GUIDE
Providing Assistance During a Zoonotic Disease Outbreak

v. 31 July 2013

Prepared by
David Bunn, UC Davis
and the PREDICT One Health Consortium

Objective: To provide guidance for PREDICT field team on how to assist governments to respond to zoonotic disease outbreaks.

USAID Disclaimer
This document was made possible by the generous support of the American people through the United States Agency for International Development (USAID) Emerging Pandemic Threats PREDICT. The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States Government.

Suggested Citation Form: PREDICT One Health Consortium 2013. Guide for Providing Assistance During a Zoonotic Disease Outbreak.
CONTENTS

SECTION 1. PREDICT OUTBREAK REPORT SHORT FORM

SECTION 2. PREDICT’s ROLE DURING A ZOONOTIC DISEASE OUTBREAK

A. PREDICT Responsibilities

B. Country Coordinator Responsibilities

SECTION 3. PRE-OUTBREAK PLANNING

A. Pre-Outbreak Coordination Discussions

B. Developing a Management Plan for Outbreak Response Tasks

SECTION 4. GUIDANCE FOR PREDICT ASSISTANCE DURING AN OUTBREAK.

APPENDIX A. IMPORTANT CONTACTS

APPENDIX B. OUTBREAK ASSISTANCE CHECKLIST

APPENDIX C. GENERAL GUIDELINES FOR OUTBREAK INVESTIGATION AND SUMMARY OF FINDINGS.

APPENDIX D. OUTBREAK INVESTIGATION ELEMENTS

APPENDIX E. OUTBREAK INVESTIGATION FORMS AND RESOURCES

APPENDIX F. WHO INTERNATIONAL HEALTH REGULATIONS RELEVANT TO SURVEILLANCE, NOTIFICATION, REPORTING, AND RESPONSE CAPACITY

APPENDIX G. OIE TERRESTRIAL ANIMAL CODE RELEVANT TO SURVEILLANCE AND OUTBREAK RESPONSE
## SECTION 1. PREDICT OUTBREAK REPORT SHORT FORM

**Country:** ________________________________________________________________

The information in Outbreak Report Short Form below should be reported to organizational leads and PREDICT Technical Management. (This form is provided in Word format on Basecamp under the project “General Information” and in the file category “Outbreaks”.)

<table>
<thead>
<tr>
<th>Summary Information to Report</th>
<th>Report below:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working Name of the Outbreak</td>
<td></td>
</tr>
<tr>
<td>(Report name if assigned or use name of region and other descriptors)</td>
<td></td>
</tr>
<tr>
<td>Date of last update of this form (most often today if you are making a change)</td>
<td></td>
</tr>
<tr>
<td>Inclusive dates (from start of outbreak to end of response – use today as end date if response ongoing)</td>
<td></td>
</tr>
<tr>
<td>Date of first notification of PREDICT</td>
<td></td>
</tr>
<tr>
<td>Date of request of support from PREDICT (Number of days from notification to request)</td>
<td></td>
</tr>
<tr>
<td>Date of initiation of response by PREDICT (Number of days from request to response)</td>
<td></td>
</tr>
<tr>
<td>Briefly describe the outbreak.</td>
<td></td>
</tr>
<tr>
<td>Was this an outbreak in humans, in animals (what species)? How many were affected &amp; what was the range of symptoms?</td>
<td></td>
</tr>
<tr>
<td>What type of assistance did PREDICT provide? Who were the PREDICT personnel involved? Include inclusive dates of PREDICT’s involvement in the response.</td>
<td></td>
</tr>
<tr>
<td>Provide description of how first noticed &amp; date if possible. When was the first official acknowledgement of the outbreak</td>
<td></td>
</tr>
</tbody>
</table>
(by which government or other reputable body and date)?

When was a response initiated and by whom? Which ministries or NGOs were involved? Who was in charge of the national response?

Comments on where it started, speed and extent of geographic spread

If a lab diagnosis and confirmation has been obtained give details, including species, sample type and dates. Where was the diagnosis made? Give number of days between initiation of response and lab confirmation of diagnosis.

Were other EPT partners involved in the response (which ones and how)?

**Summary of the Outcome:**

Did people die? How many?

Did animals die? What species & how many?

Was there a relationship between animals & humans in the disease or its transmission (state suspected or confirmed)?

---

**Start and maintain an Outbreak Action Timeline.** The Timeline should be attached to the Outbreak Report Short Form and look something like the timeline table template below. An example table is on page 10 of this guide.

**Template for Outbreak Action Timeline:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Day #</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION 2. PREDICT’s ROLE DURING A ZOONOTIC DISEASE OUTBREAK

A. PREDICT Responsibilities

PREDICT responsibilities during an outbreak of unknown origin are primarily offering animal surveillance and animal case investigation assistance to the lead ministry or national task force that is responsible for managing the outbreak response.

Typically, the lead government entity will most likely be the Ministry of Health (or equivalent) in the case of a human outbreak. The agricultural and wildlife authorities are likely to be the lead government entities in the case of an outbreak among domestic or wild animals. The health ministry may also get involved if a zoonotic disease is suspected to be the cause of the outbreak in animals. In some countries, a national task force may be formed that includes multiple ministries involved in outbreak response. PREDICT’s role will be to support the response at the request of this task force or the appropriate ministry with delegated authority from the government. In some countries, the PREDICT team has a pre-designated role for wildlife outbreak investigation and response. