

THE INFLUENCE OF SOCIAL AND ENVIRONMENTAL FACTORS ON THE SPREAD OF INFECTIOUS DISEASES IN NUNUKAN

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Abstract

The research was conducted with the aim of analyzing the impact of social and environmental factors on the spread of infectious diseases in Nunukan Regency, North Kalimantan. Nunukan Regency is facing considerable health challenges due to the high number of cases of infectious diseases such as dengue fever, malaria, tuberculosis, and sexually transmitted infections in the region. This study applies qualitative methods through in-depth interviews with health workers, community leaders, and local residents to find factors that have an impact on the spread of infectious diseases. The findings of the study show that the high number of cases of infectious diseases in the region is caused by poor sanitation conditions, limited access to health services, and low public awareness. Apart from these factors, the high mobility of the population due to the proximity to Malaysia also contributes to accelerating the spread of the disease. Protections that need to be provided, such as eradicating mosquito nests to prevent dengue fever, distributing mosquito nets to prevent malaria, and holding health campaigns to raise awareness of the importance of maintaining hygiene, must be increased. Lowering social stigma against people with tuberculosis and sexually transmitted infections is important so that the treatment process can run faster. This study suggests that it is necessary to increase access to health services and distribute more equitable educational programs, especially in remote areas, in order to accelerate efforts to control infectious diseases in Nunukan Regency.

Keywords: Environment factors, Infectious diseases, Nunukan regency, Sosial factors.

INTRODUCTION

Nunukan Regency in North Kalimantan is the starting point of cross-border travel between Indonesia and Malaysia. It stands majestically with an area of about 12. 000 km², this district is inhabited by a community rich in ethnic and cultural diversity. Despite being very rich in natural resources, Nunukan is facing significant challenges in the public health sector. Sanitation problems, limited access to health services, and low public awareness are key factors that make this region vulnerable to the spread of infectious diseases.

Diseases that are often spread in Nunukan include tuberculosis, malaria, dengue fever, and sexually transmitted infections. According to information released by the Central Statistics Agency (BPS), there has been an increase in cases of diseases such as dengue fever and tuberculosis in recent years. This situation raises concerns that need to be addressed with more effective prevention and control measures to maintain public safety.

Some of the crucial factors that contribute to the high number of cases of infectious diseases in Nunukan include the high mobility of the population due to its border with Malaysia, the lack of sanitation facilities and access to clean water, and the low level of public awareness of disease prevention efforts. Moreover, the limited medical facilities in this region make it difficult to diagnose and treat the process, which ultimately worsens the public health condition.

There are various steps that have been taken to overcome infectious diseases in Nunukan, such as increasing access to health services by providing better facilities and providing training for medical personnel. Hepatitis and diphtheria can be prevented through an intensified immunization program. In addition, health campaign efforts continue to be emphasized to foster public awareness of the importance of living a clean and healthy lifestyle. However, barriers such as social stigma against people with infectious diseases and lack of understanding among the community remain the main obstacles in disease control.

The purpose of this study is to analyze how social and environmental factors affect the spread of infectious diseases in Nunukan Regency. It is hoped that the results of the study can be a good foundation for the formulation of more effective public health policies. In addition to seeing the results of this study, it is also hoped that the data can be useful in the development of intervention programs that aim to overcome the risk of infectious diseases in the community, especially in areas that experience geographical and social constraints.

LITERATURE REVIEW

Infectious Diseases

According to Natoadmodjo (2003) Infectious diseases are diseases that can be transmitted (moving from one person to another, either directly or through intermediaries). Communicable Diseases (Comunicable Disease) is a disease caused by the transmission of infectious agents/toxin products from a person/reservoir to another person/susceptible host. Infectious diseases are generally acute (sudden) and affect all levels of society. This type of disease is prioritized considering its contagious nature which can cause outbreaks and cause great losses. Infectious diseases are a combination of various factors that affect each other. (Widoyono, 2011: 3).

The cause (agent) of infectious diseases is a biological element that varies from the simplest virus particles to the most complex organisms that can cause disease in humans (Noor, 1997: 39). Where the process of internal disease agents causing diseases in humans requires various special modes of transmission and the existence of "reservoirs of diseases such as humans, animals..." (Noor/ 1997; 39).

