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RESEARCH ARTICLE

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Sanitation and the Presence of Cockroaches on Ships at the Port of Yos Sudarso, Ambon

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ABSTRACT

Transmission of the disease via the cockroach vector as a disease transmitter, including those transported via transportation ships arriving from outside Indonesia and vice versa as well as between ports in Indonesia. Cockroaches are allowed to transmit diseases, and the Port Health Office (KKP), which is the Technical Implementation Unit (UPT) and head of the Indonesian Ministry of Health, is allowed to prevent and manage this. 112 of the 2,106 ships entering Yos Sudarso port in 2021 were still found to be carrying cockroaches, which can pose risk factors for the spread of illness, according to data collected by the Ambon KKP during surveillance of the ships landing there. This study, which was conducted in July and August 2022 on ships at Yos Sudarso Port, Ambon, was an analytical observational study using a cross-sectional study design approach to analyze ship sanitation parameters for the cockroaches' presence. As many as 30 ships were used as samples. There was a correlation between ship sanitation and the number of cockroaches, according to a Chi-square test conducted at Yos Sudarso port in Ambon, which had a p value of 0.008, and the results found that the poor level of ship sanitation can lead to the presence of cockroaches. The existence of cockroaches on board can result in a risk of disease transmission, and control measures must be taken quickly.

Keywords: ship sanitation; cockroach; port

INTRODUCTION

Aspects of disease transmission from cockroaches as disease transmitters, both those brought by way of transportation ships coming from outside Indonesia and vice versa as well as between ports in Indonesia, in accordance with the National Health Act's rules.⁽¹⁾ When the Yos Sudarso Port was under observation by the Ambon Port Health Office in 2021, 112 of the 2,106 ships arriving there were still found to be carrying cockroach vectors, which can pose risk factors for disease transmission.⁽²⁾ The purpose of this investigation is to ascertain whether ship cleaning has an impact on cockroach vectors' presence on board.

According to WHO figures, cholera causes between 1.3 million and 4 million infections and 21,000 to 143,000 fatalities annually. Yemen is one of the nations that will continue to actively contribute cholera cases through 2020; more than 500,000 people there have contracted the disease, and at least 1,975 of them have died as a result.⁽³⁾

In Indonesia, a cholera outbreak in Papua, Timika, in 2008 resulted in 108 deaths between April and August of that year, while a cholera outbreak in Bogor in 2009 was reported to have resulted in 6 deaths out of 123 cases⁽⁴⁾. According to the Regulation of the Minister of Health of the Republic of Indonesia, the Port Health Office (KKP), as the Technical Implementation Unit (UPT) and head of the Ministry of Health of the Republic of Indonesia, has the authority to prevent and control cockroaches as a transmitter of disease. This is done in order to be aware of the spread of the entry of cockroaches as disease transmitters through ports and into the territory of the Republic of Indonesia.⁽⁵⁾ To prevent the transmission of diseases carried by cockroaches that can result in a Public Health Emergency of International Concern (PHEIC), vessel sanitation checks must be carried out correctly and on schedule on every ship.⁽⁶⁾

The purpose of this study was to determine the relationship between ship sanitation and the presence of cockroaches on ships at the port of Yos Sudarso, Ambon.

METHODS

This research was an analytic observational with a cross-sectional design, to analyze ship sanitation factors for the presence of cockroaches. This research was conducted in July and August 2022 on ships arriving at Ambon's Yos Sudarso Port. The researchers used ship sanitation observation sheets to gather information from a sample of 30 ships.

Ship crews and ships that docked were the study's target populations as researchers watched ships arrive at Yos Sudarso Port in Ambon in July and August 2022. Affordable populations served as the research subjects, specifically well-docked ships where cockroaches were discovered and ships where cockroaches were not discovered. Accidental sampling was used for the sampling method, an approach to selecting a sample based on chance, specifically one that selects respondents who just so happen to be available or available somewhere in accordance with the research context, if considered suitable as a data source ⁽⁷⁾. Cockroaches on board the ship was the dependent variable. Ship sanitation while parked at Yos Sudarso Ambon port was the independent variable. The device was a ship sanitary inspection observation sheet. Data were analyzed using Chi-square test.

RESULTS

Ship Kitchen Sanitation

Table 1 shows that kitchen sanitation, as measured by the kitchen ship cleanliness variable, was in the good category (40%) and in the poor category (60%) similarly, kitchen air exchange, kitchen lighting, and kitchen washing were all in the good category (100%).

