Recommendations

IAP Workshop on Disaster Management Practices: Recommendations and IAP Plan of Action

Writing Committee

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Background

Natural calamities and disasters have become common occurrence which has very adverse consequences especially for develop-ing countries having limited resources. Considering that the children are the worst affected during disasters Indian Academy of Pediatrics (IAP) had set up a Task Force on 'Child at Risk'. A "Disaster Management Committee" was formed under this Task Force. A workshop was held to bring out IAP Guidelines on this issue. List of the members taking active part in the workshop is given in *Annexure I*.

Presented here are the broad guidelines of the workshop.

SECTION 1

Disaster Preparedness

1.1. *Objectives*

The objectives of disaster preparedness are to: (*i*) Ensure that appropriate systems are in place to provide prompt and effective assistance to disaster victims; (*ii*) Prepare the community to handle the disaster in the first 48 hours or so when outside help has not reached and the local administration is itself affected by the disaster.

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1.2. *Steps of Preparedness*

The key to disaster preparedness is the coordination of a variety of sectors to carry out the following tasks: (*i*) Evaluate the risk of the particular region to disasters; (*ii*) Develop a disaster action plan; (*iii*) Organize communication, information, and warning systems; (*iv*) Develop and conduct community education programs; (*v*) Organize disaster simulation exercises and tighten response mechanisms; (*vi*) Health institutions should develop individual disaster preparedness plans; (*vii*) Disseminate the plan widely. People with roles to play in the disaster plan must be trained for it; (*viii*) Compile a comprehensive database of the health facilities in and around the area; (*ix*) Local government must appoint a Disaster Coordinator who is in charge of preparedness activities and coordinating plans with government agencies, armed forces, foreign relations divisions, United Nations and other international agencies, Red Cross and other NGOs, and the agencies responsible for housing, communication, power, and water services, (*x*) Media should be used to convey messages on disaster preparedness and mitigation.

1.3. *Phases of Disasters*

1.3.1. Rescue Phase

The first 48 to 72 hours after the disaster are critical and are called the "Rescue" phase. After disaster has struck, the local authority/ community leaders must at once set up or

activate the Disaster Committee with the task of coordinating actions.

1.3.1.1. *Make a Chain*

The foremost task of the committee will be to enroll group leaders right at the "Mohalla" or housing block level and thus make a chain for disseminating as well as collecting information.

1.3.1.2. *Take Stock*

The committee takes stock of the consequences of the disaster and concerns itself with the essential problems. Major functions of the committee are assessment of requirements and coordination with the intermediate-level or central authorities to prevent chaos and confusion.

1.3.1.3. *Coordination of groups from outside*

One of the important tasks of the Disaster Committee would be to monitor assistance from external groups (volunteers, associa-tions). The help from external groups is important but steps must be taken to see that they do not act on their own agenda and report to the Disaster Committee. International bodies can play an important role by themselves consulting the local committees and inviting the donors and outside groups to do the same.

1.3.2. Recovery Phase

This is the period (usually after 2 to 3 days to 6-8 weeks after disaster) when outside help starts and when the reality of disaster begins to sink in the affected population.

Rapid steps must be taken to establish a system of continuous contact with the families stricken by the disaster. Community can be subdivided into groups and a group leader can be selected/nominated. The latter is in daily contact with the Disaster Committee or their sub committee. A system of this kind makes it possible to collect information on requirements, route instructions and information, distribute where necessary the means of survival (clothing, blankets, food, *etc*.).

Gradually the Disaster Committee will organize itself to deal with the post-disaster period (Rehabilitation phase), assigning responsibilities in various fields like: (*i*) transport and highway maintenance; communications and information; (*ii*) water supply, food, means of survival; (*iii*) public works, building; (*iv*) sanitation; (*v*) health; (*vi*) public law and order.

1.3.2.1. *Temporary Shelter*

When the disaster has made houses uninhabitable and there has been no evacuation of the area, temporary shelter must be arranged for those affected, for those who generally prefer to remain on the spot, in or near their property. It may happen that the population settles all over the place (waste ground, gardens, parks, squares, parking areas, sports grounds, *etc*.), using anything that comes to hand (planks, plastics, tents, cars, containers, boats, railway wagons, buildings under construction, schools, public buildings, *etc*.). The sanitary situation may then rapidly deteriorate and it becomes very difficult to assess requirements.

Communities exposed to the risk of disaster (and those that propose to give shelter to displaced persons) should select sites for temporary shelter (before a disaster strikes) and carry out the necessary preparatory work. The sites chosen for erecting shelters should be: (*i*) flood-proof, above high-water level; (*ii*) preferably on a gentle slope to facilitate rainwater and waste water drainage; (*iii*) not too close to the water table; otherwise the ground could become marshy in the rainy season; (*iv*) protected against landslides and subsidence; (*v*) easily accessible, not far from the centre of the population; (*vi*) at a higher level than waste tips; (*vii*) downstream from sources of drinking-

water.

1.3.2.2. *Reporting*

The local health personnel should prepare periodic reports (weekly at the outset, then monthly) summarizing from the daily information collected bearing the following issues:

(*a*) *The composition of the community:* It is important to know the number and age-structure of the local population in order to adapt health activity programs accordingly and to assess requirements. Since this number keeps changing, the data must be updated periodically.

(*b*) The number and type of health personnel available, including local and volunteers from elsewhere.

(*c*) The causes of death, which is an important indicator for assessing the health situation.