Social and Environmental Factors Infectious Diseases

Social and environmental factors play an important role in the spread of infectious diseases. Individuals with lower socioeconomic status often have limited access to health services, nutritious food, and a healthy environment, which increases their risk of developing infectious diseases (Tanjung *et al.*, 2023). In addition, the level of education affects health behavior; individuals with higher education tend to be more aware of the risk of disease and the necessary preventive measures (Muniyapillai *et al.*, 2022). Social and cultural norms can also influence individual health-related behavior, where certain cultural habits can increase the incidence of sexually transmitted infections (STIs) among certain groups (Paulus, 2023).

On the other hand, environmental factors such as physical conditions, sanitation, and pollution greatly influence the spread of infectious diseases. Unsanitary environments and lack of access to clean water can lead to outbreaks of diseases such as cholera (Tanjung *et al.*, 2023). Access to health services is also an important factor; People living in remote areas often find it difficult to get adequate medical care (Muniyapillai *et al.*, 2022). In addition, human mobility due to migration or travel can accelerate the spread of infectious diseases, which are often influenced by social factors

such as employment and education (Tanjung *et al.*, 2023). Therefore, an integrated approach that incorporates an understanding of social and environmental factors is essential to address these public health challenges.

RESEARCH METHOD

Research Approach

This study uses a qualitative approach with an in-depth interview method to explore information related to the influence of social and environmental factors on the spread of infectious diseases in Nunukan Regency.

Location and Time of Research

The location of the study is Nunukan Regency, focusing on areas with the highest number of infectious disease cases based on data from local health agencies. The research was carried out for three months, including the preparation stage, data collection, and analysis.

Data Collection Techniques

Interview:

Researchers conducted interviews with key informants, which include:

- a. **Health Workers:** Health Center officers, doctors, and nurses to obtain data on infectious disease trends and control efforts.
- b. **Community Leaders:** Village heads, religious leaders, or RT heads who understand the social conditions of the community.
- c. **General Public:** Residents who have experienced or are experiencing infectious diseases to understand the factors that contribute to the spread of the disease.

Interview Guidelines:

Researchers use semi-structured interview guidelines, which include related questions:

- a. The condition of the living environment (sanitation, access to clean water, and cleanliness).
- b. Social behavior (interaction, mobility, and clean living habits).
- c. Social and economic support in the prevention of infectious diseases.

Informant Selection Techniques

Informants are selected by purposive sampling, with the following criteria:

- a. Be over 18 years old.
- b. Domiciled in the Nunukan area.
- c. Have direct experience related to infectious diseases or play a role in infectious disease control.

Data Analysis

Data from the interviews were recorded, transcribed, and analyzed using thematic analysis techniques. The analysis process includes:

- a. Coding data to identify key themes.
- b. Grouping data by category (social, environmental, and infectious disease impacts).
- c. Inferring patterns of relationships between social, environmental, and disease spread.

Data Validity

To ensure the validity of the data, source triangulation was carried out by comparing information from health workers, community leaders, and residents. In addition, the results of the interviews are verified to the informants to ensure the accuracy of the data.

Research Ethics

This research adheres to the principles of research ethics by asking for informant consent through informed consent, maintaining data confidentiality, and ensuring that participation is voluntary without coercion.

RESULTS AND DISCUSSION

Interviews conducted with health workers, community leaders, and a number of residents in Nunukan Regency revealed that the spread of infectious diseases such as dengue fever, malaria, tuberculosis, and sexually transmitted infections (STIs) remain the main challenges. The main cause of the high number of dengue fever cases in the Nunukan area is due to a less clean environment, frequent waterlogging, and a lack of public awareness in eradicating mosquito nests (PSN). The implementation of PSN activities that should be carried out regularly is often less than optimal due to limited information and lack of active participation from the community.

There are still cases of malaria occurring, especially in areas adjacent to forests, where the population of *Anopheles* mosquitoes tends to increase. The availability of minimal health facilities and hard-to-reach locations often result in delays in the diagnosis and treatment process. The condition is exacerbated by the lack of public awareness to consult immediately when the initial symptoms appear, which is often influenced by the assumption that malaria is only a mild disease that does not require serious medical attention.

Tuberculosis is one of the infectious diseases that is difficult to control in Nunukan. Health workers said that despite the free treatment programs available, many patients do not complete their treatment due to a lack of understanding of the importance of long-term therapy. What's more, the social stigma against people with tuberculosis causes patients to feel reluctant to speak openly about their condition. As a result, the spread of the virus still occurs, especially in households or small communities that have poor air circulation.

