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### Abstract

This was a cross-sectional study to assess the existing AIDS case reporting system at 12 public hospitals. The first part of the study was examination of medical records from 12 public hospitals which were randomly selected from ten public health regions. Total 150 AIDS cases were reviewed for completeness, positive predictive value and representativeness while 140 AIDS cases were examined for timeliness and data quality. The second part of the study included interviewing of 32 officers from 12 public hospitals. Quantitative data was collected through reviewing of medical records. Qualitative data was collected from officers by focus groups discussion and in-depth interviews. The completeness and positive predictive value of the AIDS case reporting was 50.7% and 86.4% respectively. Data quality for date of onset and date of treatment was low. The information provided by the system did not represent the true epidemiological situation and only 20% of the surveillance information was used to monitor the disease patterns. The officers involved in the system were lack of knowledge about the system. They perceived that the AIDS reporting system was a high workload. This study indicated low completeness and somewhat high positive predictive value of the AIDS case surveillance system in Thailand. Furthermore, it highlighted the essential need to encourage AIDS reporting in public hospitals.

**Key word:** existing AIDS case report system, public hospitals

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### INTRODUCTION

Use of the case reporting of AIDS as a surveillance tool involves systematic notification of all new diagnoses to a central surveillance unit in Thailand. A standard form (Form 506/1) is used throughout the country to record the epidemiological data of all reported cases. Disease reports are collected monthly and transferred to a higher level via email. The data are analyzed and sent to all the organizations involved in each level. Literature reviews suggested that the AIDS case reporting system needed improvement. Completeness of the AIDS case reporting needed to be increased<sup>(1,2,3)</sup> and in one study, representativeness of the reports by place was low<sup>(4)</sup>. Accuracy regarding to date of onset and date of treatment was low. These variables are important because it may affect treatment of patients<sup>(5)</sup>. There had been lack of research designed to evaluate the entire AIDS case reporting system in Thailand as most studies have assessed only some

attributes of the surveillance system<sup>(1,2,4,5)</sup>. The aim of this study was therefore to conduct comprehensive evaluation of the existing AIDS case reporting system in public hospitals located in two provinces of northeastern Thailand.

## MATERIALS AND METHODS

The study used a cross-sectional design. The research was conducted in 12 public hospitals which were randomly selected from ten public health regions and situated in two provinces of northeastern Thailand.

Quantitative study: There were medical records of patients who had been diagnosed as AIDS. Medical records of 150 patients out of 163,791 patients in 2010 were analyzed for representativeness, completeness and positive predictive value (PPV) of reporting. The medical records were randomly selected from January to June 2010. Moreover, medical records of 140 patients were analyzed for data quality and timeliness. This was conducted by simple random sampling of all patients who were reported to the AIDS case reporting system during the period January-December 2010.

Qualitative study: Target population was 40 officers from those workplaces. The study group consisted of 32 persons who were willing to participate in the study after being informed by the researchers.

Data collection: The study used both quantitative and qualitative methods to assess the AIDS case surveillance system according to the updated guidelines for evaluating surveillance systems<sup>(6)</sup>.

Quantitative data: To investigate the completeness and PPV of case reports, the medical records were reviewed by two experts. Decisions about presence of the disease were based on the standard AIDS case definition<sup>(7)</sup>. The experts reached agreement on every diagnosis. These diagnoses were used as the gold standard. Kappa coefficients were computed to assess the levels of agreement between the medical records and the Form 506/1 on various epidemiological variables. Representativeness was assessed by comparing the

number of reported cases from the Form 506/1 with active case finding from medical records during the same period. Data quality was assessed by comparing the medical records and the Form 506/1 as reviewed by the researchers. Timeliness was based on number of days between date of disease diagnosis and date of reporting to the public hospital. Cases reported more than one month after diagnosis were considered to be delayed reporting.

