HIV Case Reporting In Cambodia

Monitoring The Elimination Of HIV

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Abstract

Cambodia is preparing a scale-up of the Continuum of Care for people living with HIV with the goal of eliminating new HIV infections by 2020. To measure if Cambodia is reaching its goal it is necessary to obtain high-quality strategic information. This case study looked into how HIV Case Reporting, as one component of strategic information, facilitates the monitoring of the epidemic. Doing so, it was the ambition to provide inspiration for countries with concentrated and low-level epidemics. The purpose of the study was to explore challenges and opportunities of using case reporting in HIV surveillance, and to analyze the linkages between case reporting and healthcare access. This was done by comparing the Cambodian reporting system with global recommendations. National reporting tools were reviewed and later supplemented by expert's inputs from workshops, published and un-published literature and questions addressed to key management personnel. It was concluded that Cambodian HIV case reporting largely implements globally recommended practices, however a major constraint is that individual-level data is not reported. This limits the utilization of data for monitoring purposes. Future developments should go hand in hand with stigma-reducing efforts as this could improve healthcare access, which is a prerequisite for valid case reporting.

Keywords*: HIV Case Reporting; Healthcare Access; Individual-level Information, Elimination of HIV, Confidentiality.*

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Preface

This work is the result of seven months in Cambodia. Of hard work and a lot of fun. Of ups and downs, doubts and confidence and everywhere in between. It is the result of an experience I could have not imagined, of which I would never have been without and which I surely will never forget.

During my four months internship with the HIV/AIDS-team at World Health Organization (WHO) Cambodia from July through October 2012 I followed the valuable work of WHO and the National Center for HIV/AIDS, Dermatology and STD (NCHADS) who daily do the heavy lifting of combatting HIV/AIDS in Cambodia.
While in the process of conceptualizing the future framework for elimination of new HIV infections in Cambodia by 2020, NCHADS initiated the work of documenting their HIV Case Reporting system in August 2012. In collaborations with colleagues at WHO I pursued this task, and as I had the opportunity to continue the work after my internship I was fortunate to get to follow it through to completion.

Consequently, in agreement with NCHADS, I was able to use the data and findings for my LUMID fieldwork purpose as well, and what was initially meant as a mere contribution to the work of NCHADS and WHO have now finally found its way into this thesis.

The opinions expressed in my thesis do not necessarily represent the opinions of NCHADS and WHO, although both organizations have contributed significantly to my research.

The photograph on the cover page shows a district health center in Kampong Chhnang province, and was taken by myself during fieldwork.

Acknowledgements

This thesis could not have been written without the help of many people's willingness to take part in my life and work. Not least all the amazing friends I have made along the way, and the colleagues I was fortunate to work alongside and learn from. My thanks go to everyone who has been in my life in the past year, but special thanks goes to:

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Sara Vinther Fredslund, Copenhagen, May 2013

Table Of Contents

Table Of Figures

Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral drugs.
CBPCS	Community Based Prevention Care And Support
B-CoPCT	Boosted Continuum of Prevention to Care And Treatment
B-LR	Boosted Linked Response
CoC	Continuum of Care
C/PITC	Community/Peer Initiated Testing and Counseling
DIC	Drop In Center
DMU	Data Management Unit (at NCHADS)
EID	Exposed Infant Diagnosis
EW	Entertainment Worker
FHI360	Family Health International 360
HBC	Home Based Care
HC	Health Center
HPITC	Health Provider-Initiated Testing and Counseling
HIV	Human Immunodeficiency Virus
HTC	HIV Testing and Counseling Services
INSTEDD	Innovative Support To Emergencies Diseases And Disaster
KHANA	Khmer HIV/AIDS NGO Alliance
LR	Linked Response
LTFU	Loss To Follow Up
MARPs	Most At Risk Populations
MDG	Millennium Development Goal
MMM	Mondul Mith Chouy Mith (Center for friends help friends)
MMT	Methadone Maintenance Treatment

MoH	Ministry of Health
MSF	Medecins Sans Frontieres (Doctors Without Borders)
MSM	Men who have Sex with Men
NCHADS	National Center of HIV/AIDS, Dermatology and STIDs
NGO	Non Governmental Organization
NSP	Needle and Syringe Program
OD	Operational District
OI	Opportunistic Infections
OGAC	Office Of The US Global AIDS Coordinator
PDMO	Provincial Data Management Officer
PEPFAR	The President's Emergency Plan For AIDS Relief
PHD	Provincial Health Department
PLHIV	People Living with HIV
PMTCT	Prevent Mother To Child Transmission
PSI	Population Service International
PW	Pregnant Women
PWID	People Who Inject Drugs
PWUD	People Who Use Drugs
RHAC	Reproductive Health Association Of Cambodia
SOP	Standard Operating Procedure
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
TasP	Treatment as Prevention
TB	Tuberculosis
TG	Transgender
UN	United Nations
USCDC	United States Center For Disease Control
VCCT	Voluntary Confidential Counseling and Testing
WHO	World Health Organization

1 Introduction

In June 2011 the United Nations (UN) member states committed to the 2011 Political Declaration, which amongst other targets sets out for the elimination of new cases of Human Immunodeficiency Virus (HIV), deaths related to the Acquired Immunodeficiency Syndrome (AIDS) and discrimination and stigma of people living with, or affected by, HIV/AIDS (UNAIDS 2011).

"What we need now is an accelerated response to get to that intersection where the number of people on treatment is rising faster than the number of new HIV infections, this way we can get to the beginning of the end of AIDS" (Irin 2012). This is how Miriam Were, former chairperson of Kenya's National AIDS Control Council, explains that to reach those new targets it is no longer enough to concentrate the efforts on increasing awareness and expand the numbers of testing and treatment facilities. It is equally important to find effective methods to retain patients in care and treatment and to ensure that all HIV cases are found.

But on top of that, it is necessary to document these efforts to know if they are effectively working or not, and to establish how they can continue to be optimized. Knowing the epidemic well, e.g. the geographical and demographical distribution of positive HIV cases and people at risk, is a prerequisite to plan an effective public health response. This requires a good surveillance system that can observe changes in spread, follow the evolution of the epidemic, track patients and define risk populations.

1.1 Research Problem

In accordance with the 2011 UN Declaration the Cambodian National Center for HIV/AIDS, Dermatology and STDs (NCHADS) has recently developed the "Conceptual Framework for the Elimination of New HIV infections in Cambodia by 2020" (NCHADS 2012b). The framework was developed as part of Cambodia's public health sector response towards reaching the three zeros (Zero new HIV infections, Zero AIDS related deaths, and Zero HIV/AIDS related Stigma and Discrimination) also known as Cambodia 3.0.

It is evident that when building new response strategies and in order to monitor progress towards these new targets high quality strategic information must be available[1]. In 2012, NCHADS initiated a review of the strategic information needs for Cambodia 3.0[2]. It stood clear that a more systematic look at Cambodia's passive HIV surveillance system[3], as one component of strategic information, was necessary to assess how case reporting specifically could contribute to guide and monitor the elimination of new HIV infections under Cambodia 3.0.

As will be argued later, HIV case reporting and access to health care services are closely tied together and interlinked with the ultimate goal of improving quality of health care and eliminating new HIV infections. Hence, Cambodia's HIV case reporting system will be analyzed in the framework of common principles on access to health care - which entails accessibility, availability, affordability and acceptability - and other influencing factors related to stigma and discrimination.

1.2 Aim And Research Questions

This research focuses on the importance of HIV case reporting. The purpose is to explore the challenges and opportunities that countries with concentrated and low-level HIV epidemics face in using HIV case reporting as a surveillance method, especially with regards to monitoring prevalence and incidence[4].

While using Cambodia as a case, the aim is to discuss a global challenge concerning continuous improvements of surveillance, especially seen in the light of ambitious targets that need precise monitoring and documentation. To do so, this thesis reviews how HIV Case Reporting is performed in Cambodia and discusses how it can be optimized to guide and monitor national HIV programs

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[1] Strategic Information here refers to, in accordance with NCHADS (2012b), information obtained through: 1) Surveillance Surveys And Studies; 2) HIV Case Reporting; 3) Routine Program Monitoring For Each Strategy; 4) Mathematical Modelling; and 5) Planning For Evaluation.

[2] The review is still in the process of finalization and will, among other things, incorporate findings and recommendations from a recent (i.e. May 2013) HIV health sector program review mission in Cambodia.

[3] Passive surveillance is the information obtained through clients that come to health services for treatment. This is opposed to active surveillance where cases are actively looked for. Routine Centralized HIV Case Reporting is a component of passive surveillance where all cases found in defined health facilities are systematically reported to a national centralized surveillance system (WHO 2013b).

[4] Prevalence measures the probability of **having** a disease and refers to *"/.../ the number of people suffering from a certain health condition over a specific time period"*, whereas incidence measures the probability of **getting** a disease and refers to *"/.../ the number of persons contracting a disease per 1000 population at risk, for a given period of time"* (Skolnik 2012:23-4).

towards eliminating new HIV infections. It is the ambition that this thesis will add to a global, or at least regional, inspiration for developments in HIV case reporting by providing knowledge on how it is practiced and used in Cambodia.

Research Questions

- How can passive HIV case reporting in Cambodia assist in the monitoring of the elimination of new HIV infections under Cambodia 3.0., and what are the challenges and opportunities in doing so?
- What role does HIV case reporting play in improving access to HIV health care services in Cambodia, and how does improved health care access enable HIV case reporting?

1.3 Key Concepts

This thesis will evolve around several key concepts, which are outlined in the following for a common understanding.

(Passive) HIV Case Reporting And The Staging System Classification

The WHO (2007b:11) defines that:

> *"HIV Case Reporting refers to the methods used to capture individual-level information on persons with HIV infections. This means that each person with HIV infections is reported using a single case report form containing information that pertains only to that person".*

Recognizing this, HIV is globally referred to as developing in four stages and HIV case reporting must capture data on patients who are in any of those clinical stages[5]: 1) Asymptomatic; 2) Mild Symptoms; 3) Advanced Symptoms; 4) Severe Symptoms (USCDC 2009).

[5] Note that adult and paediatric staging systems vary slightly, although the two have been increasingly harmonized over the years.

It is implicit in this thesis that HIV case reporting is passive. By *passive* is meant that the reporting of cases is a centralized and routinely performed practice, as opposed to *active* case finding which refers to the sentinel surveillance that actively surveys specific population groups[6].

Low-Level, Concentrated And Generalized HIV Epidemics

In order to streamline and define advisable surveillance needs of the world's HIV/AIDS epidemics, countries have been categorized as low-level, concentrated and generalized HIV epidemics (UNAIDS/WHO 2000).

- WHO (2007a:56-7) defines **low-level** epidemics as countries where *"HIV prevalence has not consistently exceeded 5% in any defined subpopulation"*, and where HIV is limited to groups with high-risk behavior.
- **Concentrated** epidemics are defined as countries where *"HIV has spread rapidly in a defined subpopulation, but is not well established in the general population",* and with a HIV prevalence *"/.../ consistently over 5% in at least one defined subpopulation"* (WHO 2007a:57).
- A **Generalized** epidemic is when *"HIV is firmly established in the general population"* and with a HIV prevalence *"/.../consistently over 1 % in pregnant women"* (WHO 2007a:58).

People Living with HIV (PLHIV)

The term PLHIV covers all stages of an HIV infections, also those that has deteriorated to a late stage of infection (i.e. AIDS). In this thesis PLHIV refer only to people actually infected with HIV, and does not – as used in some instances – cover for people who are affected by the infection in other ways, e.g. close relatives to PLHIV.

The term is furthermore commonly used to acknowledge that HIV is a disease that people live with, rather than something that defines the people who are affected, as could be the perception if saying 'HIV-infected people' instead.

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[6] See footnote 3 on page 10.

1.4 Disposition

The following chapter (chapter 2) will give an overview of the methods used in the research, including philosophical considerations and the assumptions that the thesis builds upon. Chapter 3 introduces a broad contextual perspective of the HIV/AIDS epidemic as well as the surveillance of it. It also provides background information on the characteristics of the HIV/AIDS epidemic in Cambodia, and how the public health sector has responded to it. The analytical framework from which the collected data is analyzed and understood is explained in chapter 4. It focuses on access to health care and the implications this has for HIV case reporting. Chapter 5 is a presentation of the data collected through primary and secondary data sources.
Finally, the information provided in chapter 3 to 5 is analyzed and discussed in chapter 6, which leads up to a concluding remark and recommendations for future considerations in chapter 7.

2 Method And Selection

This thesis is based on work conducted in collaboration between the World Health Organization (WHO) Cambodia and the NCHADS. The first steps were taking in August 2012, and over the course of five months, chunks of information was gathered and analyzed. This chapter will describe the methods used during those months in Phnom Penh, Cambodia, as well as the thoughts and considerations the author did while processing the information into becoming this thesis.

2.1 Philosophical Considerations And Assumptions

This research builds on the assumption that a comprehensive and functioning HIV case reporting system, where individual-level information is reported to national level, can provide a complete picture of the epidemic, and also replace other surveillance methods such as sentinel surveillance where only selected sources report cases on which estimates and projections are made.

While seeking to highlight the assumption above as well as find answers to the research question, methods for this research were based on applicability and feasibility in the given situations, and within the given timeframe. Prior to data collection, it was not considered whether the research was based on a deductive or inductive approach or whether qualitative versus quantitative data was preferred. Rather than paying too much attention to the choice of methods, focus was put on the

research topic. This pragmatic approach gave room and 'freedom' to apply a lot of different methods, quantitative and qualitative data, secondary data and so forth (Creswell 2007:23; Creswell 2009:8).

This research derives from realism; an epistemological understanding that although nothing can be understood and described in a truly objective manner, science can be portrayed through a set of observable structures where the researcher does not influence on reality simply by conceptualizing it (Bryman 2008:14-15). Meanwhile, the axiological assumption that researchers cannot avoid to bring in own values to their research is acknowledged (Cresswell 2007:18).

Realism, as described above, often correlates with objectivism; an ontological position that reality is external (Bryman 2008:22). However, the author personally leans towards a constructionism position believing that social structures influence reality. Although it was not possible to include the viewpoints of concerned individuals, i.e. people living with HIV (PLHIV) or health care providers, this thesis does discuss how social structures and conditions can influence HIV surveillance.

As mentioned, rather than focusing on which strategy or approach was applied, focus was put on providing the research flexibility through a pragmatic worldview. Nevertheless, as the research builds on a hypothesis, which is later tested against empirical data, one could argue that this research is based on a deductive approach. This is often associated with a quantitative study (whereas the inductive strategy is more often associated with the qualitative study). Meanwhile, it is often necessary to change between inductive and deductive strategies, as was done accordingly in this research process (Bryman 2008; Scheyvens & Storey 2003).

2.2 A Case Study Design

A case study methodology was chosen for this thesis, which can be categorized as having a non-experimental design (Bryman 2008). Although case studies are occasionally referred to as a strategy within which multiple methods can be applied (Stake 2005:443), it will in this research be referred to as a methodology that, although complex, have several advantages. One advantage is that case studies can include a wide range of data sources and can grasp both qualitative and quantitative data (Yin 2003), another is that there are different types of case studies which can be matched the size of the case(s) studied and the purpose of studying them. As such, this thesis is a single instrumental

case study variation where the *case* (Cambodia) is used to study a specific issue (HIV Case Reporting). Due to the (mainly) deductive nature of the research, a case study was found appropriate as it allows the use of several data collection methods (Creswell 2007:73-7).

Further, case study design fits especially well to research that seeks to explain something, e.g. research questions based on *how* and *why* questions as done in this thesis (Yin 2003:24).

2.2.1 Data Sources And Data Collection

While this thesis seeks to document the guidelines and methods under which HIV case reporting is conducted in Cambodia rather than exploring the experiences and perceptions of the people conducting it, the data collection largely relied on document reviews.

A large part of the data is thus secondary in the shape of official guidelines on case reporting and passive surveillance, Standard Operating Procedures (SOPs) for Cambodia, and workshop and conference presentations. To a smaller extent secondary data includes HIV program reviews, which have employed qualitative methods, e.g. semi-structured interviews. A full list of secondary data sources can be found in appendix 1 "List Of Secondary Data Sources". Throughout the data collection, information was supplemented during relevant meetings by inputs from a variety of experts in the organizations and institutions collaborating on the HIV continuum of care (CoC) in Cambodia. This refers both to inputs directly related to the surveillance as well as to inputs that gave a broader understanding of the context, background and work in the Cambodian and global HIV public health sphere. A full list of those organizations and institutions can be found in appendix 2: "Overview Of Contributing Organizations".

The primary data sources mainly consist of the recording and reporting tools currently used in Cambodia. All 48 forms, which were accessed through NCHADS, were first translated from Khmer into English[7]. Then they were thoroughly reviewed to get an understanding of the information

[7] The 48 forms include all the different forms used at site level to record data about attending clients as well as referral slips and the forms used to aggregate the information and report it to national level.

potentially obtained through case reporting, and from which sources it comes. A relevant selection of the reporting forms can be found in enclosure 1 "Reporting Forms" [8].

Other primary data sources include input from the relevant experts and key managers, who upon request have contributed with their knowledge. Towards the end of data collection, written questions were specifically addressed and submitted to five key persons in NCHADS and its data management unit (DMU) in December 2012. Please refer to enclosure 2 "Supplementing Questions" to see the questions.
Answers were provided in written format, and generally just one person addressed each question. This creates a certain bias, especially with regards to opinionated questions/answers. Also, as questions and answers were communicated per email it was not possible to immediately ask for more detailed answers or further elaborations. Yet, it was found appropriate to do the interviewing this way as per agreement with NCHADS. NCHADS' management had allowed the involvement of personnel whenever someone was thought to be able to fill in gaps in information. Formal and face-to-face interviews or the interruption of several of NCAHDS staff's busy schedules were not part of the agreement. By sending questions by email and allowing for just one person to answer each question, the work procedures of NCHADS were kept respected. Occasionally two different persons, who either confirmed each other's answers or supplemented it through further elaboration, would provide answers to the same questions.

