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Analysis of Healthcare Associated Infections (HAIs) Surveillance System at Haji Public Hospital of Surabaya

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ABSTRACT

The incidence of HAIs in Haji Public Hospital of Surabaya in the 1st quarter of 2017 was 0.20% and increased by an average of 56%. Prevention and control measures can be initiated with aseptic setup procedures, comprehensive treatment during tool installation, and possible monitoring of infection by identifying risks through bundle prevention. Bundle prevention is one of the HAIs surveillance that is used to identify and monitor every incident of HAIs in Haji Public Hospital. The purpose of this study was to describe the HAIs surveillance system at Haji Public Hospital. This study used descriptive method of evaluation type. The study was conducted from 7 to 31 August 2017 in the PPI (Infection Prevention and Control) Committee of Haji Public Hospital of Surabaya. The data collected in the form of primary data through interviews and secondary data through documentation study in the form of annual evaluation report or archive of HAIs surveillance data contained in unit PPI Haji Public Hospital. The instruments of data collection used were interview guides and observation sheets in the form of checklist. Data analysis was conducted descriptively on the components and attributes of surveillance. The results obtained from the input components that the competence of surveillance officers are not in accordance with the standards, while the attributes obtained by the results of timeliness, and low data quality. The need to conduct socialization and training of both basic and advanced PPIs and refine technology-based surveillance systems to be more effective and efficient in the implementation of the HAIs infection surveillance system.

Keywords: Surveillance, Evaluation, HAIs and Hospital

INTRODUCTION

Hospitals have a strategic role in accelerating the improvement of public health in Indonesia. Hospitals are labor-intensive and technology-intensive facilities that provide medical services that include medical services, medical rehabilitation, medical support services, and care services(4). The strategic role of hospitals is needed to deal with the current epidemiological transition. Apart from the function and role of the hospital does not rule out the possibility of health problems one of them is HAIs.

HAIs infection is an infection acquired or experienced by the patient during hospitalization and shows symptoms of new infection after >48 hours of hospitalized patients and the infection was not found or suffered at the time of admission to the hospital(3). HAIs infection causes 1.4 million deaths every day worldwide(6).

The Center for Disease Control and Prevention (2017) estimates that there are 1.7 million HAIs annually and is often associated with medical procedures, devices and performances used as a medication attempt for patients such as invasive devices (urinary catheters, ventilators, intravenous catheters, etc.). Hospitals are a means of health services that can be a source of HAIs. Infection in this health care center can be transmitted or obtained from health workers, sick people, and career or hospitalization(2).

HAIs infection causes major problems for both the hospital and the patient. For hospitals HAIs infections lead to increased operational costs and lower quality of hospital services. As for the patient, HAIs infection may lead to a substantial increase in treatment financing by 10-15%, slow patient healing, increase patient care days, and cause resistance to antibiotics(5).

Hospital Associated Infections (HAIs) is a major problem in patient safety and surveillance programs should be a top priority. HAIs is an incidence of acquired infection after treatment> 48 hours and the patient is not in the incubation period. HAIs is a health issue that needs special attention, so as not to affect the image, quality standards and quality of hospitals as service providers and health care. Some programs and efforts to

prevent and control infections need to be done effectively and efficiently to minimize the incidence of HAIs in the hospital[6].

Center for Disease Control and Prevention (2017), classifies HAIs into 4 based on the type of infection comprising CAUTI (Catheter Assicoated Urinary Tract Infection) or Urinary Tract Infection due to Urinary Catheter Installation, VAP (Ventilator Associated Pneumonia) or Pneumonia due to Ventilator Installation, CRBSI (Catheter Related Blood Stream Infection) or Primary Blood Infections, and SSI (Surgical Site Infection) or Regional Infection Surgery.

The incidence of HAIs at Haji Public Hospital in the 1st quarter of 2017 was 0.20% and increased by an average of 56%. The incidence of HAIs for the 1st Quarter of 2017 is in accordance with the established quality standard that is <2%. Based on the type of infection, the highest and lowest number of HAIs events are IDO/SSI (0.82%), and ISK/CAUTI (0.11%), while IADP/BSI, VAP and HAP no events (0%).

Surveillance is expected to reduce the incidence of HAIs by taking precautions and control of infections in the hospital, especially for the detection of outbreaks or outbreaks so as not to cause high mortality. Prevention and control measures can be initiated with aseptic setup procedures, comprehensive treatment during tool installation, and possible monitoring of infection by identifying risks through bundle prevention. Bundle prevention is one of the HAIs surveillance that is used to identify and monitor every incident of HAIs in Haji Public Hospital of Surabaya. The bundle prevention form includes data, information and is closely related to the factors that influence the increase in the incidence of HAIs

Implementation of surveillance activities refers to standard procedures, guidelines, and reporting channels involving all nurses, head of the room, IPCLN, IPCO, and treating physicians. Quality reporting will improve the validity and reliability of collected data so that reporting results are accurate. This will increase the accuracy of improvement strategies and interventions that will be done, so as to improve patient safety during treatment at Haji Hospital by reducing the incidence of HAIs. The purpose of this research is to describe HAIs surveillance system at Haji Public Hospital of Surabaya in order to know the existing problem so that it can be defined as the priority of problem that must be handled.

METHODS

This study used descriptive method of evaluation type (evaluation study). The surveillance system evaluated consists of inputs (data and resources), processes (data collection, data compilation, and analysis and data interpretation), output (epidemiological information and information dissemination) as well as the calculation of surveillance information systems consisting of simplicity, demands, acceptability, sensitivity, positive predictive value, representation, timeliness, data quality, and stability. Subjects were members of IPCN who were surveillance officers who conduct surveys conducted from various data to report on hospitals, as well as monitoring and control of infections in hospitals. IPCLN was an implementing nurse who can fill and collect information and coordinate with IPCN.

