

**Discussion:** Disaster code language is inconsistent. Few of the codes were consistently assigned to the same meaning, and none were universal. Color coding was the most common method, but there was little consistency even within color code systems. Additionally, some facilities used a combination of colors, numbers, terms, and plain language. Healthcare facilities should embrace standard terminology and create a consistent language for disaster codes to enhance response capabilities and medical security.

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### How Antibiotic Resistance Impacts Responses to Public Health Emergencies and Strategies to Mitigate the Impacts

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**Introduction:** Antibiotic resistance is when bacteria change and adapt in response to antibiotics, becoming able to defeat these drugs when used to treat infections. A direct consequence of this adaptation is an increased difficulty in treating multiple diseases. Because of increased antibiotic resistance, the World Health Organization has declared it a significant threat to public health.

**Aim:** One frequent consequence of natural disasters is infections, as seen in the December 2004 Indian Ocean tsunami. Survivors sustained a variety of wound infections that ranged from common pathogens to rarely seen organisms including fungi.

**Methods:** This research analyzes the microbiology observed in wound infections associated with exposure to freshwater, seawater, soil, fecal, and other contamination after Hurricane Harvey in 2017 and Hurricane Florence in 2018.

**Discussion:** Therapies for infections will also be discussed in addition to how the utilization of rapid detection technology for antimicrobial resistance and correct treatments require antimicrobial susceptibility knowledge to improve health outcomes, lower economic costs, prevent further spread of multi-drug resistant outbreaks and assist with antimicrobial stewardship.

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### How to Shorten the Rescue Time in Marathon by Using BLE Communication Devices: A New Study for the EMS System in Taiwan

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**Introduction:** More than one million runners have joined the marathon games since 2007 in Taiwan. There were over 150 marathon games held in Taiwan in 2018. The increase rate

was 21% as compared to that of 2014. The medical encounter rate was 1.33% in 2015 and increased to 1.41% in 2017. The most common type of injury was muscle spasm. The second most common was abrasion due to falls. The treatment for muscle spasm was RICE only. Cardiac arrest of marathon runners was reported occasionally and time is critical for rescue.

**Aim:** To shorten the rescue time of the runners in an emergency. Base on the prodromal research, BLE communication technology is further used to improve the rescue positioning communication technology in the marathon.

**Methods:** After rescue notification devices have been set up in each 0.5 km on the runway of the marathon, the runner can send a rescue signal through the rescue notification devices in case of emergency. The rescue signal, periodically advertisement SN# with rescue mark, of the runner can be precisely located and the rescue can be started very soon.

**Results:** In the simulation, the rescue signal can be located in 7.5 minutes, fastest in 3 seconds. The precision rate of timing is  $\pm 160\text{ms}/6\sigma$  that under IAAF accuracy requirement. The location error is less than 20 meters, and the rescue time can be shortened to one half as before.

**Discussion:** The rescue time of runner is correlated with the quality of marathon EMS. It is critical to the runner, especially in cardiac arrest. By using BLE communication devices, the runner can be located faster and more precisely. As rescue time shortened, CPR & AED can be given sooner. The quality of marathon EMS will be improved substantially.

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### The Human Disaster and the Urgency of the Intersertorial Join Between Public Social Policies: Lives that are Lost and Stories that Repeat Themselves

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**Introduction:** The human disaster is a permanent challenge for the Brazilian government because the difficulties faced are related to the lack of interface between public policies, resulting in fragile analyses of risk and non-prevention, being that annually several Brazilian lives are lost in disasters that continue to happen.

**Aim:** The article is the result of research and presents the analyses of health policy, actions, and programs developed to anticipate the fire victims of the Nightclub Kiss concert hall that took place in 2013 (Santa Maria, Brazil). The objective was to investigate and analyze the disasters and human disasters, especially the fire of Nightclub Kiss when 242 young people died. Causes and determinants were analyzed in order to subsidize public policies, in particular, the health policy.

**Methods:** A qualitative case study supported by the critical dialectic method with semi-structured interviews, focus group, documentary analysis, and bibliographic review.

