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Health Risk Analysis for the Slum Dwellers of Midnapore Municipality: As a Future Trend of Disaster

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Abstract : ‘Health is wealth’ is common to all. In the same way, the health risk is misery to society. This study explores the major health risk neighborhoods and underlying factors across slum neighborhoods with distinct socio-economic entities. The data was collected from the 156 slum neighborhoods through the questionnaire survey, and selected variables were processed into SPSSv26, ArcGISv10.4, and the Remote sensing algorithm. PCA and Composite index were used to explore the health risks among the slum neighborhoods. The results indicate that most of the slum neighbourhoods are under a moderate level of health risk with high disease prevalence. Therefore, special care is needed to reduce the health risk among the slum neighborhoods with geo-environmental considerations.

Keywords: Personal hygiene; geospatial techniques; personal hygiene index (PHI); principal component analysis (PCA); SPSSv26; ArcGISv10.4; slum neighborhoods

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1. Introduction:

The health risk is the product of the hazards and vulnerability of people with respect to capacity building. It is argued that failure resistance to environmental threats may cause a health risk. The environmental threat is also caused by hazards and vulnerability [12,19,25]. Hazard and vulnerability in the form of social, human-induced, and natural causes many chronic, communicable, and non-communicable diseases that

harm people mentally, physically, and socio-economically. Slums are known to be the hotspot of a health hazard as they are in deprived, poor socio-economical groups worldwide, particularly in India [5, 7, and 50]. Slums have been overgrowing within a limited city space for the past decade, lacking basic amenities such as safe drinking water, sanitation, minimum living space, housing accommodation, and secure tenure [1, 3, 32, 47, and 51]. Moreover, the slum is deprived of access to healthcare services, formal jobs, proper education, and lack of personal hygiene [21, 35, 39, 45, and 49]. Due to meeting the basic livelihood, they have a lack of awareness about health, hygiene, and the environment. Therefore, they have faced multiple stressors, health shocks, and risks in their daily livelihood. Poverty is strongly related to the health consequences of the poor, as they are unable to meet basic healthcare expenditures. Despite that, many factors are determinants of the health risk of the urban poor. Moreover, little is known in slums regarding the magnitude, distribution pattern, and risk factors of illness before the manifestation of havoc health consequences such as stroke, kidney failure, TB, heart disease, nerve problems, AIDS, etc. [9, 13, 29, 43, and 22]. Furthermore, slum dwellers have reported both infectious and non-infectious chronic diseases such as asthma, hypertension, diabetes, mental illness, cancer, skin diseases, diarrhea, obesity, underweight, alcohol use, reproductive health problems, etc. Therefore, the present study aims to explore the major health risk neighborhoods and underlying factors across slum neighborhoods with distinct socio-economic entities.

2. Study Area

Midnapore municipal area consists of 25 wards (in 2013) with an area of 2000 hectares (20 km²), and it has been recognized as a Class-I city with a population of 169,127 (Census of India, 2011). It extends from 87° 17' 18.57" to 87° 20' 30.12" East Longitude and 22° 23' 44.56" to 22° 26' 34.91" North Latitude (Fig.2.1). It is bounded by the banks of the Kangsabati River (differently known as Kasai and Cossye) in the south. It is well-connected with roads (NH-60) in the east, railway lines to the state capital, Kolkata, forest and agricultural land to the west, and agricultural land in the north. It is well organized by recent traffic signals, good infrastructure facilities, multi-storied buildings and shopping stores, small-scale industries, educational centers, healthcare centers, etc. [24,42]. Therefore, Midnapore city has been growing with the population, which indicates the developed city due to rapid rural to urban migration and dependency on its hinterlands by providing administrative, educational, and healthcare facilities. But beyond the curtain, there lies the unhygienic environment of the slums (156) with no proper sanitation, no sufficient space for dwelling, and no sign of least comfort of day-to-day life, which leads to poor living conditions, chronic

public health as well as child health problems.

