

Report

Early Warning Indicators 2013

1. Introduction

HIV prevalence among general population in Cambodia has been declining from 1.2% in 2003 to 0.8% in 2010. At the end of quarter 2, 2013, there were already 45252 adults, and 4545 pediatrics on ART. Preventing the occurrence of HIV DR, NCHADS has implemented programs such as; HIV DR Threshold survey, monitoring of HIV DR among patient receiving ART and the collection of early warning indicators from ART sites. The monitoring of EWIs has been started since 2008 and since then the data have been collected annually. In 2008, data were collected from 16 sites, 41 sites in 2009, 35 sites in 2010, 31 sites in 2011, 47 sites in 2012 and 52 sites were collected in 2013.

After many years of implementation of EWI, data have been used to provide feedback to ART sites and to inform relevant units at NCHADS to help improving the performance of each ART site including appointment keeping and ARV drugs management.

2. Objectives

The objectives of the EWI collection for HIV DR are:

- To collect the early warning indicators for HIV DR for NCHADS and Universal Access.
- To assess the extent to which ART programs are functioning to optimize the prevention of HIV drug resistance.
- To disseminate the findings to all ART sites and all stakeholders.
- To identify barriers and provide support to improve the performance of OI/ART services at each ART site.

3. Methods

The methods for collecting data related to Early Warning Indicators and the formula for calculating indicators was based on the draft of Standard operating procedure developed by NCHADS. The detail document can be found on surveillance unit at NCHADS.

The ART sites included in to the study have changed from one round to another round. In principle, the selection of the ART was primarily based on the past performance of the ART site. That is, the sites will be included into the next round if their results from the previous round of EWI were not satisfied. In addition, the Surveillance unit also plans to conduct the EWI in all OI/ART clinics in Cambodia.

3.1. List of EWI collected

NCHADS has defined 9 EWI for HIV DR:

1. Percentage of months in which there were no ARV drug stock outages
2. Percentage of months no expired ARV drug was found at ART site
3. Storage conditions of ARV drugs
4. Percentage of patients started on a standard recommended first line ART regimen
5. Percentage of patients who are not lost to follow up at 12 months after ART initiation
6. Percentage of patients who are still on first line ART regimen 12 months after ART initiation
7. Proportion of patients who kept all appointments

In addition, there are additional two indicators that are still too difficult to collect. For example; (8) the proportion of patients who picked up their ARV drugs regularly and (9) the proportion of patients who have good adherence to treatment

Since the last 2 indicators are not available, the indicator 7 we used as a proxy for adherence of ART. Therefore, only 7 indicators are routine collected from ART sites in Cambodia.

3.2. ART sites of EWI data collection

In 2013, EWI data have been collected from 51 ART sites from 21 provinces for adults. Those ART is listed in the table below:

Table 1: List of ART site for adult patient selected in 2013.

No.	Province	ART Site
1.	Kampong Speu province (KPS)	-Provincial Hospital -Oudong Referral Hospital -Korng Pisey RH
2.	Siem Reap province (SRP)	-Provincial Hospital -Krolanh RH -Sonikum RH
3.	Prey Veng province (PVG)	-Neak Loeung -Provincial Hospital -Pearing RH
4.	Kampong Chnang province (KCN)	-Provincial Hospital
5.	Koh Kong province (KHK)	-Smach Meanchey RH -Sre Ambel RH
6.	Takeo province (TKO)	-Provincial Hospital -Ang Roka RH -Kiri Vong RH
7.	Battambang province (BTB)	-BTB provincial hospital -Tmor Kol RH -Military Region No.5 RH -Mong Russey RH -Sampov Loun RH
8.	Kampong Thom province (KTH)	-Provincial Hospital
9.	Phnom Penh (PP)	-Samdach Ov Referral Hospital -Social Health Clinic -Calmette Hospital -Chhouk Sar Clinic -Center of Hope Center -Meanchey RH -Kosamac Hospital
10.	Kampong Cham province	-Kampong Cham RH -Choeung Prey Referral Hospital

