

Conference Paper

Implementation of E-Prokesmas Information Systems on Community Health monitoring in Jembrana Regency, Bali

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Abstract

Puskesmas (Community Health Center) have an important role in the society of Indonesia, especially in the current government. The Government of the Republic of Indonesia, through the Minister of Health of Indonesia announced the Healthy Indonesia Program, which is run on the basis of ministerial regulation, Guidelines For The Program Of Healthy Indonesian Programs with Family Approach, and in the Ministerial Regulation states that Implementation of Healthy Indonesia Program with Family Approach implemented by Puskesmas. For effectiveness of the program above, then E-Prokesmas Information System was built to be a tool of Puskesmas in monitoring the achievement of healthy family in its working area according to health indicators as government requirements. The data displayed in E-Prokesmas is Web based GIS, that can display the health level status of the community such as percentage of healthy population, number of pre-healthy percentage and number of newborn mothers. Data collected above can be source of information for officer action in conducting health monitoring of sick members in the community.

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1. Introduction

There have been many successes in national development in the health sector, but the Indonesian people have not yet achieved the "Healthy Indonesia" as desired in the National Long Term Development Plan [1]. Unfulfilled maternal mortality rate is still high, infant mortality rate is still high, while there are still many short stunting children, and various nutritional problems. In the field of disease control, we are exposed to a double burden, ie infectious diseases such as AIDS, Tuberculosis and Malaria are still high prevalence, while non-communicable diseases such as Hypertension, Diabetes, Cancer, and Mental Disorders continue to grow. Although the source of funds for the

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health sector continues to increase and the increase in human resources of health both in terms of quantity, type, quality, and even distribution continues, the increase in resources has not been able to fully offset the increased needs.

Realizing such problems, to achieve Healthy Indonesia within the period 2015 - 2019, the health sector efforts is directed to focus to:

- Reduce Maternal Mortality Rate and Infant Mortality Rate.
- Lower prevalence of short toddlers (stunting).
- Tackling infectious diseases HIV-AIDS, Tuberculosis, and Malaria.
- Tackling non-communicable diseases Hypertension, Diabetes, Obesity, Cancer, and Mental Disorders.

In order for existing resources to be utilized effectively and efficiently, these efforts are conducted in an integrated manner from planning to implementation, monitoring and evaluation. The goal was focused on the family, with the revival of "Family Approach".

To realize the goal of Family Approach in Healthy Indonesia above, The Minister of Health, Republic of Indonesia issued a ministerial regulation. Regulation of The Minister of Health, Republic of Indonesia No. 39 Year 2016 About Guidelines For The Program Of Healthy Indonesian Programs with Family Approach, and in Article 5 of the Ministerial Regulation states "the Implementation of Healthy Indonesia Program with Family Approach implemented by Puskesmas (Community Health Center)[1].

On the other hand, Jembrana Regency has been 10 years implementing Information Systems on its community service. So, to support the achievement of a Healthy Indonesia goal which is mandated to the puskesmas, it is necessary to integrate it into the Blueprint for e-Government implementation in Jembrana Regency.

Through e-Government implementation in Jembrana regency, Jembrana's government services will take place in a transparent, traceable process, so it can be considered accountable. Elements of irregularities can be avoided and services can be delivered effectively and efficiently. E-Government Integration through Implementation of GIS web-based thats called GIS E-Prokesmas, is expected to become a family-based health monitoring tool on Community Health in Jembrana Regency.

2. Literature

2.1. Community health center

Community Health Center or Puskesmas is the forefront of public health services in Indonesia. Puskesmas is a functional organization, funded by the government and society to organizes health services that is comprehensive, integrated, equitable, acceptable and affordable to the public.

