Cholera Outbreak in Andoni Local Government Area, Rivers State Nigeria, January 2015: The Role of Hand Washing with Soap

by

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Outline

- Background
- Objectives
- Methods
- Results
- Conclusion
- Public Health Action
- Recommendation

Background

- Cholera is an acute bacterial enteric disease
- Caused by *Vibro cholerae*
- Characterized by profuse watery diarrhea and vomiting
- Spread by faecal contamination of water and food
- Linked to poor sanitation and lack of clean drinking water
- Incubation period: few hours to 5 days

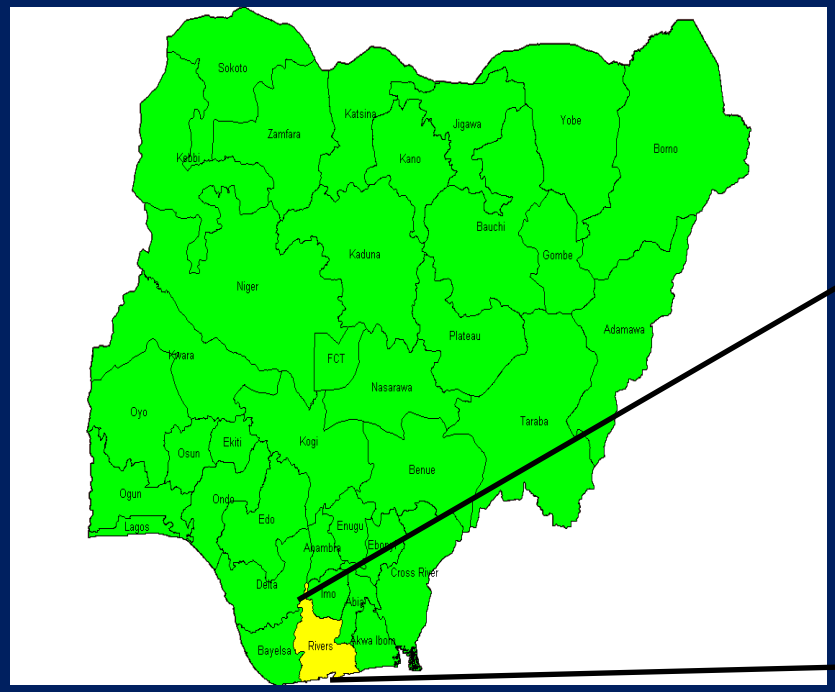
Background

- Nigerian surveillance data: January–September, 2015
  - ♦ Outbreaks reported in 18 states
  - ♦ 3,837 reported cases, 159 reported deaths (CFR 4.14%)
- Andoni LGA, Rivers State, experiences seasonal outbreaks of cholera during the dry season
- Index Outbreak: Notified on 8th Jan 2015 (77 suspected cases and 10 deaths)
- Investigation team comprised SMOH staff and 4 NFELTP residents

