SARS-COV-2 (COVID-19) EXAMINATION USES ANTIGEN SWAB FOR COMPANY'S EMPLOYEES IN SURABAYA ON JULY – AUGUST 2021

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SARS-COV-2 (COVID-19) EXAMINATION USES ANTIGEN SWAB FOR COMPANY'S EMPLOYEES IN SURABAYA ON JULY – AUGUST 2021

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ABSTRACT

Background of the problem: *Since 2020, all the countries in the world has been rocked by Covid-19 (Sars-Cov-2) pandemic. Since July 2021, Indonesia became Covid-19 epicentrum with the highest mortality 2.048 people in the world on 10th August 2021. Covid-19 supporting diagnosis checkup uses RT-PCR and Antigen rapid test, this was based on the Indonesian Health Minister instruction about the uses of antigen test for 2019 Corona Virus Disease checkup.* ***Method:*** *This research uses cross sectional, retrospective analytic study by seeing the data that was taken from SARS-Cov-2 antigen rapid test from some location of companies in Surabaya. The swab data is from Sentra Medika Clinic Surabaya by using nasopharyngeal and nasal antigen SARS-CoV-2 rapid test kit (immunochromatography method).* ***Result:*** *The main data of labor's characteristics is 6033 people. The highest number was on July to August 2021 on the age range of 30-39 years old (39,70%), meanwhile at the age of 60-69 years old is 0,45%. In the case of Covid-19 virus infection, the highest number of positive antigen was at the age range of 30-39 years old was 64 people (41,30%), whereas 2 people (1,30%) were at the age range of 60-69 years old. At the age more than 60, the number of case is not many but the statistic analytic result shows that age influences P<0,05 (P 0,043) Covid-19 Antigen swab result. From the research was found that the result of positive Antigen swab for man was 143 people (92,30%), this was higher than the woman's, 12 people (7,70%). The statistical analysis shows that gender does not influence P>0,05 (P 0,260) Covid-19 Antigen swab test result. The case spike happened on July 2021, 153 people were positive of Antigen swab test: 141 people were men (92,16%) and 12 people were women (7,84%). On August 2021, 2 men were positive (100%).* ***Conclusion:*** *The result of the research in July 2021 shows that the highest numbers of labor are at the age of 30-39 years old. The risk of Covid-19 infection mostly at men. Whereas Covid-19 infection risk is at the age of 60-69 years old are in small amount. Age influences the result of Covid-19 Antigen swab test. Meanwhile, gender does not influence the result of Covid-19 Antigen swab test.*

