WATER, HYGIENE AND SANITATION ACTIVITIES FOR CHOLERA PREVENTION IN COMMUNITIES LIVING ADJACENT TO LAKE KIVU OR RUSIZI RIVER. CYANGUGU PROVINCE, RWANDA

Presented by Peter Maes
WHO & UNICEF CHOLERA CONFERENCE, DAKAR 2008
Cholera in Rwanda

**SINCE 1994:**

- Cholera became endemic in communities surrounding Lake Kivu
- Outbreak mainly in Cyangugu but also Kibuye, Gisenyi and Ruhengeri

---

**Annual numbers of cholera cases in Rwanda and Cyangugu province: 1996-2003**

70% of all cholera cases in Rwanda have occurred in Cyangugu province.
Cholera in Cyangugu (1)

Expect yearly sporadic cholera cases with outbreaks every 2-3 years depending on herd immunity and environmental factors.

**EPIDEMIOLOGICAL CURVE**

Monthly cholera cases in Cyangugu Province: 1998-2003

- 1998
- 1999
- 2000
- 2001
- 2002
- 2003

First Well
First HP-session

15 months
15 months
March and June critical months for the flare up of “wet” and “dry” seasonal pattern
Cholera in Cyangugu (3)

TARGET IN SPACE: (i) IDENTIFY HEALTH CENTRE ZONES

**Cellules:**
Most detailed administrative unit

**Health Centre Zones:**
Population in catchments area of each of 24 Health centres
Cholera in Cyangugu (3 cont.)

TARGET IN SPACE: (ii) IDENTIFY TRANSMISSION “HOTSPOTS”

- AR > 0.3 % in 2 out of 3 outbreaks
- 5 Health Centre Zones (HCZ) comply => target population of 140,000 persons
- In 5 HCZ of 140,000 people occurs 63 % of all cases in Cyangugu (610,000)
- In 5 HCZ of 140,000 occurs 50 % of all cases in Rwanda (8,000,000)
Risk factors (1)

CHOLERA ATTACK RATE – PROXIMITY TO THE LAKE:

• The relative risk for cholera in the health centre zones adjacent to the lake was 11, 48 and 1,4 times higher (*in* 1998, 2000, 2002) than in non-adjacent zones, highly significant at 95 % confidence level (*p*<0,001)
Risk factors (2) …

CHOLERA ATTACK RATE – COVERAGE WATER POINTS:

1998

2000

2002

Attack Rate
0 - 0.14
0.15 - 0.29
0.3 - 0.49
0.5 - 0.99
1 - 3

Coverage
50 - 149
150 - 299
300 - 499
500 - 799
800 - 16000

R² = 0.423
P value = 0.005

R² = 0.320
P value = 0.011

R² = 0.440
P value = 0.002
DEFINITION OF THE PROJECT

To reduce the incidence of cholera in the target area by reducing the risk factors for primary and secondary cholera transmission

TARGET AREA

4 –not 5- Health Centre Zones out of 24 in Cyangugu Province

TARGET POPULATION

140,000

TIMEFRAME

June 2002 – June 2006 (4 effective – 5 financial years)
Means (1)

HUMAN RESOURCES (43 + outsourcing)

COORDO: #1

ADMIN/FIN: #1
Cook: #1
Guards: #5
Reception: #1

PROJECT ASSISTANT: #1

HP #2

Watsan: #1
Assistant: #1
Macons, diggers: #27

Log supply: #1
Driver: #1
Means (2):
Finance: 1.100.000 EURO

[Diagram showing financial breakdown for years 2002 to 2006 for different categories: 68 Consultants and Field support, 67 Transport - Freight - Storage, 66 Training and local support, 65 Logistic and Sanitation, 64 Medical and Nutrition, 63 Operation running costs, 62 National staff, 61 Expatriates.]
Activities (1)

IMPROVE AVAILABILITY OF POTABLE WATER FOR POPULATION

• **Islands:**
  Construction of 35 hand dug wells with Afridev handpumps (health centre and population)

• **Peninsular / mainland:**
  Rehabilitation of 21 protected springs, 3 wells & rehabilitation gravity network

• **Promote** safe water consumption: counting of users and testing at all water points
Activities (2)

IMPROVE WATER COLLECTION, TRANSPORT AND STORAGE PRACTICES

- **Distribution** of 20,000 water containers

- **Hygiene Promotion** focus on cleanliness of water containers

- Promoted *household water treatment* especially in March and June
Activities (3)

IMPROVE HYGIENE BOTH BODY AND ENVIRONMENT

POPULATION
• 417 promotion and mobilisation sessions organized for 20,000 people
• transmission of 3 different radio spots for cholera prevention during 9 weeks broadcasted 609 times on Radio Communitaire de Cyangugu
• Creation and transmission of 2 radio chat programmes of 30 minutes each on the prevention of cholera

SCHOOL and Health structure:
• Training of 351 teachers in 26 primary and 1 secondary schools
• Creation and distribution of Hygiene booklet and toolkits in schools
• Cholera poem “Concours” organised in 26 schools
• Training of health promoters and health Centre staff

