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A Year Reflection of Poltekkes Kemenkes Jakarta III Covid-19 Handling Task Force Through RDT Antibody and Antigen Swab on Suspect Cases

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ABSTRACT

The covid-19 Pandemic affected worldwide including Indonesia and obliged each part of society to handle its spread. The implementation of screening regulations for suspect cases by Polkesjati Covid-19 Handing Task Force had been established for a year since the first day of infection happen. However, the report has never been implemented. This study was conducted to describe a one-year implementation of screening suspect cases in Polkesjati. This study was a narrative-descriptive study using secondary data from polkesjati Covid-19 handling task force. Data were derived from a total of 1,062 respondents of RDT Antibody test and a total of 2,014 respondents undergone an Antigen swab test at age of 16 – 62 from January 2021 – January 2022. The respondents were a student from MLT, Physiotherapy, Midwifery, and Nursing students and employees. RDT Antibody test showed that reactive case was high in February and June 2021, meanwhile, Antigen swab test showed an increasing result from February to April 2021 and gradually decreased in September 2021. The most interesting part was shown from a contact tracing that indicated 7 respondents with a positive antigen test. The lowest portion of antibody and antigen detection indicated the succesfull strategy of task force especially with suspect cases.

KEYWORDS: Covid-19, Task Force, RDT Antibody, Antigen Swab, suspect cases

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INTRODUCTION

Coronavirus Disease 2019 (Covid-19) is a pneumonia-like disease caused by SARS-CoV-2 and became a worldwide flu-related pandemic as happened before in 1918, 1957, 1968, and 2009. It globally confirmed that a total of 165,069,258 people suffered from this infection with 3,422,907 death cases on May 21st, 2021. Southeast Asia ranked in the third position after America and Europe with a total case of 29,543,024 people and 363,515 death cases related to these infections. Indonesia, a member of Southeast Asia nations, occupied the second place with the highest case of 7,470,992 infections and a total of 48,887 death (WHO, 2021). Moreover, National Agency for Disaster Countermeasures (BNPB) added that the total number of cases of Covid-19 infection in West Java was 1,758,898 people and ranked second place after DKI Jakarta for the highest number of confirmed cases of infection in Indonesia (ArcGIS, 2021). These conditions need a rapid, precise, and accurate handling method to control infection and death cases around the nation (Dinkes, 2021).

Reverse Transcription-Polymerase Chain Reaction (RT-PCR) is a recommended gold standard test by the WHO to detect a SARS-CoV-2 genetic material in a patient's nasopharynx swab sample. However, RT-PCR test has its disadvantage in a complex procedure, high-cost expenditure, and time-consuming processing (Agustina & Fajrunni, 2020). Adji (2020) stated that West Java area, health facilities spent approximately 14 days to release RT-PCR test results. This affected RT-PCR is less interested in using and several health facilities use other options to take into consideration in diagnosing the viral infection (Agustina & Fajrunni, 2020).

Screening tests using Rapid Diagnostic Test (RDT) Swab Antigen (Antigen test) and RDT Antibody (Antibody test) were selected as a substitute to RT-PCR due to its rapid test results to resolve some derived disadvantages of RT-PCR as stated (Agustina & Fajrunni, 2020). Both Antigen and Antibody test results showed about 10 – 15 minutes from the process started. This RDT is a part of an immunochromatography test (ICT) and shares the same principle and methods. However, the

Antigen test is favored over the Antibody test. An antigen test detected viral protein or components from a nasopharynx swab sample which reflected the current condition whereas an Antibody test only detected Antibodies against SARS-CoV-2 which was exposed a few days ago. Moreover, reports from Poltekkes Kemenkes Jakarta III (Polkesjati) Covid-19 Handling Task Force showed that Antigen tests had an increasing trend in recent years (Satgas Polkesjati, 2021). Yet, both tests had their own purposes. An Antigen test is suitable for acute phase test while An Antibody test is selected for surveillance or epidemiology study (Abbott, 2020; VivaDiag, 2020).

