Response to natural disasters in developing countries

Symposium: Infectious diseases and other health risks following natural disasters

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MSF
Médecins Sans Frontières
Doctors Without Borders

• International, independent, medical-humanitarian NGO, active since 1971
• 19 national branches (5 operational centres)
• Activities in about 80 countries, responding to:
  – Man-made disasters/conflict
  – Natural disasters
  – Epidemic – endemic, nutritional crises
  – Exclusion from access to health care
• HR (2006) : 2.227 int’l and 25.855 national staff
• Funding : +- 80 % private funds
Response: integrated approach

- (Participate in) needs-assessments & planning
- Respond to basic & more specific medical needs – patient management
- Involvement in epidemiological surveillance/EWS
- Immunization (measles, ev.targeted tetanus -)
- Mental health (community-, curative-)
- Water and sanitation activities
- NFI distribution: hygienic kits, LLITN

All are a priority!
Patient management

General health care:
- support to existing structures (PHC, hospitals)
  - material: system of kits (displaced, cholera, …)
  - HR: national & international
- organization of mobile clinics

Vertical interventions:
- care for the injured
- water borne diseases/outbreaks (ex. cholera)
- malaria
- specific fields: orthopaedic surgery, nephrology …
- mental health
Surveillance - EWS

• Morbidity and data collection starts upon first consultations…
  – In supported structures
  – During mobile clinics

• Simplified form, using +- 8 epidemic prone diseases with standard case definitions (WHO, MSF)
### Estimated population

**1 case = 1 diagnosis!!!!**

#### Week starting: Week 23

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>&lt; 5</th>
<th>? 5</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>Morbidity</td>
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<td>Non bloody diarrhoea</td>
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<td>Bloody diarrhoea</td>
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<td>Skin / Eye infection</td>
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<td>Other</td>
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<td>% under 5</td>
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<td>Consultations / person / yr</td>
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#### Laboratory

- Paracheck done
- Paracheck positive

#### Dressing room

- New patients

#### Nutrition

- Under 5 screened
- Severe*
- Moderate**
MALARIA

• Risk of outbreaks depends on several factors (level of endemicity, immunity, transmission season, altitude.. )
• Floods can initially also flush out mosquito breeding site ( lag time 6-8 weeks)

➤ In epidemic prone area: time for prevention
  – Distribution long-lasting insecticide treated nets
  – Indoor residual spraying, larvacidal treatment

➤ Diagnosis: systematic confirmation of suspected cased ( place RDT for malaria !)

➤ Monitoring: trends (incl RDT positivity rate)

➤ Treatment: efficient rapid treatment: ACT
Kenya: regions prone to Malaria outbreak

Desert fringes

Highlands

Kenya

Population
25.2 Million
Area (sq km)
582,646

Elevation (meters)
- Orange = Over 2000
- Yellow = 1000-2000
- Green = 500-1000
- Light Green = Under 500

100 km
Malaria in Desert fringes: Kenya Wajir 1998

Monthly rainfall in mm & Monthly malaria admissions at the MOH Hospital in Wajir from 1991 to 1998

Source: epicentre (adapted)
MALARIA in emergencies

• Rapid diagnostic tests (HRP-2 tests, Pf only)
  – High sensitivity (95-98 %)
  – Easy to train (“2 hrs”) and supervise
  – Allows to target treatment after confirmed diagnosis
  – Surveillance: allows follow-up of numbers of real cases

• Treatment
  – Effective ACT for simple malaria
    (New Emergency Health Kits: artemether-lumefantrin and RDT)
  – Severe cases: parenteral artemisinins (Artemether IM), followed by 3 days combination (ex AS-AQ, ATM-LU)
    - one dose a day, IM, easy to give
    - No side-effects, no hypoglycemia
    - Quinin IV: efficient, but complicated nursing
MALARIA : prevention

• Long Lasting Insecticide Treated Bednets : “part of the Non-Food item distribution”

• Spraying: according to advice of a vector control expert
Dengue

• In an urban area with endemic dengue in combination with flooding (not flush floods) a “watsan”/ vector control specialist should do an assessment for vectors and presence of dengue to evaluate the risk of an outbreak.

