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IMPROVING HIV AIDS SURVEILLANCE SYSTEM IN GUNUNGKIDUL, INDONESIA: FROM PAPER TO WEB-BASED INFORMATION SYSTEM

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Abstract: Despite the availability of web-based HIV/AIDS information system launched by ministry of health (MoH) in 2012, the HIV surveillance data in Gunungkidul district was still collected manually. This often led to incomplete and inaccurate HIV reports. This study aimed to improve HIV/AIDS surveillance in Gunungkidul. This was a two phases study with the first phase was evaluation of the system and followed by improvement of the HIV/AIDS surveillance system. Participants were the district health office (DHO) and public health centers (PHC) surveillance officers. Data were collected using structured interviews. We found VCT/PITC data had not been documented during 2015 in DHO and web-based information system was not used by PHCs because 77% of the surveillance officers were never been trained. In 2016, after the intervention, 77% of the PHC sent VCT/PITC data using web-based information system. Based on the evaluation findings, we trained 30 PHC officers to use web-based HIV/AIDS information system and developed instruction manual. The report showed that during 2016, the number of people tested for HIV was 1768 people including 1536 pregnant women and 19 tuberculosis patients, and 139 people were referred to advanced counseling. Use of web-based information system was able to increase the completeness of VCT/PITC data. DHO should monitor closely the implementation of web-based information system and provide supportive supervision to the PHCs.

Keywords: Surveillance System, HIV/AIDS, Web-based Information System

Introduction

HIV/AIDS becomes a public health issue globally. At the end of 2014, there are about 36.9 million people living with HIV AIDS around the world, with 1.2 million people died from HIV and 2 million people newly infected with HIV (World Health Organization [WHO] 2016). In Indonesia, the reported number of HIV infections was 219,036 people, with the cumulative number of AIDS was 82,968 people, and 14,279 people died in 2016. The estimated AIDS prevalence was 28.3 per 100,000 population in Indonesia and 32.5 per 100,000 population in Yogyakarta Province (Ministry of Health of Indonesia, 2016).

HIV AIDS surveillance system is designed to provide data and information for decision-making. First generation surveillance relied solely on data on AIDS cases and some sentinel studies on HIV prevalence. In 2000, a new strategy named second generation surveillance (SGS) was promoted to tailor surveillance systems to the epidemic state of a country and the main component of SGS is HIV and AIDS case and mortality reporting (World Health Organization [WHO] 2013). Most of this health reporting has been

dominated by paper-based data collection and storage systems that tend to generate incomplete and inaccurate reports (Garrib *et al*. 2008; Makombe *et al*. 2008)

In 2011, the national HIV program developed an application of web-based HIV/AIDS and STDs surveillance system for HIV and AIDS case and mortality reporting. This application had launched nationally in 2012 (Ministry of Health of Indonesia, 2012). But until 2015, data related to HIV AIDS were still collected manually in Gunungkidul District despite the available web-based HIV AIDS information system has launched by MoH since 2012 (Isfandyari & Langi, 2016).

Because of that reasons, a study was conducted to evaluate HIV AIDS surveillance system and to improve HIV AIDS surveillance system in Gunungkidul 2016

Method

This was a descriptive study with evaluation and intervention of HIV AIDS surveillance system.

Evaluation method

The evaluation conducted from May until July 2016. Participants of evaluation were 31 respondents consisted of surveillance officers from Gunungkidul District Health Office and 30 Public Health Centers. Primary data was collected by interview using structured questionnaires and secondary data obtained from HIV AIDS case report of Gunungkidul DHO by 2015. Evaluation variables were reporting function, supporting function, seven attributes of surveillance system such as simplicity, flexibility, data quality, acceptability, representativeness, timeliness, and stability. Data were analyzed descriptively to assess the performance of HIV AIDS surveillance.

Intervention method

The intervention conducted after the evaluation from August until December 2016. The intervention focused on reporting function as the main component of a surveillance system based on the guideline of the second generation of HIV surveillance. The participants for intervention were 30 PHCs surveillance officers. Methods of the intervention were training using the web-based HIV AIDS information system and developing a short guideline book for the PHCs officers. Training began with installing the application to all surveillance officers' laptop in a one-day meeting. The training was conducted during three days. Ten surveillance officers were trained using the HIVAIDS web-based information system each day in Gungungkidul DHO. All surveillance officers got guideline book after the training. The contents of the book are a glance about HIV AIDS surveillance system, a short report of the current situation of HIV AIDS in Gunungkidul, a manual way to install the software application, and the way to do data entry for individual forms of VCT/PITC using the web-based information system.

