Disaster Preparedness Analysis At Intensive Health Centers In Toba Regency In 2020

Mangapul Pardede¹, Herlina J. EL- Matury², Saiful Batubara³
¹,²,³Public Health Science Study Program Master Program, Deli Husada Health Institute, Indonesia

ABSTRACT

This study analyzes the level of disaster preparedness in inpatient health centers in Toba Regency. The variables studied were disaster potential, structural safety, non-structural safety, and functional aspects. The results showed that the preparedness scores for the Ajibata Inpatient Health Center and the Parsoburan Inpatient Health Center required both inpatient health centers to intervene in the near future because they still had risks when facing disasters. Meanwhile, the Laguboti Inpatient Health Center is considered capable of protecting human life and still functioning in the event of a disaster. The structural safety score of the Ajibata Inpatient Health Center reflects that the structural security is adequate for disaster events. Meanwhile, the Parsoburan Inpatient Health Center still has a risk for disaster events. The non-structural safety scores of the Ajibata and Laguboti Inpatient Health Centers both still have risks in dealing with disasters. The Parsoburan Inpatient Health Center is not ready to face a disaster. The value of the functional aspects of the three Inpatient Health Centers shows that the three Inpatient Health Centers are not functionally ready to face disaster events. It is recommended that the three Inpatient Health Centers should continue to improve disaster preparedness.

Keywords: Preparedness; Disaster; Puskesmas.

This is an open access article under the CC BY-NC license.

Corresponding Author:
Herlina J. EL- Matury,
Public Health Science Study Program Master Program,
Deli Husada Health Institute,
Jln. Besar Deli Tua no 77 Deli Serdang
Email: herlinajelmatury.hjem@gmail.com

1. INTRODUCTION

Indonesia is a disaster-prone country. This is evident from the results of various disaster risk assessments, such as Maplecroft (2010) placing Indonesia as an extreme risk country ranked 2 after Bangladesh, in addition to the risk index made by UN University and UNDP. This fact cannot be denied considering the geographical and geological conditions of Indonesia, which is located at the confluence of three giant plates of Eurasian, Indoaustralia and Pacific, and is located on the "Ring of Fire" (PARWANTO, 2014).
Prone to Mount Eruption with 127 active volcanoes spread over 7,000 km along the volcanic path (Macías, 2007). Prone to disease outbreaks, increasing population and increasing uncontrolled settlements, prone to technological failures, inappropriate application of technology and prone to social conflicts due to diversity factors, high population growth, unequal policies, economic, social and infrastructure development.

Preparedness is an integral part of the disaster management process. It is important to protect the lives of people in the population affected by an emergency and disaster immediately following an event (Council, 2007), (Nazli et al., 2014). Health services including primary health care facilities that are accessible and function well in this situation will be a matter of life and death because the health system participates in the mitigation and response process. Disaster events throughout Indonesia greatly affect health facilities, including basic health services and hospitals (von Schreeb et al., 2008). Basic health facilities have also been affected by the two recent major disasters in particular the Lombok earthquake and the earthquake and tsunami in Palu and Donggala (Wekke et al., 2019). In the 2018 Lombok earthquake, 156 primary health facilities and 2 hospitals were damaged ranging from mild, moderate, and severe (West Nusa Tenggara Provincial Health Office, 2019). In addition, the earthquake and tsunami in Palu and Donggal also damaged health facilities including 167 primary health facilities and 18 hospitals (Central Sulawesi Provincial Government, 2018). When health facilities that are supposed to be a place for people to turn out to be during and after a disaster are not functioning properly and are damaged by the disaster, people in the communities who apply or need health assistance will be hardest hit in the situation. In emergencies, disasters and other crises, society must be able to protect the lives and well-being of the people affected, especially in minutes and hours immediately after the impact or exposure (Morganstein & Ursano, 2020). The ability of health services to function uninterruptedly in these situations is a matter of life and death (Costello, 2001).

