

# The Sanitary Hygiene of Refilled Drinking Water Depots

*by* Dr.oktavia Dewi 1 1

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# The Sanitary Hygiene of Refilled Drinking Water Depots during the Covid-19 Pandemic

Herniwanti<sup>1\*</sup>, Edi Sudarto<sup>2</sup>, Kamali Zaman<sup>1</sup>, Oktavia Dewi<sup>1</sup>, Novita Rany<sup>1</sup>

<sup>1</sup> Magister Kesehatan Masyarakat, Universitas Pang Tuah, Pekanbaru, Riau, Indonesia

<sup>2</sup> Dinas Kesehatan Kabupaten Bengkalis, Riau, Indonesia

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Corresponding Author:

Herniwanti  
[herniwanti@htp.ac.id](mailto:herniwanti@htp.ac.id)

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**Abstract:** The Coronavirus-19 (Covid-19) pandemic requires people to behave cleanly and healthily to increase the need for clean drinking water. Based on a survey conducted by the Bengkalis District Health Office, it was found that 55% of the people used drinking water from refill depots. The purpose of this study was to determine the Sanitation Hygiene of Drinking Water Depots during the Covid-19 Pandemic in Bengkalis, Riau. This research method is a quantitative descriptive analysis using secondary data from the Bengkalis Health Service for a depot that has sanitation requirements for drinking water depots according to the reference. The research location is in Bengkalis District with a sample of 40 drinking water depots and analyzed for four parameters of drinking water depot sanitation inspection: place, equipment, handlers, and drinking water quality standard certificates. Sanitation hygiene inspection was obtained for the parameters of the place, equipment, and handlers with 100% achievement and only 25% certificate of water quality standard and proper hygiene. It is necessary to innovate drinking water treatment technology for drinking water sources that are healthy, guaranteed, cheap, and free from disease and to support the PHBS and STMB programs during the Covid-19 period.

**Keywords:** Drinking water; Covid 19; Hygiene sanitation; PHBS; STBM

## Introduction

The Covid-19 pandemic hit Indonesia in 2020 which has caused activity restrictions and social distancing. Covid-19 is a virus that causes respiratory problems ranging from mild to severe symptoms (Yıldırım et al., 2020). Common signs and symptoms of COVID-19 infection include fever, cough, and shortness of breath. The incubation period for this virus is between 5-6 days with an incubation period of 14 days. WHO has declared the Covid-19 pandemic a public health emergency in the world (Parnell et al., 2022). During the Covid-19 pandemic, the government has required people to behave in a clean, healthy manner, wash their hands diligently, keep their distance, and consume healthy food and drinks. Healthy drinks can increase body stamina and avoid attacks from various diseases, including the Covid-19 virus (Zhang & Ma, 2020). Water is one of the sources of life that is useful for human survival.

The existence of water is very important because of the various benefits of water for various activities carried out by humans. Based on data obtained from the Bengkalis District Health Office, it is known that 55% of the population uses drinking water from refill depots. Refillable drinking water is commonly consumed by the public and is widely sold at affordable prices (Herniwanti, Dewi, et al., 2021). Even some drinking water depots offer delivery services so the condition adds to the public's interest in consuming refilled drinking water. Refill drinking water depot is a promising business to set up because it does not require large capital with a simple business license procedure and does not have to be continuously monitored by the Ministry of Health (Nuranisa et al., 2022).

Processed and untreated drinking water must meet the health requirements that have been determined so that it can be consumed directly. According to the Regulation of the Minister of Health of the Republic of Indonesia number 492/MENKES/PER/IV/2010

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concerning Drinking Water Quality Requirements, drinking water providers are state-owned enterprises/regional-owned enterprises, cooperatives, private enterprises, individual businesses, community groups and/or individuals who carry out the provision of drinking water (Atyikah et al., 2021). According to the Decree of the Minister of Industry and Trade of the Republic of Indonesia number: 651/MPP/Kep/10/2004 concerning Technical Requirements for Drinking Water Depots and their Trade Minister of Industry and Trade of the Republic of Indonesia, drinking water depots are businesses that process raw water into drinking water and sell directly to consumers (Syahril et al., 2022)