JAMA Open Network stated that almost 50% of Covid-19 had no symptoms and were called suspect cases. It is against the stigma of society that a confirmed positive Covid-19 case always comes with any kind of symptoms, whether mild, moderate, or severe. Yet, a suspect case tended to spread the infection to surroundings. The spread could be happened by direct contact, no distance manner, and ignoring some mild symptoms (Johansson et al., 2021).

Polkesjati is one of the public universities concerning the vocational study of health-related around the Jabotabek area. Polkesjati Covid-19 Handling Task Force reported screening tests with antigen and antibody tests preceded the laboratory activities that took place in Polkesjati from the beginning of 2021. This activity was conducted as a preventive action in preventing the spread of Covid-19 around Polkesjati. Moreover, guided lockdown policies and strict health protocols were applied under any circumstances to restrict undetected and suspect cases. One year of implementation in Polkesjati had to be described in a proper reporting manner to evaluate the successful strategy applied by Polkesjati Covid-19 Handling Task Force. This research was conducted to describe a year of implementation of RDT Antibody and Antigen swabs on suspect cases by the Polkesjati Covid-19 handling task force in the year 2021.

METHODS

This was an observative-descriptive study of secondary data derived from a Polkesjati Covid-19 handling task force in the year 2021. Data was collected from all subject respondents who had undergone the rapid RDT Antibody or RDT swab Antigen that preceded any laboratory or outdoor activities from January 2021 – January 2022. Subjects covered all academic communities from all departments (medical laboratory technology, physiotherapy, midwifery, and nursing) and Polkesjati employees. The schematic idea for collecting the data were shown in Figure 1. Data were collected and described in a table and figure. All data were displayed as summarized table and proportion. Each table and figure is described as a narrative explanation. All data and handling research methods were declared ethically appropriate in accordance with 7 (seven) WHO 2011 standards. The research permission was approved by Polkesjati ethical committee, decision number LB.02.02/KEPK/075/2022.

RESULTS AND DISCUSSION

Data on Rapid Diagnostic Test (RDT) Antibodies (Antibody test) against anti-SARS-CoV-2 was collected from a total of 1,278 respondents, with 13 respondents excluded, resulting in a final of 1,062 respondents for a research subject. All data were submitted from all students from the Nursing, midwifery, medical laboratory technology (MLT), and physiotherapy departments in addition to all employments of Poltekkes Kemenkes Jakarta III who preceded their Antibody tests for any laboratory or other outside activities. Data on RDT Swab Antigens (Antigen test) were submitted from a total of 2,218 respondents with 204 respondents being excluded for their lack of personal information data, resulting in a final 2,014 respondents fitted as subjects. All respondents were about 16 – 62 age and predominantly female subjects. All data were summarized in table 1 and point A and point B.

Table 1. Demographics summarize

Categories	Antibody test		Antigen test	
	n	%	n	%
Sex				
male	99	9.32	231	11.47
female	963	90.68	1783	88.53
Age				
16 – 25	988	93.03	1,773	88.03
26 – 35	20	1.88	70	3.48
36 – 45	26	2.45	73	3.62
> 45	28	2.64	98	4.87
Department				
Medical laboratory technology	216	20,34	310	15.39
Physiotherapy	115	10,83	216	10.73
Midwifery	367	34,56	634	31.48
Nursing	294	27,68	622	30.88
Employers	70	6,59	232	11.52

Table 2 and figure 1 showed that the case of reactive IgM was at its peak on February 2021 and June 2021. The average reactive test result was under 2% (0,3% – 1,3%) of total tests. however, this indicated the reactive case of antibody IgM Covid-19 on a suspect case with no symptoms. The highest peak of the reactive result was documented on June 2021.

Table 2. IgM Antibody test results per department per month

	IgM							
	Jan	ɔ	Mar	Apr	May	Jun	Sep	tot
MLT department	2	8	0	0	0	0	0	10
Physiotherapy department	1	3	0	1	1	0	0	6
Nursing department	1	3	2	0	1	1	0	8
Midwifery department	0	2	2	8	0	20	0	32
Employers	0	1	0	0	0	0	0	1
Total	4	16	4	9	2	21	0	56

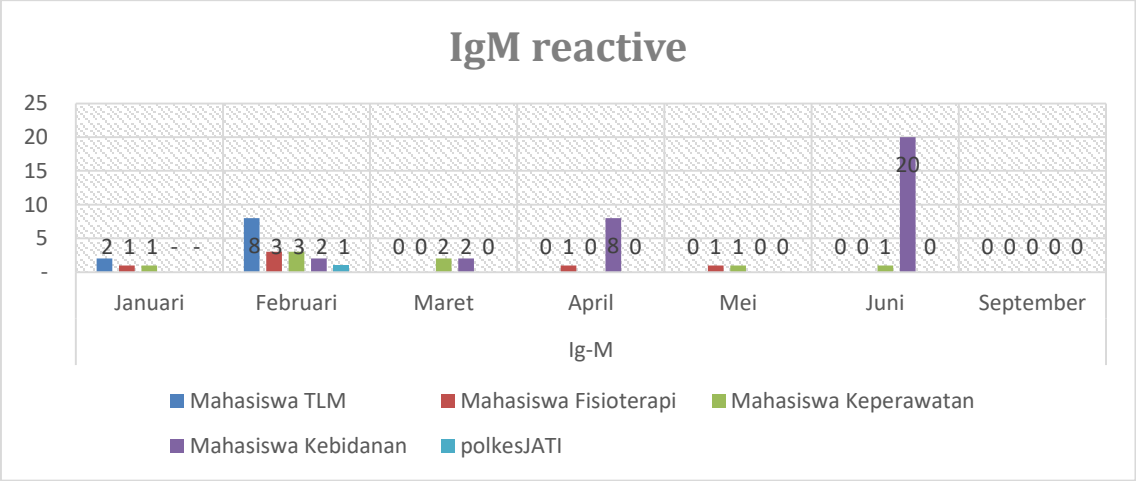

Figure 1. Antibody IgM reactive result per department per month.

Table 3 and figure 2 showed the increasing reactive IgG case from January 2021 to April 2021 then gradually lowering in September 2021. The highest reactive case was identified on April 2021. The average reactive IgG test result was below 3% (0,4% – 3%) from each month. Respondents of suspect cases of Covid-19 were showed a reactive result as recorded in the year 2021. Both reactive IgM and IgG cases showed that infection of Covid-19 was happened before and was unidentified due to lack of symptoms. These IgM and IgG data indicated a non-symptomatic Covid-19 might spread in the Polkesjati without our concern.

Table 3. IgG Antibody test results per department per month

	IgG							
	Jan	Feb	Mar	Apr	May	Jun	Sep	jumlah
MLT department	6	35	3	4	0	0	0	48
Physiotherapy department	4	18	1	2	6	8	0	39
Nursing department	3	21	44	0	16	3	0	87
Midwifery department	0	10	14	91	18	21	20	174
Employers	0	7	0	0	2	0	0	9
	13	91	62	97	42	32	20	

