

C.M.E.

## Health after Disaster

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The term "Disaster" derives from the latin dis, "again" and astruvr, "stars" and is translated as "the stars are evil". While there are many definitions of disaster, a common feature is that the event overwhelms local resources and threatens the function and safety of the community. It may be either natural or manmade or a combination of both<sup>1</sup>. The examples are: (1) Natural impact events like tornado, cyclone, flood, seismic disturbances leading to earthquake, volcanic eruption and/or tsunami, (2) natural progressive events like epidemic, floods, draught etc. (3) man related events like major vehicular or industrial accidents, major fires, terrorism, and war including biological one etc. Three most common consequences of Disaster are:<sup>2</sup> 1. It presents a serious threat to the health status of the community. 2. It results in the presentation to a healthcare provider of more casualties or patients in number, type or degree than it is staffed or equipped to treat at that time. 3. The loss of services, which prevent a healthcare facility from continuing to care for its patients.

### Magnitude

The physical effects of a disaster are usually obvious. Tens or hundreds or thousands of people lose their lives. The survivors suffer pain and disability. Homes, workplace, live stock and equipment are damaged or destroyed. Infrastructure failure (electricity, telephones, water, gas, roads), computer crashes, staff shortages and patient overload; all too frequently threaten the quality of services. No matter how hard we try, it is impossible to eliminate altogether disaster or problems that lead to a state of emergency.

Over the last quarter of a century, more than 160 million people a year have been seriously affected by disaster<sup>2</sup>. The annual economic cost to industrialized countries for the period 1990 – 94 alone was estimated to be more than US \$535 million. There are an estimated 30 – 50 million refugees and displaced people in the world. Out of this, 75% are women and children. The road to rehabilitation is strewn with hazards, health being a primary one. While the infrastructural damage from disasters is greatest in industrialized countries, more than 95% of all deaths caused by disasters occur in developing countries. Infants and young children are more vulnerable to various diseases and malnutrition leading to high morbidity and mortality unless immediate action is taken. The diseases commonly seen during this time are pneumonia, diarrhoeal diseases, malaria, measles,

malnutrition and emotional problems<sup>3</sup>. Other diseases seen are plague, influenza etc.

### Factors Influencing Health<sup>3,4</sup>

1. **Overcrowding and poor shelter:** Increasing risk of rapid spread of diarrhoeal disease and measles; malaria and ARI, risk of hypothermia in infants due to "open to sky" shelter.
2. **Poor sanitation, hygiene and contaminated water supply:** Lack of soap and water and clean protected container to carry them.
3. **Breakdown of health services:** Increasing the risk that children have missed out on immunisation, non availability of treatment of common illnesses, inadequate solid waste disposal increasing the menace of flies and mosquitoes, disturbed and contaminated water supply; and breakdown of drainage system because of cyclone, earthquake and failure of electricity
4. **Animals:** During such upheavals, even animal populations are displaced and they rush to human habitations carrying with them diseases. Animals even sweep through refugee settlement adding to dirt and unhygienic. Rats and such reptiles are often seen after earthquake.
5. **Generation of extra waste:** Remains of the relief rushed to the affected areas generate extra waste, e.g., plastics, bottles, cans, used food packets, papers, clothes etc. Large amount of leftover plastic if embedded in the soil may in due course lead to problems with crop productivity and soil percolation; and may play havoc in natural and artificial drainage of the area.
6. **Disposal of dead bodies:** Death could be rearing its ugly head from deep beneath debris of collapsed structures. Invisible under the mass rubble and such structures, thousands of bodies fast decompose – maggots and soil bacteria feasting on them causing the threat of an epidemic. Not properly disposed of bodies being feasted upon by dogs and vultures and such other animals. Traditional burning puts pressure on wood resources and adds to air pollution<sup>5</sup>.
7. **Inadequate food supply and storage:** This increases the risk of malnutrition and susceptibility to infectious illnesses. Food may be contaminated with fungus and bacteria; or may be rotten and fermented.
8. **Change of environment:** Increases the risk of malaria due to migration to endemic zones and having low immunity

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9. **Vulnerability to physical injuries:** Especially in children, elderly persons and pregnant mothers
10. **Social, emotional and psychological problems:** family separation, displacement, violence or abuse and personal loss of lives and livelihoods
11. **Large scale emergency surgeries:** Such surgeries being performed in make a shift medical center also emerge as an issue of serious concern. Sterile conditions cannot be maintained and there is problem of biomedical waste and its disposal.
12. **Electrostatic Charges:** Though not conclusively proved, yet many scientists have found that earthquake brings with them electrostatic charges from the ground that result in changes in atmosphere that adversely affects health of human beings and animals. In a study of 1906, common problems narrated are nausea resembling motion sickness, heart pains and giddiness<sup>4</sup>.
13. **Lack of financial resources at personal level:** Loss of living place and working place, physical disability, loss of earning member of family etc. lead to inability to spend on health.

