Phlebitis Surveillance System Evaluation Based on Surveillance Attribute at Rumah Sakit Umum Haji Surabaya

Anjas Dwi Purwanto
Department of Epidemiology, Faculty of Public Health,
University of Airlangga, Indonesia
Email : purwantoanjasdwi91@gmail.com

Abstract
Surveillance system is highly important in reducing nosocomial infection incident that nosocomial infection surveillance system needs to be implemented at hospital. Phlebitis surveillance is one of program focus in effort of infection prevention and control at RSU Haji Surabaya Year 2016. A surveillance system success is highly depend on attribute relatedness contained within. Surveillance attribute is an indicator representing characteristic of surveillance system. This study aimed to evaluate phlebitis surveillance based on surveillance attribute at RSU Haji Surabaya year 2016. This study used evaluative descriptive design. Subject in this study was phlebitis surveillance at RSU Haji Surabaya that includes simplicity, flexibility, acceptability, sensitivity, representativeness, punctuality, data quality, and stability. Respondents were IPCN, IPCLN, and Inpatient Room head. Data collection technique carried out through interview and documentation study. Research result showed that surveillance attribute had been simple, had high acceptability, high sensitivity, representative, and high stability. But other attribute were not punctual and had low data quality.
Keywords: *Surveillance, surveillance attribute, evaluation, phlebitis*

I.   INTRODUCTION

Nosocomial infection is infection occur at hospital that could occur on patient, health personnel, and hospital visitor. Surgery wound infection, nosocomial pneumonia, urinary tract infection, nosocomial bacterimia, phlebitis infection are within nosocomial infection at hospital (Septiari, 2012). In 2011, 25 million deaths across the globe caused by nosocomial infection (WHO, 2011). Impact that nosocomial infection could generate are pain and death number, complication, inpatient duration increase and cost burden, and could affect hospital image (Septiari, 2012). Surveillance is necessary to prevent and control such nosocomial infection occasion. Surveillance activity requires highly complete and accurate data that it could provide valid epidemiological information (Kepmenkes, 2010). Valid epidemiological information serves in describing complete and accurate health issue, and as basis in policy making concerning health issue control (Noor, 2008).

The existing surveillance system should be evaluated that it could improve utilization of the available source. Phlebitis surveillance is one of program focus in effort of infection prevention and control at RSU Haji Surabaya Year 2016. A surveillance system success is highly depend on attribute relatedness contained within. Surveillance attribute is indicator describing characteristic of surveillance system (Kepmenkes, 2010). This study aimed to evaluate phlebitis surveillance, based on surveillance attribute at RSU Haji Surabaya year 2016.

II.   LITERATURE REVIEW

A.   Phlebitis

Phlebitis is infection condition that occur around syringe prick or syringe prick mark on hospital. This infection emerges upon 3x24 hours since being hospitalized and infusion. This infection marked with hot sensation, stiffening and redness (*calor, tumor*, and *rubor*) with or without pus on syringe prick mark (Kepmenkes, 2010). This phlebitis could also defined as intra venous therapy administration compilation or infusion usage complication due to incompatibility of intra venous lane assembly and microorganism entrance during pricking.

B.   Surveillance System Evaluation

The existing surveillance system should be evaluated that it could increase the available source utilization on public health sector. That could be achieved if surveillance system runs effectively and efficiently (Depkes, 2003). Evaluation is information system used to improve, maintain, as well as terminate, program implementation. According to CDC (2001), surveillance system evaluation steps carried out by assessing surveillance system attributes are as follow:
1.   Describing the importance of health issued observed from public health point of view.
2.   Describing system to evaluate.
3.   Describing source to be used to operate system.
4.   Focusing evaluation design by determining evaluation specific purpose as performing surveillance system evaluation based on attribute.
5.   Collecting evidence concerning system performance by presenting benefit level.

6. Drawing conclusion and recommendation of surveillance system evaluation based on attribute.
7. Assuring that surveillance evaluation result are usable and utilizable as learning material for future evaluation.

C. Surveillance Attribute

Surveillance system attribute is indicator describing surveillance system characteristic in performing surveillance system evaluation. There are nine of the following surveillance system attribute (CDC, 2001:

1. **Simplicity:** Simplicity within surveillance attribute includes its structure and operation. Surveillance system designed as simple as possible, but its simplicity could still support the intended purpose. The following are dimensions to consider in assessing simplicity:
   A. Officer ability in applying operational definition.
   B. Data collection means.
   C. Surveillance form filling method.
   D. Data collection flow through reporting.
   E. Information dissemination method to information user.

2. **Flexibility:** Flexibility viewed from system ability to be able to adjust itself with information change required or implementation situation without followed by improvement which means cost, time, and energy necessities. In general, the more simple the system, it would be more flexible to apply in other health issue as only fewer components to alter.

