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by Maryani Setyowati

Implementation of Maternal Health Data Processing of Computerization for Preventing the Case of Maternal Mortality by Midwives at Puskesmas in Supporting SDG's Achievements

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Abstract: Maternal mortality cases are still common in Central Java, this may affect the achievement of Sustainable Development Goals. The Government of Central Java has accompanied pregnant women and mother data collection by midwives, but still the discovery of inaccurate data. The objective of the research is to design a form of maternal health data processing that facilitates midwife in the field. This research type was descriptive with qualitative data based on observation and interview method, using system development life cycle. Respondent was 15 Puskesmas midwives selected by nonprobability sampling method with purposive sampling. The location of the research is based on the findings of the highest maternal mortality case in Semarang city, while the data analysis is descriptive about the health data processing model maternal in puskesmas. The design of data processing form of record-based android. Based on the results of the study, maternal health data has been computerized but has not facilitated the task of midwife in the field, so it is necessary to designed the SIM-Bumil application which is expected to help the work efficiency of midwife in field and improve the accuracy of maternal health data that can support maternal health program.

1 INTRODUCTION

Maternal health needs attention because there are still maternal death, especially in Central Java. This event can affect the achievement of *Sustainable Development Goals* (SDG's). Government of Central Java, especially Semarang City has been accompaniment of pregnant women and maternal data collection by midwives.

The increase in maternal and child mortality raises the problem or irony because the MDG's target of Indonesia in 2015 is 108 per 100,000 live births as stated by Prof. Laksono Trisnantoro, this can occur due to lack of attention to the implementation of Maternal and Child Health (KIA) in the region in order decentralization and MMR (Maternal Mortality Rate) and IMR in the areas that exist in areas not used as indicators of maternal and child health program performance (Bismo, 2013).The result of the survey basic health Indonesia in 2012 explains that various government programs have not succeeded in suppressing maternal mortality, despite the maternal care insurance program (JAMPERSAL), in the form of financial assistance provided to the poor so that they can be assisted by health personnel, is midwives or doctors in health care facilities (Ruslan, 2013).

This is also the concern of the government, based on the global agreement (*Millennium Development Goals* / MDG's, 2000) by 2015, it is expected that the Maternal Mortality Rate decreased by three-quarters in the period 1990-2015 and Infant and Under-Fatal Mortality rates decreased by two-thirds during the period 1990-2015, based on that, Indonesia is committed to decrease Mortality Rate to 102 / 100.000 KH, Infant Mortality from 68 to 23 / 1,000 KH, and Underfive Mortality Rate 97 to 32 / 1,000 KH by 2015(Kementerian Kesehatan RI, 2010)This is still a concern of the Indonesian government based on the achievement of the MDG's by 2014 by Bappenas, which still requires hard work to reduce maternal and child mortality. Indonesia is currently implementing *Sustainable Deveopment*

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Goals (SDG's) as a continuation of MDG's in achieving targets to reduce maternal and child mortality(Setyowati, 2017). Based on the Health profile of Semarang city in 2016 obtained maternal mortality from 2012 to 2016 which tends to increase (Semarang, 2017).

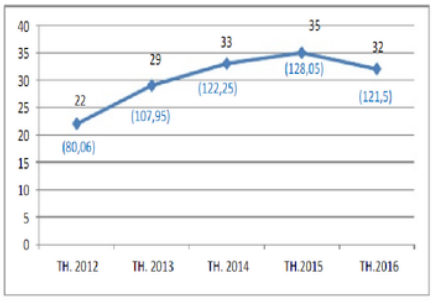

Figure 1: Graph of the number and the maternal mortality rate of Semarang City in 2012 – 2016.

Source: Health Profile of Seamarang City in 2016

The purpose of this research is to design the form of KIA-based data processing android to prevent maternal mortality cases. This is done based on the problems encountered by field survey personnel or GASURKES difficulties in recording KIA data in the field because the data collected a lot and there is no application that makes it easy for data recording.

2 METHODS

2.1 Design

This research includes the type of descriptive qualitative research by describing the form of data processing of maternal and child health (MCH or KIA), using data collection methods by observation and interview. While the method for making the application using the system development method or SDLC (*System Development Life Cycle*) which is a life cycle of system development that activities are interrelated and sustainable(Reynolds, 2008).