Keyworld *: Covid-19 pandemi, RT-PCR, Antigen rapid test*

ABSTRAK

Pendahuluan: Sejak tahun 2020, s emua negara di dunia diguncang pandemi Covid-19 (Sars-Cov-2), dan mulai Juli 2021 Indonesia menjadi episentrum Covid-19 dengan angka Kematian tertinggi di dunia mencapai 2.048 orang pada 10 Agustus 2021. Pemeriksaan penunjang diagnosis Covid-19 menggunakan RT-PCR dan Tes Rapid Antigen, keputusan Menteri Kesehatan Republik Indonesia tentang penggunaan tes Antigen untuk pemeriksaan Corona Virus Disease 2019. **Metode Penelitian:** Penelitian ini menggunakan studi Analitik, *cross sectional*, retrospektif dengan melihat data yang diambil dari Uji Tes Rapid Antigen SARS-Cov-2 yang dilakukan di lokasi perusahaan yang berada di Surabaya. Data swab di dari Klinik Utama Sentra Medika Surabaya, menggunakan swab *nasopharyngeal* dan *nasal* kit test antigen SARS - CoV-2 (metode imunokromatografi). **Hasil**: Data dasar karakteristik tenaga kerja sebanyak 6033 orang, pada bulan Juli-Agustus 2021 terbanyak pada rentang umur 30-39 tahun (39,70%), sedangkan umur rentang 60-69 tahun yaitu (0,45%). Pada kasus infeksi virus Covid-19 antigen positif terbanyak pada rentang umur 30-39 tahun jumlah 64 orang (41,30%), sedangkan rentang umur 60-69 tahun adalah 2 orang (1,30%). Pada penelitian ini didapatkan umur > 60 tahun jumlah sedikit, tetapi hasil analisis statistik menunjukkan bahwa **umur mempengaruhi** hasil pemeriksaan swab Antigen Covid-19 P<0,05 (P 0,043). Penelitian ini didapatkan hasil swab Antigen positif pada laki-laki 143 orang (92,30%) lebih tinggi dari pada perempuan 12 orang (7,70%). Hasil analisis statistik menunjukkan bahwa jenis kelamin **tidak mempengaruhi** hasil pemeriksaan swab Antigen Covid-19 P>0,05 (P 0,260). Lonjakan kasus terjadi pada bulan Juli 2021, hasil swab Antigen positif 153 orang yaitu 141 orang Laki-laki (92,16%) dan 12 orang perempuan (7,84%). Pada bulan Agustus 2021 pemeriksaan hasil swab Antigen positif 2 orang jenis kelamin laki-laki (100%). **Kesimpulan**: Hasil penelitian kami pada bulan Juli 2021 menunjukkan bahwa jumlah tenaga kerja terbanyak umur 30-39 tahun, risiko infeksi Covid-19 terbanyak pada laki-laki, sedangkan infeksi Covid-19 pada rentang umur 60-69 tahun jumlahnya sedikit. **Umur mempengaruhi** hasil pemeriksaan swab antigen Covid-19, sedangkan jenis kelamin **tidak mempengruhi** hasil pemeriksaan swab Antigen Covid-19.

Kata kunci :Covid 19 Pandemi, RT –PCR, Antigen Rapid Test

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INTRODUCTION

Since 2020, All countries in the world were shaking by Covid-19 (Sars-Cov-2) pandemic and begins on July 2021 becoming Covid-19 epicenter with the highest mortality in the world reaching for 2.048 people on August 10th 2021. (1) Covid-19 case becomes more prevalent outside Java and Bali together with Delta variant. Without any strict limitation, the case increased in some areas which will be no longer reaching the top on the middle of November 2021. (2) Safrina G.M (Genom National Eijkman Foundation), 2021 said that the Delta variant widely spread and it was signed with more and more new specimens finding. According to Indonesian Genome Surveilans Network Data, on 5th August 2021: DKI Jakarta was 425, diagnosis uses Antigen swab and biomolecular namely PCR (Polymerase Chain Reaction). (14,15) The Republic Indonesia Ministry of Health decree number HK.01.07/Menkes/3602/2021 about the changing of Health Minister decree numberHK.0107/Menkes/446/2021 was 191 and East Java was 187. about the use of Rapid Diagnostic Antigen Test in 2019 Corona Virus Disease (Covid-19). (6,8,11,13,14). West Java was 281, Central Java was 191 and East Java was 187. Based on 3th August 2021 data in Indonesia, the total case was 3.462.800 people, new case was 3.462.800 people, new case was 22.404 people, mortality was 1.568 people, meanwhile in USA the total case was 35.878.332 people, new case was 48.179 people, mortality was 193 people . (3) According to Liu K., 2020 the number of mortalities of Covid-19 patient for 60 years old or more group was 5,3% higher than under 60 years old patient (1,4%). (4,5,7,9).

Supporting laboratory test for determining Sars-Cov-2 (C-19) diagnosis uses Antigen swab and biomolecular namely PCR (Polymerase Chain Reaction). (14,15) The Republic Indonesia Ministry of Health decree number HK.01.07/Menkes/3602/2021 about the use of Rapid Diagnostic Antigen Test in 2019 Corona Virus Disease (Covid-19). (6,8,11). We are interested to do research for positive Sars-Cov-2 (Covid-19) test result uses Antigen swab in company's employees on July- August 2021 in Surabaya.