Qualitative data: In focus groups discussion, each group consisted of 10-12 participants, with total 3 groups, and 18 participants were included for in-depth interviews. All group discussion and interview sessions lasted 60 to 80 minutes, and were recorded for later verbatim transcription.

Quantitative data analysis: Sensitivity, PPV, timeliness and representativeness were analyzed using frequencies, percentages and 95% confidence intervals (CI). Cohen's unweighted kappa coefficients were used to analyze agreement between the AIDS case reports and the reviewers' opinions.

Qualitative data analysis: Information obtained from the recorded focus group discussions and in-depth interviews was analyzed by content analysis<sup>(8)</sup>.

Trustworthiness: The guidelines suggested by Guba and Lincoln<sup>(9)</sup> were used to strengthen the trustworthiness of the study outcomes.

## RESULTS

The AIDS surveillance system was evaluated with respect to nine attributes as below.

Simplicity: The structure of AIDS case reporting system in hospitals was simple (Figure 1).

Stability: The system could be regarded as stable.

Flexibility: The system used standard AIDS data formats, but could not integrated with other systems.

Acceptability: Majority officers did not pay attention to working with the current system as they perceived it to be unimportant. They considered the system was too complicated and included duplicated data on AIDS

which could be accessed using other sources and regarded as a waste of time. As one officer said, “Nowadays, there are many AIDS data storage programs, but they cannot share information. We are made redundant. Make the staff above fails and not want to work. It’s a waste of time to do this”. Moreover, little attention was paid to the administrators of the local area by the officers with regard to reporting requirements as the reporting was not considered as a key policy in the district.

**Completeness:** The completeness of reporting was low (Table 1). The officers lacked of knowledge as they had never been trained to complete the reports and they did not want the additional work. They also seemed to lack understanding of their particular role in the operational process. In more than 50% of the target hospitals, the officers responsible for the reporting process were not clearly identified, leading to frequent changes in the officers doing the work, which prevented the process from operating smoothly. One officer expressed, “I have never known how to report AIDS. I just diagnose the cases. No one tells me about reporting cases. I just carry on doing my job – diagnosis. If you want this operational process to work well, there should be coordinators and they have to keep monitoring the process”.

**Positive Predictive Value (PPV):** Overall, 86.4% of all of the AIDS case report diagnoses were found to be accurate in terms of the standard case definition criteria (Table 1). However, the PPV for each hospital ranged from 0% to 100%. The problem was that the officers reported AIDS according to their own criteria, without using the standard AIDS case definition. One officer remarked, “I worked here for a long time without knowing about the standard AIDS case definition. I just diagnosed all cases as I usually do. If you want to improve AIDS reporting, you should make sure that everyone knows about the standard case definition”.

**Representativeness:** Percentage of AIDS cases reported using the Form 506/1 was 58.7% (88/150) (Figure 2). The officers lacked motivation for reporting AIDS cases as most of them were aware that consequences of failing to provide AIDS reports were less severe than that of failing to provide other kinds of reports. One officer said, “Sometimes I think ‘why do I need to make a report?’ because some officials do not report but nothing happens. We don’t use anything from the report. Report or don’t report, no one knows”. Moreover, the officers changed very frequently, leading to lack of continuity in the work.

