



# The Impact of Flood Disasters on Public Health in Sultan Daulat District Subulussalam City in 2025

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**Abstract:** Indonesia is a country prone to flooding, which has wide-ranging impacts on public health, including in Subulussalam City, Aceh Province. This study aims to describe the impact of flooding on community health and the form of post-disaster health service responses in Sultan Daulat Subdistrict in 2025. The study uses a descriptive design with a case study approach based on data from community service activities carried out by lecturers and students of the Medica Bakti Persada Midwifery Academy. Data were obtained from official reports on the number of affected residents and displaced persons, observations of environmental conditions, and documentation of health services provided to 50 affected residents, with a primary focus on pregnant women, toddlers, and the elderly. The results show that the flood led to disrupted access to health services, declining environmental quality, and an increased risk of infectious diseases such as acute respiratory infections, skin diseases, and digestive disorders. Free health services in the form of medical check-ups and simple counseling on personal hygiene, clean water management, and prevention of infectious diseases received a positive response from the community. This activity also demonstrates the strategic role of higher education institutions as partners of local government and as field-based learning centers for students in disaster management. It is concluded that flooding in Sultan Daulat Subdistrict has the potential to cause serious health problems, thus requiring a rapid, well-planned, and sustainable health response, as well as strengthened collaboration between government, health facilities, and higher education institutions in disaster preparedness and management. Further research with more detailed clinical data recording is needed to support evidence-based policy formulation.

**Keywords:** Community Service, Flood, Health Services, Public Health, Subulussalam, Vulnerable Groups.

## Introduction

Indonesia is one of the countries highly prone to disasters, as seen from a geographical, geological, and socio-demographic perspective (Saulnier et al., 2017). Geographically, Indonesia's territory is dominated by water and lies near the equator, making the country susceptible to a tropical maritime climate with relatively high rainfall year-round (Subarno et al., 2025). These conditions increase vulnerability to hydro meteorological disasters, such as flooding from extreme rainfall, tidal flooding (rob), and landslides in hilly and highland areas (Wang et al., 2023). During the dry season, the risk of forest and peat land fires also

increases, mainly due to human activities on agricultural and plantation land.

Geologically, Indonesia lies at the junction of three major tectonic plates and two volcanic belts, namely the Pacific Ring of Fire and the Mediterranean belt (Tellman et al., 2021). This condition makes Indonesia prone to geological disasters such as earthquakes, volcanic eruptions, and tsunamis (Syakbanah & Fuad, 2021). On the other hand, socio-demographically, the large and unevenly distributed population, as well as the diversity of ethnicities, religions, races, and groups (SARA), creates potential for social vulnerability, including horizontal conflicts that can accompany post-disaster crises (Park & Choi, 2025; Saatchi et al., 2024).

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In recent years, floods and landslides in various regions of Indonesia have caused considerable damage and loss of life. In the provinces of Aceh, North Sumatra, and West Sumatra, floods and landslides reportedly caused 753 deaths, 650 missing persons, and approximately 2,600 injuries. A total of 576,300 people were displaced, and the number of victims reached around 3.3 million across 50 affected districts/cities. These figures show the magnitude of the disaster in terms of public health.

The city of Subulussalam in Aceh Province is one of the areas affected by flooding. Based on data from five subdistricts in Subulussalam City, 28 villages, 2,589 households, and 11,807 people were affected by floods and landslides, with 657 households and 3,894 people forced to evacuate. In the Sultan Daulat sub-district alone, floods hit three villages, namely Suka Maju, Jabi-Jabi, and Sigrun, with a total of 878 households and 3,622 people affected. This situation has profound implications for health, especially for vulnerable groups such as pregnant women, toddlers, and the elderly.

In general, flooding poses various health risks, ranging from acute respiratory infections (ARIs) and diarrhea to leptospirosis, skin diseases, and increased vector-borne diseases such as dengue fever and malaria. Flooded environments, poor sanitation, and limited access to clean water exacerbate the situation, requiring a rapid, targeted health response. Law No. 24 of 2007 also emphasizes that disaster risks include potential losses such as death, injury, illness, displacement, property loss, and psychological distress (Acosta-Espana et al., 2024; Ahern et al., 2005).

Universities, including health education institutions, have a strategic role in disaster mitigation and response efforts through the implementation of the three pillars of higher education, particularly community service. Free health services and assistance for communities affected by flooding in the Sultan Daulat District are one form of academic contribution that can also be studied as an illustration of flooding's impact on local community health.

Based on the above description, this activity aims to identify the impact of flood disasters on public health in the Sultan Daulat District of Subulussalam City in 2025, and to describe the health response, including free health services and assistance to flood victims.