#### **Prevention**

From the past experiences and the experience of Gujarat quake, it is clear that existing disaster management policies and practices are more concerned about the immediate relief and rescue operation and other crucial aspects like: (a) preparedness and mitigation (b) rescue and relief and (c) post disaster rehabilitation are either ignored or are given negligible importance.

The purpose of any disaster management is to provide timely response to any disaster by coordinating available resources, to protect lives and the environment, mitigate the damage and provide a rapid return to normal operations. The succession of events in a disaster are not entirely predictable, hence published reports and operational plans will serve only as guide and checklist; and may require field modification in order to meet the requirements of the event. Protecting the individual's health in emergency means meeting: (1) physical needs like food, water, sanitation, shelter, hygiene, clothes and coverings etc. (2) health needs like immunisation, medical care, disease prevention, health education, dealing with injuries and disabilities and (3) Social, emotional and psychological needs especially in case of separation, injured or who have witnessed or experienced stressor.

#### **Management**

After a massive disaster the quantity and severity of injuries will overwhelm the handling capacity of health facilities<sup>6</sup>. Triage is the only approach that can provide maximum benefit to the greatest number of injured in a disaster situation. It is a means of rapidly classifying the injured on the basis of the

severity of their injuries and the likelihood of their survival with prompt medical intervention. Higher priority is granted to victims whose immediate or long term prognosis can be dramatically affected by simple intensive care. Health planning for emergency must be based on consideration of all phases of comprehensive emergency management.

1. **Reduction:** Action to avoid or minimize the adverse health related impacts of events likely to give rise to an emergency.
2. **Readiness:** This includes planning, establishing and maintaining system and undertaking training for an efficient and effective health sector response to a potential emergency.
3. **Response:** Identifying, mobilizing and deploying health resources immediately prior to or during an emergency, in collaboration with other services to ensure as far as practicable. They are: (a) continuation of essential health services, (b) relief and treatment of people injured or in distress as a result of the emergency and (c) avoidance or reduction of ongoing public or personal health risks to all those affected by the event.
4. **Recovery:** Actions undertaken after an emergency include (a) assessment of the health needs of the affected community, (b) coordinating the health resources made available and (c) managing the rehabilitation and restoration of the affected community's health care services and health status, providing the supportive network by social and psychological services so as to reduce long term and chronic demands on health and social services.

**The health plan has five objectives.** (i) To maintain or restore the health status of the population following a major incident. (ii) To define the communication network and procedures for alerting health service providers in the event of a disaster. (iii) To define the responsibilities for control and coordination of the collective response by the health sector to a major incident or disaster. (iv) To outline the appropriate casualty evacuation chain and the relative functions of agencies and institutions operating along it. (v) To provide an overview and coordination of emergency response plans operated by hospital and health services and other strategic health providers in the region.

#### **Priorities in early phase of emergency<sup>3</sup>**

1. **Assess the situation:** The situation is assessed taking into consideration following points: (i) delineation of the area and population affected, (ii) find out number of affected persons, (iii) assess the health and nutritional status, (iv) identify the risk factors, (v) find out the health needs and priorities of children and elderly, (vi) assess the environment including water, sanitation and food

supply and (vii) find out helping agencies and what extra resources are needed.

**2. Responsibilities of administrative agencies**

(i) Establish and reestablish communication and transportation network, creating a control room and establishing a hotline, (ii) maintain electricity supply, (iii) control over "Disaster Tourism" to prevent spread of diseases and maintain environmental hygiene.

**3. Water, sanitation and environmental hygiene**

Many communicable diseases are spread through fecal contamination of drinking water and food. The importance of preparing the community on this score cannot be overemphasized.