METHODS

Research Subject

The Research data is Antigen swab result which is taken from Head Clinic of Sentra Medika Surabaya. SARS-Cov-2 antigen Rapid test examination was done in company area in Surabaya on July – August 2021 with the total number of samples are 6033 people. All the employees were examined based on the inclusion and exclusion criteria.

Sample Examination

The principle of sampling is using SARS-CoV-2 rapid antigen test *nasopharyngeal* dan *nasal swab kit* (immunochromatography method) that have been certified from WHO and Indonesian Republic Ministry Health. (7,15) The step of swab sampling was started from [1] preparation: Kit includes test device, buffer, extraction tube, extraction cap, positive control, negative control, sterile *nasopharyngeal* swab and rack for keeping the tube in 15 – 30 °C; [2] The procedure used is: buffer is put in extraction tube until the line is determined (300 μl), put on tube pad rack, *nasopharyngeal* swab is put in through the nose with position of patient look up and 3-4 times turned (for few second), then put the extraction tube on the rack tube, put in the extraction tube, turned 5 times and the stick was broken, dropping 5 drops specimen to the well specimen, read after 15 minutes incubation [3]Interpretation: negative if the control line seems ©, but result line (T) is unseen; Positive if the control line seems © dan result line (T) is seen or fade; Invalid if the control line © is unseen, but result line (T) is seen or both C and T line are unseen (10,12).

Data Analysis

This research uses analytic study, *cross sectional* by looking at the data that was taken from SARS-Cov-2 rapid antigen test examination, which was done in the company area in Surabaya.

RESEARCH RESULTS

The sample data of Data Sars-Cov-2 (covid-19) antigen examination was taken at Head clinic of Sentra Medika Surabaya on July – August 2021 with the age range of 10 – 65 years old for 6033 people. The highest percentage at the range age 30 – 39 years old is 2395 people (39,70%). The result of Antigen swab on July 2021 is 5086 people and the highest percentage at the range 30 – 39 years old 2107 people is 41,43%. Antigen swab examination on August 2021 is 947 people and the highest percentage at 20 – 29 years old 343 people is 36,21%. The mean of sample distribution based on the age on July – August 2021 is 36,17 years. The number of July 2021 sample is 5086 people, the mean is 36,89

years. Meanwhile , the number of August 2021 sample is 947 people, the mean is 36,89 years. Meanwhilw, the number of August 2021 sample is 947 people, the mean is 32,36 years . **The distribution of age and Sars-Cov-2 (Covid-19) antigen swab test result** on July – August 2021: **The most positive result examination** at the age 30 – 39 is 64 people (41,30%), meanwhile **negative** examination result is 2332 people (39,70%). The second most positive examination result at the age of 40 -49 years old is 53 people, meanwhile the negative examination result is 1558 people (26,70%). The result of positive Covid-19 antigen swab result of the range age of employee 60 – 69 years old are 2 people (1,30%). The distribution of age and Sars-Cov-2 (Covid-19) antigen swab result is on July 2021. The most positive Covid-19 swab result examination for 30-39 years old is 64 people (41,83%), meanwhile the negative result is 2043 people (41,41%). The second most positive result examination for 40-49 years is 51 people (33,33%), meanwhile negative examination result is 1397 people (28,32%). Age distribution and positive Sars-Cov-2 (Covid-19) Antigen swab result on August 2021 it is found that the most positive examination result is at 40-49 years old are two people (100%), meanwhile the negative examination result are 161 people (17,04%)

Table 1. The influence of age to Covid-19 Antigen swab test result on July-August 2021

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	0,044	0,043
N of Valid Cases	6033	

Table 1 Statistical test result (Chi-Square) **0,043 (P<0,05)** shows that age has corellation with positive Covid 19 Antigen swab test result at the range age for 30-39 years old.

Gender distribution and Covid-19 antigen swab test result on July – August 2021, positive examination result for male is 143 people (92,30%) more than the positive examination result in female is 12 people (7,70%). **Gender distribution and** Covid-19 antigen swab test examination on July 2021, the positive antigen swab examination is 153 people by detail as follows: positive examination result for male is 141 people (92,16%) more than positive

examination result for female 12 people (7,84%).

