

LETTER TO THE EDITOR

Disasters and Therapeutic or Prophylactic Interventions

War, political uprising, famine, civil war, or a natural disaster like an earthquake, flood, or cyclone involves considerable disability, mortality, and economic loss for the masses. Apart from emergency operations involving search and rescue for survivors, health-care personnel are obliged to tackle infections, psychological disorders, and other emergency situations among those afflicted by disasters. The survivors require uninterrupted administration of medications for different medical or allied disorders. Prophylactic substance usage is an integral component of the strategies needed to prevent outbreaks among large groups of survivors. Survivors may face temperature extremes, both sub-zero temperatures as well as temperatures around 45–50°C, during the period that lapses between the event and complete rehabilitation. Members of rescue teams responsible for immediate and routine interventions must be well-immunized and receive adequate prophylactic or therapeutic agents.¹ Predisaster plans and preparedness by international and allied organizations to combat future calamities would not be comprehensive unless they address the issues relating to potency of therapeutics, prophylactics, and diagnostics usage in the adverse environment around those afflicted by the disasters.

Disasters may disrupt the infrastructure available earlier for health care. Apart from negligible residual services available in different establishments, earthquakes or aerial bombings by enemy aircraft may disrupt local power-generating plants.² The storage requirements of many of the therapeutic agents against the common disorders encountered among disaster-afflicted individuals stipulate constant storage at temperatures ranging between 2–8°C: they are not to be frozen.³ Disruption of electricity to pharmacy and non-pharmacy locations affects the potency of therapeutics and prophylactics. The quality of labile therapeutics like insulin, thrombolytic agents, antibiotics, interferon and uterine stimulants (Table 1) could not be expected to be optimal if power disruption occurs. An inadvertent exposure in a disaster-devastated site to higher or lower temperatures would be associated with a poor therapeutic response to such agents, affecting patients with injuries, communicable diseases, cardiovascular disease, and psychological sequelae of the disaster. Furthermore, the storage requirements for vaccines and immunoglobulins used for prevention of vaccine-preventable diseases are stringent: storage is either at subzero temperatures or at 2 to 8°C. The liquid or lyophilized vaccines barring varicella and live poliovaccine are to be frozen. Mass immunizations with roughly handled vaccines at refugee camps for those afflicted by disasters would not be all that effective in preventing an outbreak of vaccine-preventable diseases.

Table 1—Therapeutic agents requiring constant storage between 2–8°C

Category	Representative
Hormones	insulin Chorionic gonadotrophin
Enzymes	<i>thrombolytic agents</i> : alteplase, streptokinase Pepsin
Anti-infective	<i>antibiotics</i> : cephalosporins, Penicillinase sensitive penicillin Anti-HIV agents: ritonavir
Anti-neoplastics	<i>alkylating agents</i> : thiopeta <i>Antimetabolites</i> : pentostatin <i>Vinca alkaloids</i> : cyclophosphamide
Miscellaneous	<i>Uterine stimulant</i> : ergometrine maleate, Oxytocin Interferon Proxymetacaine eye drops

Future plans to combat disasters should incorporate research efforts to produce therapeutic and prophylactic formulations that could withstand adverse environments including changes in temperature, humidity and atmospheric pressure during wars, earthquakes, and similar catastrophies. Stabilization of labile vaccines with trehalose, pirodavis, and deuterium oxide has been encouraging.⁴ Such stabilized formulations would interest armed forces globally. One would expect appropriate research input to tackle the issues of inadvertent therapeutic or prophylactic failures among those subjected to a strenuous life during a disaster.

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