Puskesmas has several functions such as functional health organization unit, public health development center, Building community participation and provide comprehensive and integrated services to the community under its coverage in the forms of principal activities

As Community Health Service, puskesmas coverage part of or the whole sub-district (kecamatan), depending on: population density (30,000), areas Geographic (extended to have supporting - Community Health Center or Puskesmas Pembantu or Puskesmas Keliling), and infrastructure (personnel and facilities). Puskesmas should emphasize its public health services in order to achieve optimal health standard. Azwar in Kardiana, et.al [2] suggested, Puskesmas as the place to implement a functional unit that serves as the development of health, fitness enhancement of community participation in health and the first layer of health care activity.

Implementation of Healthy Indonesia Program with Family Approach at Puskesmas level is through:

- Health data collection of all family members;
- Create and manage the Puskesmas database;
- Analyze, formulate health interventions, and develop Puskesmas plans;
- Conducting home visits in promotive, preventive, curative and rehabilitative efforts;
- Carry out health services (inside and outside the building) through life cycle approach; and
- Implementing Information and Reporting System of Puskesmas.

2.2. E-Health information systems

On explanation on World Health Organization (WHO) website, e-Health is the use of information and communication technologies (ICT) for health. The World Health

Assembly in 2005 recognized the potential of eHealth to strengthen health systems and improve quality, safety and access to care, and encouraged Member States to take action to incorporate eHealth into health systems and services (58th World Health Assembly, 2005; Geneva, Switzerland), and in 1998 WHO recognized the increasing importance of the Internet and its potential to impact health through the advertising and promotion of medical products, in its resolution on “Cross-border advertising, promotion and sale of medical products through the Internet” [3]

When E-Health is applied to a public service, then from an Information System implementation point of view it should be linked also to Presidential Decree no. 3 Year 2003 on National Policy and Strategy Development of e-Government and also E-Government Blueprint of local government.

In a blueprint document -such as those in jembrana regency-, function and component modules are arranged in a so-called Government Function Framework [4].

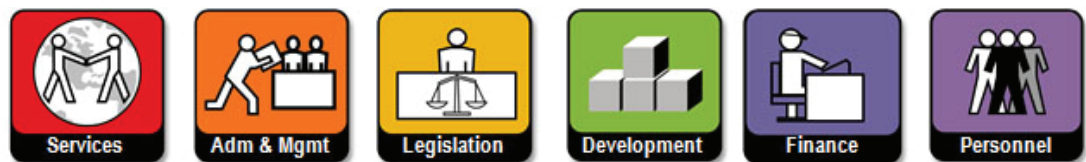


Figure 1: Government Function Framework.

On the other hand, the application system that developed, must meet the needs of government functions as it has been defined and grouped in the Governance System Functional Framework.

The application system functions and services, are then arranged and grouped in a system architecture framework, which is in the document Blueprint is hereinafter referred to as e-Government Solutions Application Map [4]

In the e-Government application map solutions that developed by Jembrana Regency. Application systems grouped by function orientation matrix approach between the service and the nature of the application system functions. Through this approach, the application system are is grouped into three (3) groups as follows:

1. Group orientation application system functions directly provide services to its users (application front office)
2. Group functions oriented application system more geared to furnish relief work that is government administration, as well as official functions and institutional (back office applications).

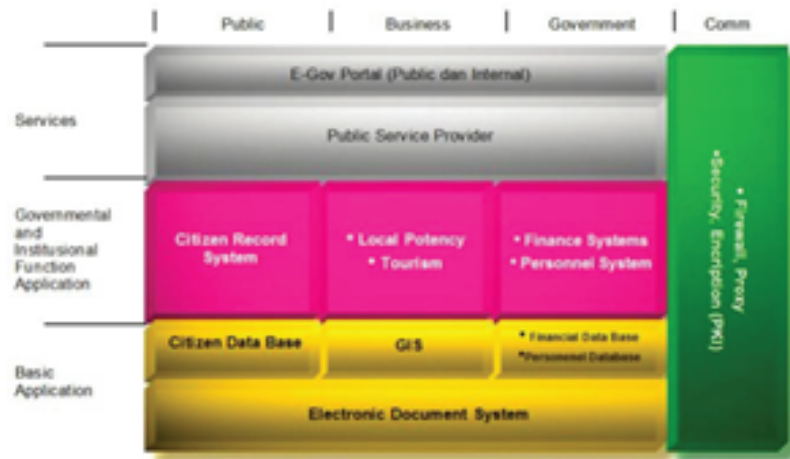


Figure 2: e-Government Solution Map.