The continued functioning of the health service depends on a number of key factors, namely: that the service is located in a structure (such as a hospital or health facility) that can withstand the exposure and strength of all types of hazards; Medical equipment is in good condition and protected from damage, community infrastructure and essential services (such as water, electricity, etc.) are available to health services; and health workers can provide medical assistance in safe situations when they are most needed. The disaster incident in North Sumatra Province, Mount Sinabung reactivated and emitted volcanic smoke and ash on August 27, 2010. The Center for Volcanology, Meteorology and Geophysics (PVMBG) raised the AWAS status (the highest level). More than 12 thousand residents were evacuated. Sinabung experienced a fluctuating status, with alert status until the end of 2017. In 2017 in Padang Sidempuan City, March 26, 2017 houses were washed away in 12 villages along the Batang Ayumi River and caused death and injury, 5 died and missing, 6 injured, 1,413 suffered and were displaced and 231 houses were damaged (BNPB, 2017). In 2019, the number of natural disasters was 9 landslides, 22 floods, 7 forest and land fires and 32 hurricanes and caused 1 unit of damage to health facilities. There have been 58 disasters in Toba Regency since 2017 with 35 floods/landslides, 4 drownings, 12 house fires, 3 tornadoes, 4 forest/land fires, damage to 1 church and 1 health facility and 7 fatalities. In 2018 there were 93 times with 53 floods/landslides, 3 drownings, 9 house fires, 2 tornadoes, 26 forest/land fires, damage to 1 church and 1 health facility and 28 fatalities. In 2019 47 times with 19 floods/landslides, 3 drownings, 14 house fires, 5 tornadoes, 6 forest/land fires and 3 fatalities and also in accordance with the Circular Letter of the Governor of North Sumatra Number 360/8039/2020 dated 26 October 2020 concerning Early Warning of Land Movements and Anticipation of Disaster Preparedness In the Covid-19 Pandemic Situation that Toba Regency has the potential for Floods and Earth Movements throughout the year.

By assessing the safety index of the Inpatient Health Center against disasters as a screening tool with reference to the monitoring carried out, it can be identified the extent to which the Inpatient Health Center can maintain its structure and performance in dealing with disasters.
The study was conducted to analyze Preparedness at the Inpatient Health Center in Toba Regency to face the 2020 disaster.

2. RESEARCH METHOD

This study uses a combination research (mix method) with a sequential explanatory design (Ivankova et al., 2006), (Harrison III, 2013). Determination of informants is done by purposive sampling. Researchers selected 7 (seven) informants (Tongco, 2007), (Onwuegbuzie & Leech, 2007). Interviews with informants used questionnaire guidelines from PAHO: Evaluation of small and medium scale health facilities series 4 and also observations of facilities and infrastructure of inpatient health centers, document review (Huttlinger et al., 2017), (Das et al., 2016), (McDonald et al., 2005). Disaster potential, structural security, non-structural safety, and functional aspects (Organization, 2010). The assessment score is 0-1, where 0 = lowest, 0.5 = moderate and 1 = high. In earthquake-prone areas, the total structural safety score is multiplied by 50%, non-structural is multiplied by 30% and functional aspects are multiplied by 20% to obtain the overall inpatient puskesmas safety index score. The results of the module evaluation were then classified into three classifications: C (0-0.35), B (0.36-0.65), and A (0.66-1).

3. RESULTS AND DISCUSSIONS

The Ajibata Inpatient Health Center is a community health service center with inpatients located in Ajibata District, Toba Regency and has 10 beds. The population is 7,588 people, where the number of men is 3,786 people and the number of women is 3,802 people. The Laguboti Inpatient Health Center is a community health service center with inpatients located in Laguboti District, Toba Regency, which has 10 inpatient beds. The total population is 19,294 people, of which 9,411 men and 9,883 women. The Parsoburan Inpatient Health Center is located in Habinsaran District, Toba Regency. It has 12 beds with a population of 16,192 people, where the number of men is 8,023 people and the number of women is 8,169 people.

3.1. Potential Disaster

Potential disasters in the three areas of the Inpatient Health Center are earthquakes, volcanic eruptions, landslides, hurricanes, floods, epidemics, explosions and fires.

3.2. Structural Security

The structural safety assessment of the Inpatient Health Center building is based on the history of the inpatient puskesmas, as well as the structural design and types of materials used in the building. According to PAHO guidelines, the structural safety module consists of 2 submodules. First, the degree of safety in relation to the history of inpatient puskesmas. The second submodule of the structural security module is building integrity. The calculation of the structural safety score of the Ajibata and Laguboti inpatient health centers with a score of 0.82 and 1 or classification "A", this value means that the adequacy of structural security in dealing with disasters, Parsoburan inpatient puskesmas scores 0.57 or classification "B", this value means safety structure has a risk of facing disaster.