**Water:**

- (i) Stocking water reserves: Water sources are to be protected. Store at least a three day water supply for each family member. The needs of each person will differ depending upon age, physical condition, activity, diet and climate. A normally active person needs to drink at least 2 quarts of water daily. Children, nursing mothers and ill people need more water. Additional water is necessary for food preparation and hygiene. At least 2 gallons of water per person per day should be stored.
- (ii) Storing of water: Water should be stored in clean and sanitary containers. Plastic containers are good because they are lightweight and unbreakable. Metal containers should be considered as a last resort because they may corrode and tend to give water an unpleasant taste. Water containers are to be distributed along with soap for personal hygiene. Contamination of water during collection, storage and transportation should be prevented.
- (iii) Purifying the water: In addition to having a bad odour and taste, contaminated water contains microorganisms. All water of uncertain purity should be purified prior to use. Though the best method of purifying the water is boiling it for at least ten minutes, it is not feasible in the field. The alternate best method is solar water disinfection (SOWDIS)<sup>7</sup>. Water is kept for 4-6 hours under sunlight in a transparent closed container, the dependent part of which can be painted black. The other method is chlorination. Instead of powder, either 1% solution or liquid chlorine bleach is added to water with a minimum contact time of 30 minutes. Residual chlorine kills pathogens from further contamination also. Chlorine tablets and iodine are not recommended.

**Sanitation:**

- (i) Defaecation: The non existent sanitation system makes the area a virtual sitting duck for diseases. The simplest

and quickest sanitation facilities are shallow French latrines, collective latrines and defaecation areas or fields. This depends upon water table level, soil, locally available materials and people's habits and customs. It may require sanitation education to accept different sanitation practices other than they use. There should be at least one latrine for every 15-20 person and which should be regularly cleaned and disinfected. Defaecation fields should be at least 15 m away from water source; but near enough to be reached by children and elderly. Proper care and cleaning is to be ensured with supply of sufficient quantity of lime and bleaching powder to prevent fly breeding. The excreta should be disposed off in prepared pits and are later on covered with at least 25 cms of soil.

- (ii) Disinfection: The most commonly used and least expensive disinfectant is probably liquid chlorine bleach. A 5.25% solution of sodium hypochlorite is required for a liquid chlorine bleach to function effectively as a disinfectant. A common recommendation for final disinfecting rinse after flood cleanup of most hard surface is ½ cup per gallon of water. The dilution recommended for laundering clothing is 1 cup per wash load for top loading washers. Bleach should not be added on top of clothes.
- (iii) Drainage: Storm water and waste water can pollute drinking water sources because of poor drainage. Drainage trenches are to be built and stagnation in the pools is to be avoided.
- (iv) Solid waste disposal: Organise regular collection of waste. Dispose of organic and medical waste and dead bodies by burning and land filling.

**4. Shelter and site planning :** Provide shelter and coverings (blankets). Shelter may be in the form of temporary residential units like tents, aluminium shelters, tarpaulin sheds etc. Try to minimize overcrowding.

**5. Food and nutrition:** Maintain food safety and supervise mass feeding facilities. Identify and treat malnutrition. Following points need a thought: (i) what foods are imperishable and do not need cooking and refrigeration (ii) What foods are easily prepared (iii) What foods are high in calories and protein that will help to provide energy (iv) What foods appeals to family members (v) What foods are needed to meet the dietary needs of family members such as babies, toddlers, diabetics and elderly.

**Food options to be avoided:** Commercially dehydrated foods require a great deal of water for reconstitution and require extra effort in preparation. They also are inedible unless they are reconstituted. Bottled foods are too heavy and bulky; and break easily. Preparation of whole grains, beans and pasta could be complicated under the circumstances of a disaster.

**Food storage:** (i) Keep food in the driest and coolest spot in the house and in dark area if possible. (ii) Keep food covered at all times (iii) Use plastic bag or tight containers (iv) Open food boxes and cans carefully so that they can be closed tightly after each use

**6. Health services :** There is a common perception that a health care response to an emergency will only involve major secondary and tertiary care hospitals, which is not so. Psychological and social health also needs attention. Decide on essential drug list, case definition and standard treatment guidelines and policies. Treat common diseases, minor injuries and illnesses onsite only. Establish mobile units and reference system. Maintain routine vaccination including DPT, OPV, measles, rabies etc. Mass immunisation during natural disaster is counterproductive. It diverts limited human resources and give false sense of security.