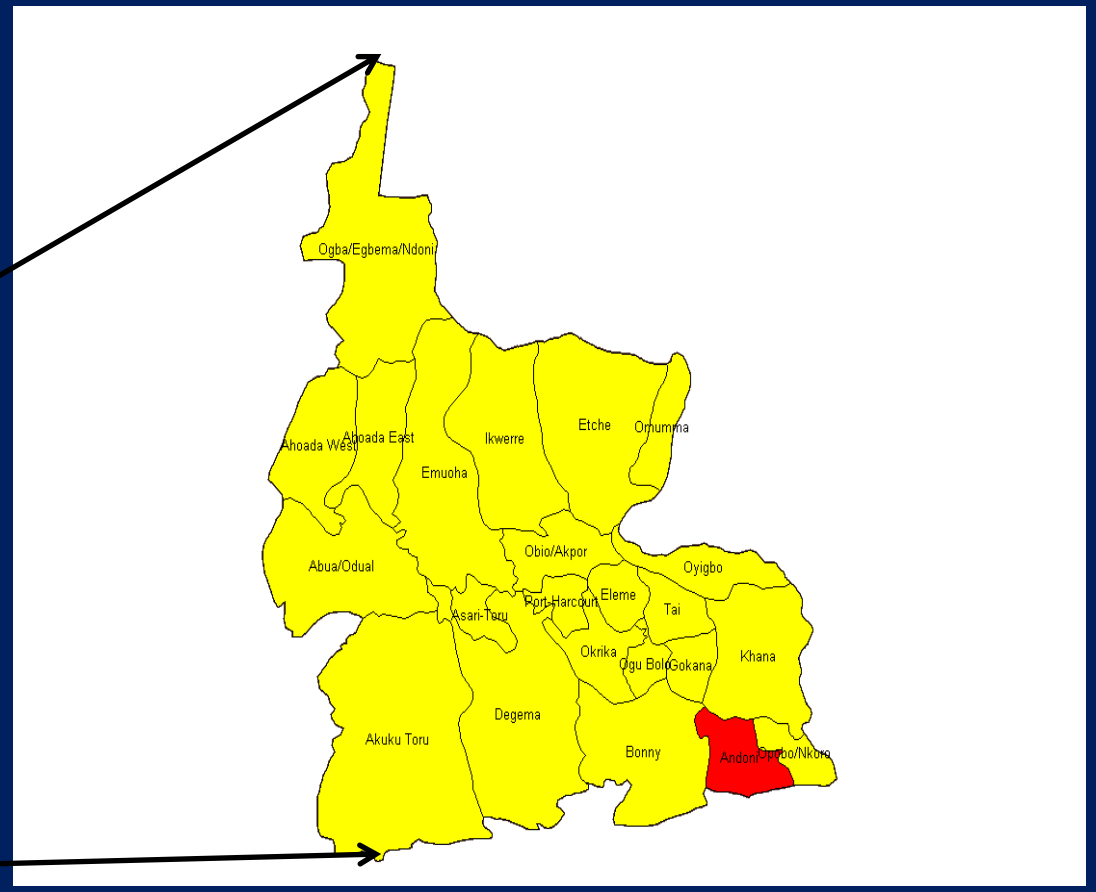
Objectives

- To confirm diagnosis using laboratory methods
- To characterize the outbreak
- To identify the source of the outbreak
- To identify risk factors associated with infection
- To support the SMOH to institute control measures

Geographical Location of Andoni LGA, Rivers State



Map of Nigeria showing Rivers State (yellow)



Map of Rivers state showing Andoni LGA (Red)

Methods

- Descriptive study
- Analytical study
- Laboratory investigation
- Environmental assessment

Eligibility Criteria

Inclusion

- All persons with watery diarrhea with/without vomiting and abdominal cramps irrespective of age and sex

Exclusion

- Unconscious patients
- Patients too ill to respond to the questions
- Persons not willing to participate in the study

Sample Size Calculation

- Sample size calculation (Epi Info 7)
  - 95% CI, Power 80%, OR-3
  - Percentage of controls exposed (wash hands before eating) was set at 46%
- Cases and Controls were selected from the community by Simple Random Sampling

Descriptive Study

- Case definition
  - ♦ any person of any age with three or more episodes of loose watery stool, with or without vomiting from 8th January 2015, residing in Andoni LGA, Rivers State
- Case finding: Active case search
- Data collected using line-list
- Data analyzed in time, place and person

Analytical Study

- Study design-Unmatched case control study
  - ♦ Case: any resident of Andoni, two years old and above, with acute watery diarrhea with or without vomiting from 8th January to 18th January 20I5
  - ♦ Control: a neighbour residing on either side of the patient's house, two years old and above without acute watery diarrhea
- Sample size: 62 cases and 62 controls

Data Collection and Analysis

- Data collected with structured questionnaire
- Information on socio-demographic characteristics, clinical symptoms, risk factors (hygiene, sanitation and food consumption)
- Data analysis - Epi info 7
  - ♦ Univariate, bivariate and multivariate analysis
- Informed consent obtained from participants
- Confidentiality assured

