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# THE RELATIONSHIP BETWEEN POTENTIAL OF VACCINE AND IMMUNIZATION SERVICES WITH QUALITY OF MEASLES VACCINE IN KONAWE KEPULAUAN DISTRICT

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**Abstract**

**Background:** Based on a report from the Directorate General of Disease Prevention and Control of the Ministry of Health, measles cases in Indonesia continued to rise in 2016 the prevalence of measles was about 7,204 people. In 2017 there were 11,389 cases, where this year there were many measles outbreaks. In 2018 there were 3,995 cases. The number of cases was still higher in 2012 namely about 6,419 cases.
**Methods:** This research is an observational analytic study with a cross sectional study design. The population was the measles vaccine which was found in 8 health centers withThe sample size was 82 Vaccine for Measles.
**Results:** Statistical test shows kai squared at α = 5% and df = 1, obtained the value of $X^2$ count> $X^2$ table 32,210> 3,841 and α = 5% and df = 1, obtained the value of $X^2$ count <$X^2$ table 1.247 <3,841 potential relationships and immunization services on quality of measles vaccine in Konawe Islands District.
**Conclusion:** There is a strong relationship between vaccine potential and the quality of the measles vaccine and there is no relationship between immunization services and the quality of the measles vaccine in Konawe Islands District.

***Key words:*** *Vaccines, Services, Immunization, Measles*

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## INTRODUCTION

Indonesia is one of the SEARO countries included in the country that will implement measles elimination in 2026(1). Measles elimination, i.e. the absence of measles endemic areas for more than 12 months and zero transmission through strong measles surveillance(2).

Measles is a contagious disease caused by the measles virus. This disease is still one of the health problems in Indonesia. This disease mainly affects children aged less than 5 (five) years(3). The clinical symptom of measles is a sudden fever followed by the appearance of a rash (rash) a few days later. The rash usually appears from behind the ear to spread throughout the body. If measles attacks children with less nutritional status, secondary infections can occur in the form of pneumonia, diarrhea, encephalitis and otitis media, this can lead to death if not treated immediately.Measles is also known as Morbili or Measles(4). Measles is a highly contagious disease caused by a virus and is transmitted through coughing, sneezing and nasal discharge. Symptoms of measles are high fever, reddish patches on the skin (rash) accompanied by cough and / or runny nose and / or red eyes (conjunctivitis). Humans are thought to be the only host (reservoir), although monkeys can be infected but do not play a role in transmission(5).

Immunization coverage in Southeast Sulawesi Province in 2019 is HB 0 immunization coverage (0 <7 days) 79.2%, BCG immunization coverage 89%, Polio 1 immunization coverage is 88.6%, DPT / HB-Hib 1 immunization coverage is 89.2%, Polio 2 immunization coverage is 89.6%, DPT / HB-Hib 2 immunization coverage is 87.5%, Polio 3 immunization coverage is 83.7%, DPT / Hb-Hib 3 immunization coverage is 81, 6%, Polio 4 immunization coverage is 84.6% and measles immunization coverage is 85.9%(6).

Measles is a disease that can be prevented by immunization. One form of the immunization program implemented by the government is routine immunization consisting of basic immunization and advanced immunization(7). The complete basic and advanced immunization required by the government is measles immunization. Measles immunization is getting more attention from the government because Indonesia is participating in a measles elimination program in 2020 with a minimum measles coverage of 95% in every region equally.(8).

Based on the profile data of the Konawe Islands District Health Office, the Immunization Coverage of KonaweKepulauan Regency in 2019 is HB 0 coverage (0 <7 days) 113.4%, BCG immunization coverage is 116%, this high enough figure can occur due to incorrect target data collection. as well as inaccurate recording and reporting. Polio 1 immunization coverage is 101.4%, DPT / HB-Hib 1 immunization coverage is 127%, Polio 2 immunization coverage is 102.2%, DPT / HB-Hib 2 immunization coverage is 99%, Polio 3 immunization coverage is 98 , 3%, DPT / Hb-Hib 3 immunization coverage is 95.8%, Polio 4 immunization coverage is 102% and measles immunization coverage is 95%.