		-Tbong Khmom -Srey Santhor -Memot -Chamkar Leu Referral Hospital
11.	Kampot province (KPT)	-Kampot Provincial Hospital -Kampong Trach Referral Hospital
12.	Pailin Provincial Hospital (PLN)	-Provincial Hospital
13.	Steng Treng province (STG)	-Provincial Hospital
14.	Kandal province (KDL)	-Chey Chumnas RH -Koh Thom Referral Hospital
15.	Svay Rieng province (SVR)	-Romeas Hek Referral hospital -Provincial Hospital
16.	Oudor Meanchey province (OMC)	-Provincial Hospital
17	Prah Sihanouk province	-Provincial Hospital
18	Pursat province	-Sampov Meas RH
19	Prah Vihear (PVH)	-16 Makara RH
20	Buntay Meanchey province (BMC)	-Tmor Pourk RH -Serey Soporn RH -Mongkol Borey RH -Poi Pet RH
21	Kratie province	-Provincial Hospital

In addition EWI from pediatric OI/ART sites were also conducted. In 2013, EWI data were collected from 32 ART pediatric sites of 21 provinces:

Table 2: List of ART site for pediatric patient selected in 2013.

No.	Province	ART Site
1.	Kampong Cham province (KCM)	- Tbong Kmom Referral Hospital - Provincial Hospital
2.	Svay Rieng province (SVR)	- Provincial Hospital - Romea Hek Referral Hospital

3.	Kampot province (KPT)	- Provincial Hospital - Kampong Trach Referral Hospital
4.	Kampong Speu Province (KSP)	- Provincial Hospital
5.	Battambang province (BTB)	- Provincial Hospital - Sampov Loun RH -Mong Russey RH
6.	Kampong Thom (KTM)	-Provincial Hospital
7.	Koh Kong Province (KHK)	- Sre Ambel RH - Smach Meanchey Provincial Hospital
8.	Pailin Provincial Hospital (PLN)	- Provincial Hospital
9.	Prey Veng province (PVG).	- Pear Raing Referral Hospital - Neak Loeung Referral Hospital
10.	Kandal province (KDL)	- Koh Thom Referral Hospital - Chey Chomnas RH
11.	Oudor Meanchey province (OMC)	- Provincial Hospital
12.	Takeo province	- Provincial Hospital - Kirivong RH
13.	Phnom Penh (PP)	-National Pediatric Hospital
14.	Kampong Chhnang (KCN)	- Provincial Hospital
15.	Steng Treng (STG)	- Provincial Hospital
16.	Prey Veng (PVG)	- Provincial Hospital
17.	Prah Sihanouk province (PSN)	- Provincial Hospital -16 Makara RH
18.	Pursat province (PST)	-Sampovmeas RH
19.	Siem Reap province (SRP)	-Koma Angkor Hospital
20.	Bunteay Meanchey province (BMC)	-Mungkol Borey RH -Serey Sophorn RH
21.	Kratie province	-Provincial Hospital

3.3. EWI data collection procedure

The purpose of HIV DR EWI is to assess the extent to which ART programs are functioning to optimize prevention of HIV drug resistance. There are 7 main

indicators to be collected in Cambodia. The summary of guidelines for collecting each indicator is presented as below:

Indicator 1: Percentage of months in which there were no ARV drug stock outages

This indicator is measured by using ARV Stock Reports and interviewing pharmacist during ART site visits. A stock-out is when any essential ARV drugs is not available at an ART site. It will not be considered as a stock out in case when one essential ARV drug is out of stock, but its alternative drug is still available, thus there is no interruption on the treatment for patients.

Indicator 2: Percentage of months no expired ARV drug was found at ART site

This indicator is measured by inspecting ARV pharmacy during ART site visits and also drug records. In addition, an interview with a responsible pharmacist is also conducted in order to identify a period that might have problem with expired drug.

Any ARV drug which is not yet expired at the time when a patient receive the drug, but it will be expired before the next appointment date will be considered as ‘expired drug’. In contrast, the presence of expired drug in the pharmacy does not automatically mean ‘using expired drug’ if there is evidence showing that those drugs are no longer in use.

Indicator 3: Storage conditions of ARV drugs

If ARV drugs are stored in good conditions, the score is “good”

If ARV drugs are stored in poor conditions, the score is “poor”

Good storage conditions is defined as drug is stored in a room temperature (the pharmacy equipped with fan and/or air conditioner) away from excess heat and moisture.

Indicator 4, 5, 6, 7:

The sample size needed for Indicator 4, 5, 6 and 7 will be determined based on the total number of new patients started ART in the sites in the previous year.

Example, if the data collection is conducted in 2009, the total number of new ARV patients initiating in 2008 will be used to decide on number of ART patients needed for each indicator.

Indicator 4: only a sample of most recent patients will be selected.

Indicator 5, 6, 7: new ART patients who started ART at least 15 months prior to the survey date.