The secondary data plays an important role in the analytical work of this thesis. While the primary data sources provide an understanding of how HIV reporting is performed in Cambodia, the secondary sources enable the comparison of current practices with those officially recommended on a global and national scale. The secondary sources also provide further understanding of achievements and challenges met so far in Cambodia. This way, some secondary sources also guided the ongoing data collection as it was early established that HIV case reporting evolves around several key events, which also guides the data presentation in chapter 5[9].

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8 Not all the available forms have been enclosed in this thesis. For the purpose of simplicity only the forms that are of most direct relevance for the data presentation and analysis in this research will be presented. When relevant the text will refer directly to the related form/enclosure.

9 Six key events was identified, being: 1) Define Reportable Events and Reporting Sources; 2) Case Reporting Methods; 3) Case Report Forms; 4) Monitoring Data Quality of HIV Case Reporting System; 5) Analysis, Interpretation and Dissemination of HIV Case Reporting Data; 6) Confidentiality and Ethical Issues.

2.2.2 Case Study Selection

Cambodia has long stood out as the good Asian example on how strong leadership and commitment can positively rub off on public health results and achievements (UN 2010). On a global basis, Cambodia was one of only eight countries to have reached the millennium development target of universal access to HIV treatment (UNAIDS 2012a:82). The government of Cambodia continues to be proactive, and have committed to ambitious goals of eliminating HIV/AIDS. As a low-income country, which has endured many years of war and broken infrastructure of all kinds, Cambodia appears to have managed well in reversing a fast-spreading epidemic. For these reasons, Cambodia is an interesting case from which to discover challenges that nations meet in developing a comprehensive HIV case reporting system, and the possibilities such a system can provide.

Moreover, the documentation of the HIV case reporting system is already of interest to the program managers and government officials who are working with, and for, HIV surveillance in Cambodia. This makes Cambodia a highly relevant case, as the country's authorities themselves took the initiatives from which this thesis commenced.

2.2.3 Representativeness

Case studies have a big role in evaluation research where the purpose can be to *"describe an intervention and the real-life context in which it occurred"* (Yin 2003:37). Similarly, Cambodia will be used as a case to describe the challenges that are met in the specific setting and with the specific conditions of Cambodia. This serves a purpose for actors working in the Cambodian HIV response to gain more specific knowledge about HIV case reporting in Cambodia, which has up until now not been documented.

The purpose of case studies is not to have the case representing, for instance, a whole population but rather to use the case to create knowledge and be theoretically generalizable. Likewise the case of Cambodia will not be fully representative for other countries, but it can serve as inspiration, and as exchange of knowledge and experience within and across countries (Yin 2003:33).

2.3 Ethical Considerations

Due to strict research criteria in Cambodia it was not possible to conduct interviews and observations in the field. For ethical purposes, all health related research that seeks to include human subjects has to be approved by the National Institute of Public Health Cambodia. Financial and time constraints caused the exclusion of such research application and consequently of interviews and participant observations[10].

However, as the research was initiated by the NCHADS it was possible to use inside knowledge of staff within the organization. Hence, written communication with relevant and available staff was used as an alternative data source. Individual consent was not taken for those interviews as it was per agreement with NCAHDS' management that information could be obtained directly from NCHADS staff when required by the author.

Names of persons contributing with inputs during meetings, or who answered directly to interview questions, will not be disclosed in this thesis.

2.4 Validity, Reliability And Limitations

Kvale (2007:10) describes qualitative interviews as a *"construction site for knowledge"*. In a perfect world this thesis would have included qualitative interviews, which entails participatory and engaging methods often used to understand the world of others. Had it been possible to do observations and informal interviews in health facilities, this could have added important dimensions to the results. Face to face interviews with government officials, health care providers and clients and/or participant observations of the day-to-day work in clinics could have provided deeper insight and a more in-depth analysis. The lacking of access to interviewees was mitigated by looking at academia and the recommended practices and by analyzing the tools that are used for reporting in Cambodia. Analyzing the system as a whole matched better the reality faced in terms of data access, and it was thus chosen to keep a broad perspective rather than seeking to obtain in-depth data of specific facilities, which could have jeopardized validity.

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[10] Processing time of a possible application was expected to be several months, on top of a fee of US$400.

Hence, this thesis examines Cambodia's HIV/AIDS passive case surveillance system and does not intend to analyze the functioning of the different health care clinics or other institutions involved in the reporting.

Relying on secondary data has the advantage that it is easier to make an objective analysis and, as a researcher, to distance oneself sufficiently from the study and the sources. Apart from contributing to answering the research questions, the secondary data used in this research have also provided an improved understanding of the context –as commonly practiced in research in developing countries (Scheyvens & Storey 2003).

Nevertheless, certain implications of relying mainly on secondary data must be taken into consideration, for instance that some data can be distorted or selective in order to present Cambodia as positively as possible (Scheyvens & Storey 2003:42).
Given that the sources used in this research only represent a management point of view, additional data sources could have been applied to obtain a broader perspective on the studied, e.g. provided by a broader spectrum of informants, had it been possible. It is assumed, however, that through a collaboration of several actors (government institutions, (International) non governmental organizations (NGOs) and several UN and other aid agencies) the data sources for this thesis provide a reliable set of information despite the fact that they do not represent all perspectives and levels in the system. Especially some of the international and local NGOs that provided inputs for this thesis have a closer relation to the health care providers and clients in the health care system, and were therefore able to give inputs based on the experiences and opinions they obtained directly from those groups.

Moreover, unpublished and raw material is used to a great extent, with which the author hopes to mitigate part of the risk of using untrustworthy or distorted secondary data that could limit the reliability.

With the available sources, the topic and the research questions are sufficiently investigated, and the thesis provides an overview of the challenges and opportunities in conducting HIV case reporting in Cambodia. As such, the integrity of the conclusions drawn from the researched is kept, which is what validity is concerned with (Bryman 2008:32).

Finally, the findings and conclusions in this thesis do not take into consideration the cost effectiveness of conducting HIV case reporting compared to other surveillance methods.

3 Context

This chapter will give an introduction to the relevant contexts. This includes HIV/AIDS in a global and national perspective as well the strategies for epidemic surveillance, which are necessary elements to understand for the upcoming analysis.

3.1 MDG 6: Combat HIV/AIDS, Malaria And Other Diseases

As the eight Millennium Development Goals (MDGs) were formulated in 2000, it stood clear that HIV/AIDS held a critical position in the fight against poverty. Thus, as part of MDG number 6, HIV/AIDS came to have its own two targets of respectively; 1) halting and reversing the spread of HIV/AIDS by 2015; and 2) achieving universal access to treatment by 2010. Some countries have been more successful than others in reaching those targets.

As a major actor in the MDG6 efforts, the WHO works specifically, among other things, with countries to strengthen health care systems in several ways – for example by expanding access to testing, care and treatment – and to improve surveillance systems as both a means and an end to this health system strengthening (WHO 2013c).

3.2 HIV/AIDS In Asia

Although each country face different situations, the HIV epidemics in Asia[11] are largely characterized by a low prevalence in the general populations and high prevalence in specific sub-population groups where the epidemic concentrates, thereof the term concentrated epidemics. Generally there are three main routes of HIV transmission in Asia; unprotected sex, injecting drug use and sex between men (Avert 2013a). Hence, the epidemics generally concentrate in specific

[11] Here 'Asia' refers to **South-East Asia**; Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar (Burma), Philippines, Singapore, Thailand, Vietnam; **East Asia**; China and Japan, and **South Asia**; Afghanistan, Bangladesh, India, Nepal and Pakistan.

groups defined as most at risk populations (MARPs) being sex workers, people who inject drugs (PWID) and men who have sex with men (MSM). As the activities conducted by people in these groups are many a times perceived as promiscuous, out of the ordinary or culturally unacceptable, stigma and discrimination arise. Since there is also great lack of knowledge in the communities on how the virus spreads, this re-enforces discrimination, and continuously puts people at higher risk of HIV/AIDS. Despite laws and policies, rights harassment and criminalization of MARPs persists and adds to the fact that, for instance, PWID refrain from using clean needles and sex workers avoid carrying condoms in fear of giving authorities a pretext for detaining them (Commission on AIDS in Asia 2008; UNAIDS 2012b).

Several countries in the region have made substantial progress towards the elimination of new HIV cases by focusing their strategies specifically on those key populations, and it now stands clear that a continuous effort on combining the access to care and treatment with the access to prevention methods is vital.

3.3 HIV/AIDS Surveillance

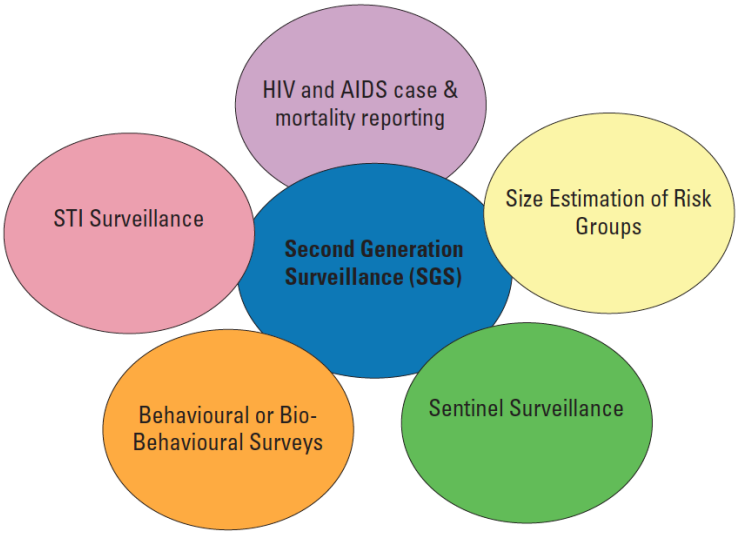
There are several methods to collect valuable data for HIV surveillance purposes. In Asia, one problem in the utilization of data is that the surveillance is fragmented both in terms of geography as well as the institutions that conduct the data collections. This means that valuable data is often not used to its fullest and trends analysis end up less precise than their potential (Commission on AIDS in Asia 2008).

If comprehensively and systematically reporting all four WHO-defined HIV clinical stages, it becomes possible to reflect the number of people in need of treatment and obtain a more complete picture of patterns in transmission. However, especially in developing countries, limited health care infrastructure makes this a continuous challenge, and HIV surveillance still heavily relies on second-generation surveillance in many countries (Sabin 2012).

Second-generation surveillance was introduced in 2000 with the purpose of defining appropriate ways of monitoring the HIV epidemic. Figure 1 illustrates the different components of second-generation surveillance. The epidemic state of each country then determines which components are

more appropriate to yield as much useful information through the strategic information methods applied (UNAIDS/WHO 2000).

Figure 1: Components Of HIV Second Generation Surveillance



Source: UNAIDS/WHO (2000)

In generalized epidemic countries, behavioral surveys in the general population are especially important in order to understand the modes of transmission, and sentinel surveillance in pregnant women (PW) are often used as indicators of prevalence.

The surveillance needs in concentrated and low-level epidemics are often similar to one another, where an increasing focus is put on high-risk populations. Case reporting appears to play a more substantial role in surveillance as prevalence drops and countries move towards low-level epidemics (UNAIDS/WHO 2000).

3.3.1 HIV Case Reporting And HIV Case Definitions

Since the outbreak of the global AIDS epidemic in 1981 case definitions and recommendations for the surveillance and reporting of it have changed.

Early in the epidemic many countries began reporting cases to monitor AIDS notifications and AIDS related deaths. As infected people quickly deteriorated to a terminal stage, early HIV-infections only made up a limited number of all reported cases (USCDC 2009). The monitoring of the epidemic therefore relied greatly on sentinel surveillance.

Up until 2004 there were only few HIV case definitions and there were no official guidelines on how to report HIV cases. As access to antiretroviral therapy (ART) increased and people lived longer with the disease, HIV case definitions were modified. In 2006 the WHO officially recommended HIV Case Reporting of all four clinical stages (Sabin 2012).

The HIV classification of a client will usually rely on a symptomatic clinical assessment, and on the decline in CD4 cells[12] as the infection progresses. For adults this means that a CD4 count below 200 complies with clinical stage 4 (i.e. AIDS). Although a person infected with HIV at clinical stage 1 does not have any significant symptoms, it is still important to detect and report primary infections.

3.4 HIV/AIDS In Cambodia

Cambodia was in the 1990's identified as having the worst epidemics in Asia with an adult prevalence of 2 % just seven years after the first case was detected in 1991 (UNAIDS 2006) - the same year as the signing of the 1991 Paris Peace Agreement[13].

Today, nearly 22 years later, Cambodia still carries vivid scars from many years of war. This shows, for instance, in the limited infrastructure, low sex ratio (93.5 % in 2004), high poverty rates ($^1/_3$ of the population living below national poverty line of US$0.61) and a large young population (below 20-year-olds represents over half of the population), which increasingly causes labor- and sexual exploitation and cross-border migration, often with increased HIV risk exposure as a result (UNIAP 2012; WFP 2013; UN 2012).

The government was early in the epidemic proactive and thus established NCHADS under the Ministry of Health (MoH) in 1998 (Wilkinson 2001:3). In response to the rapidly increasing prevalence, and after identifying the epidemic to be greatly influenced by commercial sex, a "100 %

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12 CD4 cell count expresses the functioning of one's immune system. When HIV can weaken the immune system it is because it 'eats' cells that normally fights disease. As the HIV infection progresses the CD4 count declines.

13 After years of negotiation, a transitional period in Cambodia began with the signing of the peace agreement by four political Cambodian parties and representatives from 18 other countries during the Paris Conference on Cambodia in October 1991. This, among other things, gave the UN a historically unique mandate to ensure the implementation of the settlement, including powers to conduct elections and other relevant administration on the country (USIP 2000).

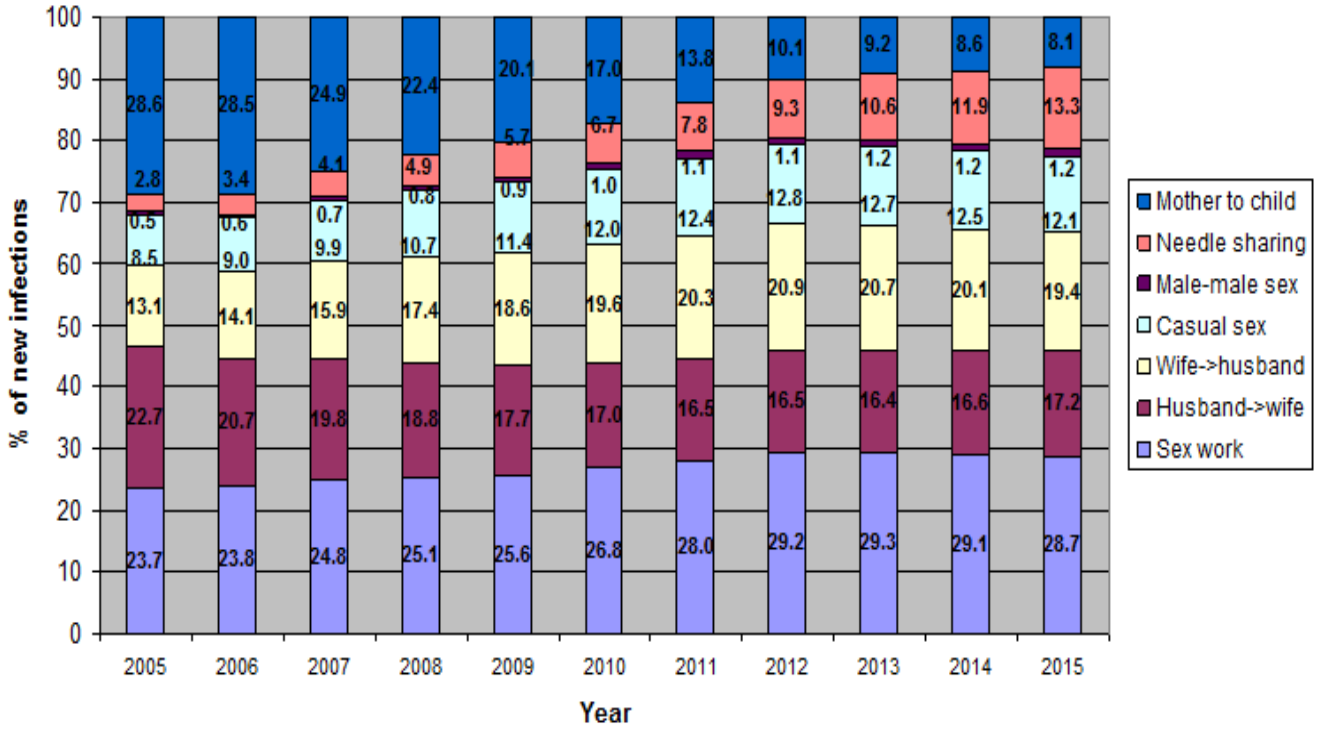
Condom Use Program (CUP)" campaign in brothels was announced in 1998[14] (TWG/OPC 2006). HIV prevalence in brothel-based female sex workers was in 1998 reported to be 45,8 % (ILO 2011:20). Subsequently to the campaign, HIV prevalence dropped just as rapidly as they had risen, and were in 2005 down to 0,6 % in the general population (MoH 2008:19) and to 12,7 % among brothel-based female sex workers (ILO 2011:20)[15].
Prevalence was estimated to be 0.7 % in the general adult population in 2010 (WHO/MoH 2012:2).

Since then, Cambodia has many a times been put forward as the good Asian example, as well as global, in the fight against HIV/AIDS as the country has been one of the few to reverse the epidemic and reach universal access to treatment for those in need (UN 2010).

The change of patterns in transmission is shown in figure 2, which also includes projections of future trends. This shows that needle sharing, sex work and sex between men accounts for a proportionately larger amount of new cases whereas husband-to-wife and mother-to-child transmission, accounts for fewer new cases.

[14] The campaign was first launched in Sihanoukville Province and in 2001 adopted on a national level.
[15] This, however, was due to not only the successful behavioural change programs, but also to the high mortality rate of PLHIV before ART was introduced.