- Group application system functions are fundamental and common services, required by each user, or any other application systems that are more specific. The nature of the basic application services typically back-office.

2.3. Geographical information systems (GIS)

As described by Burrough and McDonnell, Geographical Information Systems (GIS) can be described as general-purpose computer-based technologies for handling geographic data is in digital form in order to capture, store, manipulate, analyze and display diverse sets of spatial or Geo-referenced data is

Research on e-Government concerning the application of GIS has been carried out in Indonesia and other countries. Ramadan et al. conduct a study to assess the implementation of the e-Government system provided by ninety institutions in Indonesia. Research conducted using several criteria, the first criterion, is used GIS in their availability and accessibility, the date of GIS manufacturing facilities and GIS technologies are used. In addition, the assessment carried out by seeing integration among agencies with other agencies use GIS. The results from studies above, shown that seventeen of the total official site assessed has implemented GIS facilities. Seven of the total GIS websites only displays a static map, while others in the form of a dynamic GIS facility. It also shows that there is no integration between institutions that have implemented of GIS facilities [5]

3. Method

3.1. Development method and data collection steps

To answer the technical demands, we have made the systems development from data collection, and the data collection was done by using several methods. The first method is interview method, conducted to interviews Head of Puskesmas II Jembrana.

The second method is survey. This survey was conducted to see the indicators that will be recorded.

In order to implement Healthy Indonesia Program with Family Approach, 12 (twelve) main indicators as a marker of family health status are as follows:

- Families follow Family Planning (FP) programs;
- Mothers perform deliveries at health facilities;
- Infants get complete basic immunization;
- The baby gets exclusive breast milk (ASI);
- Toddlers get growth monitoring;
- People with pulmonary tuberculosis receive standardized treatment;
- Hypertensive patients perform regular treatment;
- People with mental disorders get treatment and not neglected;
- No family members are smoking;
- Families are already members of the National Health Insurance;
- Families have access to clean water facilities; and
- Families have access or use healthy latrines.

Stages of data collection are described in the following figure:

The process begins with Community Health Center officers recording family-based health conditions in their working areas. The data is then submitted to the operator for input on the GIS E-Prokesmas system, the data then becomes a geographic map view that can be accessed by the head of the Community Health Center and the Regency Health Office to see the health status of each family in a particular region. The third method is a method software development System development using SDLC (System Development Life Cycle).