Table 3: Number of adult patient records selected from ART sites.

No.	Name of adult sites visited in 2013	Number of patients to be sample for Indicator 4, 5, 6 and 7 in 2013
1	Oudong RH	20
2	Siem Reap PH	130
3	Neak Loeung RH	100
4	Kampong Chnang PH	66
5	Smach Meanchey Hospital	75
6	Takeo PH	75
7	Tmor Kol RH	54
8	Kampong Thom RH	53
9	Samdach Ov RH	75
10	Military Region No.5 RH	7
11	Social Health Clinic	100
12	Choeung Prey RH	51
13	Kampong Cham PH	100
14	Tbong Kmom RH	75
15	Srey Santhor RH	23
16	Memot RH	28
17	Kampong Trach RH	75
18	Kampot RH	64
19	Pailin RH	41
20	Steng Treng RH	52
21	Prey Veng PH	75
22	Romeas Hek Hospital	12
23	Svay Rieng PH	75
24	Battambang PH	100
25	Sampov Loun RH	63
26	Prah Sihanouk PH	100
27	Sampov Meas RH	75
28	Calmette Hospital	75
29	Chouk Sar Center	57
30	Center of Hope	130

31	Meanchey RH	75
32	Samrong RH	16
33	Sre Ambel RH	14
34	Ang Roka RH	22
35	Kiri vong RH	21
36	16 Makara RH	26
37	Korng Pisey RH	14
38	Kampiong Speu RH	75
39	Krolanh RH	15
40	Sonikum RH	28
41	Tmor Pourk RH	30
42	Serey Sophorn RH	60
43	Mongkol Borey RH	70
44	Poipet RH	75
45	Mong Russey RH	56
46	Pearing RH	25
47	Chamkarleu RH	5
48	Kratie PH	55
49	Kosamac RH	37
50	Koh Thom RH	42
51	Chey Chumnas RH	75

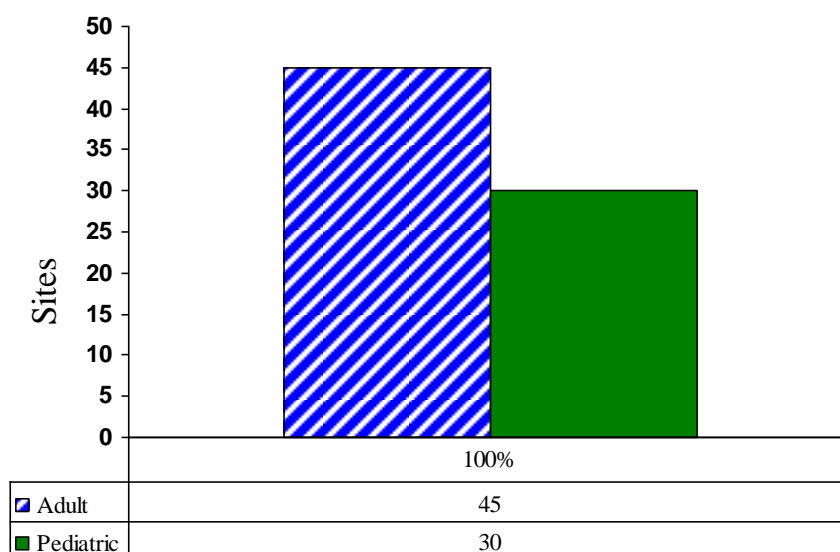
Table 4: Number of pediatric patient records collected in 2013.

	Name of pediatric sites visited in 2013	Number of patients to be sample for Indicator 4, 5, 6 and 7 in 2013
1	Neak Loeung RH	4 (Take all)
2	Kampong Chnang PH	8 (Take all)
3	Smach Meanchey (KHK)	4 (Take all)
4	Takeo PH	15 (Take all)
5	National Pediatric	63 (Take all)
6	Kampong Thom PH	21(Take all)
7	Kampong Cham PH	21(Take all)
8	Tbong Kmom RH	12 (Take all)
9	Kampong Trach	5 (Take all)
10	Kampot PH	19 (Take all)
11	Pailin PH	6 (Take all)
12	Steng Treng PH	5 (Take all)
13	Prey Veng PH	10 (Take all)
14	Romeas Hek RH	N/A
15	Svay Rieng PH	7 (Take all)
16	Battambang PH	18 (Take all)
17	Sampov Loun RH	(Take all)
18	Prah Sihanouk PH	12 (Take all)
19	Sampov Meas RH (PST)	13 (Take all)

