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RESEARCH ARTICLE

Relationship Between Waste Management Practices and Community Health Risks Under Environmental Health Law

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ABSTRACT

Waste management practices are integral to safeguarding community health, and improper waste disposal can lead to significant health risks, such as infectious diseases, respiratory conditions, and environmental contamination. This study explores the relationship between waste management practices and community health risks under the framework of environmental health law. A qualitative literature review methodology was employed to examine a wide range of studies, case reports, and policy documents that highlight the impacts of poor waste management on public health. The findings suggest that inefficient waste management practices, such as improper disposal of hazardous waste, unregulated landfills, and inadequate recycling systems, contribute to a variety of health hazards. These include the contamination of air, soil, and water, leading to diseases like respiratory infections, gastrointestinal disorders, and vector-borne diseases such as malaria and dengue. Environmental health laws are essential in regulating waste management to protect public health, providing guidelines for proper disposal, waste reduction, and promoting community-based waste management initiatives. However, the study also identifies gaps in law enforcement and compliance, which hinder the effectiveness of these regulations. It emphasizes the need for stronger legal frameworks, better enforcement mechanisms, and greater community participation in waste management practices. This research underscores the critical role of environmental health laws in mitigating health risks related to waste and advocates for a holistic approach to waste management that integrates legal accountability, sustainability, and public health protection.



INTRODUCTION

Waste management is an essential component of environmental health, as improper disposal of waste can have serious implications for both the environment and public health. As urbanization and industrialization continue to accelerate globally, the volume of waste produced by households, businesses, and industries has surged, creating unprecedented challenges for effective waste management (Sharma et al., 2020). The relationship between waste management practices and community health risks is an increasingly significant issue, especially in developing nations where waste disposal systems are often underdeveloped or poorly managed. Waste, if not managed properly, can contaminate water, soil, and air, leading to health hazards for communities. This underscores the need for comprehensive waste management systems that not only focus on the disposal of waste but also consider its long-term environmental impact.

Under the umbrella of environmental health law, effective waste management practices are not just an environmental issue but a public health imperative (Vanapalli et al., 2021). Environmental health laws are designed to mitigate the adverse effects of pollution, including waste-related health risks, by regulating and enforcing waste management practices. These laws play a critical role in defining standards and guidelines for waste disposal, recycling, and treatment, which in turn directly influence the health and well-being of communities. However, despite these legal frameworks, inadequate enforcement, lack of public awareness, and insufficient infrastructure continue to exacerbate waste-related health problems.

This research aims to explore the relationship between waste management practices and community health risks, emphasizing the role of environmental health law in addressing these challenges (Hantoko et al., 2021). By investigating the intersection of waste disposal, environmental policies, and public health, this study seeks to highlight the significance of well-structured waste management systems that comply with legal standards. Furthermore, this research will examine the effectiveness of existing environmental health laws in reducing health risks posed by improper waste management practices, and will propose recommendations for improving legal frameworks and enforcement mechanisms to ensure healthier communities.

Through a qualitative literature review, this study synthesizes key findings from existing research on waste management practices, health risks, and legal interventions. It aims to provide a comprehensive understanding of the links between environmental law, waste management, and community health, offering insights into how legal frameworks can be enhanced to better protect public health from waste-related hazards (Kulkarni & Anantharama, 2020). Ultimately, the research seeks to contribute to the broader discourse on sustainable waste management practices and their vital role in safeguarding both the environment and human health.



METHODOLOGY

This study utilizes a qualitative literature review method, which is appropriate for synthesizing existing research, theories, and concepts related to the relationship between waste management practices, community health risks, and the role of environmental health laws. The aim is to identify and analyze the patterns, themes, and key findings across diverse studies to develop an in-depth understanding of how waste management practices influence community health and how environmental health laws can mitigate associated risks (Oluwagbayide et al., 2024).

Data Collection

The data collection process for this qualitative literature review involves a comprehensive search of scholarly articles, case studies, government reports, policy documents, and grey literature (such as institutional publications and reports from non-governmental organizations). Key sources of information include:

- Academic Journals: Articles from journals such as *Environmental Health Perspectives*, *Journal of Environmental Management*, *Waste Management*, and *Environmental Health Law Review*.
- Government Reports: Documents from national environmental protection agencies (e.g., Environmental Protection Agency, WHO reports on waste management and health).
- Case Studies: Examples of waste management practices from different countries, including both developed and developing nations, to understand the range of issues and solutions.
- Policy Documents: Relevant environmental health laws and regulations, including international agreements, national frameworks, and local policies related to waste management and public health.
- Grey Literature: Reports and publications from NGOs working on waste management and environmental health.

