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An Emergency and Mass Casualty Incident Response in the Jalan Batang Kali-Jalan Genting Highlands Malaysia Landslide 2022: A Case Report and Strategies to Improve

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Abstract

At about 3 am on Friday 16 December, a landslide occurred along the Jalan Batang kali Genting highlands road. The medical team of Hospital Selayang had been activated and responded to the site. A campsite with visitors from a local school including families and children who were hit by a landslide was reported missing and trapped in the area. Of the 92 victims, and survivors were 61, the number of deaths was 31. The search and rescue team used equipment such as excavators as well as the help of the K9 unit to help locate the victims in the landslide. The media was present at the cold zone or green zone and had 24-hour coverage of the scene to spread the necessary and accurate information to the public. Regular briefings were done by the SAR teams together with the incident commander to the media to keep the public updated on the real information about the scene.

Keywords: *Casualty Incident Response; Genting Highlands Malaysia Landslide 2022; A Case Report and Strategies to Improve*

Introduction

Landslides are not an uncommon cause of natural disasters worldwide. Landslides happen in high-rise areas that tend to have mountainous and hilly landscapes. Landslides often happen in the monsoon seasons that tend to cause soil disruption that leads to the movement of landscapes leading to disruption of the geographical landscape of a high-rise sector (Jakob, 2022).

In Malaysia, the mountains around Genting highlands are known for their recreational function and are a common recreational and holiday area throughout the year. Its chilly weather and natural landscapes make for a common holiday ground and its location is not so far away from the Klang valley. Camping sites are found along this road as they make for a beautiful view of the rainforest and cold and chilly weather (Alam, 2022).

The area leading to the recreational centre is known for its plantation and beautiful landscapes making it a common site for camping and outdoor activities. Camping in the jungles of the tropical rainforest can be found all along the roads leading up to the recreation area and one such road is the Batang kali Genting Road. It is a narrow road along the mountains, mostly single-lane roads leading up and down the mountains of Malaysia (Hassan, 2022).

Disaster medicine which is a special interest and subspecialty of emergency medicine deal with natural disasters as well as man-made disasters. It teaches us the disaster paradigm of preparedness

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of a landslide to occur which is during the rainy seasons and monsoons seasons, common locations and its hazards, responding to a natural disaster as an operational wing in the national disaster guidelines, recovering from a disaster in terms of staffing, supplies, and equipment and also being involved in mitigation strategies to avoid further disasters (Tracey, 2022).

At about 3 am on Friday 16 December, a landslide occurred along the Jalan Batang kali Genting highlands road. The medical team of Hospital Selayang had been activated and responded to the site. A campsite with visitors from a local school including families and children was hit by a landslide and reported missing and trapped in the area. Of the 92 victims, and survivors were 61, the number of deaths was 31. The search and rescue team used equipment such as excavators as well as the help of the K9 unit to help locate the victims in the landslide. The media was present at the cold zone or green zone and had 24-hour coverage of the scene to spread the necessary and accurate information to the public. Regular briefings were done by the SAR teams together with the incident commander to the media to keep the public updated on real information of the scene.

Figure 1: Location of Batang Kali and Genting Road and Landslide

Case Study

Preparedness

Exercise drills in disaster response are an important factor in the preparedness of government and nongovernment agencies in responding to a disaster. It integrates multiple agencies to come together to discuss the potential hazards in a certain location and plan a response in case of a disaster.

In this scenario, an EX-GENTING EXERCISE was conducted by multiple agencies in preparation for a disaster during the monsoon season of the year 2022. This exercise was carried out in the district of Bentong which included the BOMBA (fire and rescue department), the PDRM (Royal Malaysian police), the APM (Malaysian civil defense department), KKM (Ministry of Health Malaysia), NADMA (National disaster management agency) as well as private sectors and non-governmental organizations NGOs.

A tabletop was done a week before the exercise to introduce the risk assessment of the area leading up to the highlands, the roles, and responsibilities of each agency, and establish command, control cooperation, and communication among agencies so that a disaster in this area can be a coordinated response.

After a few weeks, the clinical and practical exercise is carried out. A simulated disaster along the road leading to the highlands was conducted and a practical and clinical response was carried out by all agencies involved. This was important as it gave all agencies involved a feel of responding to a simulated disaster and application of the previous command, control coordination, and communication that was discussed in the tabletop exercise earlier.

