV/AIDS epidemic provide scientific sound projections at national and sub-national level requires strong collective efforts and commitments from all partners-governments, development partners, UN agencies, WHO, and members of the strategic information TWG, under the clear leadership and ownership of the Ministry of Health/NCHADS. This HIV/AIDS estimation and projection at sub-national level will update the national HIV estimates and projections for the years 2016-2020, and prepare provincial specific PLHIV estimates, HIV incidence, and mortality.

As the results of the declining HIV epidemic, from 1.7% in 1998 to 0.6% in 2015 among general population aged 15- 49 years-old, and will project to 0.5 % in 2020. In order to support the goals and objectives of the National HIV strategic plan in the health sector (2016-2020), to achieving 90-90-90 by 2020, the sustained reduction of HIV/AIDS-related mortality, and virtual elimination of new HIV infections by 2020, through three achieving primary objectives: 1) to reduce the estimated new HIV infections to fewer than 400 new cases per year by 2020; 2) to reduce the HIV transmission rates from HIV positive mothers to their infants from 6% in 2015 to less than 5% by 2020; and to reduce the estimated current HIV/AIDS-related mortality rate from 17.9/100,000 in 2015 to 12/100,000 in 2020. The program needs for the specific estimation and projection of PLHIV at sub-national level to guide and inform decision for the program implementation, and tracking the national responses.

The Ministry of Health strongly encourages the use of the estimates and projections illustrated in this report to improve the HIV program and to effective responses to HIV/AIDS epidemic in the country. *APS*

Phnom Penh, 05../.05../ 2017 @ *HK*

For Minister of Health



HO

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LIST OF ABBREVIATIONS

Abbreviation	Definition
AEM	Asian Epidemic Model
AIDS	Acquired Immune Deficiency Syndrome
ANC	Ante-Natal Care
ART	Anti-Retroviral Treatment
BSS	Behavioral Sentinel Surveillance
CHAI	Clinton Health Access Initiative
EPP	Estimation and Projection Package
EW	Entertainment Worker
FSW	Female Sex Worker
GFATM	Global Fund to fight AIDS, Tuberculosis and Malaria
HIV	Human Immunodeficiency Virus
IBBS	Integrated Biological and Behavioral Surveillance
IDU	Injecting Drug User
KP	Key Population
MARP	Most-at-Risk Population
MSM	Men who have Sex with Men
MSW	Men Sex Worker
NAA	National AIDS Authority
NCHADS	National center for HIV/AIDS, Dermatology and STD
NGO	None Governmental Organization
NIPH	National Institute of Public Health
PLHIV	People Living With HIV
PMTCT	Prevention of HIV Transmission from Mother to Child
PSK	Population Service Khmer
PWID	Person who inject Drugs, used interchangeably with IDU
SI	Strategic Information
STI	Sexual Transmitted Infection
TG	Transgender
TWG	Technical Working Group
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations international children and education fund for Children's Fund
WHO	World Health Organization

INTRODUCTION

BACKGROUND

The National Center for HIV/AIDS, Dermatology, and STD (NCHADS) has successfully conducted four rounds of HIV/AIDS estimation and projection (2000, 2003 and 2007, 2011), with the last HIV projections covering the period from 2011 to 2015. The above mentioned four exercises were conducted in addition to the biennial estimation and projection exercises conducted by UNAIDS and WHO to build the country capacity in estimation and projection and update the national estimates based on the strategic information produced at country level. The last round of the biennial regional estimation and projection workshop was conducted in March 2015.

As a result of the declining epidemic in Cambodia and evolving responses, over the last two years national stakeholders have started conducting epidemiological and programmatic analysis at the sub-national level. Therefore, the programme needs province specific estimation and projections to guide programme implementation and track the response at decentralized level as it moves towards national elimination targets. This has generated a strong demand for conducting a new round of HIV/AIDS estimation and projection for the period 2016 to 2020 and beyond and for the first time also producing sub-national level PLHIV estimates.

To this effect, in February 2016, one week workshop was held to update the national estimates and projections and derive sub-national estimates using AEM and Spectrum. The workshop was conducted under the leadership of NCHADS with guidance from the Strategic Information Technical Working Group (SI-TWG) and participation of the key stakeholders including NAA, NIPH, UNAIDS, USD-CDC, PEPFAR, CHAI, KHANA, FHI 360, PSK and several local NGOs working on HIV/AIDS. The workshop was supported by UNAIDS with technical assistance from East-West Center, represented by Dr. Wiwat Peerapatanapokin, and facilitated by a national consultant Dr. Kimlee Khieu.

The main methodology adopted for the estimation and projection included review of all relevant latest data produced through surveys/surveillance, research, programmes and

projects to be used with the updated versions of AEM and spectrum, and developed consensus to use informed assumptions in the case of data gaps.

HIV/AIDS STATUS AT A GLANCE

Facing in the mid-1990s, one of the fastest growing HIV epidemics in Asia, Cambodia is at a critical juncture of its HIV responses. In its third decade, the HIV response has transitioned into an elimination phase with less than 1000 new HIV infections per year since 2013 [1]. In the last decade, Cambodia become one of the few countries to have reversed its HIV trend with a decline of HIV prevalence from an estimated 1.7% (among adults aged 15-49 years-old) in 1998 [2] to a projected 0.6 % in 2015 [3]. New HIV infection has significantly declined over the last five years, and Cambodia has achieved a high coverage of antiretroviral treatment of 74.5% in 2015 among all PLHIV [4].

Alongside with the decline in HIV prevalence among the general population, it has been noted that key populations (KP) such as entertainment workers (EW), drug users, transgender people and men who have sex with men (MSM) remain the most vulnerable groups that requires special attention in the provision of prevention, care and treatment services. Whilst the HIV prevalence among female entertainment workers (FEW) has decreased from 20.8% in 2003 to 14% in 2010 [5], an upward trend in HIV prevalence has been recently observed among MSM and TG people [MSM- 2.16% in 2010 to 2.3% in 2015 and TG 4.6% in 2012 to 5.9% in 2016] [3, 6, 7, 8]. People who inject drugs (PWID) continue to have the highest prevalence of 24.4% based on the IBBS in 2012 [9]. The national response has been focusing on the key populations through adoption of innovative and cost effective strategies to reach the most hidden of the key population with HIV prevention and treatment services.

According to the current estimates and projections using Spectrum V 5.4, there are an estimated 72,601 people living with HIV (PLHIV) in Cambodia at the end of 2015 [10]. With continued targeted and effective prevention interventions and by sustaining and scaling up the current high coverage of ART, Cambodia is poised to become the first low-income country moves towards to achieve the global targets of 90-90-90 by 2020 and virtual elimination of HIV transmission by 2025.

MAIN DATA SOURCES FOR THE ESTIMATIONS AND PROJECTIONS

At the start of the workshop the SI-TWG [including representative NCHADS, NAA, UNAIDS, WHO, US-CDC, CHAI, FHI, KHANA, PSK, international and national consultants] identified and discussed various sources of data for updating the AEM baseline model done in 2014, and data needed for preparing the provincial Spectrum files leading to estimate and project of PLHIV at provincial level. In this process multiple data sources were identified, discussed, scrutinized, and the data from these sources were agreed upon for input into the model as well as some informed assumptions were agreed for the missing data/information. The key data sources were agreed for this estimation exercise using Spectrum and AEM tools are as follows:

1. **ANC Surveillance Survey and IBBS [11]:** The ANC surveillance and IBBS among MSM and TG conducted in 2014 and 2015 respectively, were used to update the relevant information in the AEM data sheets for MSM and TG. HIV prevalence from the ANC Surveillance Survey in 2014 along with data from the past years was used in deriving national female and male incidence for its use in Spectrum for sub-national estimates.
2. **UN Population Statistics and Cambodia Intercensal Population Survey 2013 [10, 12]:** UN population statistics from UN Population Division were used to derive total year wise population since 1970 to 2050 as required in AEM and Spectrum tools. The female to male proportion and the provincial total population statistics were obtained from CIP 2013. The population statistics from these two sources were compared and accordingly adjusted the national and provincial population to match with the estimated total population for the year 2015 and projected until 2050.
3. **ART program reports [13]:** NCHADS maintains an ART database system which compiles and maintains data from all ART sites in the country. The database system has been used since 2005 and key data on number of PLHIV on ART/regimen and other variables are also available. However, data were not yet available in new ART sites in some provinces, so relevant substitute sources were used for extracting relevant information. For example, the data for Tbong Khum, Kep and Mondul Kiri provinces, proxies from their neighbor provinces or their origin provinces were used

to derive the male to female ration on ART. NCHADS annual ART reports were used to update treatment coverage in AEM and Spectrum through December 2015.

OBJECTIVES

The main objectives of the HIV estimation and projection workshop were to:

- Update the national HIV estimates and projections for the years 2016-2020 and beyond.
- Prepare provincial specific PLHIV estimates, HIV incidence and mortality.
- Build national capacity for estimation and projections using AEM and Spectrum software.

