**Tides of Trouble: Exploring Health Disparities in Flood-Affected Populations in South-Eastern Part of Bangladesh**

**Abstract**

**Background:** The destructive flood of 2024 in southeastern Bangladesh severely impacted the health and livelihoods of vulnerable communities, including pregnant women, children, the elderly, and low-income populations. This study aimed to explore the health concerns, healthcare disruptions, and coping strategies among flood-affected individuals and healthcare providers.

**Method:** A qualitative study was conducted with 16 participants, including flood-affected men and women aged 15-49 and healthcare professionals, using semi-structured interviews. The participants were selected based on their direct experience with the flood and its health impacts. Data were thematically analyzed to identify key concerns and coping mechanisms.

**Results:** The findings revealed significant health challenges, including outbreaks of waterborne diseases, skin infections, and psychological distress. The disruption of essential healthcare services due to damaged infrastructure further exacerbated these issues, particularly for vulnerable groups. Healthcare providers struggled to manage the rising demand for services while facing shortages of medical supplies and inadequate facilities. Affected communities relied on temporary shelters, home remedies, and stored food as coping mechanisms, though these were insufficient to meet their needs.

**Conclusion:** The study highlights the urgent need for comprehensive disaster management strategies that prioritize healthcare infrastructure, especially in vulnerable regions. Improving access to medical services during floods, ensuring clean water and sanitation, and providing targeted care for vulnerable groups, such as pregnant women and children, are essential to mitigate future health crises.

**Keywords:** Flood, Health Disparities, Case Study, Bangladesh

**Background**

Flooding, a common natural disaster in South-Eastern Bangladesh, poses significant threats to public health, with impacts ranging from immediate physical injuries to long-term health complications. The immediate health effects include hypothermia, drowning, and injury, compounded by secondary risks such as animal attacks and loss of access to healthcare due to the destruction of medical infrastructure (Du et al., 2010). Additionally, floods often result in the disruption of sanitation systems, contaminating local food and water supplies, which increases the risk of infectious diseases such as gastrointestinal disorders and respiratory infections (Levack, 1995; 1999; World Health Organization). For instance, a study in Pakistan documented widespread cases of viral flu, pneumonia, asthma, allergic bronchitis, and chronic obstructive pulmonary disease among flood survivors due to exposure to contaminated water and a lack of shelter (Baqir et al., 2012).

Flooding also poses a grave risk to maternal and reproductive health. Safajou et al. (2024) found that maternal mortality rates in flood-affected areas were three times higher than the national average, largely due to inadequate access to healthcare and unsafe hygiene conditions. Additionally, flood-related vulnerabilities exacerbate health risks for women and children, with pregnant women experiencing higher rates of complications, urinary infections, and malnutrition (Abu-Hena Mostofa Kamal et al., 2018). The lack of access to HIV prevention and treatment further compounds health risks for people living with HIV (PLWHIV) in disaster settings, underscoring the need for more robust healthcare systems to ensure continued care during crises (Anthonj et al., 2015). Studies in urban slums of Dhaka have linked flooding to infant malnutrition, decreased breastfeeding, and increased diarrheal diseases, revealing a complex interplay between flooding, food scarcity, and maternal and child health (Goudet et al., 2011). This emphasizes the need for more targeted reproductive healthcare interventions in flood-prone regions.

The mental health consequences of flooding are equally profound, with research highlighting a strong correlation between flood exposure and mental disorders such as anxiety, depression, and post-traumatic stress disorder (PTSD) (Fewtrell and Kay, 2008; Carroll et al., 2010). Mental health outcomes are influenced by factors such as pre-existing mental health conditions, socioeconomic status, and the severity of the flood. Lamond et al. (2015) observed that lower-income individuals were particularly vulnerable to severe mental health crises following flooding. However, research indicates that there is no significant difference in the prevalence of mental health conditions like anxiety and PTSD between individuals affected by multiple floods and those affected by a single event (French et al., 2019). Women, in particular, are more susceptible to mental health challenges post-flood, as traumatic events have been shown to disproportionately impact their mental well-being compared to men (Axinn et al., 2013). This calls for mental health interventions tailored to the unique needs of flood-affected populations.