Figure 2: Modes Of HIV Transmission In Cambodia 2005-2015



Source: NCHADS/WHO 2013

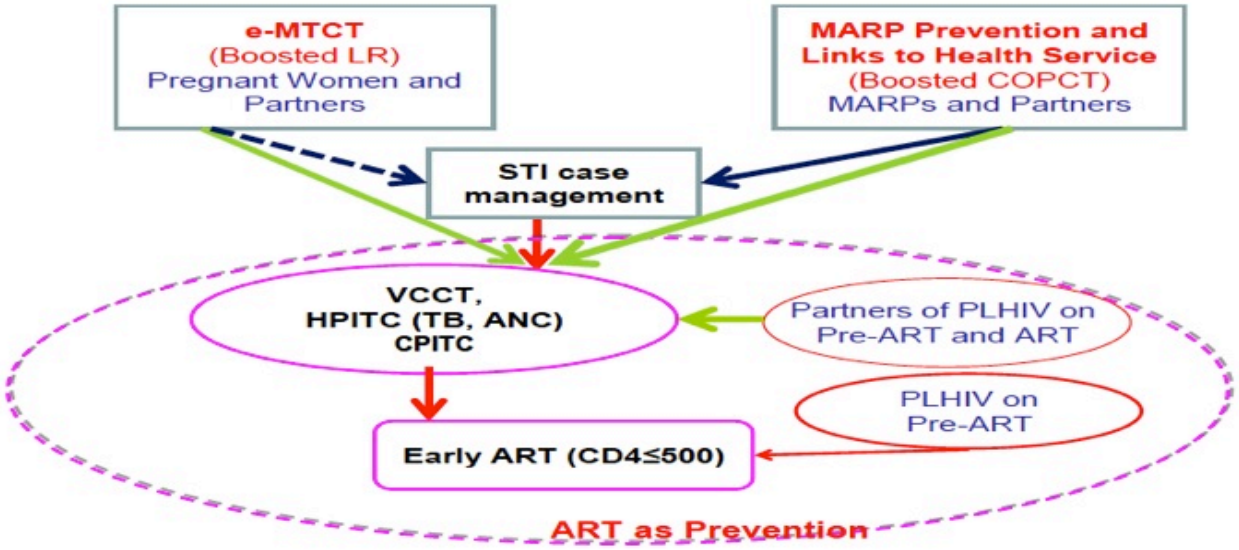
Having gone from what could be defined as a general epidemic to what is now recognized as a concentrated one has presented a range of new challenges. As incidence decreases it will take up more effort and require more resources for each new case of HIV to be reached and detected. There is an increasing need for those efforts to be well targeted to reach the right risk populations in the right geographical areas. Consequently, NCAHDS is scaling up its efforts in line with Cambodia's commitment to work towards reaching the three zeros.

The "Conceptual Framework for Elimination of New HIV infections in Cambodia by 2020" as part of Cambodia 3.0 was recently developed (NCHADS 2012b). A boost of the overall CoC for PLHIV is the corner stone in this future strategy. The Boosted-CoC comprises three key components: Boosted Continuum of Prevention to Care and Treatment (B-CoPCT); Boosted Linked Response (B-LR) and Treatment as Prevention (TasP) which together aim for an acceleration of HIV case

detection in MARPs, PW, partners of PLHIV in care and the immediate initiation of ART for prevention purposes.

The three strategic components are illustrated in figure 3 below:

Figure 3: Strategic Directions For The Elimination Of New HIV Infections In Cambodia



Source: NCHADS 2012b:11

3.4.1 HIV/AIDS Surveillance In Cambodia

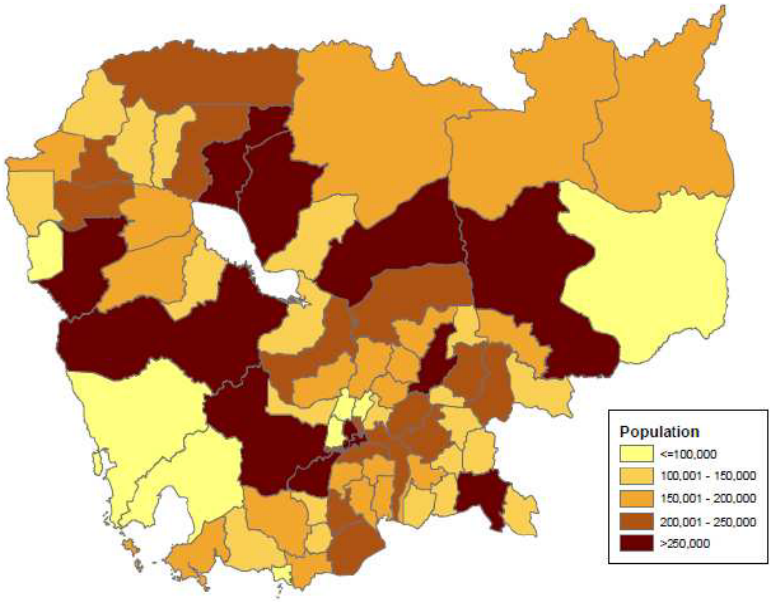
Cambodia has since the late 1990's put intensive effort into producing HIV estimates and projections, using up to date modeling software and continuously collaborating with various international organizations to receive the technical assistance required to initiate and sustain a HIV surveillance system. Over time, the surveillance system has integrated a large range of strategic information and different data sources whenever available. These have included HIV

seroprevalence surveys, behavioral surveillance surveys, sexually transmitted diseases surveillance surveys as well as the passive surveillance system consisting of centralized routine case reporting. In short; a comprehensive set of second-generation surveillance components - as presented in figure 1.

Cambodia has, with its poor infrastructure, had considerable problems in their passive surveillance system in terms of low case reporting rates and high duplication risks. The last passive surveillance report on HIV/AIDS was published in 2005, although case reporting has continued to be conducted and developed (Ullett et.al 2012).

Cambodia's health system infrastructure is based on a network of health centers (HC) and referral hospitals. There are 942 HC, which covers for the minimum of primary health care. 210 of those HCs offer services for tuberculosis (TB) clients and clients with sexually transmitted infections (STI), and antenatal care (ANC) for PW. The 69 referral hospitals cover complementary health care services.
Operational Districts (ODs) are defined by geography, economics and public health consideration and most provinces cover several ODs. Accordingly, HCs and referral hospitals are spread out over all of the 76 ODs and 24 provinces (WHO/MoH 2012; NCHADS 2012a).

Figure 4: Population Of Cambodia Per Operational District (OD), 2010



Source: NCHADS/WHO 2013:19

Cambodia has a population of 14.3 million people. Figure 4 shows the distribution of people according to ODs in Cambodia.

It is estimated that there are 15,766 MSM and 37,942 entertainment workers (EW[16]) in Cambodia. PWID was recently estimated to be 2000 on a national scale. Mapping of MARPs in Cambodia is still incomplete and the reliability of the figures is unclear, especially for MSM. This for instance shows by the low MSM size estimation of 0.4 % of males aged 15-49 compared to an international average of 2-3 % (NCHADS/WHO 2013:21). The (incomplete) mapping of MSM and EW is presented according to provinces in respectively figure 5 and 6 below[17].

Figure 5: # MSM Mapped per 1000 population

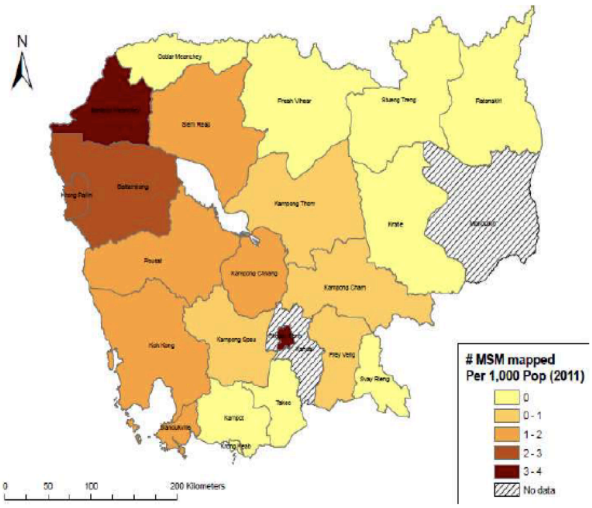
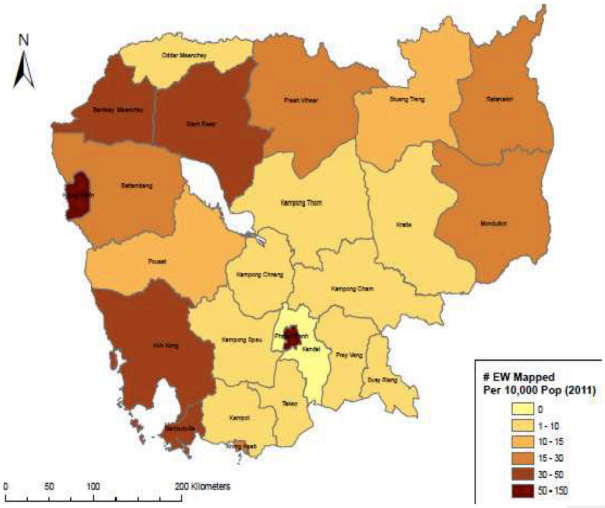


Figure 6: # EW Mapped per 10,000 population



Source: NCHADS/WHO 2013:21

[16] An Anti-trafficking law introduced in Cambodia in 2008 caused major breakdowns on brothels and sweeping of the streets, criminalizing prostitution and forcing sex workers to find work elsewhere. Consequently the definition of risk populations changed as commercial sex moved into the broader entertainment business. Sex work has been increasingly hidden and now mainly takes place in massage parlous, beer gardens, casinos and karaoke bars. Hence, the term entertainment workers (EW) was introduced and is today commonly used in Cambodia to emphasize the blurriness of a sector where entertainment work is often, but not always, closely related to sex work (NCHADS 2012b: 11; HRW 2010).

[17] As seen, especially for MSM, there is a lot of missing data (grey areas). Although light yellow areas represent provinces with zero MSM/EW, it is reasonably assumed that these figures were provided wrongly and that '0' represents provinces where mapping was never performed.

4 Analytical Framework

In order to later analyze the connection between health care access and HIV case reporting, and how this can assist in the monitoring of the elimination of new HIV cases, this chapter will describe the construction of an analytical framework from which access to health care is theoretically understood to influence on, and be influenced by, HIV case reporting. Furthermore, components of important health determinants (i.e. poverty, education and social environments), and their connection to health care access, will be drawn in as well. Appendix 3 "Brainstorming Exercise" shows a model produced by the author while in the process of formulating the analytical framework. It can serve as a further understanding of the line of thought during brainstorming and composition of this chapter.

4.1 Why Access?

So, why is it important to discuss access to health care when talking about HIV case reporting? Because access to health care and the utilization of the health care services by the clients are prerequisites for reporting HIV cases.

Evidently, the reason that HIV case reporting is interesting is because it is a tool through which the quality of the services where clients go for testing and treatment can be improved. Meanwhile, without good access to testing and treatment there are no conditions for performing HIV case reporting with the purpose of monitoring the epidemic. Hence, this framework builds on the claim that if people have access to, and use, the health care services then the conditions are in place for HIV case reporting to provide a comprehensive picture of the HIV epidemic (Seguy 2012). The benefit of this is an expanded knowledge of trends in the epidemic, which can be used to improve program planning, e.g. plan the geographical distribution of health service facilities, organize stigma reducing campaigns, consolidate necessary staff training sessions, adjust budgets, funding and prices and so forth. In the long run these improvements in health care service planning could contribute to the elimination of new HIV cases, and the monitoring of it.

4.2 What Is Access?

When talking about access it is critical to emphasize that access is not solely a matter of quantity of health care facilities and their location. Although important as well, access entails many more essential elements than the numbers of facilities, and there are equally many factors that influence access.

Generally four factors should be considered when studying access to health care. They are factors from which people make up their choices, and health care itself is not adequate if it is not based on quality or if people feel marginalized seeking health care. Accordingly, access to health care will in this research refer to, and include, the following four elements (Skolnik 2012; Jacobs et.al 2011):

Geographical Accessibility: *"Distance or travel time"* between home and health care services, i.e. the extent to which a healthcare facility and/or service is geographically within reach (Skolnik 2012:52). Geographical accessibility considers spatial factors such as poor infrastructure, the lack of health care facilities as well as indirect costs for transportation for the patient to reach the facility/service.

Availability: *"The extent to which needed services are offered in a convenient manner, by staff that are properly trained to deliver them"* (Skolnik 2012:52). This form of availability entails waiting time and the information provided on the choices of health care.

Affordability: *"The extent to which people are able or willing to pay for services and not fall into financial distress by doing so"* (Skolnik 2012:52). Financial accessibility entails the direct costs such as expenses on medication and check-ups as well as opportunity costs due to decline in productivity, hence earnings. This can potentially force individuals and families into poverty.

Acceptability: *"The extent to which services are in line with local cultural norms and expectations"* (Skolnik 2012:52). Acceptability of services entails health care providers' attitudes and expectation, and general health awareness. Quality-related factors that entail the numbers of health care personnel and the overall quality of their qualifications, the clinic environment and facilities should be considered too, as well as the cultural norms that prevent people from seeking health care (e.g. because of stigmatization and discrimination).

All four elements can be negatively or positively influenced depending on the conditions that people live under.
It is evident that poverty has negative health implications. People with lower earnings, which are often people living in rural areas, tend to have poorer access to health care services and less knowledge about healthy lifestyles (Skolnik 2012). Besides limiting people's access to health care services and health information, poverty is also both a cause and an outcome of HIV/AIDS. Poverty sometimes forces people to partake in risky behavior, e.g. selling sex for survival or engaging in other risky behaviors such as injecting drugs as a coping mechanism (Pascoe & Smart Richman 2009). Further, people forced into risky behaviors by poverty often have poor conditions for protecting themselves against contracting HIV (ILO/AIDS 2005; ICAD 2001).

As well as poverty, the social environment that people find themselves in will influence on their health. This entails the support people find in family and friends, as well as cultural beliefs in the surrounding community (WHO 2013a). Depending on the culture in the country, as well as the person's own perception, PLHIV face minor or greater risks of being stigmatized and discriminated by family, friends and society as a whole, including health care providers in clinics. Women and marginalized populations, including MARPs, often carry an even greater burden of being discriminated (UNAIDS 2007).

Discrimination can have negative impacts on health in several forms. Discriminated people are often marginalized groups who consequently lack access to adequate information about healthy life practices and about health care services. Furthermore, perceived discrimination have proven to lead to unhealthy behaviors (Pascoe & Smart Richman 2009).
Discrimination by health workers and by the general society effects health care utilization negatively, and it is evident that PLHIV are in particular risk of being discriminated by healthcare providers (Blanchard 2006; aidsmap 2013). Negative social environments and discrimination limits people's access to health care and their possibility to obtain healthy lives, and that create continuously vulnerable life conditions for the people affected (Sepulveda 2009).

Education has often been identified as the most important social determinant of health. This is related to the fact that literate and educated people are better prepared to obtain quality information about healthy life skills and health care services and facilities, besides the increased opportunity for

employment and higher earning that education provides (Low et.al 2005). This, in turn, expands people's financial resources to invest in health care, and increases control over one's own life (Skolnik 2012).

Education also has great impacts on poverty reduction and sustainable economic growth, as well as being the foundation of income increases and healthier lives (Cypher & Dietz 2008; Moe 2008; Suri et.al 2011). As education is also a medium for knowledge about how to lead a healthy life, it has significant short-term effects on health (Skolnik 2012:18-9). Improved personal health can have impacts on societal level in the form of increased productivity, outputs and capacity to reinvest in education and health, emphasizing the interlink with poverty as another health determinant and the implications that all the three mentioned determinants can have on health care access (Skolnik 2012; Tilak 2002; UNDP 2010).

4.3 The Importance Of Confidentiality

For HIV case reporting to really stand out and be useful for accurate monitoring, the reported information must be individual-level information. One way of optimizing the quality of health care services (closely linked to the availability and acceptability aspects outlined above) is by making information on the clients accessible to all staff involved in the client's caretaking. This usually requires the transporting, linking and sharing of health data across facilities. To do so, the identification of unique individuals is a prerequisite (Hutton 2012a).

When information is shared among several people and clinics, security and confidentiality becomes increasingly important if not to jeopardize those aspects of access that relates to acceptability (e.g. if clients refrain from seeking health care because they feel that confidentiality of their personal information is not respected – information that can put them in danger of stigmatization and discrimination in their community). Therefor, it is necessary to develop a system where people feel that their privacy is being protected while at the same time receiving the optimal care.

Hutton (2012b) points out that the most secure data systems are also the most useless. For the information to be useful the aim must be to strike a balance as visualized with the tilt below in figure 7.

Figure 7: Striking A Balance

Source: Hutton 2012b

The techniques and methods on how to uniquely identify people are beyond the scope of this thesis. However, this analytical framework is partly built upon the idea that linking individual-level data can have positive effects on the quality of case reporting, the access to healthcare, and in turn the monitoring of the elimination of new HIV cases.

5 Presentation Of Data

When exploring global recommendations for HIV case reporting, six key items were identified as recurring important elements of a functional reporting system. To organize both the collection and the presentation of data, this chapter will follow those six items, being:

1. Define Reportable Events and Reporting Sources
2. Case Reporting Methods
3. Case Report Forms
4. Monitoring Data Quality of HIV Case Reporting System
    a. Completeness
    b. Timeliness
    c. Validity
5. Analysis, Interpretation and Dissemination of HIV Case Reporting Data

6. Confidentiality and Ethical Issues

This chapter also includes presentations of the recommended practices for each of those six items as that has been a substantial part of the data collection and an important element in reviewing how Cambodia's HIV Case Reporting System respond to these recommendation.

It was chosen not to refer to sources specifically in this chapter, but instead the reader is suggested to have a look at appendix 1: "List Of Secondary Data Sources", appendix 2: "Overview Of Contributing Organizations", enclosure 1: "Reporting Forms" and enclosure 2: "Supplementing Questions", where the data sources are presented in more detail. The following is a presentation of the information gathered from all of those sources.

5.1 Events Reported And Reporting Sources

Diagnosing people infected with HIV as early as possible and linking them to care and treatment, as well as linking people tested negative to preventive services, are crucial steps in halting transmission.