METHODOLOGY

During the 5-day workshop (15-19 Feb 2016), the SI-TWG discussed and determined the process of preparing/collecting the key data inputs for AEM and Spectrum Models to update the national estimates and projections, and derive provincial level HIV estimates. The methodology involved key steps described below:

UPDATE THE NATIONAL HIV ESTIMATION AND PROJECTION

1. Update key population size estimates, sexual behaviors, and prevalence in AEM 2014

Asian Epidemic Model (AEM) tool was used in mid-2014 to estimate and project the HIV prevalence for national level. For the current exercise, the first step was to update the key inputs for 2014 baseline AEM model with the latest available data. It includes updating data on the population size of MSM, and TG behavior information using new data available from latest studies conducted in 2014-15. The prevalence of HIV among MSM and TG were also updated based on the latest available data. Additionally, the number of patients who received ART in 2014 and 2015 was updated into the AEM model.

2. Calibrating AEM 4.1 and SPECTRUM V5.4 using AEM-SPECTRUM Fitting Tool

Since the AEM worked in 2014 was performed with version 4.0, this needed to be converted to the latest version (4.1). After converting to the new version of AEM tool, Spectrum version 5.4 was used to complement the updated outputs from AEM. The AEM-Spectrum fitting tool was used to calibrate Spectrum results to be aligned with AEM results. The main indicators for this alignment are the number of adult PLHIV, number of new adult HIV infections, and number of deaths. The followings are the steps to calibrate the two tools:

Step 1: Upload the AEM 4.1 into Spectrum V 5.4 starting from HIV incidence.

Step 2: Use the final result of AEM to compare with Spectrum with the same range of years.

Step 3: Copy the summary result of adult HIV aged > 15 years-old, and paste into the fitting tool.

Step 4: Fitting the Spectrum to have results align with AEM results using transition, and mortality parameters in Spectrum advanced options.

3. AEM-Spectrum after calibration

After calibration, the number of new HIV infection cases, and HIV prevalence produced by the two models were very similar. This suggested that Spectrum and AEM model were ready to use in projecting sub-national HIV estimates. Figure 1, 2 and 3 show the best fit between AEM and Spectrum curves.

Figure 1 - Number of PLHIV in AEM and Spectrum

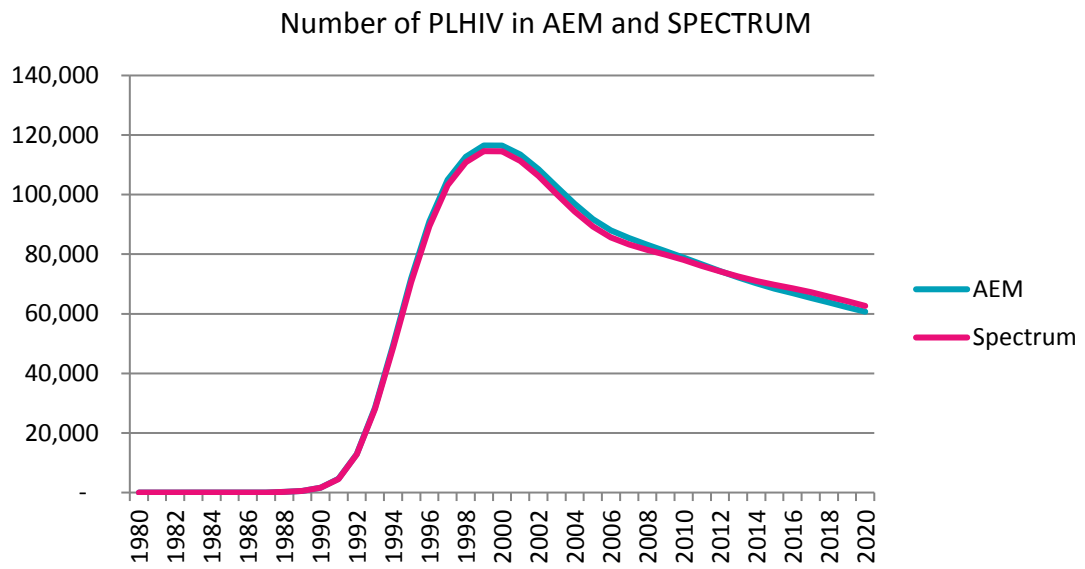


Figure 2 - Trends of HIV New infection projected in both models

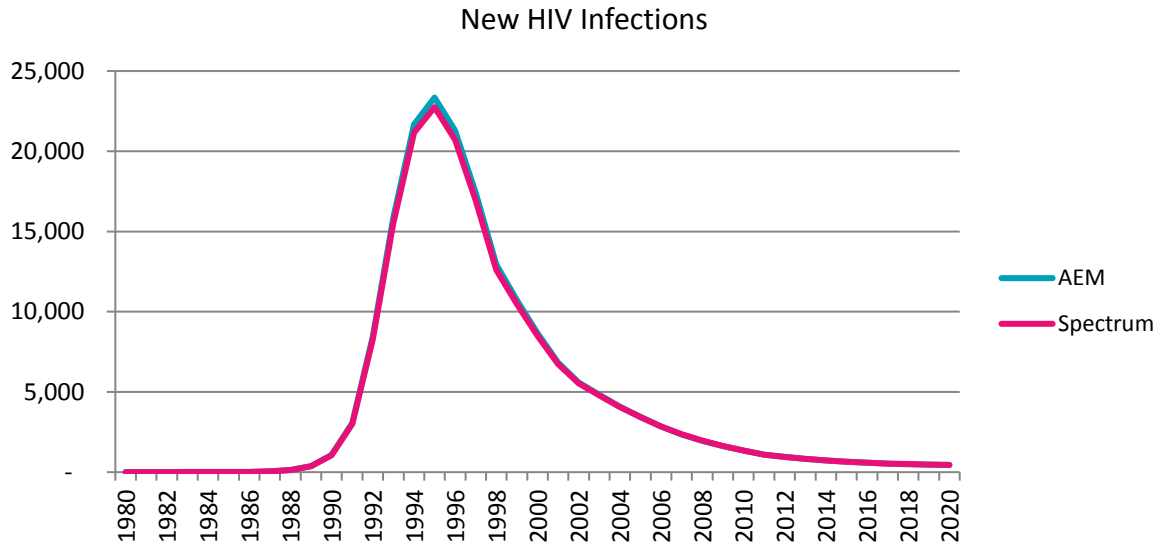
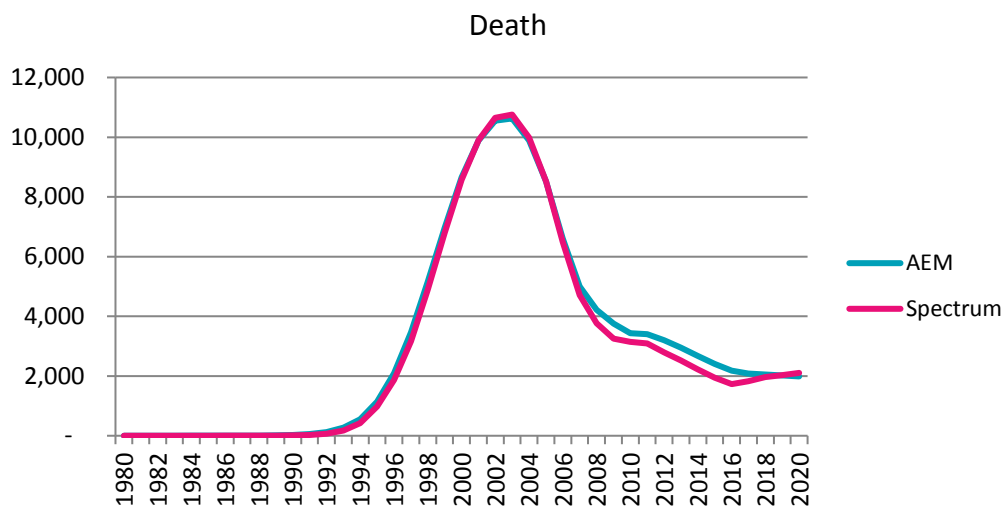


Figure 3 - Trends of HIV related deaths projected by both models

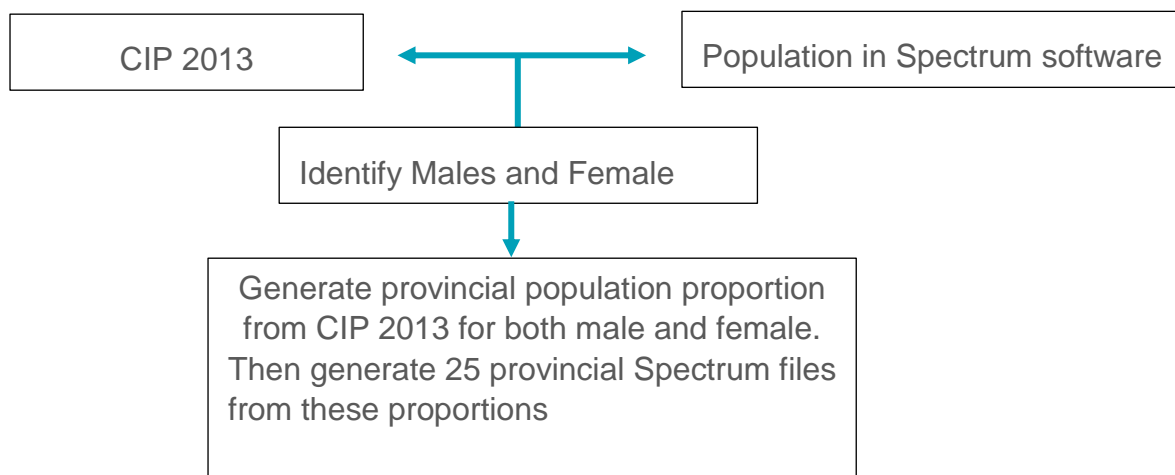


ESTIMATION AND PROJECTION OF HIV AT SUB-NATIONAL LEVEL

1. Prepare “Demographic data” to be used as inputs for sub-national Spectrum files for 25 provinces

The latest national population census data available was from 2008, so the working group decided to use Cambodia Inter-Censal population (CIP) survey conducted in 2013 to generate the provincial level population proportions and provincial male to female ratios. These provincial proportions for both male and female were used for converting national demographics in Spectrum for each province specific demographic in Spectrum. Then the 2013 provincial population figures in Spectrum were compared and crossed checked with the CIP-2013 provincial population figures.

