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## IMPLEMENTATION OF DISINFECTION IN PREVENTION OF COVID-19 TRANSMISSION AND ITS POTENTIAL HEALTH RISK AT PASUNDAN HEALTH'S CENTER IN BANDUNG

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### ABSTRACT

There have been efforts to prevent the transmission of COVID-19 disease since establishing the COVID-19 pandemic status in Indonesia; Bandung City is no exception. Disinfection is one way to break the chain of transmission of COVID-19 in the Pasundan Health Center area and the possible health risks. The type of research is descriptive observational by cross-sectional. We collect data using secondary data from implementation reports at the Public Health center and interviews and observations. The data and information collected include references, locations, methods of disinfection, the disinfectants used, and their effects on health. Data analysis was done descriptively. The results showed that disinfection at the Pasundan Health Center was carried out by directly spraying frequently touched surfaces/objects or all existing rooms. It can be concluded that the implementation of disinfection in health care facilities can pose health risks. So it is necessary to have supervision in the implementation of disinfection and socialization and education about potential health risks.

**Keywords:** Disinfection; Spraying; Community Health Center; Disinfectants; Health Risk.

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### INTRODUCTION

According to the World Health Organization (WHO), the virus first appeared in Wuhan, China. The spread of the novel coronavirus SARS-CoV 2 is known as COVID-19 to the world, including Indonesia.<sup>1</sup> Based on information from the Task Force for the Acceleration of Handling COVID-19, as of March 20, 2020, at 13:00, the examination results showed as many as 369 positive people, in March 2020 in December 2020 increased sharply to 24,538 positive people. Judging from the death rate as of March 20, 2020, the death rate for positive cases in Indonesia is double the death rate in the world, which reached 8.67%, even in March 2020, it was close to 10%. However, in December 2020, the number of confirmed cases reached 26,473 people, with the prevalence of death has decreased, which is 6.09%. The development of the COVID-19 number of confirmed cases in the city of Bandung is 37.068.<sup>2,3</sup>

Judging from the transmission mode, transmission occurs through droplets from the nose or mouth of someone infected with COVID-19 when breathing or coughing. These droplets can enter the body directly, namely the inhalation of droplets from an infected person. Indirect transmission occurs due to the fall of splashes from the patient. The splashes from the patients stick to the surface of objects around the patient. A person who touches the object/surface will be infected by touching the eyes, nose, or mouth. Therefore, in preventing its spread, the public is always advised to avoid getting infected, including washing hands properly, using masks, limiting activities outside the home, avoiding crowds, and doing social distancing. It should also be followed by the process of studying, working, and worshipping at home and carrying out disinfection of objects or surfaces suspected of being infected by the coronavirus.

Since WHO upgraded the status of COVID-19 globally to a pandemic, the Indonesian government has made efforts to increase vigilance, especially in handling and preventing the spread of cases, by issuing COVID-19 Handling Protocols for various sectors. This effort is a manifestation that the government is present and ready to face COVID-19. The protocol does not only contain guidelines on how to handle patients who have been infected with COVID-19 and avoid direct transmission; but also provides guidelines for disinfection in public places as an effort to prevent transmission in public places.<sup>2,4</sup>

By its definition, disinfection is the process of reducing the number of microorganisms to a lower hazard level on surfaces indicated by contamination by microorganisms by using materials (disinfectants) that can function to control, prevent, and even destroy harmful microorganisms.<sup>5</sup> Thus the material must be destructive. With the intensity of disinfection activities carried out by various parties in almost all public areas, it is likely to cause problems for the environment and health, considering that the materials used are generally toxic. This article is a descriptive review and analysis of news, reports, and literature regarding the description of the implementation of disinfection during the COVID-19 pandemic in health facilities, including health centers in several regions in Indonesia, and the potential public health risks due to exposure to active disinfectant ingredients.

## MATERIAL AND METHODS

This type of research is a descriptive observational study conducted in a cross-sectional manner through observations of the implementation of disinfection during the COVID-19 pandemic and possible health risks. The data and information collected

include references related to disinfection in preventing COVID-19 transmission in the form of guidelines/guidelines, protocols from various sectors, implementation of disinfection during the COVID-19 pandemic in Indonesia, methods and targets of disinfection in health facilities, types of disinfectants used.

Data collection uses secondary data from implementation reports at the public health center, and publication of activity results from various reports on various Ministry/Agency websites in Indonesia since the COVID-19 pandemic. Information about the effect of disinfectants on health comes from various published documents, guidelines issued by national and international institutions.

The data obtained were then analyzed descriptively and compared with the standards of the Regulation of the Minister of Health Number 27 of 2017 concerning the implementation of Guidelines for Prevention and Control of Infections in Health Service Facilities.<sup>6</sup>

## RESULT

The Pasundan Public Health Center is a sub-district Technical Implementation Unit that oversees two Network Health Centers. The function of the Public health center is increased as the coordinator of the sub-district health centers and is responsible for all activities carried out at the Public health center. The Pasundan Public Health Center is a Service Technical Implementation.

