

Reports at the end of each run of the simulation identify which resources ran out and which were plentiful, as well as the “outcomes” of the patients. The system delivers a what-if capability that allows a user to test the effect of substitutions for resources likely to be in short supply. The system thereby facilitates the development, in advance, of alternative care standards.

**Keywords:** model; pandemic influenza; regional management; resources; simulation

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### (230) Respiratory Hazards: Enhanced Protection for Exposure to Airborne Viruses

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**Introduction:** There are impending threats of viral respiratory infections for healthcare workers worldwide—SARS, influenza, smallpox. Respiratory protection of healthcare workers is of the utmost importance and requires the highest possible level of protection, provided by such devices as the self-contained breathing apparatus (SCBA) and powered air purifying respirator (PAPR). However, this type of equipment does not allow easy stockpiling, and its use might not be realistic in all situations.

Thus, most occupational health authorities recommend the use of NIOSH (N95, N99) or CE (FFP2, FFP3) certified respirators in situations suspected to involve an airborne infectious hazard. Such certifications require particulate filtration efficiencies of 94%–99% against an aerosol of inert particles with a mean particle size of 0.3  $\mu\text{m}$  and 0.6  $\mu\text{m}$ . Considering that most viruses of pathogenic concern are smaller than 0.3  $\mu\text{m}$  in size, and that the most penetrating particle size through charged fibers shifts towards the nano-sized range = 0.1  $\mu\text{m}$ , this represents insufficient protection.

**Methods:** N95, N99, FFP2 and FFP3 respirators were evaluated for their powered air purifying respirator (VRE) in parallel with a P95 or FFP2 iodinated polymer-containing (IPC) respirator. Full-scale devices were tested against a viral surrogate, MS2 coliphage, and an animal virus, human influenza A/H1N1.

**Results:** The IPCs showed VRE results 100 to 1,000 times higher than same class respirators. Additional benefits include a carbon layer for nuisance levels of organic vapors and resistance to oil-containing aerosols.

**Keywords:** airborne viruses; iodinated polymer-containing respirator; powered air purifying respirator; Self Contained Breathing Apparatus; respiratory hazards; viral respiratory infections

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### (231) European Front-Line Health Professionals and the New Public Health Threats: Assessment of Training Needs

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European training for health professionals on Rapid Response to Health Threats (ETHREAT) is a project co-funded by the European Commission (EC). The program consortium is comprised of institutes from Greece, Germany, Poland, Bulgaria, and the UK, and is coordinated by the University of Athens School of Medicine. The 36-month project aims to develop an educational package for front-line health professionals (FLHP) that will help to improve their ability to recognize and respond to new public health threats. Before designing the training package, members of the project team explored the opinions of their target audience and of European experts on the existence and appropriateness of currently available programmes, as well as on the desired content of an educational package.

The project team designed two questionnaires addressed to FLHPs and to Chemical, Biological, Radiological, and Nuclear (CBRN) experts in the European Union (EU) member states (MS) and other European countries. Both questionnaires were administered in hard-copy form and via the project website from March to September 2006.

The FLHP questionnaire was comprised of 47 questions. The total number of valid questionnaires returned was 231 from 23 European countries. Of this total, 106 (45.5%) were answered by physicians and 109 (47.2%) by other healthcare personnel, including 62 (27%) by public health officers.

More than 50% of the responding FLHPs felt that they currently are “poorly” or “very poorly” prepared to deal with a chemical, biological, or radiological incident. Similar numbers of FLHPs are not confident (mean: 57.7%) that they could discriminate a natural versus man-made incident. Nevertheless, 67% of FLHPs stated they know where to report a suspicious, deliberate incident, but 55% stated they do not have access to Personal Protective Equipment (PPE) in their workplace, and 49.6% were not aware of a plan for responding to a CBRN incident or their role in the plan.

The CBRN expert questionnaire included 40 questions. A total of 63 valid questionnaires were returned from 16 EUMS, of which 32 (50.8%) were answered by physicians and 31 (49.2%) by other healthcare personnel, including 14 (22.2%) by public health officers. Six (37.5%) EUMS have courses on CBRN threats for health professionals at all educational levels. Despite the available training courses, the majority of the responding experts believe that <25% of FLHPs in their country could recognize and manage a biological, chemical or radiological incident, to the extent that their role requires. The majority of experts also believe that

<25% of FLHPs in their country could discriminate between a man-made versus a natural incident involving CBRN agents. Sixty percent of the responding experts (38) believe that FLHPs in their country are better trained for natural incidents.

