
Okunromade F. Oyeladun¹, F. Osundina¹, N. Ayeola¹, H. Yusuff¹, A. Agbalaya¹, H. Bisiriyu¹, I. Abdul-Salam ²

1. Nigeria Field Epidemiology and Laboratory Training Programme, Abuja, Nigeria
2. Epidemiology Division, Ministry of Health, Lagos, Nigeria
Burden of measles

- Vaccine preventable disease
  - one of leading causes of child mortality and morbidity
- Annual global estimate of 227,121 cases in 2015*
- In Nigeria, 15,989 cases, 185 deaths recorded in 2015**
- Measles vaccination
  - 9 months (1\textsuperscript{st} dose) and
  - supplemental immunization (2\textsuperscript{nd} dose)
  - major impact in death reduction

* WHO 2015
** FMOH 2015
Outbreak notification

- Suspected measles outbreak was reported in Otodogbame community in Lagos state on the 10\textsuperscript{th} February, 2016

- Epidemic response team commenced investigation on the 11\textsuperscript{th} February, 2016
Objectives

• To confirm the existence of an outbreak
• To characterize the outbreak in terms of time, place and person
• To identify factors associated with the outbreak
• To institute control measures
Study setting
Methods

• Descriptive study
  – Active case search
  – Line listing of cases

• Analytic study
  – Unmatched case control study (1:3)

• Laboratory analysis
  – 20 blood samples collected for measles serologic testing for IgM.
Key Informant Interview

• We interviewed the following:
  – Community leaders
  – Religious leaders
  – Heads of each family
  – Executive chairman of the LGA
  – Medical of Officer of Health of the affected community to know their view of the likely cause of the outbreak

• Using Key Informant Interview guide
Results
Magnitude of the outbreak

- 82 cases
- Attack rate – 43/100,000 population
  - Age-specific AR
    - 134/100,000 population for <5yrs
    - 15/100,000 population for 5 yrs and above
- Case fatality rate (CFR) : 30%
- All 8 samples positive for measles IgM
Epidemic curve of measles outbreak in Otodogbame community, December 2015 – February 2016

Index case

Response

Cases

Death

Epidemiological week of onset

2015

2016
Socio-demographic variables of respondents in Otodogbame community, December 2015 – January 2016

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Case n=82 (%)</th>
<th>Control n=246 (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-11</td>
<td>8 (9.8)</td>
<td>42 (17.1)</td>
<td></td>
</tr>
<tr>
<td>12-59</td>
<td>68 (82.9)</td>
<td>159 (64.6)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>&gt; 59</td>
<td>6 (7.3)</td>
<td>45 (18.3)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48 (58.5)</td>
<td>148 (60.2)</td>
<td>0.06</td>
</tr>
<tr>
<td>Female</td>
<td>34 (41.5)</td>
<td>98 (39.8)</td>
<td></td>
</tr>
</tbody>
</table>

Median age for cases 36 months (range 9 – 108 months)
Median age for controls 42 months (range 10 – 156 months)
Vaccination status of the respondents in Otodogbame community, December 2015 – February 2016

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Case n=82 (%)</th>
<th>Control n=246 (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measles vaccination status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12 (14.6)</td>
<td>102 (41.5)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>No</td>
<td>70 (85.4)</td>
<td>144 (58.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Proxy for dropout - DPT3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (12.20)</td>
<td>44 (17.9)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>No</td>
<td>72 (87.80)</td>
<td>202 (82.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Health seeking behaviour</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>75 (91.5)</td>
<td>226 (91.9)</td>
<td>0.07</td>
</tr>
<tr>
<td>Orthodox</td>
<td>7 (8.5)</td>
<td>24 (9.1)</td>
<td></td>
</tr>
</tbody>
</table>
Factors associated with measles outbreak in Otodogbame, December 2015 – February 2016

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR (95% CI)</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 59 (ref: &gt; 59)</td>
<td>2.84 (1.16 - 6.91)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (ref: Female)</td>
<td>0.93 (0.56 - 1.55)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Measles vaccination status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (ref: No)</td>
<td>0.24 (0.12 - 0.47)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Factors associated with measles outbreak in Otodogbame, December 2015 – January 2016

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>AOR (95% CI)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unvaccinated for measles</td>
<td>2.3 (1.4 - 3.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Proxy for drop – out (DPT-3)</td>
<td>2.3 (1.4 - 3.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Health seeking behavior</td>
<td>1.9 (1.5 - 3.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Caregivers age ≤ to 30 years</td>
<td>2.6 (1.0 - 6.8)</td>
<td>0.07</td>
</tr>
<tr>
<td>Spending &gt; $2 per vaccination visit</td>
<td>2.3 (1.3 - 4.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Family income &lt; $50/month</td>
<td>2.1 (1.3 - 3.2)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Public health actions

- Immunization of children in the community
- Case management through instituted health post
- Community dialogue
- Community health education and sensitization
  - measles transmission
  - preventive measures
Conclusion

• Outbreak of measles was confirmed in Otodogbame community
• Case fatality rate was high
• Children less than 2 yrs were mostly affected
• Outbreak was largely due to:
  – low measles vaccination coverage
  – low utilization of routine immunization services
  – financial constraints in the family
Lesson learnt

• Rejection of immunization services
  – community dialogue
  – introduction of pluses

• Hard to reach community
  – use of canoe to conduct house-to-house case search
Recommendations

• Lagos State
  – ensure effective sensitization and delivery of routine immunization to hard-to-reach communities

• Eti-osa local government area
  – medical team should improve routine health education of the communities
  – engage community leaders in immunization activities as agent of change
Acknowledgements

- Nigerian Field Epidemiology and Laboratory training programme
- African Field Epidemiology Network (AFENET)
- Lagos State Ministry of Health
- Medical Officer of Health, Eti-Osa LGA
NFELTP TEAM DURING COMMUNITY CASE SEARCH