Evaluation of HAIs Infection surveillance at Haji Hospital in 1st semester of 2017. The research activity was conducted in PPI Committee (Infection Prevention and Control) of Haji Hospital Surabaya. The data collection time was done on 7 to 31 August 2017. The data collected were primary and secondary data. Primary data were obtained through interviews using questionnaires on Infection Prevention and Control Nurse (IPCN) and Infection Prevention and Control Link Nurse (IPCLN) at Haji Hospital of Surabaya to get results from surveillance. Secondary data obtained through annual documentation of HAIs surveillance report or archive data not available in PPI unit of Haji Hospital. The instruments of data used were checks in the form of checklists. Data analysis was conducted descriptively according to the circumstances under study based on the results that have been evaluated by using input, process, and output and attribute surveillance.

RESULTS

Evaluation of HAIs Surveillance Based on Input, Process, and Output

Table 1. Results of HAIs surveillance system evaluation based on input, process, and output at Haji Public Hospital of Surabaya Semester 1 2017

Number	Surveillance System	Evaluation Result	Description
	Input		
1.	Data	Appropriate	HAIs → records of results of care and examination (form bundle prevention, confirmation sheet), results of investigation (laboratory results), HAIs recap report, daily surveillance of infection incident, and patient or patient's family directly.
	Data source and data type		
	Resource	Inappropriate	
	Surveillance Staff		Surveillance officers who have attended basic PPI education and training by 30%.
		Appropriate	
	Tools		

Number	Surveillance System	Evaluation Result	Description
	Methods	Appropriate	2 packets of computer, 1 phone unit, 1 package of surveillance library, 1 package of surveillance form, Standard Operating Procedure of mounting tool, Standard Operational Procedure of surveillance of infection incident in hospital. The availability of basic methods from the World Health Organization (WHO), Center for Disease Control and Prevention (CDC), PPI manual published by Haji Hospital of Surabaya
2.	Process		
	Data Collection	Appropriate	IPCN assited with IPCLN
	Data Compilation	Appropriate	The compilation was carried out by IPCN assisted by 1 epidemiologist. Grouping data by person, place, and time.
	Data Analysis and Interpretation	Appropriate	The analysis was performed by IPCN assisted by 1 epidemiologist. Analysis was done once every 3 months, presented in the form of diagrams, graphs, and tables accompanied by giving meaning in accordance with the purpose of surveillance set.
3.	Output		Epidemiological information is presented in the form of periodic reports and through forum meetings. The epidemiological information presented results in the magnitude of the problem, the tendency of a situation, causation, risk factors, and conclusions from the analysis results.
	Epidemiological information	Appropriate	
	Information Dissemination	Appropriate	Information dissemination and feedback are presented to all committee members, hospital directors, related units in the form of a meeting forum (duty manager, supervision, coordination meeting, meeting room), periodical reports (quarter 1-4, semesters 1 and 2, yearly), through communication tool. Feedback is delivered and done directly if the case was found. Feedback of 70%.

Table 2. Results of HAIs surveillance system surveillance based on attribute at Haji Hospital of Surabaya Semester 1 2017

Number	Attribute of Surveillance	Evaluation Results	Description
	Sensitivity	High Sensitivity	Cases from HAIS can be detected by surveillance systems and were able to detect INOS trends in hospitals
	Positive Predictive Value (PPV)	High Positive Predictive Value	Reported cases were cases and evidenced by the results of laboratory/culture
	Representativeness	Representative	Data was distributed and analyzed by person, place, and time.
	Timeliness	Not Timeliness	The reporting unit's reporting accuracy was <80% or 48.8%
	Data quality	Low Data quality	The percentage of blank answers was 87.5%
	Stability	High Stability	High reliability (data collected, managed and stored well without disabilities) and high availability (easy data and easy operation when needed), and facilities can be used optimally in surveillance implementation.

Problem Identification

The process of identifying the problem was done by processing the secondary data and through the observation of the completeness in filling bundle prevention on HAIs infection. The following was a problem that arises in evaluating bundle prevention form at Haji Public Hospital of Surabaya:

a. The presence and absence of bundle prevention form attachment on the patient's medical records.
b. Incomplete filling in bundle prevention form
c. The nurse's understanding of prevention was lacking
d. Culture results were not written on the confirmation sheet
e. No risk analysis of HAIs events has been performed.

Determination of Priority Issues

Based on the problems that have been described in the management of HAIs, then determined the priority scale of the problem to be solved. Determining priority issues is very important in planning and for decision making. The determination of problem priority scale using CARL method that pay attention to capability, accessibility, readiness, and leverage. In each criteria has a score of 1-5. The main priority is the problem that gets the highest score from the result of multiplication of all criteria. It can be explained as follows:

a. Capability
   Availability of resources (funds and facilities or equipment)
b. Accessibility
   Ease existing problems to overcome. Ease can be based on the availability of methods and implementation support such as regulations.
c. Readiness
   Readiness of the executive as well as the readiness of targets such as ability and motivation
d. Leverage
   The magnitude of the influence of one criterion with another in the solution discussed.

Here is the scoring of the five problems in the management of HAIs;

Table 3. Scoring priority problems HAIs at Haji Public Hospital of Surabaya

Number	Problems	C	A	R	L	Value	Rank
1	The presence and absence of bundle prevention form attachment on the patient's medical records	4	4	4	5	320	3
2	Incomplete filling in bundle prevention form	4	4	5	5	400	2
3	Nurses' understanding of HAIs prevention was lacking.	4	5	5	5	500	1
4	Culture results were not written on the confirmation sheet	4	4	4	4	256	4
5	No risk analysis of HAIs events has been performed	3	3	3	4	108	5

Based on Table 3 it can be seen that prioritizing problems using the CARL method, the priority sequence of the problem in accordance with the value obtained was the understanding of the nurse about the prevention of HAIs of the main priority, the incomplete bundle prevention form becomes second priority, whether or not the attachment of the bundle prevention form on the record the patient's medical becomes the third priority, the unspoken culture result in the confirmation sheet becomes the fourth priority, the risk analysis of HAIs incident has not become the fifth or last priority. Based on the prioritization of surgical infection area problem in Haji Public Hospital of Surabaya, two problems with the highest score were obtained, the nurse on the prevention of HAIs and the incomplete filling of the bundle prevention form.