3. **Acceptability:** Acceptability describes individual or organizational willingness to participate, responsible toward surveillance system implementation. Acceptability is highly subjective attribute to provide accurate, consistent, complete, and punctual data.

4. **Sensitivity:** Sensibility could be viewed from two levels: case proportion from certain health issue detected by surveillance system, and its ability to detect outbreak/Extraordinary Condition (KLB) and health issue trend. Sensitivity within surveillance system commonly emerge it changes are found in illness occasion. Such changes occur due to the use of new diagnostic test, change in implementing surveillance system.

5. **Representativeness:** A representative surveillance system would accurately describes an health occasion in certain period of time, occasion distribution within society according to location and person. Representative assessed by comparing characteristic of reported occasion with entire available occasion.

6. **Punctuality:** Punctuality could be viewed from speed quickness and slowness within surveillance system stages. Illness reporting must be carried out accurately and fast for prevention and control actions to be carried out immediately. Punctuality assessed based on information availability concerning health issue countermeasure and prevention either immediate or long-term in nature from prevention effort.

7. **Data quality:** Data quality represents collected data completeness and validity on society health surveillance system. Data quality could be viewed from blank and do not know answer percentage on surveillance form. Excellent data quality, could increase system acceptance against system-related parties, in addition it could describe health issue reported through surveillance activity.

8. **Stability:** Stability describes expertise or reliability in data collection, managing and providing data appropriately. Surveillance system stability affected by the available sources. Surveillance system stability also presents reliability and availability within certain system. High reliability could be observed from data being collected, well managed and stored without defect, meanwhile high availability observed from easiness in gathering data and operate them when necessary are always available.

III. METHOD

This study used descriptive evaluative design. Subject in this study was phlebitis surveillance attribute at RSU Haji Surabaya, meanwhile respondents in this research were IPCN (*Infection Prevention and Control Nurse*), IPCLN (*Infection Prevention and Control Link Nurse*), and Inpatient Room Head. Study location carried out in RSU Haji Surabaya with November 2016 as implementation time. Primary data collection carried through interview toward respondents using questionnaire sheet. Interview carried out through IPCN, IPCLN, and room head to discover surveillance system implementation, meanwhile secondary data collected through documentation study in form of annual evaluation report or RSU Haji Surabaya phlebitis surveillance data archive using observation sheet in form of checklist.

IV. RESULTS

A. *Phlebitis Surveillance Implementation Description at RSU Haji Surabaya*

Data collection and recording at RSU Haji Surabaya carried out by IPCLN on each room. Reporting initiated by patient with attached infusion > 48 hours, then observed every day for monitoring should phlebitis symptom occur on such patient, and filling or recording also carried out on bundle prevention form. Such bundle prevention form carried out by nurse and or IPCLN on each room. Infected patient would be confirmed into IPCN, IPCO, room head, and the treating doctor using confirmation form, and infection management were immediately performed according to Standard Operational Procedure for treatment and medication to be able to perform. In every month, phlebitis surveillance data collected into IPCN in form of infection incident daily surveillance, HAIs occasion recapitulation report, and incident analysis form. Such collected data would be compiled, analyzed, and interpreted to generate a report. Such data compilation and report carried out by IPCN and epidemiological personnel. Analysis and data interpretation result would generate a periodic report. Such report addressed toward hospital director, Patient Quality and Safety Improvement (PKMP), nursing department, and related unit.

B. *Phlebitis Surveillance Attribute at RSU Haji Surabaya*

1. **Simplicity:** Phlebitis surveillance form filling declared simple to fill, filling on bundle prevention form only require checklist (√) mark on every column and confirmation sheet also has content that is not quite different in terms of filling with bundle prevention form. Surveillance officer had been able to perform data recording and recapitulation every day on every room. Recording and recapitulation carried out by IPCLN, meanwhile data collection carried out by nurse and or room IPCLN. Data collection and infection occasion confirmation flow stated by IPCLN were not complicated and simple. Such occasion documented through infection occasion confirmation sheet. Based on interview with IPCN and IPCLN it was found that phlebitis surveillance reporting system available at RSU Haji Surabaya had been simple, in terms of its reporting flow.

2. **Acceptability:** Phlebitis surveillance data generated by RSU Haji Surabaya utilized by Ibnu Sina Hospital, Sudono Hospital, and Menur Mental Hospital Surabaya, amongst them utilized by inpatient and hospital quality target. Analysis result generated by PPI also addressed on Personal Protective Equipment (PPE), medical service, and hospital director. Based on such matter, phlebitis surveillance had been in high acceptability, viewed from data utilization that had been utilized bt person outside the system.

