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## Letter of Acceptance

Dear Author(s),

Mr./Mrs. Endang Wahyuningsih, Sutaryono, Jaka Widada, Heru Subaris Kasjono

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Reference your article, I would like to inform you that the 1st round evaluation of your manuscript has been completed. Based on the reviewer's recommendations, I am delighted to inform you that your manuscript has been initially accepted. The article as well as has been processed utilizing the peer-review process, and has been **accepted for publication**. The article will be published in International Journal of Health Sciences (IJHS).

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Thank you for your contribution to the Journal and we are looking forward to your future participation!

Best Regards,



**Prof. María Rodríguez Gámez, Ph.D.**  
Chief Executive Editor



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# Independent isolation of infectious waste management in the COVID-19 era: A case study in Java-Bali Indonesia

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**Abstract---**The COVID-19 pandemic is not over yet, it has a global impact on all sectors of people's lives. Of the various problems that arise but we are not aware of is the generation of infectious waste originating from self-isolation. Therefore, this study was intended to explore the management of infectious waste generation from self-isolation activities carried out at the regional level in Java and Bali. Observational research design in 1979 respondents were sanitarian workers in the working area of the Puskesmas and the Health Office in 7 provinces of Java and Bali. The study was conducted for the period from June to the end of August 2021 using an online survey of members of the Association of Environmental Health Experts whose assessment was carried out using a qualitative method based on respondents' responses. The findings of this study indicate that the highest incidence of COVID-19 cases is DKI Jakarta (29.6%) followed by Central Java (22.5%) and West Java (20.3%). 48%, the most widely used isolation places are special buildings 27.5% and 34.5% there are no special places or at home. Self-isolation places that carry out infectious waste management have only reached 34.6% and mostly 79.2% are carried out independently by providing special infectious waste, separate trash bins and plastic tubs

with markings, spraying disinfection, storage time is carried out every day and final disposal is dumped or burned, while most of the supervision is carried out by the community's own individuals. To optimize the management of COVID-19 self-isolation infectious waste by increasing community empowerment supported by holistic policies that involve stakeholders at all regional levels.

**Keywords**---COVID-19, infectious, waste, infectious, sanitarian.

## Introduction

Indonesia is one of the countries that is facing a wave of increasing cases of Covid 19 where at the end of August 2021 positive cases of Covid-19 in Indonesia reached 4,079,267, the total number of Covid-19 patients who died reached 132,491, cases recovered from Covid-19 3,743,716 cases. and has spread to 510 districts/cities in 34 provinces (<https://national.kompas.com/read/2021/08/30/17460791/update-30-agustus-ada-203060-case-aktif-covid-19-di-indonesia>). Along with the increase in the number of Covid-19 cases, domestic health facilities, especially on the island of Java and Bali, are also experiencing emergency conditions. This can be seen from the hospital occupancy rate which has soared throughout the end of August 2021. The hospital occupancy rate for treating Covid-19 patients was in the range of 50% in early June. However, as of mid-June, the hospital occupancy rate reached 80%. Citing the latest figures from the DKI Jakarta Provincial Government, the hospital occupancy rate reached 92% as of August 2021. Facing the increase in new cases of Covid-19 infection, the government released a policy of Enforcement of Emergency Community Activity Restrictions (PPKM). Considering the high level of shortage of existing hospitals, the government issued a policy of care for those who are infected but have no symptoms, as well as those who are infected with mild symptoms, to self-isolate in their respective homes or communally organized by the local government.

The impact of this self-isolation activity raises its own problems, namely the presence of infectious waste that affects human health and the environment. Infectious waste that arises during the implementation of self-isolation consists of liquid waste originating from fluids from the mouth, nose or mouth of patients and washing water for work equipment, patient eating and drinking utensils and laundry linen. Domestic Solid Waste is waste originating from household activities or similar waste, such as food scraps, cardboard, paper, and so on, both organic and inorganic. Meanwhile, special solid waste includes disposable masks, used gloves, tissue/cloth containing liquid/nose and mouth droplets), treated like infectious B3 waste. Solid Medical B3 Waste is goods or materials left over from activities that are not reused that have the potential to be

contaminated by infectious substances or in contact with patients or staff who handle Covid-19 patients, including: used masks, used gloves, used bandages, used tissues. , used plastic drinks and food, food and beverage waste paper, used syringes, used infusion sets, used personal protective equipment, patient food scraps and others.