20	Samrong PH (OMC)	1
21	Sre Ambel RH (KHK)	N/A
22	Kiri Vong RH	4
23	16 Makara RH	2
24	Kampong Speu RH	25
25	Koma Angor RH	35
26	Mungkol Borey RH	4
27	Moung Russey RH	5
28	Pearing RH	6
29	Kratie PH	7
30	Koh Thom (KDL) PH	N/A
31	Chey Chumnas RH	10
32	Serei Sophorn RH	12

4. Results

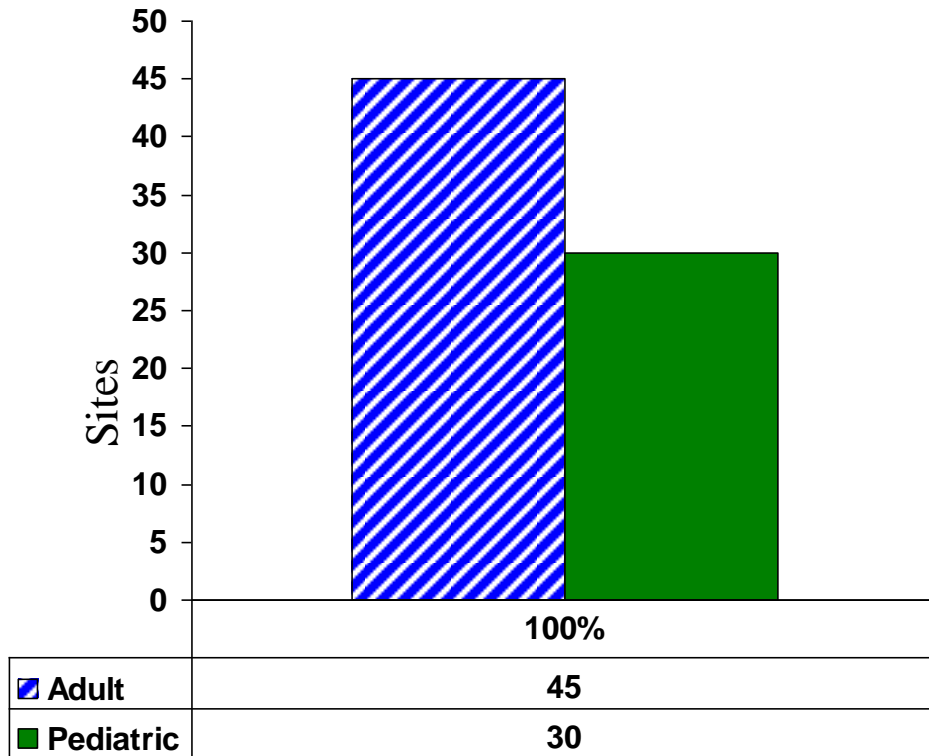
Indicator 1: percentage of months in which there was no ARV drugs stock outages.



There were six adult sites where there were no ARV drug records: Samdach Ov RH, Ang Rokar RH, Kampong speu PH, Tmor pourk RH, MongKul Borey RH, and Chey Chumnas RH. There were also two pediatric sites: Kampong Speu PH and Mongkol Borey where there were no ARV drug records.

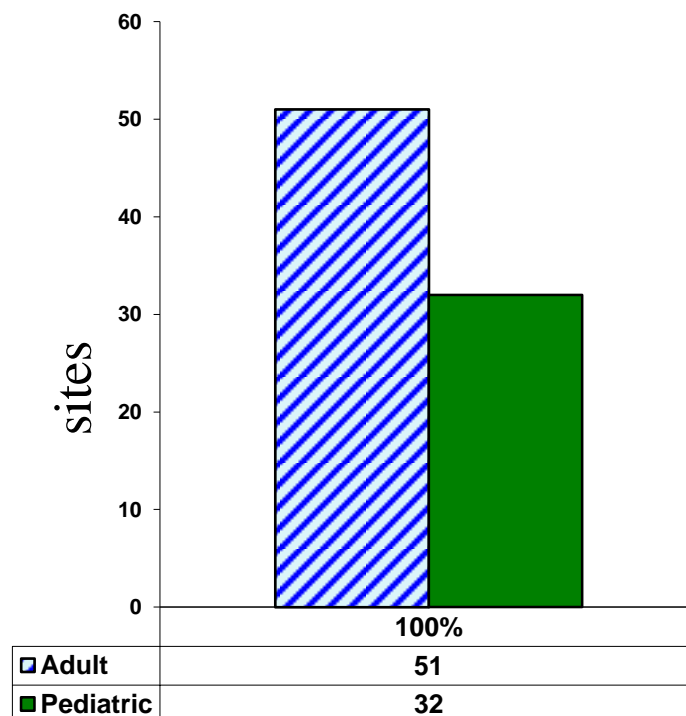
Among ART sites where there were ARV drug records, there were no ARV drug stock outages both adults and pediatric sites selected in 2013.

