

distributed to the workers to assess their hazard exposures and their local experiences related to work and industrial hazards, chemical exposures, and their consequent health effects. Interviews and focus group discussions also were conducted.

**Results:** There was 100% use of chemicals in the industries used as raw material or solvents for processing including toluene, alcohols, lead, and trichloro- and perchloroethylene. The industries generated dust and vapours, as well as acids and caustics. The blood lead levels of the 285 subjects sampled indicated that 40.7% had blood lead levels within the 21–30 ug/dL, which is considered by the Department of Health as inimical to the health of workers. When hazards and illness were correlated with the alpha set at 0.05, radiation exposure was associated with bone pain, and dust exposure with eye strain and viral exposure. Based on the results, a proposed exposure rating instrument for chemical exposure was developed. This tool provides an easy assessment of chemical risks using factors such as contact with the body surface, generation of vapor within the breathing zone, threshold limit values (TLV), and exposure time. For example, exposure rating estimate of “0” means “no” exposure either through dermal contact or within the breathing zone of the worker. “Moderate” exposure is given an estimate of “2”, which means an exposure time of less than 50% of the total 8-hour workday. “Very high” exposure is excessive exposure above the TLV that varies by the chemical, and when the exposure time is beyond the 8-hour work duration. The interviews revealed that the terms of employment included lack of social benefits, practice of unfair labor terms like apprenticeship where workers are given only 75% of the minimum wage, forced overtime, piece-rate wage rather than daily minimum wage, and the restriction from organizing labor.

**Recommendations:** It is suggested that a broad front of strategies coupled by a policy framework for industrial hazard exposures be developed. To fight for social inclusion at work means more involvement of the stakeholders in the development of actions to improve their control of their work, enhanced entitlements to economic and social benefits through policy frameworks of national governments and a thorough democratic alliance of various sectors including the now, so called third sector, so that social objectives are not subjugated to pure economic considerations. Disasters from industrial hazards can be reduced or controlled through the review of labour standards and the engagement of workers themselves through active labour organization to attain levels of safety and health in the workplace.

**Keywords:** alliance; assessments; chemicals; economics; exposures; framework; hazards; illness; Philippines; policy  
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## Task Force Session: Disaster Public Health

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### Disaster Health Impacts—The Gujarat Experience

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**Background:** On 26 January 2001 at 08:46 hours, an earthquake struck Gujarat State in the Republic of India. The earthquake magnitude was 7.9 on the Richter scale. The World Health Organization was asked to perform disaster site assessment, and to undertake coordination of external relief activities in the health sector.

**Methods:** (1) Rapid epidemiological and health facilities assessment; and (2) Expansion of existing polio surveillance into post-disaster syndromic surveillance system.

**Results:** There were approximately 20,000 deaths and >167,000 persons injured. More than 225,000 homes were destroyed and another 400,000 damaged. The geographic area most affected was Kutch District where all 884 inhabited villages were damaged, and the district hospital and 46 of 47 community and primary health centers were destroyed. Only the tented military hospital remained functional. It performed approximately 1,500 major surgeries and 7,000 minor surgeries within the first 48 hours post-event. Trauma case presentations declined sharply after 72 hours. By the second week post-event, leading causes of morbidity were undifferentiated fevers, acute respiratory infection, and simple diarrhea. Marked deficiencies occurred in solid waste disposal, standardized case management, and epidemic preparedness.

**Conclusions:** The Gujarat earthquake was the largest recorded in Indian history since the Calcutta earthquake of 1737. The burden of traumatic disease peaked before the arrival of international medical assistance. Locally endemic infectious diseases predominated afterward. Critical decisions in post-event health response relied upon a scaleable disease surveillance system developed from infrastructure and personnel of the existing polio surveillance system.

**Keywords:** clinics; deficiencies; earthquake; Gujarat, hospitals; India; infectious diseases; medical conditions; polio surveillance system; rapid epidemiological and health facilities assessment; trauma

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### Evidence-Based Tool for Redefining an Approach to Severe Malnutrition in Complex Emergencies

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**Introduction:** Merlin, an UK Medical Charity, has successfully addressed the individual medical needs of malnourished children in nutritional crises. But, with a commitment to an evidence-based approach to humanitarian aid, Merlin needed to redefine its appropriate response to populations in complex emergencies. The aim of this unique University-non-governmental organization (NGO)