3. **Sensitivity:** Phlebitis surveillance system implementation at RSU Haji Surabaya based on sensitivity attribute reviewed from aspects of data collection, illness case proportion, and detection from nosocomial infection trend in the hospital. In 2015, 508 phlebitis cases were recorded with 15,897 infusion patients or with 3.19% proportion. Such case reporting obtained from surveillance officer performing recording and reporting activities every day that data could be collected on every month, that would subsequently submitted into IPCN. Such recording could forecast and detect phlebitis case evidenced with supporting examination (laboratory examination) that include cultural result. Based on such data it was discovered that data sensitivity at RSU Haji Surabaya were categorized in high sensitivity, which was assessed through data collection, illness case proportion, and phlebitis occasion trend.

4. **Representativeness:** Representativeness observed based on analysis and data interpretation result informed from surveillance activity on certain period of time and distributed based on person, time, and location. Based on documentation study, phlebitis surveillance at RSU Haji Surabaya in terms of data presentation had been made based on person (gender, treatment day duration, infusion day period, and infection mark), time (quarterly, yearly), and location (treatment room). Data presentation on such periodic report presented in line diagram to see trend on certain period of time and bar diagram to compare total case. That it could be discovered that phlebitis surveillance at RSU Haji Surabaya had been representative, viewed from case distribution based on person, time, and location.

5. **Punctuality:** Punctuality assessed based on phlebitis surveillance implementation time at RSU Haji Surabaya, viewed from data collection time through information dissemination and the implementation of prevention action. Phlebitis surveillance implementation at RSU Haji Surabaya on report collection to PPI was given deadline on every month, i.e before fifth of the month. On data collection time accuracy, IPCN had absence sheet to record its surveillance report collection time to PPI. Based on documentation study that had been carried out, it was discovered that delay occur on most of inpatient room concerning report collection from the determined date. Such delay was amounted to 42.86% which was categorized in not punctual category. Based on Minister of Health Decree of the Republic of Indonesia Number 116 year 2003 it was stated that 80% of reporter unit report accuracy were reached, but it was only 35.12% at RSU Haji Surabaya. Therefore, it was discovered that punctuality at RSU Haji Surabaya in 2015 was not punctual.

6. **Data Quality:** Phlebitis surveillance implementation at RSU Haji Surabaya also assessed on data quality based on data completeness and data validity recorded on surveillance system. Such data quality observed from blank answer percentage on surveillance form, especially on phlebitis occasion confirmation sheet. Based on documentation study result it was obtained that confirmation sheet was not completely filled or equal to 22.5% blank answer percentage especially on presentation date, health history, infusion history, and occasion analysis sections. That it could be concluded that data quality at RSU Haji Surabaya was still categorized on low data quality.

7. **Stability:** Stability could be assessed from the available resources on surveillance implementation in terms of reliability and availability from surveillance system. Surveillance activity supporting facilities utilized at RSU Haji Surabaya were surveillance form, 1 computer set, and telephone. The collected data would be input into computer application and on every month data analysis and interpretation would be conducted for thereafter stored in a file and folder. Manual documentation, well stored in certain cabinet. Based on observation and interview result with IPCN and epidemiological personnel, surveillance supporting facilities (computer) in 2015 were went well, in terms of the absence of data loss, damage, and virus hit. IPCN and epidemiological personnel had certain method in preventing such issues, specifically having back-up data to eliminate barrier in surveillance implementation. That such supporting facilities could assured data to have high reliability and availability nature, that it could be concluded that stability at RSU Haji Surabaya was in high stability.

V. DISCUSSION

A. Phlebitis Surveillance Implementation Description

Phlebitis surveillance implementation at RSU Haji Surabaya comprised of data collection, data compilation, data analysis and interpretation, and information dissemination activities. Based on research conducted by Raras (2012) on a hospital in Surabaya that surveillance implementation were carried out by nurse in recording patient data using invasive tools documented in infection control note book, and also recorded on patient monitoring form every day. Such data then recapitulated every month by IPCLN and would be reported into IPCN with the stipulated date limit. Data would be compiled and analyzed to generate report that would be disseminated into related party or unit. Hospital infection surveillance guidance in 2010 described hospital infection surveillance implementation that IPCLN and hospital PPI team would conduct data collection and recording, IPCLN is in charge of filling and submitting surveillance form of every risk patient into each inpatient room every day. After one month, at the latest of fifth day every month, the collected data with room head signature are submitted into PPI. Data compilation and analysis carried out by PPI team which result would be reported into PPI committee for them to perform discussion and make recommendation. PPI committee also in charge of reporting entire result and recommendation into hospital director.