(*d*) The cases that could not be dealt with on the spot, and the reasons behind the decision to evacuate.

(*e*) *The establishments to which people have been evacuated:* This makes it possible to adapt the data received from the intermediate level so as to make rational use of support structures and specialized centers.

(*f*) *The symptoms and diseases seen by the local health team:* This indicates the disease pattern that is developing and the number of people affected.

(*g*) *The programs and activities under way:* this enables the intermediate level to take into account what the local team has already undertaken and to give the team indications on how to adapt its activities to the epidemiological forecasts made at intermediate level and in accordance with the evolution of the health situation in the whole of the disaster area.

1.3.2.3. *Dealing with the dead*

When the disaster results in a large number of deaths, the community should organize: (*i*) transportation of the bodies (*ii*) a pre-burial area; (*iii*) the burial place.

While doing so, it is important to remember to:

(*a*) Remove the bodies from the disaster area as rapidly and discreetly as possible and note down information necessary for identifying them (place where they were found, information from relatives and neighbors);

(*b*) Photograph the dead bodies for identification later;

(*c*) Transport the bodies, which should be covered, to the place where they are to await burial and where personal belongings are also deposited.

(*d*) Draw up an official register of the deaths, containing identification particulars.

(*e*) Bury the dead as late as is compatible with the laws and customs of the region, so as to enable identification. Common graves should be avoided; the site of the graves, numbered and marked with identification data.

(*f*) Hand over personal effects to the nearest relatives.

1.3.2.4. *Dealing with animals*

In a disaster animals may be killed (in large numbers in floods, for instance) or dispersed. They may lose their shelter. Endemic zoonoses may spread. Dogs may revert to the wild and go about in packs. The community, possibly using groups of volunteers (who will be more effective if they have been trained in advance), should take steps to carry out the essential tasks: (*a*) Destruction of animal carcasses: Often they

have to be sprinkled with petrol and covered with earth to protect them against predators until they can be destroyed or buried; (*b*) Housing of shelter less animals; capture and treatment of stray cattle who must be brought together in specially prepared premises, fed, milked and looked after; (*c*) Re-opening of slaughterhouses: existing ones if they are usable, otherwise in temporary premises or in lorries equipped for the carriage of meat; (*d*)organize the monitoring of communicable animal diseases and of slaughterhouses.

1.3.3. REHABILITATION PHASE

This is the phase in which the community is back on the normal life process and in fact is fine tuning their resources to deal with other emergencies. They are thus also in a position to provide help to some other disaster affected area in the manner that they received help and assistance.

SECTION 2

Water, Sanitation and Diarrheal Diseases

Many communicable diseases are spread through fecal contamination of drinking water and food during and after a disaster. The importance of preparing the community on this score cannot be over emphasized. How the community handles the rescue phase will depend a lot on their preparedness.

2.1. *Preparedness*

The community needs to be educated in the following areas to help them tackle the Rescue and Recovery phase more efficiently: (*a*) Ensuring safety of drinking water; (*b*) Simple and safe waste and excreta disposal practices; (*c*) Control of vector borne diseases; (*d*) Management of diarrheal diseases

2.1.1. ENSURING SAFETY OF DRINKING WATER

2.1.1.1. *Disinfection of well water/stored water*

First step is to know the amount of water to be disinfected. Amount of well water can be calculated (2 × 3.14 × radius of well × height of water column). Bleaching powder 2.5 grams per1000 liters can be used for disinfection. The required amount of bleaching powder should be dissolved in 3/4th of bucket water; this should be mixed thoroughly with well water and be left for 1 hour before using it. The coliform count in drinking water should be <10/100 ml.

The recommended chlorine residual is 0.5 mg per liter. Above 3.0 mg per liter chlorine concentration can cause diarrhea. Chlorine residual is easily checked with any of the commercially available color comparators.

2.1.1.2. *Disinfecting small quantities of water*

2.1.1.2.1. Boiling

Boiling is the best way to kill bacteria, viruses and parasites. A full boil for at least 3 minute is recommended. To remove the flat taste of boiled water, leave the boiled water in a clean covered container for a few hours.

2.1.1.2.2. Disinfecting using chemical methods

Unscented household bleach (5% chlorine) can be a good disinfectant in such circumstances. Disinfection using bleach works best with warm water. Double the amount of bleach for cloudy water, or for water that is cooler.

2.1.1.2.3. Chlorine Tablets

Usually, one small tablet is for 2 liters and large tablet for 20 liters of water. Put the tablet in specific amount of water for 30 minutes and thereafter it can be used for drinking.

2.1.2. SIMPLE AND SAFE WASTE/EXCRETA DISPOSAL PRACTICES

The following guidelines will be useful in Rescue/Recovery phase:

2.1.2.1. *Disposal of human excreta*

Identify and utilize surviving latrines and systems. Prevent defecation near water sources,

which can be used for drinking purposes. Designate areas where defecation is allowed. Organize additional latrines as per guidelines below:

(*a*) Pit Latrines should be planned, one for every 15-20 people.

(*b*) Trenches for pit latrines should be about 2 metres deep and 80 cm wide (the length will vary). It should be 2 meters above the level of ground water to avoid fecal contamination.

(*c*) Cover with planks, with seats or slabs for squatting.

(*d*) Put a cover on the opening to stop flies from getting in.

(*e*) The latrines should not be installed too far away from the temporary dwellings. It should be 15 meters away from the source of drinking water.

