

**REPORTING THE DETECTION RESULT OF SARS-CoV-2 ANTIBODY RAPID TEST
OF COMPANY'S EMPLOYEES IN SURABAYA AND PASURUAN, INDONESIA**

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ABSTRACT

Background: Coronavirus (CoV) is a large family of viruses that causes illnesses ranging from mild to severe symptoms. Coronavirus Disease (Covid-19) is a new type of virus that has never been identified in humans before.

Methods: All antibody test methods and RT-PCR tests have an optimum time window in the incubation period or infection of a person. The antibody test method cannot be used as an early detection tool for people who are still on the first day of the incubation process. IgG and IgM antibody levels are still low on the first day of infection, even though the number of viral particles is very high at the beginning.

Result: Sars-Cov-2 (Covid-19) antibody examination sample was taken from Main Clinic of Sentra Medika Surabaya, from May to August 2020, with the age range of 18-65 old amounted to 1015 people. The number of samples with the age range of 40-49 is 404 people (39,90%), Production Department has 773 samples of people (76,16%), the number of security samples is 39 people (3,84%), and others have 109 samples of people (10,74%). The number of male samples is 666 people (65,62%) more than female 349 people (34,38%). Positive Covid-19 Antibody examination results for Office Department are IgM 3 people, IgG 3 people, and the total numbers are 6 people (21%). Positive Covid-19 Antibody examination results for the production department are IgM 14 people, IgG 1 person. So, the total numbers are 17 people (59%). The most positive Covid-19 antibody examination result is the production department namely 59% and including positive results for IgM and IgG. The condition above the production department has the most frequent because of the condition of employees including some companies which had overtime work or 2 shifts.

Conclusion: The highest number of Positive Covid-19 antibody examination result. The most department is the production department. The age range of 50-59 years old has a small number. At the time of being infected with Covid-19, IgG and IgM are negative, it needs time to get a positive examination result of IgG or IgM or both. The antibody examination method **cannot** be used as an early detection tool for Covid-19.

Keywords: Covid-19, Antibody test, IgM, IgG

ABSTRAK

Latar Belakang: Coronavirus (CoV) adalah kelas baru dari keluarga besar virus yang menyebabkan penyakit dengan bermacam-macam gejala dari ringan sampai berat. Coronavirus Disease (Covid-19) adalah tipe virus baru yang sebelumnya tidak ditemukan pada manusia

Metode: Metode tes antibodi sebagai skrining sedangkan RT-PCR dilakukan sebagai tes konfirmasi (standar emas pemeriksaan virus Covid-19).

Hasil: Data sampel pemeriksaan Antibodi Sars-Cov-2 (Covid-19) diambil di Klinik Utama Sentra Medika Surabaya, pada bulan Mei 2020 sampai dengan Bulan Agustus 2020 rentang umur 18-65 tahun sebanyak 1015 orang. Jumlah sampel pada rentang umur 40 – 49 tahun sebanyak 404 orang (39,90%), Production Departement (produksi) mempunyai sampel terbanyak 773 orang (76,16%), Security jumlah sampel 39 orang (3,84%), dan others mempunyai jumlah 109 orang (10,74%). Jumlah sampel jenis kelamin laki-laki sebanyak 666 orang (65,62%) lebih banyak dari pada perempuan 349 orang (34,38%). Hasil pemeriksaan Antibodi Covid-19 positif untuk Office departement IgM (3 orang), IgG (3 orang), total jumlah 6 orang (21%), hasil pemeriksaan antibodi Covid-19 positif untuk production departement IgM (14 orang), IgG (4 orang) dan IgM, IgG (1 orang) jadi total jumlah 17 orang (59%). Hasil pemeriksaan antibodi Covid-19 positif terbanyak adalah production departement yaitu 59% dan termasuk hasil Positif untuk IgM dan IgG. Keadaan tersebut diatas Production departement terbanyak karena kondisi tenaga kerja termasuk beberapa perusahaan menerapkan kerja lembur atau 2 shift.