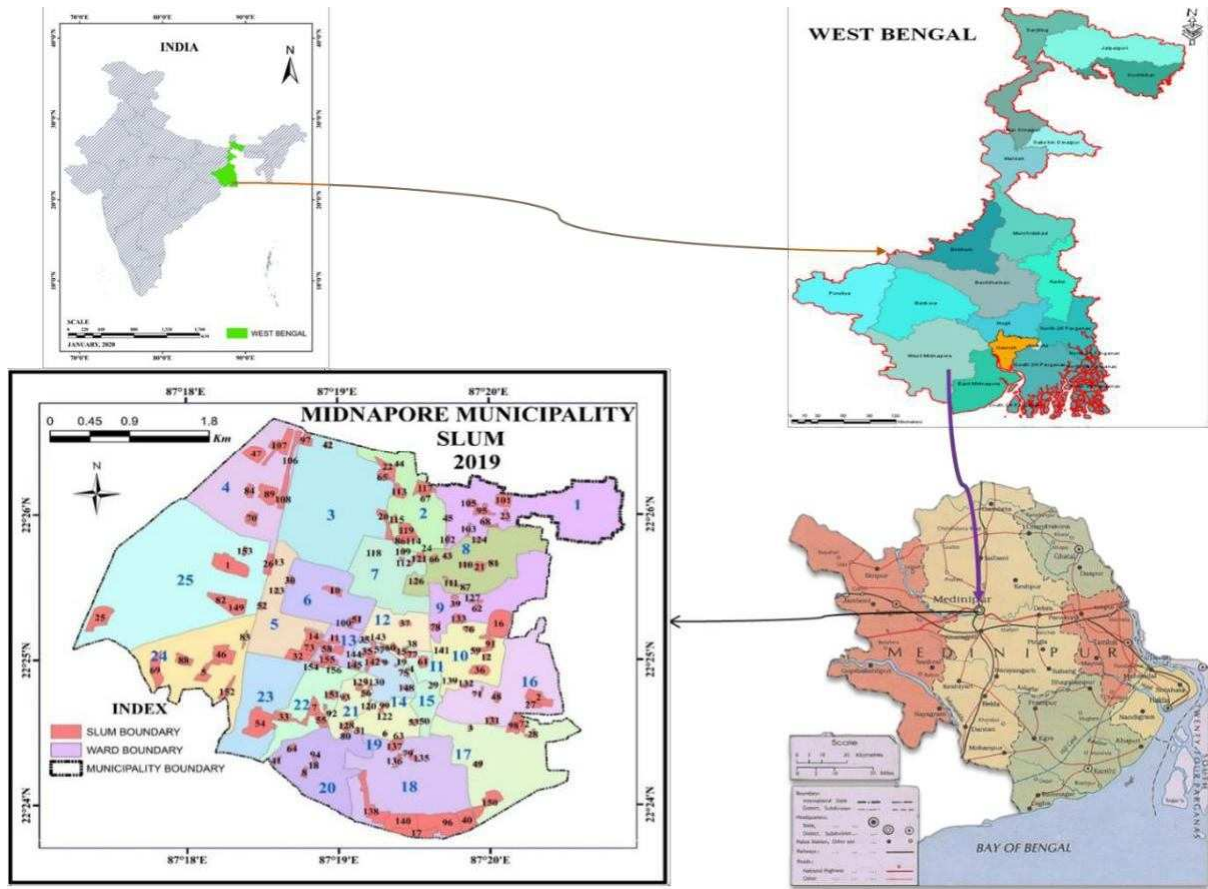


Fig.2.1: Location map of the study area (Source: Midnapore Municipality & Author, 2022)

3. Data and Methods

Different factors have contributed to the health risk of the community. The study was undertaken on air quality, average annual temperature, socio-economic vulnerability, personal hygiene, and distance to existing healthcare centers (HCF), which were grouped into four model maps: distance to HCF, environment vulnerability, personal hygiene, and socioeconomic vulnerability. Data has been collected from the West Bengal Pollution Control Board (WBCPB, <https://www.wbpcb.gov.in>), Landsat OLI-8 data from USGS (<https://earthexplorer.usgs.gov>) for land surface temperature (LST), and data of personal hygiene and socio-economic vulnerability collected through questionnaire survey schedule and location of the major healthcare center. PCA was used to find the PHI and socio-economic vulnerability [32, 46, and 27] through SPSSv26 and mapping in ArcGIS v 10.4, while environmental vulnerability and distance to HCF were mapped in ArcGIS v 10.4 (Fig.3.1 and 3.2). All the model maps were then overlaid to find the health

risk zone of the slum neighborhoods and the magnitude of health risk.