(*f*) Lime should be used in communal trench latrines to reduce the development of methane gas and odors.

If no sanitation facilities are available, people should bury their excreta.

2.1.2.2. *Solid waste disposal*

An area should be identified for disposal of solid wastes. This should be covered with earth to keep flies and rodents away.

2.1.3. Control of vector borne diseases

Establish preparedness plans for the control of epidemics of dengue, malaria and other vector borne diseases within the general organization of emergency health services, which in turn should be included within the National Disaster Preparedness Plans in areas at recognized risk. Update the epidemiological profiles of areas considered to be at risk, particularly when a potential disaster situation is forecasted. Arrange to have ready a core group of trained personnel, supplies and equipment as well as logistic support to strengthen prevention and control activities at short notice. Evaluate the situation and adjust the emergency plans to the local conditions before putting them into action. Epidemics of malaria, dengue and encephalitis subsequent to a disaster, if they occur at all, start about six weeks after the disaster hits.

Apply mosquito source reduction techniques in the home environment following the instructions of local municipal workers. Seek diagnosis and treatment for fever symptoms at the nearest health unit or community voluntary health worker post. Use mosquito repellents when working outside the home during the evening hours and a mosquito net when sleeping.

2.1.4. Control of diarrheal diseases

The following messages need to be communicated to the health worker during the preparedness phase

(*a*) During diarrhea there is an increased loss of water and electrolytes (sodium, chloride, potassium, and bicarbonate) in the liquid stool.

(*b*) Dehydration occurs when these losses are not replaced adequately and a deficit of water and electrolytes develops.

(*c*) The volume of fluid lost through the stools in 24 hours can even be >200 ml/kg as compared to 5 ml/kg (near normal).

(*d*) The total body sodium deficit in young children with severe dehydration due to diarrhea is usually about 70110 millimoles per liter of water deficit.

(*e*) Potassium and chloride losses are in a similar range. Deficits of this magnitude can occur with acute diarrhea of any etiology. The most common causes of dehydration are rotavirus, enterotoxigenic *Escherichia coli* (ETEC) and, during epidemics, *Vibrio*

cholerae O1 or O139.

(*f*) Although anyone can become dehydrated, those who become dehydrated the most easily are, babies under 1-year-old, the elderly, anyone who has a fever, people in hot climates.

(*g*) Mothers must learn to respond to diarrhea immediately by giving extra suitable drinks like lemon water, rice water and to recognize the signs of dehydration which needs special care.

(*h*) If, despite extra home drinks, dehydration occurs, or the diarrhea continues for more than two days, the child should be taken to see a health worker.

(*i*) Oral Rehydration Salts. Keep stocks in Disaster Prone Areas, Supply with food/ water in shelters/camps.

(*j*) Antimicrobials. Drugs are not used in a majority of cases of diarrhea. Drugs should not be used except in severe case. Children who have the passage of blood and mucus (dysentery) or having fever may require antimicrobials like Norfloxacin, and Trimethoprim-sulfamethoxazole.

2.1.4.1. *Prevention of Diarrhea*

Community must be taught to prepare Homemade ORS Solution. Take one liter of clean water. One teaspoon of salt and 8 teaspoons of sugar. Molasses and other forms of raw sugar can be used instead of white sugar, and these contain more potassium than white sugar. Mix all of these in a clean bottle or pot. If WHO-ORS packets are available use them as per instructions.

2.1.4.2. *How to use homemade ORS*

Guidelines for use of homemade ORS are: (*i*) Give homemade ORS as often as the child will take it. A teaspoon every 1 or 2 minutes is ideal for a child under 2 years. An older child should take sips from a cup as often as he or she can. If the child vomits, wait 10 minutes then give the solution more slowly; (*ii*) Give homemade ORS until diarrhea stops; (*iii*) Keep homemade ORS covered when it is not being used; (*iv*) Through away leftover homemade ORS after 24 hours; (*v*) Mix new homemade ORS each day; (*vi*) Keep breastfeeding and give your baby or child liquids. Clean water, soup, rice water, yogurt drinks, and homemade ORS solution are good drinks. Continue giving these liquids until the diarrhea stops; (*vii*) Get help from a trained health worker if the child does not get better in 3 days or has any of these problems: watery stools, repeated vomiting, eating or drinking poorly, fever, very thirsty, and blood in the stool.

Establish rehydration cells as close to the camps and shelters as possible.

2.2. ***Rescue Phase***

During this period the community would be required to exercise all that has been learnt in the Preparedness phase by ensuring the safety of their drinking water, disposal of their excreta and other solid wastes and preparation of home drinks in the instance of diarrhea.

If there is choice between preparing ORS in unclean water or not administrating ORS at all: The balance is in favor of the former– making ORS in unclean water in the presence of life threatening diarrhea.

2.3. ***Recovery Phase***

During the first few days it is sometimes necessary to use tanker-trucks or jerry cans and boats in floods for transporting water but as soon as possible water-supply points should be established by sinking boreholes, digging wells or laying pipes.

When people are living in temporary shelters, and particularly where there are concentrations of displaced persons, health

education is very important. Hence continue and repeat messages on waste disposal, personal hygiene, use of ORT etc should be given as often as possible.