3.3. Nonstructural Security

The non-structural safety module assesses critical systems, HVAC systems, furniture, storage units, office equipment, medical equipment, laboratory equipment, and architectural elements of inpatient puskesmas. Calculation of the non-structural safety score of the Ajibata and Laguboti inpatient health centers with a score of 0.44 and 54 or classification "B", this value means that the adequacy of non-structural security has a risk of facing disaster, the Parsoburan inpatient health center has a score of 0.35 or classification "C", the value is means that non-structural security is not prepared for disaster.
3.4. Functional Aspect
The functional aspects of inpatient puskesmas are assessed based on the availability of the puskesmas disaster committee organization, disaster response plans and the availability of medicines, supplies, equipment, and equipment for disaster situations. Table 3 below presents the results of the assessment of functional aspects in the three inpatient health centers.

The calculation of the safety score of the functional aspects of the three outpatient health centers has a score of 0.09 or classification "C", this value means that the functional aspects are not ready to face disasters.

3.5. Safety Index of Inpatient Health Center
The value of each safety level module is added up, and the results are then divided by the number of modules, in earthquake-prone areas, the weighting score for structural safety levels is multiplied by 50%, non-structural is multiplied by 30% and functional aspects are multiplied by 20% to obtain the overall inpatient health center safety index score. The calculation of the safety index score or disaster preparedness score at the Laguboti inpatient health center with a score of 0.67 or classification "A", this value means that it is considered capable of protecting human life and still functioning when a disaster occurs. The Ajibata and Paroburan Inpatient Health Centers each scored 0.55 and 0.39 or a classification of "B", this value means that it is necessary to intervene in the near future and have risks when facing disasters.

Based on the results of the study, the potential disasters in the three puskesmas were earthquakes, volcanic eruptions, landslides, hurricanes, floods, epidemics, explosions and fires. This is also in accordance with the Ministry of Energy and Mineral Resources as well as the Letter of the Governor of North Sumatra Number 360/8039/2020 regarding the potential for soil movement in Toba Regency.

Structural safety is high at the two inpatient health centers, namely Ajibata and Laguboti, while the Parsoburan Inpatient Health Center is moderate. This means that the three Puskesmas have implemented the Minister of Public Works and Public Housing Regulation Number 29/PRT/M/2006, although not entirely. And also on the score of the rehabilitation or modification effect item on the structural behavior of the Puskesmas, it is worth 1 = high (PAHO).

That the functional aspects of the three Inpatient Puskesmas are low, where there is no disaster organization or committee at the inpatient puskesmas, there is no emergency response plan or disaster response plan, adequate infrastructure and trained human resources. However, the functional aspects of disaster management can still work with the Rapid Response Team at each Inpatient Health Center and from the District Health Office. Disaster management needs to be sustainable and integrated. This is also in accordance with Law number 24 of 2007, that disaster management is a dynamic, sustainable, integrated process to improve the quality of measures as well as prevention, mitigation, preparedness, early warning, emergency response, rehabilitation and reconstruction of hazards. This is also a concern of the local government, by the Regional Secretary of Toba Regency stating that the Regional Strategic Plan for 2021-2025 on Regional Disaster Management is to provide infrastructure and superior Disaster Management human resources.

4. CONCLUSION
Potential disasters that may occur both at the puskesmas and in their working areas are earthquakes, volcanic eruptions, landslides, hurricanes, floods, epidemics, explosions and fires. The results showed that the disaster preparedness score for the laguboti inpatient health center was 0.67 or classified "A", this value means that it is considered capable of protecting human life and still functioning when a disaster occurs. The Ajibata and Paroburan Inpatient Health Centers each scored 0.55 and 0.39 or a classification of "B", this value means that it is necessary to intervene in the near future and have risks when facing disasters.
ACKNOWLEDGEMENTS

