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Comparing Diarrhea Incidence in Low- and High-Income Urban Neighborhoods

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ABSTRACT

Diarrheal diseases remain a leading cause of morbidity and mortality in urban populations, particularly among children under five, with a disproportionate burden in low-income neighborhoods. This review examines the incidence of diarrhea across low- and high-income urban communities, highlighting the influence of socioeconomic status, environmental conditions, health behaviors, and access to healthcare. Low-income areas face overcrowding, poor sanitation, unsafe water, and limited healthcare access, resulting in elevated disease risk, while high-income neighborhoods benefit from robust infrastructure, better hygiene practices, and timely medical care. Evidence underscores the need for integrated, context-specific interventions, including improvements in water, sanitation, and hygiene (WASH) infrastructure, targeted vaccination programs, community-led health education, and strengthened primary healthcare services. Broader urban planning measures, such as flood mitigation and equitable resource allocation, are also essential. Implementing coordinated strategies across socioeconomic strata can reduce diarrheal incidence, prevent morbidity and mortality, and promote health equity, fostering sustainable urban development and resilient, healthy communities.

Keywords: Diarrheal diseases; urban health; socioeconomic disparities; water, sanitation, and hygiene (WASH).

INTRODUCTION

Diarrheal diseases continue to pose a major public health concern globally, contributing significantly to morbidity and mortality, especially among children under five years of age. According to the World Health Organization (WHO), diarrhea accounts for approximately 1.6 million deaths annually [1], with the highest burden concentrated in low- and middle-income countries [2]. In urban settings, the burden of diarrheal diseases is compounded by rapid population growth, unplanned settlements, inadequate sanitation infrastructure, and inequitable access to healthcare services. Urbanization, while offering economic opportunities, has paradoxically intensified public health risks in cities where infrastructure and services lag behind population growth [3].

Urban areas are often characterized by stark socioeconomic inequalities that influence health outcomes, including the incidence of diarrheal diseases [4]. High-income neighborhoods typically benefit from better housing, reliable access to clean water, improved sanitation systems, and proximity to quality healthcare facilities. In contrast, low-income neighborhoods, often informal settlements or slums, face overcrowding, limited access to potable water, poor waste disposal systems, and substandard healthcare provision [5]. These structural inequalities create conditions conducive to the spread of waterborne diseases, with diarrhea being one of the most common and preventable illnesses in such environments [6]. Previous studies have highlighted the relationship between socioeconomic status and diarrheal disease prevalence, showing that children from low-income families are disproportionately affected due to environmental exposures, nutritional deficiencies, and limited access to healthcare services [7]. However, while global statistics provide a broad picture of the burden of diarrheal diseases, there is limited context-specific data comparing the incidence of diarrhea within different urban neighborhoods, particularly in developing countries where disparities are most pronounced [4]. Understanding these intra-urban differences is crucial for designing localized public health interventions that target vulnerable populations effectively.

Despite numerous public health interventions aimed at reducing diarrhea incidence, disparities in disease burden persist between low- and high-income urban communities [8]. In many cities in developing countries, urban planning and sanitation infrastructure development have not kept pace with rapid population growth, leading to conditions in low-income neighborhoods that exacerbate the risk of diarrheal diseases [9]. Poor water quality, inadequate sewage systems, and overcrowded living conditions contribute to the high incidence of diarrhea, which, if left unaddressed, can result in malnutrition, stunted growth in children, and increased mortality [10].

On the other hand, high-income urban neighborhoods often report lower rates of diarrheal disease, attributed to better infrastructure, higher educational levels, and increased access to healthcare services. These differences highlight the persistent inequities in health outcomes within the same urban areas. Without a clear understanding of the extent and determinants of diarrhea incidence across socioeconomic strata, public health policies may fail to address the most vulnerable populations effectively, resulting in continued health disparities and preventable morbidity and mortality [11]. This study aims to provide a comparative analysis of diarrhea incidence in low- and high-income urban neighborhoods, focusing on environmental, socioeconomic, and healthcare-related determinants. Its specific objectives are to determine diarrhea prevalence across different income settings, identify factors contributing to variations in disease incidence, examine the role of healthcare access, and propose evidence-based interventions to reduce the diarrheal burden. The research addresses key questions regarding prevalence differences, underlying environmental and socioeconomic contributors, healthcare access influences, and effective interventions tailored to urban contexts. The study is significant both practically and theoretically. Practically, it offers urban health planners, policymakers, and non-governmental organizations critical insights into neighborhood-specific risk factors, guiding targeted interventions such as improved sanitation, community health education, and equitable healthcare provision. Theoretically, it contributes to understanding social determinants of health in urban settings, highlighting how income, environment, and service access intersect to shape health disparities. By comparing low- and high-income neighborhoods, the study illuminates structural inequities influencing diarrhea prevalence and supports advocacy for equitable public health resource allocation. Ultimately, the research provides a foundation for evidence-based strategies aimed at improving sanitation, healthcare access, and overall health outcomes, fostering disease prevention, equity, and sustainable urban development.