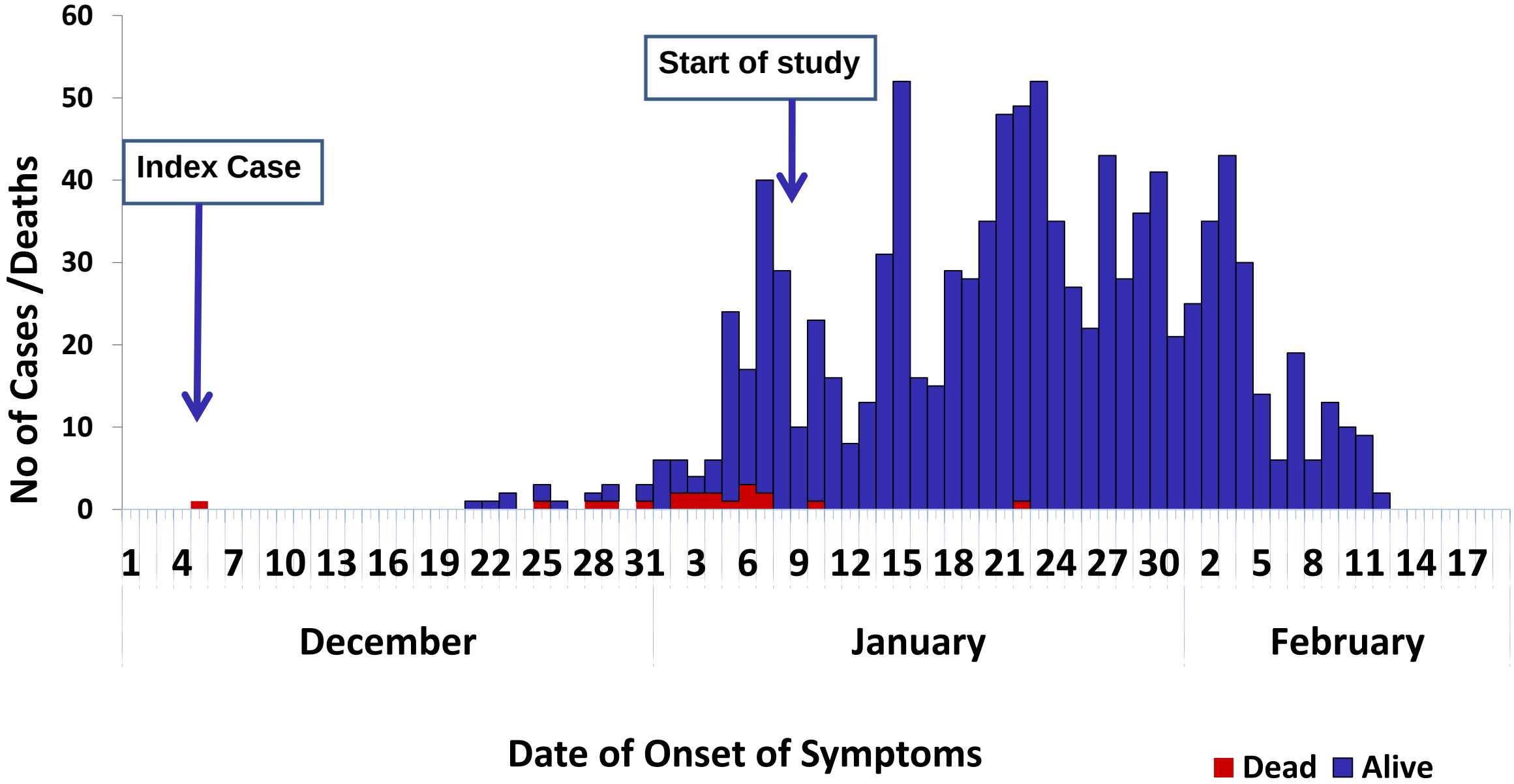
Laboratory Investigation

- Laboratory specimens
  - ♦ 21 stool specimens
  - ♦ 6 well and pond water specimens
- Laboratory methods
  - ♦ Thiosulphate-citrate-bile salt-sucrose (TCBS) agar used to culture *Vibrio cholerae*
  - ♦ Polyvalent antisera used to determine serotypes