Both issues were basically interrelated, if the nurse's understanding of prevention of HAIs then for the sustainability can not be done risk analysis from various aspects or factors. It was also related to incomplete filling of bundle prevention form which also for its sustainability can not be analyzed in some aspect or factor which will be difficult in determining prevention that must be done which can decrease the incidence of infection.

DISCUSSION

Evaluation of HAIs Surveillance Based on Input, Process, and Output

1. Input
a. Data
1) Data Source and data type

Types of data collected in supporting surveillance at Haji public Hospital of Surabaya include HAIs data, laboratory data, number of installed patients, number of equipment installed days, and number of days of care. These data types are collected daily by surveillance officers (IPCLN) as well as direct observation of each patient using the tool. Observations are conducted regularly to monitor the progress of patients to avoid the occurrence of infection.

Types of data and data sources are collected using multiple data sources, for more details can be seen in table 4 as follows:

Table 4. Data sources dan data type of HAIs at Haji Hospital of Surabaya

Number	Data type	Data Source
1	HAIs Data	1. Form bundle prevention 2. A confirmation sheet 3. Laboratory results 4. Report on HAIs event recap
2	Laboratory Data	1. Laboratory examination results (complete urine and or culture) 2. A confirmation sheet
3	Number of patients who installed the tool	1. HAIs event recap report
4	The number of days the tool pairs	1. A confirmation sheet 2. Report on HAIs event recap
5	Number of days of care	1. Daily surveillance of infection incidence 2. A confirmation sheet

Source: Interview with IPCN and IPCLN at Haji Hospital of Surabaya

HAIs patients will be confirmed to the IPCN, IPCO, head of the room, and the treating doctor using a confirmation sheet or by telephone, then administered infections according to standard operational procedures (SOP) for care and treatment. In addition, also carried out investigations (laboratory, culture) as a support of signs of infection of patients who are also recorded on the confirmation of the occurrence of infection. Laboratory data comprising the results of the Complete Urine laboratory (UL) which records the results of leukocytes and erythrocytes, culture laboratory results that record leukocyte and erythrocyte results, and blood culture results. The collection of confirmation sheets is one form of accuracy of infection incident reports.

b. Resource

1) Surveillance Staff

The collection of HAIs surveillance data at Haji Hospital Surabaya does not use special personnel in its implementation. The PPI committee establishes a surveillance team so as to support the implementation of surveillance activities from data collection to information dissemination.

Data collection is done by the room nurses who each room amounted to 16-18 people, data recording is done by IPCLN which every space there are 2 IPCLN. Recap data collected for 1 month, collected to IPCN. The number of IPCN is 2 persons with the help of 1 epidemiologist in the implementation of surveillance of HAIs, besides IPCN also play a role in processing and analyzing data collected by IPCLN every month.

IPCN at Haji Hospital of Surabaya has attended PPI training from basic to advanced level and has attended surveillance training, while IPCLN mostly have attended PPI 1 seminar one time held by PPI Team Haji Surabaya Hospital and there are only 15 The IPCLNs recorded do not have basic PPI training. So it can be seen that only 35 members of the PPI team trained at RSU Haji Surabaya. Basic levels of PPI training and advanced level (recently) were just held in April 2016, which was followed by IPCLN, nurses, spatial heads, and other hospitals.

The last education from IPCN is bachelor of nursing, epidemiology staff with the last education bachelor of Public Health, while IPCLN with the last is D3 and bachelor of Nursing. The surveillance duties are mostly not concurrent other tasks but there are also IPCLN who also serve other tasks such as clinical counselors, team leader and caretaker nurse.

2) Tools

The facilities used are supporting facilities in HAIS surveillance. Facilities available in the implementation of HAIS surveillance were:

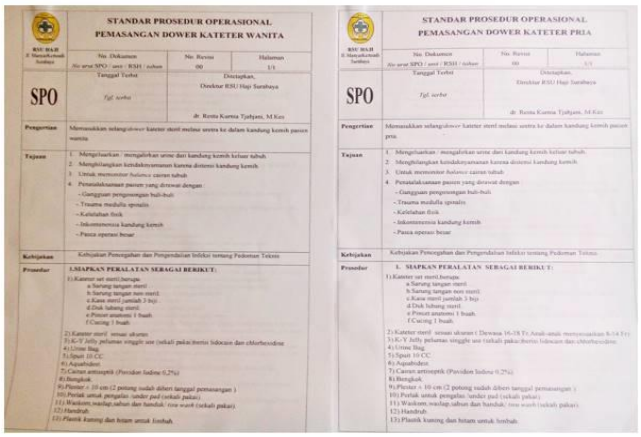
Table 5. Tools of HAIs surveillance activity at Haji Hospital of Surabaya in 2017

Number	Tools	Total	Adequacy	
			Yes	No
1	Computer and computer application programs (epi info)	2 packets	√	-
2	Communication tool:			
	a. Telephone	1 unit	√	-
	b. Facsimile	-	-	-
3	HAIs surveillance literature	1 packet	√	-
4	Surveillance Form	1 packet	√	-
5	SOP mounting tool	1 packet	√	-
6	Operational standards Procedures for surveillance of infection incidents in hospitals	1 packet	√	-

Source: Interview with IPCN at Haji Hospital of Surabaya and Observation

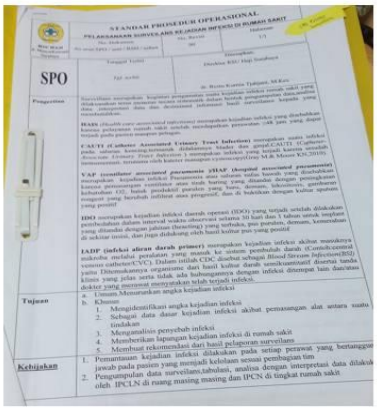
Based on the interview, IPCLN and head of the room stated that 1 package of computer for 1 space is not enough, because the computer used for various administrative and recording activities. However, most of the space heads and IPCLNs claimed that the 1 packet of the computer was considered sufficient.