Kesimpulan: Hasil pemeriksaan antibodi Covid-19 positif terbanyak pada rentang umur 30-39 tahun, departemen terbanyak bagian Produksi, rentang umur 50-59 tahun jumlah sedikit. Pada awal terinfeksi Covid-19 IgG dan IgM negatif, membutuhkan waktu untuk mendapatkan hasil pemeriksaan positif IgM atau IgG atau kedua nya. Metode pemeriksaan Antibodi tidak dapat digunakan sebagai alat deteksi dini infeksi Covid-19.

Kata Kunci: Covid-19, Tes Antibodi, IgM, IgG

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INTRODUCTION

There are 17.482.248 positive cases of Covid-19 all over the world, with number of recovered patients amounted to

10.941.911, and died 676.825. Based on data in Indonesia on July 30 2020, the number of people infected Covid-19 was 106.336 cases, 64,292 recovered and 5.058

died. In Surabaya on July 30 2020, the number of residents infected Covid-19 was 8.553 cases, including 2.793 people were still being treated. Patients recovered in Surabaya are 5.001 people, while patients died are 759 people.

Laboratory tests and diagnoses are used to confirm CoV case, with rapid antibody test is being used for screening and real-time fluorescence RT-PCR used to validate the suspected case. According to Ward's research data in May 2020 the RT-PCR examination conducted with positive test results in Indonesia was 9%, another study showed that in August 2020: 13.3% (Clinical Classification Ordinary Severe Cases and Critical Cases).

WHO warns that the virus transmitted rapidly. Corona Virus Prevention and Control Procedure issued by Ministry of Health (Kemenkes) had decided Indonesia uses two types of rapid tests, namely rapid antibody tests (method: serology) and RT-PCR (molecular, gold standard). The flow of the Rapid Test check refers to the Covid-19 Prevention and Control Guideline document issued by the government on March 27 2020, namely: (1) The flow of the antibody rapid test examination, if it is negative: is directed to self-isolation. If during isolation, the symptoms get worse, they are immediately asked to go to a health care facility.

All antibody test methods and RT-

PCR tests have an optimum time window in the someone's incubation period or infection. The antibody test method cannot be used as an early detection tool for people who are still on the first day of the incubation process. IgG and IgM antibody levels are still low on the first day of infection, even though the number of viral particles is very high at the beginning. (12)

The problems mentioned above are positive antibody test results depending on the optimum examination time for the Covid-19 infection period, resulting confusion for the users, mainly workers and company management, that they compare the result of antibody SARS-CoV-2 rapid test with PCR test results. I am keen to examine how the result of Antibody examination for company workers in Surabaya and Pasuruan could be accurately interpreted.

METHOD

Subject of Research

Rapid Test Examination for Workers Age 18 - 65 years. The examination was conducted from May 2020 to August 2020, where the company locations are in Surabaya and Pasuruan according to the Inclusion criteria of this study (1015 people). Research location: Surabaya and Pasuruan company, Indonesia. The collected data was taken from the Main Clinic Sentra Medika Surabaya, Jalan Raya

Tenggilis number 135B, Surabaya, Indonesia (secondary data).

Sample Examination

The examination was conducted from May 2020 to August 2020. The samples used were serum and blood peripheral blood, *vacutainer holders and needle plain* Becton Dickinson (BD) or Lancet, rapid test kits used under the trade names: a. RDT Eagens and Instant View; b. Clungene RDTs; c. RDT InstantView. Communauté Européenne (CE) Certification, Task Force, Food and Drug Administration (FDA), Korea IVD Certified, 12 tube DLAB centrifuge (Korea). Serum or blood is dripped onto the cassette and then dripped with buffer. The time needed to get the examination result is 15 minutes. First: the line that comes out is the control, second and third are IgM and IgG. (9,12,13) The interpretation of the Antibody Test is Positive or negative IgM and IgG according to age range, male and female (gender), division in the company. The description of antibody test results for the SARS-CoV-2 rapid test is for company workers in Surabaya and Pasuruan.