Result

1. Respondent Characteristics
   There are 31 respondents of evaluation of HIV AIDS surveillance system in Gunungkidul in 2015. The characteristics of the respondent are shown by Table 1.

Table 1. Respondent Characteristics of Evaluation of HIV AIDS Surveillance System in Gunungkidul, Indonesia, 2015.

Respondent Characteristics	Total (n=31)	
	n	%
Age (Average ± SD) 40 years (±7.7 years)		
Age group		
21-30 years	5	16.13
31-40 years	11	35.48
41-50 years	14	45.16
≥ 51 years	1	3.23
Sex		
Male	14	45.16
Female	17	54.84
Education level		
< Bachelor (Diploma)	25	80.64
≥ Bachelor	6	19.36
Length of work (Average ± SD) 3 years (±2 years)		

Table 1 shows the average of respondents' age was 40 years old. Respondents were dominated by 41-50 age group (45.16%) and female (54.16%). Most of the respondents graduated from diploma worked in the average of 3 years.

2. Result of Evaluation

Reporting function

In 2015, data related to HIV AIDS were collected manually (paper-based). We found that VCT/PITC data had not been documented in Gunungkidul DHO. From the interviews, some PHCs stated that they did VCT/PITC procedure but did not fill the individual forms. In addition, some PHCs did VCT/PTC procedure with the individual forms and send the forms to Gunungkidul DHO. But when the evaluation carried out, there was no VCT/PITC data in Gunungkidul. As the result, there were no data related to HIV screening on pregnant women or TB patients in 2015. Interviews showed that there was no cooperation between PHCs officers who had a responsibility in HIV AIDS, tuberculosis and Maternal and Child Health (MCH). There were 214 HIV AIDS cases in Gunungkidul District from 2006 until 2015. Most of HIV AIDS cases in Gunungkidul was reported from Wonosari Hospital (44,86) only five cases (2.33%) were found through Public Health Centers. The source of case reporting is shown in Table 2.

Table 2. Source of HIV AIDS Case Reporting in Gunungkidul District, 2006-2015

Source of HIV AIDS Case Reporting	District/Cities	n	%
Wonosari Hospital	Gunungkidul	96	44,86
Sardjito Hospital	Sleman	37	17,29
Bethesda Hospital	Yogyakarta	23	10,75
Lung Clinic	Yogyakarta	11	5,14
Panti Rapih Hospital	Sleman	10	4,67
Panembahan Senopati Hospital	Bantul	9	4,20
Gedongtengen PHC	Yogyakarta	7	3,27

Muhamadya Hospital	Yogyakarta	2	0.93
Respira Hospital	Bantul	5	2,33
Tanjungsari PHC	Gunungkidul	3	1,40
Patuk I PHC	Gunungkidul	2	0,93
Grasia Hospital	Sleman	2	0,93
Parahita Laboratory	Yogyakarta	2	0,93
Umbulharjo I PHC	Yogyakarta	1	0,47
Prodia Laboratory	Yogyakarta	1	0,47
Mantrijeron PHC	Yogyakarta	1	0,47
Darmais Hospital	Jakarta	1	0,47
Unknown		1	0,47
Total		214	100

Table 2 shows that half of HIV AIDS cases in Gunungkidul District are reported by health facilities outside Gunungkidul District.

- Supporting function

The supporting function such as supporting facilities and trained human resources for HIV AIDS surveillance system in Gunungkidul District can be seen in Figure 1.

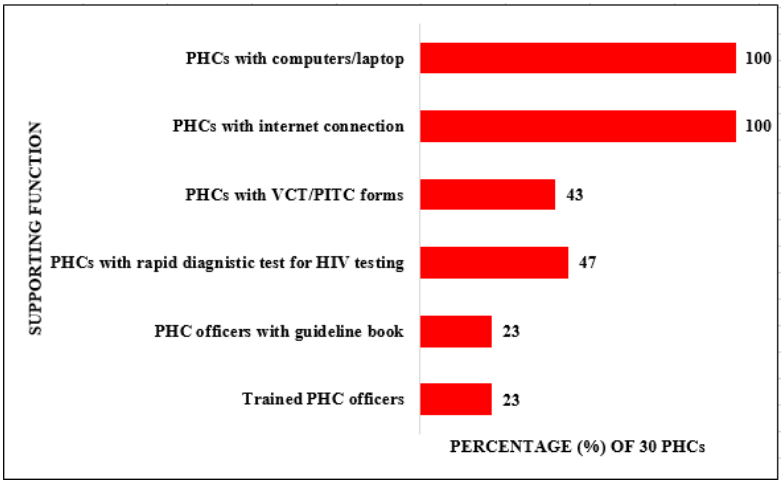

Figure 1. Supporting Function for HIV AIDS Surveillance System in Gunungkidul District 2015

In 2015, seven from 30 PHC surveillance officers (23%) who got training for using web-based HIV AIDS information system and had the guideline book of HIV surveillance system, 14 of 30 PHCs (47%) had rapid diagnostic test for HIV testing and 13 of 30 (43%) PHCs had VCT/PITC forms. All PHCs had an internet connection and computer/laptop.