Figure 2: Ex Genting Disaster Exercise

The most important purpose of this exercise is to spread awareness among medical and non-medical personnel toward disaster and to transform the awareness into a practical approach based on real-based scenarios. Based on previous experiences, the Genting area is one of the busiest spots in Malaysia because of its location at the border of Selangor-Pahang and located at the entrance of the east-coast highway (LPT). Due to increased development activities and heavy traffic as it has become the main route of transportation for the east -coast of Malaysia, Genting has transformed into the most well-known attraction site during public holidays and the popularity has exposed Genting to continuous development throughout the year. This factor may or may not lead to the vulnerability of the development site to disaster.

This exercise is to identify the area in Genting which is most prone to disaster and to simulate the response so that the disaster team's capabilities might be tested. The simulation will positively augment the teams' capabilities, and maturity, and identify the weaknesses while responding to the disaster.

Response

The response can be divided into the in-hospital and out-of-hospital response.

Out-of-Hospital Response

At about 3 am on Friday 16 December, a landslide occurred along the Jalan Batang kali Genting highlands road. The medical team of Hospital Selayang had been activated and responded to the site. The BOMBA created the red zone or warm zone which it's considered a dangerous area. The danger here is that some parts of the land were still moving and unstable, and the rainy conditions could still pose the threat of worsening of the landslide to rescuers.

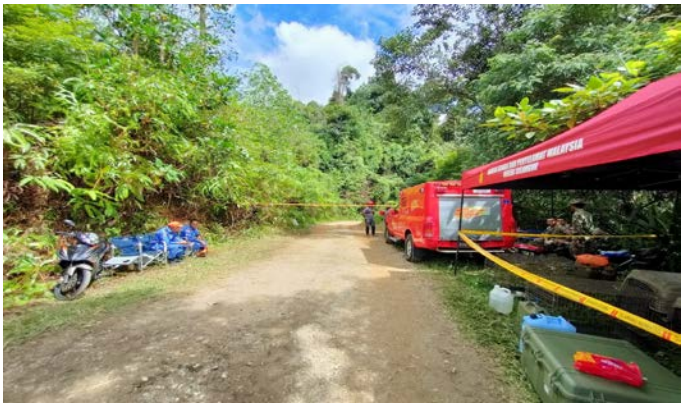

Figure 3: The Creation of the Red Zone or Hot Zone

The medical base had been set up in the yellow zone or the warm zone. This is an area that is considered safe, with no movement of soil, and a base for agencies involved in the rescue and coordination of the disaster response such as the PKTK (Pusat kawalan tempat kejadian/ center for control of disaster site), the Forward field command post of the BOMBA (Fire services). The medical base has a drop zone, where the casualty collecting points are as the casualties are removed by the search and rescue teams SAR, a triage officer to triage the patients into the medical base, a red zone and in charge personnel, a yellow zone and in charge personals. In this scenario, a white zone was also created nearer to the medical base unlike a standard medical response because the estimated number of casualties was many and the commander in charge had requested help by the medical team to coarsely identify the victims' descriptions while waiting for the arrival of the DVI (Dead victim identification) team.