## Method

This article uses a descriptive research design with a case study approach on communities affected by flooding in the Sultan Daulat District of Subulussalam City in 2025. The data used is a combination of secondary and primary data obtained during the implementation of community service activities.

### *Research Location and Time*

The research was conducted in Sultan Daulat District, Subulussalam City, Aceh Province. The main activities, which were health services and aid distribution, were carried out on December 5, 2025.

### *Population and Sample*

The population in this study was the entire community affected by flooding in Sultan Daulat District, including vulnerable groups such as pregnant women, toddlers, and the elderly. The research sample consisted of 50 affected community members who participated in free health services at the flood site.

### *Data Sources*

Data on the impact of flooding and landslides in Aceh Province, North Sumatra, and West Sumatra was issued by BNPB as secondary data. Data on the number of villages, households, and people affected in Subulussalam City, including the distribution in Longkib, Sultan Daulat, Rundeng, and other subdistricts.

Direct observation of environmental conditions and the post-disaster situation in Sultan Daulat Subdistrict as primary data. Data on health service activities, in the form of documentation of the number of participants, types of health services provided, and types of assistance distributed.

### *Data Collection Techniques*

Recording data from official reports on the number of affected residents, refugees, and the distribution of affected areas. Observation of the health and environmental situation in the flood location. Simple recording of the general characteristics of health service participants (vulnerable groups, main complaints, and service needs).

### *Data Analysis*

Data is analyzed descriptively and presented in narrative form, describing an overview of the impact of flooding at the city and subdistrict levels. The form and scope of health services provided. The implications of flooding for public health risks and issues, as well as the need for emergency and preventive health services.

## Result and Discussion

### *Overview of the Impact of Flooding in Subulussalam City and Sultan Daulat District*

The floods that occurred in Subulussalam City affected five subdistricts, with three subdistricts experiencing more widespread impacts, namely Longkib, Sultan Daulat, and Rundeng. Overall, 28 villages were affected, with 2,589 households and 11,807

people becoming victims of floods and landslides, and 657 households and 3,894 people having to evacuate.

In the Sultan Daulat District, the floods hit three villages (Suka Maju, Jabi-Jabi, and Sigrun) with a total of 878 households and 3,622 people affected. The floods caused some residents to evacuate, disrupted economic activities, and limited access to adequate health and sanitation services. This situation aligns with the general characteristics of flood disasters in Indonesia, where densely populated areas along river basins are highly vulnerable to flooding due to high rainfall and limited drainage capacity (Mora et al., 2022; Nasution et al., 2022).

#### *Provision of Health Services for Affected Communities*

As an initial response to the impact of the flooding, a team of lecturers and students from the Medica Bakti Persada Midwifery Academy carried out community service activities in the form of free health services through health checks for communities affected by the flooding and the provision of assistance to flood victims to support their livelihoods after the disaster. The activity was held on December 5, 2025, and attended by 50 flood-affected people in the Sultan Daulat District, with the primary targets being pregnant women, toddlers, and the elderly.



**Figure 1.** Data Collection Activities for Disaster Victims

The health checks focused on general conditions, acute complaints that arose after the disaster, and early detection of diseases that are more likely to occur in flood situations, such as respiratory tract infections, skin diseases, and digestive disorders. From the perspective of the three pillars of higher education, this activity

demonstrates the active role of health education institutions in responding to disaster situations with a direct and educational approach, where the presence of health workers at the disaster site not only provides curative services but also has a promotive and preventive function through simple counseling on personal hygiene, clean water management, and the prevention of infectious diseases (Alderman et al., 2012; Alied et al., 2024).

#### *The Impact of Floods on Health and Service Implications*

Theoretically, flooding is associated with an increased risk of infectious diseases and other health disorders. Flooding contaminates clean water sources, accumulates waste, and damages sanitation facilities. These environmental conditions are predisposing factors for the emergence of diarrhea, leptospirosis, skin diseases, respiratory tract infections, malaria, and dengue fever, as reported in various disaster health studies (Martins-Filho et al., 2024; Mat Jan et al., 2023).

In the context of Sultan Daulat Subdistrict, although detailed data on the types and numbers of specific disease cases were not quantified in this activity, the need for emergency and preventive health services was evident from the high level of community participation in the free health check-up activity. The presence of health workers at the flood site provided an opportunity for the community to have their condition checked after exposure to the flood, especially for vulnerable groups with lower immunity (Pramaningsih et al., 2023).



