Medical Intelligence Support During International Disaster Response Operations

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National Center for Medical Intelligence

- Who we are
- Mission
- Important to note - we are NOT emergency responders but our analysis/products can assist responders!!
Recent Examples of International Disasters/Crises

- Chilean Earthquake (Feb 2010)
- Haitian Earthquake (Jan 2010)
- Cyclone Nargis (May 2008)
- Kashmir Earthquake (2005)
- Indonesian Tsunami (Dec 2004)
- Bam Earthquake (Dec 2003)
- Izmit Earthquake (Aug 1999)
- Hurricane Mitch (Oct 1998)
- Zaire Cholera Outbreak (Jul 1994)

A member of Naval Mobile Construction Battalion bulldozes Hurricane Mitch debris in Soto Cano, Honduras.
Post-Disaster Medical Intelligence Focus Areas

- Infectious Disease Risks
  - Water, food, and vectorborne disease risk
  - Communicable diseases among refugee populations

- Environmental Health Risks
  - Harmful air, water, food, and soil exposure hazards
  - Toxic chemical releases
  - Physical Hazards

- Health Care Capabilities
  - Status of medical infrastructure
  - Availability of medical supplies
Post - Disaster Medical Intelligence
Questions of Interest for the Analyst

- What type of disaster is it?
- What is the severity of the disaster?
- What intelligence gaps exist?
- Where will DoD/US personnel be operating?
- How much time is there for product preparation?

Earthquake damaged in outskirts of Bam, Iran
Associated Effects of Different Disaster Types

- **Earthquakes**
  - Building collapses
  - Persons trapped under rubble
- **Floods**
  - Water supply contamination
  - Washed out bridges
- **Hurricanes/Tsunamis**
  - Damaged port facilities
- **Volcanic Eruptions**
  - Elevated airborne particulates

Photo of ash plume from Iceland volcano eruption taken by Iceland Coast Guard.
Common Effects of Disasters

- Significant infrastructure destruction
- Breakdown in sanitation
- Refugee creation
- Dramatic increases in human and livestock morbidity/mortality
- Food, water, and medicine shortages

Dead Hutu refugees who perished along a roadside while fleeing Rwanda in 1994.
Examples of Intelligence Gaps

- What Federal Agencies & Non-Governmental Organizations are responding?
- What is extent of our knowledge on condition of infrastructure?
- What industrial infrastructure is damaged?
- What are migration patterns of population?

Solomon island tsunami damaged area (2007)
Where will DoD assets be deploying to?

- **Typical deployment locations**
  - Airfields
  - Ports
  - Industrial Sites
  - Refugee Camp Locations
  - Hospitals
  - US Embassies/Consulates
  - Railheads

- **Updating previous Health Risk Assessments may be necessary**

  Supplies delivered to Sumatran village after 2004 tsunami.
How much time is available to prepare product?

- Time is normally the most significant constraint
- Assessments must be fluid and perpetually re-evaluated during response efforts
- 60 percent solution may be all that is initially possible

US Army helicopter delivering relief aid to Pakistani earthquake victims.
Specific NCMI Products to assist the Emergency Responder

- Environmental Health Risk Assessments
- Industrial Hazard Assessments (regional)
- Industrial Facility Hazard Risk Assessments (single facility of interest)
- Infectious Disease Risk Assessments
- Medical Capabilities Assessments
Post-Disaster Information which assist in product development for the customer

- Review open-source media accounts
- Perform imagery analysis
- Consult with DoD, State Department, and other reliable US on-the-ground assets
- Make comparisons with past similar disasters in same region of the world
- Examine Government & NGO reports

Aerial view of destruction caused by cyclone Nargi in Myanmar
2010 Haiti Earthquake Support

- NCMI produced 75+ products in support of the rescue/relief response including products for the President’s Daily Brief, CJCS, SOUTHCOM, & others
- -- 33 products were rapidly cleared for public release to assist nongovernmental organizations (NGOs) and other first responders
- NCMI analyst deployed to SOUTHCOM J2 & SIO was detailed to support HQ
- Key staff transitioned to 7-day, extended-hour operations
Timeline of Events and Analysis

Shifted from tactical to strategic level medical intelligence over time

Haiti: 7.0 Earthquake
- Republished baseline products on disease, environmental risks, and health services
- New: Earthquake-specific products

US Troops Arrive
- Operational hospitals; Foreign military and medical support; Dust hazard
- Opportunity Analysis: Vaccinations
- Updated: Environmental health risks

Chile: 8.8 Earthquake
- Radiation sources (none); Malaria risk (in depth)
- Continuous updates on hospital and medical capabilities
- Longer term: HIV vulnerability