2.3.1. Personal hygiene

It tends to decline after natural disasters, especially in densely populated areas and where there are water shortages. The following measures are recommended: (*i*) Provide basic hand washing facilities (shelters, temporary settlements and camps); (*ii*) Provide washing, cleaning, and bathing facilities (camps for refugees and displaced persons); (*iii*) Make adequate amounts of water available (disaster stricken areas and camps for refugees and displaced persons); (*iv*) Avoid overcrowding in sleeping quarters.

2.3.2. Restoration of sewage disposal/safe water supply by the civic authorities

2.4. *Rehabilitation Phase*

2.7.1. Concentrate on the restoration of (at community level) water storage methods, waste disposal techniques, food and personal hygiene, and fuel supplies, and (at the administrative level) sewage lines/excreta disposal, disposal of solid waste, prevention of the breeding of Vectors: files, mosquitoes, centralization of the water disinfection process, piped water supply, wells, and hand pumps.

SECTION 3

Trauma and Injuries

Quality and availability of immediate first aid services will depend upon the training and preparation of the community during "normal" times.

3.1. *Preparedness*

This would involve training HCW and other community members. Physicians from all branches should be given a refresher course in simple surgical procedures. A database of Referral Centers capable of handling complex cases should be updated every now and then.

3.1.1. Do's and don'ts of rescue work

(*a*) Activate a disaster plan for large-scale building collapses.

(*b*) Relief for both supervisory and field rescue personnel must be forthcoming and ensure that all rescuers eat and rest at frequent intervals, as circumstances permit.

(*c*) Establish an effective communication system as early as possible.

(*d*) To handle media, it is suggested that there should be a designated Public Information Officer who should plan and giving frequent press briefing and updates.

3.1.2. First Aid

Relief workers should be able to provide cardiopulmonary resuscitation, and to manage physical trauma, burns, and electric shock.

3.1.3. Issues in Transport

Relief workers should be well aware of safe transportation of injured persons.

3.1.4. Triage

The principle of "first come, first treated", which is applied in routine medical care, is not practical in mass emergencies. The most common classification used is the internationally accepted four-color code system. Red indicates high priority treatment or transfer, yellow signals medium priority; green is used for ambulatory patients, and black for dead or declining patients.

Triage should be carried out at the disaster site in order to determine transportation priority and admission to the hospital or treatment center where the patient's needs and priority for medical care will be reassessed. Persons with minor or moderate injuries should be treated near their own homes to avoid added drain on

resources of transporting them to central facilities. The seriously injured should be transported to hospitals with specialized treatment facilities.

3.1.5. MANAGEMENT OF COMPLICATIONS

Well-preparedness and promptness of management are the key to survival from renal failure due to crush syndrome.

(*a*) Protocols for urgent measures to prevent renal failure should be prepared and made available at all hospitals and health centres. These should be easily retrievable.

(*b*) All personnel working at Health facilities in the governmental sector as well as private sector should receive basic training in Disaster Management; and the issue of prevention and management of crush syndrome should be a part of that training.

(*c*) IV fluids and drugs (as mentioned under Rescue) should be stocked. Limited stocks may be kept at peripheral units, their availability and channels of prompt distribution should be ensured.

(*d*) All dialysis centers in the country should be identified. Nephrologists, trained nurses and technicians; and dialysis machines available should be listed. This information should be available with the Directorate of Health Services and with the Indian Society of Nephrology and Indian Pediatric Nephrology Group. These Nephrology Societies should prepare Disaster management plans and keep them updated. They should conduct their own training programs.

3.2. ***Rescue Phase***

People must be reached and rescued. Relatives, friends and local volunteers will mostly carry out the rescue work spontaneously. Often it is essential to have available, ladders, ropes, heavy gloves, spades, picks, planks, pocket torches.

When it is difficult to reach a victim or when there is a risk of further caving-in, it is advisable to leave the work of extrication to experts (firemen, trained volunteers, building workers, the army, *etc.*). As soon as the rescuers reach an injured person, they should be careful to: (*i*) Maintain and ease respiration; (*ii*) Clear the victim's airways by using fingers to clean the mouth and throat, taking out dentures and loosening collars, belts and clothing; (*iii*) Use blankets to prevent the victim catching cold; (*iv*) Pending further assessments, appropriate medical assistance should target the secondary prevention of crush syndrome among injured cases. This implies that trauma patients need to receive intravenous fluids and that such fluids need to be available in large quantities in the damaged areas. The proper management of severe crush syndrome cases may also require dialysis for renal failure.

At the hospital, triage should be the responsibility of a highly experienced clinician.

Ideally, there will be a metropolitan system of emergency medical treatment that allows hospitals to function as part of a referral network. At different levels of complexity, a network of prehospital relief teams can coordinate referrals from the disaster area. Good administrative control must be maintained over any redistribution in order to restrict it to a limited number of patients in need of specialized care not available in the disaster area. Policies regarding evacuation should be standardized among all agencies providing relief in the disaster area, and hospitals that will receive patients.

3.3. ***Recovery Phase***

Hospitals, according to their geographic

location, starting with those closest to the impact area, with a visual display of the number of beds available, medical or nursing personnel required for round-the-clock services, short-ages of essential medical items, and other needs should be listed to permit the Health Disaster Coordinator to direct external assistance to areas where needs and expected benefits are greatest. Patterns for redistributing resources or patients will emerge from analysis of the data. Such monitoring of hospital resources will be most useful when medical care is likely to be required for an extended period.

If the Health Disaster Coordinator finds that the region's total health care capacity is insufficient to meet disaster-related needs, several alternatives must be considered. The best is rapid expansion of the region's own permanent facilities and staff, which has the advantage of fulfilling immediate needs and leaving behind permanent benefits. Another alternative, which has proved to be less desirable, may be staffed, self-sufficient, mobile emergency hospitals available from government, military, Red Cross, or private sources. If such a hospital is necessary, one from the disaster-affected country, or a neighboring country with the same language and culture should be considered first, and those from more distant countries considered second.

Foreign mobile hospitals may have several limitations.

3.3.1. ORGANIZATION OF FURTHER CARE AND ESTABLISHMENT OF INFRASTRUCTURE

3.3.1.1. *Duties of the local/frontline medical and paramedical staff*

Such workers should be involved in urgent therapeutic measures, patient selection and transport victims with major problems to proper centers.

3.3.1.2. *Making hemodialysis available*

Various hemodialysis facilities and their capacity should be identified. In addition, it would be necessary to set up such units in safe areas to avoid problems of transportation for those patients who may not have other serious injuries requiring major surgery. The Indian Pediatric Nephrology Group and the Indian Society of Nephrology should prepare Disasters Plans. They should communicate with the International Pediatric Nephrology Association and the International Society of Nephrology (which has a Renal Disaster Relief Task Force of Commission on acute renal failure).

It is absolutely vital that all these problems are recognized and clear rules framed to avoid administrative hurdles and unnecessary delays.

3.4. ***Rehabilitation Phase***

The aim of restoring should not be to come back to the original state and in fact it should be taken as an opportunity to refine the existing health facilities by factoring the need to create state-of-art trauma centers.

SECTION 4

Care of Specially Vulnerable Children

When the children are displaced in a disaster situation they are most likely to be starved, killed, tortured, raped, robbed and recruited as child labor and for child trafficking. However, some children are especially vulnerable: (*i*) Those separated from their parents or adult caretakers (the unaccompanied minors); (*ii*) Girl children and adolescents; (*iii*) Disabled children.

4.1. ***Preparedness***

The community, NGOs, disaster planners and the Government need to be sensitized to address the special needs of this group who are referred to as 'Vulnerable group' in this document.

These children are prone to suffer from malnutrition, infections, dehydration, physical

torture, and posttraumatic stress disorders (PTSD). It is only during "normal" time that all those (health workers) who will be called upon to care for them in disaster situation will have to be familiar with the 'Action Plan' in all the three phases.

4.2. ***Rescue Phase***

As soon as the disaster strikes it is very natural for the surviving parents/family to look for their children, but there will many instances where they have died or are missing. In such situations it would be helpful to:

4.2.1. Identify a group leader / responsible adult (preferably a woman from the same community) as a caretaker for the vulnerable group.

4.2.2. Identify a temporary shelter/ area / camp. The area should be safe, secure, well lit and should not be isolated. The areas of bath and toilet should be secure and privacy to be maintained and a woman supervisor should especially supervise these areas.

4.2.3. Develop a list of unaccompanied minors documenting the name, parents name, address, name and address of relatives or friends/ neighbors both within and outside the disaster area.

4.2.4. Identification tags should be prepared and worn by all children.

4.2.5. Ensure that they are given priority for basic needs like water, food, clothing and medical care.

4.2.6. The distribution of food, water, fuel, clothing, *etc*., should not be done in an isolated place/corner. It should preferably be done by female group leaders and should be directly distributed especially to the girl child and those with disabilities.

4.2.7. Help children overcome the shock and fear by reassurance and emotional support.

4.2.8. Tracing parents of unaccompanied minors to unite them should be done on priority. All available sources of publicity and media should be utilized to search for parents of separated children.

4.2.9. Families/neighbors should be placed together in the relief camps.

Gender based violence like rape, molestation, torture, exploitation and forced prostitution can occur during these situations. Domestic violence and denial of food etc are also seen. These need to be prevented and taken care of in all the phases of management as outlined.

4.3. ***Recovery Phase***

4.3.1. The state agency / volunteer groups should continue to address the basic needs of nutrition, clothing, appropriate medical and immunization needs. Those in-charge of the vulnerable groups should have direct access to the Nodal Officer/NGOs to ensure appropriate services.

4.3.2 Psychosocial support should be age, gender and culture appropriate. Caretakers should speak the local language and some can be trained for psychosocial counseling to address symptoms of Post Traumatic Stress Disorders (as per the guidelines given in the section on PTSD).

4.3.3. Tracing parents of unaccom-panied minors should continue as an ongoing process in this phase. The media can be utilized for better results and coordination of these activities in this phase.

4.3.4. The activities of the voluntary groups may need supervision by the nodal authorities.

4.3.5. If a sexual assault has taken place then:

4.3.5.1. Ensure physical safety of the victim and provide medical assistance, psychosocial support and legal services. However care should

be taken to avoid removing evidence by cleaning, bathing or changing clothes.

4.3.5.2. Detailed history and examination have to be carried out preferably by health worker of the same sex.

4.3.5.3. Children may not seek support and the Health worker has to actively look for children who have been assaulted.

4.3.5.4. Unwanted pregnancy can be avoided by providing emergency contraception to rape victims

4.3.5.5. Address psychosocial needs and the victim and their family should not be stigmatized.

4.3.5.6. Media hype regarding such incidences should be avoided and personal identity of victim and the family should never be disclosed. The reporting and follow up should be discreet and confidential.

4.3.6. The local government and NGOs should assist, support and develop legal and administrative mechanisms to ensure justice.

4.4. ***Rehabilitation Phase***

4.4.1. Vulnerable children should be placed under foster care supervised by appointed social workers or NGOs to provide long-term rehabilitation of these groups. The credibility of NGOs should be scrutinized to avoid possibility of child trafficking under the garb of social work. Institutional care should be the last resort.

4.4.2. Foster and nurture a sense of hope for the future in children by establishing routines. Experience has shown that reopening/ establishing schools are the best way to rehabilitate children.

4.4.3. Children in disaster situations should not be available for adoption. It should not be permitted for a reasonable period (normally at least two years) during which time all possible steps to trace parents or other family members should have been carried out

4.4.4. Finally, the state should provide appropriate legislative, administrative, social and educational measures to protect an individual of the vulnerable group from all forms of physical and mental violence, injury or abuse, neglect, maltreatment or exploita-tion. In order to ensure that justice is done, some systems need to be put in place. It is recommended that:

4.4.4.1. Trained police personnel who are equipped to deal with a rape survivor who needs to report the case are available.

4.4.4.2. Institution of a credible criminal justice system, which is seen to come down heavily on such heinous crimes, with a sentence that meets the crime.

SECTION 5

Care of Newborn

In disaster situations, even the minimum care of pregnant woman and newborn babies will prevent a significant amount of morbidity and mortality. Usually, a majority of deliveries can be managed successfully with minimum intervention from healthcare workers.

5.1. ***Preparedness***

All health care workers (HCW) including doctors, nurses, auxiliary nurse midwives and trained birth attendants must be trained to conduct a normal delivery with minimum equipment and to look after the newborn. Information about these trained persons should be well circulated so that they can be approached/involved in relief work as early as possible. Safe and reliable methods of transportation of sick patients should be identified in advance.

The HCW should be able to identify high-risk pregnancies and at risk/sick newborns so that

referral, if possible could be arranged timely. Preferably both, the mother and newborn baby should be transported and kept together.

During this phase, childbirth may have to be conducted by untrained persons. Help of an elderly lady is useful till a Health care worker arrives.

5.2. ***Recovery Phase***

The childbirth can be better managed in this phase by ensuring the presence of trained persons during the delivery. Basic equipment, better support by referral center, and some medicines can be available now. The HCW should be able to prioritize the limited resources by following the principle that most sick should get the first priority. While transporting the HCW should write an adequate note for the Referral Center.

5.3. ***Rehabilitation Phase***

By this time it is expected to have near normal health care services. The delivery should preferably occur in a maternity center or hospital.

SECTION 6

Immunization

Immunization is a very important activity during disaster.

6.1. ***Preparedness***

6.1.1. Maintain routine vaccination (measles, polio, pertussis, diphtheria, and tetanus) with the basic vaccination schedule. A reduction in coverage could result in a resurgence of vaccine preventable diseases. IAP also recommends typhoid vaccine routinely.

6.1.2. Re-stock vaccines utilized routinely by the national immunization programs as well as other biologicals, syringes and supplies.

6.1.3. Ensure adequate stocks of Tetanus toxoid, Measles, Meningococcal, Rabies vac-cine and polyvalent antisnake venom, as their demand may be more after a disaster strikes.

6.1.4. Ensure that Cold Chain is being maintained and an alternate plan is in place in case of its disruption. Keep adequate number of vaccine carriers/iceboxes and thermos for use in emergency.

6.2. ***Rescue Phase***

Vaccination and immunization at this time have no priority and limited human resources and all efforts have to be directed towards issues related to survival, shelter, food, water and sanitation.

6.3. ***Recovery Phase***

6.3.1. VACCINATIONS

During the recovery phase, it is essential to continue and strengthen the vaccinations routinely practiced in the community. Mass vaccination would be justified only when the recommended sanitary measures do not have an effect and if there is evidence of the progressive increase in the number of cases with the risk of an epidemic.

Usually only measles and meningococcal vaccines may be required for such purposes. For measles cases good case management and vitamin A supplementation should be ensured Cholera vaccine should only be considered for pre-emptive use in high risk populations before a cholera outbreak has occurred, not reactively as a method of containing an outbreak once it has started.

6.3.1.1. *Safeguarding vaccines*

Implement the temporary use of cold boxes (RCW42) to ensure the conservation of vaccines in the affected areas and their distribution, provided that there is ice available. Implement the use of photovoltaic refrigerators for vaccine storage and ice production, guaranteeing

sufficient batteries. Most vaccines-particularly measles vaccine-require refrigeration and careful handling if they are to remain effective. If cold-chain facilities are inadequate, they should be requested for at the same time as the vaccines. Vaccine donors should ensure that adequate refrigeration facilities exist in the region before dispatching vaccines. The vaccination policy to be adopted should be decided at the national/state level only. Individual voluntary agencies should not decide to vaccinate on their own.

6.4. *Rehabilitation Phase*

In this phase the need is to bring all services back to its former levels, at least. All actions should be directed to restore the best immunization practices as per IAP guidelines, to achieve optimum coverage with the use of UIP vaccines, and to set in place an effective disease surveillance program.

SECTION 7

Nutritional Disorders

Studies on the experiences of handling nutrition related issues in disaster situations point to the need for developing strategies and operational systems that can detect vulnerability to nutritional deficiencies and address the problem through development programs, prepare contingency plans and monitor early warning indicators, promote breast-feeding, and other low cost high nutrition food, and ensure that relief efforts facilitate long-term rehabilitation.

