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ЭПИДЕМИОЛОГИЯ ЛИХОРАДКИ ДЕНГЕ И СТРАТЕГИИ ЕЕ КОНТРОЛЯ В ЭНДЕМИЧНЫХ РАЙОНАХ ЮЖНОЙ АЗИИ С РАЗЛИЧНОЙ ПЛОТНОСТЬЮ НАСЕЛЕНИЯ

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EPIDEMIOLOGY OF DENGUE FEVER AND STRATEGIES FOR ITS CONTROL IN ENDEMIC AREAS OF SOUTH ASIA WITH DIFFERENT POPULATION DENSITIES

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Резюме. Лихорадка Денге является серьезной проблемой общественного здравоохранения в Южной Азии, особенно в районах с высокой плотностью населения. В статье рассматривается эпидемиология лихорадки денге и стратегии ее контроля в густонаселенных городских районах Южной Азии по сравнению с малонаселенными регионами островного континента. На основании обзора данных о динамике передачи инфекции, инфраструктуре здравоохранения, социально-экономических условиях жизни установлены сложности управления лихорадкой Денге в районах с различной плотностью населения.

Ключевые слова: заболеваемость Лихорадкой Денге, эпидемиология, плотность населения, механизм передачи.

Resume. Dengue fever is a major public health problem in South Asia, especially in areas with high population densities. The article examines the epidemiology of dengue fever and its control strategies in densely populated urban areas of South Asia compared with sparsely populated regions of the island continent. Based on a review of data on the dynamics of infection transmission, healthcare infrastructure, and socio-economic living conditions, the difficulties of managing Dengue fever in areas with different population densities have been established.

Keywords: incidence of Dengue fever, epidemiology, population density, transmission mechanism.

Relevance. In order to deal with public health issues such as dengue it is crucial to understand epidemiology trends with respect to the environment and population affected. With urbanization in South Asia and island nations having unique challenges, this comparison highlights the need for localized public health interventions.

Purpose: this report compares dengue epidemiology and control strategies between densely populated urban areas in a South Asian country and sparsely populated regions of an island. By looking at transmission patterns, healthcare response and community engagement, the report seeks to identify best practices and learnings for future dengue control.

Tasks:

1. Review existing literature on dengue epidemiology and control in both places.
2. Analyze data on dengue cases, vector populations and healthcare response.
3. Identify key factors affecting control strategies in urban and rural areas.

4. Highlight successes and areas for improvement.

Material and methods. A review of the literature on the retrospective analysis of the incidence of Dengue Fever from various agencies, regulations and guidelines of the Lake City National Institute of Health, the All India Institute of Medical Sciences, the International Epidemiological Association, the National Center for Vector-Borne Diseases, as well as textbooks such as Comprehensive Guidelines for the Prevention and Control of Dengue Fever, Dengue Hemorrhagic Fever and Dengue fever in Recent research and recent advances in public health, edited by Marcia Aparecida Speranza. Some of the data was collected from sources such as PubMed Central research and ResearchGate, as well as online sites such as the Cleveland clinic and the mayo clinic.

Results and their discussion. In urban centers of South Asia, dengue fever has a clear seasonality, peaking during the monsoon season when conditions are perfect for mosquito breeding [1]. The *Aedes aegypti* mosquito, the main vector for dengue, thrives in urban areas where there is stagnant water due to poor drainage and waste management.

High population density allows for rapid spread of the virus. When one person gets dengue, the chance of transmission increases significantly because of close living quarters. Urban areas also have a influx of migrant population which can introduce new strain of the virus and worsen outbreaks. Data from the health department shows that incidence rates can skyrocket during outbreak years [2]. Some cities report thousands of cases in a few months and overwhelm the local health facilities. Case fatality rate is higher in these areas because of delay in seeking treatment and lack of access to healthcare during peak periods [2,3].

In contrast, sparsely populated regions of an island continent have lower overall incidence of dengue fever. Geographical isolation and low human density reduces the transmission potential. Although incidence is lower, sporadic outbreaks can still happen especially in areas with increased travel or during climate shift that favors mosquito breeding. For example, changes in rainfall can create temporary breeding sites and increase cases in a localized area. These areas may have challenges in healthcare access including limited facilities and healthcare workers. But since they have lower population density, fewer people are at risk at any given time and can mitigate the impact of outbreaks when they happen [4].

Control strategies in urban centers have evolved over time but still face challenges. Efforts include regular fogging and community clean-up to eliminate breeding sites. But these are reactive rather than proactive, done only after outbreaks are reported. Public awareness campaigns to educate about preventive measures (like eliminating standing water and using mosquito repellents) is important. But compliance can be inconsistent because of socioeconomic factors—lower income population may not have resources or awareness on effective prevention strategies. Community engagement in vector control has shown promising results. Initiatives that involves local residents in monitoring and reporting of mosquito breeding sites can empower the community and increase ownership of public health initiatives.

In sparsely populated regions, control strategies are different, these areas rely on robust surveillance systems to detect outbreaks early. Community health workers play a big role in monitoring symptoms and reporting cases to health authorities promptly. With regard to the rural areas, these methods are they are more effective because of existing social

networks. Local authorities and community health workers can mobilize resources and facilitate participation at the community level towards fighting against dengue.

While urban centers often have more health facilities, they tend to have more problems with congestion during an outbreak. This leads to a situation where there is too much waiting and not enough attending to the patients [5]. On the other hand, although the health facilities may be limited, there are usually community health activities that comprise a service delivery for the purpose of getting better control of the infrequent epidemics.

Spending power is one of the major determinants is likely to affect the response to public health problems. It is expected that the wealthy urban populace will have easier access to preventative measures like mosquito nets and repellents compared with the economically disadvantaged. In rural areas these socio-economic factors may also constrain access to health care, but there is usually great social cohesion which brings people together to pool resources and provide assistance during disease outbreaks. Within urban areas, public participation in vector control is often low due to apathy and lack of awareness of the necessity to control these factors of disease transmission. In contrast, rural communities may demonstrate more participation because of shared experience and concern for their families, especially during disease outbreaks.

Conclusion. The comparative analysis emphasizes that dengue fever poses different challenges for different demographics. For instance, the South Asian metropolitan areas have transmission rates which are worsened by both population density and infrastructural problems. Contrastingly, outbreak prone areas are thinly populated and are exposed to these outbreaks due to seasonal travel and environmental conditions. Addressing dengue requires improved healthcare access, increased community mobilization and education, surveillance, and local level tailoring of interventions. Such changes can only be achieved through active participation of governmental authorities, local communities, and international organizations willing to understand and solve the problem which is the Epidemiology of Dengue in these various ecosystems [6]. This clarity is what will be needed to address future efforts in research as well as help construct interventions directed at decreasing the burden of dengue fever.

Literature

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