

## ORIGINAL ARTICLE

# Analysis of Measles-rubella Surveillance in East Java Province During COVID-19's Pandemic

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## ABSTRACT

**Introduction:** Measles-Rubella are infectious diseases caused by paramyxovirus viruses transmitted through sneezing, coughing droplets (Ministry of Health, 2019). The suspected MR case in East Java Province, Indonesia in 2019 (668 cases), 2020 decreased significantly (213 cases). Trend of discarded rate of MR cases in East Java Province 2019-2020 shows 13th ranked. The elimination's target of MR surveillance in Indonesia there is no transmission of the virus by adequate surveillance for 3 consecutive years (East Java Provincial Health Office, 2021). Aim: Analyzing problems of MR surveillance in East Java Province during COVID-19's pandemic. **Methods:** This research is a descriptive study which is classified as an evaluation study. Respondents are the East Java Provincial surveillance officer health centers conducted on January 2021. Analyzing by system approach. **Results:** MR surveillance problems in East Java Province during the COVID-19's pandemic is suspected MR cases by IgM not reached the target (89.47%). The determinants are input aspect include man (the surveillancer are shifted to focus on COVID-19), the material-machines (MR laboratory's tools limited cause focused on COVID-19 specimens), the money (MR surveillance limited funds), the market (underreporting cases), the method (guidelines still not understanding yet). Process aspect (data analysis, interpretation doesn't completed). Output aspect (decreasing confirmed cases 83%). **Conclusion:** Many obstacles and inconsistencies in the MR surveillance guidelines through system approach effects MR findings because focus on handling COVID-19, so this research needs to be carried out during the COVID-19 pandemic. MR's morbidity and mortality must be controlled.

**Keywords:** Measles-Rubella, Surveillance, System Approach

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## INTRODUCTION

The COVID-19 pandemic has had an impact on efforts to handle health problems, especially Diseases That Can Be Prevented By Immunization (PD3I) in Indonesia, which is a priority in handling due to the very fast frequency of transmission. One of the PD3I is measles-rubella disease which has an influence on the quality of life of children due to increased morbidity and mortality rates. Children are a group that is vulnerable to disease due to low body resistance. Measles and Rubella are infectious diseases caused by the MR virus and rubella and are transmitted through sneezing and coughing droplets (1).

Measles is caused by Paramyxovirus virus, genus Morbillivirus and mostly affects toddlers aged 5-9 years. This disease is very contagious and acute if it infects toddlers, especially those with poor nutrition, complications can occur. Complications that often

occur are bronchopneumonia, gastroenteritis and otitis media, encephalitis is rare but can be fatal, namely death (2). Measles is transmitted through droplets in the air by patients from 1 day before the onset of clinical symptoms to 4 days after the appearance of the rash. The incubation period is between 10-12 days (3). The signs and symptoms of measles consist of three stages including the catarrhal stage which is characterized by fever of more than 38 degrees Celsius for 3-7 days, headache, cough, runny nose, red eyes. The second stage is the eruption stage which is characterized by coughs and colds that get worse, the temperature of the fever is increasing, reddish spots or rash appear starting from behind the ears on the body in the form of a popular macula. The third stage is the convalescence stage which is characterized by the change of reddish spots to blackish (hyperpigmentation) accompanied by scaly skin (2).

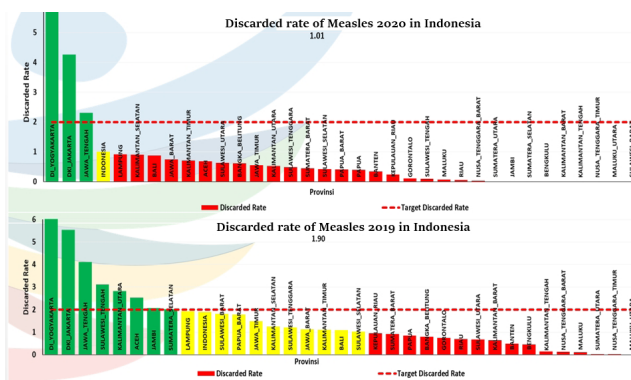
Rubella, also known as German measles, usually affects children and adolescents. Rubella is different from measles but has one thing in common: it causes a red rash on the skin (6,7). The target for Measles-Rubella (MR) elimination in Indonesia in 2021 is that there is no measles-rubella virus transmission as evidenced

by adequate MR surveillance for 3 consecutive years. MR surveillance indicators are Discarded rate MR 2 / 100,000 population per year and CBMS 100% per year (4,5). Based on the trend graph of the discovery of discarded measles-rubella cases in Indonesia in 2019-2020, it shows that in 2019 and 2020 East Java Province is ranked 13th (Table 1) (Figure 1).