- Atributes of surveillance system

Simplicity

HIV AIDS surveillance system in Gunungkidul 2015 did not meet the simplicity attribute because most PHC surveillance officers did not understand the main activities of the surveillance system. Most of the PHCs did not give HIV AIDS reports to Gunungkidul DHO especially VCT/PITC data.

Flexibility

HIV AIDS surveillance system in Gunungkidul 2015 did not meet the flexibility attribute because data were still reported with paper-based even though there was a web-based HIV AIDS information system launched nationally since 2012.

Data quality

HIV AIDS surveillance system in Gunungkidul 2015 did not meet the attribute of data quality because there was no VCT/PITC data documented in Gunungkidul DHO in 2015.

Acceptability

HIV AIDS surveillance system in Gunungkidul 2015 did not meet the acceptability attribute. Based on the results of interviews with PHC surveillance officers, it was known that there was the lack of initiatives of key populations to get HIV AIDS testing in PHCs or mobile VCT.

Representativeness

HIV AIDS surveillance system in Gunungkidul 2015 did not meet the attribute of representativeness. Most PHC surveillance officers stated that that HIV AIDS cases found in 2015 were smaller than estimated cases of HIV AIDS in Gunungkidul.

Timeliness

HIV AIDS surveillance system in Gunungkidul 2015 did not meet the attribute of timeliness because most of HIV AIDS cases were delayed to find. There were 63% HIV AIDS cases in Gunungkidul found at the stage of AIDS.

Stability

HIV AIDS surveillance system in Gunungkidul 2015 did not meet the attribute of stability because there were inadequate supporting facilities for program related to HIV AIDS surveillance system in Gunungkidul 2015 and there is no local government regulation to straighten the surveillance activities.

3. Result of Intervention

- Data reporting

After the intervention, at the end of 2016, We found that 23 of 30 PHCs used the web-based HIV AIDS information system for reporting VCT/PITC data. They used the application to report data of people who got HIV testing from January until December 2016 that can be seen in Table 3.

From the application, we found 1768 people had HIV testing and most of them were female (97.11). There were 139 people who referred to the advance counseling for getting the second or the third HIV test to confirm the HIV diagnosis or for getting HIV treatment. There were 1536 pregnant women and 19 Tb patients who got HIV testing during 2016. Data can be directly accessed online using the application by District health office, Province Health Office and Ministry of Health of Indonesia.

Table 3. Monthly Report of VCT/PITC Data from Public Health Center Using Web-based HIV AIDS Information System during 2016.

Public Health Centers	Jan	Feb	Mar	Apr	May	Jun	Jul	Agt	Sep	Oct	Nov	Dec
Panggang I	√	√	√	√	√	-	-	-	-	-	-	-
Panggang II	√	√	√	√	√	√	√	√	√	√	-	-
Purwosari	√	√	-	-	√	√	√	√	-	-	-	-
Palyan	-	-	-	-	-	-	-	-	-	-	-	-
Saptosari	√	√	√	√	√	√	√	√	√	√	√	√
Tepus I	√	√	√	√	√	-	√	√	√	√	-	-
Tepus II	-	-	-	-	-	-	-	-	-	√	√	-
Tanjungsari	-	-	-	√	√	√	√	√	√	√	√	√
Rongkop	-	-	-	√	√	-	-	-	-	-	-	-
Girisubo	√	√	√	√	√	√	√	√	√	√	-	-
Semanu I	-	-	-	-	-	-	-	-	-	√	√	-
Semanu II	-	-	-	-	-	-	-	-	-	-	-	-
Ponjong I	-	-	-	-	-	-	-	-	-	-	-	-
Ponjong II	-	-	-	-	-	-	-	-	-	-	-	-
Karangmojo I	-	-	-	-	-	-	-	-	-	√	√	√
Karangmojo II	-	-	√	-	-	-	-	-	-	-	-	-
Wonosari I	√	√	√	-	√	√	√	√	√	√	√	√
Wonosari II	-	-	-	-	-	-	-	-	-	√	-	-
Playen I	√	√	√	√	√	-	√	√	-	-	-	-
Playen II	√	√	-	-	√	√	√	√	√	√	√	√
Patuk I	-	-	-	-	-	-	-	√	√	√	√	-
Patuk II	-	-	-	-	-	-	-	-	-	-	-	-
Gedangsari I	-	-	-	-	-	-	-	-	-	-	-	-
Gedangsari II	-	-	√	√	√	-	-	-	-	-	-	-
Nglipar I	√	√	√	√	√	√	√	√	√	√	√	√
Nglipar II	√	√	√	√	√	√	√	√	√	√	-	-
Ngawen I	√	√	√	√	√	√	√	√	√	√	√	√
Ngawen II	√	√	√	√	√	√	√	√	√	√	√	-
Semin I	-	√	-	-	√	√	√	√	-	√	√	-
Semin II	-	-	-	-	-	-	-	-	-	-	-	-