Despite the scale of the problem, access to healthcare in flood-affected regions remains limited. Salami et al. (2014) noted that while victims acknowledged government efforts to provide relief, many were dissatisfied with the inefficiencies in aid distribution, such as long wait times and travel distances. Saha (2023) further highlighted the additional challenges that flood-affected populations face in accessing healthcare, which are exacerbated by non-functional healthcare centers and inadequate transportation infrastructure. To mitigate these barriers, healthcare professionals must assess family resilience and work with flood victims to identify strengths and weaknesses to support their recovery (Bruneau et al., 2003).

Flooding also has broader social and economic impacts. Victims often experience psychological trauma from property loss, while communities face disrupted public services and reduced economic productivity (Bubeck et al., 2017; Allaire, 2018). Flood-induced economic shocks also extend to local governments, which must cope with revenue losses and the cost of repairing damaged infrastructure (Svetlana et al., 2015). Effective risk mitigation, therefore, requires a comprehensive understanding of both the direct and indirect impacts of flooding on communities, as well as the effectiveness of existing response strategies. Haer et al. (2016) recommend a people-centered approach to flood risk communication, while Mai et al. (2020) advocate for proactive investments in infrastructure, technology, and capacity-building as long-term solutions to bolster community resilience against flooding.

This study aims to deepen the understanding of the health impacts of flooding in Feni, Bangladesh, with a particular focus on reproductive and mental health. By analyzing the experiences of healthcare providers and flood-affected individuals, this research seeks to inform strategies for improving healthcare access and resilience in flood-prone areas.

**Methods**

**Study Design**

Following a qualitative research approach and case study design this research was conducted at Feni, a district of south-eastern Bangladesh, which was experience the worst flood ever in between August to September 2024.  According to reports, this flood was the epicenter of one of the worst floods the nation has ever experienced, which was allegedly caused by a neighboring country's dam (Phillips, 2024).

**Study Participants and Sampling**

Participants in this study were chosen purposively from selected healthcare centers in flood-affected parts of Feni district, including XYZ and nearby villages. Participants included healthcare providers and flood-affected men and women with significant experience who could contribute their experiences. The study's inclusion criteria considered men and women who were affected by flooding and were between the ages of 15 and 49. Professionals in reproductive health and healthcare were also included. As of sample size in qualitative research is not determined by a set of rules, the sampling procedure in this study was carried out repeatedly until data saturation was achieved, which indicates that no more new information or insights were arising from the interviews.

**Data Collection Tools and Technique**

This study's collection of data included in-depth, semi-structured face to face interviews conducted between August and September 2024. As the study participants were selected purposively, a brief and unambiguous explanation of the study's goals was given to the participants before the interviews for their consent to participate in the study. One or two open-ended questions were asked at the beginning of the interview, such as what the participants thought the day of the flood occurrence was like or what difficulties they encountered. To obtain full information, specific questions were then posed. On average, 45 minutes passed throughout each interview. During the interviews, a tape recorder for recording the data and the participants' emotions, facial expressions, and body language were closely observed and documented.

**Data Analysis**

The Granheim approach was utilized to do a thematic content analysis on the interview data (Graneheim & Lundman, 2004). The analysis of the participants' statements was considered the actual content, while the interpretation and assessment of their answers was considered the latent content (Priest et al., 2002). Every interview was recorded, and it was immediately transcribed verbatim. Every interview was rapidly analyzed, allowing the knowledge gained to guide the data collection procedure in the following interviews. To be more precise, each interview was read several times by X and Y to fully comprehend its content. Condensing and abstracting techniques were used to isolate codes and give them specific names. Similar codes were grouped together to form subcategories. Based on the similarity of their content, these subcategories were then further classified into larger groups in the following stage. The implementation of a systematic process facilitated a rigorous analysis of the data, hence enabling the identification of noteworthy themes pertaining to the specific difficulties faced by participants affected by floods.