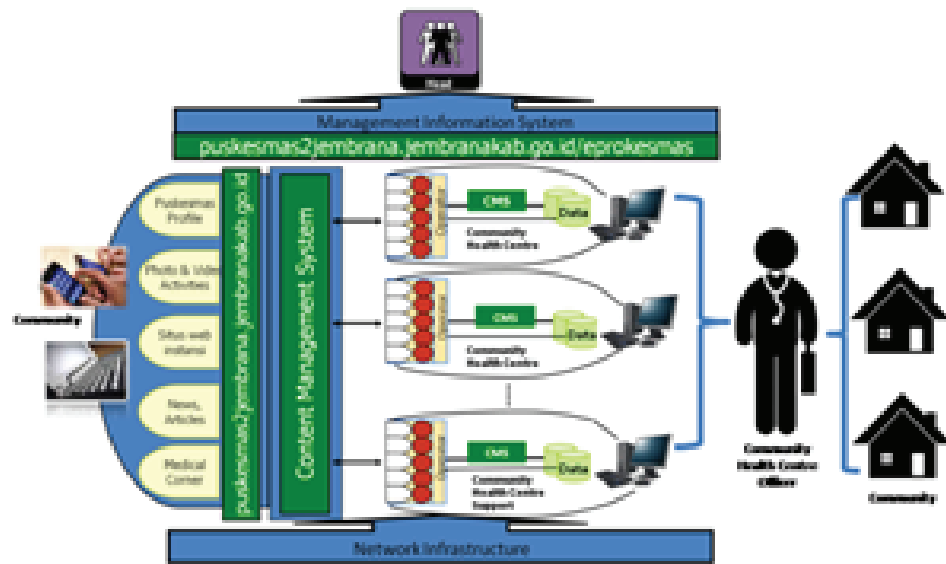


Figure 3: Collection Data Steps.

3.2. Data grouping method

In terms of data collection, data that have been obtained are grouped into several categories.

3.2.1. Based on the source

Based on the data source, the data can be grouped into primary data and secondary data. Primary data were obtained from the collection of data directly from the source by using several methods such as observation, interviews, and data obtained from relevant agencies. Secondary data were obtained from the data that has been documented and literature.

3.2.2.

Based on the rate of change Based on the rate of change is divided into two parts, static data and dynamic data. Static data are the data rate of change relatively infrequently, such as common data (data villages and village citizen). While dynamic data is the data rate of change relatively frequently, such as family's village citizen health status.

4. Results

Jembrana is a regency of Bali, Indonesia. It has an area of 841.8 km² and a population of 261,618 at the 2010 Census. Its regency capital is Negara. The Jembrana regency, administratively divided into five districts (kecamatan), listed below with their 2010 Census populations: Melaya 50,381, Negara 77,818, Jembrana 51,634, Mendoyo, 56,222, Pekutatan 25,583 [7]

Puskesmas that become research implementation in this study is Puskesmas II Jembrana. Puskesmas II Jembrana is Technical Implementation Unit of Jembrana Regency Health Office, located in Yehkuning Villag. Working area of Puskesmas II Jembrana is 320.942 km² with population of 17439 people. Puskesmas II Jembrana is an expansion of the working area of Puskesmas I Jembrana, then based on Regent Regulation No. 30 of 2013 on the second change of Regent Regulation Number 75 Year 2011 on Organizational Formation and Working Procedures of Technical Implementation Unit of Public Health Center, Health Office Jembrana Regency, then Puskesmas II Jembrana was formed and operates in January, 1st 2014. Puskesmas II Jembrana, responsible to Jembrana Regent through Head of Jembrana Regency Health Office.

Puskesmas II Jembrana area covers of 4 Traditional villages (Desa) are, Yehkuning Village, Yellow Air Village, Budeng Village, Perancak Village and 1 Administrative village (Kelurahan), Sangkar Agung Village which consists of 16 Traditional Communities (Banjar) and 3 Administrative Communities [7].

E-Government Integration through Implementation of GIS web-based (GIS E-Prokesmas) placed on the website of Puskesmas II Jembrana, under the official website of Jembrana Regency (www.jembranakab.go.id):

Level of Login to application of GIS E-Prokesmas is divided into three parts, the community health center, executive and officer

The Dashboard application is used to view GIS e-Prokesmas. When logged in as Community Health Center then on dashboard will appear public health map in selected area.

The displayed map is the output of the data entered by the Community Health Center officer and displayed in the marker to see the health level in the community (percentage of healthy population, number of pre-healthy percentage and number of newborn mothers).

When a marker or symbol is clicked it will show detail data of family and family members, so policy makers in a region can know the health condition of every villager in the area.



Figure 4: GIS E-Prokesmas interface.