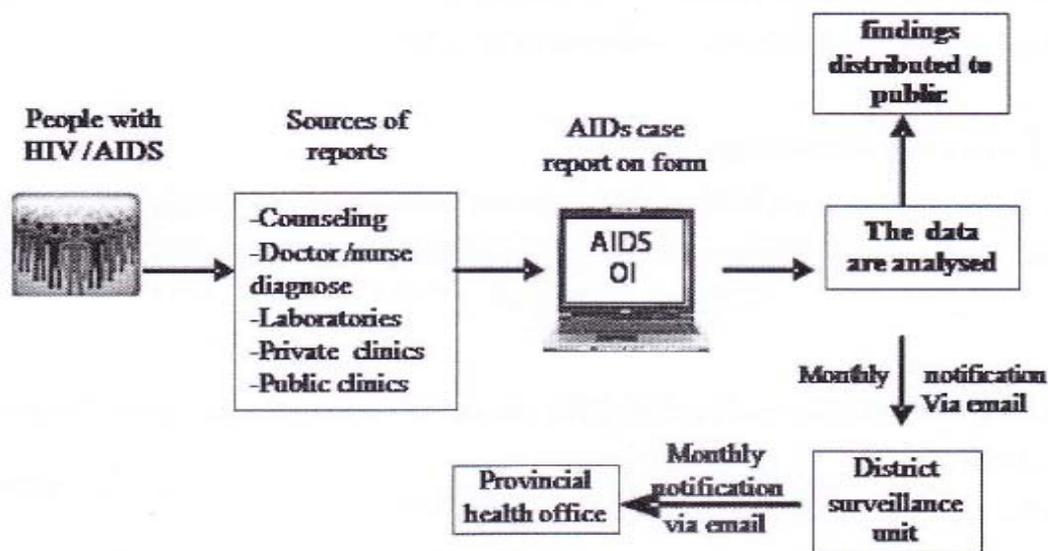
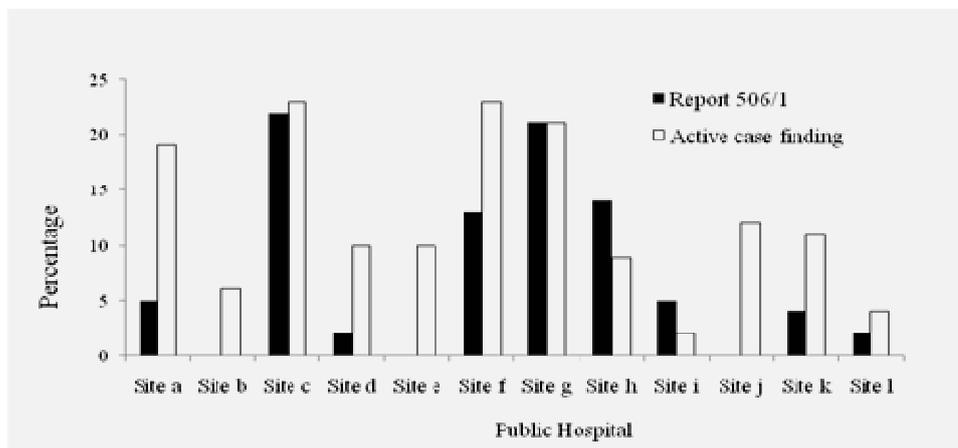


Figure 1 Flow of information in the AIDS case report system in public hospital, Thailand, 2010



**Figure 2** Percentage of reporting in the report Form 506/1 compared with the medical records during the period January 1 – March 30, 2010, Thailand (n=150). Active case finding means the patient was discovered by review of medical records.

**Data quality:** Level of agreement between the information provided in the original case reports and the medical records was greater than 70%. However, the level of agreement was low for important variables (Table 2). The officers lacked knowledge on case reporting and there was insufficient data quality control. The officers who diagnosed the patients and the officers who reported the cases were different individuals. This could have lead to mistakes. One officer explained, *“I’ve worked for nearly 10 years. I entered AIDS data from the medical records and untried data into the AIDS program. I don’t know for sure whether this was right or wrong. I’m just realized now how wrong this has been for a long time”*.

**Usefulness:** The AIDS information was not useful for monitoring the disease pattern and trends of AIDS. As many as 80% of the officers had never been trained on the AIDS case reporting. Consequently, they did not paid attention to the operational process as they should and they also lacked skills and knowledge for data analysis to use the information correctly. In addition, policy information and feedback from the national level was insufficient. One officer said, *“The policy regarding AIDS reporting was unclear. And, when the central office says nothing, what can we do? Also, the administrators never ask about AIDS reporting, so the officers pay less attention or even no attention to the operation”*.