Drink safe water - Wash your hands - Use a latrine
Activities (4)

FURTHER APPROPRIATION OF LATRINES BY THE COMMUNITIES

- **Hygiene Promotion** focus on cleanliness of latrines and safe disposal of children’s stools

- **Construction** of 20 blocks of 4 latrines each in 10 schools

© Ian Berry/Magnum Photos
HAVE A REAL COLLABORATION WITH THE STAKEHOLDERS IN THE
DESIGN, IMPLEMENTATION AND MANAGEMENT OF THE PROJECT

• **Training of** 56 water users groups with elected hygiene, technical and financial responsible per well and free of Umuganda

• Formalised operational partnerships on all administrative levels:
  • Kigali (MINITERE)
  • Cyangugu (Directors)
  • Districts (Mayors)
  • Cells
MONITORING USE OF SAFE WATER POINTS:

- 8.3 [95% CI: 7.9 – 8.6] litre water collected / person – day
- Rain water collection for domestic purposes
- Children are 63% of water collectors => adapt size of jerry cans
- Only 14% collect water properly.
Monitoring (2)

**WATER QUALITY SURVEY:**

- 10 families around 10 wells
- Verify faecal-oral contamination of the waterchain (well => cup)
- Indicator: Number of Thermo-Tolerant Coliforms (TTC) per 100 ml of water

© Ian Berry/Magnum Photos
Monitoring (2 cont.)

POST DELIVERY CONTAMINATION SURVEY:

<table>
<thead>
<tr>
<th>Water chain</th>
<th>TTC-mean (geometric)</th>
<th>Risk with TTC &gt; 10 per 100 ml (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well</td>
<td>0 [95 % CI: 0 - 0]</td>
<td>0</td>
</tr>
<tr>
<td>Pump</td>
<td>2 [2 – 3]</td>
<td>17</td>
</tr>
<tr>
<td>Jerry can</td>
<td>5 [4 - 7]</td>
<td>34</td>
</tr>
<tr>
<td>Cup</td>
<td>6 [4 - 8]</td>
<td>43</td>
</tr>
<tr>
<td>Domestic stock</td>
<td>9 [5 - 16]</td>
<td>43</td>
</tr>
</tbody>
</table>

- Water quality compromised by progressive post delivery contamination
- Values for TTC/100 ml are lower than those reported in literature
- Risk for secondary transmission of *V. cholerea* during outbreak
- Promoted household water treatment especially in March and June
Lessons Learned

JULY 2007 EVALUATION

General
• Project did not cover Bugarama HCZ
• Poor medical data collection (incomplete as of 2004)

Improve availability of potable water for population
• Wells still in good condition – no clear numbering done

Improve water collection, transport and storage practices
• Jerry cans still in use

Improve hygiene both body and environment
• Include food handling/preparation in promotion messages
• Less emphasis on utilisation of latrines (78% households have a latrine)
• Important turn-over of teachers low coverage with small sessions
• Use mass communication approach sooner – more frequent

Further appropriation of latrines by the communities
• Design issues, location issues

Collaboration with the stakeholders
• Pump maintenance/repair
Operational Conclusions

- So far no cholera outbreaks recorded when prevention project implemented
- Outbreaks recorded in neighbouring zones
  - e.g. Bukavu 2004/5
  - E.g. Bukavu 2006/7 (3508 cases, mortality 0.54 %)
- Targeted strategy enables operational implication in similar context’s
- Ongoing evaluation to duplicate targeted strategy in RDC
Acknowledgements

ALPHABETICAL ORDER

• Roger Teck (Epidemio)

• Liz Walker, Peter Maes, Zoe Young (Project support)

• Ana Berga, Raissa Azzalini (Project Coord)

• Appelès Kwizera Kapitula, Eugénie Mukabaziga, Florence Uwineza, Norbert Habyaremye, Souleiman Nizeyimana, Zacharia Ntakirutimana (Senior National Staff)
• Humanitarian Non-Governmental Organisation
  - 5 Operational Centres + 19 Partner Sections + 6 Branch Offices
• Providing medical assistance without discrimination to populations in need
• Present in 61 different countries
• Supported by 2022 international & 24,959 national staff
• Budget of 600 million euro in 2007
  - 80 % from a private donor base
• Awarded the Nobel Peace Price in 1999
Control of Diseases Related to WHS

Reservoir → transmission → Host

Reduce Reservoir
Interrupt Transmission
Prevent Disease in population
Treat Disease in person
“Primary” transmission mainly through water or food borne routes. Once people infected, and depending on prevailing conditions of crowding, behavioural practices, water supply, hygiene and sanitation, *V. cholerae* enters “secondary” transmission cycle that gradually becomes the most important pattern.
WHS Activities
Reduce Reservoir - Interrupt Transmission

- Water Supply
- Excreta Disposal
- Waste Water Management
- Waste Management
- Vector Control

"Infrastructural aspects"
Structures

"Human related aspects"
Culture, Attitudes, etc.