Communication tool used in every room that is telephone, can also be used in confirmation of infection incident to IPCN directly. There is 1 library package in supporting data collection, analysis and interpretation of data consist of technical manual of PPI, guide of incident infection of hospital, guide of infection of hospital, SOP of mounting tool, SOP of surveillance of infection incident in hospital, and there are also other literature as supporting surveillance program.



SOP Pemasangan Kateter

Standard Operating Procedure (SOP) of Cateter Fitting



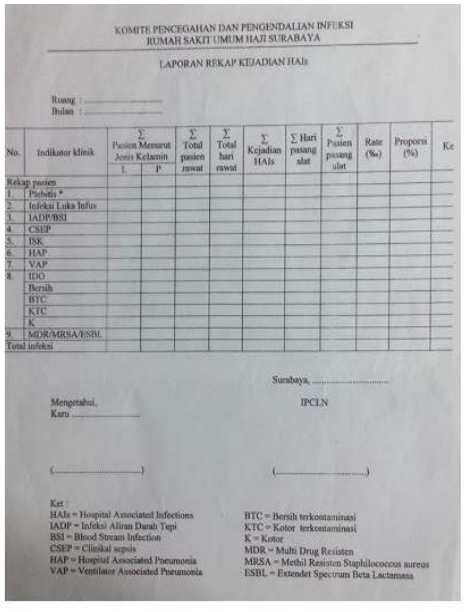
SOP Pelaksanaan Surveilans Kejadian Infeksi Rumah Sakit

Standard Operational Procedures for surveillance of infectious diseases in hospital

Source: Observation of PPI Haji Hospital of Surabaya

Figure 1. Daily surveillance of infection events and HAIs event recapitulation report

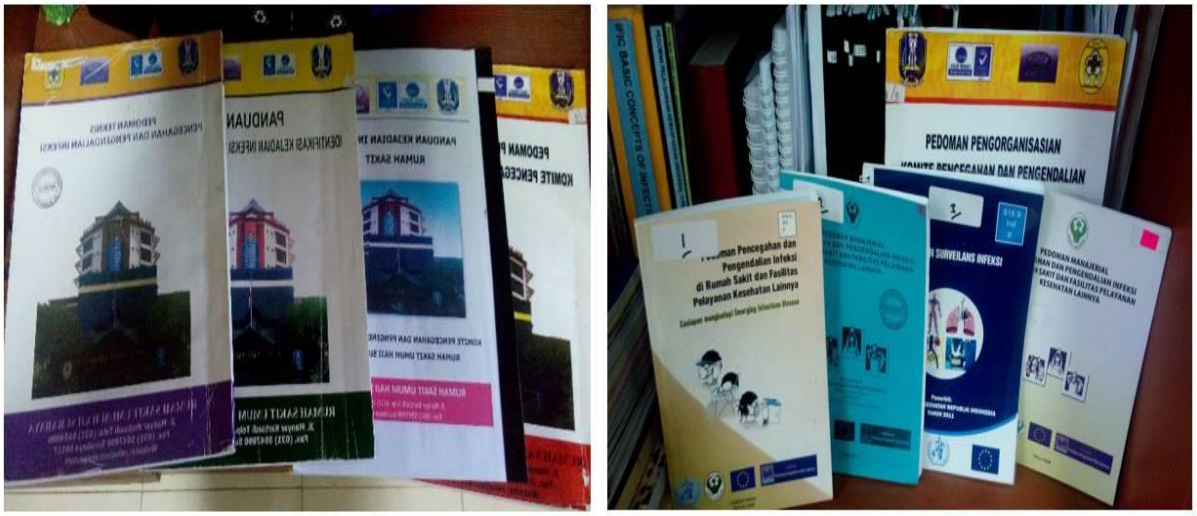
Daily Surveillance of Infection Incidence



Infection Recovery Report

Source: Observation of PPI Haji Hospital Surabaya

Figure 2. Standard operating procedures installation of tools and standard operational procedures implementation of hospital infection surveillance



Source: Observation of PPI Haji Hospital of Surabaya

Figure 3. Surveillance Library

3) Method

The implementation of HAIs surveillance everyday in Haji Hospital of Surabaya there are methods in its implementation. This can be seen from the observations in the rooms and the IPCN space that there are various basic methods used in surveillance methods, including using the basis of the World Health Organization (WHO) and the Center for Disease Control and Prevention (CDC).

Haji Hospital also made various guidebooks, in the implementation of HAIs surveillance activities such as technical guidance of PPI, guide of identification of hospital infection incident, hospital infection incidence guidance, and operational standard of equipment installation procedure, and operational standard of procedure of surveillance of infection incident in RS, the books also describe the procedures for filling bundle prevention, confirmation of the occurrence of infection, signs and symptoms of infection due to the stimulation of the device accompanied prevention.

2. Process

a. Data collection

In each room there are 16-18 people who assist in the process of data collection, data collection is done by nurses, IPCLN, and also assisted by the head of the room. Data collection is done every day in the observation of patients whose recording manually is fill the form bundle prevention, if there are patients who experience the incidence of infection it will be documented using the confirmation sheet of the infection. Based on interviews with IPCLN, the frequency of data collection is done every month collected before the 10th. However, after an interview with the IPCN related to the date of data collection is before the 5th of each month.

The surveillance data collected for 1 month in each room will be conducted by IPCLN and the data will be submitted to PPI Team every month. HAIs surveillance data collected on PPI is daily surveillance of infection incident, HAIs event recap report, and analysis form incidence of infection due to installation of the device accompanied by laboratory results.

