Risk factors for transmission of cholera in Kano State, Nigeria: September, 2013

Usaini Bala¹, K. Getso¹, M. Bawa¹, U. Shehu¹, U. Usman¹, H. Umar¹, K. Hassan², T. Hussaini², P. Nguku¹

1. Nigeria Field Epidemiology and Laboratory Training Programme, Abuja
2. Kano State Ministry of Health, Nigeria
Introduction

• Cholera is an acute diarrheal infection caused by *Vibrio cholerae*
• Through ingestion of food or water contaminated with the bacterium
• Remains a global threat
• It is one of the key indicators of social development
• Disease of public health importance
Introduction

• In 2013 – 129,064 reported cases with 2102 deaths (CFR 1.6%) world wide
• Nigeria reported 6,600 cases with 229 deaths (CFR 3.5%) in 20 States in 2013
• An outbreak of cholera was reported in Kano State in September 2013

- We investigated to:
  - determine the factors responsible for transmission
  - institute control measures
Outbreak Investigation Site

- Kano State has 44 LGAs
- 8 are metropolitan
- Most populous State in Nigeria with over 9 million people*

* (2006 National census)

Map of Nigeria highlighting Kano State (in red)
Methods (2)

• Study design - unmatched 1:1 case-control study
• Sample size: total of 226 respondents (113 cases and 113 controls)
• Cases – those admitted in hospitals who meet case definition
• Controls – recruited from the relatives of cases
Methods (3)

• Case - as any person 2 years and above with acute watery diarrhoea with or without vomiting, provoking moderate to severe dehydration in Kano State from 7th October, 2013 to 5th February 2014

• Control - any relative of the case aged 2 years and above without history of cholera (in the last 6 month) living with the case from 7th October, 2013 to 5th February, 2014
Methods (4)

- Questionnaires administered
- We reviewed hospital records and conducted active case search
- We conducted univariate and bivariate analysis
- Stool and water samples were collected for the presence of Vibrio Cholerae
- Environmental assessment was conducted using monitoring checklist
Results

• A total of 3,230 cases with 95 deaths (CFR 2.9%) from 15/9/13 to 5/2/14
• 1,783 (55.2 %) were males
• Median age was 20 years, with a range of 2 to 98 years
• Age group 16 years and above had 1,965 (60.9%) cases – highest number
Epidemic curve of cholera cases in Kano state from week 40 of 2013 to week 6 of 2014.

1st peak
Investigation commenced
2nd peak

End of investigation by the team

No. of cases
Weeks
2013
2014

Cholera cases by LGA in Kano State between 7/10/13 and 5/2/14

Local Government Area

No. of cases
Distribution of Cholera cases by LGA in Kano State between 7/10/13 and 5/2/14

Map of Kano State with LGAs

1 dot = 1 case
Laboratory results

- Sixty five samples were processed and 49 (75.4%) were positive for Vibrio cholerae
- Water samples
  - was negative for Vibrio cholerae
  - high coli form count and low residual chlorine at points of collection/use
### Risk factors for cholera in Kano State

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cases (n=113)</th>
<th>Controls (n=113)</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low educational status (secondary and below)</td>
<td>109/113</td>
<td>102/113</td>
<td>2.94(0.83-11.35)</td>
</tr>
<tr>
<td>Not washing hand before Eating</td>
<td>18/112</td>
<td>6/111</td>
<td>3.35(1.19-9.90)</td>
</tr>
<tr>
<td>Not washing hands with soap after toilet</td>
<td>41/112</td>
<td>21/111</td>
<td>2.47(1.29-4.78)</td>
</tr>
<tr>
<td>Taking water from Street vendors in jerry cans</td>
<td>22/113</td>
<td>29/113</td>
<td>0.70(0.37-1.31)</td>
</tr>
<tr>
<td>Drinking water from open well</td>
<td>18/113</td>
<td>15/113</td>
<td>1.23(0.54-2.59)</td>
</tr>
</tbody>
</table>
Environmental findings

• Septic tanks draining into gutters close to where adults eat and children play
• Food cooked and distributed not far from the toilet
• Cooking utensils left unwashed on the ground
• Containers for storing drinking water left uncovered.
Conclusion/Recommendations

• Poor hand washing and hygiene practices were identified as possible reasons for the outbreak.

• The Epidemiology unit of Kano State Ministry of Health and Ministry of information should intensify public enlightenment on cholera its modes of spread and control measures.
Public health action

• We conducted health education through media on cholera, emphasizing the importance of hand washing and environmental cleanliness.
Thank you for the attention