A number of guidelines on self-isolation have also been prepared by the Ministry of Health. Including how to manage waste. Waste generated during self-isolation activities is important to manage, because some of it is infectious waste. This kind of waste needs to be disposed of properly to prevent the transmission of the Covid 19 virus, both to family members, the surrounding community, as well as health workers and cleaners. However, so far there has been no evaluation and supervision of the implementation of infectious waste management policies from self-isolation activities in the regions. Therefore, this study captures a picture of its implementation and success in efforts to prevent and control Corona Virus Disease 2019 in the Java and Bali regions, which are the areas with the highest number of cases in Indonesia.

## Method

The research design used was analytic observational using cross sectional method on 1979 respondents who came from sanitarian staff in the working area of Puskesmas and Health Service in 7 provinces of Java and Bali. Respondents are members of the Indonesian Association of Environmental Health Experts (Hakli). Data collection with online-based questionnaires through the google form application. Data collection time is the period from June to the end of August 2021. Qualitative data analysis to obtain a frequency distribution based on respondents' responses.

## Results

In this study, it was found that 1979 respondents who gave responses through a survey using a google form questionnaire. Respondents in this study were sanitarian workers who worked in the work area of Puskesmas and Health Offices in seven provinces of Java and Bali, namely DKI Jakarta, Banten, West Java, Central Java, East Java, Special Region of Yogyakarta and Bali. Distribution of Respondents, COVID-19 Cases and Independent Isolation by Province is shown in table 1.

Table 1  
Distribution of Respondents, COVID-19 Cases and Independent Isolation by Province

Province	Sample	Cases	Independent Isolation
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	f	%	f	%	f	%
Bali	62	3,1	32.327	2,0	15.536	2,2
Banten	74	3,7	41.405	2,5	23.309	3,3
DI Yogyakarta	78	3,9	93.020	5,6	49.575	7,0
DKI Jakarta	60	3	490.578	29,6	47.418	6,7
Jawa Barat	542	27,4	335.582	20,3	254.379	36,0
Jawa Tengah	629	31,8	373.215	22,5	205.632	29,1
Jawa Timur	534	27	290.897	17,6	110.191	15,6
Total	1979		1.657.024		706.040	x:28

Table 2

Descriptive analysis of infectious waste management activities for self-isolation of COVID-19 sufferers in Java - Bali, Indonesia

Variable	f	%
<b>Place Isoman</b>		
Hotel	318	16,1
Kantor	100	5,1
Gedung Khusus	544	27,5
Rumah Khusus	212	10,7
Tidak ada isolasi terpusat	683	34,5
Lainnya	122	6,2
<b>Pengelolaan Limbah Infeksius</b>		
Ya	685	34,6
Tidak	1062	53,7
Tidak tahu	232	11,7
<b>Pelaksanaan</b>		
Mandiri	1568	79,2
Mandiri atas bimbingan petugas	232	11,7
Pihak ketiga	86	4,3
Lainnya	93	4,7
<b>Petugas Pengangkutan</b>		
Tidak Tahu	1567	79,2
Petugas Kebersihan	284	14,4
Dinas KLH	71	3,6
Pihak ketiga	55	2,8
<b>Tempat Pembuangan akhir</b>		
TPA	786	39,7
Ditimbun/ dibakar	1148	58
Dibuang begitu saja	45	2,3
<b>Tempat Sampah Khusus</b>		

Variable	f	%
Ya	988	49,9
Tidak	991	50,1
<b>Tempat Sampah Terpisah</b>		
Ya	1431	72,3
Tidak	548	27,7
<b>Tanda pada Plastik</b>		
Ya	764	38,6
Tidak	1215	61,4
<b>Pengelolaan APD</b>		
Desinfeksi, pencacahan, bak sampah di Bak sampah	1264	63,9
Tidak tahu	334	16,9
Lain-lain	149	7,5
	232	11,7
<b>Lama Pembuangan Limbah</b>		
Setiap hari	978	49,4
Lebih dari 1 Hari	677	34,2
Tidak tahu	306	15,5
Lainnya	18	0,9
<b>Penyemprotan Desinfektan Limbah</b>		
Ya	1509	76,3
Tidak	209	10,6
Tidak tahu	261	13,2
<b>Pengawasan</b>		
Individu	888	44,9
Kader/ relawan	495	25
Sanitarian	535	27
Lainnya	61	3,1
<b>Pengelolaan Limbah Jenazah</b>		
Ya	770	38,9
Tidak	1209	61,1

Table 1 shows that most of the respondents in the study were Central Java 31.8%, West Java 27.4% and East Java 27%. The highest incidence of COVID-19 cases is DKI Jakarta (29.6%) followed by Central Java (22.5%) and West Java (20.3%), meanwhile patients who are mostly self-isolating are in West Java Province (36%). ), Central Java (29.1%) and East Java (15.6%). The findings of this study indicate that of the total Covid-19 cases reported by respondents, there were 1,657,024 people who were self-isolating as many as 706,040 or 48%. Based on the results of research on infectious waste management from self-isolation activities for Covid-19 sufferers, it can be seen in table 3.2.



