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Coastal and Island Public Health Relationship between Environmental Characteristics and Disease Endemicity in Big Island

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Abstract

The purpose of the study to determine the relationship between coastel and island public health and environmental characteristics. The island has a number of health issues that might lead to an endemic sickness. Disease that is endemic to a certain location or population is known as a pandemic. People in poor nations are more vulnerable to the effects of endemic illnesses. Environmental biodiversity and area geography and biological mosquitoes and reservoirs factors, as well as response behavior and attitudes, all play a role in breaking the transmission cycle.

Introduction

There are many infectious illnesses in this area that have not been successfully eliminated by the state or society for a lengthy period of time. If the local government does not intervene, infectious illnesses can take a long time to spread from village to village, especially if there is a lack of awareness and education in the affected region. A piece of land that is smaller than a continent but larger than a reef and completely encircled by water is referred to be an island (Dawson, 2016). The island is a shared property with numerous resources. The island has a number of health issues that might lead to an endemic sickness. Disease that is endemic to a certain location or population is known as a pandemic. People in poor nations are more vulnerable to the effects of endemic illnesses. Other factors include uneven growth, as well as difficult-to-reach preventative and treatment strategies.

International health organizations like the World Health Organization (WHO) are working to improve access to healthcare for people with endemic illnesses across the world, including in Indonesia. To deal with and manage endemic illnesses, the government has implemented a number of measures through the Ministry of Health. The government, for example, has subsidized the 3M Plus Mosquito Nest Eradication (PSN) and the Jumantik 1 House 1 Movement in order to prevent dengue virus from spreading. Malaria prophylaxis, including the use of insecticide-treated mosquito nets, repellents, and prophylactic medication, is part of the government's ongoing socialization and counseling efforts aimed at preventing malaria transmission (Monroe, 2020). After that, the government implemented the Filariasis Elimination Program, a plan to distribute mass-prevention medications for filariasis in several hotspots.

Health facilities and integrated service posts in Indonesia are now being targeted for outreach activities to promote and prevent the spread of endemic illnesses, rather than simply providing access to drugs. An educational and awareness-building effort is the primary goal of this program. To keep endemic illnesses from spreading and becoming widespread, the entire community must join together to lend a hand. We hope to learn more about the environmental features and disease endemicity of the major islands in order to better understand the causes of disease endemicity.

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Literature Review

Causative factor

Malaria

Anopheles spp insects spread due to the presence of puddles of water, which mosquitoes use to lay eggs, hatch into larvae, and develop into pupae before becoming adult mosquitoes. Each Anopheles spp. breeds in a distinct environment depending on where it lives (Sukowati, 2008) While buffalo puddles have the greatest salinity (2 ppm), standing water (13 locations) is the most prevalent breeding habitat type, the water in as many as 15 locations is murky, and only 5 locations are shaded. The majority of these locations are also exposed to direct sunshine. Many varieties of flora and animals were found in the water including mosses and rice plants, as well as tin head fish, water hyacinth and grass and moss in the rivers, rice fields, lakes and buffalo puddles. The salt level of the breeding habitat discovered on Sumba Island ranges from 0-2 this implies that the breeding habitat is mainly fresh water and brackish water. spp. normally live with a salinity of 0% in fresh water and 0-7% in brackish water.

At water salinity levels as low as 7.5ppm, An. sundaicus is the most common mosquito species on Sumba Island, and it may thrive in coastal locations with an altitude of between 0 and 40 dpl. According to hourly fluctuations in the number of anopheline species, the density begins to grow after midnight when most people begin taking naps. More than 60.46 percent of Anopheles' resting activity occurred outside the home or around the cage (Table 2). For the most part, An. sundaicus was discovered resting in houses and walls, whereas An. annular was the least frequent species to be found there. However, An. kochi was not observed biting or resting in the home. According to this information, after sucking blood, mosquitoes would spend longer time outside before searching for a place to lay their eggs and reproduce.

DHF (Dengue Fever)

Rainwater plays a critical role in the supply of clean water in coastal areas. Keeping rainwater in barrels that aren't sealed might allow mosquitoes to breed there. According to the findings, the community's attitude was not positive. Many containers aren't closed, and individuals are draining water reservoirs, resulting in a large amount of water being squandered. In addition, because the Ae aegypti mosquito transmits dengue fever, living in close quarters makes it easier for the disease to spread. Because of their propensity to bite several people at once, mosquitoes have an easier time spreading dengue fever in highly populated residential areas.

Larval mosquitoes can transmit the dengue virus as they mature into adult mosquitoes that are capable of carrying the virus, which is why their presence has been linked to an increased risk of DHF. Dengue fever is not directly tied to the characteristics of the plank house or wall home, but the type of house that is damp, dark, and has a large number of holes without wire mesh will make it easier for mosquitoes to enter the house and spread disease. On the basis of female mosquitoes' tendency of searching for victims at night, the Indonesian Ministry of Health (2007) claims. The house is a hive of activity. Ae aegypti is known for persistently sucking blood (multiple bites).

Dengue fever is more likely to spread due to people's tendency to move about (Wong & AbuBakar, 2013). It is common for dengue fever to spread from one person to another by tracking the movement of people within a community. Dengue fever is more likely to spread in densely populated areas, such as coastal buffer zones, where the majority of individuals commute to and from their places of employment each day.