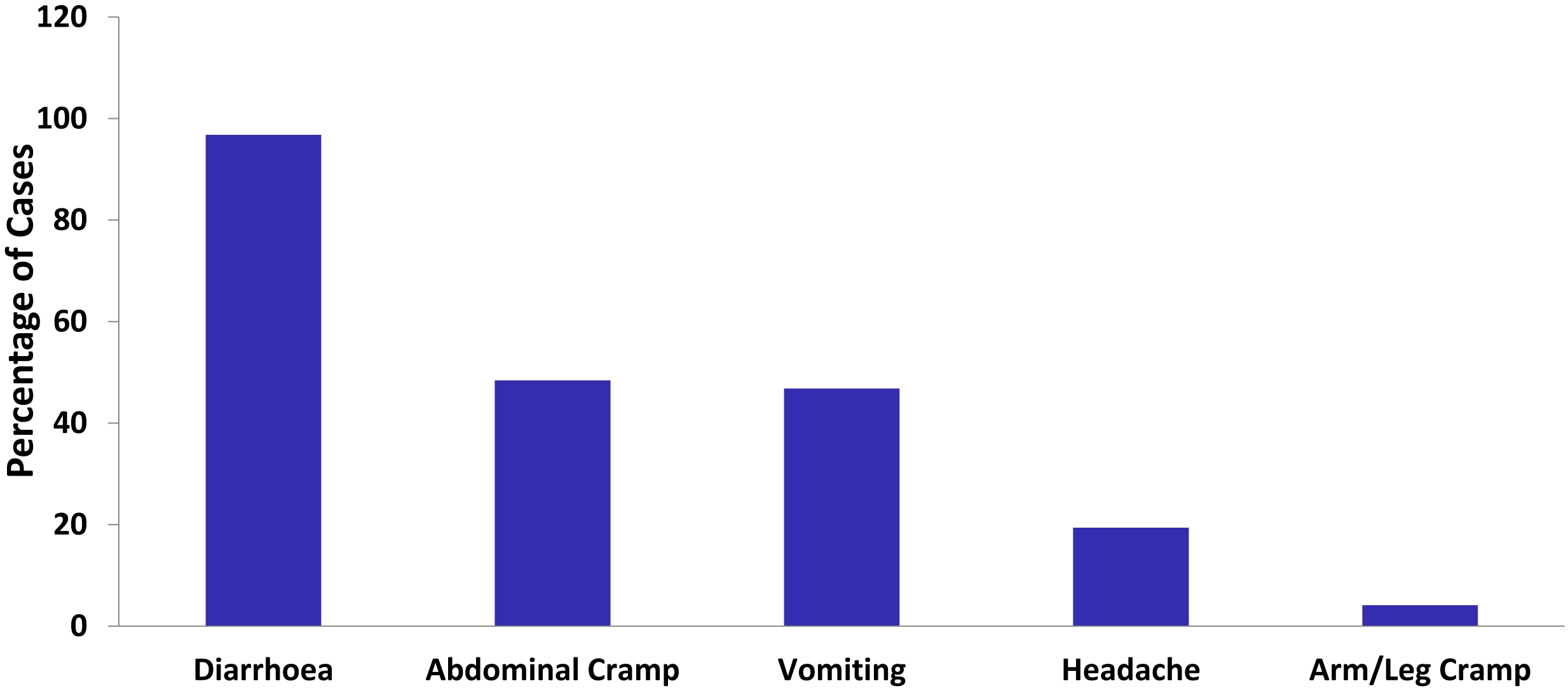
Results

- Total number of cases: 1034
- Attack Rate-375/100,000 population
- Total number of deaths:19
- Case Fatality Rate - 1.8%