The needs of the Bengkalis community for drinking water from refill depots are quite high. The legal protection of consumers is regulated in Law number 8 of 1999. The contents of the law state that consumers have the right to regularly obtain information about hygiene from the results of laboratory tests, but this procedure is not implemented. However, it is necessary to develop and monitor water quality to ensure the safety and health of public consumption. The purpose of the study was to provide guidance and supervision of the quality of drinking water depots during the Covid-19 pandemic in Bengkalis Regency. Data from UNICEF reports that water and sanitation in Indonesia are of low quality compared to other countries in Southeast Asia. In 2015 it is estimated that around 103 million people (47% of Indonesia's total population of 218 million people do not have access to good sanitation and around 47 million people (22%) do not have access to clean water. Only about 50% of the entire population of Indonesia has access to proper drinking water (Yuningsih, 2019). The purpose of this study was to determine the Sanitation Hygiene of Drinking Water Depots during the Covid-19 Pandemic in Bengkalis, Riau.

## Method

This research was conducted in Bengkalis Regency, Riau Province, Indonesia. The number of samples in this study is 40 refilled drinking water depots. Parameters of the sanitation quality of drinking water depots used 4 parameters, namely location, equipment, machine operators, and drinking water quality standard certificates. In this quantitative study, descriptive analysis was conducted to analyze secondary data. Secondary data were obtained from the Bengkalis Health Service for Depots which implemented the requirements for refilling drinking water depots based on the Minister of Health Regulation Number 43 of 2014.

## Result and Discussion

The results of measuring the quality of water depot sanitation with 4 parameters used in this study indicate that there is a 100% fulfillment of the requirements related to the location of the depot, equipment, and operators (Table 1). Based on the data in Table 1, it can be seen that there are:

- Number of refilled drinking water depots in Bengkalis = 40 Depots
- Number of depots that fulfill the location requirement = 40 depots = 100%
- Number of depots that fulfill the equipment requirement = 40 depots = 100%
- Number of depots that fulfill the machine operator requirement = 40 depots = 100%
- Number of depots that fulfill the quality water source certificate = 10 depots = 25%
- Number of depots that fulfill the sanitary hygiene certificate = 10 depots = 25%

### *The Sanitary Hygiene of Refilled Drinking Water Depots*

In Indonesia, refilled drinking water depots supply drinking water to the community. The Basic Health Research in 2018 showed that 46.5% of households in Indonesia used more than 100 liters of water per person for daily activities (bath, washing, etc). In other words, 53.5% of households did not have optimal access to clean water (Herniwanti et al., 2021).

Based on the results of the 2018 National Socio-Economic Survey (Susenas), 36.28% of households in urban and rural areas consume bottled drinking water and refilled drinking water. Currently, students and the community mostly prefer refilled drinking water for consumption because they do not have to boil the water and it is affordable and delivery service available (Suci & Arum, 2015).

The results of research (Syam, 2016) showed that 50% of drinking water depots did not meet the requirements of sanitation and hygiene, 75% did not carry out external supervision and 62% did not carry out internal supervision. Hence, the quality of the water was questionable. In research on drinking water depots, 92.4% of the operating samples did not have an operating license and 55.6% of drinking water depots in Bungus District did not meet the microbiological requirements set by the government (Wandrivel et al., 2012). The sanitary Hygiene Examination in Kota Kampar District, Kampar Regency found only 43% of total depots met the standard (Herniwanti & Ray, 2022). In the area of the Rambah Rokan Hulu Public Health Center, many depots did not have the permit and no routine checks were performed by the health center (Sari et al., 2020), while depot owners seemed to lack knowledge regarding this matter (Frisbie & Mitchell, 2022). To address this problem, guidance and supervision from the Public

Health Center and the Health Office significantly affect the quality of refilled drinking water depots.

