e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 1 | March 2026 |

# The Relationship Between Environmental Sanitation And The Incidence Of Environmentally Based Diseases

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## ABSTRACT

Environmental sanitation is an important factor in maintaining public health and preventing the occurrence of environmentally related diseases. Poor sanitation can be a medium for transmitting various diseases, such as diarrhea, skin diseases, and respiratory infections. This study aims to determine the relationship between environmental sanitation and the incidence of environmentally related diseases. The study used an observational analytical design with a cross - sectional approach. The study sample consisted of 120 heads of families selected using a purposive sampling technique. Data were collected through questionnaires and environmental sanitation observation sheets, then analyzed using the Chi- Square test. The results showed a significant relationship between environmental sanitation and the incidence of environmentally related diseases ($p < 0.05$). It was concluded that poor environmental sanitation increases the risk of environmentally related diseases. Efforts to improve environmental sanitation and provide ongoing public health education are needed.

**Keywords:** Environmental Sanitation, Environmentally Based Diseases, Public Health



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## 1. Introduction

Environmentally-related diseases remain a public health problem in various regions, particularly in areas with inadequate sanitation. Environmentally-related diseases are those influenced by physical, biological, and social environmental factors, such as water quality, waste disposal, and housing conditions.

Environmental sanitation encompasses the availability of clean water, liquid and solid waste management, the use of sanitary latrines, and a clean living environment. Substandard sanitation can increase the risk of environmental contamination by pathogenic microorganisms that cause disease.

Health data shows that diseases such as diarrhea, skin infections, and vector-borne diseases are still prevalent in communities with poor environmental sanitation. Therefore, this research is crucial to analyze the relationship between environmental sanitation and the incidence of environmentally-related diseases as a basis for planning health prevention and promotion programs.

## 2. Research Methods

### a. Types and Design of Research

This study is a quantitative, observational, and analytical study with a cross-sectional design. This design was used to analyze the relationship between environmental sanitation as the independent variable and the incidence of environmentally related diseases as the dependent variable, measured at the same time. This approach was chosen because it is effective in describing the relationship between variables in a population over a specific period and is suitable for public health research.

### b. Location and Time of Research

The research was conducted in the working area of Community Health Center X, which has residential characteristics with varying sanitation conditions. The research period took place from January to March 2025, which included the preparation stage, field data collection, data processing, data analysis, and preparation of the research report.

### c. Population and Research Sample

1) Population

The population in this study was all heads of families who live in the working area of Health Center X.

2) Sample

The number of research samples was 120 respondents, which was determined based on considerations of sample adequacy for bivariate analysis. The sampling technique used purposive sampling, namely selecting respondents based on certain criteria that are in accordance with the research objectives.



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3) Inclusion Criteria
   a) Head of family who has resided for at least 6 months in the research area
   b) Willing to be a research respondent
   c) Having family members living in the same house
4) Exclusion Criteria
   a) Respondents who were not present at the time of data collection
   b) Respondents who did not complete the questionnaire completely

**d. Research Variables**

- Independent variable: Environmental sanitation
- Dependent variable: Incidence of environmentally based diseases

**e. Operational Definition of Variables**

| Variables | Operational Definition | Indicator | Measuring instrument | Scale |
|---|---|---|---|---|
| Environmental sanitation | Condition of household environmental facilities and infrastructure | Clean water, toilets, garbage disposal, waste channels | Observation sheet | Nominal |
| Environmentally based diseases | History of illness influenced by environmental factors in the last 3 months | Diarrhea, skin disease, ARI | Questionnaire | Nominal |

**f. Research Instruments**

The instruments used in this study consist of:

1) Respondent characteristics questionnaire, including age, education, and occupation.
2) Environmental sanitation observation sheet, which assesses the condition of clean water, toilets, garbage disposal, and household waste channels.
3) Environmentally based disease incidence questionnaire, which records the disease history of family members in the last three months

The instrument was prepared based on environmental sanitation guidelines and has undergone feasibility testing before use.