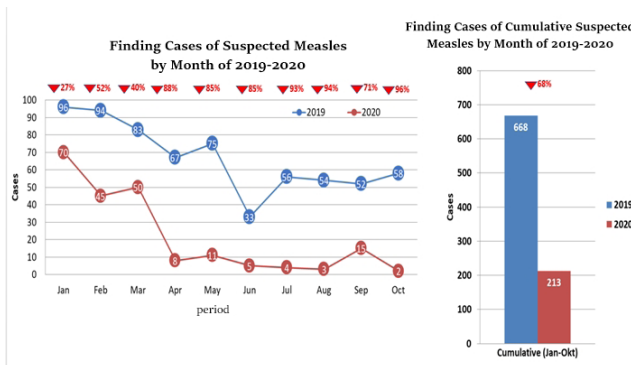
**Table 1: The Measles-Rubella Discarded Rate in Regencies/Cities in East Java in 2020**

NO	DISTRICT	DISCARDED RATE	MEASLES IR	RUBELLA IR
1	Blitar (M)	3.52	0.00	0.14
2	Batu	3.37	0.00	0.00
3	Gresik	2.67	1.31	1.31
4	Situbondo	176	0.68	0.00
5	Madiun (M)	1.69	0.00	0.00
6	Surabaya	1.07	2.90	8.69
7	Ponorogo	1.03	2.61	0.00
8	Tuban	0.94	1.17	0.00
9	Tulungagung	0.87	1.04	0.00
10	Probolinggo (M)	0.84	0.00	0.00
11	Mojokerto (M)	0.78	0.00	0.00
12	Malang (M)	0.69	0.00	0.00
13	Blitar	0.52	0.00	1.16
14	Pasuruan (M)	0.50	0.00	0.00
15	Lumajang	0.48	1.04	0.00
16	Sidoarjo	0.36	0.00	0.00
17	Kediri (M)	0.35	0.00	0.00
18	Kediri	0.32	3.15	0.00
19	Madiun	0.29	0.00	0.00
20	Trenggalek	0.29	0.00	0.00
21	Bojonegoro	0.16	0.00	0.00
22	Magetan	0.16	0.00	0.00
23	Jember	0.12	0.00	0.00
24	Malang	0.12	0.00	0.00
25	Nganjuk	0.09	0.00	0.00
26	Jombang	0.08	0.00	0.00
27	Banyuwangi	0.06	1.61	1.61
28	Pacitan	0.00	0.00	0.00
29	Sumenep	0.00	0.00	0.00
30	Bondowoso	0.00	0.00	0.00
31	Probolinggo	0.00	0.00	0.00
32	Lamongan	0.00	0.00	0.00
33	Ngawi	0.00	0.00	0.00
34	Pasuruan	0.00	0.00	0.00
35	Bangkalan	0.00	0.00	0.00
36	Mojokerto	0.00	0.00	0.00
37	Pamekasan	0.00	0.00	0.00
38	Sampang	0.00	0.00	0.00

The Trend of Finding Suspected Measles-Rubella in East Java Province in 2019-2020 showed a significant decline from 2019 to 2020, from 668 cases in 2019 to 213 cases in 2020.(Figure 2)



**Figure 1 Discarded rate of measles 2020 in indonesia**



**Figure 2 Finding Suspected MR in East Java**

Several MR surveillance indicators to achieve. The target for the elimination of Measles-Rubella (MR) in Indonesia in 2021 is a shared focus from both the MR program holders, to the supra-system and related stakeholders. The problems that occur in the effort to eliminate MR are often obstacles and subject to study by practitioners and academics. Besides that, the non-achievement of the target of finding cases of MR-rubella in East Java Province was caused by various factors, including on a systems approach covering input, process and output. Problems with input include the limited number of human resources. This is exacerbated by the COVID-19 pandemic, which has shifted the main tasks of the PD31 surveillance officers to COVID-19. This surveillance officer in East Java Province with an assignment in 29 regencies and 9 cities in East Java. So that the reporting system is diverted by COVID-19 surveillance. Based on the above problems, it is necessary to evaluate the MR surveillance system at the East Java Provincial Health Office.

So it is necessary to analyze the priority of the problem and the root causes of the problem to the intervention or alternative solutions that are formulated to overcome the problems that have been studied.