Each month the PPI Team will conduct a reporting evaluation, the issues to be covered include timeliness of reporting as well as completeness of the collected form. If the incomplete of the collected form is found, the PPI will immediately follow up on the relevant IPCLN. Data collection in patient data input is also done by IPCLN manually.

c. Data compilation

The data compilation at Haji Hospital of Surabaya was conducted by IPCN, amounting to 2 people and assisted by 1 epidemiologist. The data compilation process is conducted once every three months to provide information on the decrease or increase of HAIs incidents in every quarter and also will be evaluated in the first 6 months (semester one) and 6 months later (semester two). Prior to the compilation of data, IPCN performs data validation such as checking the completeness of the form collected by IPCLN, supervise to the rooms of patients who do the installation of equipment.Data that has been collected IPCLN to PPI will be compiled by using computer applications.

The data compilation is based on the person (gender, length of day of treatment, the length of the day of instrument installation, and the sign of infection), time (quarter, year), and place (treatment room). The presentation of HAIs event data is presented using a line chart to see trends over a specific time period and bar chart to compare the number of cases.

d. Analysis and interpretation of data

Surveillance data at Haji Hospital of Surabaya collected are always processed and analyzed accompanied by giving meaning. Each month IPCN and epidemiologist input data from monthly collection collected by IPCLN to PPI. The data compiled by person, time and place is analyzed once every 3 months (quarter 1, 2, 3, and 4), 6 months (semester 1 and 2) and 1 year by IPCLN which is also assisted by epidemiological forces.

Data analysis at Haji Hospital of Surabaya was conducted by comparative analysis (comparing between space and month), trend analysis (tendency over time period), relationship analysis (hygienepersonal with interaction with patient and patient area), and risk factor analysis. Analysis and interpretation of data conducted by the PPI team Haji Hospital of Surabaya is as follows:

1) Person

HAIs case at Haji Hospital of Surabaya in 2017, has been analyzed and interpretation of data based on people (gender, length of day care, length of days of installation of equipment, and signs of infection).

a) By sex

The incidence of HAIs infection in the first half of 2017 has been distributed by sex.

b) Based on the length of the day of treatment

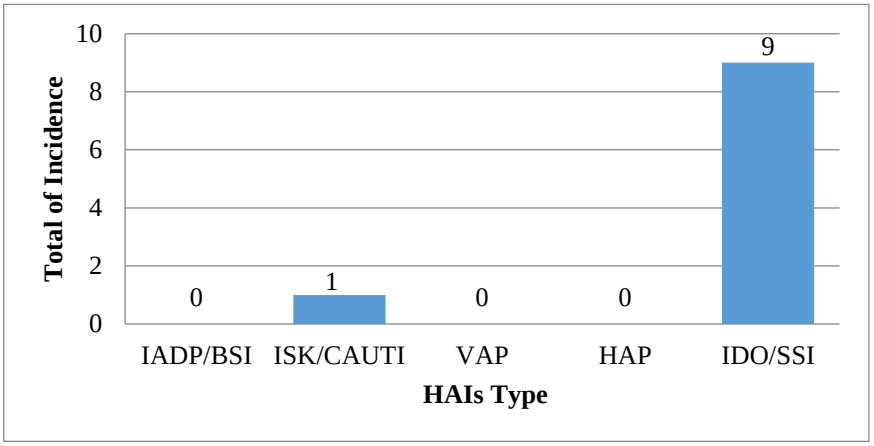
Installation of equipment in patients can affect the occurrence of HAIs infection with long days of patient care at Haji Hospital of Surabaya.

c) Based on the days of installation of the equipment

The patient's installation days are divided into three groups, starting from <3hari <7 days, 7-10 days,> 10 days,> 90 days and> 1 year.

d) Based on the infection mark

Here is an analysis of the incidence of HAIs infection based on signs of infection in patients at Haji Hospital of Surabaya semester 1 2017:



Source: HAIs Event Report Haji Hospital of Surabaya in 2017

Figure 4. Number of HAIs Occurrences at Haji Hospital of Surabaya in Period Semester 1 2017

2) Time

HAIs case in Haji Hospital of Surabaya in semester 1, 2017, has been analyzed and interpreted data based on time variable, that is done once every 3 month analysis (quarter 1, 2, 3, and 4), 6 month once (semester 1 and 2), and 1 year.

3) Place

The analysis of the incidence of HAIs infection in Haji Hospital of Surabaya was conducted based on patient care room. In the analysis and interpretation of the data experienced several constraints that often occur that there is an incomplete confirmation sheet collected at the time collected to the PPI with the number of cases confirmed earlier, the inclusion of filling the incident confirmation sheet incomplete. Filling in the incomplete confirmation sheet may affect the quality of the data and in the data analysis will also undergo the analysis as there are some unidentified. The presentation of analysis and interpretation of data is presented in the form of tables, graphs, and diagrams along with narrative explanations to be easily understood by the recipient of the incident report.

3. Output

a. Epidemiological information

Based on the results of data analysis and interpretation, epidemiological information about the incidence of HAIS nosocomial infections at Haji Public Hospital of Surabaya semester 1 2017 is as follows:

1) There were 10 cases of HAIs with HAIs quality standard <2%
2) HAIs incident occurred in 2 rooms namely OK Room and ICU
3) The number of patients who do the installation of equipment in the semester of 2017 as many as 7.825 patients

Epidemiological information presented from the results of surveillance of HAIs infection in Haji Hospital of Surabaya is in the form of periodic reports (Quarter 1 to Quarter 4, Semester 1 and Semester 2, and Annual) presented with tables, graphs and diagrams that accompanied the meaning of problems, the tendency of a situation, causation, risk factors, and conclusions from the results of the analysis.

b. Information dissemination

The results of data analysis and interpretation are disseminated or disseminated so that information can be utilized by the relevant unit in prevention and control of HAIs infection at Haji Hospital of Surabaya. The PPI team of Haji Hospital of Surabaya undertakes information dissemination and feedback aimed at the related units (inpatient installations, intensive care installations, pavilion installations and emergency department installations), medical services, PPE, PPI committee heads, PPI team leaders, director of the hospital, and IPCLN.