To obtain a more complete picture of the HIV epidemic, the WHO recommends that countries aim to design their surveillance practices to report all HIV infection cases and it is important to define who must do the reporting as well. A HIV case should be reported when:

1. A person is newly diagnosed with HIV infection, regardless of clinical status.
2. A person previously diagnosed and reported with HIV deteriorates to advanced HIV infection.
3. A person infected with HIV dies.

In Cambodia information on those three events is recorded in testing and treatment site. Aggregated information is reported to national level by the following indicators:

- HIV positive tests
- HIV negative tests
- HIV Intermediate tests
- Patients newly enrolled in pre-ART/opportunistic infection (OI) care
- Active patients in pre-ART/OI care
- Patients newly enrolled in ART care

- Active patients in ART care
- Patients who transferred in/out of pre-ART/ART
- Loss to follow up (LTFU[18])
- Patients enrolled in care who died
- HIV exposed children

The above information should be reported to DMU on a quarterly basis from all 24 provinces. Data sources for those reports are:

- Voluntary Confidential Counseling and Testing (VCCT) sites (enclosure 1a)
- Pre-ART/OI sites (enclosure 1b)
- ART sites (enclosure 1c)
- Exposed Infant Diagnose (EID) (enclosure 1d)
- Linked Response (LR) / Preventing Mother To Child Transmission (PMTCT) programs[19] (enclosure 1e)
- Home Based Care (HBC) teams (enclosure 1f)

The following sub-sections will provide an overview of reporting sources for the three key events identified and listed on page 34.

5.1.1 Reporting Sources For New HIV Infections

Newly diagnosed HIV cases are commonly captured through VCCT, community-peer initiated testing and counseling (C/PITC) and PMTCT programs.

In addition to HIV Testing and Counseling services (HTC) it is important to define other reporting sources. Some HIV infections may be detected in settings such as emergency wards, private health facilities and blood banks.

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[18] LTFU is defined as 'not seen in clinic for 3 months or more' in ART, and as 'not seen in clinic for 6 months or more' in pre-ART/OI.

[19] PMTCT refers to the efforts made specifically in antenatal care and delivery care services in order to prevent mothers with an HIV infection from transmitting the infection to their babies, whereas the LR refer to a an approach that was adopted to integrate HIV and reproductive health services. The LR approach was piloted in Cambodia from 2008 to 2009 and was considered positive in terms of PMTCT. The two terms are often used in relation to one another. For more information, see White et.al. 2013.

In concentrated epidemic countries, like Cambodia, HTC via health provider initiated testing and counseling (HPITC) can focus specifically on facilities that attract high risk groups for HIV such as services for TB, STI, ANC for PMTCT, and specific services for MARPs.
Community based approaches could favorably include home visits to known or suspected HIV cases targeting household members of PLHIV, outreach services and HTC in closed settings such as prisons. Couples testing HTC is another possible approach.

Because HTC holds a substantive role in HIV Case Reporting, as this is the main entry point for care and treatment, the different testing points found in Cambodia will be further elaborated upon in the following five sub-sections, and summarized in table 1 on page 40. A total of 374,631 clients were tested for HIV in Cambodia in 2011[20].

5.1.1.1 Voluntary Confidential Counseling and Testing (VCCT)

HIV Testing for diagnostic purposes is conducted at all national and some referral hospitals at provincial level. In 1995 the first testing center was established at the Pasteur Institute of Cambodia. There are now 255 VCCT sites in Cambodia, spread out over the country's 24 provinces. Of these sites 226 are supported directly by the government and 29 by NGOs.

Most VCCTs are set up within the public hospitals. In case of patients tested HIV positive in VCCT, health care providers shall refer the patient to other suitable services: OI including TB, ANC, STI, HBC and/or ART depending on the HIV clinical staging[21].

Self-referred clients and clients from ANC services are the most common type, although the VCCT also caters to STI, TB, MARPs outreach and HBC referrals.
In cases where blood banks detect a HIV case, the client is encouraged to seek testing confirmation at VCCT from where it will be reported. Blood Banks only report to DMU upon request.

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[20] This number represents tests given. As will be discussed later, it is challenging to know how many individuals are actually tested.
[21] At VCCT clinical staging is determined based on symptoms/OIs only, not CD4.

5.1.1.2 Health Provider-initiated testing and counseling (HPITC):

In 2006 Cambodia launched HPITC: An approach where healthcare providers recommend HIV testing to all clients of a target population (TB, STI, ANC attendees, HIV exposed infants in PMTCT programs and patients in infectious disease wards).

In 2011 there were a total of 210 HCs in 21 provinces providing STI services. There were 61 Family Health Clinics (32 specialized government STI clinics covering 21 provinces, and 29 NGO STI clinics). Family Health/STI Clinics often caters to high-risk populations, but do not systematically offer HTC to their clients[22]. In 2011 a total of 240,420 consultations were provided at specialized STI clinics.

TB patients and PW attending TB- and ANC services at HC are routinely offered HIV testing in all ODs. More than 80 % of HCs offer HIV tests.
When appropriate and/or necessary (e.g. if the facility does not house laboratory) HCs can offer pre- and post test counseling and draw blood samples from the patient and send it to the nearest VCCT laboratory, also known as VCCT satellite.

In 2011, roughly 79 % of estimated number of people with TB and 77 % of estimated PW were tested for HIV in Cambodia.

The HBC teams are an important link between the testing- and treatment sites and the communities. HBC teams identify and refer clients suspected to have - or be at risk of - HIV. Through awareness raising, psychosocial support and support for transportation costs, HBC encourage adherence to treatment. HBC supported 32,080 PLHIV in 2011.

As for children and adolescents in Cambodia there are several possible HTC entry points. These include PMTCT services and referrals to VCCT by HBC teams, Mondul Mith Chouy Mith / Center

[22] Family Health Clinics refer to a total of 61 *specialized* STI clinics on national level. Of these 32 are run by government run and are equipped with own laboratories. The remaining 29 are run by NGOs. The much more numerous Health Centers, however, also caters to STI clients on a more symptomatic basis, and can provide referrals when necessary.

For Friends Help Friends (MMM[23]), pediatric wards and child follow-up and immunization services.
Children, however, are only systematically offered HIV testing if they are born after their mother is diagnosed with HIV.

5.1.1.3 Community/Peer Initiated Testing and Counseling (C/PITC)

The C/PITC approach seeks to address the low uptake of HIV testing services among MARPs and includes outreach- and peer networks for MARP. The project was introduced after it was identified that no drastic improvements was happening in the HIV services for EWs and MSM in particular despite the 2009 SOP for COPCT for women entertainment workers. The SOP had set forward the consistency required in preventive measures and the linkages between support groups and health services.

Peer networks for EWs and MSM educate and mobilize their members to improve the demand for HIV testing and counseling and to attend meetings at the Drop in Centers (DIC). DICs are used as MARP-friendly venues for outreach HTC provision by HC staff [24].

C/PITC also provide rapid testing in entertainment venues/hot spots/DICs, and give the result to the EW/MSM immediately[25]. Such services are provided by Population Service International (PSI), Family Health International (FHI360) and the Khmer HIV/AIDS NGO Alliance (KHANA) who use government employed health care providers on outreach, and the Reproductive Health Association of Cambodia (RHAC) who uses own NGO employed health care providers.

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[23] MMM was implemented in 2006 as an essential element in the CoC for PLHIV as a means to involve PLHIV in care and treatment services. MMM meetings were organized monthly in several ODs with an average of 200 participants and apart from the social support and its stigma reducing efforts, it contributed with community and client education on topics such as healthy lifestyles and the importance of treatment adherence (Vun 2006). The MMM activities was not functioning for the whole of 2012 and in some ODs for even longer.

[24] VCCT health providers provide tests and counselling in DICs for those who voluntarily accept the service.

[25] Rapid tests are tests that do not require the normal laboratory analysis, nor highly trained personnel to perform it. The result, which should be followed up by a confirmatory test, can be produced in 20 minutes and can therefor be a good tool to reach vulnerable groups who find it challenging to seek testing themselves (Avert 2013b).

Some special EW and MSM friendly clinics[26] have been set up by FHI360. These depend on NGO funding.

Less than 1 % of EW and MSM/transgender (TG) who was mobilized by C/PITC in 2011, tested HIV positive. Furthermore, only 5 % of estimated EW and 7 % of estimated MSM/TG were mobilized to get testing in VCCT through C/PITC.
As of March 2011 there were no existing peer networks for people who use drugs (PWUD) and PWID. Since then, FHI 360, Korsang and KHANA have applied an outreach approach for these groups including peer support, and a few more NGOs[27] refer PWUD/PWID to VCCTs as well.
Services for PWID include primary health care, condom distributions, Information Education and Communication Materials, Methadone Maintenance Therapy (MMT), clean Needle and Syringe distribution programs (NSP), referral to VCCTs as well as fixed and mobile DICs, mainly located on the capital Phnom Penh.

5.1.1.4 Closed settings

The General Department of Prison under the Ministry of Interior reports HIV cases to DMU on a quarterly basis. HTC is conducted at nearby HTC sites under the MoH. For two large prisons in Phnom Penh, HTC is conducted and supported by Medecins Sans Frontieres (MSF) and FHI360.

Onsite HTC through the C/PITC approach was recommended in the SOP for closed settings (January 2012). This has not yet been implemented, but efforts are being intensified to expand TB and HIV services in prisons.

5.1.1.5 Couples/Partner testing

There are no official guidelines or system to trace partners and couples living with HIV in Cambodia, nor a clear system to monitor partner tracing for the time being.

[26] Chouk Sar 1 and 2 respectively, both situated in Phnom Penh.
[27] Apart from FHI 360 partners, Korsang and KHANA, Mith samlanh / Friends International (kalian mith) and Friends International partners also refer clients to VCCTs.

It appears that thanks to stigma-reducing initiatives it is common sense for health care providers to encourage their clients to bring their partner in for testing, and that most clients take up on this invitation.

Some EWs mobilized through the C/PITC program bring their partners for testing.

Table 1: Application Of HIV Testing And Counseling Modes In Cambodia[28]

Service and/or Facility	Recommended	Cambodia		
		Guidance / SOP	**Geographical Availability**	**Coverage**
VCCT	Located to serve key populations	All VCCT must report # of new HIV cases to DMU every quarter.	255 VCCT sites nationally. Available in all provinces and ODs.	374,631 clients were tested in VCCT in 2011
ANC and EID	Cost-effectiveness needs assessment	HPITC provided for PW and partners/spouse.	PW attending ANC services are routinely offered HIV testing in all ODs. More than 80 % of HCs offer HIV tests.	In 2011 77 % of PW were tested for HIV. 47 % of exposed infants born at PMTCT sites were provided DNA-PCR1 test before 2 months. Another 29 % received the test after 2 months of age[29]. Children only systematically offered testing if born *after* mother is diagnosed with HIV.
TB	HPITC	TB clients attending TB- services are routinely offered HIV test in all ODs.	More than 80 % of HCs offer HIV tests.	In 2011 79 % of TB clients were tested for HIV.
STI[30]	HPITC	STI and Family Health clinics do not routinely offer HTC to patients but	In 2011 210 HCs in 71 ODs and 21 provinces provided STI services. 61 Family Health Clinics offers	Of the 5958 men and 41,375 women consulted for STI in HC in 2011, 77% men and 95% women were reported

[28] The frame for this table is taken from WHO 2012 Framework for HIV Testing (*"Service Delivery Approaches to HIV Testing and Counselling (HTC): A Strategic HTC Programme Framework"*), and adjusted to specifically summarize guidelines of procedures, geographical availability and coverage of the different services in Cambodia. The recommendations set forward in the figure derives from the same document.

[29] The DNA-PCR1 test is based on tracing genetic materials of HIV rather than the commonly used antibody test. The number 1 refers to it being the first of (potentially) several tests. PCR (Polymerase Chain Reaction) is especially used with newborns with HIV positive mothers in order to have as correct results as possible as babies can carry their mother's HIV antibodies for up to 18 months. Preferably the test should be performed three times within 6 months of age of which at least two should be positive/negative to confirm the HIV status of the baby (Avert 2013b, AIDSinfo 2012).

[30] STI in a broader sense is included because of its importance and relation to HIV/AIDS. Apart from telling us something about risk exposure in the form of unprotected sex, frequent breakouts of STIs can be an indicator of a weakened immune system (i.e. HIV), as well as STIs that causes ulcers or open sores (e.g. herpes) increase the risk of HIV transmission (Sheth & Thorndycraft 2009).

		can provide referrals for VCCT.	specialized STI care.	to have symptoms of sexually transmitted and other reproductive tract infections. In the 61 specialized STI clinics a total of 240,420 consultations were provided in 2011.
Outreach & DIC	Located to serve key populations and high prevalence geographic areas.	C/PITC encourage EW and MSM/TG to seek VCCT and can provide rapid testing on site. NGOs have applied an outreach approach to reach PWUD/PWIDs including peer support and referrals to VCCTs and CPITC. DICs are used as MARP friendly venues for outreach VCCT workers providing same day/rapid tests and referrals to C/PICT.	NGOs have implemented outreach services for MSM/TG in 20 provinces. Six provinces have DIC for MSM/TG. For PWID there are four fixed DICs and 1 mobile DIC (all five run by NGOs) Some outreach for PWID also includes NSP. Two EW and MSM/TG friendly clinics were set up by FHI360 in Phnom Penh to provide HIV testing, care and treatment.	In 2011 C/PITC mobilized 1,967 EW and 1,153 MSM/TG to access VCCT, i.e. only a fraction of the estimated numbers of these population groups. Respectively 14 and 4 were found HIV positive. No figures on the amount of DICs were found, nor on HIV testing of PWID.
MMT & NSP	PITC	PWID/PWUD are referred to VCCTs through NGOs/CPITC, NSP and MMT clinics.	Cambodia has one MMT clinic, located in Phnom Penh. This clinic also manages NSP. Additionally there are three NGOs running NSPs [31] . Some programs are mobile, other in clinics.	In 2011 152 clients enrolled in MMT. In 2012 the number of enrolled clients in MMT increased to 262. There is currently no data on how many clients were referred to VCCT through MMT and NSP.
HBC	To households of those known or suspected to have HIV or TB	Provide referrals to VCCT.	881 HBC teams covered 72 ODs in 19 Provinces in 2011.	In 2011 the HBC teams supported 32,080 PLHIV, all of whom are registered in OI/ART. 5 % of VCCTs clients were referred by HBC.
Prisons	HPITC in prisons and other closed institutions	Prisoner's access to HTC depends on capacity of the given prison.	No prison provides HTC inside the prison. HTC is conducted at nearby sites.	No figures on number of prisoners tested.
Couples/ Partner of PLHIV	Couples HTC for partners of those testing HIV-positive	Offered to partners of PW who attend ANC *and* test HIV positive.	No data on the offering of partner testing outside ANC.	No Data

[31] Mith Samlanh operates one mobile NSP. The other two NSP are run by the DICs of Friends International and KHANA. NSPs are also conducted through outreach teams of Friends International and KHANA.

5.1.2 Reporting Sources For Advanced HIV Infections

Progression of previously diagnosed cases to advanced stage of the HIV infection is commonly captured in pre-ART and ART. Data on persons previously reported with HIV can be used to update the case records if recorded regularly, and if the system is based on individual-level information.

To provide the best ground for monitoring epidemic trends, a patient's first CD4 count should preferably be available within three months of diagnosis. The CD4 count can also work as an indicator for caseloads in care and treatment sites and for setting up services accordingly as well as an indicator for the feasibility of TasP, when knowing how late people get tested[32].

In Cambodia, CD4 is measured upon first visit to pre-ART site after diagnose in VCCT. This commonly happens within a short period of time, unless the client never shows at pre-ART. CD4 count is not systematically reported. Reports only include numbers of newly identified cases and people who have enrolled in pre-ART and ART. No sources report the advancement of HIV infections in Cambodia.

5.1.3 Reporting Sources For HIV Related Deaths

Information on HIV related deaths provides markers for the impact of treatment and care as more patients receive ART, and AIDS-related mortality declines. The information can also be useful to measure number of orphans resulting from HIV deaths in parents, to estimate size of workforce and assess the impact of HIV on mortality, compared to other death causes. If HIV testing rates are high and most HIV-infections are diagnosed, HIV case registries can provide a good estimate of number of PLHIV when the date of death is added to the case report.

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[32] Antiretroviral (ARV) drugs, used as HIV treatment, have shown effective in the prevention of HIV as well. Recent development led the WHO in 2010 to recommend treatment with ARV drugs for HIV clients with a CD4 count $\leq$ 350 cells as opposed to the previously recommended 200. This is because the drugs lower a person's viral load and therefor the likelihood of transmission to others. Some evidence suggests that sero-discordant couples (couples where only one have tested HIV positive) could and should even benefit from receiving ART regardless of CD4 count. More information on the topic(s) can be found in WHO (2011) and WHO (2012). In some countries, Cambodia included, treatment is beginning to be offered to specific groups at high risk of infecting other's with HIV, irrespective the CD4 count (i.e. with CD4 up to 500, which is also the minimum count for a normal CD4 level).

Vital statistic registries are important reporting sources because they can provide information on AIDS-related deaths of persons who are not enrolled in care or persons who, for other reasons, will not get reported as dead in ART sites.

Data on HIV-related deaths could be obtained in three ways:

1. **Matching case-based HIV reports with vital statistics programs (requires a well-functioning vital statistics program)**

The vital registries in Cambodia are used to study main death causes and their distributions, including HIV/AIDS, but do not serve as a direct source of reporting HIV-related deaths. Vital statistics obtained through the civil registry under the Ministry of Interior serves the purpose of legal protection. Civil registration certificates cover birth-, marriage- and death certificates. Relatives can, but are not obliged to, request the registration of the death of a family member.

2. **Periodic follow-up reviews of patient records in ART-monitoring programs**

In Cambodia aggregated case reports from care and treatment sites, including numbers of deaths of people enrolled in those services, are submitted and reviewed nationally every quarter. However, since there are no reports linked directly to individuals, tracking of clients is not an option.

3. **HIV case report forms submitted when an HIV-infected person dies, regardless of cause of death.**

In Cambodia it is recorded by pre-ART and ART sites and by Community-Based Prevention, Care and Support team (CBPCS[33]) through their HBC teams, if a person dies, regardless of cause of death. In the aggregated quarterly reports numbers of deaths are reported.

