

**EPIDEMIOLOGICAL ANALYSIS OF COVID-19 CASES IN
GORONTALO CITY (CASE STUDY OF KOTA TENGAH
SUBDISTRICT)**

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Abstract

Coronavirus Disease or COVID-19, is still a concern around the world. COVID-19 is a new disease that was previously unknown before it finally appeared in Wuhan, China, in December 2019. A new strain of coronavirus causes COVID-19, The Novel Coronavirus 2019 (2019-nCoV), and is officially named Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV-2). The novelty of this study is to analyze the epidemiology of Covid-19 cases in Gorontalo City. The purpose of this study is to analyze the epidemiology of Covid 19 disease in Gorontalo City. The type of research used is an observational survey with a descriptive approach. The population and samples are all covid 19 patients in 2020 – 2022 who live in the Puskesmas Kota Tengah area, Kota Tengah Subdistrict, Gorontalo City. The sampling technique is Purposive Sampling. The results showed the highest prevalence of covid 19 in 2021 was 2.3%, the frequency distribution of covid 19 sufferers by the highest sex in 2021 was 344 people (55.6%), the frequency distribution based on the age group of covid 19 sufferers was highest in 2022 age group 25-29 years as many as 25 people (23.6%), frequency distribution based on the month of the highest incidence in 2022 February as many as 67 people (63.2%), frequency distribution based on the highest residence in 2020 residences in Pulubala Village were 76 people (25.0%) and the highest CFR in 2021 was 3.6%. The Conclusion is the prevalence of covid-19 in 2020 was 1.1%, there was an increase in covid-19 cases in 2021 to 2.3%, and there was a decrease in mid-2022 with a prevalence of 0.4%.

Keywords: Covid-19; Epidemiology; People; Place; Time.

1. INTRODUCTION

Coronavirus Disease or COVID-19, is still a concern around the world (1) (2). COVID-19 is a new disease that was previously unknown before it finally appeared in Wuhan, China, in December 2019. COVID-19 is caused by a new strain of coronavirus, the Novel Coronavirus 2019 (2019-nCoV), and is officially named Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV- 2) (3) (4).

The emergence of 2019-nCoV has attracted global attention, and on January 30, 2020 the World Health Organization (WHO) declared Covid-19 a public health emergency of international concern (2). The increase in the number of Covid-19 cases is taking place quite quickly, and there has been a spread between countries (5). At first, some countries and even Indonesia still considered it a normal thing. But when the beginning of January 2020, Covid-19 began to be very troubling. Coronavirus is a new type of virus that has now shocked the world community (6).

Coronaviruses are a large family of disease-causing viruses in animals and humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) (7) (8). COVID-19 is transmitted

through droplets or splashes that come out when an infected person coughs, sneezes, or speaks (9).

WHO declared Covid-19 on March 12, 2020 as a pandemic (10) (11). The number of positive cases of the Covid-19 virus in Indonesia is soaring significantly day by day. The number of new cases as of early January 2021 reached its highest level since the first patient was announced (12). The total number of patients as of December 8, 2021 positive for corona has also reached 4,258,076 million confirmed cases, and this figure continues to rise (9). Of these, 5,466 (0.1%) active cases are undergoing treatment and quarantine. A total of 143,893 (3.4%) thousand people died, and 4,108,717 (96.5%) million were confirmed recovered (Covid-19 Task Force, 2021).

Covid-19 began to enter Indonesia in early February 2020. Indonesia is the fourth most populous and populous country in the world. Thus it is expected to suffer greatly and over a longer period of time. President Joko Widodo reported that he first found two cases of Covid-19 infection in Indonesia on March 2 (Ririn, 2020) (13). Patients who have been confirmed with Covid-19 in Indonesia started from an event in Jakarta where the patient came into contact with a Foreign Citizen (WNA) from Japan who lived in Malaysia, and after the meeting, the patient complained of fever, cough, and shortness of breath (9).

Indonesia itself records very significant cases every day. The Case Fatality Rate (CFR) due to Covid-19 in Indonesia is in the range of 3-4% percentage. On October 03, 2020, the percentage of Case Fatality Rate (CFR) was 3.7%. The percentage of deaths due to Covid-19 in Indonesia is relatively high compared to other countries. For example, China and America have a Case Fatality Rate (CFR) percentage rate in the range of 3% (13). Especially in Indonesia itself, the Government has issued a disaster emergency status starting from February 29, 2020 to May 29, 2020 related to this virus pandemic for a total of 91 days (Koesmawardhani, 2020). This is done because seeing the cases that have occurred in Indonesia has been very extraordinary.