2.2 Sample

The study population is data and information of MCH or KIA program from puskesmas in Semarang city area. The research sample used is part of the study population is that has maternal mortality cases.Based on data from the health section of the Health office in Semarang city in 2016, most cases of maternal mortality in the district Ngaliyan. (Semarang, 2017)

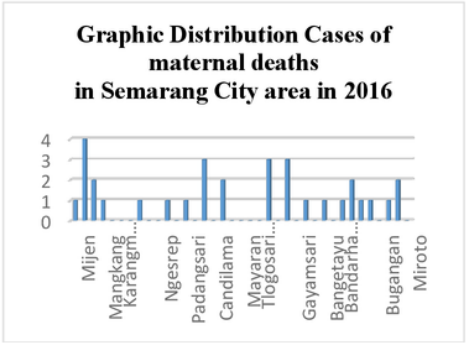

Figure 2: Graph of the distibusion of cases of maternal mortaliy in 2016.

Source: Health Profile of Seamarang City in 2016

The research subjects were midwife GASURKES and research object about the management of maternal health data at puskesmas in Ngaliyan district.

2.3 The Research Stages

The research stages as:

- Initial survey, aiming for knowing the needs of data processing form of maternal health in puskesmas so that this research based on case in an organization.
- Permission, conducted by researchers to obtain primary data and secondary data from puskesmas.
- Primary data collection and data secondary method using research instrument in the form of interview guides, observation guidance, and check list, conducted in health center Ngaliyan area.
- Data analysis by assessing and knowing the problems that exist in the agency. The sample used is Ngaliyan district which has maternal mortality case consisting of health survey officer and data processing officer of Maternal's Health. While the object of research in the form of maternal health information system at puskesmas.
- Design of information systems in the form of data processing androidmaternal health.
- Development of maternal health data processing system by making of data

processing application of maternal health using android's program to run application also used programming of database with MySQL.

- Testing of data processing application is done to test the application by entering data of maternal's health and make report of its application.

3 RESULTS

3.1 Characteristics of Respondents

Respondents consist of GASURKES who served in the region Ngaliyan City Sub-district totaling 15 people, which is divided from 2 puskesmas that is Puskesmas Ngaliyan and Puskesmas Tambakaji. Selection of respondents based on discussions with Head of Puskesmas Ngaliyan and from Coordinator of GASURKES, and still the data of maternal death case. Based on the interview results obtained as many as 15 people GASURKES have female gender and age that are still productive and have the same educational background that is Diploma of Midwifery.

Table 1: Distribution of the percentage of respondent's.

Background characteristics	N (%)
D III Midwifery	15(100%)
Total	15 (100%)

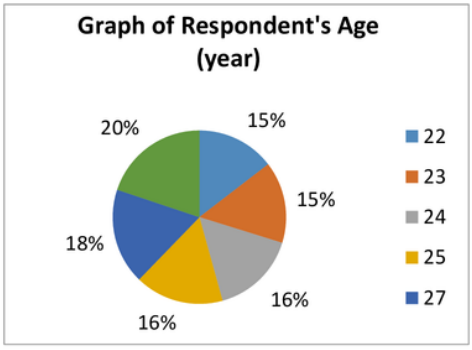

Figure 3: Graph of respondent's age.

3.2 General Description

Maternal and Child Health Services (MCH or KIA) undertaken at the puskesmas include examination of pregnant women, postpartum examination, maternal care, infant and toddler examination, immunization services, and family planning services. The service is carried out by puskesmas personnel who are midwives, but the task is from midwives at puskesmas not only provide services but also record and report for their routine activities. So that MCH or KIA services can not be optimal. The existence of GASURKES to help MCH services at puskesmas with the task of assisting pregnant women to improve their health.

3.3 SDLC

Stages of information system development (SDLC), this activity includes from several stages to produce a new form of information system design. The activities carried out as follows:

- Prelimary study, this activity consists of the discovery of the problem is by conducting interviews and observations in sections Maternal and child health at Puskesmas Ngaliyan, Semarang city, from the results interview found problems in the system information that is not yet applications for data management and information based android. Interview as well done in the system in family health section in of the Health office in Semarang city or DKK Semarang for get information or as a supporter for existing problems.
- Based on interview results with respondents is Head puskesmas, MCH (KIA) officers, and GASURKES obtained results following:
- Interview with Head of Puskesmas Ngaliyan, with the result that KIA data recording has been assisted by GASURKES as it helps to facilitate the puskesmas to improve its services
- Interview with Officer MCH or KIA, with the results interview is the work of MCH or KIA officers to be increased because after service officers have to make input data and information systems used are also many, such as SIMPUS, SIM- KIA not to mention the form of records that are still manual such as registers, and added recordings for TB and HIV screening on pregnant mother. So reporting can not be timely.

