Environmental Factors and Use of Protective Personal Equipment for the Prevention of Covid-19 in 3 Large Cities in Indonesia (Jakarta, Surabaya and Makassar)

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Abstract

In Indonesia, data from May 19, 2020 showed confirmed cases of 18,496 and 1,221 deaths. Data as of May 18, 2020, DKI Jakarta became the province with the highest cases in Indonesia, reaching 6,059 cases. The other highest case is Surabaya City, East Java Province which ranks second, with 2,296 cases. In addition, South Sulawesi Province became the province with the highest cases outside Java, amounting to 1,064 as of 19 May 2020. SARS-CoV-2 is transmitted mainly through droplets, therefore PPE (Personal Protective Equipment) is one of the most effective methods of preventing transmission. The method in this research is a qualitative method with a case study approach model. The approach model focuses on gathering various information from several sources such as documents, field surveys, observations, interviews, and detailed recordings. Data collection was carried out based on the number of cases infected in 3 major cities of Indonesia (Jakarta, Surabaya and Makassar).The results showed COVID-19 cases in Jakarta, Surabaya and Makassar continued to experience an increase in cases every day. As of March 3-April 19, 2020 confirmed 3033 cases in Jakarta, in Makassar City as many as 453 confirmed cases from March 3-April 25 2020. In Surabaya City there were 392 confirmed cases from March 23-April 28, 2020. Increasing the number of positive cases, in three big cities Makassar, Surabaya and Jakarta because there are still many people who do not follow government regulations related to social distancing. The COVID-19 transmission pathways are breathing and contact, therefore proper use of PPE will be able to prevent the transmission of Cov-2 SARS. However, the availability of PPE sometimes becomes a barrier because strategies are needed to facilitate the availability of PPE

Keywords: *Personal Protective Equipment, Covid-19, Preventing transmission*

Introduction

The number of cases in DKI Jakarta reached 6059 cases as of May 18, 2020, with the number of death cases reaching 463 cases. Until now, DKI Jakarta is still the province with the highest number of cases in all of Indonesia.

The number of cases in East Java reached 2296 cases as of May 18, 2020, with the number of death cases reaching 209 cases. This makes East Java Province as the province with the second highest number of cases in Indonesia after DKI Jakarta Province. The city with the highest number of cases in East Java Province is Surabaya City, with the number of confirmed cases reaching 1,109 cases and 132 deaths[1].

The number of cases in South Sulawesi reached 1064 cases as of May 19, 2020 with a cumulative number of death cases reaching 55 cases. This resulted in South Sulawesi Province being included in one of the provinces with the highest number of cases in Indonesia. Until May 19, 2020, the number of cases in Makassar City had reached 627 cases. This makes Makassar City one of the cities with the highest number of cases in Indonesia[2].

Personal protective equipment (PPE) is one of the effective methods of preventing transmission during rational use. The PPE component consists of gloves,

face masks, protective goggles or face shields, and long-sleeved non-sterile gowns. Personal protective equipment will be effective if supported by administrative controls and environmental and technical controls. Rational use of PPE is assessed based on the risk of exposure and transmission dynamics of the pathogen[3].

Lack of PPE availability either because the number of patients has jumped sharply or due to the production of PPE that can not meet the needs so that a situation like this is determined by the leadership of the Fasyankes as a crisis period. This alternative is given as a consideration to meet the needs of using PPE in treating patients with COVID-19. 3 APD is a strategic issue related to handling Corona virus in Indonesia. Due to lack of PPE many medical personnel are infected with this virus and must be treated. Even though health workers are at the forefront and demanded to be alert to deal with this virus. On the one hand, the fact is the number of health workers is lacking. Health workers must be protected and given adequate PPE, because of their strategic role in handling Covid-19. We worry that if they are not protected then many health workers will be infected and observed for 14 days or isolated, causing a domino effect. Namely, the reduced number of health workers who can help deal with the virus.

Materials and Method

The method used is a qualitative method with a case study approach model. Case studies are one model approach that focuses on gathering various information from several sources such as documents, field surveys, observations, interviews and detailed recordings (Prihatsanti, Suryanto and Hendriani, 2018). Data collection was carried out based on the number of cases infected with Covid-19 in 3 major cities in Indonesia (Jakarta, Makassar and Surabaya).