All responding experts report that they are aware of an operational plan to manage CBRN incidents in their country, and experts from 10 MS report that they are aware of such preparedness plans at all administrative levels (national/federal, regional and local).

When comparing the answers received from the two questionnaires, the experts tend to underestimate the proportion of FLHPs in their country who are able to deal with a chemical, biological, or radiological incident. At the same time they are aware of the fact that FLHPs do not have knowledge of the existing plans in their country and administrative level.

**Keywords:** biological; chemical; knowledge; nuclear; preparedness; public health; rapid response; threats; training

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### (232) Epidemiology: The Essential Tool of Disaster Risk Management in the Health Sector

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**Introduction:** This article introduces the national and international evidences of the application of epidemiology, as an essential tool of health risk management in disasters.

**Needs of Disaster Risk Reduction Information:** Regarding ISDR, a disaster is a function of the risk process. The success of an integrated disaster risk reduction (DRR) approach implementing the fields of actions depends on the accurate information on hazards, vulnerability and capacity.

**Applications of Epidemiology in DRR:** Epidemiological researches can provide needed information in health sector, both population and system-based, on risk awareness and assessment, hazard analysis and vulnerability/capacity analysis, knowledge development; public commitment and actions, partnership, networking and early warning systems.

**Disaster Epidemiology:** As a developing branch of health science, disaster epidemiology needs more theoretical work and standardization of methods and tools. Translating the results of epidemiologic research into practice is the integral part of the disaster epidemiologists' efforts in the future. Based on lesson learned from Bam earthquake, Iran 2003, Health Emergency & Disaster Department (HE&DD) has been established as the first academic department in Eastern Mediterranean Region (EMR) focusing on DRR in health system.

**Conclusions:** In the context of disasters, epidemiology goes beyond the issues of diseases alone; it not only covers all aspects of health outcomes in humans, but also the process of disaster risk management. Regarding effective decision making in disasters, training and application of Disaster Epidemiology should be integrated into disaster risk management of health sector.

**Keywords:** epidemiology; information system; risk reduction; disaster

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### (233) International Athens Airport (IAA) and the Use of Automated External Defibrillation (AEDs) by the Workers

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**Introduction:** The use of automated external defibrillators (AED) is a new link in the chain of survival for victims of out-of-hospital cardiac arrest. With basic life support, AED can be used by individuals other than medical officers. Early defibrillation can and should be performed by specially trained bystanders.

**Case Report:** A 55-year-old man presented with sudden cardiac arrest in the International Athens Airport (IAA). Basic life support was performed by trained bystanders and IAA personnel. Defibrillation was delivered using an AED <5 minutes from the arrest with successful conversion to spontaneous circulation. The patient then was cared for by the Emergency Physicians of the IAA Medical Service six minutes after the first call, and admitted to a cardiology intensive care unit. An AMI was treated by angiography-angioplasty. The patients' outcome was favorable, as the patient was discharged 11 days after the occurrence of the cardiac arrest. Three other similar cases occurred with favorable outcome.

**Conclusions:** The time interval before the delivery of the first shock clearly is a determinant for survival after pre-hospital cardiac arrest. Use of an automated external defibrillator by individuals other than physicians, can contribute to an earlier defibrillation.

**Keywords:** airport; automated external defibrillation; defibrillation; Greece

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### (234) Clinical Profile of Patients Presenting with Dengue Fever in an Emergency Department at an Urban, Tertiary-Care Hospital during the Outbreak in 2005

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**Objective:** To study the clinical profile of patients with dengue fever (DF) presenting to the emergency ward of an urban, tertiary-care hospital during the outbreak in 2005.

**Methods:** The study was conducted in the Emergency Department at the All India Institute of Medical Sciences, New Delhi from August to October 2005. All patients testing positive for IgM and/or IgG antibodies were included.

**Results:** Of the 119 cases included, DF was diagnosed in 58 (48.7%), DHF in 53 (44.5%), and DSS in 8 (6.75%) cases. The predominant presentations were fever (100%), rash (24.3%), abdominal pain (16.8%), seizures (1.6%), and retroorbital pain (0.8%). Bleeding manifestations were observed in 56 (47%) cases. Petichiae (13%), hematemesis (10.9%), gum bleeding (10.1%), subconjunctival hemor-