This study aims to identify and analyze measles-rubella problems in East Java during the COVID-19 pandemic.

**MATERIALS AND METHODS**

This research is a descriptive study which is classified

as an evaluation study. The type of evaluation research that will be carried out is the type of review, namely research conducted to find out how far the program is running and the extent to which the program can have an impact. Evaluation of the MR surveillance system uses a systems approach covering aspects of input, process and output. The subjects of this study were eight people in the surveillance officers at the East Java Provincial Health Office and one person in charge of the MR program. This research was conducted in January 2021 during the COVID-19 pandemic and was conducted at the East Java Provincial Health Office located on Jl. A.Yani No. 48 Surabaya. The data sources used in this study are primary data and secondary data which will then be analyzed into the required information. The primary data in this study were obtained from interviews and direct observations or observations of parties involved in the implementation of MR Surveillance activities at the East Java Provincial Health Office. Secondary data is used to complement and support primary data taken by researchers at the East Java Provincial Health Office from Health profile data regarding MR in 2020, Epidemiological Disease Surveillance (PEP) books, MR surveillance technical manuals, and MR-rubella surveillance manuals. Data collection techniques in this study were conducted by interviewing and documentation. Documentation in this study as a complement to the use of observation and interview methods. The data collection instrument used in this study was a surveillance system evaluation questionnaire based on systems approach to interviews and observation sheets.

#### **ETHICAL CLEARANCE**

This study was approved by Health Research Ethics Committee, Faculty of Public Health Airlangga University, Surabaya Indonesia No: 141-KEPK.

#### **RESULT**

Evaluation of the MR Surveillance System at the East Java Provincial Health Office Based on a System Approach

##### **Input Aspect**

###### **1. Man**

The results of the evaluation based on indicators of epidemiological surveillance based on KMK No. 1116/2003 show that the number of MR surveillance officers in the Health Office East Java Province as many as 8 people with the main task of functioning in 38 regencies/cities in East Java Province. The Characteristics respondents with a total educational history of bachelor of Public Health (75%), post graduated of public health (25%), work for 1-5 years of service at the Sidoarjo District Health Office as (62,5%), and have never attended training related to MR surveillance (37,5%).

###### **2. Material and Machines**

The results of the evaluation show the availability of materials based on the analysis of the evaluation of the MR surveillance system at the East Java Provincial Health Office includes computers/laptops, telephone/mobile/fax, stationery, manual, case reporting forms, weekly calendar, personal protective equipment, specimen collection media, technical instructions, official vehicles in good and adequate condition on these tools and laboratory facilities for MR surveillance activities. Most of the laboratories in East Java Province have become references for the examination of COVID-19 specimens. It is not uncommon for long queues to check for COVID-19 specimens. So that this becomes a separate obstacle for the IgM examination of MR suspects which further aggravates the queue for examination in the laboratory.

###### **3. Money**

The results of the evaluation show that the sources of funds allocated for MR surveillance activities are East Java Province based on the APBD budget with a sufficiently adjusted amount with a Plan of Action adapted to the work program carried out.

###### **4. Market**

Passive response in the discovery of MR cases and MR suspects which were subsequently not reported and further action was taken because afraid of being considered COVID-19 sufferers when dealing with health services.

###### **5. Methode**

The results of the evaluation show that several supporting documents for MR epidemiological surveillance activities are available in East Java Province including C1 MR Case Report's form, C2 MR Outbreak Investigation's form, C3 Recapitulation of data on PE KLB MR result's form, C-KLB-K Recapitulation of MR-Rubella outbreaks form, Integration Form K (AFP and PD3I Integration Surveillance Report), Specimen Inspection Request's Form. However, the MR supervision checklist is not available. This is because supervision is carried out by looking at the completeness of the af points so that no other attributes are assessed during supervision. In addition, there are applications in MR surveillance in East Java Province so that data can be monitored daily or routinely from online.

