

# Abstracts of Scientific Papers-WADEM Congress on Disaster and Emergency Medicine 2017

## Community Disaster Risk Reduction using Indigenous Knowledge, Integrating with Climate Smart Interventions in Coastal Andhra Pradesh

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**Study/Objective:** Using indigenous techniques to reduce the dependency on outside resources.

**Background:** Andhra Pradesh (AP) is a state that has suffered the most from the adverse effects of severe cyclones, floods, and drought. It is estimated that about 90% of AP's total territory are vulnerable to tropical storms, floods, and related hazards, while the coastal belt is even more vulnerable to natural disasters, and the state's population is compounded by the recurrent impact of disasters.

**Methods:** Vulnerability Analysis, Situational Analysis, Participatory Vulnerability Capacities Assessment, Hazard Hunt Capacity building.

**Results:** The project is a model to all the vulnerable communities; capacities of vulnerable communities are increased and confident of combating the disaster situations. Innovative elements and results: Horizontal trainings by trained taskforce members in other vulnerable villages are conducted on their own initiation. Cost Effectiveness: There is no need to purchase anything from outside to implement this initiative at vulnerable villages. Workshop with the Education Department officials: Workshops with the department and regular one-on-one meetings have been organized. Lessons Learned: Flexibility and patience in order to survive and grow the structures, admit to mistakes, and correct them.

**Conclusion:** CHALLENGES: Initially, there was no response from the government as well as from the local communities. How to improve similar initiatives in the future? A similar intervention can be implemented in other villages overcoming the above mentioned challenges, involving the trained children and task force groups of this project. Replication: This intervention can be replicated in any part of the world, at a vulnerable village or school based on the type of disaster - but same methodology can be adopted for any type of disaster. This can be replicated to any context either for Tsunami or Cyclone prone, floods or flash floods, fire accident zone, or in a peacetime.

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## Risk Factors of an Earthquake Hospitalized Patient Death in the Wenchuan Earthquake Victim Database

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**Study/Objective:** This paper is aimed at identifying the contributing factors of mortality and providing a clinical reference for the management of those injured in earthquakes.

**Background:** Few epidemiological studies have been conducted on the determinants of the mortality of patients hospitalized after an earthquake. The West China Hospital Earthquake Database includes earthquake injury cases who were treated in Sichuan Hospitals in the Wenchuan Earthquake, the Luahan Earthquake, and the Yushu Earthquake.

**Methods:** A hospital-based, case-control study was conducted. Records from West China Hospital Earthquake Database included all deaths (n = 36) due to earthquake injuries. Controls were the quake survivors from the same hospital. A conditional logistic regression was performed to assess the Odds Ratio (OR) of variables used in the study. A chi-squared test for trend was performed to reveal the possible relations between risk factor (variable) number and case fatality.

**Results:** People with a severe Traumatic Brain Injury (TBI) had the greatest risk of death (adjusted OR = 63.3). Multi-system Organ Failure (MSOF) and infection significantly increased the risk of earthquake-related death (adjusted OR = 87.8 and 11.2).

**Conclusion:** Based on the West China Hospital Earthquake Database, Severe Traumatic Brain Injury, Multisystem Organ Failure, and infection are the significant determinants of earthquake-related inpatient death.

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## Physical Rehabilitation in the Context of Natural Disasters:

### A Case Study in Nova Friburgo, Rio de Janeiro, Brazil

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**Study/Objective:** To identify and analyze the needs of physical rehabilitation, and the health care seeking behavior related to recovery and preservation of physical capacities of people affected by disaster

**Background:** Disasters may cause physical injury and generate incapacities and deficiencies as consequences. In January 2011, the major disaster registered in Brazil occurred in the Mountain Region of Rio de Janeiro. Rains caused floods and landslides, killing approximately a thousand people.

**Methods:** A case study was performed in one of the most affected municipalities– Nova Friburgo. Data related to types of medical complaints in local emergency services, one week before and after the disaster was collected. Victims, health professionals and public health managers were interviewed. The requirements for physical rehabilitation and the responsiveness of health services in the disaster’s recovery period were explored. Simple frequency measures were applied for quantitative data and the content of interviews was analyzed.