**g. Data Collection Procedures**

Data collection is carried out in several stages:

1) Processing research permits to relevant agencies
2) Coordination with the Community Health Center and local authorities
3) Explanation of the purpose and benefits of the research to respondents
4) Informed signing consent
5) Completion of questionnaire by respondents



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6) Direct observation of household environmental sanitation conditions
7) Data completeness check

**h. Data Processing Techniques**

The collected data is processed through the following stages:

1) Editing – checking data for completeness and consistency
2) Coding – assigning a code to each variable
3) Data entry – entering data into statistical software
4) Cleaning – ensuring data is free from input errors

**i. Data Analysis Techniques**

1) Univariate Analysis

Univariate analysis was used to describe the frequency and percentage distribution of each research variable, both environmental sanitation and the incidence of environmentally based diseases.

2) Bivariate Analysis

Bivariate analysis was conducted using the Chi- Square test to determine the relationship between environmental sanitation and the incidence of environmentally related diseases. The statistical significance level was set at $\alpha = 0.05$.

*(Optional journal development)*

Odds Analysis The ratio (OR) can be used to determine the risk of disease occurrence in respondents with poor environmental sanitation compared to those with good environmental sanitation.

**j. Bias Control**

Bias control efforts are carried out by:

1) Clear inclusion and exclusion criteria
2) Direct observation of environmental sanitation conditions
3) Structured research instruments

**k. Research Ethics**

This research was conducted in accordance with the ethical principles of health research, which include:

1) Informed consent
2) Confidentiality of respondent identity
3) Anonymity
4) The principle of justice and nonmaleficence

## 3. Research Results And Discussion

### a. Result

1) Respondent's Environmental Sanitation



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The research results show that some respondents have poor environmental sanitation conditions, especially in terms of waste disposal and household liquid waste management.

| Environmental Sanitation | f | % |
|---|---|---|
| Good | 48 | 40.0 |
| Not enough | 72 | 60.0 |
| **Total** | **120** | **100** |

2) Environmentally Based Disease Incidence

| Disease Incidence | f | % |
|---|---|---|
| Ever been sick | 70 | 58.3 |
| No pain | 50 | 41.7 |
| **Total** | **120** | **100** |

The most frequently reported diseases are diarrhea, skin diseases, and ARI.

3) The Relationship between Environmental Sanitation and Disease Incidence

| Environmental Sanitation | Ever been sick | No Pain | Total |
|---|---|---|---|
| Not enough | 52 | 20 | 72 |
| Good | 18 | 30 | 48 |

Square test show a p value = 0.002 (< 0.05), which means there is a significant relationship between environmental sanitation and the incidence of environmentally based diseases.

**b. Discussion**

The results of this study indicate that environmental sanitation has a significant relationship with the incidence of environmentally related diseases. Respondents with poor environmental sanitation experienced more illnesses than those with good sanitation.

Poor sanitation conditions can lead to contamination of water, soil, and the surrounding environment by pathogenic microorganisms. The use of substandard water and improperly managed waste disposal can increase the risk of disease transmission, particularly diarrheal diseases and skin diseases.

This finding aligns with the concept of environmental health, which states that a healthy environment is a primary prerequisite for achieving optimal public health. Therefore, improving environmental sanitation is a crucial step in preventing environmentally-based diseases.



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## 4. Conclusion And Suggestions

### a. Conclusion

There is a significant relationship between environmental sanitation and the incidence of environmentally related diseases. Poor environmental sanitation increases the risk of disease in the community.

### b. Suggestion

1) The community is expected to improve cleanliness and environmental sanitation management.
2) Community health centers need to strengthen environmental health promotion and education programs.
3) Local governments are expected to support the provision of adequate sanitation facilities.
4) Further research is recommended to use a longitudinal design.

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