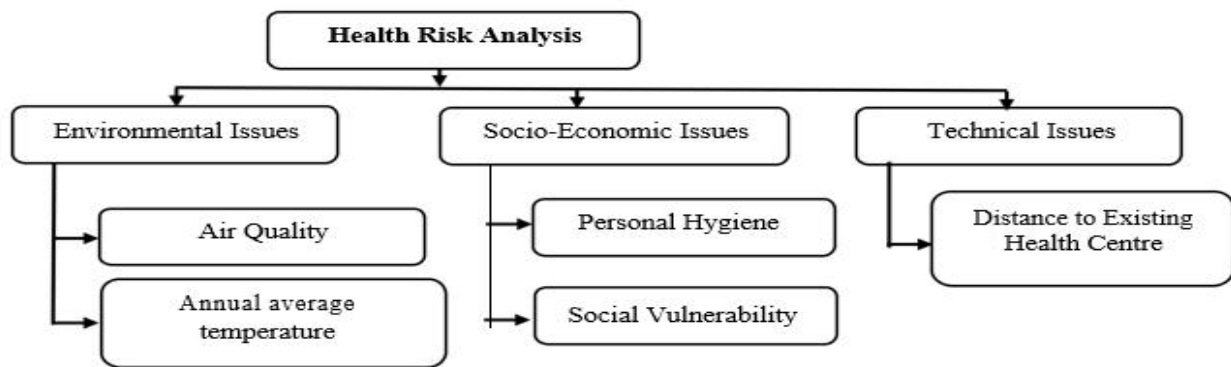


Fig.3.1: Variables and model map used for health risk analysis (Source: Author)