Feb

Jan 12

13

15 - 16

22

22

27

Beyond

- Evaluate progress of Haitians Needs
- Review of intelligence production

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NCMI’s Estimates of Potential Impact of Disease on U.S. Personnel (13 Jan)

- Existing Infectious Disease Risk Assessment (IDRA)

### Vector-borne Diseases (Detailed Risk Information)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Specific disease risk</th>
<th>Risk period</th>
<th>Typical severity</th>
<th>Potential attack rates per month in the absence of countermeasures for personnel in field conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue fever</td>
<td>High</td>
<td>Year-round</td>
<td>Moderate</td>
<td>Potentially 11-50% (risk varies by location - see map).</td>
</tr>
<tr>
<td>Malaria</td>
<td>High</td>
<td>Year-round</td>
<td>Moderate</td>
<td>Potentially 1-10% (risk varies by location - see map).</td>
</tr>
<tr>
<td>West Nile fever</td>
<td>Intermediate</td>
<td>Year-round</td>
<td>Moderate</td>
<td>Risk present, level unknown</td>
</tr>
<tr>
<td>Equine encephalitis (Includes Eastern and Western)</td>
<td>Low</td>
<td>Year-round</td>
<td>Very Severe</td>
<td>Risk unknown - rare cases possible</td>
</tr>
<tr>
<td>St. Louis encephalitis</td>
<td>Low</td>
<td>Year-round</td>
<td>Moderate</td>
<td>Risk unknown - rare cases possible</td>
</tr>
<tr>
<td>Leishmaniasis - cutaneous</td>
<td>Low</td>
<td>Year-round</td>
<td>Mild</td>
<td>Risk unknown - rare cases possible</td>
</tr>
</tbody>
</table>

Note: Estimates of a force living in field conditions in the absence of countermeasures
Health Risk from Air Contaminants After Haiti Earthquake

- Particulates
  - Asbestos
  - Cement
  - Fungal Spores

- Combustion air contaminants
  - Tire fires
  - Plastics
  - Burnable building material

Smoke from fire in Port-Au-Prince (18 Jan 2010)
Opportunity Analysis

- Critical element of intelligence analysis
- What opportunities exist to effect a desired outcome
- Measles vaccine = biggest bang for the buck!

Devastation in Haiti.
What Risks Do Dead Bodies Pose?

- Widely misunderstood
- Question raised from all levels of the relief effort, critical issue for decision makers
- Must distinguish occupation health risks from population health risks

Members of Fairfax County Urban Search and Rescue conduct a rescue operation at the Montana Hotel in Port-au-Prince, Haiti, Jan. 14, 2010.
Urban Displaced and Dengue

- Significant cause of morbidity in Port-au-Prince pre-earthquake
- Annual infection rate approx 30%*
- High risk to U.S. personnel
  1st case within 7 days of arrival**

Haiti: Dengue Risk to U.S. Forces

Typical Risk Period: Year-round

Potential attack rate 11-50% per month
Potential attack rate 1-10% per month
Potential attack rate <1% per month
No risk

- - - Department boundary

NOTE: Boundaries of the risk area should not be interpreted as strict demarcations; risk area varies with multiple ecological factors.

Updated: January 2010
NGA-NCMI

Datum: WGS84, Coordinate System: Geographic

Boundary representation is not necessarily authoritative.
Malaria and Population Movement

- No appreciable change to underlying malaria risk in urban or rural areas, however...
- Significant risk to U.S. relief personnel
- Movement of internally displaced persons (IDPs) to more rural encampments will increase exposure
- Key for planners as long-term encampments considered
2009-H1N1 Influenza Risk to Haitians

- Ongoing pandemic
- 2009-H1N1 circulating in Haiti prior to the earthquake
- Increase in cases expected, particularly in camps, crowded settlements
- Nonetheless, population risk posed by 2009-H1N1 far less than other key diseases
Homeland Health Protection Concerns from Haitian Response

- Assessing infectious disease risks to the U.S. Homeland is a part of NCMI’s mission.
- New World screwworm (NWSW) eradicated in the U.S. in 1966
- Working dogs, injured relief workers, or injured Haitians in-bound may reintroduce NWSW
Planning the Way Forward

- Predicting future disease trends
  - HIV infection rates
  - Dengue
  - Others

- Identifying measures to improve health infrastructure and prevent disease
More Information/Contact

- **NCMI OPERATIONS**
  - DSN 343-7574
  - 301-619-7574

- **NCMI Websites**
  - SIPRNET: [http://www.ncmi.dia.smil.mil](http://www.ncmi.dia.smil.mil)
Questions?