As of March 21, 2022, more than 470.8 million confirmed cases in 229 countries, and more than 6 million deaths have been reported. Indonesia with a total confirmation of more than 5.9 million cases, whereas Gorontalo Province with several confirmed cases is 13,785 cases, with 4,880 points in Gorontalo City, and there are 62 cases died (14).

Based on this description, to find out more in-depth about the distribution, determinants, and prevalence of Covid 19 in Gorontalo City, especially in The Kota Tengah subdistrict, the researchers studied it through a study entitled "Epidemiological Analysis of Covid-19 Cases in Gorontalo City (Case Study

of Kota Tengah subdistrict".

2. METODE

The type of research used is an observational survey with a descriptive approach. The research was conducted in April – August 2022 in the Working Area of the Puskesmas Kota Tengah, Kota Tengah subdistrict, Gorontalo City.

The population and samples in this study were all covid 19 patients in 2020 – 2021 who lived in the Central City Health Center area, Central City District, Gorontalo City (15).

The sampling technique used in this study is Purposive Sampling, which is a sample based on a specific consideration made by the researcher:

- a. Have complete data
- b. Domiciled in the Puskesmas Kota Tengah, Kota Tengah subdistrict, Gorontalo City working area.

The variables in this study consisted of independent variables consisting of Age, gender, place of residence, and time of occurrence, and the dependent variable was Covid-19 Disease.

Data collection is obtained directly through the register book of the Puskesmas Kota Tengah Data processing is carried out manually and electronically using calculators and computers. The research instrument used in this study is a fill sheet. The data are presented in the form of a frequency distribution table,

and the graph is accompanied by a narrative for viewing the epidemiological picture of the malaria disease by person, place, and time.

RESULTS AND DISCUSSION

Research Results

The research was carried out in the Kota Tengah subdistrict of Gorontalo City. The data taken was data on the time span of 2020 to June 2022. The results of the study are as follows:

1. Number of Sufferers According to the Year of Occurrence

Table 3.1 Distribution of Sufferers By Year of Occurrence 2020-2022

Year of Occurrence	n	Prevalence (%)
2020	304	1,1
2021	619	2,3
2022	106	0,4

Source: Secondary Data

Table 3.1 shows that the number of Covid 19 patients in Kota Tengah subdistrict of Gorontalo City, based on the year of the 2020 event, was 304 people with a prevalence of 1.1%, an increase in 2021 of 619 people with a prevalence of 2.3% and a decrease in mid-2022 of 106 people with a prevalence of 0.4%.

2. Number of Sufferers By Gender

Table 3.2 Distribution of Sufferers By Sex In 2020-2022

Gender	2020		2021		2022		Sum	
	n	%	n	%	n	%	n	%
Male	142	46.7	275	44.4	51	48,1	468	46.7
Female	162	53.3	344	55.6	55	51,9	561	53.3
Sum	304	100,0	619	100,0	106	100,0	1029	100,0

Source: Secondary Data

Table 3.2 shows that the number of Covid 19 sufferers in the Central City of Gorontalo City by gender in 2020 was the most female sex, as many as 162 people (53.3%). In 2021 the most female sex was 344 people

(55.6%) and in 2022 the most were also female sex as many as 55 people (53.3%).

3. Number of Sufferers According To Age

Table 3.3 Distribution of Sufferers By Age Group 2020-2022

Age Group (Year)	2020		2021		2022		Sum	
	n	%	n	%	n	%	n	%
< 5	4	1.3	12	1.9	1	0,9	17	1,7
5 - 9	4	1.3	9	1.5	4	3,8	17	1,7
10 - 14	3	1.0	16	2.6	2	1,9	21	2,0
15 - 19	7	2.3	29	4.7	5	4,7	41	4,0
20 - 24	29	9.5	52	8.4	19	17,9	100	9,7
25 - 29	45	14.8	54	8.7	25	23,6	124	12,1
30 - 34	40	13.2	70	11.3	10	9,4	120	11,7
35 - 39	46	15.1	67	10.8	7	6,6	120	11,7
40 - 44	43	14.1	66	10.7	7	6,6	116	11,3

Age Group (Year)	2020		2021		2022		Sum	
	n	%	n	%	n	%	n	%
45 - 49	30	9.9	71	11.5	11	10,4	112	10,9
50 - 54	23	7.6	67	10.8	13	12,3	103	10,0
55 - 59	15	4.9	48	7.8	1	0,9	64	6,2
60 - 64	8	2.6	20	3.2	1	0,9	29	2,8
>= 65	7	2.3	38	6.1	0	0,0	45	4,4
Sum	304	100,0	619	100,0	106	100,0	1029	100,0

Source: Secondary Data

Table 3.3 shows that the number of Covid 19 sufferers in Kota Tengah subdistrict of Gorontalo City, based on the age group in 2020 is the highest in the age group of 35-39 years, as many as 46 people (15.1%). In 2021

most age groups 45-49 years, as many as 70 people (11.5%), and in 2022 the age group 25-29 years, as many as 25 people (23.6%).