5.2 Case Reporting Methods

There are different methods to conduct HIV Case Reporting. Methods include the ways in which the data is recorded and reported, and between which institutions, i.e. the flow of information (section 5.2.1); variables that cases are counted by and the ways in which the data can be updated and unduplicated (section 5.2.2).

Case reporting systems distinguish between case-based and aggregate case reporting.

[33] CBPCS is a term that covers for all community-based HIV activities, HBC included.

In *case-based case reporting*, individual information is collected and reported directly all the way up to national health authorities where data is computerized. This allows for differentiation of individuals and for linking individuals across databases, facilities and geographical areas.

Cambodia's case reporting system is based on *aggregate case reporting*. This means that individual-level information is collected through a single rationalized form for each individual, which is sent on to district level on a monthly or quarterly basis, depending. Here the data is aggregated by sex, age and, when applicable, by risk group[34]. Finally the information is aggregated in the same manner by province and forwarded to DMU every quarter. Individual-level information does not reach national level.

Even though this way of reporting is often simpler than case-based reporting it is less flexible as it does not allow for non-predetermined analysis of the data.

Battambang province is currently preparing the implementation of a pilot project on linking individual client data in and across 16 VCCT sites, 4 OI/ART sites and 2 STI clinics[35]. Upon consent, finger print technology will be used to identify and distinguish clients.
The objectives are to 1) improve the linkages and referrals between different services by linking the existing health information system with a unique identifier system, and ultimately to 2) promote the use of data from this new integrated system to monitor and improve the quality of health care services.

5.2.1 Reporting Flow

It is important that roles and responsibilities of each level in the reporting flow are clearly defined and that they are understood by all staff on all levels. This, as well as adequate training of personnel, will enhance the process of obtaining quality data in a complete manner (more on data quality in section 5.4)
The reporting flow for Cambodia is depicted in figure 8.

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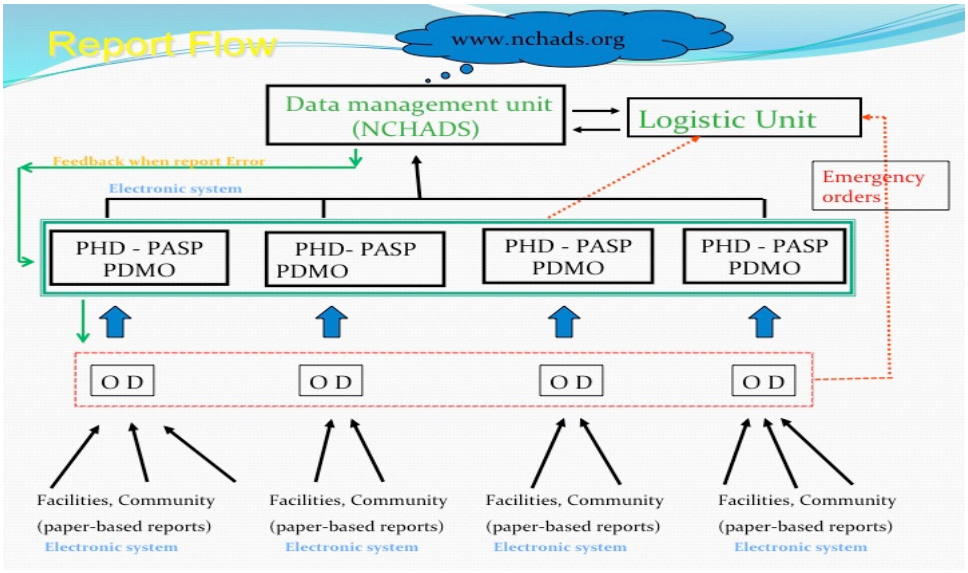
[34] TB clients, MARPs, PW and partners of PW. See for instance enclosure 1a: VCCT Report.
[35] The pilot project is a collaboration between NCHADS, USCDC (OGAC/PEPFAR) and INSTEDD

Figure 8: Flow Of HIV Case Reporting In Cambodia



Source: Figure provided by NCHADS

NCHADS' Functional Task Force Analysis - first initiated in 2001 and since regularly updated - serves the purpose of describing the different responsibilities of NCHADS personnel. The responsibilities set forward in this document is restricted to personnel within NCHADS' head office and does not describe specific responsibilities of personnel on provincial, OD or site level.

DMU has the overall responsibility for the collection, management and storage of patient data from STI, VCCT, OI/ART and HBC in appropriate databases, and to provide feedback and training to the concerned units. All VCCT services, public and NGO, must report to the DMU every quarter using standardized reporting forms.

Facility and community reports are first to be collected and aggregated at OD level, and from there reported to the provincial health department (PHD). From there the provincial aggregated information is forwarded to DMU at NCHADS' Head Quarters in Phnom Penh.

At DMU, a data management team checks for consistency with previous reports and for completeness of the report. In case of error DMU contacts the relevant Provincial Data Management Officer (PDMO) for him to follow up with the concerned site. If no PDMO exists in the province DMU will contact the health facility in question directly for clarification.

Feedback on the results of the reporting is similarly provided back to sites on a quarterly basis. In case some issues require specific action from the sites, NCHADS provide feedback via telephone to the responsible officers. In critical situations notification letters to address specific issues identified in the reports, can be issued to the relevant sites and to the PHD.

The Provincial AIDS Office is responsible for the planning, management, coordination, reporting and implementation of HIV programs, as well as the management of VCCTs in provincial towns and support to ODs for all HIV program related activities.

At any given point when a new project or activity is launched, the relevant staff receives training. Refresher trainings on HIV Case Reporting are provided on an annual basis and have targeted, amongst other things, issues identified during NCHADS' field supervision trips. It appears that there is still a gap between the knowledge obtained during training and the practices being implemented. The nature of these gaps was not further specified/elaborated on by the source.

5.2.2 Variables For Counting Cases And Updating & Un-duplicating Cases

For surveillance program officers to count a reportable case the case report form must include, as a minimum, the following variables:

- Case identifier (name or code)
- Sex
- Date of birth
- Date of diagnosis
- Clinical stage (CD4 if available)
- Date of death (or number of deaths in case of aggregate reporting).

The above are variables that are used regardless if the system is case-based or based on aggregate data. All variables are collected on site-level in Cambodia and information on sex, birthday, date of diagnosis and deaths are reported in an aggregated format to the DMU.

Cases are most often recorded by name and code but there is no standardized system as how this code is constructed, and it is unique within one health facility only. The same patient will therefor have different codes across different facilities, ODs and provinces.

Adopting a case-based surveillance system would allow to distinguish newly reported persons from persons already previously reported. To track duplications, a minimum of a patient identifier and the date of birth must be available.

Implementing case-based case reporting with a longitudinal computerized database could facilitate the inclusion of data such as HIV test date, CD4 count, care and treatment received, residence at diagnosis, progression to more advanced clinical stage, vital status and cause of death and make it possible to:

- Add new information into existing case records.
- Capture the time of which a client was diagnosed with HIV, when the client deteriorates to late infection and/or when the client is eligible for treatment.
- Include both date and cause of death.
- Add start dates for care, ART and prophylaxis.

5.3 Case Report Forms

The case report form has the purpose of standardizing the collection of information on HIV diagnosed clients, and of facilitating the reporting of it. The form works as the link between surveillance input and surveillance output.

After agreeing on a case definition and on case identifiers, and when reportable events has been identified it must be determined what minimum of information is needed to report a case. As established, having an aggregated case reporting system will limit reportable information.

It is important that the information included in the report forms is information that can easily be obtained by the person completing the forms on site.
During some refresher training sessions and networking/coordination meetings, health care providers have been consulted on the content of some forms. In addition, some health care providers are members of the national technical working group and have the possibility to provide inputs to the forms via this mechanism. Each specific technical working group is responsible for

revising the reporting forms when found necessary and applicable. In Cambodia the frequency of the revision of the forms themselves depends also on how many new activities are being launched.

Ideally, case report forms should facilitate data outputs such as:

- Distribution of patient demographics and risk characteristics.
- Levels of and trends in:
  - Diagnosis of HIV
  - Clinical stage at time of diagnosis
  - Use of ART and prophylaxis
  - HIV- and non-HIV related deaths
  - Development and types of OIs
- Time between most recent negative HIV test and diagnosis.

Table 2 summarizes how Cambodia's HIV case reporting system responds to the optimal outputs outlined above.

Table 2: Case Report Forms - Inputs and Outputs

Recommended Data Outputs[36]		**Data Recorded On Site In Cambodia**	**Data Reported To DMU In Cambodia**
From Testing Facilities			
	Demographic information	Data on sex, age and residency is recorded on site.	Data is reported in aggregated form by sex and age. Geographical distributions of positive cases are reported according to facility, not according to where the client lives.
	Risk characteristics	Risk evaluation of HIV exposure, risk related behavior and reasons for seeking testing is recorded in VCCTs.	Reports include figures on clients who can be categorized as EW, MSM, PWID/PWUD, TB or PW. The actual risk *behavior* is not reported.
	Diagnosis of HIV (and advancement of infection) and time since most recent negative HIV test	Date and facility is recorded. Advancement of the infection is not recorded at time of diagnosis. Testing history is recorded on site.	Aggregated figures on the amount of positive, negative and intermediate tests respectively are reported for each reporting facility. Testing history not reported.
From Care And Treatment Facilities			

[36] Recommended in *"Participant Manual, Module 2: HIV Clinical Staging And Case Reporting"* WHO 2007.

	Clinical Stage and Immunological Status	HIV related illnesses (according to WHO classification clinical stage 1-4) and CD4 count is recorded upon enrollment in OI/ART only	Not reported
	Use of ART and Prophylaxis	Recorded in OI/ART	Number of active patients on ART and number of patients on ART who started Cotrimoxazole[37] is reported quarterly.
	Vital Status; HIV- and Non-HIV Related Deaths	Deaths, if known, are recorded. Cause of death is not recorded.	HBC teams report deaths of people with HIV enrolled in care/treatment. ART sites report deaths of patients on ART. Whether deaths appear to be related to HIV or not is not reported.

5.4 Monitoring Data Quality of HIV Case Reporting Systems

Ongoing monitoring and evaluations of a HIV case reporting system is an important part of improving service delivery. It can help determine completeness of the case report forms and whether reporting sources are sending the forms as soon as cases are identified. It can also detect the number and proportion of facilities that report cases, and the facilities that are not reporting cases –and why.

Regular evaluations, e.g. every five years, can be useful to ensure that a public health surveillance system is doing what it is supposed to do, as their purpose is to confirm if problems of public health importance are monitored efficiently and effectively. It should include recommendations for improving quality, efficiency, and usefulness.

Monitoring - the ongoing process taking place at all levels of the reporting system - is important to ensure that surveillance officers receive high-quality data from which assumptions and plans can be made.

Three key monitoring and evaluation criteria can be defined, which should be reported at least annually:

- Completeness
- Timeliness

[37] Anti-bacterial drug

- Validity

5.4.1 Completeness

Completeness of reporting measures the *proportion of all true cases reported to the surveillance system* and is an expression of the ability to accurately describe the disease over time and by population and place.
The success of completeness of reporting depends both on the individual behavior of the patients seeking testing and care and on the healthcare provider's involvement in completion and forwarding of the case reports.

Completeness of reporting can be improved by periodically evaluating the number of facilities that are reporting cases. The completeness can be evaluated by holding the actual number of reported cases up against the total number of expected cases (measured as a percentage) during a defined period of time.

In 2005 it was estimated that just 10% of HIV positive cases and AIDS diagnosed cases in Cambodia were reported to MoH, showing a big gap in completeness of reports. More recent estimates were not found available.
In 2011 two out of 255 VCCTs failed to report, and in the first quarterly report of 2012 only 250 VCCTs are referenced.

5.4.2 Timelines of Reporting

Timeliness refers to the speed between steps in the system and is measured by *how soon after diagnosis the case was reported to the authorities*. Health officials must know about diseases in a timely fashion in order to implement and plan effective prevention, care and treatment. Timeliness can be measured either by the time between diagnosis of HIV and receipt of the report or by proportion of cases that are reported within a specified time frame.

Suggested and realistic standards for timeliness in case reporting are as follows:

- 66 % of cases should be reported within six months of diagnosis.
- 85 % of cases should be reported within a year of diagnosis.

In Cambodia, ODs are requested to report all new HIV cases on a quarterly basis, and within 10 days of the following quarter. There are no available figures on the success of this.

5.4.3 Validity

Assuming that the patient record at health facility is correct, validity measures *the extent to which the information in the case report form matches information in the patient record at the health facility*.

To measure the validity of a case reporting system, information in the case report forms and data on previously reported cases must be compared. Preferably a re-abstraction program is established, to routinely re-abstract demographics, risks factors, and laboratory and clinical data from a representative sample (sample size: 5 % -10 %) of records once a year, and this way assess the validity of the national information.

In Cambodia HIV reports are checked for errors and followed up by DMU every quarter when they receive them. There is, however, no available information on the validity of the data obtained through the HIV case reports.

5.5 Analysis, Interpretation and Dissemination of HIV Case Reporting Data

To obtain a comprehensive picture of the HIV prevalence it requires that HTC services are available and used throughout a wide range of the population, including MARPs. Both HIV infections, advanced HIV diseases and AIDS case data should be examined in order to determine the developments in HIV prevalence and incidence, the geographical distribution of it, risk characteristics, treatment coverage and opportunistic diseases, and this way obtain an improved understanding of the HIV epidemic.

5.5.1 Analysis And Utilization Of Data

While interpreting surveillance data it is important to be aware of factors that can affect the conclusions, such as expansion in HTC and treatment services, change in population size and

reporting practices (e.g. efforts to increase reporting from private practices), change of case definitions, duplication of case reports, and changes in numbers of healthcare facilities or factors affecting their service uptake. Likewise, it is important to take into consideration the quality of the data used for the analysis.
Surveillance data can also be used to confirm observed trends, engage the community and collaborate on taking the appropriate action.

The purpose of analyzing the surveillance data will affect the way the data can be interpreted and displayed. Using the data and the results from monitoring and evaluations is crucial to continue to improve the quality of the reporting system and the data collected. Confidence in using the data will also facilitate a virtuous spiral of improvements in quality of collection as well as cleaning, analyzing and interpreting the data.

5.5.2 Dissemination Of Data

Case reporting data can be used for regular epidemiological reports in a variety of ways. In an annually (as a minimum) manner the data should be presented in a HIV surveillance report, including trends of the epidemic, risk patters, transmission categories, age, sex and geographical distributions. Ideally this strategic information is used to summarize the state of the HIV epidemic in epidemiological reports.

Quarterly, or even more frequently, fact sheets can highlight the emerging trends. Annual surveillance reports can more comprehensively provide information on trends in *who, where and why*, by distinguishing between new diagnoses and already known PLHIV.

Data on *who* (e.g. sex or ethnicity) is powerful, when compared to the country's overall population distribution, in showing burden of the disease by different population groups.
Including information on client's residence can provide a more complete picture on *where* the epidemic is concentrated, and where services are needed.
Obtaining information on *why* (e.g. risk factors and routes of transmission) is valuable for targeting prevention strategies, even more so if also presented by sex and gender (*who*).

In Cambodia, NCHADS produces comprehensive reports on an annual basis presenting aggregated data and information collected from all OI/ART, VCCT, Family Health Clinics, HBC and PMTCT throughout the whole country. The reports are published on NCHADS' homepage[38].
The comprehensive reports contain information from different strategic information sources, not solely the passive surveillance system.

Also published on NCHADS' webpage, on a quarterly basis, are the aggregated figures on each of the following categories; ART, pre-ART, HBC, STI, VCCT, LR, EID and Ioniazid Prevention Therapy[39].
Ultimately the information obtained through the HIV case reports is reviewed by national and provincial level officials and used for management purposes, i.e. planning, budgeting and setting targets.

5.6 Confidentiality

As a HIV diagnose in many societies put people at risk of stigmatization and discrimination, it is important to address a number of ethical issues in all aspects of HIV testing, care and treatment as well as in the surveillance system. While certain groups are of increased risk special attention must be applied to assure the confidentiality of their information. These groups include MARPs as well as prisoners, mobile populations and sex partners of these high-risk groups.

Confidentiality is especially important if unique cases are to be reported. A case-based surveillance system requires countries to decide on a way to identify cases (either by name or by unique identifier code). Regardless of how patients are identified, the surveillance program must make sure that information - both in the collection of the information and in the forwarding and presentation of it - is kept both confidential and in a secure manner, taking into account that:

- Data is maintained in a physically secure environment
- Data is transferred in a secure manner

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[38] http://www.nchads.org/index.php?lang=en
[39] Ioniazid Prevention Therapy is mentioned here because it is included in the quarterly reports from NCHADS, but is beyond the scope of this paper. IPT is provided for HIV clients who are also screened for TB and has shown an effective method to reduce the common co-infection of TB in PLHIV.

- Computers holding surveillance data are secure, and with as few individuals as possible permitted to access the data.
- Surveillance staff receive training on security and confidentiality
- Breaches in security and confidentiality are investigated and handled accordingly
- Guidelines, protocols and policies on data security matters are continuously updated and reviewed.

To ensure confidentiality of clients it should also be considered who is responsible for, and permitted to, filling out the forms, and roles and responsibilities should be defined in written guidelines.

The 'SOP for Quality Improvement for HIV Counseling and Quality Control for HIV Testing' sets forward the need for an appropriate physical environment in testing facilities to ensure privacy and confidentiality as well as secure record keeping.
Unfortunately it has not been possible to obtain any clear information on how, in practice, confidentiality is ensured in the HIV case report cascade in Cambodia.

6 Analysis

HIV/AIDS has a relatively short history and has only been a known phenomenon for about 30 years. Since the 1980's much development has happened both in terms of the spread and the defeat of the disease.

In general, knowledge about the disease has expanded. Nevertheless, it still stands clear that people infected and/or affected by the disease are wrongly discriminated and stigmatized against, often based on a lack of understanding of the nature of the disease by local communities and their association with promiscuous, 'unacceptable', behavior. Partly for the same reason the methods for surveillance of the epidemic have received increasing attention, and they are of much and ongoing debate. Especially methods that require the identification of individuals, such as those frequently used in case reporting.