Indicator 2: percentage of months with no expired ARV drugs at the sites.



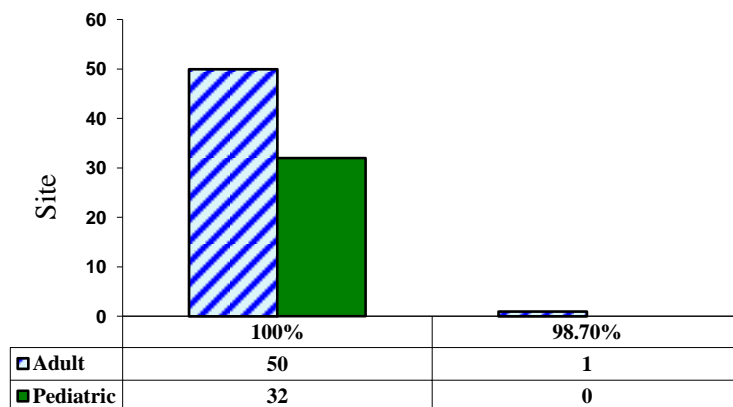
The same as Indicator 1, there were no expired ARV drugs (both adult and pediatric sites) among sites where there were ARV drug records.

Indicator 3: ARV drugs storage condition.



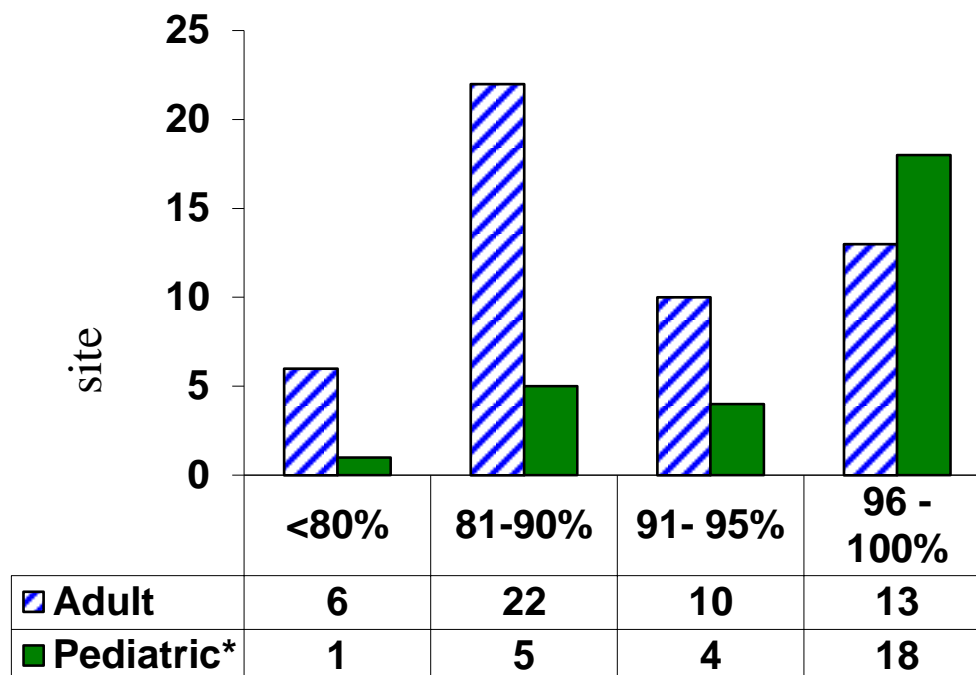
All adult and pediatric sites have good storage condition for ARV drugs.

Indicator4: percentage of patients who started ART on a standard recommended first line regimen.



