Enhancing Surveillance and Diagnostics in Anthrax-Endemic Countries

Technical Appendix

**Technical Appendix Table.** CDC-supported activities for enhancing anthrax prevention and control in endemic countries*

<table>
<thead>
<tr>
<th>Country</th>
<th>Years</th>
<th>Purpose of consultancy</th>
<th>Training/Assistance provided</th>
<th>Participants</th>
<th>Overall impact and public health benefit</th>
</tr>
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<tbody>
<tr>
<td>Bangladesh</td>
<td>2016–2017</td>
<td>Develop country strategy for prevention and control of anthrax in humans and animals</td>
<td>Stakeholder workshop facilitating intersectoral discussions on enhancing anthrax prevention and control, Review and technical assistance drafting new surveillance protocol and SOPs for sample collection and laboratory diagnostics, Training on PCR diagnostics</td>
<td>20 participants, including representatives of Ministry of Health and Ministry of Fisheries and Livestock, Consultation with 5 persons from Ministry of Health, 11 laboratory scientists and microbiologists trained, including representatives from Ministry of Health and Ministry of Fisheries and Livestock</td>
<td>Improved coordination and collaboration between human and animal health officials; agreement to focus on same priority endemic areas for active surveillance in next phase of activities, Improved protocol for anthrax surveillance and outbreak response, which should improve identification of anthrax and timeliness of outbreak response activities, Improved ability to confirm anthrax outbreaks by human and animal health officials</td>
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<td>Bangladesh</td>
<td>2016–2017</td>
<td>Training on anthrax surveillance development and laboratory diagnostics, Establishing cross border collaboration and anthrax training</td>
<td>6 GIS webinars and 6-d in-person GIS courses, 3-week intensive training on advanced spatial analysis of anthrax, Training on sample collection from dead animals with suspected anthrax, and use of RDT</td>
<td>31 participants from Ministry of Health, Ministry of Livestock and Food, Ghana FELTP, 2 participants from Ghana FELTP</td>
<td>Developed models to target livestock vaccination to improve anthrax control in high-risk areas, Train-the-trainer model extended capacity to 61 veterinarians; appropriate sample collection enables anthrax diagnostics; validation of RDT improves timing of diagnosis and response to prevent anthrax in humans and livestock</td>
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*Enhancing Surveillance and Diagnostics in Anthrax-Endemic Countries Technical Appendix Table: CDC-supported activities for enhancing anthrax prevention and control in endemic countries.*

- **Bangladesh:** 2016–2017
  - **Purpose:** Develop country strategy for prevention and control of anthrax in humans and animals
  - **Training/Assistance:** Stakeholder workshop facilitating intersectoral discussions on enhancing anthrax prevention and control, Review and technical assistance drafting new surveillance protocol and SOPs for sample collection and laboratory diagnostics, Training on PCR diagnostics
  - **Participants:** 20 participants, including representatives of Ministry of Health and Ministry of Fisheries and Livestock, Consultation with 5 persons from Ministry of Health, 11 laboratory scientists and microbiologists trained, including representatives from Ministry of Health and Ministry of Fisheries and Livestock
  - **Impact:** Improved coordination and collaboration between human and animal health officials; agreement to focus on same priority endemic areas for active surveillance in next phase of activities, Improved protocol for anthrax surveillance and outbreak response, which should improve identification of anthrax and timeliness of outbreak response activities, Improved ability to confirm anthrax outbreaks by human and animal health officials

- **Bangladesh and India:** 2016–2017
  - **Purpose:** Training on anthrax surveillance development and laboratory diagnostics, Establishing cross border collaboration and anthrax training
  - **Training/Assistance:** Manipal University in India provided training; logistical and financial support from CDC, Bangladesh-India cooperative workshop on anthrax
  - **Participants:** 6 laboratory scientists and epidemiologists from Bangladesh Ministry of Health, 20 veterinary officers, medical officers, scientists, and epidemiologists
  - **Impact:** Improved collaboration and training between India and Bangladesh health agencies to address anthrax regionally, Improved collaboration and training between India and Bangladesh health agencies to address anthrax regionally

- **Ghana:** 2015–2017
  - **Purpose:** GIS and anthrax laboratory training
  - **Training/Assistance:** 6 GIS webinars and 6-d in-person GIS courses, 3-week intensive training on advanced spatial analysis of anthrax, Training on sample collection from dead animals with suspected anthrax, and use of RDT
  - **Participants:** 31 participants from Ministry of Health, Ministry of Livestock and Food, Ghana FELTP, 2 participants from Ghana FELTP, 6 veterinarians from Ministry of Livestock and Food and from Ghana FELTP
  - **Impact:** Developed models to target livestock vaccination to improve anthrax control in high-risk areas, Train-the-trainer model extended capacity to 61 veterinarians; appropriate sample collection enables anthrax diagnostics; validation of RDT improves timing of diagnosis and response to prevent anthrax in humans and livestock
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<td>Georgia</td>
<td>2013–2015</td>
<td>Identify source of human anthrax outbreak; continued collaboration on livestock anthrax control</td>
<td>Training reference laboratory on PCR and culture diagnostics. Technical assistance to conduct case–control and cross-sectional studies to determine sources of exposure among human anthrax cases. Anthrax workshop series. Technical assistance to conduct case–control study of livestock anthrax; epidemiology, data quality, and data collection training.</td>
<td>3 persons from Noguchi Memorial Institute for Medical Research Collaborative team from NCDC, NFA, LMA, SC-FELTP. Participants from NCDC, NFA, LMA, SC-FELTP.</td>
<td>Confirmation of anthrax improves sensitivity and specificity of diagnostics. Identified sources of exposure; developed communication materials for identified sources; recognized the need for surveillance and disease control improvements. Strengthen interagency relationships; develop plans to improve existing systems; promote integration of human and animal anthrax surveillance; promote rigorous scientific investigations. Findings solidified the need for nationally sponsored anthrax vaccination.</td>
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*CDC, Centers for Disease Control and Prevention; FAO, Food and Agriculture Organization; GIS, geographic information system; LMA, Laboratory of the Ministry of Agriculture; NCDC, National Center for Disease Control; NFA, National Food Agency; SC-FELTP, South Caucasus Field Epidemiology and Laboratory Training Program; RDT, rapid diagnostic test; SOP, standard operational procedures; WHO, World Health Organization.*