Data Analysis

The research design is *cross-sectional*, descriptive, with a sample of 1015 workers in Surabaya and Pasuruan. I took the sample at the main Clinic of Sentra Medika Surabaya. A Rapid Test

(Immunochromatography method) was conducted to get a positive test result for the workers

RESEARCH RESULT

Sample data for the Sars-Cov-2 (Covid-19) Antibodies examination were taken at the Main Clinic of Sentra Medika Surabaya, from May to August 2020 with the age range of 18-65 years was 1015 people. The number of samples were taken at the main clinic of Sentra Medika Surabaya in May - August 2020. The highest number of samples was in the age range of 40-49 years old was as many as 404 people (39.90%), the second largest sample was 20-29 years old amounted to 247 people (24.33%). Lastly, samples in the age range of 60-69 years old was 5 people (0.41%). According to Liu K.'s data, the Covid-19 mortality rate for the age range of 60 years old was higher than those under 60 years old. (Liu K., 2020). The age range of 50-59 years old workers in Surabaya and Pasuruan are approaching retirement so that the number of samples in that age range is small.

Office Department is the Division of Finance, General Affair, Human Resources Department (HRD), Marketing and others. Production Department is Operator, Secondary Mechanic Team Leader, SKT (Hand-rolled Cigarettes), SKM (Cigarette-rolled Machine). Others are Driver, office

Boy. The total sample is 1015 people, consisting of the Office Department, Production Department, Security, others with the following details; The Office Department has a sample of 94 people (9.26%), the Production Department has the

most samples, 773 people (76.16%), Security has samples of 39 people (3.84%), and others have a total of 109 people (10.74%). The number of male samples was 666 people (65.62%) more than 349 women (34.38%).

Sample Distribution of Age Range Against Covid-19 Antibody Test Results

In May 2020 - August 2020

Range Age (years old)	Positive					Negative	
	Numbers of sample	IgM	IgG	IgM, IgG	%	Numbers of sample	%
11 – 19	0	0	0	0	0%	6	0,60%
20 – 29	9	4	5	0	31,03 %	238	24,14%
30 – 39	10	6	4	0	34,48 %	236	23,94%
40 – 49	8	7	2	1	27,59 %	396	40,16%
50 – 59	2	2	0	0	6,90%	105	10,65%
60 – 69	0	0	0	0	0%	5	0,51%
Total	29	19	11	1	100%	986	100%

The highest number of positive antibody examination results were found in the age range of 30-39 years old with 10 people (34.48%) and the second highest were found in the age range of 20-29 years old with 9 people (31.03%), followed by age range of 40-49 years old with 8 people (27.59%). The age range of 50 – 59 years old with positive antibody test results were 2

people (6.90%). There were 19 people who tested positive for IgM antibodies, 11 people for IgG and the results for positive antibodies for IgM and IgG were 1 (one) person. The results of the positive Covid-19 antibody examination for male were 19 people (66%) more than women as many as 10 people (34%)

Distribution Sample of Department or Division Against Positive Covid-19 Test Result
 In May 2020 - August 2020.

Departemen	Positive					Negative	
	IgM	IgG	IgM, IgG	Numbers of sample	%	Numbers of sample	%
Office Departement	3	3	0	6	21%	88	9%
Product Departement	14	4	1	17	59%	756	77%
Others	2	4	0	6	21%	103	10%
Security	0	0	0	0	0%	39	4%
Total	19	11	1	29	100%	986	100%

The results of positive Covid-19 antibody examination for office department, namely the IgM are 3 people, IgG are 3 people, the total number is 6 people (21%). The results of positive Covid-19 antibody examination for product department, namely IgM are 14 people, IgG are 4 people and IgM, IgG is 1 person. So, the total number is 17 people (59%). Other departments examination with IgM are 2 people, IgG are 4 people, so the total number is 6 people (21%). The most positive Covid-19 antibody test results were in the production department, which was 59% and included positive results for IgM and IgG.

DISCUSSIONS

Corona Virus Prevention and Control Procedure issued by Ministry of Health (Kemenkes) had decided Indonesia

uses two types of rapid tests, namely antibody and antigen rapid tests (method: serology), and RT-PCR. The flow of the Rapid Test check refers to the Covid-19 Prevention and Control Guideline document issued by the government on March 27 2020.