In accordance with the analytical framework, this chapter is built off two main sections; Individual-level information and Access to health care (although with overlaps), while discussing the challenges and opportunities that HIV case reporting offers Cambodia in monitoring the HIV epidemic.

6.1 Individual-level information

When reviewing how HIV case reporting can contribute to monitoring the elimination of new HIV cases, we are interested in monitoring not only incidence but also the prevalence of PLHIV. Prevalence gives us important information for the purpose of planning healthcare service distribution and prevention programs, which are critical elements in bringing down incidence.

The surveillance and monitoring of prevalence and incidence can be based on either estimates or on reporting of exact numbers. For the latter to happen it must at least be possible to identify individuals, or else duplications of cases reported cannot be tracked and the accuracy will likely be lost. Meanwhile, there are many more concerns to take into consideration when planning for individual-level information reporting, such as cost-effectiveness relative to the goal wanted to pursue with it (beyond the scope of this thesis), the security of personal information and the risk that clients face by revealing information that will go through several hands and eventually be stored in large databases.

6.1.1 The Challenges Of Aggregated Data

Table 2 "*Reporting Forms – Inputs And Outputs"* summarized what data is recorded on site level versus the data that is reported to national level in Cambodia. It showed that a comprehensive set of client data is collected and recorded on site-level in Cambodia at entry points to testing, care and treatment. However, an aggregated case reporting system, as practiced in Cambodia, is less flexible and does not allow for pre-determined analysis, and duplication is a likely risk. In summary, aggregate reporting limits the reportable information.

Firstly, an overall weak point in the Cambodian HIV case reporting system is that a breakdown of reporting sources is not available on national level. Figures that tell us which sources report the new HIV cases are available from various NGOs and testing sites, but there are no national figures

available on how many cases the different reporting sources yield. This is important for planning resource allocation.

Secondly, no cases in Cambodia are reported according to residency or risk behavior, possibly giving a distorted picture of the distribution of the HIV cases both in terms of geography (in some provinces labor migration is substantial and people may get tested and diagnosed in different provinces than where they actually live) and in terms of risk exposure (for instance, working as an EW does not always mean that the person engages in commercial sex work, just as well as PWID do not necessarily share needles). The reports does not mention about needle sharing, hygiene, number of clients or condom use, i.e. *behavior*.

More so, clients' clinical staging and advancements of infection is not systematically reported. Reports only include numbers on newly identified cases and people who have enrolled in pre-ART/OI and ART. No sources report the advancement of HIV infections in Cambodia, and as long as the reporting system is based on aggregate information, it is not possible to routinely report CD4 count without having a separate system to monitor it.

Previously it was important to know when PLHIV deteriorated to an advanced HIV stage, i.e. to know who and how many were in need of treatment. Now, with new initiatives like early treatment and TasP this information is a decreasing need. Rather a breakdown of CD4 count becomes a still increasingly important individual piece of information in monitoring the epidemic, partly because it provides information on eligibility to treatment, both for preventive and treatment purposes.

One of Cambodia's strategies to eliminate new HIV infections is to use TasP and it is being discussed to offer ART to people with relatively high CD4 counts (350-500). Measuring the CD4 count earlier (i.e. upon diagnosis rather than upon enrollment in care) and reporting it individually (which would also allow for monitoring the advancement of infection, as not currently practiced) would enable the monitoring of this new initiative more closely. It could monitor the effect of the interventions, eligibility and adherence to treatment, measure caseload in ART sites as well as monitor which groups of clients are more frequently loss to follow up.

Another challenge of doing aggregate case reporting is the reporting of deaths. In Cambodia deaths of persons infected with HIV are recorded and reported only if the person is enrolled in care and/or

treatment. Vital statistics registries do not yet manage to capture all deaths in Cambodia and there are no case-based HIV case reports with which vital registries could potentially be matched to track HIV-related deaths. Without a system to count deaths and only a system to count new HIV cases, it is not possible to count the actual number of PLHIV in Cambodia, i.e. prevalence.

To meet the challenges and constraints of the currently used aggregate HIV case reporting methods in Cambodia a unique identifier project is currently piloted in Battambang province. Regardless the success of the pilot it is a big jump to implement unique identifier in Cambodia given the weak infrastructure, and it may take a long time to fully implement such a system. One possibility could be to have an interim solution by implementing a case-based reporting system where counting variables like sex, date of birth, date of diagnosis, and clinical staging could be used to un-duplicate cases. This way, individual-level information could still be reported, without implementing a complex, expensive and in some eyes confidentiality-compromising unique identifier system.

Besides the benefits of facilitating more accurate data, linking individual level information could have positive spill-over effects on the quality of care and treatment because of the accuracy of the information shared among health care providers, and the time saved on collecting new information every time a person transfer in from another facility. If quality of care is improved people are more easily retained in treatment, and there is an overall improved access (in all aspects) to testing, care, treatment as well as prevention efforts such as TasP. In turn, this could enable the overall elimination of HIV/AIDS.

6.1.2 Involvement And Utilization

It is evident that high-risk groups are groups that are hard to reach, namely because of stigma and discrimination in the society. Case reporting is therefor not only about reporting. In order to obtain high quality data that can be used efficiently, it requires increased involvement and training of personnel on site, improved policies on data confidentiality and security as well as linking these policies to practice (reaching the health care providers) and not least improved mapping of MARPs.

Completeness, timeliness and validity of case reports are not regularly evaluated in Cambodia. Monitoring the data quality closely and regularly would be easier if individual information was reported. Then it would be possible to track the records and to avoid duplication. Revising the

forms in collaboration with health care providers can also contribute to improvements in quality of the data (by identifying what is necessary to record and report, and this way optimize the utilization of the collected data). This is already practiced to some extent, as health care providers are involved in technical working groups where they can influence the contents of recording and reporting forms. This can be a way forward to avoid the supposed gaps between the knowledge that health care providers obtain through trainings, and the reporting procedures they actually implement. It should be explored further why there are these gaps, and it could with advantage be explored what the incentives are for health care providers to improve the reporting practices. An open dialogue about this may be needed in order to keep improving the quality of the reported data and the data stored on facility level.

If information is not utilized it may not give the health care providers the incentives to fill out long and time consuming forms. This raises the question whether the recording forms are even fully filled out, when much of the available information will never be used in further analysis. Hence, the completeness of recording forms may depend on ongoing monitoring and the utilization of the data in analysis and program planning. Taking up the task again of conducting annual passive surveillance reports, which haven't been done since 2005, may provide good insight into what information is really obtained through HIV case reporting. This would also facilitate the identification of gaps and weaknesses in the system, which should be addressed to create a system that can produce complete and reliable data for monitoring purposes.
Additionally, the completeness of the case reporting would possibly benefit from an inclusion of the private sector, which today is not obliged to report HIV cases to NCHADS.

6.1.3 Confidentiality

In the health care facilities, client's data is collected and filed on an individual basis regardless of being reported in aggregate form to national level. Therefor, confidentiality and data security is still of great relevance.

If confidentiality is an issue that makes people refrain from seeking health care, Cambodia faces a challenge in introducing the reporting of individual information and at the same time ensure that people, especially MARPs, get tested for HIV, let alone enrolled in care. If people do not use the

healthcare services case reporting will be futile, and yet again the balance between data security and data accessibility, as explained by Hutton (2012b), shows important.
Especially MARP's access to testing and care facilities is greatly connected to confidentiality issues, thus the reporting of individual-level information.

Section 6.2 will go more in depth with the issues relates to access and how this is linked to HIV case reporting.

6.2 Access To Health Care

To give an overview of the different entry points to HIV testing in Cambodia, table 1 *"Applications Of HIV Testing And Counseling Modes"* was constructed. The table builds on the recommended testing modes set forward by the WHO in their 2012 Strategic HTC Program Framework (WHO 2012), and shows that Cambodia largely implements recommended practices with only few exceptions. VCCTs and HCs are established in all ODs, and services for PW and TB clients have high testing coverage. Efforts are increasingly put into systematizing couples/partners testing as well. HBC teams provide an important link between communities and clinics, and enables access through financial support (i.e. geographical accessibility) as well as community awareness, HIV health care information, and psychosocial support (i.e. availability and acceptability).
Yet, there is room for improvements.

For starters, STI services are not provided in all provinces and ODs, despite a large proportion of the people consulted in HCs suffer from STIs. If in need for specialized treatment, people living in ODs or provinces without STI services will have to travel to other districts, possibly causing financial distress. Access to STI services is highly relevant in the prevention of new HIV infections, and the reporting of its uptake and service provisions can prove to be important information for monitoring purposes related to Cambodia 3.0.

Next, MARPs' access to testing, care and treatment is compromised in several ways. The low number of MARPs who were mobilized through C/PITC and tested HIV positive suggests that the program has not managed to reach the groups at the highest risk. Further, as the MARPs mobilized for testing only made up for a small proportion of the estimated numbers of MARPs, it appears that these are groups that are both hard to reach and to convince to get tested. Taking into consideration

that estimated numbers are relatively low, and mapping is incomplete, the mobilization is likely to prove even poorer than at a first glance.

The approaches applied in the HIV response in Cambodia recognize the difficulties in reaching MARPs, and try to meet the needs through collaboration with various NGOs and their specialized programs. This is definitely one of the strengths of Cambodia's public health sector. For instance, DICs and peer networks bring testing services closer to the clients, and an increasing number of PWID are reached and enrolled in MMT.
However, programs targeting MARPs are concentrated in Phnom Penh and other large cities, in particular for PWID, and MARP friendly clinics are vulnerable as they depend on NGO funding. Such solution does not seem sustainable, especially given such institution's importance of MARPs' *access* (availability and acceptability) to health care services where they feel safe from the harm of discrimination, and where they can conveniently look for help.
Programs targeting PWID/PWUD specifically are still under heavy development. They need increasing efforts as a growing proportion of HIV transmission happens through needle sharing.
In extension, it would be relevant to develop the reporting of risk behavior as this tells more about the actual transmission modes than the currently aggregated numbers of MARPs. This, for instance, could enable the monitoring of the extent of injecting drug use in PLHIV, and in turn facilitate improved program planning and appropriate health care access.

Private facilities are still missing in the detection and reporting of new cases, and could also play an important role, just as well as systematic testing of partners and children of PLHIV could. In order to move towards an elimination of new HIV cases, efforts in HTC services still needs to be intensified, especially in settings like prisons where testing and reporting is still scarce.
Missing HIV detection in prisons are also closely linked to gaps in the reporting system. Access to health care for prisoners is limited, and prisoners have to be allowed to leave the prisons in order to reach HTC. It was beyond the scope of this thesis to investigate specifically in prisoner's access to HTC and other HIV care facilities, but it can reasonably be assumed that they face even greater restrictions than other high risk populations in all four aspects of *access*. If so, the reporting of prisoners living with HIV is equally challenging within the current system, and will probably appear missing as a result.

7 Conclusion

HIV case reporting is interesting to look at because it is a tool through which quality of testing and treatment services can be improved, just as well as adequate access to the services is a prerequisite for case reporting to provide valid data. So, without access there are no grounds for case reporting. But is it valid to say that there is no access without case reporting? No, not quite, but if performed and utilized well, case reporting data can surely improve access in many aspects.

HIV case reporting as it is currently practiced in Cambodia provides a solid ground from which to develop a system that can deliver precise and comprehensive information on HIV. But there are still challenges to overcome, and improvements to be made, before HIV case reporting can stand on its own and replace other surveillance methods. We have seen that the methods used for case reporting are crucial for the precision of the data obtained, especially in monitoring incidence. Aggregated reporting will often cause duplication of cases.

Developing a system to link individual-level data is an important step, and it shall be useful and interesting to see the outcomes and conclusions of the unique identifier project currently piloted in Battambang province. Next, intensified training and better inclusion of health care providers appear to be important for the quality of the case reporting data, which is after all a condition for the data to be useful for monitoring purposes. Improved involvement, improved data quality and improved utilization are tied together in a virtuous or vicious spiral depending on how it is approached. It is reasonable to conclude that there is a close link between facilitating health care provider's incentives for conducting case reporting and the quality of the case reports.

Furthermore, improving health care provider's understanding of the positive effects their work can have, as well as of all issues related to HIV/AIDS, must spill off on their attitude towards their clients in a positive way. This is highly relevant for client's access to testing and treatment, which is often compromised due to stigma and discrimination either in the client's home or community or within the health care facility.

Confidentiality has been a recurring topic in this thesis and in line with the above the *acceptability* aspect of access stands out as particularly important. Confidentiality issues and limited access to health care are especially relevant topics when considering vulnerable population groups, which are also the groups most at risk of getting infected with HIV.
This research has not looked deeply into the reasons *why* MARPs are hard to reach and get tested, but it points in the direction that the reasons are connected to stigma and discrimination. Other organizations on the ground perform research that look into these issues more closely, but they have not been substantially drawn into this thesis.

That said, it is highly possible that a larger proportion of MARPs than first assumed get tested for HIV, but without identifying themselves as MARPs in the clinic. It stands clear though, that MARPs are moving increasingly into focus in Cambodia's HIV response, and for valid reasons. HIV case reporting can facilitate comprehensive knowledge in monitoring the elimination of new HIV cases, but it has to go hand in hand with extensive stigma reducing efforts at all levels of society as well as in health care facilities to improve access to testing, care and treatment.

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Appendix 1: List Of Secondary Data Sources

The data sources listed here include only written materials used in the data collection, also referred to as secondary data sources. Sources to primary data, i.e. reporting forms and the interview questions are not included here, but can be found in enclosure 1 and 2 respectively.
The sources are listed by name, not by source.

Global Official Guidelines And Recommendations

- *"Introduction to HIV, AIDS and STI Surveillance. HIV Clinical Staging and Reporting. Participant Manual"*: USCDC - US Department of HHS-CDC, Global AIDS Program. September 2009.
- *"Participant Manual, Module 1: Overview of the HIV/AIDS Epidemic with and Introduction to Public Health Surveillance"*: WHO – Regional Office for South-East Asia, Manila, 2007.
- *"Participant Manual, Module 2: HIV Clinical Staging And Case Reporting"*: WHO – Regional Office for South-East Asia, Manila, 2007.
- *"Service Delivery Approaches To HIV Testing And Counseling (HTC): A strategic Program Framework"*: WHO 2012.
- *"WHO Case Definitions of HIV for Surveillance and Revised Clinical Staging And Immunological Classification of HIV-related Disease In Adults And Children"*: WHO HIV/AIDS Programme – Strengthening Health Services to Fight HIV/AIDS, 2007.
- *"WHO Report on Global Surveillance of Epidemic-prone Infectious Diseases"*: WHO Department on Communicable Disease and Response, 2000.

National documents; Conceptual Frameworks, SOPs, Annual Reports and MoH-specific literature

- *"Annual Report 2011"*: NCHADS, 2012.
- *"Cambodia Country Progress Report: Monitoring The Progress towards the implementation of the declaration of commitment on HIV and AIDS"*: National AIDS Authority, 2012.

- *"Conceptual Framework For Elimination Of New HIV Infections In Cambodia by 2020"*: NCHADS, December 2012.
- *"Concept Note On Increasing MARPs (EW and MSM) Access to HIV Testing and Counseling Through Community/Peer Initiated Testing and Counseling (CPITC), 2011-2015":* NCHADS, March 2011.
- *"Functional Task Analysis of NCHADS"*: MoH, July 2007.
- *"Passive Surveillance Report on HIV/AIDS and Sexually Transmitted Infections, VCCT and Others HIV/AIDS Related in Cambodia in 2003"*: NCHADS, July 2005.
- *"Passive Surveillance Report on HIV/AIDS and Sexually Transmitted Infections, VCCT and Others HIV/AIDS Related in Cambodia in 2005"*: NCHADS 2005.
- *"SOP for HIV, STI and TB-HIV Prevention, Care, Treatment and Support in Prisons (And Correctional Centers) in Cambodia"*: Ministry of Interior & MoH, January 2012.
- *"SOP For Prompt Testing of TB-HIV and Rapid Access to Treatment and Care Services"*: CENAT (National Center of TB and Leprosy Control) & NCHADS, MoH 2006.
- *"SOP for Quality Improvement (QI) for HIV Counseling and Quality Control (QC) For HIV testing":* NCHADS 2006.
- *"Strengthening Integration Towards Sustainability – Annual Report 2011"*: KHANA 2012.
- "*The Continuum of Care for People Living with HIV/AIDS in Cambodia: Linkages and Strengthening in the Public Health System. Case Study"*: WHO in collaboration with NCHADS, 2006.

Workshops and Conferences; Presentations

The author attended not all of the events listed here but WHO colleagues provided access to presentations.

Asia Region Workshop On Integrated HIV/AIDS Case Surveillance. Organized and Hosted by NASTAD in partnership with WHO and CDC. Bangkok, Thailand, October 2012:

- "*Session 1: HIV Case Reporting and Second Generation Surveillance"*: by Sabin, Keith.
- *"Session 2: Overview And Review of HIV Case Surveillance"*: by Zaidi, Irum & Pessoa-Brandão, Luisa.

- ”*Session 6: Monitoring and Evaluation Case Reporting Systems – Nuts and Bolts”* by Pessoa-Brandáo, Luisa.
- ”*Session 7: How to Monitor and Evaluate Case Reporting Systems”* by Meredith, Gen.

Workshop on Strengthening Monitoring of HIV Care and Antiretroviral Therapy. Organized and Hosted by WHO Western Pacific Region. Vientiane, Lao PDR, November 2012:

- ”*Patient Monitoring and HIV/AIDS Case Surveillance”* by Seguy, Nicole on behalf of WHO.

The 9th Meeting on 2012 Achievements and Developing AOCP for HIV/AIDS and STI Prevention, Care and Treatment Programs in Health Sector. Organized and Hosted by NCHADS and MoH in Battambang, Cambodia 3rd-6th December 2012.

- *”Contributing To Cambodia 3.0. HIV-Related Achievements 2012”* presented by FHI360.

