

Conference Paper

The Existing Information System At All Levels of Health Service Facilities in Depok City, 2017

Kemal N. Siregar¹, Besral¹, Rico Kurniawan¹, Eddy Affriansyah², R. Sutiawan¹, Fresty C. Maulina³, and Dion Z. Nuridzin³

¹Department of Biostatistics and Population Studies, Faculty of Public Health, Universitas Indonesia, Depok, West Java, Indonesia

²IT Unit, Faculty of Public Health, Universitas Indonesia, Depok, West Java, Indonesia

³Research Center for Biostatistics and Health Informatics, Faculty of Public Health, Universitas Indonesia, Depok, West Java, Indonesia

Abstract

One of the advantages of electronic information system is data sharing. Data sharing would be beneficial for the patients when there is system integration among health service facilities. One of the constraints is there is no standardized system yet, so that every health service facility develops its own system according to its needs and the capacity of the stakeholders. This study is one stage of system-development life cycle, which focuses on system description to assess the gaps between the existing system and the standard. This study was conducted in health service facilities that have potentials to be part of referral network with University of Indonesia Hospital. The health service facilities consist of three major groups: Primary Healthcare (Puskesmas), Private Clinic and Hospital, and General Hospital of Depok. The assessment focuses on three major aspects: Technical including infrastructure and technology, staff behaviour, and organization. The Electronic Medical Record (EMR) is not well functioning yet, and currently the running electronic system is for the billing. Recording, compilation, storage, analysis, and reporting data apparently are better functioning in private clinic and hospital as they have clear SOP and punishment mechanism. Data sharing is generally still limited to manually written medical resume, and there are no formal data sharing at all health service facilities. **Conclusion.** Not all health service facilities have are using standardized EMR, so that they are not capable of conducting data sharing among health service facilities under wider Electronic Health Record (EHR) mechanism.

Keywords: EMR (Electronic Medical Record), EHR (Electronic Health Record), data sharing

Corresponding Author:

Kemal N. Siregar
nazarudin.kemal51@gmail.com

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1. Introduction

Health Information System (HIS) nationally in Indonesia is recognized still far from ideal condition, has not been able to provide valid and reliable information for effective

health development and program. Furthermore, HIS in Indonesia still has some key issues that need attention such as, data management that is not integrated in a good collaboration mechanism, the implementation of the system is not fully efficient, there are redundant data, duplication of activities, and inefficient use of limited resources [1]. The findings were resulted from the assessment of HIS in 2007 using the Health Metric Network (HMN) tool of World Health Organization (WHO). The assessment covering 6 major components of HIS that shows the inadequate conditions, for resources (47%), indicators (61%), data sources (51%), data quality (55%), data usage and dissemination (57%) and for data management (35%).

It is known that the information technology has very important role for HIS. One application of the information technology is the utilization of Electronic Medical Record (EMR), which is the foundation to develop Electronic Health Record (EHR). EMR is recognized as one of the important data sources for health indicators. EMR does not have standard yet so each health service delivery point develops EMR according to their conditions. However, the medical data recorded that owned by each health service facility has the same variable blocks. Therefore, data sharing is possible.

EHR development would be feasible when data sharing under EMR mechanism is conducted well. The development of EHR is not only limited to medical data as contained in EMR, but also includes general data such as available doctors, hours of service, availability of beds and other information needed in the referral process among health service facilities. Moreover, EHR and related technologies are very promising in an effort to improve health services to be more easily and efficiently [2]. But the level of use of EHR in Indonesia even globally is still low. The low use of EHR in health service facilities is largely due to the implementation of electronic system is not meeting the standards yet. There are still many hospitals or health service facilities that use paper and semi-electronic paper records instead of using EHR intact [3].