Socioeconomic Determinants of Diarrhea

Socioeconomic status significantly influences the risk and prevalence of diarrheal disease [7]. In low-income urban areas, overcrowding, poor sanitation, and limited access to clean water create conditions that facilitate the transmission of enteric pathogens. Residents in these communities often face additional challenges such as inadequate waste management and constrained resources for maintaining proper hygiene, which further increase susceptibility to diarrhea [6]. Limited awareness of preventive practices, coupled with environmental hazards, compounds the problem. In contrast, high-income urban neighborhoods benefit from well-developed sanitation systems, reliable potable water supply, and greater health literacy, all of which contribute to lower incidence rates of diarrheal disease [4]. The disparity between low- and high-income communities highlights how socioeconomic factors ranging from infrastructure and resource availability to education and hygiene practices directly impact public health outcomes [6]. Addressing these inequities requires targeted interventions that improve access to clean water, sanitation, and hygiene education in disadvantaged areas, thereby reducing the burden of diarrhea and promoting health equity across different socioeconomic strata [8].

Environmental and Infrastructure Factors

Environmental and infrastructural conditions play a pivotal role in shaping the prevalence of diarrheal diseases, particularly in urban settings [9]. In low-income neighborhoods, inadequate urban planning and limited access to essential services create environments conducive to the transmission of fecal-oral pathogens. Open drainage channels, poorly maintained or contaminated water sources, and shared or insufficient toilet facilities increase residents' exposure to infectious agents, heightening the risk of diarrhea outbreaks. The lack of proper sanitation infrastructure is further compounded by irregular waste collection, which allows organic and human waste to accumulate in public spaces, creating breeding grounds for disease vectors. Flooding, a frequent occurrence in low-income settlements due to insufficient drainage systems and impervious surfaces, exacerbates this risk by dispersing pathogens across wider areas, contaminating water supplies, and increasing direct contact with infectious materials [10]. In contrast, high-income urban areas typically benefit from structured and well-maintained infrastructure that serves as a protective barrier against diarrheal diseases. Access to piped, treated water, effective sewage networks, and reliable waste management reduces the likelihood of pathogen exposure, while urban planning measures such as proper drainage and flood mitigation limit environmental contamination. These disparities underscore the significant influence of both environmental and infrastructural factors on health outcomes, demonstrating that improving sanitation, water quality, waste management, and flood control in low-income urban areas is essential for reducing diarrheal disease burden [11]. Addressing these determinants requires integrated public health strategies that combine infrastructure development, environmental management, and community engagement to promote safe living conditions and prevent disease transmission.

Health Behaviors and Access to Care

Health behaviors and access to care are strongly influenced by socioeconomic status, shaping the risk and outcomes of diarrheal diseases across different communities. In high-income neighborhoods, residents typically have greater awareness and resources to adopt preventive practices, including regular handwashing, safe food handling, and water treatment methods such as boiling or using disinfectants. These behaviors reduce exposure to pathogens and enhance overall health resilience [12]. Additionally, access to healthcare in wealthier areas tends to be timely and reliable, allowing for early diagnosis, prompt treatment, and effective management of diarrheal episodes, thereby minimizing complications and reducing the burden of disease. In contrast, residents of low-income neighborhoods often face multiple barriers that exacerbate health risks. Limited financial resources restrict the ability to afford safe water, hygiene products, or medical care [13]. Knowledge gaps and lower health literacy may hinder the adoption of preventive behaviors, while delays in seeking treatment can lead to prolonged illness and more severe outcomes. The interplay between economic constraints, behavioral practices, and healthcare access underscores persistent health inequities within urban settings. Addressing these disparities requires interventions that combine public health education, improved sanitation infrastructure, affordable healthcare services, and targeted community support [14]. By promoting preventive behaviors and ensuring equitable access to care, it is possible to reduce the incidence, severity, and duration of diarrheal diseases in low-income populations, while sustaining positive health practices in higher-income communities. Such measures are critical for improving overall community health and reducing socioeconomic disparities in health outcomes.