4. Number of Sufferers By Month of Occurrence

Table 3.4 Distribution of Sufferers By Month of Occurrence 2020-2022

Month of Genesis	2020		2021		2022		Sum	
	n	%	n	%	n	%	n	%
January	0	0,0	67	10.8	4	3,8	71	6,9
February	0	0,0	42	6.8	67	63,2	109	10,6
March	0	0,0	57	9.2	33	31,1	90	8,7
April	2	0.7	24	3.9	2	1,9	28	2,7
May	4	1.3	7	1.1	0	0,0	11	1,1
June	12	3.9	32	5.2	0	0,0	44	4,3
July	33	10.9	113	18.3	0	0,0	146	14,2
August	97	31.9	225	36.3	0	0,0	322	31,3
September	65	21.4	43	6.9	0	0,0	108	10,5
October	38	12.5	7	1.1	0	0,0	45	4,4
November	5	1.6	1	0.2	0	0,0	6	0,6
December	48	15.8	1	0.2	0	0,0	49	4,8
Sum	304	100,0	619	100,0	106	100,0	1029	100,0

Source: Secondary Data

Table 4.4 shows that the number of Covid-19 sufferers in Kota Tengah subdistrict of Gorontalo City, based on the month of events in 2020 was the most in August as many as 97 people (31.9%) in 2021 the most in

August was 225 people (36.3%) and in 2022 the most in February was 67 people (63.2%).

5. Number of Sufferers By Place of Residence

Table 3.5 Distribution of Sufferers By Place of Residence 2020-2021

Residence	2020		2021		2022		Sum	
	n	%	n	%	n	%	n	%
Dulalowo	33	10,9	73	11,8	11	10,4	117	11,4
Dulalowo Timur	45	14,8	89	14,4	17	16,0	151	14,7
Liluwo	68	22,4	136	22,0	30	28,3	234	22,7
Paguyaman	38	12,5	70	11,3	10	9,4	118	11,5
Pulubala	76	25,0	133	21,5	17	16,0	226	22,0
Wumialo	44	14,5	118	19,1	21	19,8	183	19,7
Sum	304	100,0	619	100,0	106	100,0	1029	100,0

Source : Secondary Data

Table 3.5 shows that the number of Covid 19 sufferers Kota Tengah subdistrict of Gorontalo City based on the most residences in 2020 is 76 people (25.0%), and in 2021 and in 2022, the most residences in Liluwo Village

were 136 people (22.0%) and 30 people (28.3%) respectively

6. Number of Sufferers According to Patient Status

Table 3.6 Distribution of Patients By Patient Status in 2020-2022

Patient Status	2020		2021		2022		Sum	
	n	%	n	%	n	%	n	%
Die	7	2,3	22	3,6	0	0,0	29	2,8
Recover	297	97,7	597	96,4	106	100,0	1000	97,2
Sum	304	100,0	619	100,0	106	100,0	1029	100,0

Source: Secondary Data

Table 3.6 shows that the number of Covid 19 patients in Kota Tengah subdistrict of Gorontalo City, based on patient status in 2020 is the most recovered status, as many as 297 people (97.7%) with CFR 2.3%, 2021 the most recovered group is 597 people (96.4%) with CFR 3.6% and in 2022 the most recovered status is 106 people (100%) with CFR 0%.

was 304 people with a prevalence of 1.1%, an increase in 2021 as many as 619 people with a prevalence of 2.3% and a decrease in mid-2022 of 106 people with a prevalence of 0.4%.

Discussion

By Year of Occurrence

The results showed that the number of Covid 19 patients in Kota Tengah subdistrict of Gorontalo City, based on the 2020 event year

To predict disease patterns, the model emphasizes the need for analysis and understanding of each of the components. The disease can occur due to an imbalance between the three components. This model is better known as the epidemiological triangle model or epidemiological triad and is suitable for describing infectious diseases because the role of the agent is easily isolated clearly from his

environment.