**7. Health education :** Find out myths and beliefs, attitudes and customary practices. Base the health education on an understanding of people's culture, customs and habits. Conduct community health education with participation of community leaders on all matters related to public health, e.g., public health, sanitation, food storage, personal and environmental hygiene, child care, common diseases, peer led school health activities etc.

**8. Surveillance and control of communicable diseases and epidemic :** Encourage the use of insecticides treated bed nets. Immunise all children against measles if there is a risk of disease outbreak. Vaccinating all children irrespective of their immunisation status is quicker and more effective method. Monitoring morbidity and mortality gives early warning of epidemics. Prepare contingency plans and stock of ORS and vaccines. Confirm outbreaks, conduct investigation; plan and implement control measures.

**9. Control and disposal of hazardous substances :** This includes measures to tackle bioterrorism (prevention, control and treatment).

**10. Social, psychological and psychiatric support:** Children caught up in a major incident may need the supportive frame work provided by social and psychological services in which they can come to terms with the effects of disaster on their lives. Not only does this rapidly get help to those who need it, but it may also reduce long term and chronic demands on health and social services.

#### **Management of individual situation**

**1. Diarrhoeal Diseases:** Acute diarrhea kills more children in emergencies than other types of diarrhea. Cholera and dysentery are more common. Diagnose, treat and control the spread. If ORS is not available, prepare 'homemade' ORS (one level tsp salt, eight tsp sugar in a liter of clean drinking water). Ensure clean water supply, hygiene and sterilization. Proper hand washing and personal sanitation is the most effective way of preventing dysentery transmission.

Encourage breast feeding. Management of diarrhoea does not differ from routine cases except addition of antibiotics.

**2. Measles :** It is most contagious disease. Overcrowding may increase its spread. Measles outbreak may still occur in spite of pre disaster high vaccination coverage, as coverage and efficacy are not 100%. All children 6 month to 5 years should be immunized irrespective of their immunisation status, preferably within first week. Good treatment should be provided to older children having fever with adequate fluid intake, continued feeding and vitamin A. After this vaccination is completed, provide regular immunisation with measles and other EPI vaccines. This covers initial left outs infants reaching six months and infants who received first dose between 6-9 months get the second dose.

**3. Malaria :** Young children and pregnant mothers are at increased risk. If there is malaria epidemic, patients with fever and malaise are to be treated with antimalarials because laboratory diagnosis is not possible in the field. Curative treatment alone is not useful and enough in young children as they may be reinfected. So stress is given to prophylactic and preventive measures also. Preventive measures include spraying insecticides, protection from mosquitoes with chemical impregnated net or mosquito repellants, and destroying breeding sites.

**4. Respiratory diseases :** They are caused due to overcrowding, inadequate clothing and inappropriate shelter. They are managed with good supportive care, antipyretics and antibiotics.

#### **5. Other minor health problems**

- (i) Skin diseases like scabies, impetigo and boils, lice, bed bugs
- (ii) Eye diseases like trachoma and conjunctivitis
- (iii) Worm infestation and protozoal infection

These all can be treated accordingly on OPD basis.

#### **6. A. Malnutrition**

**Causes:** (i) Inadequate dietary intake due to lack or poor variety of food, too few meals, food being too bulky and unfamiliar, lack of breast feeding in infants, dependency of elders etc. (ii) Diseases as mentioned reduce appetite and absorption and increased metabolism increases the need of food (iii) Lack of food preparation (iv) Lack of child care due to separation and it is second priority after family problems and; lack of time in food preparation and feeding (v) Even elders and such vulnerable group are not given priority over managing their family as a whole.

**Prevention:** After assessing the overall nutritional status of the people, food distribution and supplementation is planned.

**Assessment:** For assessment, weight for height is the most reliable way and mid arm circumference for under fives. Look for pallor, signs of vitamin A deficiency, wasting and failure to gain weight.

**Treatment:** (i) Stabilisation: Diagnosis and treatment of complications like hypoglycemia, hypothermia, dehydration, infection, sepsis etc. Other general measures to be taken are deworming, measles immunisation, vitamin A supplementation, continuing breast-feeding. (ii) Rehabilitation: High energy food is supplied with iron and micronutrient supplementation. Apart from this, physical, social and emotional aspects are also taken care of.