Many obstacles in the application of EHR technology, among others, the complexity of the system, the lack of competent staff of health informatics, organizational issues, the need for coordination between local government and national, data utilization problems, and issues related to data interoperability. As mentioned earlier, EHR is potentially applicable to health service facilities in Indonesia. The standardized implementation of EHR will facilitate the implementation of clinical pathway management. Clinical pathway is an approach to standardize the treatment process to support the implementation of clinical guidelines and protocols. This mechanism is designed to support the management of patient care and treatment including both clinical and non-clinical activities, resources, as well as financial aspects. However, recording of

medical records that are still in manual/paper format remains a major obstacle in producing clinical pathways for the efficiency and effectiveness of health services. The development of hospital information system with computerized data sharing is expected to produce a good clinical pathway and beneficial to health service efficiency [4].

Depok is one of the buffer city of DKI Jakarta with high population mobility. Depok City has a lot of healthcare facilities, including 35 health centres and 20 hospitals and more than 113 Medical Clinic or Clinic [5]. Health facilities that cause a lot of diversity information systems or health recordkeeping mechanisms, both electronic and manual systems. The large number of health-care facilities, both public and private, has the potential for RSUI to build information networks with other health service facilities when operating later.

RSUI as one of education hospital is one of the health service facility which has potential to become referral health service facility for other health service facility. On the other hand, the need for effective and efficient measures that do not reduce the quality of health services and data is also increasingly urgent. One of the problems that is still a common concern is the issue of quality health data where there is no integration or sharing of data from one health service facility to other health service facilities and availability of accurate and reliable data. A case in point when a patient has received an initial examination at a primary care facility, but must undergo re-examination at a referral service facility due to the absence of preliminary patient health information.

These problems can certainly be resolved if there is a mechanism of data exchange between healthcare facilities with certain models and standards. One important part of health data exchange comes from standard health records. Standard, effective, and efficient health records can be overcome by applying a full standard of electronic health records.

2. Methods

This study is the stage of system development with focus on system description until system requirement analysis. The method used in this study refers to the method of System Development Life Cycle (SDLC). Data collection was conducted qualitatively in-depth interviews and observations and tri-angulation data, that is, comparing opinions from various sources and comparing from various levels and agencies.

Data collection is done systematically, data collected in accordance with components that can support system integration. The study focused on the technical dimensions, organizational dimensions, and behavioural dimensions of information system users.

Activity plans, including data collection and data analysis and report generation are as follows:

1. Literature review of organizational behavioural changes in the implementation of information systems; concepts and methodologies
2. Preparation of data collection and analysis instruments
3. Data collection and data analysis (health information system performance and electronic health record);
4. Dimensions of organizational environment-behaviour-technology-external factor driven
5. Prepare standard electronic health record protocol
6. Design an integrated model of electronic health record and regional health information system
7. Preparation of research results report
8. Dissemination of research results

This study uses descriptive analysis to provide an overview of the selected indicators in answering research objectives. Qualitative analysis is carried out to obtain a description of the system picture (policy, actors, standards, & data) on the existing system of information and documented constraints in the integration of information systems, a description of system integration needs including technical and non-technical dimensions.

Qualitative data from the in-depth interview results are then written down in written form (transcript). The transcript results are cleaned by rechecking between transcripts and interview records to maintain the accuracy of the data. Furthermore, data analysis uses frequently emerging topics derived from the coding results as well as using theme analysis that provides patterns of information obtained from all transcripts.

3. Results and Discussion

This research was conducted on health service facilities that have potential to become network of Universitas Pendidikan Indonesia University Hospital. This study was conducted at all levels of existing healthcare facilities in Depok City. The health service facilities are divided into three major groups, namely (a) Primary Health Service of the Government, that is, Puskesmas, (b) Private Health Services, and (c) Regional General Hospital. Each healthcare facility has a different information system, depending on the needs, capabilities and organizational factors including the regulation that oversees the healthcare facility. This early stage of research is a description of the system and the gap assessment between the current system and the existing standard.