Table. 2 shows that from several provinces that carry out self-isolation, the most widely used places are special buildings 27.5%, these special buildings such as athletes' homestays, sports buildings, pilgrimage buildings, unused schools, apartments and others. There are 34.5% stating that there is no centralized isolation in their area, which means that isolation is carried out at home. Self-isolation is allowed for someone experiencing symptoms of Covid-19 such as coughing, loss of sense of smell (anosmia), or fever. for someone who has been confirmed based on a PCR test or someone has had close contact with a person who has tested positive for Covid-19. Individuals who are infected with the Corona virus and do not have symptoms must report to the Puskesmas according to their domicile, so that they are directed to available controlled isolation locations. Generally, self-isolation lasts for 10-14 days after someone is confirmed positive. However, if the symptoms you feel do not decrease or improve, then self-isolation can be longer in duration. When undergoing self-isolation, always wear a mask at home, do not come into physical contact with other people, and separate personal equipment from other people's. Then, make sure the supply of personal medicines, masks, hand sanitizers, and disinfectants is sufficient. So that air circulation in the room is good, don't forget to open the windows every morning. Finally, always monitor your health condition, until the symptoms feel better.

Provinces that carry out self-isolation for patients with Covid 19 symptoms who manage infectious waste are 34.6% while 53.7% do not carry out management, this situation is quite worrying because there are still many self-isolation places that do not manage infectious waste, so it has the potential to transmit infection. corona virus. Infectious waste generated from household self-isolation activities such as tissues, masks, feces may contain viruses and can spread and contaminate others easily. It is realized that such infectious waste management is not easy to do because it requires training and individual awareness of the environment and public health. Besides that, there is a need for government policies to support the implementation, monitoring and evaluation of waste management, it is not enough with just an appeal or the issuance of guidelines, this can be seen from the existing management of 79.2% carried out independently, seen the lack of assistance from field officers and third parties.

Management of infectious waste management shows that in the self-isolation location there are 50% special infectious waste bins, and 72% stated that there are separate trash bins, while 39% of plastic tubs have signs. All healthcare waste generated during the care of patients with confirmed COVID-19 infection, is considered infectious and must be collected safely in clearly marked containers or tubs (WHO, 2020a). COVID-19 infections contaminated with medical waste generated must first be properly disinfected, separated and packaged in their respective standard waste disposal bags. The results showed that 63.9% of isoman sites had been disinfected or enumerated for the management of personal protective equipment.

The duration of storage of infectious waste in 49.4% isoman is carried out every day, while 34.2% is more than one day and most of 76.3% has been sprayed on the waste. good storage of waste in closed packaging no later than 2 (two) days from the time it is generated. An equally important source of waste is waste originating from the bodies of deceased COVID-19 patients. From the report on self-isolation

sites, it was shown that only 39% had managed the waste of corpses while others had not. One of the problems that arise in society today is the fear of corpses that are positive for Covid 19. This is possible because the bodies of people with COVID-19 are suspected of transmitting the virus, when a COVID-19 patient dies, the virus is still dangerous and can be transmitted to people who make contact with the corpse. Therefore, it is necessary to increase the knowledge of the community and the volunteer team in relocating bodies infected with the virus. (Sutaryono et al, 2021).

Success in the management of infectious waste in self-isolation places is very dependent on supervision, the results of the study show that most of the supervision is still carried out by the individual community itself, namely 45%, while by cadres or volunteers 25% and by sanitarian officers 27%, this is needed in the future intensive sanitarian officers in conducting supervision so that management can run well.

## Conclusion

The implementation of self-isolation in Java and Bali accounted for 48% of the total reported COVID-19 cases, the most widely used isolation places were at home and special buildings. Infectious waste management has not all been carried out, it only reached 34.6% and most of them are done independently, namely providing special infectious waste, separate trash bins and plastic tubs with markings, spraying disinfection, storage time is carried out every day and final disposal by stockpiling or burning while Most of the supervision is carried out by individuals in the community themselves. A holistic policy support is needed from all regional levels for the implementation of this infectious waste management.

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