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DESCRIPTIVE OF QUANTITATIVE DATA | SUPPLEMENTARY

Spatial Analysis and Quantitative Microbial Risk Assessment (QMRA) on The Quality of Refilled Drinking Water in Puskesmas Work Area Moncongloe Maros District

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Abstract: The type of research used is descriptive research with a Microbial Risk Assessment (MRA) on refilled drinking water (Ryan et al., 2022). The design of this study uses a Geographic Information System (GIS) approach. Retrieval of data using the exploratory method, namely sampling is done directly. The research was carried out in the Working Area of the Moncongloe Health Center, Maros Regency, for approximately 1 (one) month in October 2020. The population in this study were all Refill Drinking Water Depots in the working area of the Moncongloe Health Center, Maros Regency, namely 17 depots. The sampling technique in this study was total sampling, namely 17 Refill Drinking Water Depots in the working area of the Moncongloe Health Center, Maros Regency. The bacteria that became the research were Escherichia coli bacteria. The exposure assessment was carried out on 170 respondents, namely 10 respondents who consumed drinking water from each depot. The type of data used in this study is quantitative data in the form of the results of laboratory examinations for Escherichia coli content in refilled drinking water.

1. INTRODUCTION

In everyday life, water is the closest component to humans and is a basic need for the quality and sustainability of human life, therefore it must be available in sufficient quantity and quality. This is inseparable from the need for drinking water for humans (Debnath et al., 2022). The increasing need for clean water as a source of drinking water for the community is the reason for the development of refill drinking water businesses originating from drinking water depots at relatively affordable prices. According to (Narita et al., 2023) that refill drinking water depots is one of the business activities that lead to clean water to meet people's drinking water needs and also meet the current lifestyle of people who prioritize practicality and convenience in meeting life's needs. Based on WHO data (2019), it is known that almost 40% of deadly diseases in all countries are related to poor water quality, besides that WHO also notes that around 6 million people worldwide die each year due to diseases caused by dirty or unsafe water. Meet health requirements. Water quality can be viewed in terms of physical, chemical, and bacteriological. According to the Minister of Health of the Republic of Indonesia No.492/Menkes/Per/IV/2010, the physical requirements for drinking water are that it is odorless, tasteless, colorless, and not cloudy. The bacteriological requirements of drinking water must not contain bacteria, while chemically the water must not contain toxic chemical compounds and any dissolved substances in water have certain permissible limits. According to (Mohamed et al., 2022), in general (94.1%) household drinking water in Indonesia is in a good category (not cloudy, colorless, tasteless, not foamy, and odorless) however, there are still households with cloudy drinking water quality (3.3%), color (1.6%), taste (2.6%), foam (0.5%) and smell (1.4%). Based on the 2014 Maros District Health Profile, 79 drinking water depots met sanitation hygiene requirements, and 8 drinking water depots that did not meet sanitation hygiene requirements. Meanwhile, diarrheal diseases in

Maros Regency in 2014 reached 6,910 cases. Used to (Amoah et al., 2022) based on the background above, the researcher is interested in researching with the title "Spatial Analysis and Quantitative Microbial Risk Assessment (QMRA) on the Quality of Refill Drinking Water in the Working Area of the Moncongloe Health Center, Maros Regency in 2020". The formulation of the problem in this study is as follows: (1) how is the hygiene and sanitation of refilled drinking water depots in the working area of the Moncongloe Health Center, Kab. Maros? (2) What is the content of Escherichia coli in refilled drinking water in the working area of the Moncongloe Health Center, Maros Regency? (3) How is the Quantitative Microbial Risk Assessment (QMRA) on refilling drinking water in the working area of the Moncongloe Health Center, Kab. Maros? (4) How is the Quantitative Microbial Risk Assessment (QMRA) mapping of refilled drinking water in the working area of the Moncongloe Health Center, Maros Regency? (Perez-Mercado et al., 2022) The general objective of this research is to map spatially the Microbial Risk of Refill Drinking Water in the Working Area of the Moncongloe Health Center, Kab. Maros 2020. The specific objectives of this research are as follows: (1) to analyze the hygiene and sanitation of refilled drinking water depots in the working area of the Moncongloe Health Center, Maros Regency. (2) To analyze the content of Escherichia coli in refilled drinking water in the working area of the Moncongloe Health Center, Kab. Maros. (3) To analyze the Quantitative Microbial Risk Assessment (QMRA) on refilling drinking water in the working area of the Moncongloe Health Center, Maros Regency. (4) To map the Quantitative Microbial Risk Assessment (QMRA) on refilled drinking water in the working area of the Moncongloe Health Center, Maros Regency.

2. RESEARCH METHODS

The type of research used is descriptive research with a Microbial Risk Assessment (MRA) on refilled drinking water (Ryan et al., 2022). The design of this study uses a Geographic Information System (GIS) approach. Retrieval of data using the exploratory method, namely sampling is done directly. The research was carried out in the Working Area of the Moncongloe Health Center, Maros Regency, for approximately 1 (one) month in October 2020. The population in this study were all Refill Drinking Water Depots in the working area of the Moncongloe Health Center, Maros Regency, namely 17 depots. The sampling technique in this study was total sampling, namely 17 Refill Drinking Water Depots in the working area of the Moncongloe Health Center, Maros Regency. The bacteria that became the research were Escherichia coli bacteria. The exposure assessment was carried out on 170 respondents, namely 10 respondents who consumed drinking water from each depot. The type of data used in this study is quantitative data in the form of the results of laboratory examinations for Escherichia coli content in refilled drinking water. Several methods were used to collect data in this study, including (1) Observation and (2) Literature Study. The data that has been obtained from the results of field observations and examination of water samples in the laboratory is then analyzed using univariate analysis techniques for each variable from the results of the study using a frequency distribution to determine the microbial risk in refilled drinking water.