**Figure 2.** Delivery of Aid to Disaster Victims

This activity also shows that flooding not only has physical impacts, such as damage to homes and infrastructure, but also causes a sense of insecurity, psychological stress, and a decline in quality of life. Therefore, the health response in disaster areas should

include a comprehensive approach, not only treating acute complaints but also providing health education, conducting follow-up monitoring, and coordinating with other sectors to improve sanitation, provide clean water, and manage waste (Heaney & Brown, 2024).

When linked to the national disaster mitigation framework, field findings underscore the importance of strengthening communities' and local institutions' capacity to address recurring disasters. The city of Subulussalam, which has experienced flooding several times, requires more systematic planning in spatial planning, river basin management, and drainage systems, as well as improved preparedness of health facilities at the sub-district and village levels (Du et al., 2010).

#### *The Role of Higher Education Institutions and Recommendations for Strengthening Services*

The implementation of health services and assistance by the Medica Bakti Persada Midwifery Academy in Sultan Daulat Subdistrict shows that higher education institutions have a strategic role in disaster management, particularly in the health sector. They can partner with local governments and communities, implement the three pillars of higher education in tangible ways through community service relevant to local needs, and serve as a field-learning center for students to understand public health practices in disaster situations. In the future, similar activities can be developed into sustainable programs with more systematic research designs, for example, by recording detailed types of complaints, diagnoses, and actions taken. This will enable a more in-depth analysis of post-flood disease patterns, allowing health policy recommendations to be formulated more evidence-based (Basaria et al., 2023; Cerbaro et al., 2022).



**Figure 3.** Community Service Documentation

## Conclusion

The flooding in Subulussalam City, particularly in the Sultan Daulat District in 2025, had a significant impact on the community, affecting the number of people affected and the potential for health problems, especially among vulnerable groups such as pregnant women, toddlers, and the elderly. The free health services and assistance provided by lecturers and students of the Medica Bakti Persada Midwifery Academy were well received and contributed to early detection and prevention of health problems after the disaster. This flood disaster also increased the risk of infectious diseases and other health problems due to disrupted sanitation, water quality, and environmental conditions, emphasizing the importance of a rapid, comprehensive, and integrated health response with mitigation and preparedness efforts at the local level. In this context, universities have a strategic role in strengthening community health resilience through planned, collaborative, and field-based service activities, including the development of similar programs with more detailed health data recording to enrich scientific studies and support the formulation of more effective policies.

Post-disaster health services and education activities need to be carried out regularly in flood-prone areas, not only in the Sultan Daulat sub-district but also in other sub-districts and districts with similar risk characteristics. Local governments, health care facilities, and universities need to strengthen coordination in the planning and implementation of disaster preparedness programs, including the development of clearer post-flood health management protocols and better case recording systems, so that each disaster can be managed more effectively and sustainably.

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## References

- Acosta-Espana, J. D., Romero-Alvarez, D., Luna, C., & Rodriguez-Morales, A. J. (2024). Infectious disease outbreaks in the wake of natural flood disasters: global patterns and local implications. *Infezioni in Medicina*, 4(32). <https://doi.org/10.53854/liim-3204-4>
- Ahern, M., Kovats, R. S., Wilkinson, P., Few, R., & Matthies, F. (2005). Global Health Impacts of Floods: Epidemiologic Evidence. *Epidemiologic*