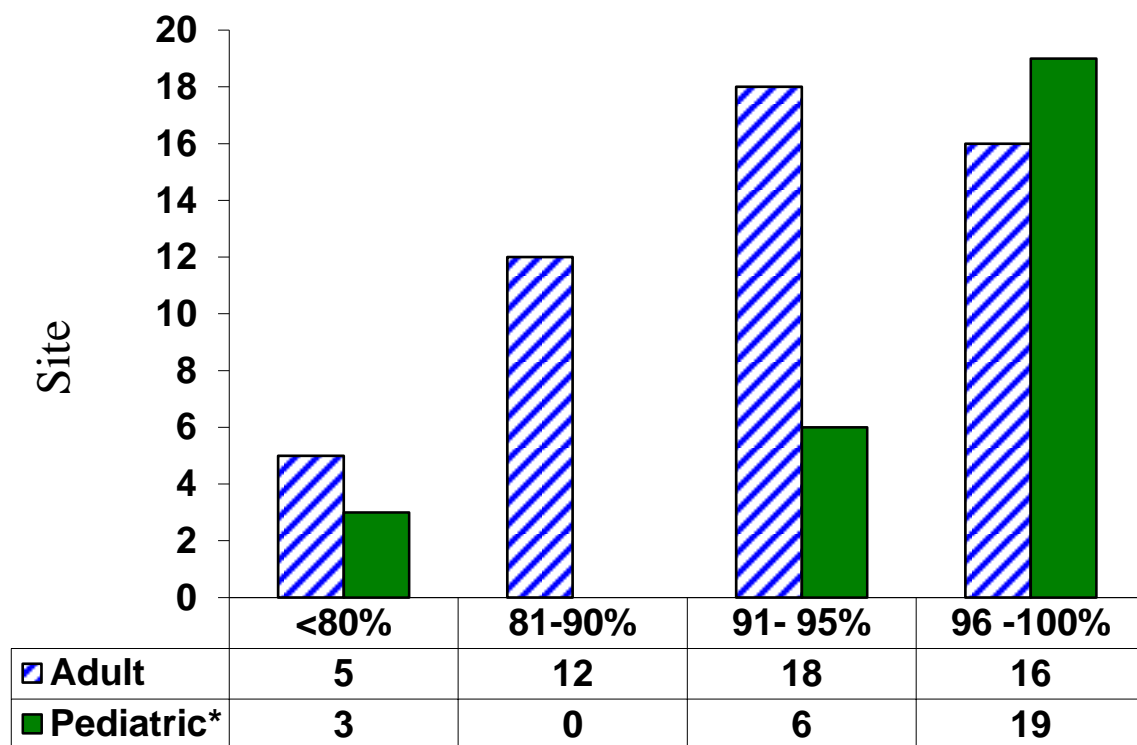
All pediatric patients had started ARV with standard recommended first line regimen. Adult patients of 51 sites had started ARV with standard recommended first line regimen. There was an adult patient from one site had started ARV with second line regimen.

Indicator 5: percentage of patients on ART who are not lost to follow up during 12 months after initiation.



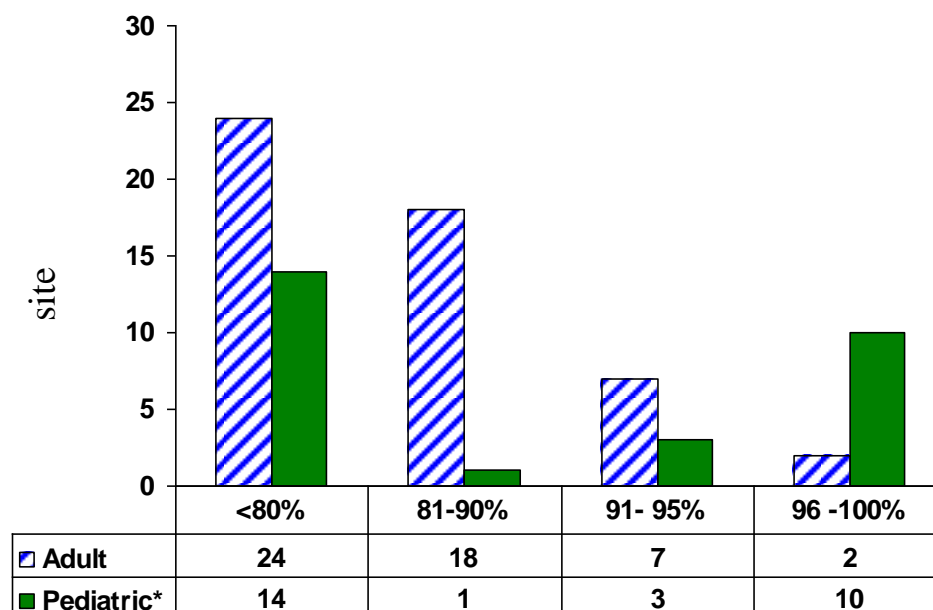
The proportion of patients who not lost to follow up varied from ART sites to sites. For example: 22 ART sites have the percent of not lost to follow up between 81% - 90%. The percent of pediatric patients who are not lost to follow up during the same period of time are higher than adult patients. For instance, 18 pediatric sites have 96 to 100 per cent of patients who are not lost to follow up, whereas there are only 13 adult sites. There are 6 adult sites and 1 pediatric site that have percent of patients who not lost to follow up below the WHO's target.