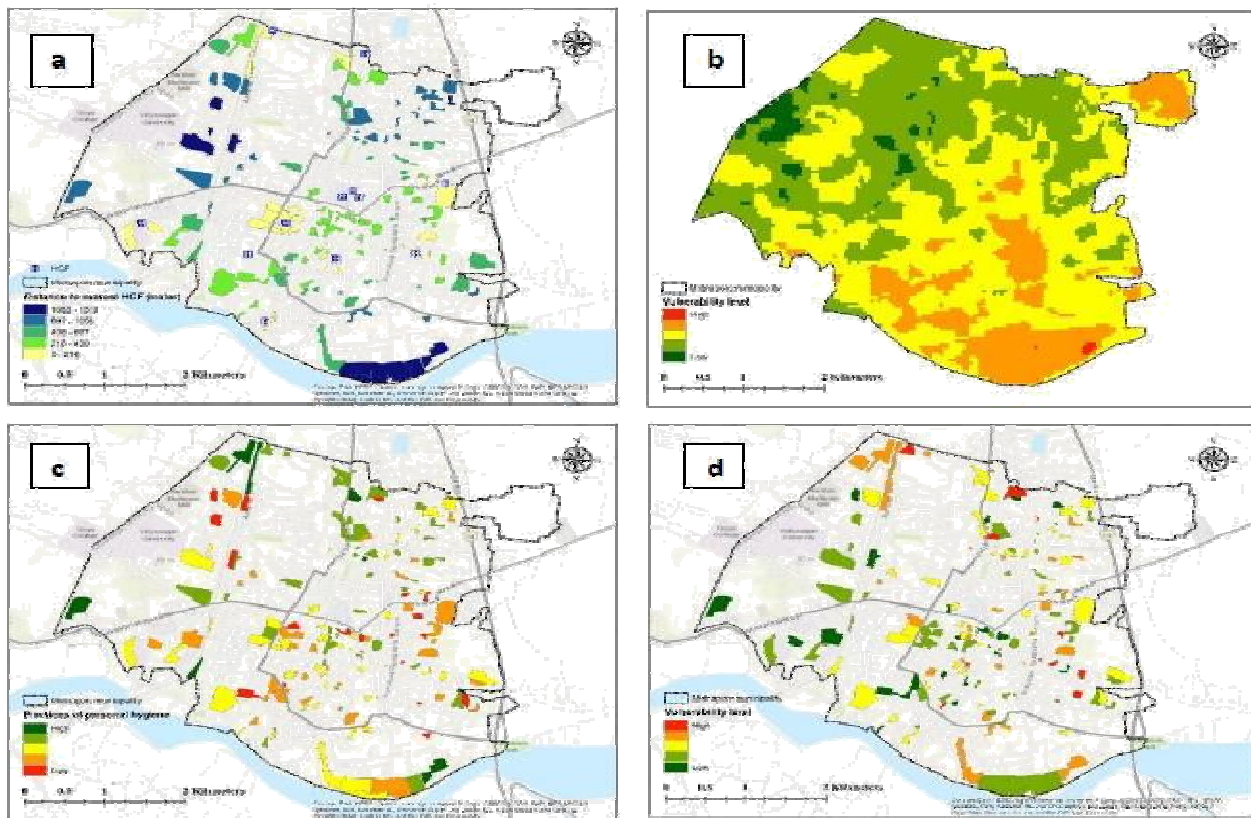


Fig.3.2: Health Risk variables a. Distance to HCF b. Environmental issue or vulnerability c. Personal hygiene d. Socio-economic vulnerability (Source: Author)

4. Result and Discussion

Health risks are common in slums in India. Based on the employed criteria, the magnitude of health risk was shown in Fig.4.2, which revealed that most of the slum is undergoing moderate health risk. However, many slum neighborhoods are at high health risks, such as Palbari, Bara astana sirisbagan, Beltala, the back side of Commerce College, Sialdanga, and Nibeditapallybastee. Therefore, special care should be given to those slums

with high health risks and reduce the burden of health expenditures. The study also suggests that many underlying socioeconomic, demographic and services of basic amenities-related factors may contribute to health risks, which were not included due to restraint of data availability and economic viability. Moreover, further refinement and research need to focus on health risk factors. The reason behind health risks in the study area the author argues that lack of awareness, lack of primary healthcare services, housing accommodation, lack of waste material treatments, lack of sanitation and regular cleaning of a drain (sewerage system), lack of nutritious foods, overeaten junk foods of children and adolescents, alcoholism, smoking and lack of personal hygiene, etc promote disease prevalence (Fig.-4.2) and health risk based on collected data.