**Timeliness:** During 2010, 58.33% of the hospitals sent monthly reports to the Provincial Health Office (PHO) via email or hard copy. In addition, 75% of the hospitals had not sent their reports continuously over last two years. The officers perceived the AIDS reporting to be unimportant and inconvenient. While various programs were used for collecting data, AIDS-OI and the Napha extension program, these programs were not linked. This caused confusion and resulted in overlapping of the reporters’ tasks. *“I thought that AIDS reporting should be cancelled because I did not see any information about the reports. Also, we have not been motivated to complete the reports. People in this position are always being changed. It is like a boring pill. No one wants to work in this position”*.

#### DISCUSSION

The AIDS case surveillance system in public hospitals can be used as a tool for monitoring disease trends, and recommending effective disease prevention and control measures. The existing situation in this study demonstrated that there were some problems within core activity of the case reporting and lack of support from the higher level. Most of the officers were responsible and sent data to the higher level. However, this data was not analyzed and no feedback was provided. This finding was similar to other studies in Thailand<sup>(10)</sup>. In addition, the AIDS case data was not

used in a meaningful way to analyze or monitor disease pattern and trends. The officers only collected the data to report to the higher level, without performing any data analysis, as they were not aware of the usefulness of this process. The administrators only used the data for decision-making at lower level. Making use of the data to solve problems in the local areas was minimal. They perceived that the AIDS case reporting was not important and were reluctant to report AIDS cases. However, this was different to other studies<sup>(11)</sup> which found that the surveillance information was useful for describing the basic epidemiology of disease and could help monitoring disease patterns and trends. This study indicated that the local officers had lack of awareness on data analysis and poor quality control from higher level.

The completeness of reporting was low and varied from 0-100%, whereas the standard AIDS case reporting procedures stated that data should be provided into the system with at least 70% of completed information<sup>(12)</sup>. Therefore, the information did not indicate the magnitude of the problem in northeastern Thailand. These findings differed from another assessment conducted in developed country<sup>(13)</sup> with high completeness of reporting. In this study, the officers believed that reporting system was unimportant and inconvenient. In addition, the officers had lack of knowledge of reporting process.

PPV ranged from 0-100%, whereas according to the standard AIDS case reporting procedures, data should be provided into the system with at least 80% of completed information<sup>(12)</sup>. The number of diagnoses following the standard AIDS case definition was low because most of the officers were not aware of the standard AIDS case definition and reported based on their own experiences. This caused confusion in the reporting. Besides, the management of reporting was inefficient as the policy was unclear. Thus, the officers were not motivated to pay attention for reporting.

Moreover, as they had never discussed about the standard AIDS case definition, some local officers did not know the details of the standard AIDS case definition. This was similar to other studies in Thailand<sup>(15)</sup> which revealed that the officers did not use the standard case definition to report cases.

The data quality of reporting was low. Some data variables were important as they might affect treatment of the patients. In contrast, a study in the United States<sup>(15)</sup> found that data quality was high. This could be due to the fact that diagnostics and data entry into the system were a one-stop process in developed countries as the physician who examined the patient entered the data into the computer. The situation was different in Thai hospitals as the physician only recorded disease diagnosis on medical record and then medical statisticians undertook the data entry. Moreover, the local officers lacked supervision on quality control, causing low rate of the definition use.

Overall, the representativeness of the data was low, indicating that the AIDS case reporting system did not reflect the actual situation. This was similar to observations in Japan where only 50% of cases were reported into the system<sup>(11)</sup>. This was in contrast to developed countries where almost all cases were reported and the data closely reflected the real situation<sup>(13)</sup>. In this study, participatory observation revealed that the officers were frequently reassigned, often with no single individual responsible for reporting. This led to lack of coordination in the local areas, resulting in case reports that might not be sent to the higher level for several years.