• MSF experience: not much evidence that floods are linked to later dengue epidemics
EWS – Tsunami – Aceh

Conclusions

• isolated cases of
  – Malaria (*note: prevention activities from start*)
  – Meningitis
  – Shigelloses
  – Dengue fever

➤ No outbreak
➤ High number of tetanus cases…
Tetanus  Tsunami – Aceh

2004, December 26th Tsunami
Aceh (Indonesia, Sumatra island):
  – 160,000 killed
  – 390,000 homeless

• Tetanus: 106 cases of tetanus (different locations, different actors)
  – All linked to exposure first day(s) of tsunami
  – 1st case: December 30th, last January 26th

• 20 deaths (CFR 18,9)
Tetanus  Tsunami-Aceh location MSF projects
Figure 5: Tetanus cases in Aceh Province

Cases and deaths of tetanus by date of admission to hospitals, Aceh province, 30 December 2004 to 26 January 2005.

Source: Epicentre/WHO
Tetanus *Tsunami – Aceh*

- **Improving medical care for the injured**
  - Special attention at triage centres and ER, including some “tetanus prevention clinics” for wound dressing and/or referral, IG when indicated and immunization (MSF: 350 patients received IG, 3000 immunized)

- **Prevention**
  - Distribution boots, gloves to people working in the ruins
  - Awareness raising through health centres and community leaders
Mental Health: acute phase (2-3 d)

- Acute stress reactions, agitation, panic, ...

- Provide information!
- “Psychological first aid”: listening, attention for the needs, showing respect, encourage peer support
Mental Health : assimilation phase ( < 3 months)

- Acute stress disorders
  (anxiety, avoidance reactions, “re-experiencing”, sleeping disorders…)

- Information (explain normal reactions…)
- Social support
- Reinforcing solidarity mechanisms
- Facilitate verbalisation
Mental Health : Chronic phase
( > 3 months )

- Post traumatic stress disorder
- Depression
- Somatic disorders

- Identification for referral
- Curative – psychotherapy
- Medication
 Specific medical needs: example
Cruʃ Syndrome/ AKI management...

Cruʃ syndrome: Patients with muscle cell damage resulting from pressure and crush.
Systemic manifestations may include ARF, sepsis, acute respiratory distress syndrome, DIC, bleeding, hypovolemic shock, cardiac failure, arrhythmias, electrolyte disturbances.

- Prevention
- Management of AKI (Acute Kidney Injury) and kidney failure
- Partnership RDRTF (Renal Disaster Relief Task Force) within ISN (Int’l Society of Nephrology) and MSF (Launched after Armenia earthquake in ’88)
EARLY FLUID ADMINISTRATION IS OF VITAL IMPORTANCE!

→ ALREADY PRE-EXTRICATION

(1 L / hr saline)

Better and Stein, NEJM, 1990
Turkey Earthquake (Marmara’99)  
MSF- RDRTF intervention

Earthquake 1999 August 17th, 7.4 Richter  
Mortality > 17,000  
Injured > 35,000  
Homeless 600,000

Crush syndrome : 500 (crush injury with developing oligo-anuria or needing dialysis treatment)  
Dialyzed : 477  
Mortality dialyzed patients : 17 % (literature : 40 %)
Turkey: MSF-RDRTF

Intervention MSF

Nephrologists  6  Dialysis machines  5
Nurses  29  Central vein caths  536
Technicians  1  Dialyzers  5.000

Kayexalate  10 kg

Intervention of the Renal Disaster Relief Task Force in 1999 Marmara, Turkey Earthquake. Raymond Van Holder, Martin De Smet a.o.

Kashmir, Pakistan, October 2005

*Int. 7,6 RS*, mortality 73,000–100,000 injured

- Intervention 22 days
- 8 nurses, 5 MD, 2 dialysis technicians
- 8 machines, 335 dialyzers, catheters etc

- 88 victims with AKI registered in broad Islamabad area, mortality 15/85 dialyzed (19%)

Experiences RDRTF-MSF

• 1995  Turkey  (Dinar)
• 1997  Iran
• 1999  Turquie (Marmara – August and Nov)
• 2001  Inde (Gujarat)
• 2003  Algeria
• 2004  Iran (Bam)
• 2005  Pakistan (Kashmir)
• 2006  Indonesia
• 2007  Peru

+ follow-up more earthquakes, not leading to intervention
MSF : combined assessment-intervention team

• Emergency coordinator
• 2 MD, 2 nurses (assessment + organise immediate care)
• Surgical team
• Pharmacist/pharmacy nurse
• 2 water and sanitation specialists
• 2 psychologists
• Nephrologist + nurse
• Logisticians and administrative staff

Later phase, on indication: epidemiologist, vector control specialist, specialised surgeons, …
Thank you for your attention

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