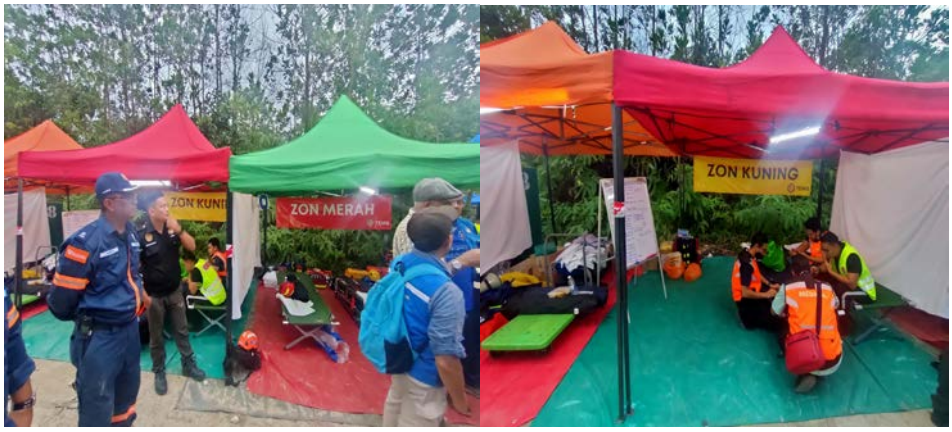

Figure 4: Showing the Medical Base Camps with Red One and Yellow Zone Officers

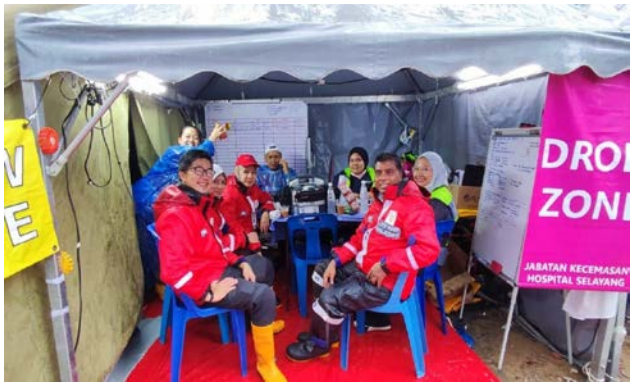

Figure 5: Showing the Drop Zone

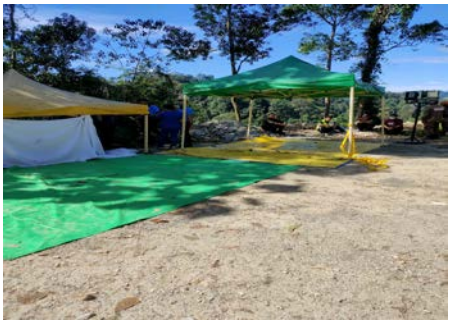

Figure 6: The White Zone Area for the Collection of the Victims that Had Been Pronounced Dead at the Scene

In-Hospital Disaster Activation and Response

To establish command and control and improve communication over the situation among the KKM staff from hospital Selayang, an emergency coordination centre was set up in the medical emergency coordination MECC Hospital Selayang.

The communication with the site of the incident was done using the GIRN (government-integrated audio networking) system because there was little network convergence over the incident site. Regular communication was carried out using the METHANE approach to know the condition of the site, the exact locations of the victims, the types of hazards at the site including rain and floods affecting the medical base, number of casualties being extricated, and the access routes of the ambulances. Visits from the health minister and director of the hospital also helped in mobilizing resources for the improvement of service at the site of the incident. The bilik Gerakan was also involved in deciding which hospitals to transport the victims depending on the injuries suspected.

Figure 7: GIRN Networking

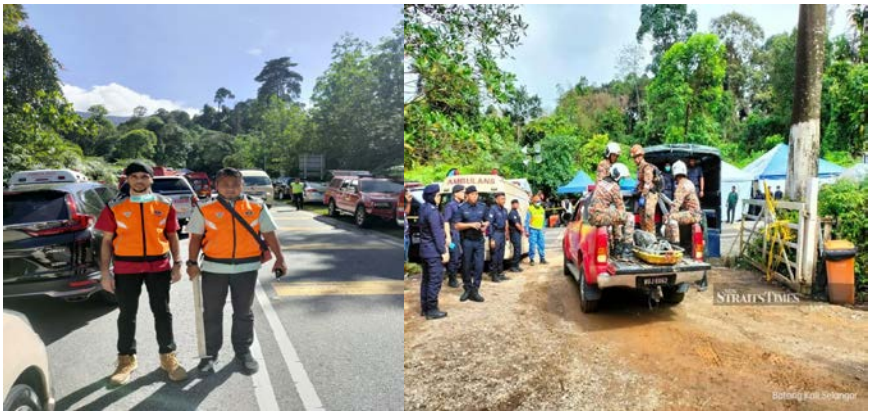

Figure 8: (a) Coordination of Transport Ingress and Egress Routes at the Site (b) A Newspaper Article NST Showing transport of the Victims from the Casualty Collecting Points to the Medical Base

Recovery and Mitigation Strategies

In planning a recovery from a long standing disaster, it must be made in coordination with other agencies. The progress of other agencies with its activities and resources must be taken into account. A regular meeting by the head of operations, forward field posts commander, medical on scene commander and the lead of other agencies to discuss the current progress, strategies to move forward is essential in deciding to deploy more specialty trained staffs, more specific equipment or medications to be brought to the site.