There were several reasons for the poor performance of officers. The reporting policy was not well enforced at the national level and was not in line with attitudes of the officers. They perceived the reporting system as unimportant and inconvenient, and also lacked the skills and knowledge required for effective data analysis. The reporting was of no benefit to the local officers.

They lacked the knowledge and supervision to develop their work, and this poor information management required improvement. Overall, the officers with lacked of awareness of reporting and quality control were not enforced at the higher level. There were lack of motivation and feedback on data collection from the higher level as well.

There were two limitations. One was that a “gold standard” was used to evaluate completeness and PPV. Additionally, two experts assessed the AIDS case diagnoses and they might have some different opinions regarding to conclusions of the diagnoses. However, the diagnostic criteria used were standardized before the study began.

**Table 1** Completeness and Positive Predictive Value of reporting of public hospital

Public Hospital	Total (case) (a+c)	Report 506/1 (a+b)	No.of accuracy report(a)	No.of inaccuracy report(b)	Active case finding(c)	Completeness (a*100)/(a+c)	PPV (a*100)/(a+b)
Site a	19	5	5	0	14	26.3	100.0
Site b	6	0	0	0	3	0.0	-
Site c	23	22	20	2	3	87.0	90.9
Site d	10	2	2	0	8	20.0	100.0
Site e	10	0	0	0	3	0.0	-
Site f	23	13	12	1	11	52.2	92.3
Site g	21	21	20	1	1	95.2	95.2
Site h	9	14	9	5	0	100.0	64.3
Site i	2	5	2	3	0	100.0	40.0
Site g	12	0	0	0	10	0.0	-
Site k	11	4	4	0	7	36.4	100.0
Site l	4	2	2	0	2	50.0	100.0
Total	150	88	76	12	62	50.7	86.4

Footnote: Site means public hospital

**Table 2** Levels of agreement between data recorded in reporting forms and in medical records

Data item	No. of reports	Percent agreement	Kappa
Occupation	140	79.29	0.79
Place	140	77.14	0.77
Date of visit	140	76.43	0.76
Date of onset	140	49.30	0.49
Type of patients	140	54.29	0.54
Risk factors	140	64.29	0.69

In conclusion, the AIDS case reporting is an important tool in disease monitoring, which can enable appropriate disease control and response planning. However, the AIDS case reporting at public hospitals still needed improvement, especially with respect to PPV, data quality, timeliness and usefulness in order to support the system more effectively. Furthermore, this

study showed that AIDS case reporting could be enhanced by improving its starting point, the actual case reporting process, as the reporting process determines the accuracy of the information in the system database. In addition, there needed to improve on representativeness and completeness in order to represent the actual situation more accurately. The

AIDS case reporting should be empowered in terms of policy. These improvements might lead to improve on the data on AIDS cases in Thailand and contribute to motivate officers in the reporting process. If the system improves, improvements on situation of AIDS as a public health issue may follow and the problems associated with this disease may potentially be solved more easily.

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### แนะนำการอ้างอิงสำหรับบทความนี้

เกษร แถวโนนจิว, พวงทิพย์ รัตนะรัตน์, สุภาลักษณ์ หมายสุข, อีรยุทธ แก้วสิงห์, จุมจี รัตนวงศ์, กิติพิชญ์ จันท์, ปานแก้ว รัตนศิลป์กัลชาญ, วัฒนา นิลบรรพต. การเฝ้าระวังโรคเอดส์โดยการรายงานในโรงพยาบาลสังกัดกระทรวงสาธารณสุข ภาคตะวันออกเฉียงเหนือ ปี พ.ศ. 2554. รายงานการเฝ้าระวังทางระบาดวิทยา ประจำสัปดาห์ 2556; 44: S15-22.

### Suggested Citation for this Article

Thaewnongiew K, Ratanarat P, Maisuk S, Kaewsig T, Ratawong J, Chantee K, Ratanasilkulchan P, Nilpot W. Surveillance Evaluation on Existing AIDS Case Reporting System in Public Hospitals in Two Selected Provinces of North-eastern Thailand, 2011. Weekly Epidemiological Surveillance Report 2013; 44: S15-22.