Gender distribution and Covid-19 antigen swab test result on August 2021, positive antigen swab examination

are people by detail as follows: positive examination result for male is 2 people (100%), meanwhile for female, 204 people (21,59) are all negative.

Table 2. The influence of gender and Covid -19 Antigen swab test result on July-August 2021

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	0,014	0,260
N of Valid Cases	6033	

Table 2., Statistical test result (Chi-Square) 0,260 (P>0,05) shows that **gender does not shows the correlation with positive Covid-19 Antigen swab**

result. This condition may be caused by the number of male employees are more than fema

Table 3. The number of positive Sars-Cov-2 Antigen Rapid test examination result of employees in Surabaya on July-August 2021 compares with Sars-Cov-2 national total case on August 3rd 2021

Result	National case on August 3rd 2021	Antigen swab test examination result on July-August 2021 of Company's employees (6033 people) in Surabaya			
		July 2021	Percentage (%)	August 2021	Percentage (%)
Positif	3.462.800	153	3,01	2	0,21
Negatif	-	4933	96,99	945	99,79

Table 3, data. shows that on **July 2021** positive Covid-19 Antigen swab examination result are 153 people (sample 5086 people) and   positive examination result are 2 people (947 people) on **August 2021**. On 3rd August 2021 in Indonesia: the total case is 3.462.800 people; new case is

22.404 people and **the mortality is 1.568 people**. (3) There are 22.858 people Covid-19 new case in Java and Bali on **7th July 2021**, 38.562 people are on **18th July 2021,** meanwhile on **5th August 2021,** the number of new case has decreased into 19.049,1 people. (1,2)

Diagram 1. The number of *Positivity Rate* sample of daily examination result in Male,
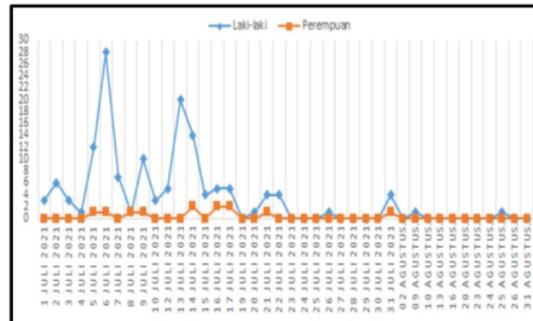Female on July-August 2021

Diagram 1., shows that the difference between the number of patients with daily positive swab result comparing with male and female. **On 7th July 2021**, the number of patients with positive antigen swab test are more than male from all period of antigen swab examination namely 28 people are positive. The number of most second positive antigen swab test result employee on 13th July 2021 are 20 people. Female group has same number of employee with positive antigen swab result, 2 people every day, on **14th July 2021, 16th July 2021 and 17th July 2021.**

Diagram 2. The percentage of *Positivity Rate* daily sample of examination result in male,
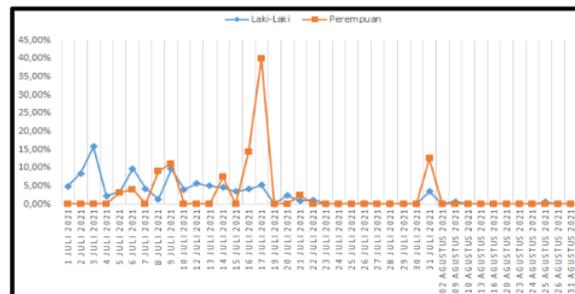female on July-August 2021

Diagram 2., shows that decrease pattern of positive antigen swab test result of male female employee number. The highest positive rate result **on 17th July 2021** for female employee during examination period namely 40%, meanwhile the number of positive antigen examination result on July 2021 is 12 employees. On 3rd July 2021 was the day in which male employee has the highest positive result, namely 15 %. On July, The number of male employee

with positive antigen examination are 141 people.