B. Phlebitis Surveillance Attribute

1. **Simplicity:** Simplicity assessed from the available structure on system and simplicity on its operation means such as structure simplicity, simplicity in information flow, data collection method, compilation, analysis, reporting and report utilization (WHO, 2006). Data collection at RSU Haji Surabaya carried out using surveillance form that refer to Center for Disease Control and Prevention (CDC), either on prevention bundle form and on confirmation sheet. Based on observation and interview result, surveillance form filling method, reporting flow, and data collection flow were declared uncomplex and simple. That could be viewed from phlebitis prevention bundle form which filling only require the subject to give checklist ($\sqrt{}$) mark on the available column, data collection and data reporting flow are quite simple and structured, IPCLN directly submit to PPI then data compilation and data analysis performed by IPCN that subsequently generate a report and shall be disseminated into related unit, medical service, Personal Protective Equipment (PPE), and director.

2. **Acceptability:** Acceptability on surveillance attribute assessed from acceptance and willingness in utilizing data, either from person within system or those outside system (CDC, 2001). Acceptability at RSU Haji Surabaya categorized in high acceptability which means such generated data are utilized by person within and outside system.

3. **Sensitivity:** Sensitivity on surveillance attribute assessed on data collection with validity, case proportion, and nosocomial infection trend detection assured (CDC, 2001). According to Murti (2003), the effective surveillance was the one that could detect all illness as well as non-illness occasion. Surveillance system at RSU Haji Surabaya has been able to detect PHLEBITIS case, could discover its case proportion, and could describe nosocomial infection trend. Different total case recorded on every month and year could be

discovered through documentation carried out by PPI team. These could be utilized in identification to perform immediate action, identification of various causing factors to assess the potential of health issue and trend identification occasions (CDC, 2001).

4. **Representativeness:** Representativeness assessed from health issues occasion description by distributing them according to person, time, and location variables (CDC, 2001). In addition, according to Noor (2008), representativeness could be observed from data source being used by comparing them with total case recorded on data source. Based on documentation study and interview, reporting available at RSU Haji Surabaya, its data analysis and interpretation carried out based on person ((gender, treatment day duration, infusion day period, and infection mark), time (quarterly, yearly). Such distribution is highly crucial to perform, as it is useful in identifying high risk group and high risk location identification (Guerra, et al., 2012). According to Loustalot (2012), such distribution could also be utilized to forecast person number and percentage with certain health issue, monitor trend, risk factors, and prevalence. Data presentation on periodic report presented with diagram, table, and graph equipped with narration. Representative surveillance system is surveillance system that is effective in monitoring actual field situation (Murti, 2003).

5. **Punctuality:** Punctuality is highly necessary to consider, from punctuality in reporting, prevention and control of a case, and information dissemination on surveillance system (Barr et al., 2011). Based on Minister of Health Decree of the Republic of Indonesia Number 1116 year 2013 it was stated that reporting accuracy was as of > 80%, meanwhile RSU Haji Surabaya could only reach 35.12% on punctuality, therefore it was discovered that report punctuality was very low. According to Kartono (2006), data reported in timely manner and complete is highly supporting in data quality that could support data analysis and interpretation, as well as on early detection of a health issue. Additionally, should data utilized in timely manner and information generated is also in high quality state, then it could support health issue identification and health issue priority determination effectively and efficiently (Wilkins, et al., 2008).

6. **Data Quality:** Monitoring on data quality is crucial to perform, as it is activity within validation of collected data to be meaningful to meet surveillance system purpose. Such activity could also support in data analysis and interpretation improvement within surveillance report (ECDC, 2014). Data quality could ne discovered through data completeness, data validation, and the presence of blank answer in surveillance form (CDC, 2001). There were 22.5% blank answer on form surveillance at RSU Haji Surabaya.

7. **Stability:** Stability refers to reliability (ability to collect data, managing and providing free defect data) and availability (ability to be operated should necessary) on society health surveillance system(CDC, 2001). Stability could lower if lack of sources occur. Stability assessment based on system approach purpose would be more useful, as surveillance system are vary in method, scope, purpose, and target (Arana, 2009). Based on interview toward IPCLN and epidemiological personnel of RSU Haji Surabaya, surveillance system stability at RSU Haji Surabaya showed that it had high reliability and high availability which means high stability. High stability demonstrated from supporting facilities (computer) being used could be maximally and optimally used in surveillance implementation. Additionally, PPI also made back-up to prevent undesired occasion, eliminating obstacles in its implementation, the available sources also had been able to perform surveillance system.

VI. CONCLUSION

Phlebitis surveillance based on surveillance attribute at RSU Haji Surabaya showed that system had been simple and capable in providing defect-free data and always ready when necessary. Additionally attribute of acceptability had high acceptability, high sensitivity, and data generated had been representative with its distribution based on person, location, and time. Punctuality attribute had been categorized as unpunctual with 35.12% percentage. Quality of data collected to PPI were still categorized as low data quality, evidenced from 22.5% blank answer percentage.

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