Indicator 6: percentage of patients still on first line regimen 12 months after ART initiation.



Overall, 91.25 per cent of patients still on first line regimen 12 months after initiation for adult patients, whereas 83.23 per cent of pediatric patients still on first line regimen 12 months after ART initiation. By sites, there was 12 adult sites with the percentage of adult patient still on the first line regimen of 81% - 90%, 18 sites with the proportion from 91% - 95% and 16 sites have the proportion of higher than 95%. There were 5 sites with the percentage of adult patients still on the first line regimen below the WHO's target.

Indicator 7: percentage of patients on ART who kept all appointments



Almost half of adult as well as pediatric sites have the percentage of patients who kept all appointment below the WHO recommended target.

Table 5: Percent of appointment keeping among adult patient, by site

No.	Province	Sites	Sample size	Number kept all appointment in 12 month period	Percentage by site
1	KPS	Oudong RH	20	16	80.0
2	KPS	Kampong Speu RH	75	63	84.00
3	KPS	Korng Pisey RH	14	5	35.71
4	SRP	Siem Reap PH	130	104	80.0
5	SRP	Krolanh RH	15	8	53.33
6	SRP	Sonikum RH	28	21	75.00
7	PVG	Neak Loeung RH	100	93	93.0
8	PVG	Prey Veng PH	75	69	92.00
9	PVG	Pearing RH	25	17	68.00
10	KCN	Kampong Chnang PH	66	56	84.84
11	KHK	Sre Ambel RH	14	5	35.71
12	KHK	Smach Meanchey Hospital	75	61	81.33
13	BTB	Sampov Loun RH	63	46	73.01
14	BTB	Mong Russey RH	56	51	91.07

15	BTB	Tmor Kol RH	54	45	83.33
16	BTB	Military Region No.5 RH	7	100	100.00
17	BTB	Battambang PH	100	86	86.00
18	KTH	Kampong Thom PH	53	45	84.90
19	PP	Samdach Ov RH	75	63	84.00
20	PP	Kosamac RH	37	32	86.48
21	PP	Social Health Clinic	100	98	98.00
22	PP	Calmette Hospital	75	61	81.33
23	PP	Chouk Sar Center	57	34	59.64
24	PP	Center of Hope	130	120	92.30
25	PP	Meanchey RH	75	59	78.66
26	KCM	Chamkarleu RH	5	4	80.00
27	KCM	Choeung Prey RH	51	36	70.58
28	KCM	Kampong Cham PH	100	74	74.00
29	KCM	Tbong Kmom RH	75	54	72.00
30	KCM	Srey Santhor RH	23	18	78.26
31	KCM	Memot RH	28	22	78.57
32	KPT	Kampong Trach RH	75	63	84.00
33	KPT	Kampot PH	64	55	85.93
34	PLN	Pailin RH	41	33	80.48
35	STG	Steng Treng RH	52	48	92.30
36	SRV	Romeas Hek Hospital	12	11	91.66
37	SRV	Svay Rieng PH	75	66	88.00
38	PSN	Prah Sihanouk PH	100	73	73.00
39	PST	Sampov Meas RH	75	70	93.33
40	OMC	Samrong RH	16	12	75.00
41	TKO	Takeo PH	75	64	85.33
42	TKO	Ang Roka RH	22	13	59.09
43	TKO	Kiri vong RH	21	18	85.71
44	PVH	16 Makara RH	26	19	73.07
45	BMC	Tmor Pourk RH	30	25	83.33
46	BMC	Serey Sophorn RH	60	42	70.00
47	BMC	Mongkol Borey RH	70	57	81.42
48	BMC	Poipet RH	75	62	82.66
49	Kratie	Kratie PH	55	34	61.81
50	KDL	Koh Thom RH	42	31	73.80
51	KDL	Chey Chumnas RH	75	62	82.66
Total:			2862	2424	84.69