**Ethical Consideration**

**Result**

**Participants Profile**

The study included 16 participants (***Table01***) who were divided into two main categories: healthcare providers and flood-affected men and women. The flood-affected participants were aged between 15 and 49 and provided diverse insights into the health and socioeconomic impacts of the 2024 flood. This group included men and women from various backgrounds such as farmers, homemakers, and teachers who experienced loss of livelihood, property damage, and limited access to essential healthcare. Pregnant women and mothers also highlighted the severe disruption in prenatal care and childcare services.

The healthcare providers, on the other hand, shared their experiences of dealing with the overwhelming health crises caused by the flood, particularly in maternal and reproductive healthcare. They included nurses, midwives, healthcare administrators, and community health workers who faced numerous challenges, including managing disrupted medical supplies, providing care in temporary shelters, and addressing an increase in waterborne diseases. This participant profile captures the varied yet interconnected experiences of those most affected by the flood, offering a comprehensive understanding of the disaster's impact.

***Table01:*** Profile of the participants

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant ID** | **Gender** | **Age** | **Occupation** | **Role in Study** |
| 1 | Male | 38 | Farmer | Flood-affected male |
| 2 | Female | 29 | Homemaker | Flood-affected female |
| 3 | Female | 45 | Midwife | Healthcare provider (Reproductive health) |
| 4 | Male | 41 | Healthcare Administrator | Healthcare provider |
| 5 | Female | 34 | Pregnant (No formal occupation) | Flood-affected female (Pregnant) |
| 6 | Male | 47 | Teacher | Flood-affected male |
| 7 | Female | 28 | Nurse | Healthcare provider (Reproductive health) |
| 8 | Male | 49 | Fisherman | Flood-affected male |
| 9 | Female | 33 | Community Health Worker | Healthcare provider |
| 10 | Male | 36 | Local Shop Owner | Flood-affected male |
| 11 | Female | 24 | Student | Flood-affected female |
| 12 | Male | 43 | Construction Worker | Flood-affected male |
| 13 | Female | 39 | Midwife | Healthcare provider (Reproductive health) |
| 14 | Male | 29 | Farmer | Flood-affected male |
| 15 | Male | 28 | Social Worker | Voluntary Service provider |
| P16 | Male | 35 | Shopkeeper | Flood-affected male |

**Health Implications and Socioeconomic Effects**

The flood of August 2024 stands as a devastating event that exacerbated pre-existing vulnerabilities, bringing to light the dire consequences of extreme weather on human health and socioeconomic conditions. Respondents frequently described the unprecedented nature of this disaster, noting how rapidly the floodwaters overtook homes, destroyed livelihoods, and compromised their health. The combination of prolonged exposure to stagnant, polluted water and inadequate sanitation facilities led to a surge in waterborne illnesses, skin infections, and snakebites, often leaving communities overwhelmed and without access to timely medical care. One respondent vividly captured the impact:

*"We had never experienced flooding in our lives. Water remained in our house for more than seven days, creating a terrible situation. The sanitation systems were severely compromised as dirty water filled our houses and streets.”*

The socioeconomic repercussions were equally disastrous. Rural farmers, in particular, bore the brunt of the flood’s wrath. Investments in crops, livestock, and fishponds were submerged, resulting in not only the immediate loss of food security but also long-term financial instability. For many families, their entire livelihoods were swept away. One participant explained the tragic loss of both assets and hope:

*"I had cultivated fish worth 22,000 taka in my pond and owned cows and hens, all of which are now lost to floodwater... My crops, which were almost ready to harvest, are now submerged. Insects and fish are now feeding on them. My whole life is damaged.”*

In addition to the direct loss of property, the prolonged displacement and destruction of infrastructure left many families with no access to safe drinking water, functional sanitation, or healthcare, further exacerbating the crisis. The widespread socioeconomic disruption points to the urgent need for investment in climate-resilient infrastructure, early warning systems, and stronger social safety nets for the most vulnerable populations.