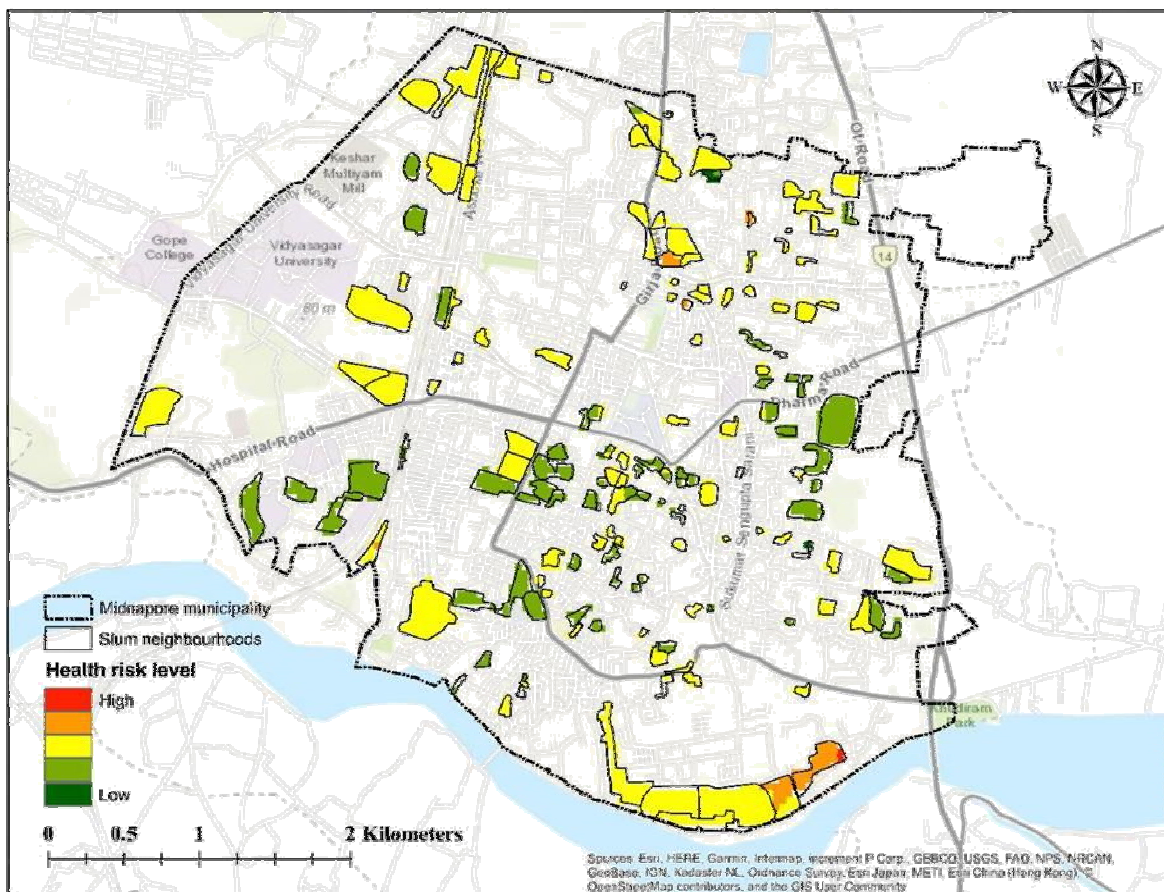


Fig.4.1: Spatial Distribution of slums as per magnitude of health risk (Source: Author)

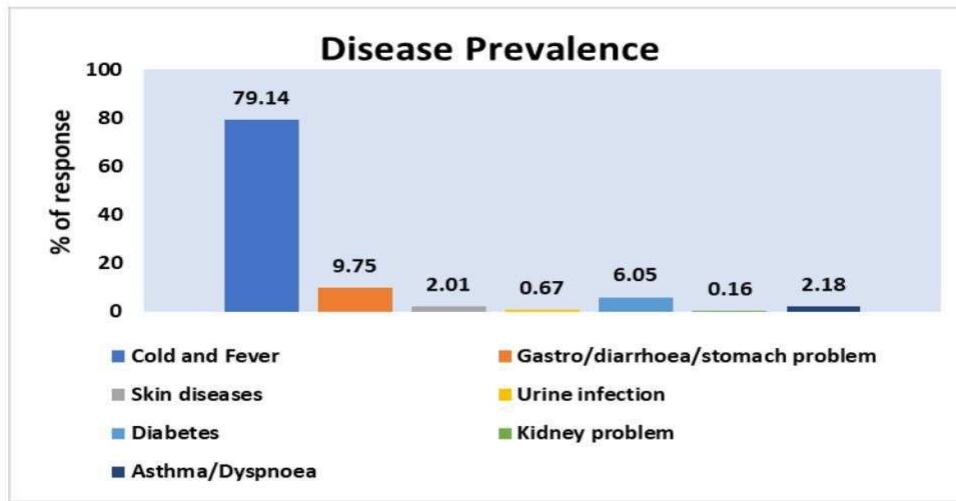


Fig.4.2: Disease prevalence in the slum neighborhoods in the study area (Source: Author, Field survey, 2022)

5. Conclusion

Lifestyle behavior depends on cultural and behavioral habits directly allied to health awareness, which may lead to a healthy life and society. Lifestyle behavior is in trouble cause of different health problems and economic and environmental challenges. All cities and megacities in developing countries contain huge slum areas with very high population growth. As a result, they faced different vulnerability conditions such as local environment, wired housing conditions, huge water, air, and soil pollution, monsoonal waterlogging, violence, accidents, and very high prevalence of diseases, which increased their health risk as soon as possible. Due to the economic crisis, they are turned into bad hygienic practices, unhealthy food habits, smoking, alcoholism, malnutrition, lack of physical exercise, etc. Most of the slum neighborhoods of the study area face health shocks during the whole year, and they are forced to take a loan or mortgage loan or sell their household property to recover from health shocks. Their sickness or mental conditions control detrimental housing and environmental conditions. As a result, physical abuse or beating and mental torture are the common types of women violence among the family in slum neighborhoods. Slum-dwellers are less aware during menstruation care due to being unable to afford sanitary napkins and cleaning dresses daily due to a lack of continuous supply of water. Finally, slum neighbors are recognized as having moderate to low health risk levels. The employed model would have been useful to explore the significant factors in this concern.

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Declarations:

Conflict of interest

There is no potential conflict of interest was reported by the authors.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants involved in the study.

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