- Supporting Function

Supporting function for HIV AIDS surveillance system in Gunungkidul District in 2016 can be seen in Figure 2 which shows the comparison of supporting facilities and trained human resources before and after the intervention of surveillance system in Gunungkidul. After the intervention, all PHCs (100%) had trained officers for using web-based HIV AIDS information system with the guideline book, had the rapid diagnostic test for HIV testing, and had VCT/PITC forms.

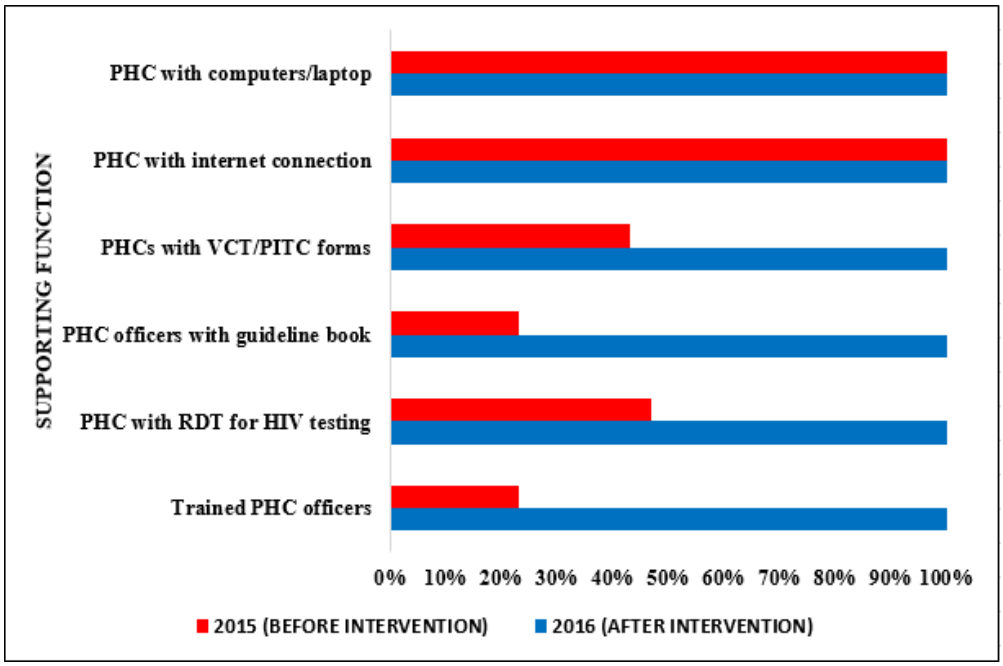

Figure 2. Comparison of Supporting Function Before and After Intervention of HIV AIDS Surveillance System in Gunungkidul District.

Discussion

WHO (2006) defined evaluation as the periodic assessment of the relevance, effectiveness, and impact of activities in the light of the objectives of the surveillance and response systems. The evaluation shows the weakness of HIV AIDS surveillance system in Gunungkidul during 2015, especially in reporting function. HIV AIDS surveillance system in Gunungkidul in 2015 did not meet the attributes of simplicity, flexibility, data quality, acceptability, representativeness, timeliness, and stability. Factors contributing to the weakness of the HIV surveillance system consisted of inadequate facilities (especially guideline book, rapid diagnostic test for HIV testing and VCT/PITC form), lack of trained human resources, and lack of cooperation with other health programs. When data collected with paper-based in 2015, there was no VCT/PITC data documented in Gunungkidul DHO. The previous study showed the continued use of paper-based systems contributes to poor data quality in terms of reliability, availability, timeliness, and completeness of reporting, and compromises health service delivery (Garrib *et al*. 2008; Makombe *et al*. 2008).