Table 1. Distribution of kitchen sanitation

No	Kitchen sanitation	Frequency	Percentage
1	Cleanliness		
	Well	12 ships	40
	Poor	18 ships	60
2	Air exchange		
	Well	30 ships	100
	Poor	30 ships	0
3	Kitchen lighting		
	Well	30 ships	100
	Poor	0 ships	0
4	Kitchen wash		
	Well	30 ships	100
	Poor	0 ships	0

Shipyards Sanitation

According to the study's findings (table 2), there were 14 ships (40%) with good shipyard cleanliness, 16 ships (60%) with poor shipyard cleanliness, and 30 ships (100%) with good air exchange and kitchen illumination.

Table 2. Distribution of shipyard sanitation

No	Shipyards sanitation	Frequency	Percentage
1	Cleanliness		
	Well	14 ships	40
	Poor	16 ships	60
2	Air Exchange		
	Well	30 ships	100
	Poor	0 ships	0
3	Kitchen Lighting		
	Well	30 ships	100
	Poor	0 ships	0

Cockroaches Presence on the Ship

The study indicate that there were 14 ships (40%) with cockroaches present (table 3).

Table 3. Distribution of cockroach on the ship

Cockroach presence	Frequency	Percentage
None	16 ships	60
Found	14 ships	40

Correlation between Kitchen Sanitation and Cockroach Presence

Table 4. Distribution of cockroach presence based on kitchen sanitation

Kitchen sanitation	Cockroach presence				p	OR
	Found		Not Found			
	Frequency	Percentage	Frequency	Percentage		
Poor	12	75	4	25	0.008	2.712
Well	2	14.3	12	85.7		

Based on table 4, it was known that 75% of the 16 ships with inadequate kitchen sanitation had cockroaches. The 14.3% of the 14 well ships had cockroaches. P-value was 0.008, there was a correlation between cockroach activity and kitchen hygiene. Additional testing yielded OR = 2.712 (>2), indicating that the existence of cockroaches in kitchen sanitation was uncertain based on the findings.

Correlation between Shipyard Sanitation and Cockroach Presence

Table 5. Distribution of cockroach presence based on shipyard sanitation

Shipyard sanitation	Cockroach presence				p	OR
	Found		Not Found			
	Frequency	Percentage	Frequency	Percentage		
Poor	13	81.3	3	18.7	0.005	2.893
Well	1	7.1	13	92.9		

Based on table 5, it was known that 81.3% of the 16 ships with inadequate storage sanitation had cockroaches; but only 7.1% of well ships had cockroaches. The p-value was 0.005, there was correlation between shipyard sanitation and the cockroaches presence. Additional testing yielded OR = 2.893 (>2), indicating that cockroaches may be present in shipyard sanitation, according to the data.

DISCUSSION

Based on the results, there is a correlation between the existence of devils and sanitation, ship sanitation is vulnerable to risk factors for disease spread. According to research by Harahap (2016), 40% of motor ships have a high level of risk of health problems and of the 40%, 91.67% found cockroaches in the high or dense category, thus there is a significant relationship between ship sanitation with cockroach density⁽¹⁸⁾. According to Rozendal's research, the explorer vector is an insect that lives very close to people and is frequently observed in dry, moist, unhygienic environments with plenty of food or food leftovers⁽⁹⁾.

Noorhayati's (2017) in the port of Banjarmasin discovered that, out of 20 ships, 11 (55%) met the requirements and 9 (45%) did not, according to the study's findings. Out of 20 ships, it is known that 13 (65%) satisfied the requirements and 7 (35%) discovered positive evidence of the vector's presence. Based on the findings of statistical tests, the Fisher Exact Test was used as an alternative test, and a p-value of 0.017 was obtained; indicating a correlation between rodents, indicators of vector presence, and ship sanitation⁽¹⁰⁾.

The Chi square test between ship sanitation and the presence of rodents and vectors has a p-value of 0.009 in research done in 2018 at the Port of Banten, indicating that there is a relationship between the two factors on passenger ships at Merak port, Banten Province⁽¹¹⁾.

CONCLUSION

Based on the results, the poor level of ship sanitation can lead to the presence of cockroaches. The existence of cockroaches on board can result in a risk of disease transmission, and control measures must be taken quickly.

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