7.1. *Preparedness*

During this phase the health workers must be educated about: (*i*) Normal nutritional requirements of infants and young children; (*ii*) Foods to be used in disaster situation and their food value; (*iii*) The indicators of malnutrition; (*iv*) The signs and symptoms related to nutritional deficiencies; (*v*) How to assess and calculate nutritional needs; (*vi*) The identification of vulnerable groups.

Knowledge acquired on all the above topics goes a long way in controlling malnutrition after a disaster has struck.

7.1.1. The indicators of malnutrition

Deficit in weight for height reflects recent malnutrition. Weight for height less than 70% indicates severe malnutrition. Apart from weight, measurement of mid-arm circumference is also useful in detecting malnutrition. This is an age independent indicator of malnutrition between 1-5 years of age. Measurements less than 12.6 cm suggest severe malnutrition. Direct measurement of mid-arm circumference can be replaced by a simple test called the 'Bangle test'.

Clinically, a severely malnourished child is easily identified on the basis of physical findings like wasting and/ or edema (specially presence of bilateral ankle edema). Often other signs of vitamin deficiencies, anemia, depigmentation of the skin and hairs are present. HCW must be made familiar with the important and clinically relevant signs of important signs and symptoms of nutritional deficiencies.

7.1.2. Identifying vulnerable groups

It is also essential to identify the most vulnerable groups in the population, which generally include: (*i*) Pregnant and lactating women; (*ii*) Infants and young children; (*iii*) Children with disabilities; (*iv*) Elderly.

7.1.3. Calculating nutritional needs

Factors influencing intake of calories are: (*i*)Age and sex composition of the population; (*ii*) Mean adult heights and weights (men and women); (*iii*) Physical activity levels; (*iv*) Environmental temperatures; (*v*) Malnutrition and ill-health; (*vi*) Food security.

About 100-110 calories/kg body-weight per

day are required in the first year of life. By one year of age, the child should consume 1000 calories per day. Thereafter, the calorie requirements increase by 100 calories/day/year of age. Thus, a 6-year-old child should ingest 1500 calories per day. Around 10-15 percent of these calories should be obtained from proteins, 35% from fats and 55% from carbohydrates.

7.2. *Rescue Phase*

In the first 48 hours of the occurrence of a disaster, the community is engrossed and battling with life survival issues. Non-perishable food (like jaggery and "channa") can be stored in situations where the disaster was anticipated like in floods. The help from outside starts coming soon in the "Recovery phase".

7.3. *Recovery Phase*

One of the most urgently needed actions to prevent death and illness caused by malnutrition is to ensure adequate provision and intake of food.

The kind of food provided will make a significant difference in the management of Nutrition related issues of the affected population. It is recommended that fats/oils provide at least 15% of the total energy intake of adults (but 20% for women of reproductive age) and 30-40% for children up to 2 years of age. However, saturated fatty acids found in animal fats and some vegetable oils should not provide more than 10%.

Nutritional emergencies may be characterized not only by protein-energy malnutrition, wasting, and growth failure but also by a variety of micronutrient (mineral and vitamin) deficiencies, some of which lead to blindness, disability, paralysis, and death. Prevention of these deficiencies should be a further consideration in determining the food requirements.

In times of nutritional emergency it is primarily the more acute forms of PEM that have to be dealt with. These are characterized by a rapid loss of weight and may affect significantly larger numbers of older children, adolescents, and adults than usual.

Death rates are high among severely malnourished children Special attention need to be given to prevent hypoglycemia, hypothermia, infections and electrolyte imbalance.

7.3.1. Management of severely malnourished children

The treatment should be on the lines described in management of severe malnutrition: A manual for physicians and other senior health workers. Geneva, World Health Organization, 1999.

The most effective way to prevent micronutrient deficiency is to provide a diet that is diversified and includes fresh foods. For practical and logistic reasons, however, emergency food supplies usually consist of three or four basic items that are rarely changed and do not normally include fresh foods. A population that has to depend entirely on such a limited range of food items for more than 2 months runs the risk of developing nutritional deficiencies, especially scurvy (from lack of vitamin C) and pellagra (from lack of niacin).

There are several approaches to preventing onset of micronutrient deficiencies in emergency situations affecting large populations:

(*a*) Varying the composition of the food basket, so that it contains more micronutrient-rich foods such as pulses (*e.g.*, dried beans), groundnuts, fresh fruits and vegetables. Local production of fruits and vegetables in home gardens should be encouraged wherever agricultural conditions permit.

(*b*) Including micronutrient-fortified

foods in the ration. The use of low cost high micronutrient food like drum stick leaves should be encouraged.

(*c*) Prevention of iodine deficiency is usually achieved through the use of iodized salt.

7.3.2. BREAST-MILK SUBSTITUTES

It is not uncommon in disaster situations that mother's milk is not available to the infant because of mother's injuries/death. Breast-milk substitutes, fed by cup, should be available only for infants under six months of age for whom breast-feeding is not possible and breast milk is not available. Use of breast-milk substitutes in a minority of cases should in no way interfere with protecting and promoting breast-feeding among the majority. The use of infant-feeding bottles and artificial teats should be actively discouraged.