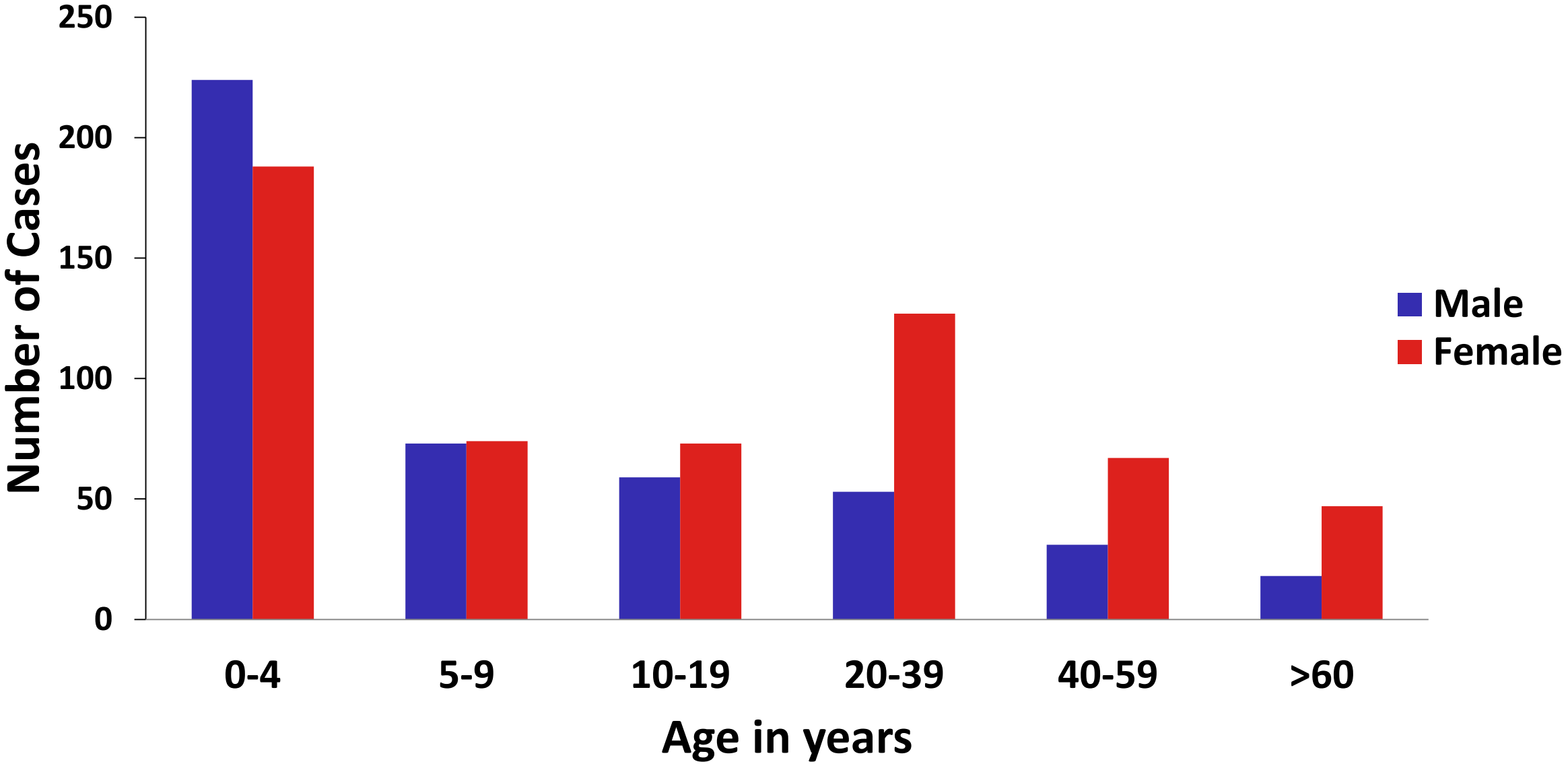
Epidemic Curve of Cholera Outbreak in Andoni LGA, Rivers State, January – February 2015 (n=1034)