Table 6: Percent of appointment keeping among pediatric patient, by site

No.	Provinces	Sites	Sample size	Number kept all appointments in 12 month period	Percentage by site
1	KCM	Tbong Kmom	12	9	75.00
2	KCM	Provincial Hospital	21	17	80.95
3	SVR	Romea Hek RH	N/A		
4	SVR	Provincial Hospital	7	7	100.00
5	KPT	Kampong Trach RH	5	5	100.00
6	KTP	Provincial Hospital	19	18	94.73
7	KPS	Provincial Hospital	25	20	80.00
8	BTB	Provincial Hospital	18	17	94.44
9	BTB	Sampov Loun RH	N/A		
10	BTB	Mong Russey	5		
11	KTH	Provincial Hospital	21	16	76.19
12	KHK	Sre Ambel RH	N/A		
13	KHK	Smach Meanchey PH	4	3	75.00
14	PLN	Provincial Hospital	6	3	50.00
15	PVG	Pear Raing RH	6	2	33.33
16	PVG	Neak Loeung RH	4	4	100.00
17	KDL	Chey Chumnas RH	10	8	80.00
18	KDL	Koh Thom RH	N/A		
19	OMC	Provincial Hospital	1	1	100.00
20	TKO	Provincial Hospital	15	15	100.00
21	TKO	Kirivong RH	4	3	75.00
22	KCN	Provincial Hospital	8	8	100.00
23	STG	Provincial Hospital	5	4	80.00
24	PVG	Provincial Hospital	10	3	30.00
25	PSN	Provincial Hospital	12	8	66.66
26	PSN	16 Makara RH	2	1	50.00
27	PST	Sampovmeas RH	13	12	92.30
28	BMC	Serey Sophorn RH	12	8	66.66
29	Kratie	Provincial Hospital	7	7	100.00
30	SRP	Koma Angkor RH	35	34	97.14
31	BTB	Mong Russey RH	5	4	80.00
32	PP	National Pediatric Hospital	63	61	96.82
Total:			355	298	83.94

Overall, there were 84.69 per cent of patients kept all appointment for adult patients and 83.94 per cent of pediatric patients kept all appointment.

Table 7: Average appointment keeping for adult and pediatric AIDS patients

	Sample size	Number kept all appointments in 12 month period	Percentage kept all appointments
Adult	2862	2424	84.69%
Child	355	298	83.94%
Total	3217	2722	84.61%

5. Discussion

Based on the finding from EWI in 2013, there were no ARV drugs stock outages at any ART sites which have ARV drug records and all ARV were stored in a good condition for all ART sites. Moreover, there was no use of expired ARV drugs for both adult and pediatric patients among sites where there were ARV drug records.

All pediatric and adult patients had started ARV based on the standard recommended first line regimen, except an adult patient who had started ARV on the second line regimen but this patient has used to take the second line ARV regimen from outside. The majority of adult and pediatric ART sites has the percentage of patients who were not lost to follow up above the WHO's recommended target of 80%. However, there were 6 adult and 1 pediatric sites which have the percentage of patients who were not lost to follow up below the WHO's recommended target.

The data also revealed that the majority of both adult and pediatric sites have the percentage of adult patients who were still on first line regimen at 12 months after ART initiation above the WHO's recommended target. However, there were 5 adult and 3 pediatric sites have the percentage of adult patients who were still on first line regimen at 12 months after ART initiation below the WHO's recommended target, which is lower than 80 percent.

Although the average percentage of patients who kept all appointment for both adult and pediatric patients were about the WHO recommended target, there were about half of adult and pediatric sites have the percentage of patients who kept all appointment below the WHO recommended target.

6. Recommendation

From the EWI 2013, the low appointment keeping remains one of the main problems at ART sites for both pediatric and adult AIDS patients. This issue should be further explored by using more robust scientific investigation and the findings could be used to develop health intervention programs to improve the appointment keeping at ART sites.

ARV drug management including, emergency request and expired drug should be minimized through the coordination between NCHADS, CMS and provincial health departments in order to speed up the ARV distribution.

In addition, the issues such as no ARV drug records, loss of patient records, incompleteness of the data, and no filling in the patient registered book should be solved immediately to ensure the completeness and quality of the data from ART sites and ultimately to make HIV drug resistance surveillance more feasible and productive.

Date: 25 November, 2013

Seen and approved

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