

BURN MASS CASUALTY INCIDENTS: THE CHALLENGE



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INTRODUCTION

Burn mass casualty incidents (BMCI) as it suggests, are major burn disasters which may occur due to a myriad of factors and locations. The Plastic & Reconstructive Surgery team of Sarawak General Hospital (SGH), Sarawak, Malaysia has encountered two contrasting BMCI in the past, the Selantik coal mine explosion (2014) and Cityone Megamall explosion (2018). Being four years apart, with contrasting factors, we have been able to learn, improve and apply the experiences of both disasters. Here we list out some of the challenges faced. Data is taken from retrospective review, disaster records and news from the disasters.



Figure 1: Cityone Megamall explosion (left) : Selantik explosion (right)

	Selantik	City One
Distance to Sarawak General Hospital	125 km	5 km
Total victim	119	41
Nationality	N. Korea, Myanmar, China, Bangladesh	Malaysian
Age (years)	32 (21 – 53)	28 (18 – 55)
Triage & Transfer Time	24 hours	5 hours
Burn patient	33	15
On site mortality	3	3
Burn percentage	22.5 (1-70%)	22.4 (1-43%)
- Major	20% (6)	20% (3)
Inhalational injury	63% (19)	20% (3)
ICU Admission	4-25 days	3-7 days
Total Admission	20.3 days (2-70 days)	15.8 days (1-48 days)
Mortality	20% (6)	nil

Table 1: Summary of Selantik coal mine vs Cityone Megamall explosion

DISCUSSION

Increasing amount of burn facility with specialized personnel and support throughout the state to improve time to specialized care and reduction in patient transfer to tertiary centers.

Hospitals should plot out disaster protocols based on disaster paradigms suitable to local settings. This would ensure patients' management to be smooth upon BMCI. These protocols should be constantly tested to keep staff trained and ready.

Constant check on resources at hand and reduce reliance on single product and familiarizing with alternative products. Constant feedback with suppliers to ensure continuity of supply chain.

CONCLUSION

We are unable to predict when and where a BMCI will occur. To limit the burden to the healthcare system, specialized services should be expanded to rural areas. Regular disaster drills with front line agencies should also be held with constant update on staff and resource capabilities.

REFERENCES

Basic Disaster Life Support v3.2, National Disaster Life Support Foundation 2015

Hughes, A., Almeland, S. K., Leclerc, T., Ogura, T., Hayashi, M., Mills, J. A., Norton, I., & Potokar, T. (2021). Recommendations for burns care in mass casualty incidents: WHO Emergency Medical Teams Technical Working Group on Burns (WHO TWGB) 2017-2020. *Burns : journal of the International Society for Burn Injuries*, 47(2), 349–370. <https://doi.org/10.1016/j.burns.2020.07.001>

Kearns, R. D., Conlon, K. M., Valenta, A. L., Lord, G. C., Cairns, C. B., Holmes, J. H., Johnson, D. D., Matherly, A. F., Sawyer, D., Skaroté, M. B., Siler, S. M., Helminiak, R. C., & Cairns, B. A. (2014). Disaster planning: the basics of creating a burn mass casualty disaster plan for a burn center. *Journal of burn care & research : official publication of the American Burn Association*, 35(1), e1–e13. <https://doi.org/10.1097/BCR.0b013e31829afe25>

Kearns, R. D., Conlon, K. M., Matherly, A. F., Chung, K. K., Bebartha, V. S., Hansen, J. J., Cancio, L. C., Peck, M., & Palmieri, T. L. (2016). Guidelines for Burn Care Under Austere Conditions: Introduction to Burn Disaster, Airway and Ventilator Management, and Fluid Resuscitation. *Journal of burn care & research : official publication of the American Burn Association*, 37(5), e427–e439. <https://doi.org/10.1097/BCR.0000000000000304>

RESULTS

1) GEOGRAPHY

- the Selantik coal mine occurred at a rural area 125km away from SGH compared to Cityone Megamall explosion in the city 5km away.
- delay in specialized management due to transfer (land transfer).
- logistics arrangement for transfer of ill patients, increasing cost and time to specialized treatment

2) SCALE of disaster

- more victims in Selantik explosion 119 vs 41 stretching out emergency response team
- burn victims: 33 vs 15
- six times more patients with inhalation injury
- hospital unable to cope with sudden surge of patients and insufficient available ventilator
- resort to transfer patients to other state / step down to cluster hospitals and buying service from private hospitals
- lead to more logistics and financial costs

3) FINANCIAL limitations

- Selantik coal mine victims mostly uninsured, financial burden to local healthcare system
- Sudden spike of requiring specialized dressing products (expensive), lack of availability of products at hand
- Reliance of NGO for financial aids

4) PUBLIC relations

- Selantik patients are mainly foreigners, leading to communication difficulties with patients



Figure 2 PRE-DISASTER Paradigm™ (Basic Disaster Life Support)