Feedback (feedback) is done directly by IPCN to the room if at that time also found the case, IPCN also do a search for a direct cause that can cause the patient is infected. In addition, socialization related to HAIs is mainly concerning SOP of equipment installation and identification of infection incident. Dissemination of information and feedback (feedback) at Haji Hospital of Surabaya conducted in the following way:

1) Forum meeting (duty manager, supervision, coordination meeting, and meeting room)

a) Duty manager is done every Monday followed by all head of room and IPCN. In the duty manager is submitted all information related to the hospital, whether related to facilities, incidents of infection, and patients
b) Supervision is done daily by IPCN to rooms related to surveillance implementation such as direct check to patient and review of bundle prevention.
c) Coordination meetings are held every 2 weeks (1 month done 2 times) in the presence of PPI committee chairman, PPI team leader, entire IPCLN from all rooms, and some nurses to deliver results and related evaluations from reports collected to PPI.
d) Meeting of the room is done by the head of the room in case of a case and after obtaining information through the duty manager.

2) Presented in the form of periodic reports (Quarter 1 to Quarter 4, Semester 1 and 2nd Semester, and Annual) indicated on the related units (inpatient installation, intensive care, pavilion installation and emergency room), medical services, and Director of Haji Hospital of Surabaya
3) On case reporting per room is also done by telephone and can also through application of mobile phone.

Attribute Evaluation of HAIs Surveillance System at Haji Hospital of Surabaya in 2017

1. Simplicity

In the implementation of HAIs infection surveillance in Haji Hospital of Surabaya has used Standard Operating Procedures (SOP) that exist. Standard Operating Procedures (SOP) in the implementation of HAIs infection surveillance used is SOP mounting tool and SOP implementation surveillance incident infection in hospital.

Based on the results of interviews with IPCLN and IPCN, the HAIs surveillance form submission is easy to fill, because the officer only checks in every day observation on the patient who installed the equipment, and also fill in the symptom column only check the available column. There are respondents who also feel that filling in surveillance forms is difficult because too many filled columns have to look over and over again from the previous writing so that they can get overfilled.

The flow of data collection and reporting of HAIs surveillance is not complicated and simple. Recording and recording activities are carried out by the IPCLN and the room nurse on a daily basis, if there is an infection event it will be filled in the confirmation sheet of the infection incident and immediately reported to IPCN, IPCO, head of the room, and treating doctor. In every month, IPCLN data recording room will be collected to the PPI and will be analyzed and interpreted data conducted every 3 months.

Dissemination of information is done 2 weeks in 1 month and will be evaluated from the result. Based on interviews with IPCN and IPCLN, the HAIs surveillance reporting system in Haji Hospital of Surabaya is simple, in terms of its reporting flow. However, there is also documentation that is still manual or using paper with various documentation such as infectious area infection surveillance, primary blood stream infection surveillance, ventilator associated penumonia, and cauti surveillance so that according to the respondent has not been simple.

2. Flexibility

The flexibility of the HAIs surveillance system in Haji Surabaya Hospital is evaluated by the system's ability to adapt to changes in the system. In general, the surveillance system has not been able to adjust to the changes occurring, due to changes in information or situations required with limited costs, time and personnel.

Previously on the surveillance system Haji Hospital of Surabaya had experienced changes in the implementation, the change has also been done training and dissemination in the form of how to fill out surveillance forms and computerized documentation using epi info software.

Changes in the HAIs surveillance system in 2017 include changes to the bundle prevention form, confirmation of infectious events, and computerization in input, analysis, compilation, analysis and interpretation of data. Based on interviews, the changes according to IPCLN are considered to be more complete, more columns detailed yet, still looks complicated. The surveillance staff feels ease with the change, although in daily surveillance charging is sometimes missed and/or forgot to fill it with high work load.

3. Acceptability

Acceptability Haji Hospital of Surabaya can be evaluated through depiction of acceptance or willingness of a person and other institution or unit to participate and responsible in carrying out surveillance system and utilizing surveillance system.

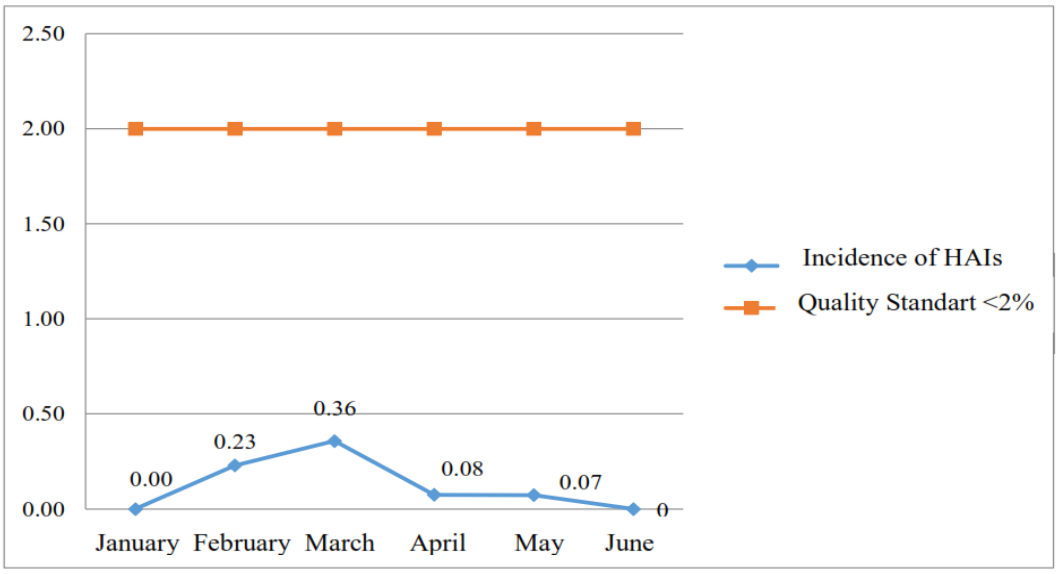
HAIs infection surveillance system Haji Hospital of Surabaya is acceptable because the data generated utilized by people who are outside the system such as Ibn Sina Gresik Hospital, Soedono Madiun Hospital, and Menur Mental Hospital of Surabaya. The data is used as comparative data with hospitals related to the incidence of infection.