##### **Process Aspect**

Surveillance is carried out at each level according to their respective roles and authorities. The results of MR surveillance analysis in East Java Province are as follows:

###### **1. Case Detection**

a. Once a week District/City Health Office officers visit the hospital in their working area (RS/SARS Active

Surveillance) to validate the SARS-PD3I format data that has been reported by the hospital to the District/City Health Office by reviewing the register, verification and validation of medical record data. This was done to avoid missing suspected MR cases in the previously reported SARS-PD3I form.

b. Every suspected case of MR that is found and reported from private hospitals and health facilities is immediately notified to the Public health center within 1x24 hours from the time the report is received by the District/City Health Office. The Public health center immediately conducts epidemiological investigations, searches for additional cases and collects specimens (if needed) within 2x24 hours of receiving information from the District/City Health Office.

c. Every signal/alert that appears from the SKDR, then within 1x24 hours since the signal is received the District/City Health Office immediately:

- 1) Completeness check MR-01
- 2) Re-verify if MR-01 is incomplete or not available
- 3) If the data is complete, the District/City Health Office coordinates with the public health center to conduct an investigation in the field.
- 4) If there are rumors/issues in the community, mass media and/or social media, the District/City Health Office will verify the source of the rumor/issue within <24 hours since the signal is received.

## 2. Case Recording

Recording of MR cases in CBMS (Case Based Measles Surveillance) which is completed with form C1 after an epidemiological investigation has been carried out. The flow of MR surveillance data collection in East Java Province is MR cases found from patients who come for treatment to health services, both to General Hospitals, Private Hospitals, Public Health Centers, private clinics and private practice both to doctors and other health workers. The provincial surveillance officers pass the information on to the district surveillance officers. Public health center to the case area, so that officers can carry out investigations according to the address of the case to look for new cases or similar cases that have not been reported, and take patient specimens for laboratory examination to find out whether the patient suffers from MR confirmation. Based on the results of interviews, the data collection method is carried out actively, namely surveillance officers from the health office and health centers carry out data collection directly or pick up the ball for MR cases. The reporting flow and steps have been systematically regulated in the surveillance Standar Operating Procedure.

## 3. Case Confirmation

a. MR cases that have been subjected to epidemiological investigations are then performed with patient blood samples for laboratory examination

to determine whether the patient has confirmed MR or confirmed cases in East Java Province. District/City Health Offices take specimens from hospitals and health centers every Monday and Thursday and then send them to the Provincial Health Office (Provincial Health Office) or to the referral MR-Rubela Laboratory (using Form MR-04).

b. During the delivery of specimens to the Provincial Health Office or to the reference MR-Rubela Laboratory, it must be ensured that the specimen is stored at a temperature between 2-8 °C and maintained until it reaches its destination. On the other hand, the laboratories in East Java Province have become references for the examination of COVID-19 specimens. It is not uncommon for long queues to check for COVID-19 specimens. So that this becomes a separate obstacle for the IgM examination of MR suspects which further aggravates the queue for examination in the laboratory.

## 4. Reporting

a. The District/City Health Office provides an EPID number for each suspected MR-rubella case reported from the Public health center, hospitals and private health facilities. Make sure the EPID number given follows the rules for writing the EPID number (for more details, see Chapter VII regarding the Assignment of EPID Numbers to Individual Cases and Outbreaks).

b. Form MR-01 reported from the Public health center is re-checked, to ensure that all information on Form MR-01 has been filled out correctly. If there is incomplete information, it will be immediately re-coordinated with the Public health center.

c. Report each suspected case of MR-rubella to the Provincial Health Office no later than Tuesday of each week by attaching form MR-01 through the reporting mechanism determined by the Provincial Health Office (WA, email, etc.)

d. Make Form MR-02 District/City which comes from the recapitulation of form MR-01 from all Public health center. Form MR-02 District/city is reported to the Provincial Health Office every month on the 10th of the following month, through the reporting mechanism determined by the Provincial Health Office (WA, email, etc.)

e. Make a Regency/City MR-05 Form that comes from the recapitulation of each outbreak of an MR-rubella suspect at the Public health center. Form MR-05 District/City is reported to the Provincial Health Office every month on the 10th of the following month through the reporting mechanism determined by the Provincial Health Office (WA, email, etc.)

f. Make a recap of the completeness of the accuracy

of the Public health center and Hospital reports based on the absence of weekly public health center reports from SKDR data and weekly hospital reports from the SARS-PD3I form to then report to the Provincial Health Office every month on the 10th of the following month, through the reporting mechanism determined by the Provincial Health Office (WA, e-mail, etc.)

## 5. Data Analysis and Interpretation

- a. Analyze data by time, place and person.
- b. There are no maps to describe immunization coverage and distribution of MR cases by region.
- c. There is no analysis of risk factors for the incidence of MR and rubella for early warning of outbreaks included are trends in low immunization coverage, dense and slum residential locations, nutrient prone areas, areas that are difficult to reach or far from health services, areas where community groups refuse/anti-immunization, evacuation situations such as in disaster conditions, immigrant community.