**B. Anemia:** Anemia can be caused by malaria, worm infestation or malnutrition. Iron given in stabilization phase can reduce resistance to infection. Hence wait giving iron preparation until proper weight gain. Along with iron, vitamin B complex and C are also given

**C. Vitamin A:** Deficiency of vitamin A further reduces immunity of a child. It is supplemented with foods having vitamin A and high doses of oral supplementation (to be given only when it is not given within last one month). The dose for under 6 months child is 50,000 i.u. once only, for 6-12 months child One lac i.u. every six months and for above one year child, 2 lac i.u. every six months.

**D. Breast Feeding:** It is very important source of nutrition for infants and young children. It avoids infection, prevent malnutrition and neither need fuel and water nor creates rubbish. Certain false beliefs like effect of emergency on ability to breast feed are to be clarified and do not entertain inappropriate promotion of artificial feeding. Alternative like wet nursing, breast milk banks or artificial formulas are to be thought for orphan and separated child. Mothers are helped in reestablishing breast feeding: (i) Motivation and support (ii) Explain disadvantages of top feeding over breast feeding (iii) reassure about "no milk" and explain suckling reflex (iv) Ensure enough fluid and food for mothers (v) Avoid dummies and pacifiers.

**7. Typhoid :** Typhoid is very common disease in our country and is more so in disaster situation. Indian Academy of Pediatrics recommends routine use of typhoid vaccine but not as a mass immunisation.

**8. Tetanus :** Significant increases in tetanus have not occurred after natural disasters and hence mass vaccination against tetanus is usually unnecessary.

**9. Emotional Problems :** The short term emotional effects of disaster like fear, acute anxiety, emotional numbness and grief may also be obvious. For many victims these effects fade with time, but for many others; there may be long term emotional effects, both obvious and subtle. Some of the emotional effects are direct response to the trauma of disaster while others are long term response to interpersonal,

societal and economic effects of the disaster. In any case, in the absence of treatment more than half of the victims of a disaster may develop lasting depression, pervasive anxiety, post traumatic stress disorder (PTSD) and other emotional disturbances. Even more than the physical effects of disaster, the emotional effects cause long lasting suffering, disability and loss of income.

Social dependency is another issue where child often becomes heavily reliant on others for help. Involving them in their own rehabilitation can prevent this. (Helping people to help themselves).

### **Conclusion**

Natural and manmade disasters are occurring with increasing frequency worldwide, but we are lacking in preparedness and post disaster management. The focus has begun to shift from merely providing post disaster assistance to putting in a place a system that will readily swing into action, once disaster strikes. The attitude has to shift from spending money after a disaster to investing in technology that can prevent, control and warn such disaster. Containerised emergency supplies and a strong network of professionals should be in place to take immediate measures.

While natural calamities are beyond human control, the lives lost for want of proper medical care are a greater disaster. Simple measures can go a long way in preventing disease outbreaks and reducing the cost of expensive treatment later.

It is not a one man show and needs cooperation from various government and N.G.Os. with community participation. There should be proper coordination and sharing of information with decentralisation and not centralization of the work. It is important that everyone does what they are best at and work together. Together we can turn the tragedy into an opportunity that uses innovative approaches towards community building and livelihood growth.

**Disaster of new millennium :** Topic will not end without a mention of this new threat.<sup>8,9,10,11</sup> After the conventional weapons e.g. explosives (bullets and bombs), new millennium has brought with it a new type of disaster threat called NBC disaster (Nuclear, Biological and Chemical), though the use of chemical agents in war is documented way back in 400 BC. This has become the truth as can be seen currently by the headings of the daily newspaper. Peculiarities of NBC disaster (terrorism) are (1) production is not costly, (2) ease of dissemination or transmission, (3) unidentifiable source, (4) can cause massive fatality and morbidity without sound and blast and without property loss, (5) though does not cause instant death, keeps a person ailing for a long and (6) Creates a panic of magnitude in the whole country and not only at frontiers. It may result in social disruption.

The agent that can be used for NBC disaster can cause deleterious change in environment, can damage food, water, or equipment supply; and can cause disease or fatality in living beings

Management of natural and manmade disasters is radically different from one another and call for specialized implantation of disaster management plans. In natural disaster the immediate need is for things like evacuation to safe place, arrangement for temporary shelters, medical assistance, maintaining sanitation, hygiene and food supply.

