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The Effect of the Sphere Standards on the Incidence of Communicable and Infectious diseases in a Complex Humanitarian Emergency

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The effect of the Sphere Standards on the incidence of communicable and infectious diseases in a complex humanitarian emergency

Masashi Rotte
MPH Candidate
Jefferson School of Population Health
Study

- **Design**
  - Retrospective, pre- and post-intervention

- **Purpose**
  - Determine the effect of the Sphere Standards on the incidence of communicable and infectious diseases during a CHE

- **Hypothesis**
  - Achieving the Sphere Standards will reduce the morbidity of communicable and infectious diseases during a CHE
Background

- 2012 – United Nations High Commissioner for Refugees
  - 10.4 million refugees
  - 28.8 million internally displaced people (IDP)
- Numbers are increasing
  - Organized wars (WWII)
  - Unregulated fighting (Rwanda, Bosnia)

Complex Humanitarian Emergencies (CHE)

- “affecting large civilian populations . . . combination of war or civil strife, food shortages and population displacement . . . significant excess mortality”
- “breadth of their causes and complications, and for their impact on the civilian population”

Morbidity and Mortality

- Communicable and infectious diseases
  - Diarrhea
  - Respiratory tract infections
  - Malaria
- Majority of impact in children under age 5

- Mass population movement
- Crowding
- Poverty
- Limited water supply
- Poor sanitation
- Food shortages
- Limited healthcare access

Rwanda – 1994

- Refugee camp in Goma, Zaire
  - 34 - 54 deaths / 10,000 people / day
  - “one of the highest mortality rates ever recorded”
- Aid agencies
  - Sphere Project
  - Handbook for managing CHE

Humanitarian Charter and Minimum Standards in Humanitarian Response
The Sphere Standards

- Quantitative
  - Food
  - Water, Sanitation, Hygiene (WASH)
  - Healthcare
- Qualitative
  - Psychosocial
WASH – Sphere Standards

- **Water**
  - 15 liters / person / day

- **Latrines**
  - Defecation Field -> Trench Latrines
  - 50 people / toilet -> 20 people / toilet

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South Sudan

- Seceded from Sudan on July 9, 2011
  - World’s “youngest” nation
- Population: 10,625,176 (July 2012 est.)
- Literacy rate: total population: 27%
- Poor health indicators
- Forcible repatriation
IOM South Sudan
2013 Country Programme
NTTI Returnee Camp
NATIONAL TEACHER'S TRAINING INSTITUTE (NTTI) PROJECT

"Centre for Excellence" in Mathematics and Sciences

Funding: The Government of Japan

Implementers: Ministry of Education, Science and Technology, GoS and UNHCR

Contractor: Macdowel Limited, Uganda
2012 Highlights

- In 2012 alone, IOM registered 155,000 returnees reaching their final destinations. Aiming to establish conditions that allow for dignified and humane returns, IOM provided multi-sectoral support including emergency shelter (ES), water, sanitation and hygiene promotion (WASH), healthcare and non-food items (NFIs) at returnee transit sites and settlements. In addition, nearly 28,000

- The displaced population from the Abyei Area began to return home following improvements in security conditions. IOM established population movement tracking systems to closely monitor the returns, and provided NFI and shelter support to the Abyei returnees.
Diagnoses Recorded

- Watery Diarrhea
- Bloody Diarrhea
- Upper Respiratory Tract Infection
- Lower Respiratory Tract Infection
- Malaria
- Fever, unknown origin
- Trauma/Burns
- Skin Disease
- Urinary/Sexually Transmitted Infections
- Obstetric/Gynecologic Conditions
- Eye/Ear/Nose/Throat Disease
- Chronic Disease
- Bacterial Meningitis (Suspected or Confirmed)
- Psychological/Somatiform Conditions
- Jaundice/Hepatitis
- Measles
- Other
Study

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Methods (Data)

- Daily Population of camp
  - Tent-to-tent headcount
  - Minutes of camp meetings
- Water (liters / person / day)
  - Minutes of camp meetings
- Latrines (people / latrines)
  - Minutes of camp meetings
- Daily disease counts from clinic ledger
Methods (Analysis)

- Clinic data + Camp population
  - Daily incidence of communicable diseases
  - Grouped into weekly proportions
- Water and Latrines
  - Sphere Standards
- Chi-square analysis for differences in disease proportion before and after Sphere Standards
## Summary of clinic data

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total days of operation</td>
<td>76</td>
</tr>
<tr>
<td>Total consultations</td>
<td>12,655</td>
</tr>
<tr>
<td>Total consultations (under age 5)</td>
<td>3,469</td>
</tr>
<tr>
<td>Cases of Watery Diarrhea</td>
<td>1,191</td>
</tr>
<tr>
<td>Cases of Bloody Diarrhea</td>
<td>137</td>
</tr>
<tr>
<td>Cases of Upper Respiratory Tract Infection</td>
<td>2,323</td>
</tr>
<tr>
<td>Cases of Lower Respiratory Tract Infection</td>
<td>714</td>
</tr>
</tbody>
</table>
Proportion of the camp population with Watery Diarrhea by week before and after the Sphere Standards were met.

- Under age 5: $p < 0.01$
- Over age 5: $p = 0.44$
- All ages: $p < 0.01$
Proportion of the camp population with Bloody Diarrhea by week before and after the Sphere Standards were met

Before

After

Proportion of the camp population with bloody diarrhea

Week 1

Week 2

Week 3

Week 4

Under age 5 (p = 0.57)
Over age 5 (p = 0.27)
All ages (p = 0.13)
Proportion of the camp population with Diarrhea by week before and after the Sphere Standards were met

- Under age 5 (p < 0.01)
- Over age 5 (p = 0.29)
- All ages (p < 0.01)

Week 1
Week 2
Week 3
Week 4
Proportion of the camp population with a URTI by week before and after the Sphere Standards were met

- Under age 5 (p < 0.01)
- Over age 5 (p < 0.01)
- All ages (p < 0.01)
Proportion of the camp population with a LRTI by week before and after the Sphere Standards were met

- Under age 5 (p < 0.01)
- Over age 5 (p < 0.01)
- All ages (p < 0.01)
Proportion of the camp population visiting the Medical Clinic for any reason by week before and after the Sphere Standards were met

Before
After

Under age 5 (p < 0.01)
Over age 5 (p < 0.01)
All ages (p < 0.01)
Prior studies showed trend towards lower incidence of diarrhea or lower mortality rates with increased water supply.

Achieving the Sphere Standards for water and latrines may eventually decrease the incidence of communicable and infectious disease in a CHE.

Limitations

- Repeat visits
- No control group
- Open camp
  - Camp population counts
  - Patients not from the camp
Achieving and maintaining the Sphere Standards may have a significant, although possibly delayed, effect on the incidence of communicable diseases during a complex humanitarian emergency.
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Questions?