## การเฝ้าระวังโรคเอดส์โดยการรายงานในโรงพยาบาลสังกัดกระทรวงสาธารณสุข ภาคตะวันออกเฉียงเหนือ ปี พ.ศ. 2554

ผู้เขียนบทความ: เกษร แถวโนนจิว<sup>1</sup> พวงทิพย์ รัตนะรัตน์<sup>2</sup> สุภาลักษณ์ หมายสุข<sup>3</sup> อีรยุทธ แก้วสิงห์<sup>4</sup> จุมจี รัตนวงศ์<sup>5</sup>  
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<sup>6</sup> สำนักงานสาธารณสุข จังหวัดขอนแก่น

### บทคัดย่อ

การศึกษานี้เป็นการศึกษาภาคตัดขวาง เพื่อประเมินระบบเฝ้าระวังโรคเอดส์โดยการรายงานในโรงพยาบาลสังกัดกระทรวงสาธารณสุข 12 แห่ง (สุ่มจากเขตตรวจราชการที่ 10) ข้อมูลส่วนแรกทำการทบทวนประวัติผู้ป่วยที่มารับการรักษาในโรงพยาบาลสังกัดกระทรวงสาธารณสุข 12 แห่ง จำนวน 150 ราย เพื่อประเมินความครบถ้วน ค่าทำนายผลบวก และความเป็นตัวแทนของการรายงาน และประวัติผู้ป่วย 140 รายเพื่อประเมินความทันเวลาและคุณภาพของข้อมูล ข้อมูลส่วนที่สองเก็บรวบรวมจากบุคลากรที่เกี่ยวข้องกับการรายงานเอดส์จำนวน 32 คนจากโรงพยาบาลทั้ง 12 แห่ง ข้อมูลเชิงปริมาณเก็บรวบรวมข้อมูลโดยการทบทวนเวชระเบียนผู้ป่วย ส่วนข้อมูลเชิงคุณภาพเก็บรวบรวมข้อมูลจากบุคลากรที่เกี่ยวข้อง โดยการสนทนากลุ่มและการสัมภาษณ์เชิงลึก ความครบถ้วนและค่าพยากรณ์ผลบวกของการรายงานผู้ป่วยเอดส์ คิดเป็นร้อยละ 50.7 และ 86.4 ตามลำดับ คุณภาพของข้อมูลต่ำในตัวแปรวันเดือนปีที่เริ่มป่วย และวันเดือนปีที่รับการรักษา ข้อมูลในระบบเฝ้าระวังโรคเอดส์ไม่สามารถสะท้อนภาพความเป็นตัวแทนของข้อมูลการเจ็บป่วยที่เกิดขึ้นในพื้นที่ได้ และมีเพียง ร้อยละ 20 ของข้อมูลในระบบเฝ้าระวังที่ถูกนำไปใช้ในการติดตามสถานการณ์โรค เจ้าหน้าที่สาธารณสุขที่เกี่ยวข้องในระบบเฝ้าระวังขาดความรู้ความเข้าใจในการดำเนินงานและมีความเชื่อว่าการรายงานผู้ป่วยเอดส์ไปเพิ่มภาระในการทำงาน การศึกษานี้ชี้ให้เห็นว่า ความครบถ้วนของการรายงานโรคต่ำแต่ค่าพยากรณ์ผลบวกของการรายงานโรคสูง ดังนั้นมีความจำเป็นต้องกระตุ้นการรายงานผู้ป่วยเอดส์ในโรงพยาบาลในสังกัดกระทรวงสาธารณสุขให้มากขึ้นในอนาคต

**คำสำคัญ:** การประเมินระบบเฝ้าระวังโรคเอดส์, โรงพยาบาลสังกัดกระทรวงสาธารณสุข