The antibody rapid test has a slightly different inspection flow. (Directorate General of Disease Prevention and Control, Ministry of Health, Republic Indonesia, 2020). The flow of the antibody rapid test examination if it is negative: People Without Symptoms (OTG) or People under Monitoring (ODP) or Patients under Monitoring (PDP) is directed to self-isolate. If during isolation the symptoms get worse, they are immediately asked to go to a health care facility. The patient who does not have an increased symptoms will repeat the rapid

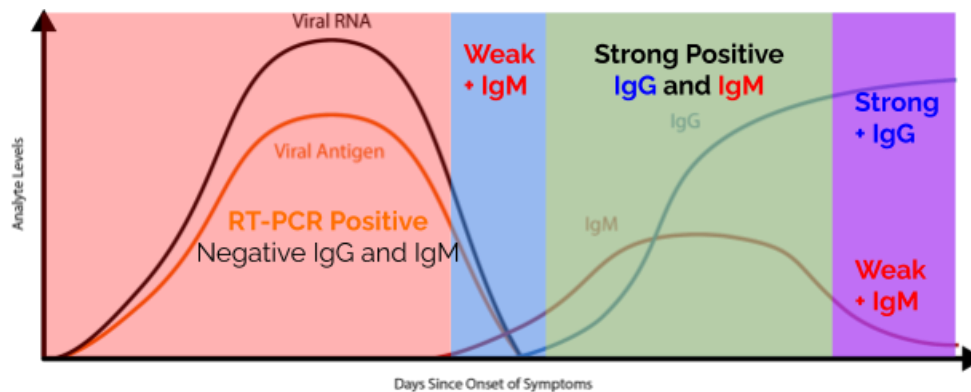
Antibody test 10 days later. If the result of the rapid test is negative, the illness is not Covid-19. If the result is positive (ie 8-10 days after incubation and clinical symptoms, Real Time (RT)-PCR SARS-Cov-2 (Gold Standard) Swab will be conducted twice (2 consecutive days). If the RT-PCR swab test results are negative, it is not Covid-19. If the results are positive, then it is confirmed Covid-19. (Adhi I.S., 2020)

Sample data for testing the Sars-Cov-2 (Covid-19) Antibodies were taken at the main clinic of Sentra Medika Surabaya, from May 2020 to August 2020. The age range of 18-65 was 1015 people. The samples were taken at the main clinic of Sentra Medika Surabaya in May - August 2020. The highest number of samples was in the age range of 40-49 years old was as many as 404 people (39.90%), the second largest sample was 20-29 years old amounted to 247 people (24.33%). Lastly, samples in the age range of 60-69 years old was 5 people (0.41%). According to Liu K.'s data, the Covid-19 mortality rate for the age range of 60 years old was higher than those under 60 years old. (Liu K., 2020). The age range of 50-59 years old workers in Surabaya and Pasuruan are approaching

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Quoted from : Kawal Covid-19, 2020

IgG and IgM antibody levels are still low during the first days of infection, even though the number of viral particles is very high at the beginning. Based on the scheme above, if the patient is tested with an antibody test in red conditions, the antibody test result will be false negative, even though the patient actually has COVID-19. Patient who is considered high risk but negative on the first antibody test results, will be tested again about a week until it shows blue for IgM positive and it shows green for positive IgG and IgM. IgG will be positive until next 6 months.(9,12) Positive Covid-19 antibody test results for Male are 19 people (66%) more than women as much as 10 people (34%). (Table 5.) Problems: This method can not be used as an early detection tool for people who are still in the first days of the incubation process.

The results of the Covid-19 antibody examination were positive for the IgM office department are 3 people, IgG are 3 people, and the total number of people are 6 (21%).

The results of the Covid-19 antibody examination were positive for the IgM production department are 14 people, IgG are 4 people and IgM, IgG is 1 person, so the total number of people is 17 people (59%). The most positive Covid-19 antibody test results were in the production department, which is 59% including positive results for IgM and IgG. (Table 6.) The above conditions are mostly in the production department due to working conditions, including some companies implementing overtime work or shift 2.

CONCLUSIONS

1. The most positive Covid antibody examination result is in production department.
2. Positive Covid 19 antibody examination result for male is more than female.
3. The most positive Covid 19 antibody examination result is at the age range of 30-39 years old.
4. The least positive antibody result

examination is at the age range of 50-59 years old.

5. At first infected Covid 19, the IgG and IgM are negative. It needs time to get

examination result of positive IgM or IgG or both.

6. Antibody examination method cannot be used as early detection tool of Covid 19

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