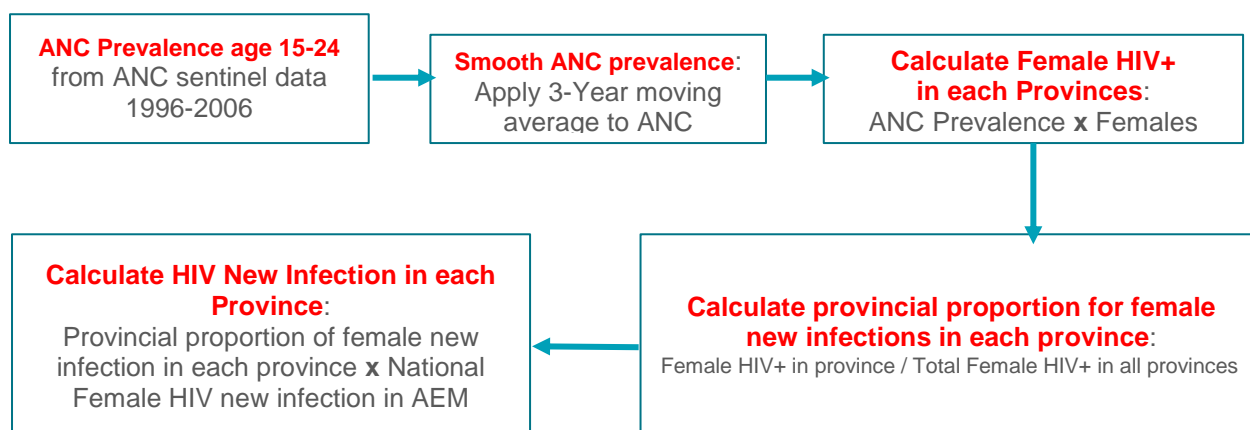
Figure 4 - Method to estimate the females and males ratio



2. Estimation of provincial HIV incidence among females aged > 15 years-old

After reviewing available data for sub-national level, it was agreed that the prevalence of HIV among pregnant women could be used for the estimation process. Figure 5 shows methods to identify HIV incidence among females aged > 15 years-old based on the ANC data from the surveillance survey. Pregnant women aged less than 25 years-old were used to generate HIV incidence rate because data were available in most provinces over multiple years. Then, the 3-year moving average was applied to smooth ANC prevalence, followed by the distribution of the new HIV infections in female proportionally to each of the 25 provinces.

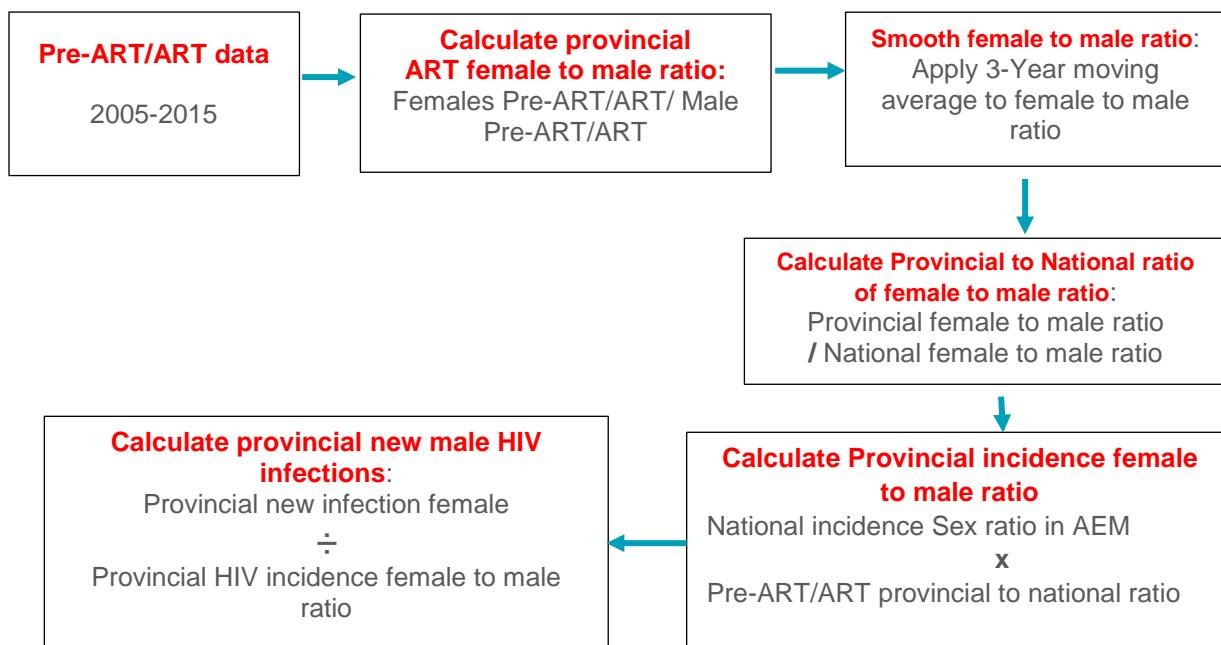
Figure 5 - Method of calculating provincial HIV incidence among females aged > 15 yrs



3. Estimation of HIV incidence among males aged > 15 years-old

To derive HIV incidence among males aged 15 years-old was one of the most challenging tasks. The team reviewed existing data from HIV-TB cases, blood donation and so on. However, the pre-ART/ART data from NCHADS was agreed as being more completed and accurate and found most useable of all data sources. Figure 6 below illustrates the method to estimate HIV incidence estimate among males aged > 15 years-old. The data on number of people enrolled on pre-ART/ART was used for this process. With this, the sex ratio and smoothing method using 3-year moving average were applied, and incidence generated.

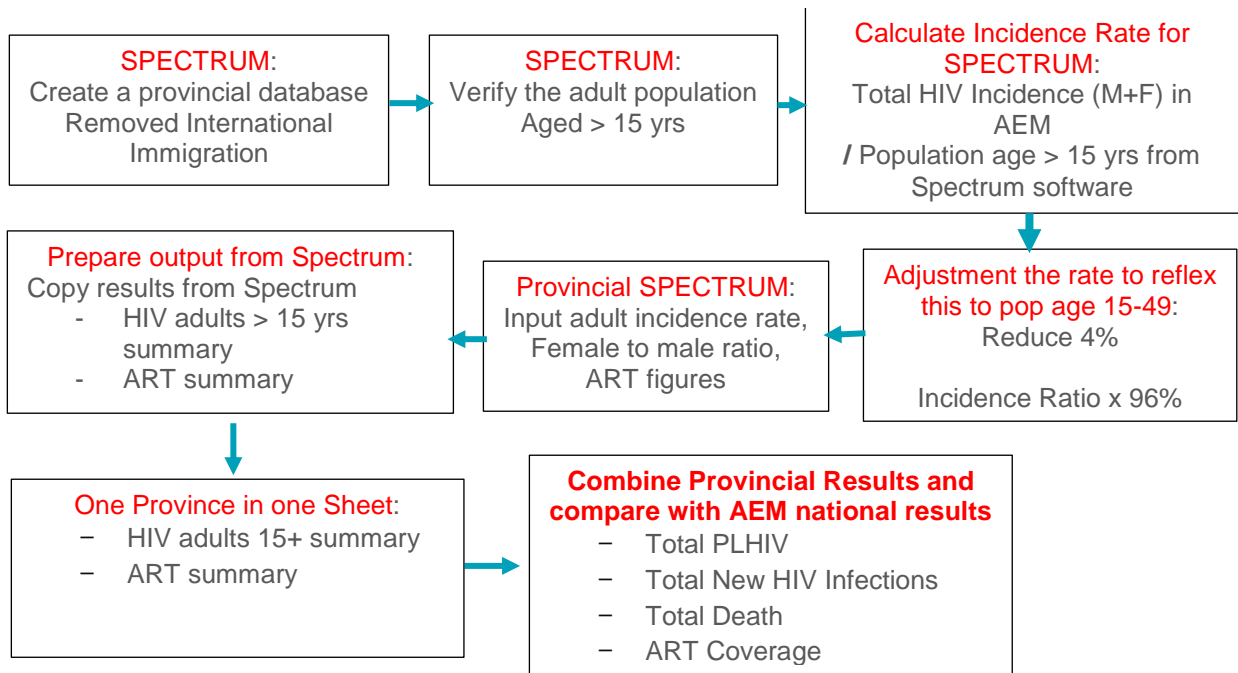
Figure 6 - Calculation of HIV incidence among males aged >15 Yrs at Provincial Level



4. Using AEM and Spectrum Model for HIV estimation and projections at Sub-National Level

The method to identify the HIV sub-national estimates and projections was to work with Spectrum and AEM. At this stage, the sub-national estimates and projections were established using the combination between Spectrum and AEM. First, each provincial population and incidence was established one by one. Second, AEM was used to generate the total HIV incidence among males and females starting from 1970 to 2050. Third, the ratio of incidence were adjusted 4% down from the Spectrum because of fitting method in AEM using HIV adults aged > 15 years-old and ART summary results. Last, the sub-national estimates and projections were established in the format of AEM with the starting year from 1970 to 2050 described in the diagram below.