**Disruption of Healthcare Access**

The flood exposed severe gaps in the healthcare infrastructure, particularly in the ability to respond to large-scale environmental crises. Many respondents shared harrowing accounts of healthcare centers, including government hospitals, being either partially or fully submerged, leading to the suspension of critical services. The inability to access healthcare during such emergencies, especially in rural areas where hospitals were often the only source of medical aid, led to untreated injuries, worsening chronic illnesses, and preventable deaths. One respondent lamented the condition:

*"My father's kidneys are damaged. He was in dying need of dialysis. However, the service in our district hospital was suspended for many weeks. As a result, my father endured immense suffering, with severe swelling in his legs.”*

Medical camps were set up to address the rising number of patients suffering from flood-related diseases, but these were often overcrowded, under-resourced, and unable to meet the immense demand for services. One participant described the chaos of trying to receive care:

*"We had tried to receive treatment from a nearby medical camp, but it was so crowded that we couldn’t get the proper medication.”*

The response highlighted the stark reality of inadequate preparedness in health systems to deal with disasters of this magnitude. The severe shortage of essential medicines, doctors, and medical supplies led many to resort to traditional remedies, which sometimes worsened their health conditions. This theme emphasizes the need for disaster-resilient healthcare infrastructure, mobile health clinics, and improved emergency response mechanisms in flood-prone areas.

**Effects on Vulnerable Groups**

While the entire population was severely affected, certain vulnerable groups, including the elderly, pregnant and lactating women, and children, faced disproportionate challenges. These populations, already struggling with pre-existing health vulnerabilities and inadequate access to resources, were placed at an even greater disadvantage by the flood.

***Impacts on Older Adults***

Older adults were among the most vulnerable due to their limited mobility and heightened dependence on healthcare services. The challenge of evacuation, compounded by the destruction of homes and sanitation systems, led to many elderly individuals going without necessary medications or basic care. As one elderly participant explained:

*"I couldn't leave our house and shift. As a result, I went without food and necessary medications for days... There was no access to sanitation facilities, too."*

The floodwaters not only heightened the risks of disease but also isolated the elderly, making it difficult for them to access care or seek help. This underscores the need for tailored disaster-response strategies that account for the unique vulnerabilities of older adults, ensuring their timely evacuation and continuous access to healthcare services.

***Consequences on Lactating Mothers and Pregnant Women***

Maternal health services were critically disrupted during the flood, with road damages and submerged healthcare centers preventing many pregnant women from receiving necessary prenatal or postpartum care. Lactating mothers faced additional challenges, as their access to clean water and food was severely compromised. One new mother described her struggles:

*"I struggled to find clean water and adequate food. This harshly affected my ability to breastfeed... I only depended on the relief food and water and remained hungry if not available.”*

This group’s health was further jeopardized by a lack of sanitation and increased exposure to infections. Given the critical importance of maternal and infant health during disasters, these findings point to the need for dedicated maternal health interventions, including mobile clinics, specialized shelters for pregnant and lactating women, and targeted nutritional support.

***Child Vulnerabilities in Floods***

Children were among the most severely impacted by the flood due to their vulnerability to malnutrition, waterborne diseases, and the loss of educational infrastructure. Educational institutions, often turned into shelters, were destroyed, depriving children of safe learning spaces and exacerbating the impact on their overall well-being. Many children contracted diseases like diarrhea from drinking contaminated water, as one participant recounted:

*"My daughter fell ill from drinking water stored in a tank. She did not know it was filled with flood water. She began vomiting and suffered from diarrhea.”*

The flood’s impact on children highlights the urgent need for child-centered disaster management plans that ensure access to clean water, food, and continued education during crises.