1. Terulin S. Meliala, M.Keb, SKM, M.Kes as the Chairperson of the Sembiring Deli Tua RSU Foundation.
2. Drs. Johannes Sembiring, M.Pd, M.Kes, as Chancellor of the DELI HUSADA Deli Tua Health Institute.
3. Prof. Dr. Jon Piter Sinaga, M.Kes as Dean of the Faculty of Public Health, DELI HUSADA Health Institute Deli Tua.
4. Dr. Herlina J. EL- Matury, ST, M.Kes, as Head of the Public Health Study Program, Master Program at the DELI HUSADA Deli Tua Health Institute and as Chair of the Advisory Commission who has guided me and provided input and suggestions in the completion of this proposal.
5. Dr. Saiful Batubara, M.Pd, M.KM as the Second Advisor who carefully and patiently guided, directed and took the time to guide the author from the submission of the title to the completion of the writing of this Proposal.
6. Dr. dr. Felix Kasim, M.Kes, and Ns. Congratulations Ginting, M.Kes as examiners 1 and 2 who with great care and patience tested, directed and took the time to test the authors for the good of the contents of this proposal.
7. Lecturers and Staff in the Public Health Study Program, Master Program at the DELI HUSADA Institute of Health, Deli Tua.
8. Dr. Juliwan Hutapea as the Head of the Toba District Health Office who has given me permission to conduct research at the Inpatient Health Center in Toba Regency.
9. All respect and infinite gratitude to my beloved parents, namely my father M. Parde (Op. Naomi) and the late. R.br Manurung’s mother (Op. Naomi) who always gives encouragement and prayers to the writer.
10. Especially for my beloved wife, namely Rosenni br.Sirait, S.STP and my two children David Kairos Parde and Christian Ebenezer Parde who always give encouragement, moral support and prayers to the author.
11. Thank you, Class 08, Masters Program in Public Health, DELI HUSADA Institute of Health, Deli Tua

REFERENCES

Costello, J. (2001). Nursing older dying patients: findings from an ethnographic study of death and dying in elderly care wards. Journal of Advanced Nursing, 35(1), 59–68.

Council, N. R. (2007). Improving disaster management: the role of IT in mitigation, preparedness, response, and recovery. National Academies Press.

Das, A., Gopalan, S. S., & Chandramohan, D. (2016). Effect of pay for performance to improve quality of maternal and child care in low-and middle-income countries: a systematic review. BMC Public Health, 16(1), 1–11.

Harrison III, R. L. (2013). Using mixed methods designs in the Journal of Business Research, 1990–2010. Journal of Business Research, 66(11), 2153–2162.

Huttinger, A., Dreibelbis, R., Kayigamba, F., Ngabo, F., Mfura, L., Merryweather, B., Cardon, A., & Moe, C. (2017). Water, sanitation and hygiene infrastructure and quality in rural healthcare facilities in Rwanda. BMC Health Services Research, 17(1), 1–11.

Ivankova, N. V, Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. Field Methods, 18(1), 3–20.

Macias, J. L. (2007). Geology and eruptive history of some active volcanoes of México. SPECIAL PAPERS-GEOLOGICAL SOCIETY OF AMERICA, 422, 183.

McDonald, C. J., Overhage, J. M., Barnes, M., Schadow, G., Blevins, L., Dexter, P. R., Mamlin, B., & Committee, I. M. (2005). The Indiana network for patient care: a working local health information infrastructure. Health Affairs, 24(5), 1214–1220.

Morganstein, J. C., & Ursano, R. J. (2020). Ecological disasters and mental health: causes, consequences, and interventions. Frontiers in Psychiatry, 11, 1.

Nazli, N. N. N., Sipon, S., & Radzi, H. M. (2014). Analysis of training needs in disaster preparedness. Procedia-Social and Behavioral Sciences, 140, 576–580.

Onwuegbuzie, A. J., & Leech, N. L. (2007). Sampling designs in qualitative research: Making the sampling process more public. Qualitative Report, 12(2), 238–254.

Organization, W. H. (2010). Safe hospitals in emergencies and disasters: structural, non-structural and functional indicators. Manila: WHO Regional Office for the Western Pacific.

PARWANTO, N. B. (2014). QUANTITATIVE STUDY ON NATURAL DISASTERS.

Tongco, M. D. C. (2007). Purposive sampling as a tool for informant selection. Ethnobotany Research and Applications.
von Schreeb, J., Riddez, L., Samnegård, H., & Rosling, H. (2008). Foreign field hospitals in the recent sudden-onset disasters in Iran, Haiti, Indonesia, and Pakistan. *Prehospital and Disaster Medicine, 23*(2), 144–151.

Wekke, I. S., Sabara, Z., Samad, M. A., Yani, A., Abbas, T., & Umam, R. (2019). *Earthquake, tsunami, and society cooperation: Early findings in palu of indonesia post disaster.*