- Interview with GASURKES, with results are GASURKES find it difficult in the field because of the too many forms of recording besides they also do mentoring to the mother pregnant, and must send a report to the puskesmas
- Interview with GASURKES, with results are GASURKES find it difficult in the field because of the too many forms of recording besides they also do mentoring to the mother pregnant, and must send a report to the puskesmas, sub-district and the Health Office in Semarang City.

II. System Analysis (system analysis), this activity includes :

- Project planning (project planning), this activity done by making in preparation form proposal and make a schedule for the stages undertaken for development system and discuss to the parties involved the service of the Health office in Semarang city and puskesmas.
- System requirements, based on the results of interviews and observations found that the existing information system at puskesmas supported by the recording done by GASURKES and requires applications that facilitate and can be done integration between recording on field with onpuskesmas. Needs this system includes hardware analysis that used for data processing is handphone or android based smartphone, computer or laptop used for data processing is handphone or android based smartphone, computer or laptop.
- Data and information needs for maternal and child health services done by collecting that data used by GASURKES and MCH or KIA services at puskesmas. The types of data used include maternal maternal data, maternal cohort, mapping of pregnant women.

Decision Analysis, at this stage there are several alternative solutions selected to meet the needs of systems designed with the aim of identifying candidates solutions, analyze candidate solutions, accordingly feasibility and recommend as a system candidate which will be developed. Alternative selection of solutions that is in the design KIA data processing to prevent Case Maternal and Child Mortality which is based on Adroid in the framework of achievement SDG's, that is:

- Selection of KIA data processing design is selected with approach starting from Semarang City Health Officeto analyze information needs based on sie policy Nutrition of Kesganext down to lower level is puskesmas working area the Health Office in Semarang City. Process this approach is done to determine the model, output, input, database, and operating procedures.
- Selection of software system development new: on KIA-based data processing plan based on android mobile is selected alternative with consideration that the application of the program is not available at puskesmas working area of the Health Office in Semarang City, therefore alternative is selected according to the needs of the system users.
- Selection of new information system operating system: operating system for new information system using Windows, because the computer is on puskesmas Semarang already using Windows operating system, and is user friendly, as well as with the device which is android based.
- Selection of Users or users of new information systems: alternative selection of users in information systems in the form of this mapping is multi user, with data communication network make it possiblecommunication data between GASURKES with puskesmas.
- Selection of new information system tools: tools which are used for the design of data processing using the Android studio program, while for reporting using PHP programming and MySQL database.

III.Design of information systems, at this stage is done initial design for recording of maternal health data, based on the records used by GASURKES and puskesmas :

- The design of maternal data processing application using web-based PHP program, its purpose to be used by GASURKES and Puskesmas, as well as listing for android based GASURKES.
- Database design using MySQL that can be done up-date data
- The design of the android-based display form in mobile devices: Creation of an android-shaped application can make it easier for officers in the field.

Figure 4: Display menu login base android.

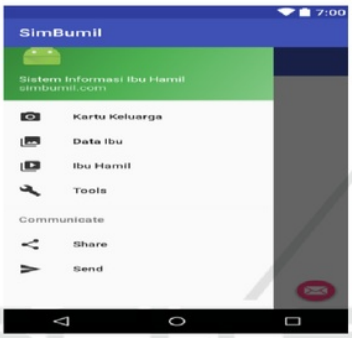

Figure 5: Display login menu of android base.

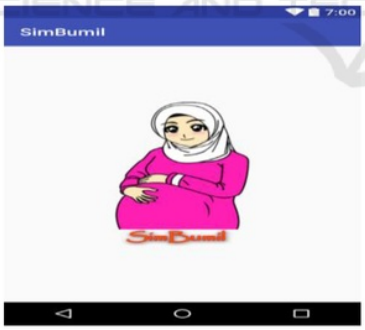

Figure 6. Display splash menu.

4 DISCUSSION

Maternal mortalityinternationally accepted definitions for indicators of maternal mortality and obstetric causes of death have been published by the World Health Organization (Cohran SD, 2014).

The WHO findings, based on Vital Statistics data, were not seen when temporal trends in maternal mortality were assessed using hospitalization data. Dr Lisonkova and colleagues found no evidence of an increase in maternal mortality between 1996 and 2007, and concluded that the increases in maternal mortality seen with use of Vital Statistics data reflect improved ascertainment of maternal death (Rowe, 2011).

