

## Indian Ocean Tsunami: A Case Study

**Introduction:** On December 26, 2004, an earthquake triggered a series of massive tsunamis that slammed into the coast of 14 countries in the Indian Ocean that killed 227,898 lives and 125,000 people were injured. Globally coordinated emergency response to reconstruct disaster areas and raised awareness about the threat of tsunamis for coastal regions.

**Facts of the Case:** A Sunday morning at 7:58 am on Dec 26<sup>th</sup>, 2004, a magnitude 9.1 earthquake rattled the coast of the Indonesian island of Sumatra in the Indian Ocean triggering a catastrophic tsunami. The earthquake caused about 800 miles rupture that was the third-largest in the World Active since 1900. Within 20 mins of the earthquake, the tsunami attacked Indonesia and India's Andaman and Nicobar, and in Northern Sumatra waves reached 167 feet and 3 miles flooding inland.<sup>1</sup> The tsunami brought damage to 14 countries, including Indonesia, Sri Lanka, India, Thailand, Somalia, Myanmar, Maldives, Malaysia, Tanzania, Seychelles, Bangladesh, South Africa, Yemen, and Kenya. After tsunamis, 43,786 were missing, and 1,740,000 were displaced. 227,898 lives were killed in 14 countries by this deadliest tsunami. There are 125,000 people injured. The total damage cost roughly \$15 billion in the Indian Ocean. Material losses were roughly \$10 million by the tsunami.

**Epidemiological aspects of the event:** Indonesia, Sri Lanka, and India lost the greatest lives of all countries met this disaster. Indonesia has the highest mortality of 73.5% in this disaster. The tsunami mortality of Sri Lanka and India are 15.4% and 7.1%. Female mortality has around 20% to 200% higher than male mortality in different regions. Aceh Barat, Meulaboh, and Ampara District have more than twice times higher female mortality than male mortality.<sup>2</sup> Adult males of twenty years old have the lowest mortality in all age groups. Mortality has an association with the distance of the coast. 1 in 20 people died at less than 5km from the coast. The age and gender gap in mortality narrow as distance from the coast increases. In the distance of 1km of coast, 7 of 10 deaths are older women. At the distance area 2-5km from the coast, the mortality rate for older women was about the same as for prime-age males within the distance of 1 km from the coast.<sup>3</sup> The Synthesis Report collected data and information from 4 pages of officially published articles, Wikipedia, News, and NGO's website by The Tsunami Evaluation Coalition that could help to avoid potential biases, threats of validity, or confounding. The article Mortality, The Family and the Indian Ocean Tsunami did a longitudinal survey for 43,606 residents living along the coast of North Sumatra and Aceh. Data was collected from the study they have conducted. They designed and collected STAR data for analysis. The baseline for the study collected a large-scale household survey before the tsunami about nine months as part of the annual National Socioeconomic Survey. This study determined the survival status of more than 98% of people on the baseline. In 200 households, 93% of families accepted an in-person interview with them. The standard error of the population who died between baseline and resurvey in severely damaged communities (1.85%) is 0.39% (not including deaths in tsunami). The standard error of mortality rate between the survey waves (1.6%) is 0.16% in those communities without directly being affected by the tsunami. The authors did not mention missing data.

**Management of the event:** Within a few hours, governments, aid agencies, and people responded to emergency teams, goodwill, and massive donations around the world. It is the first devastating tsunami around the world after 1883. It was a point of the global aid community that is the first large-scale coordinated natural disaster response and reconstruction plan globally. Non-official tsunami warning system before this tsunami.<sup>1</sup> The World Food Programme

1. JetStream Max: 2004 Indian Ocean Tsunami

2. Cosgrave, J. Synthesis Report: Expanded Summary. Joint evaluation of the international response to the Indian Ocean tsunami.

3. Frankenberg, E., Gillespie, T., Preston, S., Sikoki, B., Thomas, D., 2011. Mortality, The Family and the Indian Ocean Tsunami.

supported food aid to more than 1.3 million people living from this tsunami. Financial aid was provided more than US \$14 billion from nations around the world. USAID pledged to fund tsunami victims to rebuild their households and living environments in a long term.<sup>4</sup> In the absence of the official tsunami warning system, donations, and reconstruction assistance were supported to the affected areas very fast after the tsunami. The tsunami damaged a large proportion of the medical system of those countries, 107 of 240 health clinics were seriously damaged or destroyed in Indonesia. The disaster led 600 agencies to coordinate together with material assistance, funds, and personnel. 130 relief organizations from different nations around the world arrived to help to set up mobile field hospitals, purchased and distributed medical supplies, established vaccines, deployed emergency medical personnel and cold chain systems.<sup>5</sup> Global support has allowed the affected areas and populations to be treated and reconstructed as quickly as possible. The first global disaster aid also had many problems, such as not marking the name and expiration date of medicines and receiving pre-cooked food that people didn't know how to use.<sup>5</sup>

**Communications of the event:** Due to the first major disaster globally, public health awareness of tsunami prevention and post-disaster reconstruction is insufficient. A systematic warning and prevention system for global tsunami earthquakes has been improved. Financial aid comes from different countries. US\$819.9 million were pledged by the Australian government. The German government offered US\$660 million, and Japan supported US\$500 million. World bank offered US\$250 million. In the UK, the public donated around £330 million. It was the starting point of the large-scale coordinated natural disaster response and reconstruction plan globally.

**Summarize:** In conclusion, a sudden tsunami brought devastating damage without any prevention. The global public health response is as comprehensive and effective as possible. Numerous relief teams, donations, supplies, and food came from nations and 130 non-profits organizations to help reconstruct the affected areas and provide adequate medical care for the casualties. Many NGOs kept providing economic, material, and medical support to the affected areas for many years after the disaster. People started realizing the importance of tsunami warning systems. An official tsunami warning system was established that is very necessary to prevent damage from tsunamis. After eight years of the Indian Ocean tsunami, that preparedness saved many lives in the 2012 Japan earthquake and tsunami.

1. JetStream Max: 2004 Indian Ocean Tsunami  
4. Humanitarian response, 2004 Indian Ocean earthquake and tsunami  
5. Carballo, M., 2005. Impact of the Tsunami on healthcare systems

Assignment-Module 1: Case Study Report  
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5. Carballo, M., 2005. Impact of the Tsunami on healthcare systems. *Journal of the Royal Society of Medicine* 98, 390–395.. doi:10.1258/jrsm.98.9.390 [https://click.endnote.com/viewer?doi=10.1258%2Fjrsm.98.9.390&token=WzI3OTA5OTMsljEwLjEyNTgvanJzbS45OC45LjM5MCJd.jLMsRDox4mpKRWd\\_52TMTa69dmE](https://click.endnote.com/viewer?doi=10.1258%2Fjrsm.98.9.390&token=WzI3OTA5OTMsljEwLjEyNTgvanJzbS45OC45LjM5MCJd.jLMsRDox4mpKRWd_52TMTa69dmE). Assessed Feb 22nd, 2022