## METHOD

This quantitative of research is an observational analytic study with a cross sectional study design(9). The population was the measles vaccine which was found in 8 Puskesmas withThe sample size was 82 Vaccine for Measles.This research was carried out in all Puskesmas in Konawe Islands Regency in 2020.

## RESULT

**The table 1** shows that of the 82 samples, 33 samples (40.2%) had low vaccine potential, and 49 samples (59.8%) had good potency.

**The table 2** shows that the immunization service category is less than 39 people (47.6%) and the good

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immunization service category is 43 people (52.4%).

Based on the results of statistical tests using kai squared analysis at α = 5% and df = 1, it was obtained that the value of $X^2$ was calculated > $X^2$ table 32.210> 3,841, meaning that the potential of the vaccine as a determining factor for the quality of the measles vaccine in Konawe Kepulauan Regency **(Table 3).** The results of the relationship closeness test showed a coefficient of Phi (Φ) of 0.652, this shows the strength of a strong relationship between vaccine potency and the quality of measles vaccine in Konawe Kepulauan Regency. Based on the calculation of the Odds Ratio (OR) potential of the vaccine against the quality of the measles vaccine, the lower limit is 7,964> 1, which means that the vaccine potency is a risk factor.

Based on the results of statistical tests using kai squared analysis at α = 5% and df = 1, the value of $X^2$ was calculated < $X^2$ table 1.247 < 3,841, meaning that immunization services were not a determining factor for the quality of the measles vaccine in Konawe Kepulauan Regency **(Table 4)**. The result of the relationship closeness test shows the Phi coefficient (Φ) of 0.148, this shows the strength of the weak relationship between immunization services and the quality of the measles vaccine in Konawe Kepulauan Regency. Based on the calculation of the Odds Ratio (OR) of immunization services to the quality of the measles vaccine, the lower limit is 0.755 <1, which means that immunization services are a protective factor

**Table 1**
**Sample Distribution Based on Potential Measles Vaccine in the District Konawe Islands**

| No. | Vaccine potential | total | % |
|---|---|---|---|
| 1. | Less | 33 | 40.2 |
| 2. | Good | 49 | 59.8 |
| Total | | 82 | 100 |

*Source: Primary Data 2020*

**Table 2**
**Distribution of Respondents Based on Measles Vaccine Immunization Officer in Konawe Islands Regency**

| No. | Immunization Officer | total | % |
|---|---|---|---|
| 1. | Less | 33 | 40.2 |
| 2. | Good | 49 | 59.8 |
| Total | | 82 | 100 |

Source: Primary Data 2020

**Table 3**
**Potential Analysis of Vaccines as Determinants of Vaccine Quality in Konawe Islands Regency**

| Potential Vaccines | Measles Vaccine Quality | | | | | | $X^2$ Count | *Phi* (Φ) | OR |
|---|---|---|---|---|---|---|---|---|---|
| | Good | | Less | | total | | | | |
| | n | % | n | % | n | % | | | |
| Less | 3 | 3,7 | 30 | 36.6 | 33 | 40.2 | 32,210 | 0.652 | 30,833 LL = 7,964 UP = 119,377 |
| Good | 37 | 45.1 | 12 | 14.6 | 49 | 59.8 | | | |
| total | 40 | 48.8 | 42 | 51.2 | 82 | 100 | | | |

Source: Primary Data 2020

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**Table 4**
**Analysis of Immunization Services as a Determining Factor of Vaccine Quality in Konawe Islands Regency**

| Immunization Services | Measles Vaccine Quality | | | | | | $X^2$ Count | *Phi* (Φ) | OR |
|---|---|---|---|---|---|---|---|---|---|
| | Good | | Less | | total | | | | |
| | n | % | n | % | n | % | | | |
| Less | 16 | 19.5 | 23 | 28.0 | 39 | 47.6 | 1,247 | 0.148 | 1,816 LL = 0.755 UP = 4,356 |
| Good | 24 | 29.3 | 19 | 23.2 | 43 | 52.4 | | | |
| total | 40 | 48.8 | 42 | 51.2 | 82 | 100 | | | |

Source: Primary Data 2020

## DISCUSSION

### Potential of Vaccines as Determinants of Vaccine Quality

Vaccines are biological products that contain antigens in the form of weakened dead or alive microorganisms, intact or part of them, or in the form of microorganism toxins that have been processed into toxoid or recombinant protein, which when given to a person will actively create specific immunity against certain diseases.(10).

