Trends and spatial distribution of animal bite injuries and rabies deaths in Uganda; 2001-2015

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Rabies mortality and morbidity

- Deadly infection with one of the highest case fatality rates of any infectious disease
- Annually kills about 60,000 people worldwide, majority occurring in developing countries
- Responsible for 1,460,000 DALYs lost
- Eliminated in most developed countries
Rabies surveillance in Uganda

- Surveillance of human rabies infection is weak
- Challenges in clinical diagnosis
- Lack of diagnostic facilities
- Under reporting of actual rabies cases
- Animal bites are used as a proxy of rabies
Objectives

- Describe secular trends of animal bite injuries and suspected rabies deaths from 2001 to 2015
- Describe the geographical distribution of animal bite injuries from 2001 to 2015
Data reporting

Animal bites and rabies deaths in Uganda
Data collection

- Weekly epidemiological surveillance data from 2001 to 2015 was used
- Collected from 2521 health facilities in 112 districts of Uganda
- Extracted data on number of animal bite injuries by sex, age group, period (year), region and district
Data analysis

- Proportions of animal bite injuries by age and sex were computed for the period of 2013 to 2015
- Annual populations were estimated using a growth rate of 3.03%
- Regression used to test the significance of trends ($p<0.05$)
- Geographical differences illustrated using colorimetric maps
## Number of animal bites; 2001-2015

<table>
<thead>
<tr>
<th>Region</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>57,252</td>
<td>27.4</td>
</tr>
<tr>
<td>Eastern</td>
<td>46,742</td>
<td>22.4</td>
</tr>
<tr>
<td>Northern</td>
<td>56,382</td>
<td>27.0</td>
</tr>
<tr>
<td>Western</td>
<td>48,344</td>
<td>23.2</td>
</tr>
<tr>
<td>Overall</td>
<td>208,720</td>
<td>100</td>
</tr>
</tbody>
</table>
## Animal bites higher among males

<table>
<thead>
<tr>
<th>Period</th>
<th>Male (%)</th>
<th>Female (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>8735 (65)</td>
<td>4716 (35)</td>
</tr>
<tr>
<td>2014</td>
<td>10744 (60)</td>
<td>7328 (40)</td>
</tr>
<tr>
<td>2015</td>
<td>11210 (65)</td>
<td>5987 (35)</td>
</tr>
<tr>
<td>Overall</td>
<td>30689 (63)</td>
<td>18031 (37)</td>
</tr>
</tbody>
</table>
## Animal bites higher among ≥5 years

<table>
<thead>
<tr>
<th>Period</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-4 (%)</td>
</tr>
<tr>
<td>2013</td>
<td>1369 (10)</td>
</tr>
<tr>
<td>2014</td>
<td>3822 (29)</td>
</tr>
<tr>
<td>2015</td>
<td>3911 (23)</td>
</tr>
<tr>
<td>Overall</td>
<td>9102 (19)</td>
</tr>
</tbody>
</table>
Significant increase in incidence of animal bites in all regions

Incidence (per 100,000)

Year

Northern
Central
Western
Eastern

Increase in rabies deaths in Central region

- Central (n=122)
- Eastern (n=132)
- Northern (n=125)
- Western (n=78)
Incidence of animal bite injuries; 2001-2005

Legend
Incidence of animal bites
- 0 - 49
- 50 - 199
- 200 - 499
- ≥500

Animal bites and rabies deaths in Uganda
Incidence of animal bite injuries; 2006-2010

Legend
Incidence of animal bites
- 0 - 49
- 50 - 199
- 200 - 499
- ≥500

Animal bites and rabies deaths in Uganda
Incidence of animal bite injuries; 2011-2015

Legend
Incidence of animal bites
- 0 - 49
- 50 - 199
- 200 - 499
- ≥500

Animal bites and rabies deaths in Uganda
Conclusions

- Evidence of increasing incidence of animal bite injuries in Uganda
- Increasing number of deaths due to suspected rabies in the Central region
- Geographical differences were noted with Northern and Eastern region persistently having higher incidence
Recommendations

- Rabies should be given special attention during planning of national public health priorities
- Strengthen rabies surveillance in order to collect more reliable data that can guide interventions
- Strengthen animal and human control strategies in most affected districts
Acknowledgement

- MoH
- Centers for Disease Control and Prevention
- Public Health Fellowship Program/FETP Secretariat
- Makerere School of Public Health
Animal bites and rabies deaths in Uganda

Central(P<0.001)  Eastern(P<0.001)  Northern(P<0.001)  Western(P<0.001)  National reporting rate