## Reference disinfection prevention of transmission COVID-19

The existence of protocols or guidelines as a response to the spread of COVID-19 for the government, such as Health and communication protocols and Border Control, where the guide serves as a break in the chain of transmission.<sup>2,6,7</sup> The following table summarizes the procedures for carrying out disinfection based on these references.

**Table 1.** Disinfection procedures based on protocols/ guidelines for preventing the transmission of COVID-19 in Indonesia

Guideline	Place	Disinfectant	Way
Protocol Disinfection in the workplace <sup>7</sup>	Working place (office, mall)	Bleach, 70% alcohol, carbolic acid, household cleaners (soap, floor cleaner, glass cleaner)	Sprayed or by using a cloth (microfiber cloth)
Guidelines for the Prevention of COVID-19 Transmission in Public Places and Facilities <sup>6</sup>	Home, public areas (shopping centers, terminals, markets, stations, schools, mosques, restaurants) and air.	Bleach, diamine compound, Carbol/Lysol, floor cleaner, hydrogen peroxide	The object's surface: sprayed using a cloth (microfiber cloth). Air: dry mist disinfection.
Guideline of disinfection <sup>8</sup>	The surface of household furniture, air/room, clothes	Bleach, 70% alcohol, carbolic acid, floor cleaner, hydrogen peroxide	Sprayed or by using a cloth (microfiber cloth)
Protocol in transportation and general facility Implementing disinfection in bandung <sup>6</sup>	Transportation and public areas: terminals, public transportation	unspecific	Unspecific
	Health facility	Prodestan	The surface of the object is sprayed or using a cloth or directly sprayed directly

Judging from the location/place/area of disinfection, the protocol/guideline is prepared to provide disinfection guidelines for almost all public areas such as offices, shopping centers, restaurants, schools, mosques, including housing, and others. The targets for disinfection are objects/surfaces (door handles, light switches, computers, desks, computer keyboards facilities that are often touched by hands) and room air (workplace) which indicate the presence of contaminants. For this type of disinfectant, it is recommended to use a solution of bleach (bleach), 70% alcohol, Carbol/Lysol, diamine compounds, and hydrogen peroxide with a frequency of once every 2 hours and no later than every 12 hours. In the Transport and Public Area Protocol, it does not mention the type of disinfection; but only recommends the frequency of disinfection three times a day (morning, afternoon, and evening)<sup>4</sup> on clothing, gloves, masks, goggles, and boots. Also, clean yourself (wash your hands with running water after doing directly. In spraying, officers use complete personal protective equipment, such as head protection, eye protection goggles), gloves, special clothing, foot protection (boots).

In terms of the method of disinfection, the surface of objects is carried out (fumigation/fumigation using a cartridge to regulate the steam/fume of the disinfectant). by spraying or by using a cloth; while for air disinfection using dry mist.

### **Implementation of disinfection during the COVID-19 Pandemic**

There is an increase in COVID-19 cases, so steps are taken to reduce its spread, such as disinfection. Based on the information obtained, it was found that the method, target, type of disinfectant used, the use of personal protective equipment by officers who carried out disinfection by direct spraying.

### **Implementation of Disinfecting in Health facilities**

Disinfection in health facilities (hospitals, health centers) is carried out by direct spraying. The target of spraying at the

Public Health center serves to disinfect surfaces/objects in every room, including patient waiting rooms, emergency rooms, and all rooms and sections of health centers. Judging from the type of disinfectant used, information was only obtained from implementing disinfection at the Pasundan Health Center, namely using benzalkonium chloride for direct spraying. In spraying, officers use complete personal protective equipment, such as head protection, eye protection (goggles), gloves, special clothing, foot protection (boots).<sup>6</sup>

Implementing the daily activity at Pasundan Health Center in figures 1 and 2:



**Figure-1.** Cleaning after doing disinfection



**Figure 2.** Doing disinfection

### **Effect of disinfectant on health**

Following the purpose of disinfection, namely to decontaminate bacteria or viruses from surfaces/objects, the disinfectants used are usually destructive chemicals. All chemically active disinfectants are toxic,

posing risks to the environment and human health if not used according to instructions. Evidence of the effect of exposure to disinfectants on health, from research results in various countries, is still limited to the impact on workers (industry and health facilities).<sup>9,10,11,1</sup>

From the search results of various websites, the types of disinfectants in the implementation of disinfection in various public areas are not widely revealed. Only a few mentioned the type of disinfectant when spraying health facilities in Central Jakarta.<sup>8</sup> The Bandung Regency Government Office mentioned it; even then did not mention the type specifically. From these various locations/places, it is known that the disinfectants used are clothes bleach, floor cleaning fluid (carbolic acid), 0.1% hypochlorite solution, compounds that do not contain chlorine, benzaclin povidone-iodine, and citrus scent. The following are the characteristics/chemical properties and the effects of exposure to these various materials.