In NBC disaster, the primary consideration would be:

1. Investigating immediately any report of a cluster of illness or other events that suggests an intentional release of a biologic or chemical agent.
2. Rapid response to a NBC related disaster requires prompt identification of its onset. It may not be practical to await diagnostic laboratory confirmation.
3. Identify the components of the chemical or germs. Centre for Disease Control, USA has developed a rapid toxicology screen that can identify up to 50 different agents in a blood sample and soon it would be 150 agents.
4. Judge the effects they would cause.
5. Prevent further exposure and thereby long term complications.
6. Measures for prevention of spread, control and treatment.

**Nuclear Disaster :** Nuclear disaster and its long lasting effects, we have seen during World War II at Nagasaki and Hiroshima. After nuclear explosion, measures are to be taken to prevent further exposure and neutralise the radiating effect.

**Biological agents :** The biological agent of highest importance is Bacillus Anthracis causing anthrax. 12 Other agents are Yersinia Pestis (plague), Variola Major (small pox), Clostridium Botulinum toxin (botulism), Francisella tularensis (tularemia), Arena viruses (Lassa fever), filoviruses (ebola haemorrhagic fever). They all are disease specific.

**Chemical Agents<sup>11</sup> :** Chemical agents may be in the form of gas, liquid, spray or powder, but in majority of cases it is gas. Gaseous agents are classified according to their property. (Table I) Various methods are used to disperse the gas. It can be sprayed from aero plane, dropped as a bomb, fired by artillery or dispersed by exploding land mines. It can be accidental as in Bhopal gas tragedy or may be a terrorist act. They are classified depending upon their action on human beings.

**Table I : Types of Gases and their Effects**

Type of gases	Property	Name	Effect
Arsenical or blood gas	Stroch mortar	Hydrogen Cyanide	Blocks transfer or use of oxygen by blood
Mustard Gas	Linseed liquid like	-	Burns and tissue damage to skin, eyes and lungs
Nerve Gas	Organophosphorous Compound	Sarin, Tabun, Soman	Inhibits acetylcholin-esterase
Chocking Agents	-	Chlorine Phosgene	Cough and Respiratory distress

### Conclusion

Health care providers, clinical laboratory personnel, infection and pollution control professionals; and health department play critical and complementary roles in recognizing and responding to illnesses caused by intentional release of biologic or chemical agents. The syndrome descriptions, epidemiological clues and laboratory recommendations provide basic guidance that can be implemented to improve recognition of these events.

### References

1. Ehrenreich JH. Coping with disaster In: A guidebook to psychosocial intervention prepared for mental health workers without borders. August 1999. Available from <www.mhwwb.org/dm\_ch1/chapter 1 > Assessed 25.2.2001.
2. Health Emergency Management New Zealand (HEMNZ). Disaster Management. A leaflet. Available from <www.hemnz.org.nz/news> Assessed 7.10.2001.
3. Katht Attawel. Children's health in emergencies-a practical approach. A special supplement to Child Health Dialogue, Health Link worldwide, UK. October-December 1999: 1-16.
4. Times of India, Ahmedabad Edition. 25.3.2001: 2, 5.
5. Times of India, Ahmedabad Edition. 1.2.2001: 5.
6. HEMNZ. Emergency Preparedness. May 2001. Available from <www.hemnz.org.nz/pdf/healthplan.pdf> Assessed on 25.2.2001.
7. Gujarat Samachar, A Gujarati daily, Ahmedabad. 24.7.2001: 2.
8. Times of India, Ahmedabad Edition. 18.10.2001: 12.
9. Centre for Disease Control and Prevention (CDC). Recognition of illness associated with the international release of a biologic agent. Mortality and Morbidity Weekly Report (MMWR), CDC, USA. 19.10.2001: 1-2.
10. Government of Gujarat. Biological and chemical warfare training module. GOG, Dept of health and family welfare, Gandhinagar, Gujarat. October 2001: 40-49.
11. CDC. Bioterrorism Readiness Plan: A Template for Healthcare Facilities. April 1999: 1-34. Available from <www.cdc.gov/ncidod/disease/bioterr> Assessed on 1.3.2002