Figure 7 – Sub-national estimates and projection using AEM and Spectrum



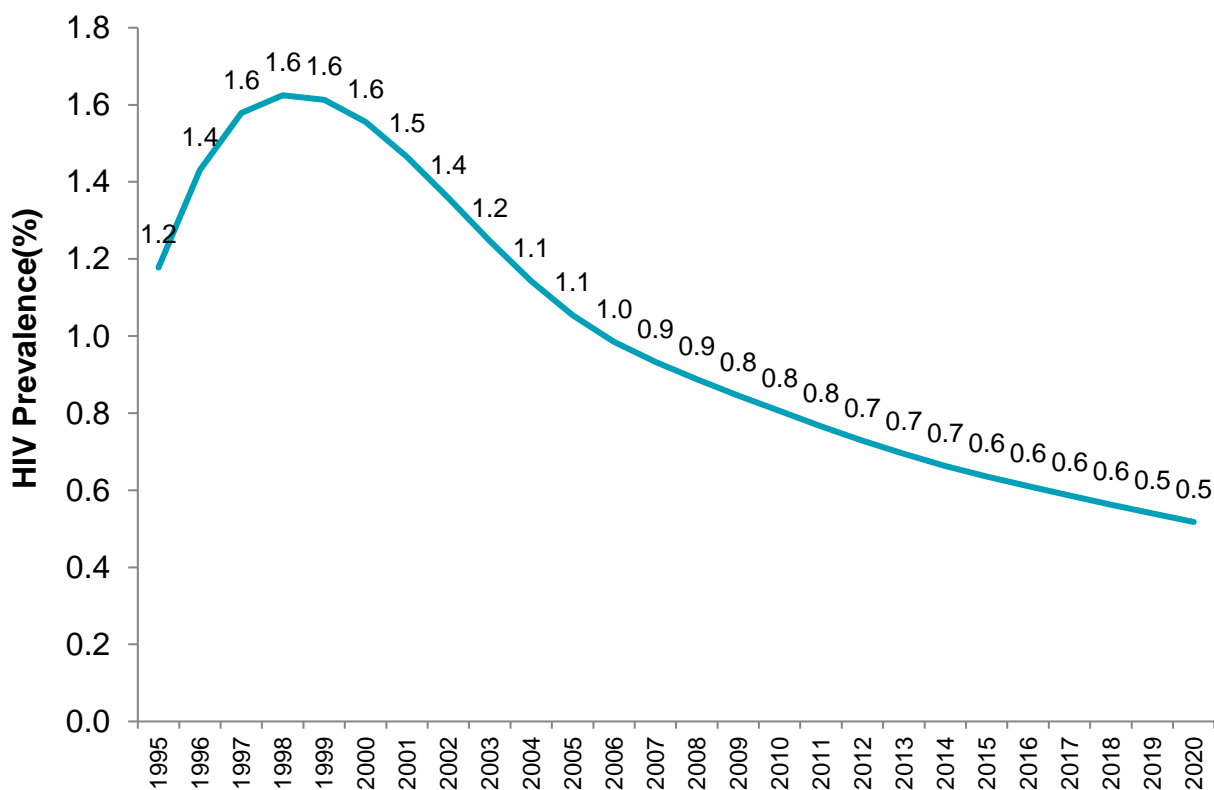
RESULTS

NATIONAL HIV ESTIMATES AND PROJECTION

1. National HIV prevalence

The national HIV prevalence has been decreasing after its peak in 1998. Figure 8 below clearly illustrates the trend of HIV prevalence which declined gradually from 1.6% in 1998 to 0.6% in 2015. From 2015 to 2020, the trend appears to decrease slowly. The AEM/Spectrum projections in early 2016 shows the same downwards trend in the coming years and project a prevalence of 0.5% by 2020.

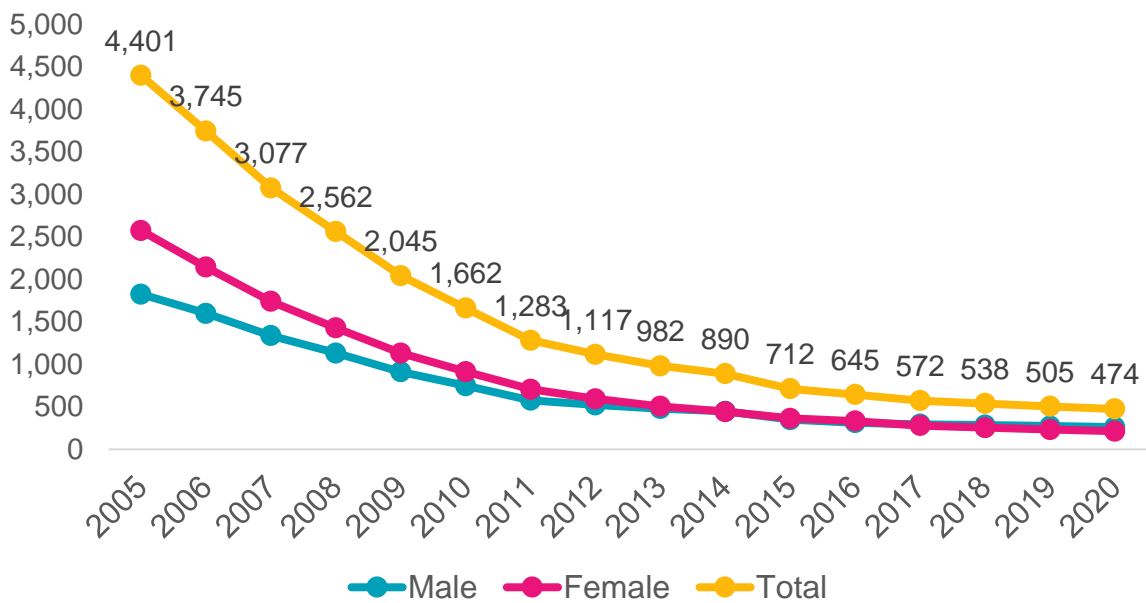
Figure 8 - Prevalence of national HIV estimated using AEM and Spectrum



2. National HIV New Infection

The trend of HIV new infection among general population has decreased since 2005. Then, this trend gradually declined from 2010. As a result, the total HIV new infection in 2015 was around 715 cases among children and adults > 15 years-old. The trend gradually decreased to around 474 cases in 2020 (See Figure 9).

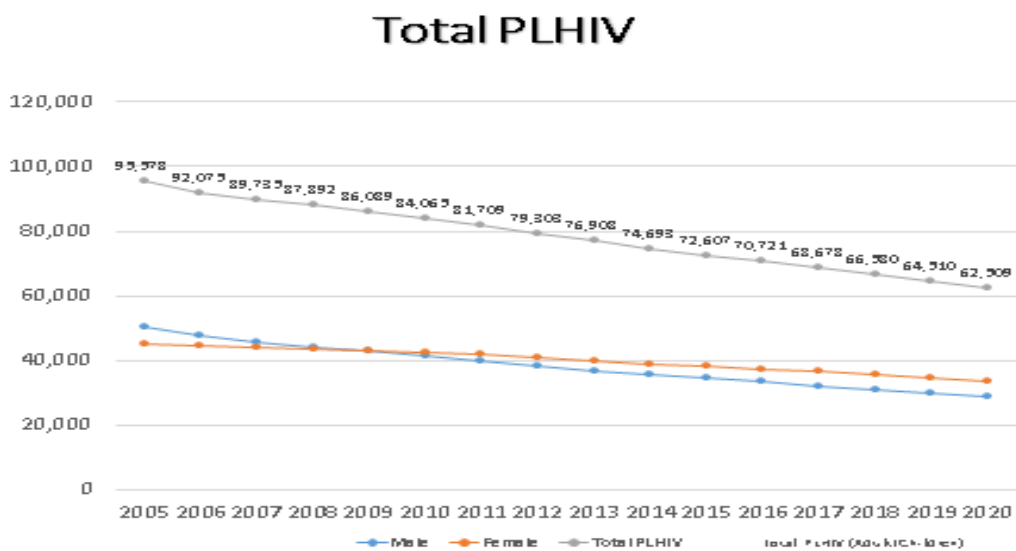
Figure 9 - National HIV new infection projected by AEM and Spectrum



3. Total PLHIV Estimates

Figure 10 illustrates total PLHIV from 2005 to 2020. In 2015 there were estimated 72,607 PLHIV, this estimated figures goes down to 62,500 by 2020 mainly due to decrease in new HIV infections and mortality. However, it has to be noted that the new infections and overall HIV related deaths have gone down significantly over the years. Part of the mortality also is due to ageing of the PLHIV population.