***Psychosocial Effects of Flooding***

The mental health consequences of the 2024 flood were profound, particularly among poor and marginalized communities. The flood triggered high levels of stress, anxiety, and trauma, as many survivors faced the loss of homes, loved ones, and livelihoods. Displacement, financial ruin, and the scarcity of basic resources contributed to a widespread sense of hopelessness. One survivor encapsulated the emotional toll:

*"The flood took away everything like a nightmare, and we are feeling completely abandoned."*

The lack of mental health services in flood-affected areas meant that these emotional scars often went untreated, further compounding the trauma experienced by survivors. Vulnerable groups, such as pregnant women, children, and the elderly, were particularly affected. These findings point to the need for comprehensive disaster response programs that include mental health support, alongside physical and economic recovery.

**Coping Strategies with Corresponding Recommendations**

Communities deployed various coping strategies during and after the flood, but their effectiveness was limited by the magnitude of the disaster and the slow pace of relief efforts. Displaced families sought refuge in overcrowded shelters, while many others relied on stored food and improvised transportation to survive. However, the lack of disaster preparedness at the household level, combined with insufficient governmental and non-governmental aid, left many communities struggling. A participant explained the need for strategic disaster management:

*"This crisis clearly demands urgent long-term planning. One night, everything seemed fine, but by midnight, the water inside our house had risen to chest level. We were fortunate enough not to drown."*

Respondents emphasized the need for flood-resilient infrastructure, particularly in flood-prone areas. The construction of multipurpose community centers, equipped with healthcare, sanitation, and food supplies, was suggested as a long-term solution for improving disaster preparedness. The idea of community-based boat programs and mobile healthcare units was also put forward as a means of ensuring more timely and effective responses to future floods.

**Discussion**  
The destructive flood of 2024 in southeastern Bangladesh has revealed critical gaps in healthcare and infrastructure, particularly in its impact on vulnerable populations such as the elderly, pregnant and postnatal women, and children. The findings of this study highlight the severe health consequences experienced by these groups, including a surge in waterborne diseases, skin infections, and psychological distress, especially in poorer communities. The disruption of essential healthcare services, amplified by the destruction of infrastructure, worsened the ability of flood-affected individuals to access medical treatment. These challenges were compounded by the inadequate coping strategies adopted by the community, such as reliance on home remedies and temporary shelters, which proved insufficient to address the scale of the disaster.

From an analytical perspective, these findings align with the broader literature on the health impacts of floods, particularly the role of compromised sanitation facilities and prolonged exposure to contaminated water. As Oriza (n.d.) points out, the scarcity of clean water and inadequate sanitation during floods are major factors contributing to the spread of disease. The situation in the 2024 flood mirrors these concerns, with waterlogged areas remaining submerged for days, creating breeding grounds for infections. The surge in waterborne diseases, such as diarrhea and skin infections, underscores the need for improved public health interventions during floods. This is consistent with Paterson et al. (2018), who found that floods often lead to a rise in both communicable and non-communicable diseases, highlighting the critical need for resilient healthcare infrastructure capable of responding to such crises.

A more nuanced analysis of the findings reveals that the health crisis brought on by the flood was exacerbated by the destruction of agricultural productivity and transportation systems, which are essential for both economic stability and access to healthcare. The devastation of farmland and fishponds not only affected food security but also had long-term economic consequences for flood-affected communities, aligning with Banerjee's (2010) research on the impact of floods on agricultural yields. This connection between economic vulnerability and health outcomes is crucial, as it demonstrates that the effects of the flood extended beyond immediate health concerns to include long-term socioeconomic disparities.

The collapse of the transportation system, particularly in the rural setting of Feni, further intensified the healthcare crisis. The destruction of roads hampered relief efforts and made it nearly impossible for many people to access hospitals and medical centers. This is supported by Abdullah et al. (2019), who emphasize that in flood-affected areas, the lack of accessible and affordable transportation discourages people from seeking medical treatment. Similar observations have been made in studies from other countries, such as Klipper et al. (2021) in Jakarta, Indonesia, where healthcare systems become more vulnerable during floods, further compromising the ability to provide timely and adequate care.