Linking Individual-level Data To Improve The National Health Information System Workshop. Organized and Hosted by INSTEDD & US-CDC in collaboration with NCHADS and MoH. Phnom Penh, Cambodia, 6th-7th December 2012:

- DMU (2012): ”*Health Informatics Public Private Partnership Project in Cambodia”* prepared by Mam, Sovatha from NCHADS Data Management Unit and presented by University of Health Science.
- ”*The Civil Registration of Kingdom of Cambodia”* by Sophat, Heng on behalf of Ministry of Interior.

Other Documents (Articles, Assessments and Presentations)

- *“Achievements And Challenges Of The Continuum Of Care For PLHIV In Cambodia”:* NCHADS & WHO 2013.
    - *This extensive program review, of which the report is still not published, was initiated while the author of this thesis was volunteering/interning at the WHO and thus took part in the data collection and the analysis of the data.*

- "*Assessment of Provider-Initiated Counseling and Testing Implementation; Cambodia"*: Spratt, K. & Maria, C.E.: USAID's AIDS Support and Technical Assistance Resources, AIDSTAR-One, Task Order 1, 2011.
- *"Data Triangulation - HIV/AIDS and Drug Users in Cambodia"*: Power Point Presentations prepared by UNAIDS Cambodia, October 2011.
- *"Models of PWUD/PWID Interventions being implemented by NGOs (with inputs from KHANA, FI, MS, KSG, FHI 360)".* Power Point Presentation by Frederick Curtis on behalf of FHI 360, Phnom Penh, 29 March 2012.
- *"Producing HIV Estimates and Projections in Cambodia – Lessons Learned"*: Ullett, A., Chhorvorn, C., Welle, E. & Ammassari, S. for NCAHDS with Support from UNAIDS, 2012. Unpublished report.
- *Questionnaire (with answers) for the 2011-Review of HIV service delivery in six Asia Pacific Countries from the view of Continuum Of Prevention And Care (Country: Cambodia).* Unpublished document.
- "Review of HIV services in Cambodia for PWUD/PWID". Power Point Presentation by Mr. Graham Shaw, WHO and Dr Phauly Tea, UNAIDS, March 2012.
- *"Setting Standards And An Evaluation Framework For Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome Surveillance":* Hall, H.I & Mokotoff, E.D. in Journal Of Public Health Management Practice, 2007, 13(5), pp. 519-523.

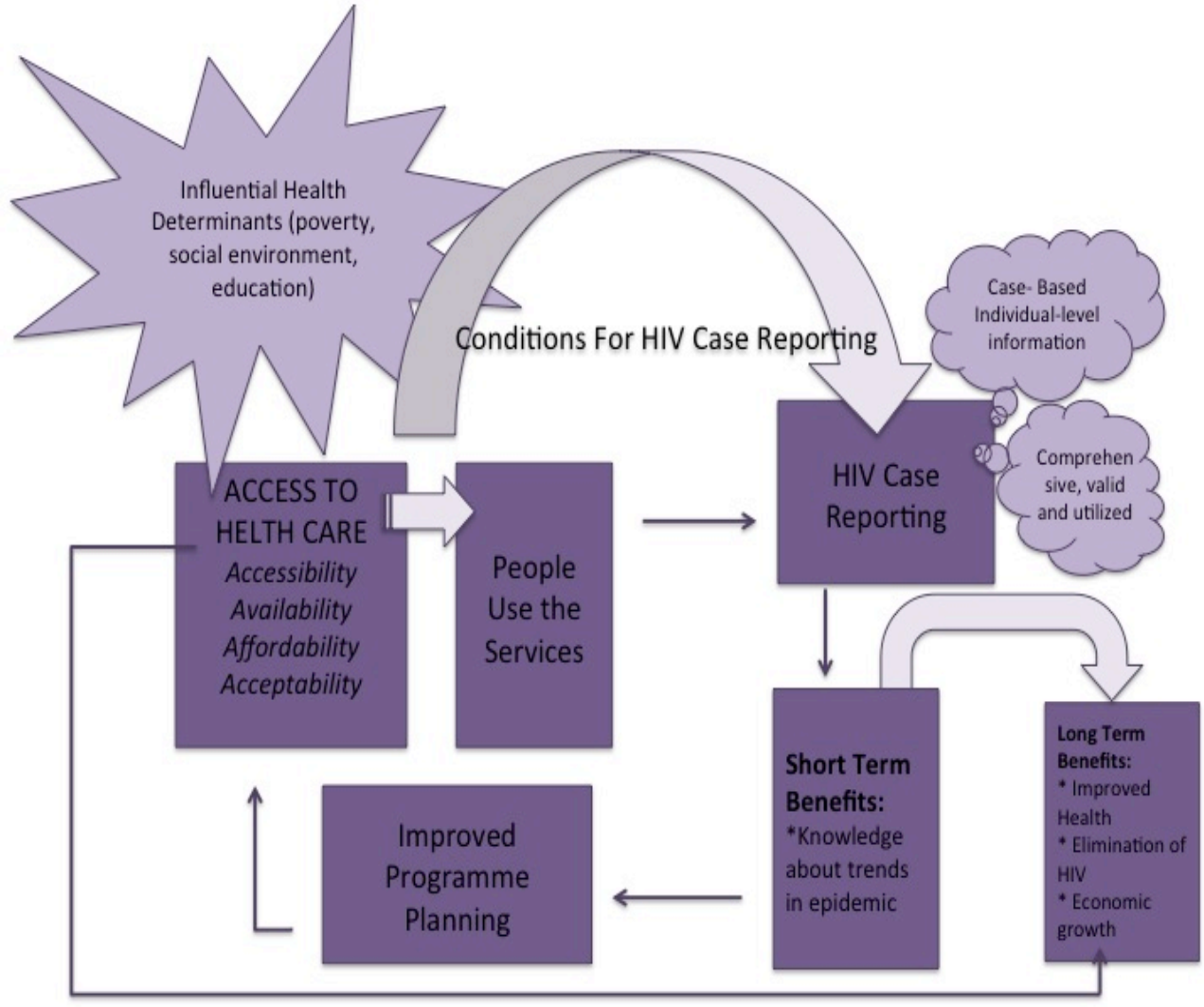
Appendix 2: Overview of Contributing Organizations

The organizations and institutions listed in this appendix all contributed with inputs and contextual knowledge along the way. This most often happened in CoC meetings, which regularly took place at NCHADS and in which the author participated when found relevant during the four months from July to October 2012.

- Clinton Health Access Initiative (CHAI)
- Cambodian Network For People Living With HIV/AIDS (CPN+)
- Family Health International 360 (FHI360)
- Friends International / Mith Samlanh
- Khmer HIV/AIDS NGO Alliance (KHANA)
- KorSang
- National Center For HIV/AIDS, Dermatology And STDs (NCHADS)
- National Institute For Public Health (NIPH)
- National Maternity And Child Health Center (NMCHC)
- United Nations Program On HIV/AIDS, The Joint (UNAIDS)
- United Nations Children's Fund (UNICEF)
- United Nations Office On Drugs And Crime (UNODC)
- United State's Agency For International Development (USAID)
- United States Center For Disease Control (US-CDC)
- World Health Organization (WHO)

Appendix 3: Brainstorming Exercise

The below model was developed as a brainstorming exercise in the development of the analytical framework used in this thesis. It sought to give an overview on how health care access interlinks with HIV case reporting, and in turn how this potentially contributes to short- and long-term benefits moving towards reaching the three zeros.



Enclosure 1: Reporting Forms

Enclosure 1a: VCCT Report

VCCT Reporting: HIV/AIDS Counseling And Blood Testing Report (VCCT)

Facility	Facility Code		
Operational District	Province		
Year	Quarter		

Pre-Test						
Number of client referred from						
Self referred		Maternity		Surgical Service		
STD Clinic		BS/FP		Health Center		
TB Program		ANC		EW		
HBC		Skin care		MSM		
General Medicine		Dental Service		DU/IDU		
Pediatric Care		Infection Disease				

Total Pre-Test Customers=

Tested	# of Clients Tested	Age	VCCT		TB		MARP				PMTCT		
			Female	Total	Female	Total	EW	MSM	DU/IDU		Pregnant women	Partner	Total
									DU	IDU			
	Test HIV +	<= 14											
		15-19											
		>49											
		Total											
	Test HIV -	<= 14											
		15-19											
		>49											
		Total											
	Test Indeterminate HIV (+ -)	<= 14											
		15-19											
		>49											
		Total											

Total tested customers=

After Testing													
	# of Clients who received Post-Test Counseling	<= 14											
		15-19											
		>49											
		Total											
	# of HIV+ Clients referred to other Service	OI/ART Service Center											
		TB Program											
		Home Base Care											
		Others											
		Total											

Date reported	/ /	
Report Completed by		
Approved by		

Enclosure 1b: pre-ART Report

មជ្ឈមណ្ឌលជាតិប្រយុទ្ធនឹងជំងឺអេដស៍ សើស្បែក និងកាមរោគ

National Center for HIV/AIDS Dermatology and STD

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របាយការណ៍ប្រចាំត្រីមាសស្តីពីការព្យាបាលជំងឺឱកាសនិយម មុនពេល ART

Facility Pre-ART (OI) report

ឈ្មោះមន្ទីរពេទ្យបង្អែក.គ្លីនិក (Facility)	លេខកូដ (Facility Code)				
ឈ្មោះស្រុកប្រតិបត្តិ (Operational District)	ខេត្ត-ក្រុង (Province)				
ឆ្នាំ (Year)	ត្រីមាសទី (Quarter)				

ប្រភេទ (Category)			អាយុ Age	ភេទ (Sex) ប្រុស Male	ស្រី Female	សរុប Total	
ចំនួនអ្នកជំងឺដែលសកម្មទទួលបានការព្យាបាល OI រហូតដល់ចុងត្រីមាសមុន (Number of active patients at the end of preceding quarter)			>14			0	
			0 - 14			0	A
ចំនួនអ្នកជំងឺថ្មី ព្យាបាល OI លើកដំបូងក្នុងត្រីមាសនេះ (Number of new patients (First OI Care visit) during quarter)	>14		**សរុបអ្នកជំងឺថ្មី >14**			0	
		ពិនិត្យសុខភាពរកមេរោគសញ្ញាជំងឺរបេង (TB Symptom Screening) *	+			0	
			-			0	
			បានចាប់ផ្តើមព្យាបាលបង្ការដោយ INH (IPT Started)			0	
			បានធ្វើរោគវិនិច្ឆ័យថាមានជំងឺរបេង Diagnosed TB (BK+ / - , EP)			0	
			បានចាប់ផ្តើមព្យាបាលជំងឺរបេង TB Tx Started			0	
			មានផ្ទៃពោះ (Pregnant)			0	
			ការបង្ការជាវិជ្ជមាន (ផ្តល់សេវាពពែបបយ៉ាងតិច) Positve Prevention (at least 3 **)			0	
		សរុបអ្នកជំងឺថ្មី 0 - 14				0	
		សរុបអ្នកជំងឺថ្មីទាំងអស់ Total new patients		0	0	0	B
ចំនួនអ្នកជំងឺដែលចាកចេញពីការព្យាបាល OI ក្នុងត្រីមាសនេះ (Number of patients who left OI Care during quarter)	បាត់មុខ (Lost) [1]		>14			0	
			0 - 14			0	
	ស្លាប់ (Died)		>14			0	
			0 - 14			0	
	ចាប់ផ្តើម (Start ART)		>14			0	
			0 - 14			0	
	សរុបអ្នកជំងឺដែលចាកចេញពីការព្យាបាល OI ទាំងអស់			0	0	0	C
ចំនួនអ្នកជំងឺដែលសកម្មព្យាបាល OI រហូតដល់ចុងត្រីមាសនេះ (Number of active patients at the end of the quarter)			>14			0	
			0 - 14	0	0	0	
			សរុប Total	0	0	0	D
ចំនួនអ្នកជំងឺដែលសកម្មព្យាបាល OI រហូតដល់ចុងត្រីមាសនេះ (Number of active patients at the end of the quarter)	សមស្របចាប់ផ្តើម ART [2] (Eligible for ART)		>14			0	
			0 - 14			0	
	មិនទាន់ដល់ពេលចាប់ផ្តើម ART (Not Eligible for ART)		>14			0	
			0 - 14			0	E

ចំនួនអ្នកជំងឺដែលសកម្មព្យាបាល OI បានធ្វើរោគវិនិច្ឆ័យថាមានកើតរបេង ក្នុងត្រីមាសនេះ (Number of active patients diagnosed TB (BK+/-, EP) during this quarter.)	> 14			0	
ចំនួនអ្នកជំងឺដែលសកម្មព្យាបាល OI បានចាប់ផ្តើមព្យាបាលជំងឺរបេង នៅក្នុងត្រីមាសនេះ (Number of active patient Started TB Treatment during this quarter)	> 14			0	F
ចំនួនអ្នកជំងឺសកម្មបានចាប់ផ្តើមព្យាបាលបង្ការដោយ INH (Started IPT) ក្នុងត្រីមាសនេះ (Number of actives patients started IPT)	> 14			0	G
ចំនួនអ្នកជំងឺបេង-អេដស៍កំពុងព្យាបាល OI បានចាប់ផ្តើមព្យាបាលបង្ការដោយ Cotrimoxazole (CPT) នៅក្នុងត្រីមាសនេះ (Number of TB-HIV patients on OI Started Cotrimoxazole during this quarter)	> 14			0	H
ចំនួនស្ត្រីបានព្យាបាល OI មានផ្ទៃពោះក្នុងត្រីមាសនេះ (Number of women on OI got pregnant during this quarter.)				0	I
ចំនួនស្ត្រីមានផ្ទៃពោះបានចាប់ផ្តើមការព្យាបាលបង្ការដោយ ARV ក្នុងត្រីមាសនេះ (Number of pregnan women started ARV Prophylaxis.)				0	J
ចំនួនស្ត្រីមានផ្ទៃពោះដែលបានរាយការណ៍ថា (Number of pregnan women reported)	រលូត (Spontaneous abortion)			0	
	រំលូត (Induced abortion)			0	K

ថ្ងៃ ខែ ឆ្នាំធ្វើរបាយការណ៍ (Date Reported):		
ឈ្មោះ និងហត្ថលេខាអ្នកធ្វើរបាយការណ៍ (Report completed by)		
ឈ្មោះ និងហត្ថលេខាអ្នកអនុម័តអោយធ្វើរបាយការណ៍ (Report Approved by)		

Formula: D = A + B - C *A = D from Previous Quarter* ***A = D*** នៅក្នុងរបាយការណ៍កាលពីត្រីមាសមុន

* **ពិនិត្យសុខភាពរកវត្តមានជំងឺរបេង (+)**: មានវត្តមានសញ្ញាណាមួយក្នុងចំណោមវត្តមានសញ្ញាទាំងបី. **(-)**: មិនមានវត្តមានសញ្ញាណាមួយក្នុងចំណោមវត្តមានសញ្ញាទាំងបី

[1] **បាត់អូស Lost**: រាប់បញ្ចូលទាំងអ្នកមិនបានឃើញមកតាមគ្លីនិកនេះយះពេល>/=៦ ខែ និង អ្នកដែលបានបញ្ជូនចេញ [1] **Lost**: included lost (not seen in the clinic >/=6 months) and transfered out

[2] **Eligible**: អ្នកជំងឺដែលបានចាត់ទុកក្នុងដំណាក់កាល ទី៤ របស់ WHO ឬ CD4 ទាបជាង ៣៥០ /mm^3.. (ល័ក្ខណ្ឌទាំងនេះអាចនឹងមាន ការផ្លាស់ប្តូរនៅពេលដែល មានការផ្លាស់ប្តូរនៅក្នុងគោលការណ៍ណែនាំ) (patient at WHO stage4 or CD4 below 350 /mm3,... (definition ***may change based on the National guidelines***)

** **ការបម្រុងជាជំហ៊ាន :** ១-ការបង្ការជំងឺកាមរោគ, ២-ការផ្តល់ប្រឹក្សាអំពី ART Adherence, ៣-ណែនាំអំពីការពន្យាកំណើត, ៤-ណែនាំអំពី TB Infection Control, ៥-ស្ថានភាពដៃគូ, ៦-ផ្តល់ប្រឹក្សាអំពីការប្រើប្រាស់ស្រោមអនាម័យ, ៧-ចំនួនស្រោមអនាម័យដែលបានផ្តល់អោយ (*** PP services include** : 1-STI prevention, 2-ART Adhearence, 3-Birth spacing / safe abortion/ safe pregnancy, 4-TB Infection control, 5-Partner status, 6-Advice and counselling on condoms use, 7-Number of condoms given)

Last update: 12-Dec-2010

Enclosure 1c: ART Report

មជ្ឈមណ្ឌលជាតិប្រយុទ្ធនឹងជំងឺអេដស៍ សើស្បែក និងកាមរោគ

National Center for HIV/AIDS Dermatology and STD

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របាយការណ៍ប្រចាំត្រីមាសស្តីពីការព្យាបាលដោយ ARV

Facility ART report

ឈ្មោះមន្ទីរពេទ្យបង្អែក,គ្លីនិក (Facility)	លេខកូដ (Facility Code)				
ឈ្មោះស្រុកប្រតិបត្តិ (Operational District)	ខេត្ត-ក្រុង (Province)				
ឆ្នាំ (Year) :	ត្រីមាសទី (Quarter)				