Utilization of data is also utilized by other units in Haji Surabaya Hospital in addition to PPI team Haji hospital of Surabaya is data utilized by inpatient and for the target of hospital quality. Reporting from the analysis conducted by PPI is also aimed at PPE, Medical Service, and Director.

4. Sensitivity

The sensitivity of the HAIs infection surveillance system is assessed at the level of data collection, the proportion of cases of disease, as well as being able to detect HAIs trends in hospitals. In 2017 it was noted that there were 10 cases of HAIs in Haji Hospital of Surabaya with the number of patients doing the installation of equipment as many as 7.825 patients with a proportion of 0.13%. HAIs case data obtained from recording and reporting collected every month by IPCLN to PPI, in case of case then it will be filling on confirmation sheet and/or via phone. The confirmation sheet will be collected to the PPI as physical evidence that a case has occurred.

Surveillance system in Haji Hospital of Surabaya is able to predict and detect HAIs case. The incidence of HAIs infection is also evidenced by the investigation (laboratory examination), laboratory data in the form of laboratory results of Complete Urine (UL) which records leukocyte and erythrocyte results, and culture results. Here is the distribution of HAIs infection incidence in 1st half of 2017 at Haji Hospital of Surabaya:

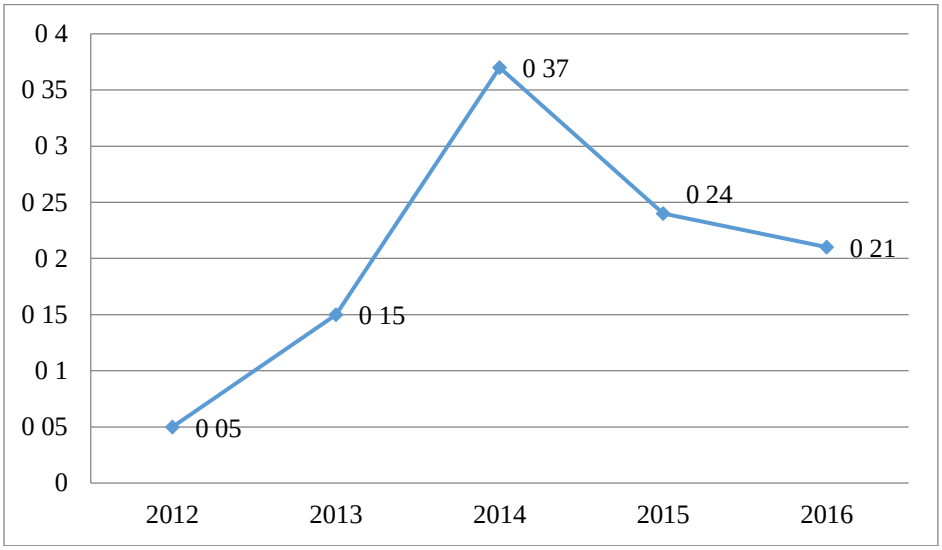


Source: HAIs Genesis Report Haji Hospital of Surabaya 1st semester 2017

Figure 5. Number of HAIs Occurrences at Haji Hospital of Surabaya semester 1 2017

It is known that the incidence of HAIs in the first semester of 2017 at Haji Hospital of Surabaya decreased to 0% from January to June and fluctuate in the increase and decrease in the period of March to June 2017. The incidence of HAIs in the semester of 2017 is in accordance with the established quality standard (<2%).

Based on document studies and secondary data observation, HAIs case in 2012 was recorded as 7 cases with number of patients installing equipment as many as 7.417 patients, in the year of HAIs case happened 10 cases with 1.655 patients installing equipment, year 2014 noted that there is an increase of case from in previous years that recorded 15 cases HAIs with the number of patients 2.142 who do the installation tool, and in 2015 there are 33 cases HAIs with the number of patients who installed the tool as much as 13.669 and in 2016 as many as 31 cases with the number of patients 15.058. Here is the trend of the incident HAIs at Haji Hospital of Surabaya in 2012-2016:



Source: HAIs Genesis Report of Haji Public Hospital of Surabaya 2016

Figure 5. Trend of HAIs Events at Haji Public Hospital of Surabaya 2012-2016

IPCN states that it does not have to wait for a case of a high disease first but the cause chain must be immediately cut off so that further can be made sustainability in the prevention and control of hospital infections.

5. Predictive Positive Value

A positive predictive value is judged to be related to viewing the proportion of the population identified as the case by the surveillance system and in fact is the case, as well as proven and/or declared by laboratory results/culture results.

In the case of HAIs in Haji Public Hospital is known through the confirmation sheet of infected incident reported every month to PPI through confirmation sheet and laboratory appendix. HAIs case seen from the results of investigation (laboratory examination). Here is the result of HAIs case reporting at Haji Public Hospital in 2017:

Table 6. Positive Predictive Value of HAIs at Haji Hospital of Surabaya semester 1 2017

Number	Month	Number of Patients Install Tool	Case		Confirmation of laboratory / culture results		Proportion (%)
			+	-	+	-	
1	January	198	2		√		1.01
2	February	218	1		√		0.46
3	March	224	-				0.00
4	April	276	1		√		0.36
5	May	213	-				0.47
6	June	275	1		√		0.36

Source: HAIs Genesis Report Haji Hospital of Surabaya 1st semester 2017

The positive predictive value of the HAIs surveillance system at Haji Hospital of Surabaya was included in the high positive predictive value obtained from the reported cases and cases proven by laboratory or culture

results. The table found 6 HAIs cases through a confirmation sheet collected by IPCLN to PPI. However, the PPI periodical report 1st semester of 2017 stated that in the first half of 2017 recorded 10 cases HAIs. Based on the results of the interview, it happens is influenced by several circumstances such as:

a) When IPCLN conducts supervision, IPCN finds cases so that IPCLN performs data validity in order to avoid cases of missing and undocumented
b) The HAIs case is also not documented on the confirmation sheet because it has been recorded on the medical record or on nursing care
c) A confirmation sheet has been collected to the PPI but, borrowed for certain purposes and not refunded, thereby reducing written proof of documentation of the occurrence of the case.