Sexually transmitted infections (STIs) are also a health threat in Nunukan, especially among productive age people who are often involved in cross-border activities. Increased population mobility can increase the risk of spreading diseases such as gonorrhea, syphilis, and HIV/AIDS. The results of the interviews showed that risky behaviors, such as having sex without protective equipment and rarely having regular health check-ups, were the dominant factors. Counseling on reproductive health and STI prevention is still not evenly reached, especially in remote areas.

The discussion on the spread of infectious diseases in Nunukan Regency occurred as a complexity of challenges affected by various factors, such as the environment, community behavior, and the availability of health services. The high incidence rate of dengue fever emphasizes the importance of implementing orderly and efficient Mosquito Nest Eradication (PSN). In addition, it is important to increase public knowledge so that they are more aware of the risks of this disease and the actions that can be taken to prevent it. Active community participation, both at the household and community levels, is essential to create a healthy environment free from mosquito breeding grounds.

The importance of special treatment is noted in cases of malaria in high-risk areas. The implementation of insecticide spraying (fogging) in endemic areas should be considered. In addition, providing better access to health services in remote areas can help speed up the diagnosis and treatment process, thereby preventing the possibility of further complications and spread.

Tuberculosis indicates that medical efforts alone are not enough to control the disease. A deeper social approach is needed so that the stigma against sufferers can be reduced, so that they feel more comfortable in seeking treatment. Health campaigns that focus on removing stigma and paying attention to the importance of long-term care need to be carried out continuously.

Sexually transmitted infections (STIs) can be the main focus in reproductive health counseling efforts. Considering the high mobility of the population in Nunukan, it is important that we increase prevention efforts such as condom use campaigns, routine checkups, and reproductive health counseling. This counseling is important to be accessible not only in urban areas, but also in remote communities that often have difficulty obtaining adequate health information.

To deal with disease transmission in Nunukan Regency, various strategic steps need to be taken. Improving access to health services is placed as a top priority. The government should increase the number of health facilities and pay attention to the existence of skilled medical personnel. In addition, the use of mobile clinic cars will provide benefits in reaching people who have difficulty accessing health services.

Improving health learning and socialization programs needs to be improved in an inclusive way, by involving community leaders, religious leaders, and the younger generation so that health messages can be conveyed more effectively. In this campaign, important aspects that need to be emphasized are environmental sanitation, healthy lifestyles, and measures to prevent infectious diseases such as the use of mosquito nets and personal protective equipment. Distribution priorities should be given to prevention tools such as mosquito nets, vaccinations, and personal protective equipment, especially in areas with high levels of endemicness. In the case of dengue fever, it is important for mosquito nest eradication programs to be carried out regularly by involving the government, schools, and local communities.

Removing the stigma against individuals with infectious diseases such as tuberculosis and STIs is something that needs to be taken seriously. There is a need for a campaign that highlights the importance of social solidarity and support for sufferers on a large scale. Increasing cross-sectoral collaboration, both with global health institutions and governments of neighboring countries such as Malaysia, will make a positive contribution in addressing these challenges.

In a harmonious manner and involving all parties involved, it is hoped that the spread of infectious diseases in Nunukan Regency can be overcome properly. This action will not only provide protection to the community from potential diseases, but will also improve the quality of life and productivity of the population in the area.

CONCLUSION

Conclusions that can be drawn From the results of interviews and discussions that have been conducted, it can be concluded that the spread of infectious diseases in Nunukan Regency, such as dengue fever, malaria, tuberculosis, and sexually transmitted infections, is influenced by various factors, both social and environmental. The inability to access adequate health facilities, poor sanitation, and lack of public awareness are the main factors that contribute to the increase in the number of cases of the disease. To increase the effectiveness of countermeasures efforts, it is

necessary to strengthen collaboration with the community in various activities, such as eradication of mosquito nests for dengue fever, distribution of mosquito nets for malaria, and immunization programs to prevent infection. In addition, it is important to reduce social stigma against individuals suffering from tuberculosis and sexually transmitted infections so that they can more easily receive appropriate treatment. Increasing access to health services and educational programs in remote areas is very important to accelerate efforts to prevent and control infectious diseases in Nunukan Regency.

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