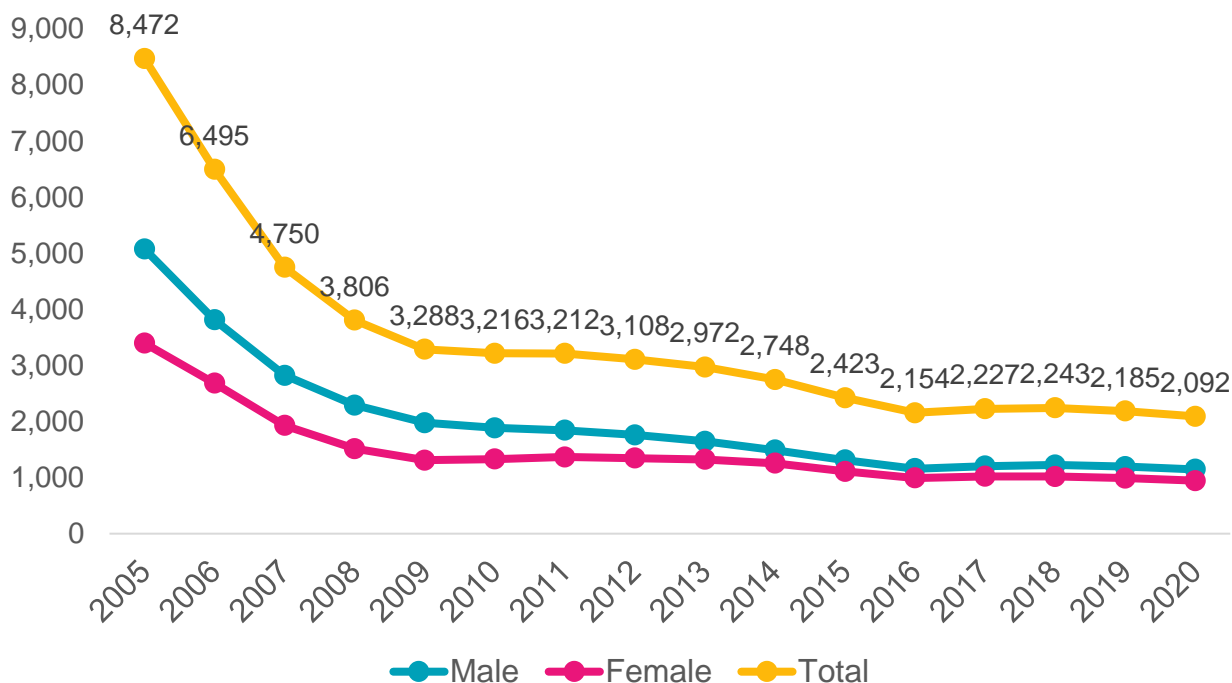
Figure 10 – Total PLHIV from 2005 to 2020



4. Total HIV related deaths among PLHIV

Figure 10 illustrates the number of total dead among children and adults aged > 15 years-old nationally which caused by AIDS. The number of deaths slowly dropped from 2016 to 2020 at the approximately 2,000 cases per year.

Figure 10- AIDS and non-AIDS deaths in total adult population living with HIV, 2010-2020



SUB-NATIONAL HIV ESTIMATES AND PROJECTION

1. Sub-national population and sex ratio

Table 1 below shows the population by provinces (both new and old) and male to female ratios which needed in the process of calculating HIV incidence among 15 -24 years age pregnant women. Cambodia has recently divided a new province (Tbong Khum) out of the Kampong Cham province. As a result, the population in that province was extracted from the 2014 commune database, as it was not a distinct entity in CIP 2013 and the female to male ratio was calculated for this new province as well to use in the next steps in the provincial estimates process.

Table 1 - General Population of Cambodia in CIP 2013

No	Provinces/cities	Total pop	Sex Ratio F/M	# Males	% of Males	# Females	% of Female
1	Banteay Meanchey	729,624	94.60%	354,689	4.98%	374,935	4.96%
2	Battambang	1,121,001	98.80%	557,117	7.83%	563,884	7.46%
3	Kampong Cham	1,007,277	90.90%	479,631	6.74%	527,647	6.98%
4	Kampong Speu	755,465	92.70%	363,423	5.10%	392,042	5.19%
5	Kampong Thom	690,386	93.70%	333,966	4.69%	356,420	4.72%
6	Kampot	611,583	98.70%	303,791	4.27%	307,792	4.07%
7	Kandal	1,115,959	93.10%	538,041	7.56%	577,918	7.65%
8	Kep	38,700	96.60%	19,015	0.27%	19,685	0.26%
9	Kg. Chhnang	523,202	91.90%	250,559	3.52%	272,643	3.61%
10	Koh Kong	122,258	100.60%	61,312	0.86%	60,946	0.81%
11	Kratie	344,195	94.70%	167,413	2.35%	176,782	2.34%
12	Monduliri	72,680	104.30%	37,105	0.52%	35,575	0.47%
13	Oddor Meanchey	231,387	100.70%	116,097	1.63%	115,290	1.53%
14	Pailin	65,795	99.80%	32,865	0.46%	32,930	0.44%
15	Phnom Penh	1,688,040	93.60%	816,119	11.46%	871,921	11.54%
16	Preah Vihear	235,355	98.40%	116,728	1.64%	118,627	1.57%
17	Prey Veng	1,156,821	93.10%	557,742	7.83%	599,079	7.93%
18	Pursat	435,562	91.60%	208,233	2.92%	227,329	3.01%
19	Rattanakiri	183,699	98.70%	91,249	1.28%	92,450	1.22%
20	Siem Reap	922,975	93.90%	446,969	6.28%	476,006	6.30%
21	Sihanouk Ville	250,180	96.70%	122,991	1.73%	127,189	1.68%
22	Stung Treng	122,791	102.50%	62,153	0.87%	60,638	0.80%
23	Svay Rieng	578,461	97.90%	286,161	4.02%	292,300	3.87%
24	Takeo	923,297	91.30%	440,654	6.19%	482,644	6.39%
25	Tbong Khum	749,946	90.00%	355,238	4.99%	394,708	5.22%
*	Total	14,676,639		7,119,261		7,557,378	

2. Sub-National/Provincial level PLHIV Estimates and Projection

Table 2 below shows the total PLHIV estimates and projection in all 25 provinces/cities from 2015-2020. Each province has a downward trend of PLHIV comparing between 2015 and 2020. The highest number of PLHIV is in Phnom Penh, around 14,000 per year. The other provinces with high numbers of PLHIV are Siem Reap and Battambang. The lowest number of PLHIV is in Kep province because of its small size of the population.

Table 2 - Total Adult PLHIV [> 15 Years-old] Estimated and Projected in 25 provinces

Code	ABB	Provinces	2015	2016	2017	2018	2019	2020
01	BMC	Banteay Meanchey	4,692	4,603	4,516	4,421	4,318	4,211
02	BTB	Battambang	6,279	6,241	6,199	6,150	6,087	6,006
03	KCM	Kampong Cham	3,952	3,852	3,746	3,638	3,528	3,423
04	KCN	Kampong Chhnang	1,259	1,211	1,163	1,118	1,076	1,036
05	KDL	Kandal	4,226	4,074	3,932	3,794	3,663	3,539
06	KEP	Kep	48	49	49	50	50	51
07	KKH	Koh Kong	1,304	1,272	1,244	1,212	1,180	1,147

08	KPT	Kampot	1,597	1,592	1,582	1,568	1,552	1,532
09	KSP	Kampong Speu	2,610	2,545	2,475	2,402	2,329	2,257
10	KTE	Kratie	762	738	711	686	660	636
11	KTM	Kampong Thom	1,957	1,872	1,790	1,709	1,636	1,570
12	MDK	Mondulkiri	117	103	91	82	75	68
13	OMC	Oddor Meanchey	1,027	953	887	828	778	735
14	PLN	Pailin	416	416	416	414	413	411
15	PNH	Phnom Penh	14,779	14,629	14,467	14,312	14,145	13,953
16	PST	Pursat	2,068	1,996	1,927	1,858	1,790	1,724
17	PVG	Prey Veng	3,588	3,483	3,382	3,280	3,180	3,084
18	PVH	Preah vihear	293	294	296	298	298	298
19	RTK	Rattanakiri	302	268	239	215	196	179
20	SRP	Siem Reap	6,575	6,277	6,004	5,746	5,507	5,286
21	STR	Stung Treng	537	534	530	526	519	513
22	SVH	Sihanouk Ville	2,291	2,268	2,246	2,222	2,195	2,163
23	SVR	Svay Rieng	2,054	1,982	1,918	1,853	1,791	1,733
24	TBK	Tbong Khum	2,462	2,386	2,306	2,225	2,147	2,073
25	TVK	Takeo	3,303	3,269	3,230	3,184	3,133	3,075
Total Adult PLHIV from AEM Cambodia			68,499	66,908	65,346	63,791	62,245	60,703

3. Estimated sub-national HIV New Infection

Table 3 below shows the total estimated and projected number of adult HIV new infections in all 25 provinces. While Phnom Penh has the highest number of adult HIV new infections, the number of new infection is relatively similar to Battambang province at 82 and 76 cases respectively in 2015. The third province with high number of HIV new infections is Siem Reap. Those three locations are twice higher than the rest of provinces in Cambodia.