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Filariasis

The location of filariasis patients and the transmission chain are heavily influenced by the environment. Climate, geography, geological features, temperature, humidity, and so on are all examples of the physical environment. The development of filariasis transmission vectors is influenced by the physical environment, which is intertwined with vector life (Tabachnick, 2010). Mosquitoes can breed and relax in the physical surroundings. The spread of B. malayi, a sub-periodic nocturnal and periodic pathogen, is hampered by the existence of reservoir hosts (apes, langurs, and cats) and marshy vegetation. It is possible that the biological environment contributes to filariasis transmission. Aquatic plants, puddles, marshes, and shrubs are examples of the biological environment because they serve as breeding grounds for the Mansonia spp mosquito. Many plants, such as mangroves, mosses and algae, can have an impact on the larvae's survival by obstructing sunlight or protecting them from predators.

Mosquitoes typically have a flying range of between 0.5 and 1 kilometer. Humans who live in close proximity to puddles are at an increased risk of contracting filariasis because the mosquitoes that transmit filariasis are more easily accessible to them. Because they are shielded from sunshine and humidity, shrubs, cow pens, and hanging garments are ideal resting spots for mosquitoes before and after coming into contact with humans. Aside from their affinity for human and animal blood, certain mosquitoes are also known as zoophiles and anthropophiles. Filariasis transmission can occur in areas where there are shrubs, cattle pens, and garments hanging on hooks.

Among the many ways plants influence mosquito life is as a place to lay eggs, a place to hide from predators, a place for larvae to feed and a place for adults to rest until the gonotropic cycle begins. Another factor that helps predict the prevalence of mosquitoes is the availability of different types of plants in an area. Kodi Many aquatic plants, including as moss, algae, and other weeds, have taken up residence in the Balaghar Sub-District. There are a lot of mosquito larvae in this area because of the abundance of these plants.

Health Aspect

The archipelago has a wide range of health issues due to a variety of environmental causes. According to the journals we obtained, coastal and island environments are home to three distinct forms of illnesses. Each of these conditions is brought on by a parasite. Mansonia, Culex, and Armigeres mosquitoes are the primary vectors of filarial worm infections that cause elephant foot disease (EFD). Inflammation of the ducts and lymph nodes, as well as recurring fever, are the most common acute clinical symptoms of the worms' presence in these organs (Gecse & Vermeire, 2018). Excessive growth in the arms, legs, breasts, and genital organs can be permanently disabling at an advanced level. Because this condition can lead to long-term disabilities that make the patient unable to work, they become a burden on their families and society, as well.

Plasmodium protozoa produce malaria, an acute infectious illness that is transmitted by mosquitoes (Paul et al., 2002). The female Anopheles mosquito bite is the vector for the transmission of this parasite. P. falciparum, P. vivax, P. ovale, and P. Malaria are the four species that cause malaria in humans. Female Anopheles mosquitoes are responsible for the spontaneous transmission of malaria parasites. Infectious malaria can manifest as an acute or long-term infection. Plasmodium asexualis enters the human body and is spread by female Anopheles mosquitoes, which carry the illness. An erythrocyte-parasitic illness, malaria is marked by the detection of asexual forms of Plasmodium in the blood. Anemia, chills, and splenomegaly are all symptoms of malaria infection. It can be either acute or long-term.

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Infection with malaria can be mild or develop systemic consequences, which is described as "severe malaria." Malaria infection. A babesiosa infection, which results in babesiosis, is a parasite illness that resembles malaria (Sudoyo, et al 2006).

Indigenous occurrences are observed to be endemic in numerous Indonesian archipelagic locations. Tidore is home to one of them. If indigenous instances are still detected, the potential for becoming an area of elimination is thwarted. Indigenous is a localized illness. No indigenous transmission of malaria has been observed in the region designated as a malaria-free zone. (Health Department of Tidore, 2016) Activities to strengthen the Early Alert System/SKD can help keep the Akelamo Health Center's operating area free of indigenous illnesses. The Mass Blood Survey, a community-wide effort to collect blood samples for the purpose of identifying the malaria parasite, is one activity that might help enhance the Early Awareness System for puskesmas.

The solution

The goal of filariasis control is to disrupt the transmission chain. Environmental biodiversity and area geography and biological mosquitoes and reservoirs factors, as well as response behavior and attitudes, all play a role in breaking the transmission cycle (Sylvie et al., 2008). Therefore, the entire community must take an active part to guarantee that there are no more vector breeding access points by preventing the creation of puddles.

DHF incidences in Tarakan were exacerbated by the absence of potable water in the neighborhood. As a result, coastal populations' access to safe drinking water is highly reliant on rainfall. Keeping rainwater in barrels that aren't sealed might allow mosquitoes to breed there. Because of this, the 3M program must be included into the overall community structure. Malaria vectors and their breeding habitats have been discovered in several Indonesian islands and coastal areas, so efforts must be made to eliminate breeding sites by stockpiling or draining puddles of water, using insect repellent, and wearing long clothes when engaging in outdoor activities to prevent the transmission of malaria to others.

Conclusion

Mosquitoes can reproduce in unfavorable environmental conditions, such as the presence of disease agents conveyed by water media, which can lead to the emergence of endemic illnesses such as malaria and dengue fever.

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