Clothing bleach is a sodium hypochlorite compound known as an asthma agent, an asthma trigger agent.<sup>11</sup> Exposure to low levels will cause irritation, sore throat, and cough. In contrast, it can cause dyspnea or shortness of breath at high levels due to insufficient oxygen supply to the lungs, bronchial muscle disorders to disrupt air entry and exit, and pulmonary edema. If it comes into contact with the skin and eyes, it can irritate.<sup>1</sup> Until now, no chlorine antidote has been found, so to avoid the effects of chlorine exposure, you must comply with the rules for its use.

Benzaclin povidone-iodine is an external medicine that functions as an antiseptic and broad-spectrum disinfectant which is mainly used to clean and kill bacteria, fungi, and viruses on the skin. In large doses for wounds that can cause kidney problems, high sodium in the blood, and metabolic acidosis. It is not recommended for pregnant women under 32 weeks of gestation or patients undergoing treatment with lithium, take povidone-iodine too often.<sup>5</sup>

Vircon is a disinfectant containing oxone, sodium dodecylbenzene sulfonate, sulfamic acid, and inorganic buffer; effective against viral, bacterial, and fungal pathogens important for infection control, including HIV, hepatitis B and C, MRSA, VRE, and Salmonella. Exposure to the body has the potential to cause effects on the skin (irritant), eyes (risk of serious damage), irritation of the respiratory tract.<sup>12</sup>

Benzalconium chloride is a drug commonly used to inhibit the growth of microorganisms such as fungi and viruses in skin wounds and prevent infection. But it can also cause damage to the eye lens and conjunctival corneal surface. In conjunctivitis treatment (long-term treatment with eye drops containing benzalconium chloride as a preservative) can cause muscle paralysis and very severe skin inflammation.<sup>13</sup>

## DISCUSSION

Disinfection is often carried out during the COVID-19 pandemic as one of the measures to prevent coronavirus transmission. It can be sprayed directly on surfaces, rooms, or clothes worn and items carried by someone with the intention of disinfection so that it is very likely to be inhaled and hit the skin, mouth, throat, and eye. Then it can negatively impact health due to the disinfectant solutions used, such as clothes bleach solution and irritating floor cleaners.<sup>14,15,16</sup>

Judging from the type, the use of disinfectants in spraying activities (directly or with a disinfection booth) follows the recommended disinfectant protocols/guidelines for preventing the transmission of COVID-19, except for benzaclin povidone-iodine. One of the districts disinfects by spraying the material because it is considered the safest compound. Functionally, benzaclin povidone-iodine is more appropriate to be used as an antiseptic. In the list issued by the United States Environmental Protection Agency (EPA) and protocols/guidelines for preventing transmission of COVID-19 (they are not mentioning benzaclin povidone-

iodine. This means that the compound is not a disinfectant recommended for disinfection in preventing the transmission of COVID-19. Suppose it is used to disinfect surfaces/objects. In that case, it may be less effective and will only contaminate surfaces/objects and impact the environment and health if used massively and continuously. With limited information about the type of disinfectant used from the search results obtained, it is still possible to use other types of disinfectant so that the health risks that arise may be more diverse.<sup>4,17</sup>

In terms of the use of Personal Protective Equipment spraying officers, from the search results, it can be seen that there are still officers who use incomplete Personal Protective Equipment, even only wearing masks. In this case, spraying officers are at a very high risk of being exposed to disinfectants continuously and in higher doses than the general public. This is because it is related to his work which has to carry out spraying activities in various places with a frequency of up to 2 times (according to the Transport and Public Area Protocol.<sup>6</sup>

Compared with the protocols that have been issued by the government (the Task Force for the Acceleration of Handling COVID-19), there are discrepancies in their implementation, including the method of disinfection. There are still disinfectants in the disinfection booths even though the government has issued a circular not to use them because they can endanger health. In addition, in disinfection in transportation areas, officers spray vehicles, while the Transport and Public Area Protocol does not recommend this. For the types of disinfectants used indirectly or through disinfection booths, use a disinfectant that is not following the recommendations in the protocol, such as benzaclin povidone-iodine, which tends to function as an antiseptic. The use of ozone nanomist, although not recommended in the protocol, is considered safer. However, it must comply with the provisions in its implementation because excessive ozone exposure can affect health.

Regarding the use of Personal Protective Equipment by spraying officers, some information stated that officers did not use full Personal Protective Equipment when spraying (there were even officers who only wore masks). Some of these discrepancies will result in public health risks in COVID-19 (especially prevention of transmission). Based on the method (spraying), the target of disinfection (objects that are often touched), and the disinfectant used (irritating); potential health risks. Some public areas (offices, shopping centers, even in residential areas) still carry out disinfection in disinfection booths, even though the government has issued a circular in the form of recommendations not to use disinfection booths because it is hazardous to health.

## CONCLUSION

The implementation of disinfectants in preventing the transmission of COVID-19 and the potential for health risks at the Pasundan Health Center requires monitoring and evaluation in its implementation to minimize risks to health for both Public Health Center.

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