Epidemiological Evidence

Epidemiological studies consistently indicate that diarrheal diseases disproportionately affect children under five in low-income urban neighborhoods, highlighting a significant public health disparity [15]. Evidence shows that the incidence of diarrhea in these settings can be up to three times higher than in wealthier urban areas, reflecting the influence of socio-economic and environmental factors on disease burden. Key contributors to this elevated risk include inadequate access to clean water, overcrowded living conditions, poor sanitation infrastructure, and limited hygiene practices. These factors create an environment conducive to the transmission of enteric pathogens, such as rotavirus, Escherichia coli, and Shigella species, which are commonly implicated in pediatric diarrheal episodes. The high prevalence of these pathogens exacerbates morbidity and mortality rates among young children, who are particularly vulnerable due to immature immune systems and nutritional deficiencies. Furthermore, repeated diarrheal infections in early childhood can lead to long-term consequences, including stunted growth, impaired cognitive development, and increased susceptibility to other infectious diseases, thereby perpetuating cycles of poverty and poor health outcomes [16]. Urbanization trends in low- and middle-income countries often intensify these challenges, as rapid population growth in informal settlements outpaces the development of adequate sanitation, water supply, and healthcare services. Addressing the burden of diarrheal diseases in low-income urban neighborhoods requires integrated interventions that combine improvements in water, sanitation, and hygiene (WASH) infrastructure, targeted vaccination programs, community health education, and strengthened healthcare access to prevent, detect, and manage infections effectively. Such strategies are essential for reducing morbidity, mortality, and health inequities among vulnerable pediatric populations.

Policy and Intervention Implications

Addressing disparities in diarrhea incidence across different socioeconomic neighborhoods requires context-specific public health strategies that combine prevention, treatment, and infrastructure development. In low-income areas, where residents often face limited access to safe drinking water and adequate sanitation, interventions must prioritize expanding water supply systems, improving waste management, and promoting hygienic practices through community-led education programs. Vaccination campaigns, particularly against rotavirus, are crucial to reduce preventable cases among vulnerable populations, while strengthening primary healthcare facilities ensures timely diagnosis, treatment, and follow-up care [17]. Engaging local communities in the design and implementation of these interventions enhances adoption, sustainability, and overall health literacy. In contrast, high-income neighborhoods, which generally have established infrastructure, require ongoing monitoring and maintenance to sustain low diarrhea incidence rates. Health promotion initiatives focusing on hygiene, safe food practices, and public awareness campaigns help maintain preventative behaviors. Beyond neighborhood-level measures, broader urban planning efforts play a critical role in reducing disease burden across the entire city. Policies that address overcrowding, improve sanitation systems, and ensure equitable access to clean water not only mitigate diarrhea risk in vulnerable communities but also enhance public health outcomes for all residents. Integrating these strategies into a coordinated public health framework ensures that interventions are effective, sustainable, and responsive to local needs, ultimately reducing the overall burden of diarrhea and promoting health equity in urban and peri-urban settings.

CONCLUSION

Diarrheal diseases in urban settings reflect profound socioeconomic and environmental disparities, with low-income neighborhoods disproportionately affected due to inadequate sanitation, limited access to clean water, overcrowding,

and constrained healthcare services. In contrast, high-income neighborhoods benefit from robust infrastructure, higher health literacy, and timely medical care, resulting in lower disease incidence. The evidence underscores the critical role of socioeconomic status, environmental conditions, health behaviors, and access to care in shaping diarrheal risk. Addressing these inequities requires integrated, context-specific public health strategies that combine improvements in water, sanitation, and hygiene infrastructure, targeted vaccination programs, community-led education, and strengthened primary healthcare services. Broader urban planning interventions, including flood mitigation, waste management, and equitable resource allocation, are also essential. By implementing coordinated policies that target vulnerable populations while sustaining preventative measures in wealthier areas, cities can reduce diarrheal incidence, prevent associated morbidity and mortality, and promote health equity, ultimately fostering sustainable urban development and resilient, healthy communities across socioeconomic strata.