6. Representative

The HAIs nosocomial infection surveillance system in Haji Hospital of Surabaya is representative because in reporting the analysis and interpretation of data has been based on the person (sex, length of day of treatment, the length of day of equipment installation, and the sign of infection), time (quarter, year), and place care) as described in the analysis and interpretation of the data. Presentation of HAIs event data in periodic reports, is displayed using a line chart to see trends over a specific time period and bar charts to compare the number of cases.

7. Timeliness

Timeliness describes the speed or slowness of the steps in the implementation of the surveillance system, starting from data collection to information dissemination and prevention. In the implementation of HAIs infection surveillance in Haji Hospital of Surabaya in the case of collection of reports to PPI given the deadline every month. IPCLN collects the recap of each room to PPI every month before the 10th day but after further interview with IPCN regarding data collection date is done before the 5th of every month. The PPI team has an attendance on collecting reports by IPCLN to PPI, so as to monitor the accuracy of collection dates per space and who have not collected. Based on the number of rooms in Haji Hospital of Surabaya most of the time delayed with the specified time that exceeds the 5th of each month. Submission of results and evaluation at the time of coordination meetings conducted 2 weeks once every month is done on time, there will be inaccuracy if there are obstacles or other activities, such as meetings. The punctuality at Haji Hospital of Surabaya in the 12017 semester still has a low time accuracy. The lateness of the collection is due to the collection of reports exceeding the 5th of each month.

8. Quality of data

The quality of Haji Hospital of Surabaya data is assessed based on the completeness of the data, the validity of data recorded on the surveillance system and the dissemination of information. The quality of the data can be seen from the percentage of blank answers on the surveillance form, especially on the confirmation sheet of the HAIs incident.

The result of the documentation study on the confirmation sheet of HAIs incident found that the filling on the confirmation sheet was not filled completely. The percentage of blank answers on the HAIs confirmation sheet is 87.5%, especially on the date of assessment, medical history, history of tool installs, and on the event analysis of the diagnosis of HAIs. However, on the other part is completely filled. Based on interviews with IPCN, it is known that the quality of RSU Haji Surabaya data is not guaranteed good quality in terms of data completeness and validity of data due to the understanding of IPCLN uneven understanding so that IPCN also make certain case or data validity in order to avoid the case kelolosan in every room however, in terms of quality is good. This is not because IPCLN is incapable, but IPCLN is able to identify cases. Once IPCLN is on duty in the afternoon shift and finds HAIs case it will be reported immediately to IPCN but if IPCLN is not on duty there may be cases like the room nurse who found HAIs case but did not report it to IPCN. So IPCN performs data validity by conducting spatial-room supervision of patients who do the installation of equipment or by phone.

9. Stability

The equipment used in the implementation of surveillance system at Haji Hospital of Surabaya is surveillance form, 1 computer package, and telephone. Data collected by IPCLN every month will be made entry to computer applications and every 3 months will be analyzed and interpreted using computer applications and stored in a file and folder. Documentation is manually saved properly in a special cabinet. Based on interviews with IPCN and epidemiologists, by 2017 the surveillance support facilities can run well. Means of 1 computer package in its use has never happened something unexpected, such as data loss, damage, virus, and formatted. The PPI team also has back-up data to avoid such occurrence in order to avoid obstacles in the implementation of surveillance, so that the supporting facilities can guarantee the data has high reliability and high availability.

CONCLUSION

Evaluation of HAIs surveillance system component at Haji Public Hospital of Surabaya in first semester 2017 shows that the surveillance system is in accordance with hospital infection surveillance guideline issued by Ministry of Health RI 2010, Kepmenkes RI Number 1116 of 2003, Permenkes RI Number 45 year 2014. Implementation of system HAIs surveillance in data collection, data compilation, data analysis, data interpretation, and information dissemination are appropriate based on existing guidelines. However, there are still deficiencies in input components, especially for surveillance officers who have not complied with Kepmenkes RI Number 129 year 2008. Surveillance officers in Haji Public Hospital of Surabaya who have attended basic and advanced education and training only 30% with standard 75% of PPI team members who are trained.

Evaluation of the attributes of the HAIs surveillance system at Haji Public Hospital of Surabaya in the first semester of 2017 indicates that HAIs surveillance system is simple and capable in providing data of disability and always available when needed. Surveillance systems based on flexibility attributes are still inflexible because the existing surveillance system has not been able to adapt to the changes taking place. The HAIs surveillance system has high acceptability, high sensitivity, high positive predictive value in the presence of reported cases evidenced by laboratory or culture results, and the resulting data is representatively distributed by person, place and time. However, the timeliness in reporting from the reporting unit has timely, timely 48.8% assessment in the collection of reports and the quality of data collected on the IPCN is still of low quality,

Alternative solutions that can be done is to conduct socialization and training of basic and advanced PPI and surveillance training that can be followed by all parts of Haji Public Hospital of Surabaya. The training can also increase the competence of IPCLN and nurses, improve supervisory functions in each unit, establish data standardization, improve infrastructure procurement, regulate reward and punishment system, and improve surveillance system based on technology to be more effective and efficient in the implementation of surveillance system HAIs infection.

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