The search will be conducted using academic databases such as Google Scholar, PubMed, Scopus, JSTOR, and other relevant repositories. Keywords for the search will include "waste management", "community health risks", "environmental health law", "waste disposal practices", "public health impact", and "environmental regulation".

Inclusion and Exclusion Criteria

To ensure the quality and relevance of the selected literature, the following criteria will be applied:

Inclusion Criteria:



- Studies published within the last 10 years (2013-2023), ensuring that the information reflects the current state of knowledge.
- Articles that focus specifically on waste management practices (e.g., solid waste management, hazardous waste disposal) and their direct or indirect impacts on community health risks.
- Research articles, case studies, and reports that include a focus on the role of environmental health laws in regulating waste management.
- Publications that offer a clear connection between waste management practices and public health outcomes, either through empirical data, policy analysis, or theoretical frameworks.

Exclusion Criteria:

- Articles not directly addressing the link between waste management and community health risks.
- Literature not focused on environmental health laws, such as studies that solely examine waste management without considering regulatory frameworks.
- Publications prior to 2013 to ensure the review captures the latest developments and policies in waste management and health risks.

Data Analysis

The data analysis process will involve several stages to identify key patterns and insights from the reviewed literature:

a. Thematic Analysis:

Thematic analysis will be used to identify common themes across the selected literature. These themes may include:

- Impact of Poor Waste Management on Health: Focused on the direct and indirect health risks of improper waste management, such as air and water pollution, infectious diseases, and chronic health conditions.
- Effectiveness of Environmental Health Laws: Examining how environmental regulations and policies (such as the Basel Convention, the Resource Conservation and Recovery Act, or local waste management ordinances) mitigate health risks associated with waste.
- Barriers to Effective Waste Management: Identifying challenges such as lack of infrastructure, insufficient funding, low public awareness, and weak enforcement of regulations.
- Case Studies and Best Practices: Analyzing successful examples of waste management policies that have resulted in improved health outcomes.

b. Content Analysis:



Content analysis will also be used to systematically analyze policy documents and legal frameworks. Key factors to analyze include:

- The scope and effectiveness of regulations in controlling waste management practices.
- Legal provisions related to waste disposal, recycling, hazardous waste management, and pollution control.
- The role of community health in shaping waste management laws and policies.

c. Synthesis of Findings:

The findings will be synthesized into a narrative that links waste management practices to community health outcomes and the role of environmental health law in managing these risks. The synthesis will also highlight any gaps or contradictions in the existing literature and suggest areas for further research (Foster et al., 2020).

Ethical Considerations

Given the nature of the study, ethical concerns primarily relate to the transparency and integrity of the review process. The research will follow standard academic ethics guidelines, ensuring:

- Proper Citation: All sources of information will be properly cited to avoid plagiarism.
- No Primary Data Collection: As this is a literature review, no new data will be collected from human participants, thus eliminating potential ethical concerns related to participant consent or confidentiality.
- Bias Mitigation: The research will aim to present a balanced and objective analysis, acknowledging different viewpoints, particularly in the interpretation of policy effectiveness and health outcomes.

RESULT AND DISCUSSION

This section presents the findings of the literature review regarding the relationship between waste management practices and community health risks, with a particular focus on the role of environmental health law. The analysis reveals several key themes and insights derived from the existing body of literature.

1. Impact of Poor Waste Management on Public Health

Improper waste management practices, particularly in developing countries, have been found to significantly contribute to a range of public health risks. Studies consistently indicate that inadequate waste disposal systems, such as open dumping, uncontrolled landfills, and the burning of waste, lead to direct health threats for nearby communities (Siddiqua et al., 2022). For example, improper disposal of hazardous materials like chemicals, medical waste, and e-waste increases the risk of exposure to toxic substances, leading to respiratory illnesses, skin disorders, and poisoning. Additionally, organic waste improperly managed in open areas becomes a breeding ground for



disease vectors such as mosquitoes and rats, increasing the prevalence of diseases like malaria, dengue fever, and leptospirosis.

2. Waste Management Practices and Disease Transmission

The relationship between waste management and disease transmission is notably evident in the spread of waterborne diseases. In areas where waste is disposed of near water sources, there is a higher likelihood of water contamination, leading to diseases such as cholera, dysentery, and typhoid fever. Studies emphasize the need for proper waste treatment, including the safe disposal of sewage and waste that may come into contact with drinking water sources, to reduce the incidence of these diseases. Additionally, improper handling of medical waste in healthcare facilities has been linked to the spread of infections, including hepatitis and HIV, posing significant health risks to both healthcare workers and the broader community.