- Reviews*, 27(1), 36–46.  
<https://doi.org/10.1093/epirev/mxi004>
- Alderman, K., Turner, L. R., & Tong, S. (2012). Floods and human health: A systematic review. *Environment International*, 47, 37–47.  
<https://doi.org/10.1016/j.envint.2012.06.003>
- Alied, M., Salam, A., Sediqi, S. M., Kwaah, P. A., Tran, L., & Huy, N. T. (2024). Disaster after disaster: the outbreak of infectious diseases in Pakistan in the wake of 2022 floods. *Annals of Medicine & Surgery*, 86(2), 891–898.  
<https://doi.org/10.1097/MS9.0000000000001597>
- Basaria, A. A. A., Ahsan, A., Nadeem, A., Tariq, R., & Raufi, N. (2023). Infectious diseases following hydrometeorological disasters: current scenario, prevention, and control measures. *Annals of Medicine & Surgery*, 85(8), 3778–3782.  
<https://doi.org/10.1097/MS9.0000000000001056>
- Cerbaro, M., Morse, S., Murphy, R., Middlemiss, S., & Michelakis, D. (2022). Assessing Urban Vulnerability to Flooding: A Framework to Measure Resilience Using Remote Sensing Approaches. *Sustainability*, 14(4), 2276.  
<https://doi.org/10.3390/su14042276>
- 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>
- Heanoy, E. Z., & Brown, N. R. (2024). Impact of Natural Disasters on Mental Health: Evidence and Implications. *Healthcare*, 12(18), 1812.  
<https://doi.org/10.3390/healthcare12181812>
- Martins-Filho, P. R., Croda, J., Araújo, A. A. de S., Correia, D., & Quintans-Júnior, L. J. (2024). Catastrophic Floods in Rio Grande do Sul, Brazil: The Need for Public Health Responses to Potential Infectious Disease Outbreaks. *Revista Da Sociedade Brasileira de Medicina Tropical*, 57.  
<https://doi.org/10.1590/0037-8682-0162-2024>
- Mat Jan, N. A. M. J., Marsani, M. F., Thiruchelvam, L., Zainal Abidin, N. B., Shabri, A., & Abdullah Sani, S. A. (2023). Mitigating infectious disease risks through non-stationary flood frequency analysis: a case study in Malaysia based on natural disaster reduction strategy. *Geospatial Health*, 18(2).  
<https://doi.org/10.4081/gh.2023.1236>
- Mora, C., McKenzie, T., Gaw, I. M., Dean, J. M., von Hammerstein, H., Knudson, T. A., Setter, R. O., Smith, C. Z., Webster, K. M., Patz, J. A., & Franklin, E. C. (2022). Over half of known human pathogenic diseases can be aggravated by climate change. *Nature Climate Change*, 12(9), 869–875.  
<https://doi.org/10.1038/s41558-022-01426-1>
- Nasution, B. I., Saputra, F. M., Kurniawan, R., Ridwan, A. N., Fudholi, A., & Sumargo, B. (2022). Urban vulnerability to floods investigation in jakarta, Indonesia: A hybrid optimized fuzzy spatial clustering and news media analysis approach. *International Journal of Disaster Risk Reduction*, 83, 103407.  
<https://doi.org/10.1016/j.ijdrr.2022.103407>
- Park, K., & Choi, S. (2025). *Analysis of Urban Flood Risk for the Implementation of Sustainable Land Use Measures*.  
<https://doi.org/10.2139/ssrn.5104712>
- Pramaningsih, V., Yuliawati, R., Sukisman, S., Hansen, H., Suhelmi, R., & Daramusseng, A. (2023). Indeks Kualitas Air dan Dampak terhadap Kesehatan Masyarakat Sekitar Sungai Karang Mumus, Samarinda. *Jurnal Kesehatan Lingkungan Indonesia*, 22(3), 313–319.  
<https://doi.org/10.14710/jkli.22.3.313-319>
- Saatchi, M., Khankeh, H. R., Shojafard, J., Barzanji, A., Ranjbar, M., Nazari, N., Mahmodi, M. A., Ahmadi, S., & Farrokhi, M. (2024). Communicable diseases outbreaks after natural disasters: A systematic scoping review for incidence, risk factors and recommendations. *Progress in Disaster Science*, 23, 100334.  
<https://doi.org/10.1016/j.pdisas.2024.100334>
- Saulnier, D. D., Brolin Ribacke, K., & von Schreeb, J. (2017). No Calm After the Storm: A Systematic Review of Human Health Following Flood and Storm Disasters. *Prehospital and Disaster Medicine*, 32(5), 568–579.  
<https://doi.org/10.1017/S1049023X17006574>
- Subarno, A., Koesuma, S., & Sukatiman. (2025). Integrating Environmental Health into Disaster-Resilient Villages: Strategies, Challenges, and Solutions in Surakarta, Indonesia. *JURNAL KESEHATAN LINGKUNGAN*, 17(1), 60–68.  
<https://doi.org/10.20473/jkl.v17i1.2025.60-68>
- Syakbanah, N. L., & Fuad, A. (2021). Human Leptospirosis Outbreak: A Year After the ‘Cempaka’ Tropical Cyclone. *JURNAL KESEHATAN LINGKUNGAN*, 13(4), 211.  
<https://doi.org/10.20473/jkl.v13i4.2021.211-218>
- Tellman, B., Sullivan, J. A., Kuhn, C., Kettner, A. J., Doyle, C. S., Brakenridge, G. R., Erickson, T. A., & Slayback, D. A. (2021). Satellite imaging reveals increased proportion of population exposed to floods. *Nature*, 596(7870), 80–86.  
<https://doi.org/10.1038/s41586-021-03695-w>
- Wang, P., Asare, E. O., Pitzer, V. E., Dubrow, R., & Chen, K. (2023). Floods and Diarrhea Risk in Young Children in Low- and Middle-Income Countries. *JAMA Pediatrics*, 177(11), 1206.  
<https://doi.org/10.1001/jamapediatrics.2023.3964>