In the time of a recovery during a long standing mass casualty incident, it is important to remember that not only are the medical teams on standby for the victims that may be rescued and handling of the casualties, rather it is also important for the medical teams to plan and mitigate the potential risks to the SAR team members themselves, The medical team had done in this scenario, a pre and post deployment screening, checking the vital signs of patients and addressing any acute complaints before and after deployment into the red zone or hot zones. In this case, we had seen records of staff who had hypertensive urgencies and emergencies, acute coronary syndromes, acute stroke, hypoglycemia and heat exhaustion and heat cramps.

Risk analysis of infections and communicable disease during long standing disasters must be addressed. In this scenario, as we had noticed, the land hazards, floods, soil related diseases, the medical team had considered to start leptospirosis prophylaxis, together with the pharmacy and PKD initiatives.

Figure 9: Discussion with Other Agencies on Continuous Strategies and Pre and Post Deployment Screening for SAR Teams

Hazards preventing or delaying recovery or mitigation strategies must also be taken into account so that the recovery can be quicker and more efficient. In this scenario, the operation was

carried out for 24 hours in the beginning and the hazards of rains, dim lighting, floods, and insect bites must also be mitigated concomitantly with rescue and recovery services.

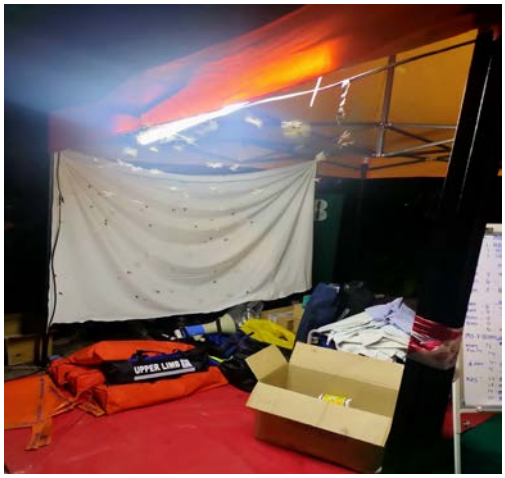

Figure 11: Showing Hazards during the Night at the Medical Base Station

Discussion

In-House Hospital Resilience Strategies towards the Future

According to Cutter et al, resilience is defined as the capacity of an individual or community to adapt (by resisting or changing) in order to reach and maintain its survival and functioning, the social aspect less formally relates to the capacity of the individuals to recover with minimal disruption.

To translate it into a disaster context, it is defined as how the hospital responded by maintaining its capabilities to cope with surge capacities during a disaster without interference with daily healthcare services (Hick,2014).

To achieve a balance, of community-based and hospital-based disaster resilience, disaster management response should be based on risk stratification, prognostication, and a strategic long-term plan which focuses on the nature of in-house hospital issues and challenges. These positive strategies should be targeted into the issues of pre- and post-disaster response, identification of the issues regarding human resources and facilities with quality improvement of training of the staffs for disaster. The only way to improve in-hospital disaster resilience is through routine interdepartmental meetings and training with the involvement of NGOs and ministries, implementations of training with the latest updates in global healthcare and non-healthcare issues, and routine post-mortem briefing after each disaster response. All these strategies are proposed to achieve systematic disaster response with a high resilience rate in order to maintain balance in daily healthcare services.

By becoming more concrete in addressing the issues and obstacles in disaster response, a systematic algorithm to achieve mature and stable resilience will be realistic in no time. Perhaps not surprisingly, the challenge in disaster response will minimize and reduce the number of mortalities in this millennium.

Conclusion

A disaster response must follow the disaster paradigm. Early preparedness with training exercises in high-risk areas among interagency is a must to mitigate disasters. A recovery process entailing in and out of hospital disaster activation with good command, control, coordination, and communication helps a good response environment and improves efficiency while the hospital prepares with resources, staff, and coordination of transport of cases. The majority of the improvements are in the area of recovery and mitigation in long-standing disasters, and this must be highlighted with

interagency coordination and risk mitigation strategies to ensure a smooth and fully functional medical base and rescue operation.

Conflict of Interest

The authors declare that they have no competing interests.

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