One of the most striking findings of this study is the disproportionate impact of the flood on vulnerable groups, particularly pregnant and postpartum women, children, and the elderly. The increased exposure of these groups to the detrimental effects of the flood is consistent with global research, including Morisaki et al.'s (2023) analysis of flood risk for vulnerable populations in Japan. This study found that the elderly and infants are particularly vulnerable to the impacts of flooding, a pattern that is clearly evident in the case of the 2024 flood in Bangladesh. The exposure of pregnant and postpartum women to health risks, such as limited access to maternal healthcare, further emphasizes the need for targeted interventions during natural disasters. Abdullah et al. (2019) also highlight the heightened risks to maternal health during floods in Bangladesh, underscoring the importance of ensuring access to essential services for women during such crises.

Furthermore, the mental health effects of the flood on low-income communities are particularly concerning. The worsening psychological conditions of individuals already facing economic hardship demonstrate the intersection between socioeconomic status and mental health. This aligns with the findings of Flores et al. (2024), who identified similar patterns in flood-affected communities in the United States. The emotional and psychological toll of losing homes, livelihoods, and access to basic services compounds the physical health impacts, revealing the multifaceted nature of flood-related vulnerabilities.

The coping strategies employed by flood-affected communities, while a testament to their resilience, were inadequate in addressing the scale of the disaster. Relying on stored food, using home remedies for minor health issues, and seeking refuge in overcrowded shelters were short-term solutions that failed to meet the long-term needs of the population. Bulambo (2023) emphasizes that coping strategies developed by communities can help them adapt to flood-affected areas, but the extent of the 2024 flood overwhelmed these localized efforts. This finding underscores the need for more comprehensive disaster management strategies that go beyond community-based coping mechanisms and include robust government intervention, infrastructure improvement, and the provision of essential services.

This study has several strengths, including its comprehensive analysis of the 2024 flood's health impacts in southeastern Bangladesh, with a focus on vulnerable groups such as pregnant women, children, and the elderly. By examining both health outcomes like waterborne diseases and mental health issues alongside infrastructure damage, the study offers a multidisciplinary perspective, making the findings relevant for policymakers and healthcare providers. However, the study is geographically limited to one region, which may not reflect the experiences of flood-affected populations across the country. The reliance on qualitative data introduces potential biases, and the short time frame only captures immediate impacts, leaving long-term health consequences underexplored. Additionally, while healthcare access challenges are discussed, mental health interventions are not sufficiently addressed. Despite these limitations, the study provides valuable insights into the complex interplay of health, infrastructure, and socio-economic factors in disaster contexts.

However, to address the severe health and infrastructure challenges caused by the 2024 flood in southeastern Bangladesh, several recommendations are essential. First, strengthening public health infrastructure is critical, particularly by improving water, sanitation, and hygiene (WASH) facilities to prevent waterborne diseases. Flood-resilient healthcare facilities and mobile units are necessary to ensure continuous healthcare access during floods, supported by trained rapid-response medical teams. Specialized care for vulnerable groups such as pregnant women, children, and the elderly should be prioritized through mobile clinics and targeted programs. Disaster preparedness must be enhanced at the community level through training in first aid, hygiene, and flood-specific health precautions, alongside the development of local disaster management committees. Emergency healthcare protocols should be established, and early warning systems strengthened to reduce health impacts. Furthermore, flood-resilient transportation infrastructure, including elevated roads and alternative networks like boats, is vital for ensuring access to healthcare and relief. Addressing mental health through psychosocial support in disaster response, especially in poor communities, can mitigate the psychological toll of floods. Community volunteers should be trained in mental health first aid to provide timely support.

Agricultural and livelihood resilience can be strengthened by promoting flood-resilient practices, such as cultivating flood-tolerant crops and building elevated fishponds. Additionally, diversifying livelihoods and providing insurance schemes will reduce economic vulnerability. Long-term solutions include comprehensive disaster management policies that integrate flood risk reduction, climate adaptation, and infrastructure resilience. Investments in flood control infrastructure, such as levees and drainage systems, should be prioritized, along with floodplain management plans to regulate land use in vulnerable areas. Finally, enhancing coordination among stakeholders—government, healthcare providers, NGOs, and community organizations—is crucial for a coordinated disaster response. Decentralizing disaster response to local authorities and ensuring they have the necessary resources, and decision-making power will improve the effectiveness of relief efforts. Together, these recommendations offer a holistic approach to mitigating the impact of floods on health, infrastructure, and livelihoods, fostering long-term resilience in flood-prone regions like southeastern Bangladesh.