Maternal mortality indicators are also used in maternal and child health services as a benchmark for the achievement of services performed by puskesmas, so that if there is inaccurate data will affect maternal mortality.

The MMR is defined as the number of all maternal deaths from direct and indirect obstetric causes per 100 000 live births. We did not calculate MMRs by cause of death because of the small number of deaths. (MH Bouvier-Colle, 2012).

A big problem in the recent implementation of health information system is that there has been yet any manifestation of efficiency which was marked with: 1) the occurrence of redundant daya, 2) duplicated activities, 3) low data quality, 4) data is not in line with the necessities, 5) report not submitted on time, 6) unoptimized feedback system, 7) low data and information utilization in regency level for the purpose of advocating, program planning, monitoring, and management, and 8) inefficient resources utilization. Those conditions were due to: 1) overlapping in data gathering and data processing, 2) data and information processing have not been yet well integrated and well coordinated (Heru Santoso Wahiro Nugroho, 2016).

Recording of maternal health data has been done by puskesmas but its achievement is not optimal so health department of Semarang city carrying out maternal health record which assisted by midwives called GASURKES. It aims to achieve better maternal health and reduce maternal mortality.

Despite the existence of longstanding cause of death registration systems and hospital morbidity registers in European countries, currently available data for surveillance of maternal morbidity and mortality associated with pregnancy, childbirth and the postpartum period are inadequate. All countries should be encouraged to use validated methods to improve the ascertainment of maternal deaths and in particular confidential enquiries and data linkage. Better use of data available in hospital discharge databases should make it possible to identify indicators of morbidity that can be validly compared. (MH Bouvier-Colle, 2012)

In fact, the major part of data gathering is performed manually at lower levels without the use of new information technologies, but official automation system and the mortality registration system are used to inform at higher levels (Emami Afshar N, 2006).

Mother and child health data management is very important both manually and computerized. The more advanced information technology today is also considered by the puskesmas. The use of computerized recordings has been done in the field but midwives still have difficulties in their implementation, requiring the form of recording which facilitates the listing in the field and can improve maternal health data accuracy. This is in accordance with research on the management of toddler nutrition data in android-based puskesmas with the result that is consistent with research on maternal and child health data management for android-based nutrition services resulting in a design that helps to manage nutritional data (Setyowati, 2017).

Based on research on Information Management in Iranian Maternal Mortality Surveillance System is Although the status of information management in IMMSS (the Iranian Maternal Mortality Surveillance System) was desirable, considering the significant importance of this process for designing and implementation of properinterventions, the following recommendations could be done to further improve the quality of IMMSS: modification of the data-gathering method using information technology; creating communication links between different data resources; periodic sample controlling of female deaths in reproductive age in the universities of medical sciences; implementing the International Classification of Diseases-Maternal Mortality and the integration of its rules on Integrated System of Death; and creating the expert positions of Maternal Health in the Treatment deputies. Also, the results of similar research topics in university levels could be useful to improve the performance of this system. (Farahnaz Sadoughi, 2017).

Maternal deaths were identified initially from discharge coding data for the years of interest. Pertinent medical records that pertain to the admission ending in death were then examined for extraction of data used in this analysis (Steven L. Clark, et al., 2014).

Data management in MCH services has an important influence, one of which is research on the model of service indicators kia produce model indicator MCH model is a new era for maternal and child health. Limitations indicator indicate further development is required. However, the total MCH Model Indicator package provides a solid structure for the modification of this infinite dynamic indicator, while five application areas suggest activities that touch almost all aspects of maternal and child health (Marry D. Peoples-Sheps, 1998).

The existence of proper maternal health data recording forms will facilitate the recording of GASURKES in the field, in accordance with the research on Application of Maternal Health Data Processing to Reduce the Case of Maternal Death in Puskesmas in order to Achieve Sustainable Development Goals (SDG'S) is The design of data processing application of maternal health in the form of application made with Visual Basic programming by using MySQL database. This application is made and has been done early testing by entering the data of mother's health and see the result of health report of mother which result is expected to improve efficiency and effectively of performance of health data processing officer of mother at puskesmas because can reduce recording which is manual because officer easily enter data maternal health in the application and easy to search data of mother which have been included in application and recording and report needed already available become one in the form of application of data processing of mother's health and can support service of puskesmas for achievement of indicator of SDG's (M Setyowati, 20017).