ប្រភេទ (Category)		អាយុ Age	ភេទ (Sex) ប្រុស Male	ភេទ (Sex) ស្រី Female	សរុប Total	
ចំនួនអ្នកជំងឺដែលសកម្ម ទទួលបានការព្យាបាលដោយ ART នៅចុងត្រីមាសមុន (Number of Active Patients on ART at the end of preceding quarter)		> 14			0	
		0 - 14			0	A
ចំនួនអ្នកជំងឺថ្មីចាប់ផ្តើមព្យាបាលដោយ **ART** នៅក្នុងមន្ទីរពេទ្យបង្អែក/គ្លីនិក នៅក្នុងត្រីមាស (Number of new patients started on ART Care at this facility during this quarter)	>14	**សរុបអ្នកជំងឺថ្មី > 14**			0	
		បានធ្វើរោគវិនិច្ឆ័យថាមានជំងឺរបេង Diagnosed TB (BK+ / - , EP)			0	
		បានចាប់ផ្តើមព្យាបាលជំងឺរបេង (TB Tx Started)			0	
		មានផ្ទៃពោះ (Pregnant)			0	
		ការបង្ការជាវិជ្ជមាន (ផ្តល់សេវាពបែបយ៉ាងតិច) Positve Prevention (at least 3 *)			0	
	សរុបអ្នកជំងឺ ART ថ្មី 0 - 14				0	
	សរុបអ្នកជំងឺថ្មីទាំងអស់ Total all new ART patients		0	0	0	B
ចំនួនអ្នកជំងឺដែលបានបញ្ជូនចូល នៅក្នុងរយៈពេលត្រីមាស (Number of Patients transferred in during this quarter)		> 14			0	
		0 - 14			0	
		សរុប Total	0	0	0	C
ចំនួនអ្នកជំងឺដែលចាកចេញពីការ ព្យាបាលដោយ **ART** ក្នុងត្រីមាស (Number of patients who left ART Care during this quarter)	បញ្ជូនចេញ (Transferred Out)	> 14			0	
		0 - 14			0	
	លះបង់ការព្យាបាល (Lost) [1]	> 14			0	
		0 - 14			0	
	ស្លាប់ (Died)	> 14			0	
		0 - 14			0	
	សរុបអ្នកជំងឺដែលចាកចេញពីការព្យាបាល ART ទាំងអស់		0	0	0	D
ចំនួនអ្នកជំងឺដែលសកម្ម ទទួលព្យាបាល ដោយ **ART** រហូតដល់ចុងត្រីមាស (Number of active patients at end of quarter)		> 14			0	
		0 - 14	0	0	0	
		សរុប Total	0	0	0	E

ចំនួនអ្នកជំងឺកំពុងទទួល ART បានធ្វើរោគវិនិច្ឆ័យថាមានកើតរបេង ក្នុងត្រីមាសនេះ (Number of patients active on ART diagnosed TB (BK+/-, EP) during this quarter.)	> 14			0	
ចំនួនអ្នកជំងឺកំពុងទទួល ART បានចាប់ផ្តើមព្យាបាលជំងឺរបេង នៅក្នុងត្រីមាសនេះ (Number of patient active on ART Started TB Treatment during this quarter)	> 14			0	F
ចំនួនអ្នកជំងឺរបេង-អេដស៍កំពុងព្យាបាល ART បានចាប់ផ្តើមព្យាបាលបង្ការដោយ Cotrimoxazole (CPT) នៅក្នុងត្រីមាសនេះ (Number of TB-HIV patients on ART Started Cotrimoxazole during this quarter)	> 14			0	G
ចំនួនស្ត្រីបានព្យាបាល ART មានផ្ទៃពោះ ក្នុងត្រីមាសនេះ (Number of woman on ART got pregnant during this quarter)				0	H
ចំនួនស្ត្រីមានផ្ទៃពោះដែលបានរាយការណ៍ថា (Number of pregnan women reported)	រលូត (Spontaneous abortion)			0	
	រំលូត (Induced abortion)			0	I
ថ្ងៃ ខែ ឆ្នាំធ្វើរបាយការណ៍ (Date Reported):					
ឈ្មោះ និងហត្ថលេខាអ្នកធ្វើរបាយការណ៍ (Report completed by)					
ឈ្មោះ និងហត្ថលេខាអ្នកអនុម័តអោយធ្វើរបាយការណ៍ (Report Approved by)					

E = A+B+C-D *A = E from Previous Quarter* *A = E* នៅក្នុងរបាយការណ៍កាលពីត្រីមាសមុន

[1] **បាត់មុខ** Lost: រាប់បញ្ចូលទាំងអ្នកមិនបានឃើញមកការស្លីនិកនេះរយៈពេល >/=3 [1] **Lost**: included lost (not seen in the clinic >/=3 months)

* **ការបង្ការពិជិមាន :** ១-ការបង្ការជំងឺកាមរោគ. ២-ការផ្តល់ប្រឹក្សាអំពី ART Adherence, ៣-ណែនាំអំពីការពន្យារកំណើត. ៤-ណែនាំអំពី TB Infection Control, ៥-ស្ថានភាពដៃគូ. ៦-ផ្តល់ប្រឹក្សាអំពីការប្រើប្រាស់ស្រោមអនាម័យ. ៧-ចំនួនស្រោមអនាម័យដែលបានផ្តល់អោយ (* **PP services include** : 1-STI prevention, 2-ART Adhearence, 3-Birth spacing / safe abortion/ safe pregnancy, 4-TB Infection control, 5-Partner status, 6-Advice and counselling on condoms use, 7-Number of condoms given)

Last update: 12-Dec-2010

Enclosure 1d: EID Report

Exposed Infant Diagnose Reporting: Facility Exposed Infant Report

National Center for HIV/AIDS, Dermatology and STD

Facility	Facility Code					
Operational District	Province/City					
Year	Quarter No.					

Category		Sex		Total	
		Male	Female		
Number of Exposed Infants Receiving Care at the end of Preceding Quarter					A
Number of New Exposed Infant (First Care Visit) during quarter	**≤ 2 months**				
	> 2 months				
	Total				B
Number of Expose Infant stated Cotrimoxazole during semester	**≤ 2 months**				
	> 2 months				
	Total				C
Number of Exposed Infant Tested DNA PCR 1 during Quarter	**≤ 2 months**				
	> 2 months				
	Total				D
Number of Exposed Infant Tested DNA PCR 1 during Quarter	**Result (+)**				
	Result (-)				
	Waiting				
	Total				E
Number of DNA PCR 1 Confirmatory test during this quarter	**Result (+)**				
	Result (-)				
	Waiting				
	Total				F

Number of Exposed Infant Tested DNA PCR2 during this Quarter	**Result (+)**				
	Result (-)				
	Waiting				
	Total				G
Number of DNA PCR 2 Confirmatory test during this quarter	**Result (+)**				
	Result (-)				
	Waiting				
	Total				H
Number of Exposed Infant Tested DNA PCR in case of **OI Symptomatic** during this Quarter	**Result (+)**				
	Result (-)				
	Waiting				
	Total				I
Number of DNA PCR confirmatory test in case of IO Symptomatic during this quarter	**Result (+)**				
	Result (-)				
	Waiting				
	Total				J
Number of Exposed Infant who left Care during quarter	**Dies**				
	HIV – Discharged				
	HIV + received Pediatric AIDS Care				
	Total				k
Total Number of Exposed Infant at the end of this quarter					L

Date Reported		
Report completed by		
Report approved by		

Enclosure 1e: LR / PMTCT Report

Linked Response Reporting: PMTCT/Linked Response Report

KINGDOM OF CAMBODIA
NATION RELIGION KING
Ministry of Health

Quarter……. Year 20…….

Section I-ANC Service Information	**Month** ……. …..	**Month** ……. …..	**Month** ……. …..
1. Blood testing for pregnant women			
1-Total women come for ANC1			
1.1-Total women come for ANC1 at Health Center			
1.2-Total women come for first ANC at communities/outreach			
2-Number of women come for ANC4			
3-Number of women known about HIV status during this pregnancy			
3.1-Number of women at ANC who already have HIV (-) result during this pregnancy			
3.2-Number of HIV (+) women who already self referred/referred from other service to ANC			
4-Number of blood samples of pregnant women referred to laboratory			
4.1-Number of HIV (+) blood samples			
4.2-Number of pregnant women who receive test result			
4.2.1-Number of HIV (+) pregnant women			
5-Number of pregnant women tested for Syphilis (Rapid Test)			
5.1-Number of positive Syphilis results of pregnant women by rapid test			
5.1.1-Number of positive Syphilis of pregnant women by rapid test referred for RPR confirmatory test			
5.1.1.1-Number RPR positive test result			
5.1.1.1.1-Number of pregnant women who started Syphilis treatment			
6-Number of pregnant women tested for anemia			
6.1-Number of HIV (+) pregnant women tested for anemia			
7-Number of pregnant women tested for proteinuria			
7.1-Number of HIV (+) pregnant women tested for proteinuria			
8-Number of pregnant women tested for glucose			
8.1-Number of HIV (+) pregnant women tested for glucose			
2.Partner blood testing/ pregnant women husband at ANC			
9-Number of partners/husband tested for HIV			
9.1-Number of partners/husband who received test result			
9.1.1-Number of partners/husband tested HIV (+)			
10-Number of partners/ husband of HIV (+) pregnant women tested for HIV			
10.1-Number of partners/ husband who received result			
10.1.1-Number tested HIV (+)			
3.Blood testing for other patients			
11-Number of TB patients tested for HIV (referred blood sample to laboratory)			

12-Number of TB patients received HIV test result			
12.1-Number of HIV (+) TB patients			
13-Number of Syphilis patients tested for HIV			
14-Number of Syphilis patients received HIV test result			
14.1-Number of HIV (+) Syphilis patients			
15-Number of general patients tested for HIV (referred blood sample to laboratory)			
16-Number of general patients received HIV test result			
16.1-Number of HIV (+) general patients			
4.Family Planning			
17-Number of pregnant women with HIV used advance Family Planning/modern contraceptives (current users)			
17.1-Number of mothers with HIV start using advance Family Planning/modern contraceptives at 6 weeks after delivery			
Section II-Delivery and Taking Care After Delivery			
1.Taking Care and Treatment during delivery			
1-Number of mother delivered in health facility			
1.1-Number of mothers delivering with known HIV status			
1.1.1-Number of mother with HIV			
1.1.1.1-Number of HIV (+) mothers reported receiving ART			
1.1.1.2-Number of of HIV (+) mothers reported receiving triple ART prophylaxis during pregnancy			
1.1.1.3-Number of HIV (+) mothers at delivery who received ART prophylaxis only during labor and delivery/post natal care			
1.2-Number of mother with unknown HIV status at delivery			
1.2.1-Number of mothers with unknown HIV status who were tested and received result during delivery			
1.2.1.1-Number of HIV (+) mothers			
1.2.1.1.1-Number of mother received preventive medicine during labor and delivery/post natal care			
2-Number of mother with HIV who delivered at referral hospital			
3-Number of mother with HIV who delivered at health center			
4-Number of exposed infants born from mother with HIV			
4.1-Numer of stillbirths/neonatal deaths at maternity ward			
5-Number of HIV exposed infants who received ARV prophylaxis supply for 6 weeks			
6-Number of mothers with HIV who received infant feeding counseling			
6.1-Number of mothers who wish to breast feed			
6.2-Number of mothers who wish to replacement feed			
2.Taking Care and Treatment After Delivery			
7-Number of mothers who received at least 2 PNC visits, including women with HIV			
Section III-OI/ART Information			
1.Safe abortion			

1-Number of HIV (+) pregnant women who reported spontaneous and induced abortion			
1.1-Number of pregnant women with HIV who reported induced abortion			
2.Treatment for mother			
2-Number of HIV (+) mothers who received ART treatment for own health (ART cohort)			
3-Number of HIV (+) mothers who started ARV Prophylaxis (pre-ART cohort)			
3.Exposed Infant			
4-Number of infants born to HIV (+) mothers reported receiving 6 weeks supply of daily NVP or AZT suspension			
5-Number of infants born to HIV (+) mothers started CTx prophylaxix before 2 months of age			
6- Number of infants born to HIV (+) mothers reported exclusive breast feeding at 6 months			
7- Number of infants born to HIV (+) mothers reported formula feeding at 6 months			
8- Number of infants born to HIV (+) mothers reported mixed feeding at 6 months of age			
9-Number of exposed infants tested for HIV			
9.1-Number of exposed infants received first HIV-DNA-PCR test			
9.1.1-Number of exposed infants received first HIV-DNA-PCR test before 2 months of age			
9.1.2-Number of first HIV-DNA-PCR tests with positive results			
9.1.2.1-Number of confirmatory test of first HIV-DNA-PCR (for positive tests)			
9.1.2.1.1-Number of positive confirmatory tests			
9.2-Number of exposed infants received 2nd HIV-DNA-PCR tests			
9.2.1-Number of positive 2nd HIV-DNA-PCR test			
9.2.1.1- Number of confirmatory tests of 2nd HIV-DNA-PCR (if positive)			
9.2.1.1.1-Number of positive confirmatory tests			
9.3-Number of exposed infants who received HIV-DNA-PCR test, if HIV related symptoms occur			
9.3.1-Number of positive HIV-DNA-PCR tests			
9.3.1.1-Number of confirmatory tests of HIV-DNA-PCR, if HIV related symptoms occur (for positive tests)			
9.3.1.1.1-Number of positive confirmatory tests			
9.4-Number of exposed infants received HIV Antibody test			
9.4.1-Number of exposed infants tested HIV positive			
10-Number of exposed infants died during follow-up			

Enclosure 1f: HBC Report

National Center For HIV/AIDS, Dermatology and STD
Home Base Care and Communities Report
Report for Quarter 20...

* **General Information**

Number of Cities/Provinces:..... . ... Number of Operational Districts:..... Number of Coverages Health Centers:.. ... Number of Teams:... .. ..

I- People Living with HIV/AIDS Information

No.	Name of Cities - Provinces	Number of People Living with HIV/AIDS (PLHIV)											
		Number of PLHA Registered in Pre-ART (OI)						Number of PLHA Registered in ART					
		Number of PLHIV in Previous Quarter	Number of New PLHIV Identified in Quarter	Number of PLHIV Moved Out and Lost in Quarter	PLHIV Died in Quarter	Number of PLHIV Started ART in Quarter	Active Patients in Quarter	Number of PLHIV in Previous Quarter	Number of New PLHIV Identified in Quarter	Number of New PLHIV Started ART in Quarter	Number of PLHIV Moved Out in Quarter	PLHIV Died in Quarter	Active PLHIV in Quarter
1	Kampot												
2	Kandal												
3	Koh Kong												
4	Prey Veng												
5	Siem Reap												
6	Sihanouk Ville												
7	Svay Rieng												
8	Takeo												
9	Pursat												
10	Battam Bang												
11	Banteay Meanchey												
12	Kampong Speu												
13	Kampong Thom												
14	Kampong Cham												
15	Phnom Penh												
16	Oddor Meanchey												
17	Kampong Chhnang												
18	Preah Vihear												
19	Pailin												
20	Kratie												
	Total												

Enclosure 2: Supplementing Questions

Following questions was written and send by email to key personal in NCHADS. Answers were provided in written format as well, and mostly just one person addressed each question.

Questions for DMU and Technical Bureau

Reporting Sources

- **Where are HIV-positive person's deaths captured and who is responsible for reporting it?**
    - Are there any other mechanisms outside ART sites to capture the deaths of HIV positives?
- **Are there any other sources to report HIV events** *(newly diagnosed, advanced infection and deaths)* **other than HTC and ART sites?** If yes: what/who are those sources and to whom do they report?
    - Do private practitioners report HIV events?
    - Do Blood Banks report the number of HIV cases found to NCHADS?
    - What is the role of laboratories in HIV case reporting?
        - Are laboratories responsible of reporting new HIV positive test results to others than those who ordered the tests directly? If yes, to whom do laboratories report? Do they report to NCHADS?
        - Is there any difference between Early Infant Diagnose and Anti-Body testing in terms of reporting responsibility of the laboratories?
- **Does the HIV focal point at OD level have any role in HIV case reporting?** If yes: what events do the focal person report? From where do they gather the information?
- **How many prisons offer HTC?** (For 2011, and 2012 if available)

Reporting Methods

- **In relation to the "Flow Chart of HIV Case Reporting", which you provided us earlier, is there any document describing the responsibilities of each of the personnel?** If yes can you tell us where we can find it?

  - How often have personnel at different levels been offered training in HIV case reporting?
  - Do you think sufficient training has been provided to these officials at each level?
  - If you think training has not been sufficient, what have been the challenges/obstacles?
- **How many times (which years) were the reporting forms revised in the past decade?**
  - Were health care providers/counselors involved in revising the forms in the past? If yes, how were they involved?

Ethical Considerations

- **Is there any specific protocol, which states confidentiality procedures of HIV case reporting?** If yes, can you tell us what are the documents and where we can find them?
- **Are there any security procedures written on HIV case reporting?** If yes, can you share them?

Utilization of data

- **How is feedback being provided to health care workers on the results of the HIV care reporting?**
  - How often?
  - What kind of feedback?
- **Can you describe how the information obtained through HIV case reporting is being used?**

Monitoring and Evaluation

- **How is the case reporting system being evaluated and monitored?**
  - How often are evaluations conducted?
  - How is **timeliness** monitored?
    - Are the HIV cases submitted and processed within a reasonable time? (E.g. ODs are required to report newly identified PLHIV on a quarterly basis. To what extent does this happen in practice?)
    - Are there any existing figures on timeliness in Cambodia? (E.g. how many cases, percentagewise, are reported within 6 and 12 months from diagnosis?)

- How is **completeness** monitored? (Completeness here refers to the extent that the variables expected to be recorded through the case report forms are submitted/reported)
- How is **accuracy** monitored? (Accuracy here refers to the degree of matching/discrepancy between the data recorded and the data reported)
- How is **validity** assessed?
  - (Validity here refers to the degree that submitted data measures what it is supposed to measure, i.e. are reported data within normal ranges)

Development / Future Strategies

- **What elements of HIV case reporting in Cambodia need to be improved, in your view?**

Questions for VCT Unit

- **How many prisons offer HTC?** (For 2011 and 2012 if available)
- **In VCCT, if a person is tested positive, is testing systematically offered to his/her children as well?**
- **In VCCT, if a person is tested positive, is testing systematically offered to his/her spouse/partner?**
- **What elements of HIV case reporting in Cambodia need to be improved, in your view?**

Questions for AIDS Care Unit

- **In Pre-ART and ART sites, are children of PLHIV in care systematically offered testing?**
- **In Pre-ART and ART sites, are spouses of PLHIV in care systematically offered testing?**
- **What elements of HIV case reporting in Cambodia need to be improved, in your view?**

Questions for STI Unit

- **How many STI clinics systematically offer PITC for STI clients?**
- **How many Family Health Clinics offer PITC for STI clients?**
- **What elements of HIV case reporting in Cambodia need to be improved in your view?**