Results

1. Results of Covid-19 Disease Cases in Jakarta

Table 1. Table of Positive Cases, ODP, and PDP Covid-19 in Jakarta

Date	Positive	PDP	ODP
3 March 2020	3	24	215
4 March 2020	3	56	241
5 March 2020	7	83	267
6 March 2020	7	88	304
7 March 2020	7	98	356
8 March 2020	7	127	362
9 March 2020	34	166	378
10 March 2020	34	197	401
11 March 2020	36	209	445
12 March 2020	62	238	486
13 March 2020	72	261	586
14 March 2020	79	289	660
15 March 2020	95	308	695
16 March 2020	97	330	813
17 March 2020	122	374	862
18 March 2020	160	374	862
19 March 2020	221	480	976
20 March 2020	224	505	1209
21 March 2020	268	528	1376
22 March 2020	307	646	1447
23 March 2020	356	765	1612
24 March 2020	427	849	1811
25 March 2020	472	899	1872

Cont... **Table 1. Table of Positive Cases, ODP, and PDP Covid-19 in Jakarta**

26 March 2020	515	916	1940
27 March 2020	566	940	1924
28 March 2020	603	985	2200
29 March 2020	701	1046	2289
30 March 2020	727	1085	2300
31 March 2020	741	1156	2349
01 April 2020	816	1196	2394
02 April 2020	909	1202	2468
03 April 2020	990	1955	2481
04 April 2020	1071	2040	2451
05 April 2020	1151	2091	2515
06 April 2020	1299	2225	2566
07 April 2020	1443	2254	2598
08 April 2020	1552	2254	2598
09 April 2020	1719	2327	2865
10 April 2020	1810	2353	2872
11 April 2020	1903	2379	2873
12 April 2020	2082	2395	2897
13 April 2020	2242	2405	2917
14 April 2020	2349	2446	2977
15 April 2020	2447	2457	2991
16 April 2020	2670	2465	3040
17 April 2020	2819	2867	3779
18 April 2020	2902	5155	5684
19 April 2020	3033	5227	5862

Sumber: covid19.sulselprov.go.id, 2020

From 3 March 2020 to 19 April 2020 the total number of positive cases of Covid 19 was 3033 cases, for PDP there were 5227 cases and ODP were 5862 cases.

2. Results of Covid-19 Disease Cases in Makassar

Table 2. Table of Positive Cases, ODP, and PDP Covid-19 in Makassar

Date	positive	PDP	ODP
3 March 2020	0	0	0
4 March 2020	0	0	0
5 March 2020	0	0	0
6 March 2020	0	0	0
7 March 2020	0	0	0
8 March 2020	0	0	0
9 March 2020	0	0	0
10 March 2020	0	0	0
11 March 2020	0	0	0
12 March 2020	0	0	0
13 March 2020	0	0	0

Cont... **Table 2. Table of Positive Cases, ODP, and PDP Covid-19 in Makassar**

14 March 2020	0	0	0
15 March 2020	0	0	0
16 March 2020	0	0	0
17 March 2020	0	0	0
18 March 2020	0	0	0
19 March 2020	2	0	0
20 March 2020	2	0	42
21 March 2020	2	27	50
22 March 2020	2	28	95
23 March 2020	2	29	114
24 March 2020	4	53	149
25 March 2020	13	89	158
26 March 2020	27	81	182
27 March 2020	29	77	284
28 March 2020	33	80	365
29 March 2020	48	92	496
30 March 2020	50	105	620
31 March 2020	50	106	691
01 April 2020	65	110	1072
02 April 2020	66	123	1305
03 April 2020	80	172	1691
04 April 2020	80	233	2072
05 April 2020	82	263	2166
06 April 2020	112	282	2308
07 April 2020	112	306	2399
08 April 2020	128	324	2430
09 April 2020	138	329	2511
10 April 2020	168	346	2581
11 April 2020	178	383	2650
12 April 2020	222	382	2672
13 April 2020	223	404	2762
14 April 2020	231	420	2749
15 April 2020	240	427	2752
16 April 2020	248	461	2799
17 April 2020	369	560	3206
18 April 2020	374	601	3270
19 April 2020	387	617	3334
20 April 2020	397	637	3356
21 April 2020	419	661	3589
22 April 2020	432	706	3617
23 April 2020	440	768	3730
24 April 2020	440	784	3762
25 April 2020	453	781	3781

Sumber: covid19.sulselprov.go.id, 2020

The number of cases is increasing every day. Regarding from 3 March 2020 to 25 April 2020 the total number of positive cases of Covid 19 was 453 cases, for PDP there were 781 cases and ODP was 3781 cases.