The results of the analysis can be used for planning, advocacy, and decision making for program improvement. MR data analysis was carried out on a quarterly basis (3 months) so that data recapitulation was carried out four times. The interpretation of MR data is still not optimally carried out because it coincides with the COVID-19 pandemic with a significant addition in March 2020 so that attention to MR disease has been neglected.

## 6. Epidemic Preparedness, Response and Control

The form of MR epidemic preparedness in East Java Province has not been carried out, there is no MR control and control task force team. This is because most of the health workers have concurrent positions of the COVID-19 task force and the COVID-19 tracing team, thus prioritizing the prevention of COVID-19 over other infectious diseases.

## 7. Feedback

- a. Target : District/City Health Offices, Hospitals, Private Health Facilities
- b. Frequency: once every three months
- c. Dissemination : Official letter, Meeting, e-mail, SMS, WA, telephone
- d. Contents : analysis of the MR case situation, the absence of completeness and accuracy of the District/City Health Office and Hospital reports. However, recommendations/suggestions for solving problems that occur in every Regency/City in East Java Province have not been carried out because the discovery of MR cases has not been optimal and the problems that occur tend to be not prioritized because the province focuses on handling the COVID-19 pandemic.

## Output Aspect

The results of the MR surveillance evaluation based on the output obtained regarding MR in East Java Province

are Monthly MR data recapitulation, MR newscast impressions graph, Monthly trend graph of MR cases, Annual trend graph of MR cases and MR case spotmap (routine/outbreak). The results of the data analysis were visualized in the form of reports and health profile books as well as files on a computer which became the data base. Prior to data visualization, the East Java Provincial Health Office coordinated with Health Office regency and cross-sectors to present the results of the surveillance program along with evaluation evaluations and validate data with a frequency of every quarter or at least once a year. Dissemination of information on the MR case in East Java is carried out through monitoring and evaluation efforts. During the meetings of the heads of the East Java and during regular meetings with program managers

## DISCUSSION

### Input Aspect

#### 1. Man Health center surveillance officers shift their focus to COVID-19 surveillance

Most of respondent's educational characteristic are bachelor of Public Health (75%). This number still limited based on KMK No. 1116/ 2003. The COVID-19 pandemic that has hit Indonesia since March 2020 has had a major impact on the quality of PD3I surveillance, including MR surveillance. Most of the number of surveillance personnel from each public health center is only one person. The surveillance task carried out does not only cover one program, as the reality in the field shows that the measles-rubella surveillance officer is also a surveillance officer for diphtheria, AFP, and other diseases. This is exacerbated by the conditions of the COVID-19 pandemic where in 2020, COVID-19 cases are at the peak of the wave. In essence, to be optimal in doing a job, one must focus on one thing only. It is the same with surveillance officers who have to focus on one program so that the achievement of performance is in line with the target. Surveillance officers who double as COVID-19 surveillance can also affect their level of concentration in the implementation of MR surveillance. This is because each surveillance program that covers different diseases has a different surveillance implementation flow (SOP). Starting from data collection, recording, reporting (13).

#### The New Public Health Center Surveillance Officer Does Not Understand The Jobdesk

Most of the new measles-rubella surveillance officers in each public health center do not understand the jobdesk. This is because there is no coordination between the old and new surveillance officers regarding the jobdesk's overall understanding of surveillance, especially regarding the importance of taking IgM on MR suspects. It is also influenced by lack of attention from the head of the public health center regarding the main duties of the

surveillance officer (13).

## 2. Materials and Machines

### Limited IgM Testing Laboratory

Most of the laboratories in East Java Province have become references for the examination of COVID-19 specimens. It is not uncommon for long queues to check for COVID-19 specimens. So that this becomes a separate obstacle for the IgM examination of MR suspects which further aggravates the queue for examination in the laboratory (14). Therefore, IgM examination in suspected MR is not a priority. In addition, this is exacerbated by the limited availability of reagents in the laboratory (8,11).

### There Is No Software That Can Monitor MR Suspects.

This resulted in the evaluation of IgM examination in suspected MR could not be done (13).

### Money Aspect

#### MR surveillance budget from APBN and WHO is minimal

There is budget assistance for specimen management (small) including collection and transportation of public health center/hospitals to districts/cities in the amount of Rp. 50.000,- per case. In addition, there is also financial assistance for the delivery of specimens from the Regency/City to BBLK Surabaya in the amount of Rp. 125,000 per package but this is still not sufficient due to the increasing number of MR cases and the need for specimen examination to the laboratory. Urgently budgeting named BTT (Bantuan Tidak Terduga) was also diverted to handling COVID-19 (15).