**Results:** Twelve affected people were interviewed, nine women (average 47 years old) and three men (average 43 years old). Only one woman had private health care insurance. Seven women and three men had jobs before the disaster, 40% of them were able to keep working after the disaster. The proportion of traumatic complaints in the emergency municipal service tripled in the week after the disaster. However, there was no increase in the demand for rehabilitation services in the municipality. Possible explanations arise from the analysis of interviews: lack of knowledge about physical rehabilitation possibilities, lack of confidence concerning the public health services, prioritization of other activities related to life maintenance (eg. overcome losses and family care) and misconception of patient complaints by health professionals, hampering the continuity of care.

**Conclusion:** The demand for rehabilitation was suppressed after the disaster, being of utmost importance to actively seek the victims out.

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### Disaster Complexity: South Pacific Origins of the Blizzard of 2016

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**Study/Objective:** Apply complexity science to a disaster case study.

**Background:** The Blizzard of 2016 produced blizzard conditions and heavy snowfall throughout the Mid-Atlantic and Northeast United States during January 22–24, 2016. This Category 4 (“crippling”) nor’easter created significant human impact due to its passage over densely-populated coastal “megalopolises”, extending from Washington D.C. to Boston.

**Methods:** A multidisciplinary team was assembled to review this storm from a complexity sciences vantage. The blizzard was distinguished by its dynamic, “globally-networked” risk landscape, a hallmark of complexity. Investigators explored how factors related to climate change, including record-setting global temperatures and a powerful El Niño, ultimately contributed to the season’s strongest winter storm.

**Results:** The Blizzard of 2016 was a natural hydro-meteorological disaster; combining elements of winter storm, nor’easter, blizzard, and coastal flood; that disrupted transportation and infrastructure for millions. With snow depths exceeding 3 feet in some areas, the blizzard covered an estimated 434 thousand square miles and impacted more than 100 million people. The antecedent climate events that led to the

blizzard included an explosive, thunderstorm-generating interaction between the east-to-west migrating Madden-Julian Oscillation (MJO), emerging from the Indian Ocean, as it encountered peak ocean temperatures associated with an extremely strong 2015/2016 El Niño Southern Oscillation (ENSO). This took place in the tropical Pacific Ocean, just north of American Samoa, in the vicinity of the equator where it intersects with the International Date Line. This destabilizing MJO-ENSO interaction affected the jet stream and set in motion a cascade of atmospheric effects, that ultimately influenced the development of a powerful blizzard several weeks later and 7,000 miles (11,000 km) away.

**Conclusion:** From a disaster complexity point of view, the Blizzard of 2016 reveals the intricate interconnections among weather systems worldwide, and illustrates how natural and anthropogenic (eg. climate change) phenomena interact to produce far-ranging consequences.

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### A Framework for Analyzing Performance Under Pressure in Diverse Healthcare Settings in Ecuador

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**Study/Objective:** To better understand the performance of health workers under pressure.

**Background:** This paper addresses a challenging landscape for health care professionals, and endeavours to analyze the healthcare system at a national level, and how it has adapted to the many challenges of both internal and external conditions. I have undertaken complex and extensive research to identify the factors that influence the responses of health professionals in diverse and changing scenarios, so as to examine their performance under extreme crisis situations.

**Methods:** Forty-five detailed interviews with key professionals (doctors, nurses, paramedics) were undertaken in diverse locations in Ecuador. Participants described high pressure scenarios including: natural disasters, emergency departments, large and small facilities, intensive care and operating theaters. Grounded theory was used to develop models to better understand performance under pressure.

**Results:** An ‘emic’ approach was used to understand ‘pressure’: namely, participants described scenarios where they personally experienced ‘pressure’. Broad interacting classes of factors contributing to ‘pressure’ were identified. Using dramaturgical analysis, we developed a ‘performative matrix’ that helped deepen our understanding of performance under pressure as a dynamic, collectively-determined social phenomenon shaped by (1) facilities and systems (staging, props); (2) teams and personnel (roles, actors), and (3) case complexity (plots, storylines). Explanatory frameworks to emerge included dramaturgical, processual and evolutionary models.

**Conclusion:** Rather than capturing a static view of individuals and outcomes, performance is modeled as a complex unfolding collective drama. Using dramaturgical, processual and evolutionary