Distribution of Symptoms of Cholera Among Case Patients, Andoni 2015



Age and Gender Distribution of Cholera Cases in Andoni LGA, Rivers State; January – February, 2015



Socio-demographic Characteristics of Cases and Control

Variables	Cases n=62 (%)	Control n=62 (%)
Age (years)		
Median age	8.5	18.0
Range	2-70	2-70
Gender		
Females	32 (51.6)	36 (56.5)
Males	30 (48.4)	26 (44.5)
Highest Level of Education		
No education	23 (37.1)	18 (29.0)
Primary	25 (40.2)	18 (29.0)
Secondary	10 (16.1)	22 (35.5)

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Risk Factors for the Transmission of Cholera in Andoni LGA, 2015

Variables	Cases n=62	Control n=62	Odds Ratio	95% CI
Age less than 5years	19 (30.7)	10 (16.1)	2.3	1.1-5.5
Drinking from borehole	4 (6.5)	6 (9.7)	0.6	0.2 - 2.4
Drinking tap water	1 (9.1)	10 (90.9)	0.1	0.0 - 0.7
Drinking well water	25 (40.3)	31 (50.0)	0.7	0.3 – 1.4
Drinking pond water	17 (27.4)	12 (19.3)	1.6	0.7 - 3.7
Washing hands with soap and water after defaecation	10 (16.1)	20 (32.3)	0.4	0.2 - 0.9
Wash hands before eating	17 (27.4)	15 (24.2)	1.2	0.5 -2.7
Contact with diarrhoea case	5 (8.1)	3 (4.9)	1.7	0.4 -7.4

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Unconditional Logistic Regression of Risk Factors for Cholera Transmission in Andoni LGA, 2015

Exposure Factor	Adjusted Odds Ratio	95% CI
Drinking Tap Water	0.1	0.1 – 1.0
Washing hands with soap and water after defaecation	0.3	0.1 - 0.8

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Laboratory Results

- Lab confirmed cases: 11 (of 21 specimens)
  - ♦ *Vibrio cholerae* (Non O1/O139)

- Water sample: 6 (of 6 specimen)
  - ♦ *Vibrio cholerae* (Non O1/O139)

Environmental Findings

- Surroundings were unsanitary
- Sources of drinking water: wells and ponds
  - ♦ Well: Present in several compounds
  - ♦ Pond: Average of 2 per community
- Toilet facilities are over-hung latrines

Limitation

- Misclassification of cases and controls
  - ♦ Stool samples from controls not tested

Conclusion

- Outbreak confirmed by laboratory diagnosis
- Highest proportion of cases were among under-5
- Contaminated wells and ponds are the most likely sources of the infection
- Hand washing with soap and water was protective of the disease

Public Health Action

- Community education;
  - ♦ Personal hygiene; emphasis on hand washing with soap
  - ♦ Environmental sanitation
- Nine treatment centres set up in the LGA to support case management
- Provision of water tankers and potable sachet water to affected communities
- UNICEF; Donation of water purifiers to communities through RUWASA

Recommendation

- State Ministry of Health
  - ♦ Super-chlorination of wells in affected communities
  - ♦ Ban on drinking from open ponds in the community
  - ♦ Provision of boreholes to at-risk communities within the LGA
  - ♦ Continuous community hygiene education with emphasis on hand washing with soap
  - ♦ Intensify surveillance for cholera in neighboring communities

Acknowledgements

- Federal Ministry of Health, Nigeria
- Nigeria FELTP
- Rivers State Ministry of Health
- Community heads and people of Andoni, Rivers State

Thank You

References

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Community River

Community Pond