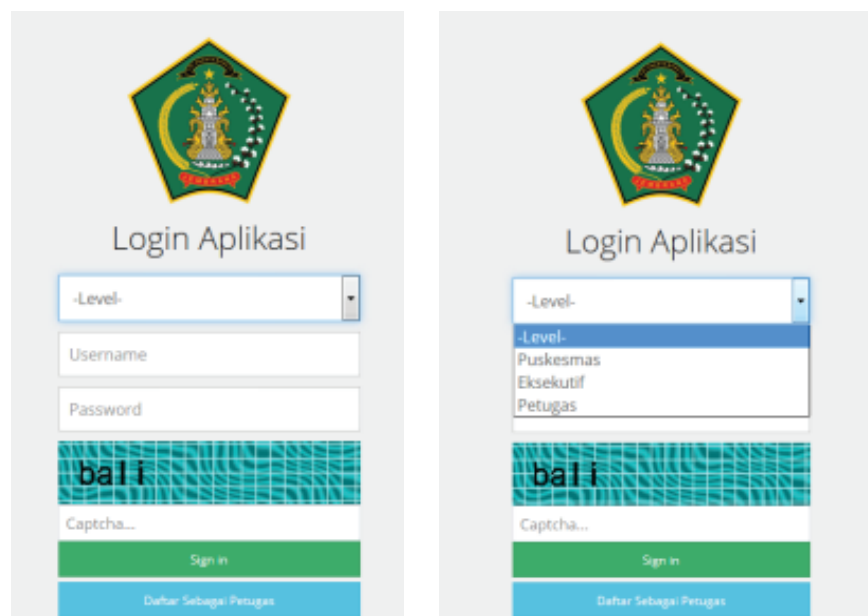


Figure 5: Login Level.

The output above can be displayed from the data collection related to 12 indicators of Community Health Condition based on Family Approach conducted by Community Health Center officers

The data displayed in GIS-E-Prokesmas not only can display the health level status of the community (percentage of healthy population, number of pre-healthy percentage and number of newborn mothers), but it can also be a source of information for officer action in conducting health monitoring of sick members in the community.

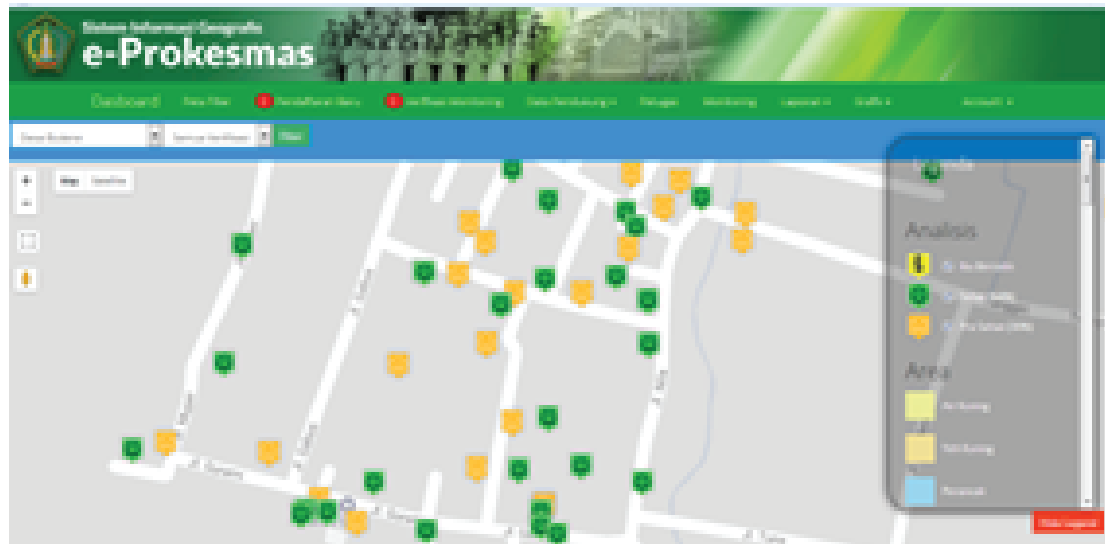


Figure 6: Community Health Map.