Table 3 - Total estimated Adult HIV New Infection in 25 Provinces

Code	ABB	Province	2015	2016	2017	2018	2019	2020
01	BMC	Banteay Meanchey	42	39	34	33	31	30
02	BTB	Battambang	76	71	62	59	57	54
03	KCM	Kampong Cham	43	39	34	33	31	30
04	KCN	Kampong Chhnang	14	13	11	10	10	10
05	KDL	Kandal	22	20	18	17	17	15
06	KEP	Kep	2	2	1	1	1	1
07	KKH	Koh Kong	11	9	9	8	8	8
08	KPT	Kampot	22	20	18	17	17	15
09	KSP	Kampong Speu	41	37	33	31	30	28
10	KTE	Kratie	9	8	7	7	7	6
11	KTM	Kampong Thom	33	29	26	25	24	22
12	MDK	Mondulkiri	2	2	2	2	2	1
13	OMC	Oddor Meanchey	15	13	12	12	10	10
14	PLN	Pailin	4	4	4	3	3	3
15	PNH	Phnom Penh	82	74	65	62	59	56
16	PST	Pursat	27	24	22	21	20	18
17	PVG	Prey Veng	26	24	21	20	18	17
18	PVH	Preah Vihear	6	5	5	5	5	4
19	RTK	Rattanakiri	5	4	4	4	3	3
20	SRP	Siem Reap	61	55	50	47	44	43
21	STR	Stung Treng	6	5	5	5	5	4
22	SVH	Sihanouk Ville	18	17	15	15	13	13
23	SVR	Svay Rieng	18	17	15	14	14	13
24	TBK	Tbong Khum	31	28	25	24	24	22
25	TVK	Takeo	32	29	26	25	23	22
Total national new adult HIV Infections from AEM Cambodia			651	590	523	497	472	450

4. Estimated HIV/AIDS related death at Sub-National Level

In contrast, the number of HIV death-related cases increased in several provinces (e.g. Battambang and Phnom Penh). Siem Reap province had around 4 times higher number of deaths than other provinces/cities [423 cases in 2015]. However, Phnom Penh and Siem Reap will have similar number of death starting from 2019 (see table 4).

Table 4 - Total HIV death related cases in 25 provinces

Code	ABB	Province	2015	2016	2017	2018	2019	2020
01	BMC	Banteay Meanchey	146	124	118	126	131	133
02	BTB	Battambang	114	98	92	102	116	131
03	KCM	Kampong Cham	147	138	139	138	138	134
04	KCN	Kampong Chhnang	66	64	62	60	55	52
05	KDL	Kandal	199	180	169	162	151	141
06	KEP	Kep	1	0	0	0	0	2
07	KKH	Koh Kong	55	43	38	40	41	41
08	KPT	Kampot	21	23	24	27	31	34
09	KSP	Kampong Speu	107	105	108	108	107	105
10	KTE	Kratie	32	34	35	34	32	30
11	KTM	Kampong Thom	123	117	112	105	98	91
12	MDK	Monduliri	19	16	14	12	9	8
13	OMC	Oddor Meanchey	103	94	87	75	66	58
14	PLN	Pailin	4	5	5	4	6	6
15	PNH	Phnom Penh	183	182	182	183	198	218
16	PST	Pursat	121	104	95	93	91	85
17	PVG	Prey Veng	149	135	130	128	123	118
18	PVH	Preah vihear	3	2	2	3	4	6
19	RTK	Rattanakiri	49	44	37	31	26	22
20	SRP	Siem Reap	423	369	339	317	291	269
21	STR	Stung Treng	9	7	10	9	11	13
22	SVH	Sihanouk Ville	44	37	34	36	39	44
23	SVR	Svay Rieng	109	93	85	81	77	74
24	TBK	Tbong Khum	111	109	110	108	104	98
25	TVK	Takeo	63	59	60	68	73	78
Total estimated adult HIV-related deaths from AEM Cambodia			2,402	2,182	2,085	2,052	2,018	1,991

5. Estimated ART coverage at sub-national level in 2015

Table 5 highlights the coverage of ART among people aged > 15 years-old at the sub-national level in the 25 provinces. The estimated coverage of ART in Phnom Penh is slightly more than 100%, as it is the capital city and people from provinces migrate to Phnom Penh is relatively high. Significant numbers of PLHIV who are resident of other provinces are registered in ART in Phnom Penh. The lowest coverage provinces are Rattanakiri and Modulkiri provinces (where there are no ART clinics). This table also shows the coverage of ART per population, and HIV cases per population.

Table 5 - Total PLHIV who received ART, and the coverage in 2015 in 25 provinces

Code	ABB	Province	PLHIV Total2015	ART Male 2015	ART Female 2015	ART Total 2015	% ART Male	% ART Female	% ART Total	Total pop
01	BMC	Banteay Meanchey	4,692	1,437	1,755	3,192	65.44%	70.31%	68.03%	729,624
02	BTB	Battambang	6,279	2,031	2,457	4,488	70.47%	72.33%	71.48%	1,121,001
03	KCM	Kampong Cham	3,952	1,107	1,352	2,459	60.03%	64.15%	62.23%	1,007,277
04	KCN	Kampong Chhnang	1,259	295	374	669	52.74%	53.48%	53.15%	523,202
05	KDL	Kandal	4,226	1,255	1,486	2,741	59.92%	69.71%	64.86%	1,115,959
06	KEP	Kep	48	22	31	53	105.98%	113.54%	110.28%	38,700
07	KKH	Koh Kong	1,304	399	461	860	60.48%	71.50%	65.93%	122,258
08	KPT	Kampot	1,597	706	567	1,273	91.37%	68.78%	79.71%	611,583
09	KSP	Kampong Speu	2,610	550	810	1,360	53.76%	51.05%	52.11%	755,465
10	KTE	Kratie	762	189	238	427	50.42%	61.42%	56.01%	344,195
11	KTM	Kampong Thom	1,957	366	504	870	44.51%	44.40%	44.45%	690,386
12	MDK	Mondulkiri	117	1	4	5	1.70%	6.93%	4.29%	72,680
13	OMC	Oddor Meanchey	1,027	140	183	323	29.39%	33.26%	31.46%	231,387
14	PLN	Pailin	416	146	190	336	80.12%	81.14%	80.69%	65,795
15	PNH	Phnom Penh	14,779	7,960	8,813	16,773	100.90%	127.90%	113.49%	1,688,040
16	PST	Pursat	2,068	481	608	1,089	49.07%	55.89%	52.65%	435,562
17	PVG	Prey Veng	3,588	937	1,343	2,280	60.72%	65.69%	63.55%	1,156,821
18	PVH	Preah vihear	293	106	121	227	80.62%	74.82%	77.42%	235,355
19	RTK	Rattanakiri	302	13	12	25	8.60%	7.94%	8.27%	183,699
20	SRP	Siem Reap	6,575	1,588	1,983	3,571	50.45%	57.86%	54.31%	922,975
21	STR	Stung Treng	537	159	154	313	57.44%	59.14%	58.26%	122,791
22	SVH	Sihanouk Ville	2,291	822	923	1,745	72.88%	79.33%	76.15%	250,180
23	SVR	Svay Rieng	2,054	515	695	1,210	58.45%	59.25%	58.91%	578,461
24	TBK	Tbong Khum	2,462	617	723	1,340	53.44%	55.30%	54.43%	749,946
25	TVK	Takeo	3,303	1,002	1,354	2,356	68.52%	73.56%	71.33%	923,297
		Total	68499	22,844	27,141	49,985	69.84%	75.84%	72.97%	14,676,639
		Total non PNH	53,720	14,884	18,328	33,212	59.96%	63.43%	61.82%	12,988,599

KEY ISSUES AND DATA GAPS

KEY ISSUES AND ASSUMPTIONS USED FOR UPDATING AEM BASELINE MODEL

Since Spectrum and AEM models for the national estimation and projection were updated in 2014, only few indicators/inputs were updated based on the new available data from studies/survey undertaken in late 2014 and 2015. This included HIV prevalence among MSM, TG and the number of PLHIV registered in pre-ART/ART sites.