DISCUSSION

Research data states that Covid-19 figure genesis case of infection and mortality are high. The total case number on 3rd August 2021 in Indonesia is 3.462.800 people, the mortality is 1.568 people, meanwhile in USA the total case is 35.878.332 people, the mortality is 193 people. (3) According to Liu K., Covid-19 mortality range of 60 years old is higher than under 60 years old. (4) This research was done at company's occupational community in Surabaya. Main characteristic data of employees are 6033 people as follows: on July-August 2021, the most age range of 30-39 years old is 39,70%, next 40-49 years old is 26,70%, 60-69 years old is 0,45%. The most covid-19 virus infection or positive antigen swab at the range age of 30-39 years are 64 people (sample number are 2395 people) (41,30%), next range age of 40-49 years are 53 people (34,20%), meanwhile range age of 60-69 years are 2 people including 1 male and 1 female (sample number are 28 people) (1,30%). According to Seftiya A., most of Covid-19 patient are males and the most age range is between 31-40 years. The research data above has the same age range with this research, namely 30-39nyears (41,30%). (17) age sample $\geq$ 60 years of

Covid-19 infection risk (1,30%). Shahid's research states that case increase in elderly people have comorbid toward Covid-19 such as hypertension, mellitus diabetes, kidney function disorders. (16) According to WHO and CDC report that pre-elderly age (50-59) has mortality number almost 2%, age of > 70 years is 15%. The most mortality number happened to Covid-19 patient of up 80 years old with the percentage of 21,9%. (26) From this research, it is found that in age of > 60 years is in few numbers, but **age influences** covid-19 P<0,05 antigen examination result. This condition is caused by this research that is held in a company having age limitation 50 years old. This research found that positive antigen swab result in male are 143 people (92,30%) higher than female positive antigen swab result 12 people (7,70%), in which **the total number of male is more than female. (diagram 1,2)** Statistical analysis result shows that gender does not influence Covid-19 P>0,05 (P 0,260) antigen swab test result. In Nabilah Z 2022's research., male has tendency of bad attitude comparing with female. This phenomenon causes man's less concerned toward health and environment condition. (24,25) The male positive result above is more than female in which it can be influenced by chromosome X that is more dominant in female comparing to male.

Chromosome X can influence gene in innate and adaptive immunity system. Chromosome X has effector to control cytokine receptor activity. Cytokine receptor has function as mediator and regulator of immunity system so that female (XX) has dominant immunity system than male (XY). (17,18,25) Based on Zhao Y., 2020's research, Angiotensin Converting Enzyme 2 (ACE-2) receptor expression in male is found more than female so that this condition becomes one of factors making SARS-COV-2 easy to infect male. (19,20) Another factor is transmembrane Sreine Protease 2 (TMPRSS2), excreted by male's prostate organ. SARS-COV-2 virus enters human body bonds between S (Spike) protein from virus with ACE-2 (Receptor host). This research said that SARS-COV-2 will bind TMPRRS2 so that male risk to be infected from Covid-19 will be greater. (21,22,23) The case spike happened on July 2021. The positive antigen swab result is 153 people such as 141 people male (92,16%) and 12 people are females (7,84%). On August 2021, there are 2 males having positive antigen swab result (100%). Java and Bali Covid-19 data, new case on 7th July 2021 are 22.858 people, 18th July 2021 are 38.562 people and 5th August 2021 are 19.049,1 people (1,2). This research also shows case drop on August 2021.

CONCLUSIONS

Our research result shows as follows:

1. The most employees range age tested are 30-39 people, next will be 40-49 years and the least are 60-69 people.

2. Sars-Cov-2 (Covid-19) infected risk for male is more than female.

3. Covid-19 antigen swab result has highest positive confirmed at the age of 30-39 years, meanwhile the lowest infected risk at the age of 60-69 years.

4. Age range influences Covid-19 with $P<0,05$ antigen swab result, but gender does not influence Covid-19 with $P<0,005$ antigen swab resu

5. The number of most Covid-19 infected case on July 2021, according to new case of Indonesian national data of Java – B

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