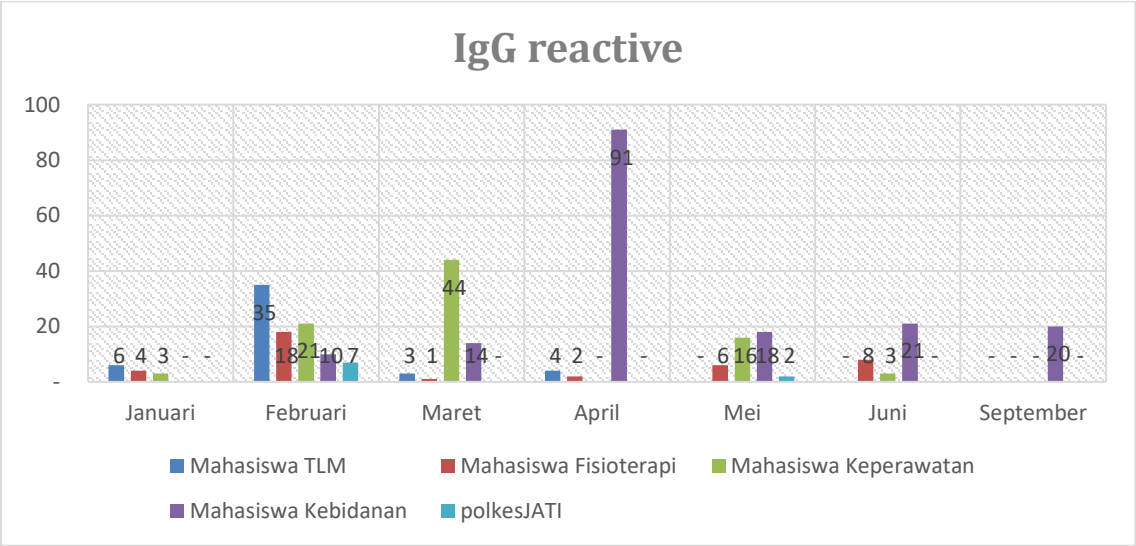

Figure 2. Antibody IgG reactive result per department per month.

Almost rapid RDT IgM-IgG showed that reactive cases were increasing from February to June 2021 (figures 1 and 2). This indicated that the massive spread of Covid-19 has its peak as shown in Poltekkes Kemenkes Jakarta III (Polkesjati), one of the education centers in the Jabotabek area. The spreading in Polkesjati was reflecting the massive Indonesian Covid-19 spreading situation. The peak was indicated highly in February and June 2021, as the first and second wave has happened in Indonesia (Haryono & Harsari, 2022). Moreover, a serological study in Jakarta showed the increasing Covid-19 detection trend by Antigen. The same survey stated that only 44.5% of all Jakarta people had Antigen testing in July 2021. Yet, one-third of which was derived from a symptomatic person that indicated the unsymptomatic cases occupied most of the cases of Covid-19 in Jakarta alone. The worst part was only 8% of antigen-reactive cases had been tested and diagnosed. It means that in this handling situation of Covid-19 spreading, the best way possible to solve the problem is by detecting and tracing all respondents wheater it has symptoms or not, especially in the educational setting (Dyer, 2021). The strategy has been implemented for a year by the Polkesjati Covid-19 handling task force to test all of the respondents in the preceding laboratory or other outdoor activities.

The antibody IgM-IgG test showed the reactive rate was below 3%. This could happen because of the fast responses by the Polkesjati Covid-19 task force in preventing and handling the spreading cases in the area. All the cases were screened to reveal the current status of respondents, especially with no symptoms cases. The task force participates in handling Covid-19 infection by supporting the regulation proposed by the government. The proposed regulation in implementing the social regulation and screening the suspect cases to prevent the spreading of Covid-19 infection. The government obliged the scenario of Pembatasan Social Berskala Besar (PSBB) and Pemberlakuan Pembatasan Kegiatan Masyarakat (PPKM) in Indonesia as a Covid-19 handling system setting. These social restrictions and lockdown mechanisms brought Indonesia to 54 ranking of 120 nations around the world in responding to, handling, and succeding the Covid-19 pandemic condition, excelling Singapore, Thailand, and Malaysia in Southeast Asia Nation (Haryono & Harsari, 2021). Lockdown restrictions were applied to all antibody-reactive and Antigen positive tests, or RT-PCR tests as well. The condition would prevent the infection from spreading to the surrounding area of a positive respondent.

Table 4. Antigen test result per department

	positif	negatif
Mahasiswa Keperawatan	6	1242
Mahasiswa Kebidanan	2	934
Mahasiswa TLM	2	455
Mahasiswa Fisioterapi	2	331
polkesJATI	10	252
total	22	3214