#### No budget for MR surveillance training from Regency/City

MR surveillance training is very important considering the MR elimination target in 2021 as well as providing understanding related to surveillance tasks. However, this has not received attention from the Regency/City as evidenced by the absence of a budget for these activities (16).

### Market Aspect

Most of the community did not actively participate in the discovery of MR cases and MR suspects which were subsequently not reported and further action was taken. This is because people are afraid of being considered COVID-19 sufferers when dealing with health services. The community paradigm regarding MR disease assumes that MR is an ordinary disease and can heal by itself so that no help from health services is needed. A person's paradigm is closely related to knowledge, because knowledge affects their mindset. Lack of knowledge about MR is still common in the community, especially mothers of toddlers (17).

### Method Aspect

Technical guidelines on MR Surveillance are still not fully understood because they are still relatively new. This supports the priority issue of IgM testing in MR suspects (10).

### Process

On process aspect, MR surveillance is infectious disease surveillance whose activities include case detection, case recording, case confirmation, reporting are based on standar operating procedure but on step of data analysis and interpretation doesn't optimally because the data not analysis completely. There are no maps to describe immunization coverage and distribution of MR cases by region, no analysis of risk factors for the incidence of MR and rubella for early warning of outbreaks included are trends in low immunization coverage, dense and slum residential locations, nutrient prone areas, areas that are difficult to reach or far from health services, areas where community groups refuse/anti-immunization, evacuation situations such as in disaster conditions, immigrant community. Then there is no MR control and control task force team as epidemic preparedness, response and control. All of them because most of the health workers have concurrent positions of the COVID-19 task force and the COVID-19 tracing team, thus prioritizing the prevention of COVID-19 over other infectious diseases(9).

### Output

There was an 83% reduction in the number of confirmed MR cases and a 67% decrease in the utility of RIK for complicated MR patients due to rare case finding. This is also influenced by the situation that is still in the COVID-19 pandemic (12).

The Recommendations based on evaluation Measles-Rubella surveillance system's description in East Java province, namely the recruitment of Measles-Rubella surveillance personnel in accordance with KMK No 1116/2003 and followed by training on increasing the capacity and function of epidemiologists in carrying out Measles-Rubella surveillance activities in East Java Province. This is in line with Anggraini's research (2016) based on an evaluation of measles surveillance in Bangkalan, Madura Indonesia recommends providing training for all surveillance officers and the fulfillment of facilities in the implementation of the measles surveillance system (18).

In addition, priority funding was refocused on Measles-Rubella to facilitate laboratory examination of IgM suspected Measles-Rubella. As well as conducting information and communication education counseling to increase general public knowledge about the symptoms and signs of Measles-Rubella along with prevention and control efforts so that Measles-Rubella disease can

be detected quickly and minimize its morbidity and mortality. This is in line with the results of Sabono's research (2017) which states that recommendations for improvement efforts that can be made in evaluating the measles surveillance system in Magelang City, Central Java, Indonesia, are conducting advocacy, training, procuring guidelines, and communication forums on a regular basis as well as through social media groups (19).

## CONCLUSION

The coverage of suspected measles-rubella cases examined by IgM has not reached the target (100%), which is only 89.47%, which is a major problem in the implementation of measles-rubella problems. Evaluation of measles rubella surveilans analysis based on the system approach (input-process-output), namely Health center surveillance officers shift their focus to COVID-19 surveillance, The new public health center surveillance officers do not understand the job desk, the IgM examination laboratory is limited, there is no software that can monitor MR suspects, minimal budget for MR surveillance from APBN and WHO, no budget for MR surveillance training from districts/cities, most people do not actively participate in finding MR cases or MR suspects, technical guidelines on MR surveillance are still not fully understood, lack of socialization about the characteristics of MR and a decrease of 83% in the number of confirmed cases of MR and a 67% decrease in utility RIK for MR patients. Based on the results of the MR surveillance analysis in East Java Province during the COVID-19 pandemic through a systems approach, there are many obstacles and inconsistencies in the MR surveillance guidelines that have been set in terms of input, process and output so that this affects the number of MR case findings. This is largely due to the fact that resources including health workers and other materials have been diverted to focus on handling COVID-19, so MR surveillance analysis needs to be carried out during the COVID-19 pandemic, considering that MR is an infectious disease whose morbidity and mortality rates must be controlled.

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