However, the model needed several other additional inputs to generate estimates by provinces. Thus, informed assumption were agreed upon and used for missing data/information. The main issues and consensus are described below:

Table 6 - Key issues and assumptions for key inputs

Issues	Assumptions	Sources
Population aged > 15 years-old	Using UN population projection in SPECTRUM version 5.4 and CIPS 2013 to compare the population and sex ratio. The total population in 2015 as follow: <ul style="list-style-type: none"> • Males (> 15 Yrs): 4,899,598 • Females (> 15 Yrs): 5,454,770 • F/M ratio (> 15 Yrs): 1.11 	NIS, 2013: Cambodia Inter-Censal population survey 2013 [1] SPECTRUM V 5.4
Heterosexual Behavior and STI	Remain the same as AEM 2014	AEM 2014 Report
People who Injecting Drug (PWID)	Remain the same as AEM 2014	AEM 2014 Report
Updated MSM data	Total Men who have Sex with Men: from 101,300 (AEM 2014) to 63,200 in 2015 1).% of MSM Group 1: 19.7% to 32.1% 2).% of MSM condom use in anal sex with MSM: 74% to 69% Percent of males aged 15-49 engaging in same-sex behavior: 1.5% of the total male population <ul style="list-style-type: none"> - 1.7% MSM in City/urban and 0.5% in rural of the total male population - 20% of people living in city, 80% in rural - Weighted MSM: 1.7%x 20% + 0.5%x 80% = 0.74% 	- Bros-Khmer study, 2014 [6] - GIS Mapping 2015 3 ways to detect MSM - Capture-Recapture - Key informant interview to identify the hidden MSM - Using the median method to calculate
Updated data on Transgender People	- Size of TG in 2015 = 3,200 - % condom use in anal sex with	- IBBS 2015 - AEM 2014

	clients: from 75% to 60% - Anal STIs (%) among transgender who sell sex: 11.4% to 12%	Report
Updated Adults ART Coverage	- Male: 22,291 (2014) and 23,184 (2015) - Female: 26,629 (2014) and 27,904 (2015)	ART registration database, NCHADS program data 2015

DATA GAPS FOR HIV PROVINCIAL LEVEL ESTIMATION AND PROJECTION

1. Data gaps for prevention:

- A. The prevention program coverage [reached] for MSM, TG and PWID remains unchanged from the end of 2014 coverage level. The coverage is the same as what reported in AEM 2014.
- B. The migration factor could not be calculated, it was assumed that there is no migration from one province to another.
- C. **ANC data:** the ANC data from 1996 to 2006 was useable and was used to calculate the HIV prevalence and incidence as the rest of the years beyond 2006 have very low prevalence, almost close to zero, and was not usable.

2. Data gaps for care and treatment:

- A. Treatment eligibility criteria have been kept at CD4 350.
- B. **pre-ART/ART data:** the program data could not be disaggregated between male and female for the early years when the program started. The available data was from 2005 until 2015.
- C. **Other data,** such as TB-HIV, PMTCT, and VCCT were not used as significant information was missing and incomplete in these data sources. The missing parts particularly were the location, sex and years.

3. Data gaps for location

- A. Some provinces like Mondulkiri, Kep and Tbong Khmum need to use the proxy program data output and HIV incidence of the nearby provinces as these were new provinces or ART programme started there quite recently.
- B. Use proxy HIV incidence for the province which has neither program data nor any results from any study.

CONCLUSION

The four main variables reported in the HIV estimates and projections report included: the total number of PLHIV, the new HIV infections in 2015 and the projection up to 2020, the total HIV deaths, and last but not the least, the ART coverage per province.

The 2016 estimation and projections using AEM/spectrum models confirms declining HIV incidence and mortality among the general population and various sub-population groups. It shows that the past and current HIV prevention and treatment programs are producing positive impact in terms of averting both new HIV infections and AIDS-related deaths. Furthermore, it provides the critical evidence to reach the 2020 and 2025 elimination targets, Cambodia has to maintain the focus on providing HIV prevention services to Key Populations with varying intensity, depending on vulnerability and risk behaviors and sustain and further scale up treatment services.

The sub-national HIV estimates and projections will be very useful for the program implementers at national and sub-national levels. The National programme is in process of scaling up Boosted Integrated Active Case Management (B-IACM) to more provinces and these sub-national estimates and projections will help in setting sub-national targets and tracking of the HIV prevention and treatment cascades at national and provincial level.

ANNEXES

HIV PREVALENCE AMONG ANC WOMEN AGED <25 YEARS

Provinces	1996	1997	1998	1999	2000	2001	2002	2003	2006	2010
Banteay Meanchey	2.00	2.10	2.10	2.00	1.90	1.80	1.80	1.70	0.60	0.30
Battambang	0.90	1.50	1.90	2.00	2.00	1.90	1.80	1.60	1.20	0.30
Kampong Cham	0.80	1.10	1.30	1.40	1.30	1.20	1.20	1.10	0.80	-
Kampong Chhnang	0.80	1.30	1.60	1.70	1.70	1.50	1.40	1.20	-	-
Kampong Speu	0.50	1.00	1.60	2.20	2.60	2.70	2.70	2.70	-	-
Kampong Thom	0.30	0.60	1.00	1.50	1.90	2.10	2.10	2.00	-	0.30
Kampot	0.10	0.20	0.40	0.60	0.90	1.20	1.40	1.50	-	-
Kandal	1.90	1.90	1.80	1.60	1.40	1.20	1.00	0.90	-	-
Koh Kong	4.40	4.60	4.40	4.10	3.70	3.30	2.80	2.40	0.90	0.80
Kratie	0.90	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.90	-
Odor Meanchey									-	0.50
Pailin	1.30	2.40	2.90	3.00	2.90	2.80	2.70	2.50	0.80	-
Phnom Penh	2.40	2.70	2.60	2.40	2.20	1.90	1.70	1.40	0.70	-
Preah vihear	0.10	0.10	0.20	0.40	0.60	0.70	0.80	0.80	-	0.30
Prey Veng	1.30	1.70	1.80	1.80	1.70	1.50	1.30	1.10	-	-
Pursat	1.80	2.10	2.10	2.00	1.90	1.70	1.40	1.20	0.80	0.90
Ratanak Kiri	1.70	1.80	1.70	1.60	1.40	1.30	1.10	0.90	-	0.30
Siem Reap	2.40	3.60	4.10	4.10	3.80	3.50	3.10	2.70	0.40	-
Sihanoukville	2.20	3.10	3.40	3.40	3.30	3.10	2.90	2.60	0.70	-
Stung Treng	1.30	1.90	2.10	2.10	2.00	1.80	1.70	1.50	0.60	-
Svay Rieng	1.70	2.10	2.20	2.10	2.00	1.80	1.50	1.30	-	0.30
Takeo	0.60	1.00	1.20	1.30	1.20	1.10	1.00	0.90	0.80	-
Modul Kiri	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thbong Khum (KCH)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kep (Kpt)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

HIV PREVALENCE AMONG ANC WOMEN AGED >25 YEARS

Provinces	1996	1997	1998	1999	2000	2001	2002	2003	2006	2010
Banteay Meanchey	2.4	3.1	3.3	3.3	3.1	2.9	2.6	2.3	2.1	1.1
Battambang	1.3	2	2.2	2.2	2.2	2.1	2.1	2	1.8	1.8
Kampong Cham	1	1.8	2.7	3.1	3.1	3	2.8	2.5	0.8	1.3
Kampong Chhnang	0.9	1.5	2	2.2	2.2	2.1	1.9	1.7	1.6	0.6
Kampong Speu	0.7	1.3	2.1	2.7	3	3.2	3.2	3.1	1.2	0.2
Kampong Thom	0.8	1.5	2.1	2.4	2.5	2.4	2.4	2.3	1.1	0.2
Kampot	1	1.6	2	2.1	2.1	2.1	2.1	2	1.6	0.3
Kandal	2.8	2.7	2.6	2.5	2.4	2.2	2.1	1.9	1.2	0.4
Koh Kong	5	5	4.8	4.5	4.1	3.6	3.1	2.6	2.2	1.5
Kratie	1.5	1.5	1.4	1.3	1.2	1	0.9	0.7	0.3	0.4
Odor Meanchey									0.3	0.8
Pailin	2.2	3.2	3.6	3.6	3.5	3.3	3.1	2.8	3.5	0.5
Phnom Penh	3.3	3.6	3.5	3.3	3	2.7	2.4	2	0.9	1.4
Preah vihear	0.2	0.3	0.6	0.9	1.2	1.4	1.4	1.4	0.8	0.7
Prey Veng	1.8	2.5	2.7	2.7	2.6	2.4	2.2	2	1.3	0
Pursat	2.7	2.6	2.5	2.3	2.1	1.9	1.6	1.4	0.7	1.1
Ratanak Kiri	2.7	2.9	2.8	2.7	2.4	2.1	1.8	1.5	0.4	0.3
Siem Reap	2.8	3.9	4.3	4.3	4.1	3.8	3.4	3	0.9	0.4
Sihanoukville	2.4	3.6	4.1	4.1	3.9	3.6	3.2	2.8	2.8	1.2
Stung Treng	1.8	2.5	2.7	2.7	2.5	2.4	2.2	2	0.5	0.7
Svay Rieng	3	3.3	3.3	3.1	2.8	2.5	2.1	1.8	0.9	0.2
Takeo	1.3	2.2	2.7	2.8	2.7	2.5	2.3	2	0.6	0
Modul Kiri	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thbong Khum (KCH)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kep (Kpt)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