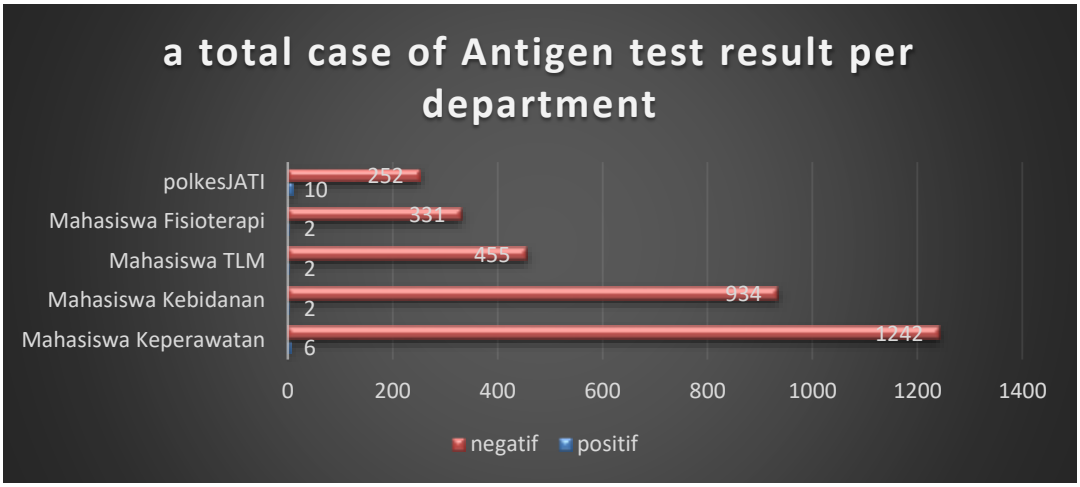

Figure 3. Antigen test result per department.

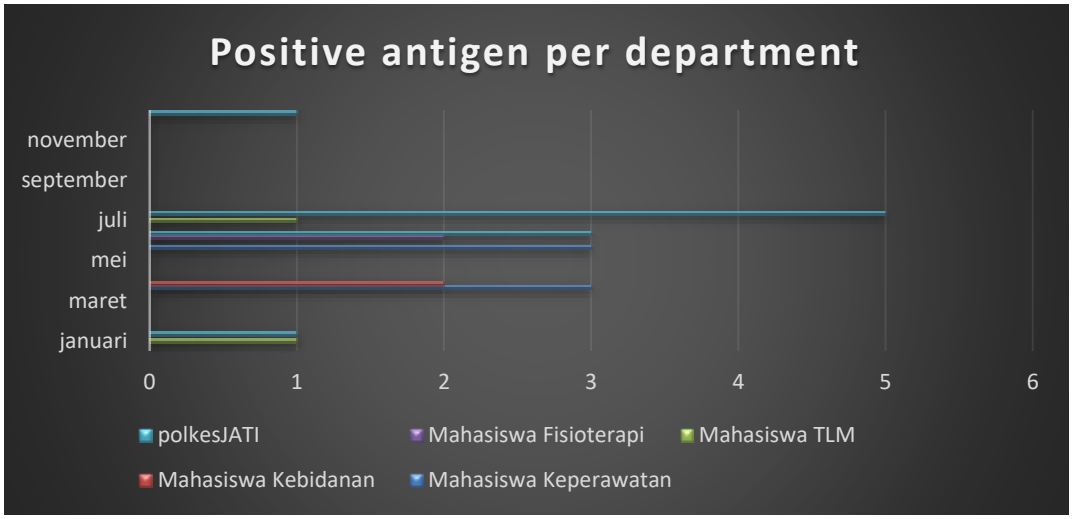

Figure 4. Positive antigen case per department.

Table 4, Figures 3 and 4 showed each department's positive cases of Antigen tests. The total positive cases of antigen indicated in a small portion, approximately below 1% of total respondents who had an antigen test. However, the small portion of positive antigen Covid-19 could spread to a wider scope. The identification of positive cases of antigen would prevent the spread of Covid-19, as the result of the test had been considered for taking follow-up action, such as social restriction, lockdown policies, and contact tracing. Contact tracing would identify all respondents who had tight contact from a long and near period of time with a confirmed case.