3. RESEARCH RESULTS AND DISCUSSION

Table 1: Distribution of Respondents Consuming Other Drinking Water Sources in the Work Area of the Moncongloe Health Center, Kab. Maros

Other Water Consumption Sources	(n)	%
Yes	55	32,4
No	115	67,6
Total	170	100

Based on table 1 above, as many as 55 respondents (3.4 %) consume water from other water source regularly. While the remaining 115 respondents (67.6 %) only consumed refilled drinking water products.

Table 2: Distribution of Respondents by Source of Drinking Water Consumed in the Work Area of the Moncongloe Health Center, Kab. Maros

Source of Drinking Water	(n)	%
PAM water	29	17,1
Well water	6	3,5
Branded AMDK	13	7,6
Other	122	71.8
Total	170	100

29 respondents (17.1 %) consume tap water. As many as 6 respondents (3.5%) consume well water. As many as 13 respondents (7.6 %) consumed branded bottled drinking water and the remaining 122 respondents (71.8%) consumed refilled drinking water.

Table 3: Distribution of Respondents based on the Volume of Other Drinking Water Sources Consumed in the Work Area of the Moncongloe Health Center, Kab. Maros

Consumption Volume of Other Water Sources	(n)	%
< 50 Liters	13	7,6
50-100 Liters	20	11,8
100-150 Liters	9	5,3
>150 Liters	12	7,1
Others (DAMIU Consumption)	115	67,6
Total	170	100

Based on table 3 above, in one month 13 respondents consume less than 50 liters of water from sources or other types of water (7.6%). As many as 20 respondents (11.8%) consume 50-100 liters of water from other water sources. As many as 9 respondents (5.3 %) consume 100-150 liters of water from other water sources. Meanwhile, as many as 12 respondents (7.1%) consume water from other water sources with a frequency of more than 150 liters per month. As many as 115 respondents (67.6 %) do not consume water from other sources or types of water.

Table 4: Distribution of Respondents based on Duration of Refill Water Consumption in the Work Area of the Moncongloe Health Center, Kab. Maros

Duration of Consumption of Refill Drinking Water	(n)	%
<2 Years	41	24,1
2-5 Years	51	30.0
>5 Years	78	45,9
Total	170	100

Based on table 4 above, as many as 41 respondents (24.1 %) have consumed refilled water products for less than two years. While the sample that has consumed refilled water products for two to five years is 51 respondents (30%). There are 78 respondents (45.9 %) who have consumed refilled water products for more than five years.

Table 5: Distribution of Respondents based on Frequency of Consumption of Refill Drinking Water in the Work Area of the Moncongloe Health Center, Kab. Maros

Refill Drinking Water Consumption Volume	(n)	%
< 5 Gallons	86	50,6
5-10 Gallons	58	34,1
11-16 Gallons	17	10.0
>16 Gallons	9	5,3
Total	170	100

Source: Primary Data, 2021

Based on table 5 above, 86 respondents (50.6 %) consume less than five gallons per month. A total of 58 respondents (34.1 %) consume five to 10 gallons per month. As many as 17 respondents (10%) consume 11-16 gallons per month. Meanwhile, only 9 respondents (5.3 %) consumed refiled drinking water of more than 16 gallons per month.

Table 6: Distribution of Respondents based on Use of Refillable Water in the Work Area of the Moncongloe Health Center, Kab. Maros

Use of Refill Drinking Water	(n)	%
Just Drink	66	38,8
Cooking Only	31	18,2
Drinking and Cooking	63	37,1
Bathe	20	5,9
Total	170	100

Table 7: Distribution of Respondents by Way of Consuming Refillable Water in the Work Area of the Moncongloe Health Center, Kab. Maros

How to Consumption of Refill Drinking Water	(n)	%
Immediately Drink	91	53.5
Boiled First	79	5,5
Total	170	100

Table 8: Distribution of Respondents based on Conditions of Water Source/Type in the Work Area of the Moncongloe Health Center, Kab. Maros

Conditions Source/Type of Water	(n)	%
Limited Quantity	73	42,9
Expensive price	60	35,3
Impractical Consumed	37	21,8
Total	170	100

Table 9: Distribution of Respondents based on Cleanliness of Refill Drinking Water Packages in the Work Area of the Moncongloe Health Center, Kab. Maros

Packaging Cleanliness	(n)	%
Clean	105	61.8
Not clean enough	65	38,2
Total	170	100

Table 10: Distribution of Respondents Experiencing Diarrhea After Consumption of Refill Drinking Water in the Work Area of the Moncongloe Health Center, Kab. Maros

Diarrhea	(n)	%
Yes	24	14,1
No	146	85.9
Total	170	100

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