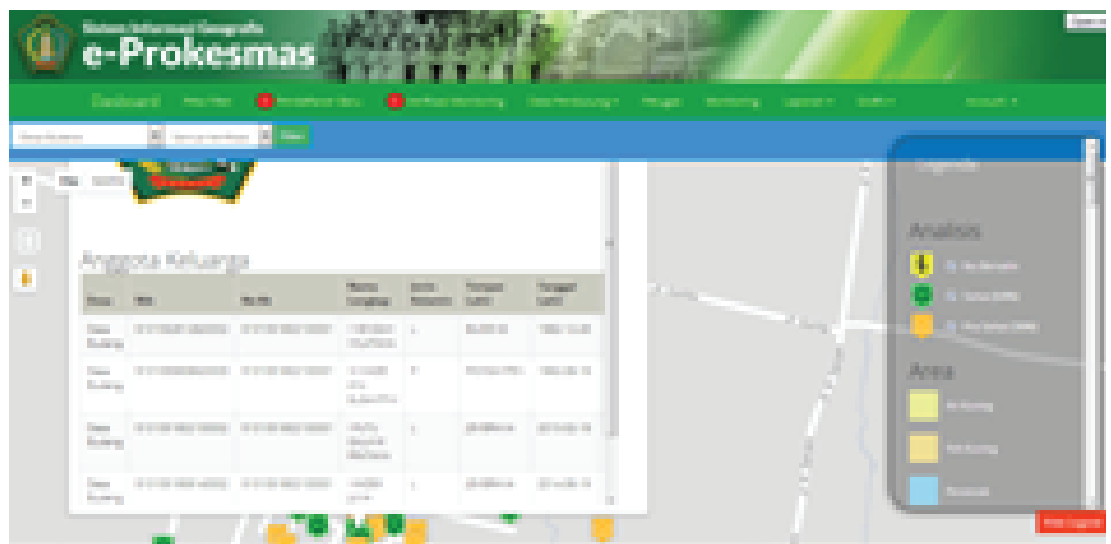


Figure 7: Family and Family member Health Status.

For information on decision makers GIS E-Prokesmas can also display regular public health monitoring charts.

5. Conclusion

Development of e-Government and documented as a blueprint for e-government will make it easier to meet the specific needs, for a general nature or basic needs of government agencies. Through implementation of GIS E-Prokesmas, Head of Central Community Center and also Regency Health Office can monitor the achievement of healthy family in its working area according to government Goal.

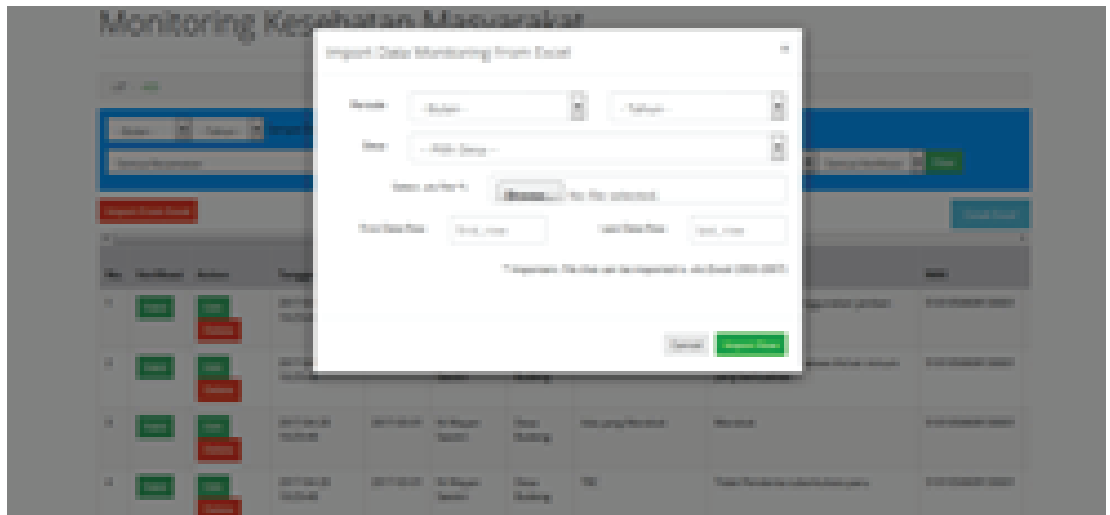


Figure 8: Data Import of Community Health Condition.