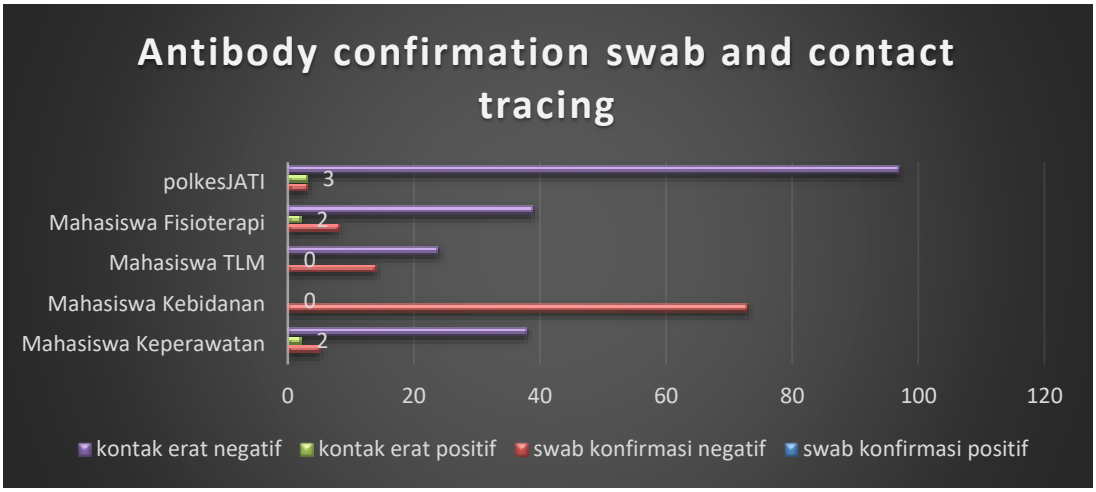

Figure 5. showed an antigen confirmation test from a preceded reactive Antibody IgM/IgG test and contact tracing from a tight contact from a respondent with a confirmed case.

Contact tracing was conducted using an antigen test, and so a confirmation test of the reactive antibody test. The confirmation swab showed no positive antigen, but, contact tracing indicated 7 positive cases of Covid-19 antigen. It means that the spreading of Covid-19 happened without any symptoms (silent symptoms) as identified from the contact tracing responses that had no symptoms.

The Diagnosis of Covid-19 could be done by *Nucleic Acid Amplification Test* (NAAT) test, the most general was Reverse-Transcription Polymerase Chain Reactions (RT-PCR), which is stated to be the gold standard of diagnostic Covid-19 test. However, due to any particular difficulties, such as an inability or restricted to PCR access and cost relation and time-consuming excuses, diagnosis of Covid-19 using RDT Antigen Swab could replace RT-PCR (Dirjen P2P, 2020; Caliendo & Hanson, 2022). A remote area is applicable to this strategy setting (Dirjen P2P, 2020).

RDT Antibody test should be followed by an antigen swab test as the result showed in supplement figure 5. The figure identified that all reactive Antibody test was not displayed any positive antigen swab results. The best possible way to describe the phenomena was an antibody test that does not display the current status of infection, as shown with an antigen swab test. Antibody titer that was shown in the test indicated the prior infection and antigen positive reaction of the test indicated the more current condition. However, the antibody titer could be detected for a period of time after infection and circulate in the body and stay more persistent than antigen detection (Alejo et al., 2022).

It differs from contact tracing cases (Figure 5). Data from contact tracing showed that 7 suspect people were positive from antigen swab test. This indicated that screening of the suspect respondents is crucial in the Covid-19 handling (Ditjen P2P, 2020; Caleindo & Handon, 2022). Task force strategy in preceding all laboratory and any outdoor activities with antigen screening is valued to be an effective way to achieve and maintain the infection, especially in suspect respondents, locally and globally. Regard, to antigen tests, reflected the current condition of infection as the capability of the test to detect antigens around 5 – 7 days after infection (Caleindo & Handon, 2022).

CONCLUDING REMARKS

The Performance of Polkesjati Covid-19 Handling Task Force showed remarkably work and results in capturing and restricting the spreading case of Covid-19 in Polkesjati area. The regulation implementation of RDT Antibody and Antigen Swab had supported the government policy in implementing the social of crowded society. However, a follow-up RT-PCR test of Covid-19 hadn't been recorded yet. Nevertheless, the beginning step in implementing the prevention setting had already been shown to be the effective strategy to maintain the lowest positivity rate in antigen-positive infection, especially in the educational setting. Further study needs to include a confirmation of RT-PCR.

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