After the interventions were given to all surveillance officers in PHCs, VCT/PITC data was documented in Gunungkidul DHO at the end of 2016. Most PHCs used the web-based HIV AIDS information system for reporting VCT/PITC data from January until December 2016. The previous study showed the rapid development of internet technology has changed the way that expert systems can be developed to support data reporting (Duan *et al*. 2005). Haskew *et al*. (2015) described the benefit of using electronic medical record compared to the existing paper record. The study showed that implementation of the cloud-based electronic medical record (EMR) was associated with a significant reduction in missing data. The cloud-based EMR model enables data to be shared across multiple sites in real-time, potentially enhancing access to data at different levels of care. Similar results were also found in this study that showed data can be directly accessed online using the web-based HIV AIDS information system by District health office, Province Health Office and Ministry of Health of Indonesia with their own username and password.

Interviewed with HIV AIDS programmer in Gunungkidul DHO showed that successful intervention or the good results of the intervention was strongly supported by adequate facilities on HIV AIDS program in Gunungkidul in 2016 such as the availability of rapid diagnostic test, VCT/PITC forms, computers/laptop and

good internet connections in all PHCs. The facilities were supported by adequate funding from Global Fund. Gunungkidul DHO has accepted the additional budget for HIV AIDS program from the Global Fund since early 2016. Muhaise & Ejiri (2016) had similar findings that showed the salient success factors for the District Health Information Software Version 2 (DHIS2) for the greater Bushenyi Districts Uganda in the developing country context is the resource supply that involves the supply of computers and modems, electricity/source of power and internet.

There were some obstacles when giving interventions. Some computers were difficult to be installed by the software application and some PHCs officers asked for assistance to DHO in reporting VCT/PITC data using the web-based information system. They did not input the data independently even though they had the guideline book. However, this application entirely depends on the need of internet connection for data reporting.

Conclusion

Inadequate facilities, untrained human resources and no collaboration with other health programs hampered HIV AIDS surveillance system. Manual reporting was an obstacle in documenting HIV AIDS related data (VCT/PITC) in Gunungkidul DHO. Overall, the use of web-based HIV AIDS information system was able to increase the completeness of VCT/PITC data. Gunungkidul DHO should closely monitor the implementation of web-based HIV AIDS information system by providing supportive supervision to all PHCs, should train the new PHC officers and ensure the availability of the facilities especially rapid diagnostic test (RDT) and VCT/PITC forms in all PHCs.

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References

Duan, Y., Edwards, J. S., & Xu, M. X., 2005. Web-based expert systems: benefits and challenges. Information & Management, 42(6), 799-811.

Garrib, A., Herbst, K., Dlamini, L., McKenzie, A., Stoops, N., Govender, T., & Rohde, J., 2008, An evaluation of the district health information system in rural South Africa. SAMJ: *South African Medical Journal*, 98(7), 549-552.

Haskew, J., Rø, G., Saito, K., Turner, K., Odhiambo, G., Wamae, A., & Sugishita, T., 2015, Implementation of a cloud-based electronic medical record for maternal and child health in rural Kenya. *International journal of medical informatics*, 84(5), 349-354.

Isfandyari, A., Langi, G. 2016. Gunungkidul District Health Problem Analysis 2015. Field Epidemiology Training Program Universitas Gadjah Mada.

Makombe, S. D., Hochgesang, M., Jahn, A., Tweya, H., Hedt, B., Chuka, S., & Kamoto, K., 2008, Assessing the quality of data aggregated by antiretroviral treatment clinics in Malawi. *Bulletin of the World Health Organization*, 86(4), 310-314.

Ministry of Health of Indonesia, 2016, AIDS and STDs Situation Reports in Indonesia. Directorate of Infectious Disease Control.

Ministry of Health of Indonesia, 2012, Kemenkes RI, 2012. Technical Guidance for Manual Registration Form of HIV AIDS and STIs Control Program. Directorate of Infectious Disease Control.

Muhaise, H., & Ejiri, A. H., 2016, Factors Influencing District Health Information Software Version 2 Success–A Case of the Greater Bushenyi Districts, Uganda. *American Scientific Research Journal for Engineering, Technology, and Sciences* (ASRJETS), 26(1), 166-176.

World Health Organization (WHO), 2006. Communicable Disease Surveillance and Response System. WHO. Genewa

World Health Organization (WHO), 2013. Guidelines for second generation HIV surveillance: An update: Know your epidemic.

World Health Organization (WHO), 2016. HIV/AIDS. Date of access: 12/04/2016 http://www.who.int/mediacentre/factsheets/fs360/en/