7.3.2.1. *Type of milk preferred for top feeding*

Although reasonable growth of the infant could be maintained by any of the animal (cow, buffalo, goat) milks and by infant formulas, yet the relative advantages and disadvantages of these should be kept in mind while advising mothers. Commercially available milk powders are very convenient and hygienic, but are almost 4 times costlier than fresh animal milk. Milk powder must be mixed in the ratio of one measure to one ounce (30 ml) of boiled and cooled water. Properly reconstituted powder milk has a slightly thicker consistency than fresh animal milk. Fresh animal milks are also on the whole nutritionally adequate. Further, boiling or pasteurization of fresh milk, takes away quite a few disadvantages of cow's milk (like increased curd formation, possible bacterial contamination). Unfortunately, these fresh milks are amenable to dilution by unscrupulous traders and this can compromise the nutritional status of the infant.

7.3.2.2. *Buffalo milk*

Buffalo milk has a high fat content and like cow's milk, has high ash content. If one is sure of the purity then it may be preferable to dilute buffalo milk in the ratio of 3 parts milk and one part water, to decrease the solute load in young infants. Vitamins and iron should be supplemented in all such infants.

7.3.2.3. *The best way of giving top-milk to the baby*

Top-milk should be given to a child with a bowl and spoon. Infants fed by spoon do not suffer the disadvantages of bottle-feeding like increased flatulence, colic and increased infections. It is easy to clean these utensils and maintain them relatively uncontaminated. Proper hygienic measures should be followed. However, if a mother chooses to to bottle feed , bottle hygiene should be ensured.

7.4. *Rehabilitation Phase*

Essential interventions include the following: (*i*) Education and information; (***ii***) Provision of necessary material resources; (*iii*) Establishment of communications and support networks; (*iv*) Coordination with related services; (*v*) Development of special programs for breast-feeding, rehabilitation, orphans.

SECTION 8

Common Childhood Illnesses

In disaster situations the incidence of common childhood illnesses increases due to the breakdown of the entire system leading to inadequate water supply, poor sanitation, overcrowding malnutrition *etc*. Though generally health workers are the ones to provide primary care, in times such as these the experts too, have to function at this level.

8.1. *Preparedness*

Standardization of the procedures used for disease prevention and treatment is

particularly important in an emergency. Such procedures should be recorded and all health personnel should be familiar with them. The range of drugs used in camps or in health facilities for the affected population should be limited to the minimum needed for the management of common diseases. Similarly, medical equipment should be simple, sturdy, and easily replaceable. Such provisos can be executed at the time of need only if the planners have done their homework in times of peace and calm.

The aims and objectives during preparedness are:

1. To train the health workers to identify and manage the common childhood illnesses like acute respiratory illnesses, conjunctivitis, diarrheal diseases, hepatitis, malaria, measles, meningitis, pediculosis, acute flaccid paralysis, scabies, snake Bites, tetanus, tuberculosis, typhoid fever, whooping cough, worm infestation. This list may have to be revised keeping the local conditions and epidemiology in mind.
2. To identify indications for further referral for hospital care *e.g.*, a single case of cholera, measles and meningitis should alert the authorities for further action. Similarly, for hepatitis, typhoid, mumps, *etc*.
3. To identify problems, which are the early indicators of epidemics.
4. To be familiar with disease surveillance methodology and program ie, reporting to local/district health authorities and also zero-reporting.
5. Health workers/medical personnel should be trained in the management of the childhood illnesses.

8.2. ***Rescue Phase***

Common illnesses are usually not of major importance and hence tend to take a back seat during this phase giving way to more pressing concerns of survival like food, water, shelter, injuries (major and minor), sanitation *etc*.

8.3. ***Recovery Phase***

The health care workers will have to provide primary health services under the constraint of prevalent situation. The administrators will have to look after the resetting of the health delivery system and resolve the underlying problems. In the first few weeks and months the health workers will be over whelmed by the overload of the work and may have to focus attention on the diseases likely to cause greater mortality *e.g.*, diarrheas, pneumonias, malaria, measles and mal-nutrition. Immunization to be undertaken as per the Guidelines on Immunization.

8.4. ***Rehabilitation Phase***

Health delivery services to be restored to normal as far as possible. The nutritional status and indices should reflect the path of recovery *i.e*., no evidence of malnutrition. The underlying factors to be taken care of Environmental issues of water, sanitation and overcrowding.

8.5. ***Disease surveillance***

A disease surveillance system should be organized in order to identify possible outbreaks of common diseases and to give the earliest possible warning of incidence of a new disease ("sentinel" cases). Disease surveillance is usually based on reports of cases seen at health facilities and by health workers. Systematic, community-based surveys of most diseases are difficult and rarely attempted under emergency conditions. When an outbreak occurs, its source should be investigated and measures taken to prevent both the spread of the disease concerned and any further outbreaks.

8.5.1. SURVEILLANCE REPORTS

Dispensaries, clinics, maternal and child health centers, and other health posts should identify and record major causes of illness. For some diseases (*e.g*., measles) this is straightforward, but for others (*e.g.*, diarrhea, with or without blood in the stools) it is more difficult - though no less desirable - to identify the cause. The reporting system should include only those diseases or symptoms of major public health significance that are easy to treat or prevent (this may include nutritional diseases, such as PEM, xerophthalmia, scurvy, beriberi, and pellagra).

Details of the proceedings are available in the IAP website www.iapindia.org. and soft copy can also be obtained by email on request to Dr Swati Y. Bhave at sybhave@yahoo.com with a copy to Dr Harish Pemde at harishpemde@.vsnl.com or harishpemde@gmail.com

Annexure I

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