

who can be grouped into two categories. Some low-frequency oscillations of structures give rise to panic among inhabitants who rush to the staircases of multistoried buildings. The combination of a panic and gathering in the staircases that are the weakest structural element in building leads to casualties in non-damaged buildings. Some high-frequency oscillations produce heart attacks in persons who seem to be healthy.

The above aspects of medical casualties and corresponding LETs are discussed in this paper.

**Keywords:** causes of injury; damage; earthquakes; loss estimation techniques; panic; structural strength

**G-65:  
Simulation for Estimating Timing for  
Influenza Vaccination for Disaster Refugees**

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**Introduction:** Prevention of infectious diseases by vaccination has been one of the major merits of medicine. In particular, influenza vaccination is recommended with expected benefits for high-risk groups such as the elderly, children, and adults who have serious health problems. Deaths and serious complications are largely preventable by timely vaccination under specific conditions such as the aftermath of a disaster. However, there are few scientific studies that suggest the most appropriate timing for vaccination, which corresponds to actual surveillance data. This is true especially for the critical decisions, e.g., whether or when refugees following a disaster should have the vaccines has not been investigated using quantitative methods.

**Methods:** We conducted a decision analysis based on the decision-tree model as to whether the influenza vaccination should be performed or not in terms of maximizing life expectancy given the risk caused by the vaccination.

**Results:** We theoretically formulated the decision level at which the benefit of the vaccination overcomes the risk. Furthermore, we applied the results of this decision analysis to investigate the appropriate timing for vaccination in term of cost-effectiveness. The mathematical obtained formula will be helpful for decision-makers who wonder when the influenza vaccination should be conducted under the disaster circumstances in which the surveillance data suggest the influenza epidemic is highly likely to become a serious problem.

**Conclusions:** The computer simulations based on the records from the Great Hanshin-Awaji Earthquake, in Kobe, Japan in 1995, validated the formula to determine the optimal onset time for population-based vaccination activities.

**Keywords:** disasters; Great Hanshin-Awaji Earthquake; influenza; public health; refugees; surveillance; vaccination, timing of

**G-66**

**Snow-Slide Accident with 41 Cases of Sudden Death**

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This article deals with a snow-slide that occurred on the Ton Gu La Mountains at an altitude of 5,400 meters above the sea

**Cause:** The snow-capped tops of the mountains above the snowline are frozen all year. But, the temperature below the snowline is only 10–15° C. Therefore, the internal part of snow gradually dissolves and the snow loses its support. Eventually, snow slides occur.

**Case Report:** 41 persons were killed in a snow slide. They all were young men <25 years old and were submerged by a thick layer of snow. They died suddenly from traumatic asphyxia. The clinical signs of the dead showed that all of the dead persons were submerged under a few meters of snow and died of crush syndrome. The vocal cords closed immediately, and the air in the lungs and trachea could not be expired, and the intrathoracic pressure became elevated. The organs in the mediastinum were displaced. Most of the venous blood was forced toward veins of head, neck, and the upper part of chest that do not contain valves. Clinically, there were subcutaneous ecchymoses, conjunctival hemorrhage, and fractures.

**Prophylaxis:** Any one wishing to pass through this area is advised to avoid passing through the mountains prone to develop snow slides. If it is necessary for persons to go this area, they should pass on the northern slope of the mountains. Some guides and natives of Xi Zang usually mark the safety line before mass corps can pass through the area.

**Keywords:** asphyxia; valanches; mountains; safety; snow-slides; traumatic asphyxia

*General Session XV*  
**Cardiopulmonary Resuscitation**  
Tuesday, 11 May, 8:30–9:45 hours  
Chair: *Judith M. Fisher, Kenji Oguri*

**G-71**

**Out-of-Hospital Cardiac Arrests in the Northern Part of Osaka Prefecture: Utstein Style Reporting in Japan**

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**Objective:** To describe the epidemiological features of