**Conclusion**

The 2024 flood in southeastern Bangladesh revealed critical vulnerabilities in healthcare access, infrastructure, and the well-being of marginalized populations, particularly the elderly, pregnant and postpartum women, and children. The findings underscore the widespread health consequences, including a surge in waterborne diseases, skin infections, and psychological distress, which were aggravated by damaged infrastructure and limited healthcare access. Coping strategies, such as reliance on temporary shelters and home remedies, proved inadequate to meet the scale of the crisis. This study highlights the urgent need for a comprehensive and integrated disaster management approach that not only strengthens healthcare systems and infrastructure resilience but also ensures targeted support for vulnerable groups. Addressing these challenges will be essential to reducing the disproportionate impact of future disasters and promoting long-term social and economic equity in flood-affected areas of Bangladesh.

**References**

Abu-Hena Mostofa Kamal, B., Umama, U., Roman, S., Khan, M. M., Mostofa Kamal α, A.-H., Umama σ, U., Roman ρ, S., & Khan Ѡ, M. M. (2018). Impact of Flood on Women’s Sexual and Reproductive Health: An Empirical Evidence from Northern Bangladesh. *Global Journal of Medical Research: K Interdisciplinary*, *18*.

Allaire, M. (2018). Socio-economic impacts of flooding: A review of the empirical literature. *Water Security*, *3*, 18–26. https://doi.org/10.1016/J.WASEC.2018.09.002

Anthonj, C., Nkongolo, O. T., Schmitz, P., Hango, J. N., & Kistemann, T. (2015). The impact of flooding on people living with HIV: A case study from the Ohangwena Region, Namibia. *Global Health Action*, *8*(1). https://doi.org/10.3402/GHA.V8.26441/ASSET/9FACDAB6-4715-4925-B61A-CC4D5AA283B1/ASSETS/IMAGES/ZGHA\_A\_11818337\_F0003\_OB.JPG

Asim, M., Mekkodathil, A., … B. S.-N. journal of, & 2019, undefined. (n.d.). Post-traumatic stress disorder among the flood affected population in Indian subcontinent. *Ncbi.Nlm.Nih.GovM Asim, A Mekkodathil, B Sathian, R Elayedath, R Kumar, P Simkhada, E van TeijlingenNepal Journal of Epidemiology, 2019•ncbi.Nlm.Nih.Gov*. Retrieved September 16, 2024, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6546152/

Axinn, W. G., Ghimire, D. J., Williams, N. E., & Scott, K. M. (2013). Gender, Traumatic Events, and Mental Health Disorders in a Rural Asian Setting. *Https://Doi.Org/10.1177/0022146513501518*, *54*(4), 444–461. https://doi.org/10.1177/0022146513501518

Baqir, M., Sobani, Z. A., Bhamani, A., Bham, N. S., Abid, S., Farook, J., & Beg, M. A. (2012). Infectious diseases in the aftermath of monsoon flooding in Pakistan. *Asian Pacific Journal of Tropical Biomedicine*, *2*(1), 76–79. https://doi.org/10.1016/S2221-1691(11)60194-9

Bruneau, M., Chang, S. E., Eguchi, R. T., Lee, G. C., O’Rourke, T. D., Reinhorn, A. M., Shinozuka, M., Tierney, K., Wallace, W. A., & Von Winterfeldt, D. (2003). A Framework to Quantitatively Assess and Enhance the Seismic Resilience of Communities. *Earthquake Spectra*, *19*(4), 733–752. https://doi.org/10.1193/1.1623497