**Table 1.** The Results of Sanitary Hygiene Evaluation on Refilled Drinking Water Depot

Depot	Requirements in Ministry Regulation No 43 of 2014								Sanitary Hygiene Certificate
	Location		Equipment		Operator		Certificate		
	Yes	No	Yes	No	Yes	No	Yes	No	
Riski	√		√		√			√	No
Sumber Mineral	√		√		√		√		Yes
AA Aqua	√		√		√		√		Yes
BP. Spam Tuna Baku	√		√		√		√		Yes
UPP Water	√		√		√			√	No
Ada Aqua	√		√		√		√		Yes
Bidadari	√		√		√			√	No
Sejati	√		√		√		√		Yes
Rizki Water	√		√		√			√	No
Segar	√		√		√			√	No
Pandaqua	√		√		√			√	No
Bersih	√		√		√			√	No
Citraqua	√		√		√			√	No
Re-Qua	√		√		√			√	No
Pamsimas Mandiri	√		√		√		√		Yes
Arzi Water	√		√		√			√	No
Soraya	√		√		√			√	No
Alif	√		√		√			√	No
Embun Salju	√		√		√		√		Yes
Bella	√		√		√			√	No
Intan Saya Water	√		√		√		√		Yes
Fresh Water	√		√		√		√		Yes
Sehat Segar	√		√		√			√	No
Serambi Mineral	√		√		√		√		Yes
Sukses	√		√		√			√	No
Sehat	√		√		√			√	No
Ro Mas	√		√		√			√	No
Pentagonal	√		√		√			√	No
Barokah	√		√		√			√	No
Cintaqua	√		√		√			√	No
R3	√		√		√			√	No
Fresh Water	√		√		√			√	No
Razqa Water	√		√		√			√	No
Dpa Lasmi	√		√		√			√	No
Putri Tujuh	√		√		√			√	No
As Qua	√		√		√			√	No
Rasa Bersama	√		√		√			√	No
Rainbow	√		√		√			√	No
Sukses	√		√		√			√	No
Anda	√		√		√			√	No

Standards of Quality Drinking Water and Hygienic Refilled Drinking Water Depots.

Refilled drinking water depots process water into drinking water to be sold (Iqbal et al., 2020). Hence, the business should possess a business license. The provisions on the technical requirements for drinking water depots are regulated in the Decree of the Minister of Industry and Trade stating that drinking water depots must conduct periodic supervision on the quality of the water source through laboratory tests. The source water quality testing is carried out at least once in three months for coliform analysis and twice a year for total chemical

and physical analysis at the Water Quality Inspection Laboratory appointed by the Regency/City Government or an accredited laboratory.

The drinking water depot business must meet the following business requirements: a. Having an Industrial Registration Certificate (TDI) and a Trading Business Registration Certificate (TDUP) b. Having a Source Water Guarantee Letter from the PDAM or a company that has a Water Intake Permit from the authorized agency. c. Performing drinking water tests through a water quality inspection laboratory appointed by the district/city government or an accredited one.



Most depots use ozonation, ultraviolet (UV), and reverse osmosis (RO) processes in producing drinking water (Indriyani et al., 2016). Ultra Violet (UV) rays function as sterilizers (Lin et al., 2021).

#### *Clean Water Management during the Covid-19 Pandemic, Health, and Behavior, and STBM*

During the Covid 19 pandemic, the government is urged to further improve environmental health and health and behavior (PHBS). Improper implementation of the health protocol (wearing masks, washing hands with soap, maintaining distance, avoiding crowds, and reducing mobilization) can lead to an increased case of the disease. However, the communal culture of Indonesia makes it difficult for the Indonesian community to keep a distance from others since kinship and relationships among the community are strong. Lack of attention to environmental health can also make the spread of hepatitis (Sumarni & Susanna, 2014) increase, causing transmission, and new clusters as reported in national news reports. Boarding school/boarding school students that form a new cluster of transmission were forced to be quarantined to stop the infection.

In a research done in 2018 (Sari et al., 2018), it was found that adequate clean water supply should be guaranteed to support the handwashing with soap program to avoid hepatitis disease which is part of the Community-Based Total Sanitation program and also the 3M program (wearing masks, keeping distance and washing hands with soap). Both programs help prevent the spread of the Covid 19 Virus through personal hygiene education to the public, including the elderly who are more vulnerable to getting infected (Herniwanti et al., 2020) of the bacteriological quality of refilled drinking water in the sememi district, East Java showed the prevalence of diarrhea in consumers was 16%. It is concluded that 11 of 16 (68.75%) diarrhea patients consume eligible drinking water refills (Mohan & Rahayu, 2021).