Monitoring Kesehatan Masyarakat

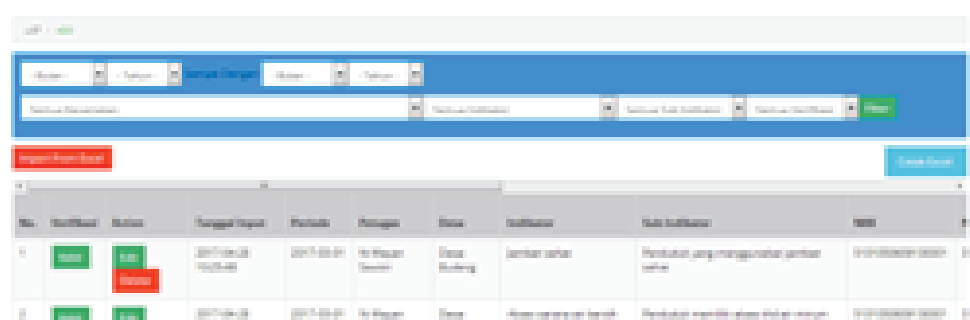
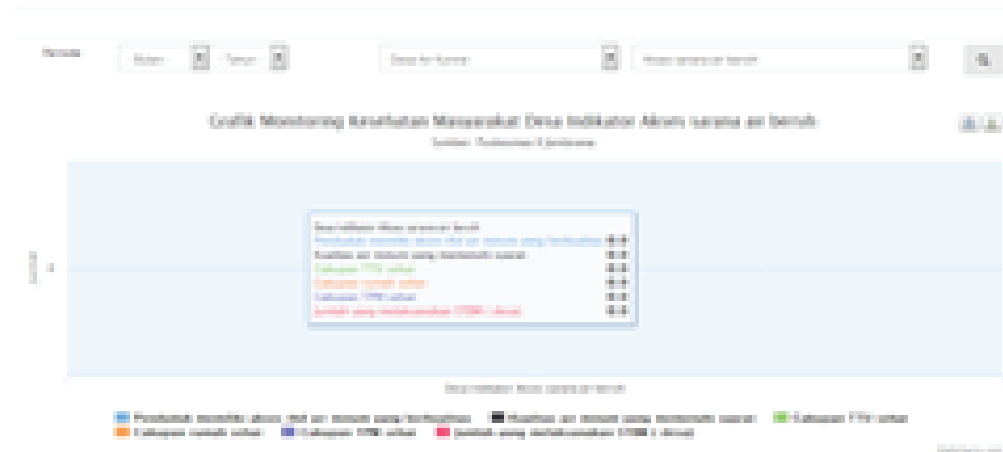


Figure 9: Further Monitoring of Health Condition for spesific Community Member.

GIS is built using a series of systems development methods and data collection methods related to 12 indicator as Regulation of The Minister of Health, Republic of Indonesia No. 39 Year 2016, About Guidelines for the Program Of Healthy Indonesian Programs with Family Approach. Methods for development system conducted by interview with the head of Community Health Center, according to the technical needs required, surveys by Community Health Center Officer in community and software development methods related to SDLC (system development life cycle).

Data collection methods are done by grouping the data into three categories based on their sources, based on the rate of change, and by designation, and finally data displayed in the form of maps with markers that can be used for public health decision making.

Grafik Monitoring Kesehatan Masyarakat



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