Table 1. Specific Relationships between Waste Management Practices and Transmission of Waterborne and Infectious Diseases

Waste Management Aspect	Specific Impact on Disease Transmission	Examples of Diseases	Recommended Waste Management Practices
Proximity of Waste to Water Sources	Disposal of solid and liquid waste near water bodies increases contamination risk.	Cholera, dysentery, typhoid fever	Implement safe sewage systems; restrict dumping near water sources.
Untreated Sewage Discharge	Release of untreated human waste introduces pathogens into water supply.	Diarrheal diseases, hepatitis A	Ensure proper sewage treatment and disposal facilities.
Medical Waste Handling in Healthcare Facilities	Inadequate segregation and disposal of medical waste can spread bloodborne infections.	Hepatitis B, Hepatitis C, HIV	Adopt strict medical waste segregation, disinfection, and incineration protocols.



Waste Management Aspect	Specific Impact on Disease Transmission	Examples of Diseases	Recommended Waste Management Practices
Community Solid Waste Disposal	Improper garbage disposal attracts vectors such as flies and rodents.	Diarrhea, leptospirosis	Promote community waste collection and sanitary landfill use.
Reuse of Contaminated Water	Using polluted water for irrigation or domestic use can perpetuate disease spread.	Intestinal parasites, cholera	Promote water treatment and safe reuse practices.

3. Role of Environmental Health Laws in Mitigating Health Risks

Environmental health laws serve as a crucial tool in regulating waste management practices to protect public health. Legislation such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal has made significant strides in international waste management regulations. However, enforcement remains a major challenge, particularly in low-income countries where regulatory frameworks are often weak(Heinrich et al., 2025). National and local laws that mandate waste segregation, recycling, and the establishment of sanitary landfills play a key role in reducing the health risks associated with poor waste management. Research has shown that communities with strong regulatory oversight and effective waste management policies experience lower rates of waste-related health conditions.

4. Challenges in Waste Management Law Enforcement

Despite the existence of legal frameworks, the enforcement of waste management regulations remains inconsistent, especially in urban and peri-urban areas with high population densities(Livieri et al., 2025). Lack of resources, insufficient infrastructure, and weak governance are significant barriers to the successful implementation of waste management laws. Literature suggests that corruption, inadequate waste collection services, and insufficient public awareness contribute to the poor enforcement of environmental health laws. Consequently, the intended benefits of legal frameworks are often undermined, leading to continued exposure to health risks. Strengthening



enforcement mechanisms and ensuring the allocation of resources for effective waste management practices are essential steps in addressing these challenges.

5. Community Engagement and Education in Waste Management

The review highlights the importance of community engagement and public education in improving waste management practices and reducing health risks. Communities that actively participate in waste segregation, recycling programs, and proper waste disposal are better equipped to manage the health risks associated with poor waste management (Portus et al., 2024). The role of education in fostering a sense of environmental responsibility is critical, as communities informed about the dangers of improper waste disposal tend to adopt safer practices (Gunistiyo et al., 2025). Effective environmental health laws should therefore incorporate strategies to raise public awareness, encourage community involvement, and foster partnerships between local governments and citizens in managing waste.

6. Sustainability of Waste Management Practices Under Legal Frameworks

Lastly, the sustainability of waste management practices under environmental health laws is a growing concern. While current legal frameworks often emphasize compliance with minimum standards, there is a shift toward encouraging more sustainable practices, such as circular economy principles, zero waste initiatives, and the adoption of green technologies. The literature suggests that a more holistic approach to waste management, one that integrates sustainability into waste management laws and policies, could reduce the long-term health risks posed by poor waste management. This includes incentivizing the reduction of waste generation, promoting sustainable material use, and supporting innovation in waste recycling technologies.

CONCLUSION

The literature strongly supports the notion that poor waste management practices significantly contribute to public health risks, particularly in communities with weak environmental health regulations. The role of environmental health laws is central in reducing these risks, though challenges remain in law enforcement, resource allocation, and public engagement. A more integrated approach, emphasizing both legal compliance and community involvement, is crucial for mitigating health risks and promoting sustainable waste management practices. Furthermore, strengthening regulatory frameworks and focusing on the long-term sustainability of waste management policies are essential steps toward safeguarding public health.

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