The study was conducted on 4 (four) health service facilities and 1 (one) Depok City Health Office as the main responsibility of health service in Depok City. Health facilities that have been assessed are Depok District General Hospital, Tugu Ibu Hospital, Sukmajaya Health Center, and Morula IVF Depok Clinic. Assessment is done to determine the system used and medical record applied by each health service facility under study.

This study assessed Electronic Medical Record, which is the main foundation in the development of Electronic Health Record. The implementation of RME in Depok City generally still varies from manual recording mechanisms to electronically run systems. Based on the results of interviews and observations that have been done there are several applications that have been used to facilitate the process of data management and improve services to patients.

Assessment is conducted on 3 (three) main aspects, namely (a) technical aspects, (b) behavioural aspects, and (c) organizational aspects:

1. Technical aspects include the type of system used, the development model undertaken, the infrastructure and information technology used.
2. Behavioural aspects include the behaviour of officers in carrying out tasks that have been given.
3. Aspects of the organization assess how the data sharing process is done in one healthcare facility or between healthcare facilities.

The HL7 standard used refers to the first HL7 layer standard Physical: providing the interface to the physical communications medium [6]. The first layer provides a standard on the development of interfaces that make it possible to perform a communication medium. In this research RME is a physical communication medium that will be

developed. This is because each facility must provide medical record function as one of data management process done. RME also has some standard recording standards provided such as diagnostic records using ICD 10 and recording actions with ICD 9 CM or ICOPIIM.

Medical records running in service facilities are currently being implemented with two methods: manual or paper-based and electronic. In healthcare facilities with manual method it is necessary to develop electronisation so that communication media can be built. Development of RME must be standardized or have the same standard among healthcare facilities so that communication media can be built. The standard is one of them by identifying the minimal variables that must be provided in the system to the programming language which is done in the development process.

The information system gap in each of the current healthcare facilities with HL7 standards is seen based on the standards that exist on the first layer of the HL7 standard.

The existing electronic health record gap in RSUD Depok City is as follows.

1. The absence of standards used in the development of electronic medical records
2. The standard action code that still uses the ICOPIIM standard is different from the standard action code used
3. The current information system is a billing system and has not been referring to electronic medical record
4. The data sharing model that has been running is limited to the permissions to view data on the system

The gap that happened at Tugu Ibu Hospital has some similarities with the gap that happened in RSUD Depok City. This happens because the level of management is at the same level that is at the level of second-level healthcare facilities. The gap in Tugu Ibu Hospital is as follows.

1. The current information system is a billing system and has not been referring to electronic medical record
2. The data sharing model that has been running is limited to the permissions to view data on the system
3. Recording of medical records is still done manually so there is no standard system development used

Some of these gaps are common gaps in the existing development model of the Depok health service facility. The gap that occurs in Morocco IVF Depok Clinic has little difference. The development of information system conducted at Morula IVF Depok Clinic has been referring to HL7 standard. The gap that occurred at Morula IVF Depok Clinic is as follows.

1. Not all records of medical records are done electronically although the development of information systems has been referring to the HL7 standard
2. The current information system is a billing system and has not been referring to electronic medical record
3. Data sharing has not been done with the network of clinics located in other areas.

Meanwhile, some problems that arise in the integration of information systems running in Depok City is related to the model of information system development conducted in each health service facility. Common problems that arise such as the absence of electronic medical records record standards. This causes each healthcare facility to develop electronic medical records in accordance with the needs and capabilities of each stakeholder. Development of the current system is still in the form of billing system where the system still refers to the financial function and not on the management data. Data sharing that has been running at this time was still very limited. Limitations that occur today can be data sharing is still done manually and if data sharing is done electronically limited to the permissions to view existing data.

4. Conclusion

Based on the assessment of the existing systems the conclusions are as follows:

1. Medical record system implemented at service facility in Depok City using two methods namely manual (paper-based) and electronics still limited.
2. Medical records have no standard of development so the development of medical records is done based on stakeholder needs and capabilities.

There have been some electronic system-based development in healthcare facilities but limited to billing systems used to facilitate the management process.

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