Effect of Oral Cholera Vaccine on the Geographical Spread of Cholera Epidemic in Borno State, North-eastern Nigeria, 2017 - 2018

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Introduction (1/3)

• Oral Cholera Vaccine (OCV) plays an important role
  – prevention and control measure in epidemics

• Cholera is an acute enteric infection
  – caused by the bacterium *Vibrio cholerae*
  – epidemics are associated with two serogroups 01 or 0139

• Transmission mainly faecal-oral route
  – via ingestion of contaminated food or water
Introduction (2/3)

- National Epidemiological bulletin, globally yearly:
  - Cholera case-patients: 1.3 - 4.0 million
  - Cholera deaths: 2,000 - 143,000
  - Africa - 55%
  - Nigeria - 20.9%
  - case fatality rates (CFR): 1.9% - 6.1%

- There has been a resurgence of cholera in Africa since in the mid-1980s
  - > 80% of the world’s cases occurred in 1999
Introduction (3/3)

• Cholera Epidemic is a global health problem
  – internally displaced persons (IDPs)
  – complex emergencies

• Insurgency in North-eastern Nigeria
  – disrupted social services and displaced thousands

• IDPs camps are overcrowded
  – with inadequate water, sanitation and hygiene (WASH)
Objectives

• Confirm

• Characterise

• Institute control measures
  – first ever use of Oral Cholera Vaccine (OCV) in Nigeria

• Determine the effect of OCV on the geographical spread of the cholera epidemic in Borno State
Methods
Map of Nigeria
Highlighting three (3) North-eastern States worst hit by Insurgency

Risk (At LGA Level)
- Very High
- High
- Medium
- State Capital
- Neighbouring States
- International Boundary
Map of Nigeria Highlighting Borno State
Case Definition

• A suspected cholera case is any person ≥ 2 years in Borno State presenting with acute watery diarrhoea with or without vomiting and severe dehydration or died as a result, between 16th August, 2017 – 13th January 2019
Results
First cholera epidemic, 16th Aug., - 21st Dec., 2017

Borno State: (Dikwa, Gubio, Guzamala, Jere, Mafa, Maiduguri & Monguno)
Second cholera epidemic 13th Feb., - 16th July 2018

Number of Cases

NIGERIA FIELD EPIDEMIOLOGY AND LABORATORY TRAINING PROGRAMME
Third cholera epidemic 5th Sept., 2018 - 13th Jan., 2019
## OCV Status of third epidemic case-patients

<table>
<thead>
<tr>
<th>OCV Status</th>
<th>Number of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>6214</td>
<td>99.7%</td>
</tr>
<tr>
<td>YES</td>
<td>16</td>
<td>0.3%</td>
</tr>
<tr>
<td>YES 1 DOSE</td>
<td>6</td>
<td>38%</td>
</tr>
<tr>
<td>YES 2 DOSE</td>
<td>10</td>
<td>63%</td>
</tr>
<tr>
<td>Grand Total</td>
<td>6230</td>
<td>100%</td>
</tr>
</tbody>
</table>
Distribution of cholera cases during the first epidemic August - December 2017
Public Health Action
Oral Cholera Vaccination

• The first ever use of Oral Cholera Vaccine (OCV) in Nigeria

• *Shanchol Cholera Vaccine* was licenced for use

• Using the Polio vaccination structure
  – we conducted an OCV campaign in two phases
    ▪ targeting all people >1yr of age
    ▪ affected communities
    ▪ IDP camps
Objectives of OCV campaign

• Vaccination coverage of at least 95%

• sensitize 100% of the population in the affected areas

• Intensify active surveillance for cholera
OCV Campaign Operations - Strategy

• Door-to-door delivery
  – Polio Immunization Structure was engaged
  – Vaccinated every person >1yr old with one dose of OCV
  – Issued a vaccination card - OCV2 only
  – Provided key messages on cholera

• Use of permanent facilities

• Outreach services
OCV Outcome

First Dose (Phase)
- OCV doses: 914,565
- Total Target Population: 855,492
- Total Number vaccinated: 896,919
- Coverage rate: 105%
- Wastage rate: 0.4%

Second Dose (Phase)
- OCV doses: 914,565
- Total Target Population: 896,919
- Total Number vaccinated: 891,137
- Coverage rate: 99%
- No Adverse Event Following Immunisation was reported

No Adverse Event Following Immunisation was reported
Map of Borno State highlighting Two-dose OCV campaign in selected LGAs and Wards.

- **Monguno LGA**
  - No. of Implementing Wards: 1
  - Total Population: 111,938
  - Target Population: 129,506
  - Total Immunized (Round 1): 130,226

- **Mafa LGA**
  - No. of Implementing Wards: 2
  - Total Population: 52,614
  - Target Population: 52,614
  - Total Immunized (Round 1): 87,429

- **Jere LGA**
  - No. of Implementing Wards: 3
  - Total Population: 131,264
  - Target Population: 129,451
  - Total Immunized (Round 1): 108,979

- **Maiduguri LGA**
  - No. of Implementing Wards: 3
  - Total Population: 352,954
  - Target Population: 338,108
  - Total Immunized (Round 1): 338,108

- **Konduga LGA**
  - No. of Implementing Wards: 3
  - Total Population: 43,832
  - Target Population: 43,832
  - Total Immunized (Round 1): 46,632

- **Dikwa LGA**
  - No. of Implementing Wards: 1
  - Total Population: 197,020
  - Target Population: 203,408
  - Total Immunized (Round 1): 171,210

Total Population: 891,137
Target Population: 896,919
Target Age Group: >1 year

OCV Round 2 LGAs
Geographical spread of second epidemic in relation to two-dose OCV areas

Distribution of cholera cases during the second epidemic February - July 2018
Geographical spread of third cholera epidemic in relation to OCV areas

Distribution of cholera cases during the third epidemic 23rd August 2018 - 13th January 2019
Successes during OCV Implementation

• High demand for the vaccine
• Full participation of the State Polio EOC
  – Planning and monitoring
• Daily
  – evening review meeting
  – call in data
  – revisit Plans
  – In-process monitoring and household coverage survey
• Post implementation evaluation (coverage survey)
Conclusion

• High reactive OCV coverage

• With a two-dose OCV we controlled the protracted cholera epidemic

• Second epidemic in an entirely different geographical location

• Most of the cases in the third epidemic were in wards not previously vaccinated with OCV
Limitations

• Inadequate vaccine cold chain storage system

• Insurgency
  – Incomplete and late daily call - in data due to network challenges
  – Non - commencement of implementation at the time
  – External supervisors unable to access some LGAs

• Broken down Incinerators

• Non use of vaccination cards during the first dose (Phase 1)
Recommendations

• Borno State Ministry of Health and Partners
  – Intensify health promotion and education
  – Provide adequate clean water supply
  – Provide more cold chain capacity and additional vaccine carrier per team
  – Undertake exhaustive repairs of all the broken down incinerators

• Federal Ministry of Health/NPHCDA
  – Support Borno State to achieve above recommendations
  – Plan for a preventive OCV Campaign

• NFELTP/NCDC
  – A timely designed study to determine the vaccine efficacy, effect of OCV on cholera rapid diagnostic test
Acknowledgements

The international conference on (re-)emerging infectious diseases
Addis Ababa, Ethiopia - March 13-15, 2019
Thank you for your Attention

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