Bubeck, P., Otto, A., & Weichselgartner, J. (2017). Societal Impacts of Flood Hazards. *Oxford Research Encyclopedia of Natural Hazard Science*. https://doi.org/10.1093/ACREFORE/9780199389407.013.281

Du, W., Fitzgerald, G. J., Clark, M., & Hou, X. Y. (2010). Health Impacts of Floods. *Prehospital and Disaster Medicine*, *25*(3), 265–272. https://doi.org/10.1017/S1049023X00008141

Fewtrell, L., health, D. K.-P., & 2008, undefined. (n.d.). An attempt to quantify the health impacts of flooding in the UK using an urban case study. *Elsevier*. Retrieved September 16, 2024, from https://www.sciencedirect.com/science/article/pii/S0033350607003198

French, C. E., Waite, T. D., Armstrong, B., Rubin, G. J., Beck, C. R., & Oliver, I. (2019). Impact of repeat flooding on mental health and health-related quality of life: a cross-sectional analysis of the English National Study of Flooding and Health. *BMJ Open*, *9*(11), e031562. https://doi.org/10.1136/BMJOPEN-2019-031562

Goudet, S. M., Faiz, S., Bogin, B. A., & Griffiths, P. L. (2011). Pregnant women’s and community health workers’ perceptions of root causes of malnutrition among infants and young children in the slums of Dhaka, Bangladesh. *American Journal of Public Health*, *101*(7), 1225–1233. https://doi.org/10.2105/AJPH.2010.300090

Haer, T., Botzen, W. J. W., & Aerts, J. C. J. H. (2016). The effectiveness of flood risk communication strategies and the influence of social networks—Insights from an agent-based model. *Environmental Science & Policy*, *60*, 44–52. https://doi.org/10.1016/J.ENVSCI.2016.03.006

Lamond, J. E., Joseph, R. D., & Proverbs, D. G. (2015). An exploration of factors affecting the long term psychological impact and deterioration of mental health in flooded households. *Environmental Research*, *140*, 325–334. https://doi.org/10.1016/J.ENVRES.2015.04.008

Levack, I. (1995). Wilderness Medicine: Management of Wilderness and Environmental Emergencies. *Occupational and Environmental Medicine*, *52*(8), 560. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1128300/

Mai, T., Mushtaq, S., Reardon-Smith, K., Webb, P., Stone, R., Kath, J., & An-Vo, D. A. (2020). Defining flood risk management strategies: A systems approach. *International Journal of Disaster Risk Reduction*, *47*, 101550. https://doi.org/10.1016/J.IJDRR.2020.101550

Safajou, F., Nahidi, F., & Ahmadi, F. (2024). Reproductive health challenges during a flood: A qualitative study. *Nursing Open*, *11*(1), e2044. https://doi.org/10.1002/NOP2.2044

Saha, J. (2023). *The Open Public Health Journal The Pattern of Morbidity and Access to Healthcare Service in the Riverine Flood-prone Villages of Assam, India*. *16*, 18749445269914. https://doi.org/10.2174/0118749445269914231023070506

Salami, K. K., Adedeji, I. A., Ayegboyin, M., & Umego, N. L. (n.d.). *Health Risks and Healthcare Delivery in Flood Disaster Affected Communities in Southwest Nigeria*. https://doi.org/10.36108/NJSA/4102/12(0290)

Svetlana, D., Radovan, D., & Ján, D. (2015). The Economic Impact of Floods and their Importance in Different Regions of the World with Emphasis on Europe. *Procedia Economics and Finance*, *34*, 649–655. https://doi.org/10.1016/S2212-5671(15)01681-0

*UNFPA India | Menstrual Health and Hygiene Management during Emergencies*. (n.d.). Retrieved September 10, 2024, from https://india.unfpa.org/en/publications/menstrual-health-and-hygiene-management-during-emergencies

*World Health Organization. Flooding and Communicable Diseases Fact Sheet. Retrieved October 15, 2011World Health Organization. Flooding and Communicable Diseases Fact Sheet. Retrieved October 15, 2011 - Google Search*. (n.d.). Retrieved September 16, 2024.