**Results:** The experiences accumulated throughout history show that disaster situations require public policies to be able to act readily, resolve, and pay attention to the needs of the population involved. Disasters are increasingly recurrent episodes and

generate deep social consequences that mark human life. Managing a human disaster remains a challenge for the health policy in Brazil. The difficulties faced are related to the lack of interface with other public policies. The urgency to incorporate intervention/action strategies into health plans is important. Implementation of prevention and training programs, and adopting strategies and protocols for the whole network of attention is critical.

**Discussion:** It is important to emphasize the importance of broadening the theoretical definitions by overcoming the divergences of the concepts adopted between the theoretical and operational field, by elaborating a review of the Brazilian legislation in order to broaden and contemplate the needs of different people.

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### Human Factor and Disasters: Possible Equations

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**Introduction:** This research starts from the assumption that work accidents, in addition to fortuitous or individual phenomena, imply social and organizational factors, and highlights the social character of the production of the accident at work. For this reason, this study investigates the living conditions and the ways of workers in the oil and gas industry in Brazil.

**Aim:** To analyze the human factors in the relationship with work accidents on oil platforms from the social dimensions.

**Methods:** It is qualitative research and it has as instruments of collection the focal group and individual interviews with workers and managers of the platforms, participant observation, and documentary analysis.

**Results:** The research is still being carried out, but some reflections are possible so far: accidents at work depend on the direct or indirect relationship of workers with the work process itself, the modalities of production of work, and management of work. Possible causes underlying the accident are the quality of life and the conceptions of health and safety. Associated with it are social constructs and the multifactorial causes of occupational accidents including the relations between acts and unsafe conditions.

**Discussion:** The increase in outsourcing and the decrease in training quality, as well as the prioritization of production, targets the detriment of meeting safety criteria. There is a need to reassess labor management, safety policies, and outsourcing processes. Lack of awareness of the proper use of safety equipment and the organization of the work environment are major causes of work-related accidents. The human factor focuses on the individual, group, organizational, and social dimensions in complex interactions. The identification of social processes between working groups in empirical reality, the influence of elements of culture, organizational management, and their impacts on relations and on safe work performance allows an understanding of social risks.

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### Identification of Preventable Death and Severe Complications in Train Crashes in Rural and Cold Environment Using a Simulation-Based Model

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**Introduction:** The use of rail transport is increasing in Sweden, as well as within Europe, and train speeds are escalating. These factors contribute to an increasing frequency of train crashes and major crashes so severe that they can be classified as disasters. There is a lack of knowledge concerning factors of importance related to the rescue operation that can influence survival rate at train crashes, especially in cold environments.

**Aim:** The aim was to identify preventable death and severe complications among passengers in a train crash in rural and cold environments using a simulation-based model.

**Methods:** A train crash scenario was developed based on scientific research, crash reports, and lessons observed in incidents. The scenario was set to a train with seven carriages consisting of 150 passengers that derailed in a curve in 160km/h, 10km from the hospital. In Umeå in the north of Sweden, 12 participants from seven emergency/disaster organizations joined in two preparing workshops and a real-time simulation-based train crash. The Emergo Train System (ETS) was chosen as a simulation tool. Data collection such as rescue capacities, response time, and patient surge were collected and transferred into the ETS.

**Results:** The results show 17 preventable death and 9 preventable severe complications since the actions were not implemented in the recommended time.

**Discussion:** The results show that an extended rescue operation can have devastating consequences especially in cold environments. Further experimental simulations are needed with defined interventions to find out how preventable deaths and severe complications can be reduced.

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### Immunization Readiness of a Deploying Emergency Medical Team

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**Introduction:** It is a requirement for a World Health Organization verified Emergency Medical Team (EMT) that all members be immunized against common diseases in the deploying region. Most jurisdictions use private suppliers such as travel doctors for immunization services. When a deployment is announced, members are nominated by their jurisdiction under the condition they are fully immunized. It is up to the individual to monitor their immunization status.

**Aim:** To determine how many members nominated for deployment were fully immunized.

**Methods:** Nominated members sent their completed vaccination record to a central location for assessment of their immunization status. The following data were recorded: vaccination