According to this model, a change in one of the components will change the balance of the interaction of the three components, which ultimately results in an increase or decrease in disease.

The increase in the prevalence of the disease is due to a rise in the number of cases. The greater the number of new and unrecovered cases in the previous year will increase the prevalence of the disease in the current year or the following year.

By Age and Gender

The results showed that the number of Covid 19 sufferers in Kota Tengah subdistrict of Gorontalo City, based on gender in 2020 was the most female sex, as many as 162 people (53.3%), in 2021 the most female sex was 344 people (55.6%) and in 2022 the most were also female sex as many as 55 people (53.3%).

The results showed that the number of Covid 19 patients in Kota Tengah subdistrict of Gorontalo City, based on the age group in 2020 was the highest in the age group of 35-39 years, as many as 46 people (15.1%), in 2021 the most age group of 45-49 years as many as 70 people (11.5%) and in 2022 the most age group 25-29 years as many as 25 people (23.6%).

Characteristics of individuals that affect exposure or sensitivity to the disease. People whose characteristics are easily exposed or

sensitive to the disease will be easily affected by pain. Characteristics of people can be genetic factors, Age, gender, occupation, habits, and socioeconomic status. Individuals who have genetic factors carrying the disease will be easily exposed to genetic factors and sensitive to getting sick. Differences based on Age, there is a possibility of exposure based on the course of life.

The covid-19 disease is more suffered by people with female sex, especially children, more caused by immune factors and endurance. Many suffer in the productive age group because it is related to activities, for example, because they have to work in the midst of a pandemic (16) (17).

By Month of Occurrence

The results showed that the number of Covid 19 sufferers in Kota Tengah subdistrict of Gorontalo City, based on the month of occurrence in 2020 was the most in August, as many as 97 people (31.9%), in 2021 the most in August was 225 people (36.3%), and in 2022 the most in February was 67 people (63.2%).

The time of occurrence of the disease can be expressed in hours, days, months, or years. This information can be used as a guide on events that arise in society. Sufferers were widely distributed in August of 2020 due to the peak of the first wave of the pandemic and 2021 because it was caused at the time when it was the peak of the pandemic for the second wave.

In February 2022, there was an increase because it had begun to enter a transition period.

By Place of Residence

The results showed that the number of Covid 19 sufferers in Kota Tengah subdistrict of Gorontalo City, on the most residences in 2020 was 76 people (25.0%), and in 2021 the most places in Liluwo Village were 136 people (21.97%).

The environment is very influential on individuals because the climate is a land for behavioral development. The environment that affects a person's behavior is the social environment, and the social environment can be socially related. (Son, 2020). The social environment is one of the components of the external living environment. A social environment is where people interact and do things together and with their environment in the form of habits, beliefs, customs, attitudes, lifestyle, work, social life, social organizations, and laws. (Sumantri, 2015).

This factor is related to geographical characteristics. This information can be natural, rivers, mountains, or administrative and historical boundaries. Differences in distribution by place provide clues to patterns of disease differences that can be a handle in looking for other factors that are not yet known. Sufferers are widely distributed in Pulubala and Liluwo Villages. This is more because, in these two villages, public places are at risk of

becoming places of transmission of Covid-19, namely markets, culinary snack places, and crowded housing conditions.

By Patient Status

The results showed that the number of Covid 19 patients in Kecamatan, the Central City of Gorontalo City, based on patient status in 2020, the most recovered quality was 297 people (97.7%) with a CFR of 2.3%, in 2021, the most recovered quality was 597 people (96.4%) with a CFR of 3.6% and in 2022 the most recovered status was 106 people (100%) with a CFR of 0%.

The case fatality rate due to Covid 19, or the Case Fatality Rate (CFR), is still high, especially in 2021, which exceeds the national figure. This is due to the high number of cases in the community, so the percentage that is rising is also still high.

Then there is also the factor of lack of treatment and education for self-isolating patients who have mild to severe symptoms (7). Sometimes new patients are taken to the hospital when they patient has had severe symptoms for several days, whether with comorbidities or not.

Covid testing has also yet to reach the target. As a result, only some cases in the community have been detected, so new patients are not appropriately tracked. The vaccination coverage is low, so there are still many people who still need to receive vaccine protection.

CONCLUSION

The prevalence of covid 19 in 2020 was 1.1%, increased in 2021 to 2.3%, and there was a decrease in mid-2022. The majority was 0.4%.

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