5 CONCLUSIONS

The design of data processing of Maternal and Child Health based on Android is a form of application that can be used to facilitate the task of GASURKES that collect data in the field.

The data processing application is used to support the reporting of the Local Area Maternal and Child Health Control (PWS KIA) made by the puskesmas in order to monitor the health of maternal and child and can help prevent the incidence of maternal death cases.

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REFERENCES

Bismo, M., 2013. *Berita Sati,com.* [Online] Available at: http://www.beritasatu.com/kesra/147343-angka-kematian-ibu-dan-bayi-meningkat-tajam.htm

Cohran SD, D. J. K. E. G. A. G.-M. E. M. A. V. E. R. G., 2014. Proposed declassification of disease categories related sexual orientation in the International Statistical Classification of Disease and Related Health Probelms (ICD-11). *Bull Worl Organ, 92(9),* pp. 672-9.

Emami Afshar N, J. P. D. B. R. L. A. A. M. M. e. a., 2006. *National maternal mortality surveillance system,* Teheran, Iran: Iran's health ministry.

Farahnaz Sadoughi, A. K. L. E., 2017. Information management in Iranian Maternal Mortality Surveillance System. *Electron Physician, July 9 (7),* pp. 4914-4923.

Heru Santoso Wahiro Nugroho, S. S. H. B. N., 2016. Indicators of Organizational Support in Implementing Maternal and Child Health Information System. *International Journal of Public Health Science (IJPHS),* V(3), pp. 280-283.

Hogan MC, F. N. M. A. S. W. M. M. S. L. A. L. R. M. C., 2010. Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millenium Development Goals 5. *Lencet, May 8, 375(9726),* pp. 1609-23.

Kementerian Kesehatan RI, D. J. B. K. M. D. B. K. I., 2010. *Pedoman Pemantauan Wilayah Setempat Kesehatan Ibu dan Anak (PWS-KIA),* Jakarta: Kemenkes RI.

M Setyowati, V. S., 20017. *Aplikasi Pengolahan Data Kesehatan Ibu untuk Menurunkan Kasus Kematian Ibu di Puskesmas dalam rangka Mencapai Sustainable Development Goals (SDG's) 2017.* Semarang, Engeneering faculty of PGRI University, pp. 64 -66.

Marry D. Peoples-Sheps, P. A. G. A. M. F. C. E. C. J. K. e. a., 1998. Model Indicators for Maternal and Child Health:. *Maternal and Child Health Journal,* II(4), pp. 241-256.

MH Bouvier-Colle, A. M. M. G. Z. N.-A. C. V. K. S. a. J. Z., 2012. What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe. *BJOG : 119 (7),* pp. 880-90.

Reynolds, R., 2008. *Principles of Information System.* Canada: Thomson Course Technology.

Rowe, T., 2011. *Journal of obstetrics and gynaecology Canada : JOGC.* [Online] Available at: http://www.jogc.com/article/S1701-2163(16)35044-7/pdf [Accessed 15 January 2018].

Ruslan, K., 2013. *Catatan Menjelang 2014 : Angka Kematian Ibu meningkat,* Jakarta: Kesehatan.kompasianan.com.

Satu.com, B., 2014. *Angka Kematian Ibu dan Bayi Meningkat Tajam,* Jakarta: www.beritasatu.com/kesehatan.

Semarang, D. K. K., 2017. *Profil Kesehatan Kota Semarang tahun 2016.* [Online] Available at: https://kupdf.com/download/profil-kesehatan-kota-semarang-2016pdf_59eaf1ef08bbc58508e65d65_pdf

Semarang, D. K. K., 2017. *PROFIL KESEHATAN KOTA SEMARANG TAHUN 2016.* [Online] Available at: https://www.scribd.com/document/360135154/Profil-Kesehatan-KotEa-Semarang-2016-pdf

Setyowati, M., 2017. *Pengelolaan Data Pelayanan Kesehatan Ibu dan Anak Bagian Gizi Balita di Puskesmas Berbasis Android Mobile untuk Mendukung Pencapaian Sustainable Mellinium Goals.* Surakarta, Jawa Tengah, Universitas Muhammadiyah Surakarta, pp. 22-26.

Steven L. Clark, M. et al., 2014. *Journal AJOG.* [Online] Available at: https://www.ajog.org/article/S0002-9378(14)00241-5/pdf [Accessed 15 January 2018].

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