HIV INCIDENCE AMONG SEX RATIO OF PRE-ART/ART SERVICES

Province	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Banteay Meanchey	1.26	1.25	1.25	1.21	1.23	1.25	1.26	1.24	1.24	1.24	1.24
Battambang	1.36	1.35	1.31	1.26	1.23	1.22	1.22	1.23	1.23	1.22	1.23
Kampong Cham	1.09	1.11	1.14	1.13	1.13	1.17	1.20	1.21	1.22	1.22	1.22
Kampong Chhnang	1.34	1.34	1.34	1.34	1.30	1.33	1.33	1.34	1.31	1.29	1.27
Kampong Speu	1.70	1.61	1.49	1.48	1.49	1.48	1.45	1.45	1.45	1.45	1.45
Kampong Thom	1.38	1.39	1.35	1.36	1.37	1.41	1.37	1.33	1.31	1.33	1.36
Kampot	1.21	1.26	1.29	1.29	1.25	1.24	1.25	1.25	1.25	1.24	1.23
Kandal	1.23	1.20	1.16	1.17	1.19	1.20	1.19	1.16	1.16	1.17	1.18
Kep	1.21	1.26	1.29	1.29	1.25	1.24	1.25	1.25	1.25	1.24	1.23
Koh Kong	1.02	1.04	1.07	1.12	1.15	1.15	1.15	1.14	1.14	1.15	1.15
Kratie	1.12	1.12	1.12	1.12	1.14	1.10	1.12	1.14	1.21	1.25	1.27
Mondulkiri	1.20	1.20	1.20	1.20	1.20	1.21	1.21	1.21	1.21	1.21	1.21
Oddor Meanchey	1.28	1.28	1.22	1.19	1.17	1.21	1.23	1.21	1.21	1.23	1.26
Pailin	1.46	1.37	1.30	1.15	1.18	1.23	1.25	1.22	1.22	1.25	1.28
Phnom Penh	1.11	1.11	1.12	1.13	1.12	1.13	1.12	1.12	1.12	1.12	1.13
Preah Vihear	1.17	1.17	1.17	1.17	1.23	1.20	1.22	1.17	1.19	1.17	1.18
Prey Veng	1.54	1.50	1.43	1.40	1.38	1.40	1.41	1.45	1.44	1.44	1.42
Pursat	1.06	1.10	1.23	1.27	1.30	1.28	1.29	1.29	1.27	1.27	1.25
Siem Reap	1.10	1.11	1.12	1.15	1.15	1.16	1.19	1.21	1.23	1.24	1.25
Sihanouk Ville	1.16	1.15	1.12	1.09	1.08	1.10	1.10	1.10	1.10	1.11	1.11
Stung Treng	0.99	0.99	0.99	0.99	0.99	0.98	1.03	1.05	1.09	1.06	1.07
Svay Rieng	1.64	1.62	1.56	1.53	1.52	1.53	1.50	1.45	1.39	1.38	1.37
Takeo	1.35	1.35	1.35	1.35	1.35	1.35	1.37	1.37	1.38	1.37	1.37
Grand Total	1.20	1.20	1.20	1.20	1.20	1.21	1.21	1.21	1.21	1.21	1.21

HIV INCIDENCE AMONG FEMALE IN 25 PROVINCES

Female Incidence	2015	2016	2017	2018	2019	2020
Banteay Meanchey	19.17	16.68	14.13	13.05	11.97	10.96
Battambang	34.38	29.92	25.34	23.41	21.46	19.66
Kampong Cham	19.72	17.16	14.53	13.42	12.31	11.28
Kampong Chhnang	6.43	5.60	4.74	4.38	4.02	3.68
Kampong Speu	20.82	18.12	15.34	14.17	12.99	11.91
Kampong Thom	16.12	14.03	11.88	10.98	10.06	9.22
Kampot	9.08	7.90	6.69	6.18	5.67	5.19
Kandal	10.23	8.90	7.54	6.96	6.38	5.85
Koh Kong	4.91	4.28	3.62	3.35	3.07	2.81
Kratie	4.17	3.63	3.07	2.84	2.60	2.39
Oddor Meanchey	7.03	6.12	5.18	4.79	4.39	4.02
Pailin	2.14	1.86	1.58	1.46	1.33	1.22
Phnom Penh	36.01	31.34	26.54	24.52	22.48	20.59
Preah vihear	2.57	2.23	1.89	1.75	1.60	1.47
Prey Veng	12.96	11.28	9.55	8.82	8.09	7.41
Pursat	12.97	11.28	9.56	8.83	8.09	7.41
Rattanakiri	2.18	1.90	1.61	1.49	1.36	1.25
Siem Reap	29.02	25.25	21.39	19.76	18.11	16.60
Sihanouk Ville	8.25	7.18	6.08	5.62	5.15	4.72
Stung Treng	2.50	2.18	1.85	1.71	1.56	1.43
Svay Rieng	9.20	8.00	6.78	6.26	5.74	5.26
Takeo	16.14	14.04	11.89	10.99	10.07	9.23
Mondulkiri	0.84	0.73	0.62	0.57	0.52	0.48
Tbong Khum	14.75	12.83	10.87	10.04	9.21	8.43
Kep	0.58	0.51	0.43	0.40	0.36	0.33
Total	302.17	262.95	222.69	205.73	188.59	172.80

HIV INCIDENCE AMONG MALES IN 25 PROVINCES

Incidenc among males	2015	2016	2017	2018	2019	2020
Banteay Meanchey	21.63	20.31	18.64	18.08	17.59	17.17
Battambang	39.20	36.81	33.78	32.76	31.88	31.11
Kampong Cham	22.61	21.23	19.48	18.89	18.39	17.94
Kampong Chhnang	7.09	6.66	6.11	5.93	5.77	5.63
Kampong Speu	20.18	18.94	17.38	16.86	16.41	16.01
Kampong Thom	16.65	15.63	14.35	13.91	13.54	13.21
Kampot	12.91	12.12	11.13	10.79	10.50	10.25
Kandal	12.13	11.39	10.45	10.14	9.87	9.63
Koh Kong	5.98	5.62	5.16	5.00	4.87	4.75
Kratie	4.60	4.32	3.97	3.85	3.74	3.65
Oddor Meanchey	7.83	7.35	6.75	6.54	6.37	6.21
Pailin	2.35	2.20	2.02	1.96	1.91	1.86
Phnom Penh	44.76	42.02	38.56	37.40	36.39	35.51
Preah vihear	3.05	2.87	2.63	2.55	2.48	2.42
Prey Veng	12.74	11.96	10.98	10.65	10.36	10.11
Pursat	14.49	13.60	12.48	12.10	11.78	11.49
Rattanakiri	2.52	2.36	2.17	2.10	2.05	2.00
Siem Reap	32.65	30.65	28.13	27.28	26.54	25.90
Sihanouk Ville	10.38	9.75	8.95	8.67	8.44	8.24
Stung Treng	3.29	3.09	2.83	2.75	2.67	2.61
Svay Rieng	9.40	8.82	8.10	7.85	7.64	7.46
Takeo	16.51	15.50	14.23	13.80	13.43	13.10
Mondulkiri	0.97	0.91	0.84	0.81	0.79	0.77
Tbong Khum	16.92	15.88	14.57	14.13	13.75	13.42
Kep	0.66	0.62	0.57	0.55	0.54	0.52
Total	348.85	327.51	300.57	291.49	283.65	276.81

TOTAL HIV INCIDENCE IN 25 PROVINCES

Total incidence	2015	2016	2017	2018	2019	2020
Banteay Meanchey	40.81	36.99	32.77	31.13	29.56	28.13
Battambang	73.58	66.72	59.12	56.17	53.33	50.77
Kampong Cham	42.33	38.39	34.01	32.32	30.69	29.22
Kampong Chhnang	13.53	12.26	10.85	10.31	9.78	9.31
Kampong Speu	40.99	37.06	32.73	31.03	29.40	27.92
Kampong Thom	32.77	29.66	26.23	24.89	23.60	22.43
Kampot	21.99	20.02	17.82	16.97	16.17	15.44
Kandal	22.36	20.29	17.99	17.10	16.25	15.48
Koh Kong	10.90	9.89	8.78	8.35	7.93	7.56
Kratie	8.77	7.95	7.04	6.69	6.35	6.04
Oddor Meanchey	14.86	13.47	11.93	11.33	10.75	10.23
Pailin	4.48	4.06	3.60	3.42	3.24	3.08
Phnom Penh	80.77	73.36	65.10	61.91	58.87	56.11
Preah vihear	5.62	5.10	4.52	4.30	4.08	3.89
Prey Veng	25.70	23.24	20.53	19.47	18.45	17.52
Pursat	27.45	24.88	22.04	20.93	19.87	18.91
Rattanakiri	4.70	4.26	3.78	3.59	3.41	3.25
Siem Reap	61.67	55.90	49.52	47.04	44.66	42.50
Sihanouk Ville	18.64	16.93	15.03	14.30	13.59	12.96
Stung Treng	5.79	5.27	4.68	4.45	4.24	4.04
Svay Rieng	18.59	16.82	14.87	14.11	13.38	12.72
Takeo	32.65	29.54	26.12	24.78	23.50	22.33
Mondulkiri	1.81	1.64	1.45	1.38	1.31	1.25
Tbong Khum	31.66	28.72	25.44	24.18	22.96	21.86
Kep	1.24	1.13	1.00	0.95	0.90	0.86
Total	651.02	590.46	523.26	497.22	472.24	449.61

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