#### *Ministry Regulation on the Quality of Drinking Water and the Law Enforcement*

The Ministry Regulation Number 492 of 2010 states that drinking water consumed by the community in general needs to have quality standard requirements (Abdilanov et al., 2013) which are the responsibility of the city or district health office to supervise. Drinking water that does not meet the criteria should be under the responsibility of depot owners (Anggreni & Suyatna, 2018). Legal protection for refilled drinking water consumers has been stipulated in a government regulation in the Minister of Health of the Republic of Indonesia No. 736 of 2010 (Permenkes, 2010) concerning monitoring of drinking water quality, in which it is regulated that physical and microbiological parameters

should be checked monthly and complete chemical parameters should be evaluated every six months. Consumers have the right to only consume drinking water from depots that possess the operational permit and are certified for the quality standards as seen from the food and beverage registration number related to food safety.

In Slawi Regency, especially Tegal District, refilled drinking water depots still need to be improved (Aziz et al., 2019). In Pontianak as well, regular evaluation should be carried out by the local health office. In Malaysia, the legal protection for consumers has been well-implemented to maintain the quality of consumer health and preserve environmental resources (Abdilanov et al., 2013).

The legal basis is the Regulation of the Minister of Public Works Number 13/PRT/M/2013 concerning the National Policy and Strategy for the Development of the Drinking Water Supply System. The regulation states that the government will help provide facilities and infrastructure for the provision of clean water in collaboration with the local community, starting from planning, development, and operation which will later become a Village-Owned Enterprise (BUMD). The regulation also states the following-up actions such as monitoring the quality of drinking water quality standards and maintaining the construction of the drinking water supply system. This program reinforces the village development, particularly regarding the implementation of the Clean and Healthy Life Behavior (PHBS) program.

#### *PANSIMAS and Water Processing Technology*

The PANSIMAS Program (Community-Based Drinking Water Supply and Sanitation Program) is a national drinking water management program that helps rural communities to become independent in finding clean water sources, and planning the construction of facilities to be publicly accessible by the surrounding community. This program allows the supply of clean water from the community and for the community. In Bajo Village, the ability to provide clean water was only 50%, requiring the community to collaborate with non-government organizations in fulfilling their water necessities (Than et al., 2018). The community also participated in the PANSIMAS program to apply the drinking water distribution system which was also developed in the Muara Enim area on a larger scale with a carrying capacity of 20 years (Alatas et al., 2017).

Evaluation of the PANSIMAS program supported by the World Bank in one of the districts. Bluto, Sumenep Regency, East Java showed good results with a 95% community participation rate. The community obtained the benefits as they had access to cleaner water sources. This program could be continued by

establishing toilet facilities to better support the PHBS program (Hasanah, 2019), The importance of access to clean water sources for rural communities should be highlighted to increase the community's awareness of the need to maintain the quality of the water springs to supply their water needs and even to be developed into a profitable business (Subekti, 2012).

Most refilled drinking water depots use Ozonization and UV technology. Each of those technologies offers certain advantages and disadvantages. The maintenance of the refilled drinking water machine must be regularly carried out. The results of the evaluation done in Kebumen Regency, Central Java Province showed that 75% of the depots were categorized as good (Driyaningsih et al., 2017). However, improvements should be made in equipment maintenance, such as: draining the raw water reservoir, replacing the microfilter regularly, and sterilizing the drinking water filling area on daily basis (Umri, 2021); (Herniwanti & Rahayu, 2022).

The agency for the Assessment and Application of technology has developed a technology to treat brackish/salt water to be consumable by communities in coastal areas using the Reverse Osmose Technology (Rahayu & Herniwanti, 2022). The RO technology processes salt water into drinking water that can be consumed with simple and inexpensive technology (Widayat, 2019). Another technology was also developed to treat cloudy and unsterile water in a high school in the Probolinggo area, East Java using a filtration and osmosis system. The system makes the water safe and ready to drink (Indriatmoko & Setiadi, 2020). In addition, a drinking water data collection system is being developed online or web-based at the Semarang City Health Office (Artanto et al., 2011).

## Conclusion

The results of the evaluation on the Sanitary Hygiene of 40 Drinking Water Depots in Bengkalis, Riau referring to the requirements of [13](#) Minister of Health No. 43 of 2014 showed 100% fulfillment of requirements related to the depot location, equipment, and operators. However, only 10 depots (25%) had quality standard [7](#) certificates and Hygiene Eligibility Certificates. During the Covid-19 pandemic, it is necessary to ensure clean water management and reinforce clean and healthy living behavior. Supervision and guidance from the Health Office are needed for the establishment and operational activities of drinking water depots.

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