The results of the study show thatIn the lack of vaccine potential, there were 3 samples with good measles vaccine quality and 30 samples (36.6%) with poor vaccine quality. This shows that the potential for vaccines clearly illustrates the relationship between the management of vaccine potency and the quality of the measles vaccine. However, it was also found that the lack of vaccine potency but the quality of the vaccine was still good, this could happen in all the sample observations because there were other variables that would have an effect during the researchers conducting the research.

Furthermore, for good vaccine potential, there are 37 samples with good vaccine quality and 12 samples with poor vaccine quality. This could have happened because in addition to the officers' negligence in carrying out the storage or recording process, it was also due to the condition of the Puskesmas itself, which sometimes in the Puskesmas there were still frequent blackouts so that it would disturb the temperature conditions of the vaccine storage.

The results of the tests conducted show that the vaccine potency is a variable that determines the quality of the measles vaccine. In addition to being known to have a strong relationship with adherence, it is also known that vaccine potency is a risk factor for determining vaccine quality through Odds Ratio (OR) testing.

To maintain quality, all vaccines must continuously be stored at the correct temperature from the time they are made until they are used. Once the potency of the vaccine is lost or damaged, it cannot be recovered or repaired(11). Without proper treatment, each vaccine becomes ineffective in providing protection against targets. In some cases, the loss of potency can also make the vaccine easier to cause a reaction. Damage to the potential of the vaccine can be prevented by carrying out transportation, storage and handling of the vaccine properly, from the time the vaccine is produced in factories to being used in service units.

### Immunization Services as a Determining Factor of Vaccine Quality

According to the Regulation of the Minister of Health Number 12 of 2017 concerning the Implementation of Immunization, before carrying out the Immunization Program service, health

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workers must provide an explanation of Immunization including the types of vaccines to be given, the benefits, consequences of not being immunized, the possibility of AEFI and efforts to be made, as well as a schedule. Next immunization. The officer must also screen for any contra indication on the immunization target(12).

The results of the study show thatIn immunization services that are lacking, there are 16 samples (19.5%) with good measles vaccine quality and 23 samples (28.0%) with poor vaccine quality. This can happen if the immunization service is carried out outside the predetermined schedule, or done earlier or on a different schedule so that the use or frequency to open and close the vaccine storage refrigerator will of course affect the refrigerator temperature. That the more often the refrigerator is opened, the temperature of the refrigerator will become more unstable so that the quality of the vaccine will also be affected.

Furthermore, in good immunization services there are 24 samples with good quality vaccines and 19 samples with poor quality vaccines. This could happen because to ensure maximum vaccine quality,vaccine storage and handling requires special attention. Often times adequate electricity intake and refrigeration are important problems for health service facilities, especially in areas with less than optimal access to electricity, where it should be storage, handling and temperature stability require special attention.

The results of the tests conducted show that immunization management is a variable that is not related to vaccine quality or is not a determining factor for the quality of the measles vaccine. In addition, based on the relationship closeness test, it is known that immunization services have a weak relationship and through the Odds Ratio (OR) analysis test it is also known that immunization services are a protective factor for cases.

Apart from the above, in terms of providing immunization services, you should also consider how to bring vaccines or transportation to be used because how to carry vaccines and the means of transportation used are also an important part of vaccine management.(13). The wrong way to carry the vaccine when you are going to immunization services will reduce the quality of the vaccine itself.

## CONCLUSION

There is a strong relationship between vaccine potential and the quality of the measles vaccine and there is no relationship between immunization services and the quality of the measles vaccine in Konawe Islands District. It is hoped that the head of the Puskesmas will improve supervision and control over vaccine management strictly, given the potential for perishable vaccines and knowledge in the field of vaccine management.

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