3. Results of Covid-19 Disease Cases in Surabaya City

Table 3. Table Number of Covid-19 Patients in Surabaya City

Date	Positive	PDP	ODP
3 March 2020	23	7	135
24 March 2020	29	8	182
25 March 2020	29	8	182
26 March 2020	31	16	189
27 March 2020	31	34	193
28 March 2020	31	34	193
29 March 2020	38	61	206
30 March 2020	38	66	207
31 March 2020	38	73	237
01 April 2020	41	137	258
02 April 2020	41	229	508
03 April 2020	74	221	575
04 April 2020	77	251	653
05 April 2020	84	309	814
06 April 2020	84	318	832
07 April 2020	84	367	1056
08 April 2020	84	416	1056
09 April 2020	93	448	1167
10 April 2020	97	497	1255
11 April 2020	97	519	1290
12 April 2020	180	502	1360
13 April 2020	208	523	1398
14 April 2020	228	536	1447
15 April 2020	244	585	1560
16 April 2020	246	634	1658
17 April 2020	250	669	1728
18 April 2020	270	703	1806
19 April 2020	299	745	1892
20 April 2020	299	795	1941
21 April 2020	310	829	2007
22 April 2020	315	870	2072
23 April 2020	325	895	2125
24 April 2020	327	935	2196
25 April 2020	368	948	2232
26 April 2020	367	1004	2278
27 April 2020	372	1036	2314
28 April 2020	392	1056	2364

Based on the table above it can be seen that the number of cases is increasing every day. Regarding from 23 March 2020 to 28 April 2020 the total number of positive cases of Covid 19 was 392 cases, for PDP as many as 1056 cases and ODP as many as 2364 cases.

Discussion

Environmental factors include physical factors such as geology and climate, biological factors such as insects that transmit agents, and socioeconomic factors such as crowding, sanitation, and the availability of health services. The physical environment, such as a slum area, will speed up the transmission of the virus due to the large number of contacts between humans. The number of facilities and medical devices (laboratories) is also an influential factor. While the socio-cultural environment in question is the existence of events or activities that gather people[4].

The most important benefit of PHBS is the creation of a community that is health conscious and has the provision of knowledge and awareness to live life behaviors that maintain hygiene and meet health standards. Creating a healthy environment will be able to prevent the spread of disease, the community will use health facility services and be able to develop health sourced from the community[5]. PHBS is one way to prevent someone from being infected and COVID-19 transmission. PHBS is implemented by routinely washing hands with soap and running water, using self-protection tools, such as masks, and applying the ethics of coughing and sneezing[3,5].

Furthermore, regarding climate and geology was discussed by the Indonesian Research Institute (LIPI). The result, air temperature, sunlight, and humidity levels affect the speed, death of the Covid-19 virus in the air and on non-porous surfaces. Clearly, the COVID-19 virus can be transmitted in all areas, including areas with hot and humid weather, can attack anyone and anywhere, regardless of race or geographical location[6,7].

Furthermore, the increase in the number of positive cases in the 3 major cities of Makassar, Jakarta and Surbaya is because there are still many people who do not follow government regulations related to social interaction restrictions or social distancing. This is in line with the events that occurred in Lampung, an increase in the number of people infected with the Corona virus in March 2020 in Lampung due to activities that gather many people (Sri, 2020).

The main transmission pathways of COVID-19 are breathing and contact. Sprinkling of breathing originates from coughing or sneezing of an infected person and anyone who has close contact with someone who has symptoms of respiratory problems (such as sneezing and coughing) at risk of infected splash. In the results of studies that have been carried out the risk of being infected with the COVID-19 virus from the feces of an infected person seems to be low. Some studies suggest that the COVID-19 virus might cause intestinal infections and can be found in feces[9-11].

• For the general public, people who experience symptoms that show COVID-19 or who treat COVID-19 patients at home should get a medical mask and instructions for use. Further information can be seen in the home care guide for COVID-19 patients with mild symptoms and management of their contacts. Further information can be seen in the recommendations regarding the use of masks in the community, during treatment at home, and in health care facilities in the context of COVID-19. Coordinate PPM supply chain management mechanisms PPD management should be coordinated through national and international supply chain management mechanisms that include but are not limited to: • Estimated use of PPE based on a rational quantification model to ensure the rationalization of the requested inventory, • Monitoring and controlling PPE requests from countries and responding parties with a large number of members; • Promotion of a centralized demand management approach to avoid duplication of inventory and ensure strict compliance with essential inventory management rules to limit disposal, excess inventory, and lack of inventory; • Monitoring overall PPE distribution; • Monitoring and controlling PPE distribution from medical facility warehouses.

Conclusion

The Covid-19 pandemic still attacks Indonesia today. One of them is that the increase in Covid-19 cases is still very massive in three big cities, namely Jakarta, Surabaya and Makassar. PSBB is a step implemented by the state to combat Covid-19. However, there are still many violations that occur so that transmission is still

very high. In the PSBB, the PPE factor also determines the success of the PSBB in decreasing cases and breaking the chain of transmission. However, PPE is still very difficult to access by the community to this day. Though PPE like a mask is the main weapon to fight viruses such as Covid-19.

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Conflict of Interest – Nil

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