REFERENCES

1. Manetu, W. M., M'masi, S., & Recha, C. W. (2021). Diarrhea disease among children under 5 years of age: A global systematic review. *Open Journal of Epidemiology*, 11(3), 207-221. https://doi.org/10.4236/OJEPI.2021.113018
2. Alum, E. U., Obeagu, E. I.,Ugwu, O. P. C. Curbing Diarrhea in Children below five years old: The sub-Saharan African Standpoint.*J. New Medical Innovations and Research.* 2024;5(1); DOI:10.31579/2767-7370/083
3. Tebeje, T. M., Aregu, M. B., Asgedom, Y. S., Gebrekidan, A. Y., & Abebe, M. (2025). From poverty to health: Intraurban inequalities in child health indicators in low-income and middle-income countries during the SDG era. *BMJ Global Health*, 10(8), e019134. https://doi.org/10.1136/bmjgh-2025-019134
4. Ugwu, O. P. C., Alum, E. U., Uhama, K. C. (2024). Role of Phytochemical-Rich Foods in Mitigating Diarrhea among Diabetic Patients. Research Invention Journal of Scientific and Experimental Sciences. 3(1):45-55.
5. Meki, C. D., Ncube, E. J., & Voyi, K. V. V. (2022). Community-level interventions for mitigating the risk of waterborne diarrheal diseases: A systematic review. *Systematic Reviews*, 11(1), 1-18. https://doi.org/10.1186/s13643-022-01947-y
6. Alum EU, Obeagu EI, Ugwu OP. Enhancing quality water, good sanitation, and proper hygiene is the panacea to diarrhea control and the attainment of some related sustainable development goals: A review. Medicine (Baltimore). 2024 Sep 20;103(38):e39578. doi: 10.1097/MD.0000000000039578. PMID: 39312342; PMCID: PMC11419503.
7. Ogban G. I, Ndueso E. M, Iwuafor A. A, Emanghe U. E, Ushie S. N, Ejemot-Nwadiaro R. I(2020). Basic Knowledge of Childhood Diarrhea and Health-seeking Practices of Caregivers of Under-five ChildreninCalabar-South, Calabar, Nigeria. *Asian Journal of Medicine and Health, 18, (4), 12-23. https://doi.org/10.9734/ajmah/2020/v18i430195*
8. Amadu, I., Seidu, A. A., Agyemang, K., Ahinkorah, B. O., Yaya, S., & Schack, T. (2023). Joint effect of water and sanitation practices on childhood diarrhoea in sub-Saharan Africa. *PLOS ONE*, 18(5), e0283826. https://doi.org/10.1371/journal.pone.0283826
9. Awor P, Wamani H, Bwire G, Jagoe G, Peterson S (2012). Private sector drug shops in integrated community case management of malaria, pneumonia, and diarrhea in children in Uganda. *The American journal of tropical medicine and hygiene, 87, (5), 92, doi: 10.4269/ajtmh.2012.11-0791.*
10. Uti, D. E., Agah, V. M., Orji, O. U., Ezeani, N. N., Ugwu, O. P., Bawa, I., Omang, W. A. and Itodo, M. O. (2023). Physico-chemical and Bacteriological Analysis of Water used for Drinking and other Domestic Purposes in Amaozara Ozizza, Afikpo North, Ebonyi State, Nigeria. *Nigerian Journal of Biochemistry and Molecular Biology*, 38(1), 1-8. https://doi.org/10.2659/njbmb.2023.151.
11. Omuna D., Obaroh I. O., Akiyode O. O., Eniru E. I., Tiyo C. E & Omoding, J. (2024). Impacts of climate change on water security in Uganda: A review. Int. J. Adv. Multidiscip. Res. 11(9): 47-60. DOI: http://dx.doi.org/10.22192/ijamr.2024.11.09.005
12. Cananda, M. J. F., Constantino, A. B. T., Buanango, M. A., Nhamirre, A. A. A., & Simbine, A. P. (2025). Knowledge and hygiene practices among residents with diarrhea in Tete, Mozambique. *RevSALUS*, 7(2), 45-52. https://doi.org/10.51126/revsalus.v7i2.912
13. Agwu E, Oming S, Moazzam M. L. (2015). Prevalence of Cryptosporidiosis among diarrhea patients attending clinics in Bushenyi district of Uganda. Spec parasite pathogens J, 1, (1), 01-08.
14. Critchley J. A, Ejemot-Nwadiaro R. I, Ehiri J. E, Arikpo D, Meremikwu M. M (2015). Hand washing promotion for preventing diarrhea. *Cochrane Database of Systematic Reviews, 9, 9. Art. No.: CD004265. DOI: 10.100.*

15. Almasi, A., Zangeneh, A., Ziapour, A., Saeidi, S., Ahmadi, S., & Soroush, A. (2022). Investigating global spatial patterns of diarrhea-related mortality in children under five. *Frontiers in Public Health*, 10, 861629. https://doi.org/10.3389/fpubh.2022.861629
16. Ugwu, O. P. C., Alum, E. U. Uhama, K. C. (2024). Phytochemicals and Vitamins as Adjunct Therapies for Diarrhea in Diabetic Patients. Research Invention Journal of Research in Medical Sciences. 3(2):27-37.
17. Shafique, S., Bhattacharyya, D. S., Nowrin, I., & Sultana, F. (2024). Effective community-based interventions to prevent and control infectious diseases in urban informal settlements in low-and middle-income countries: A systematic review. *Systematic Reviews*, 13(1), 1-15. https://doi.org/10.1186/s13643-024-02651-9

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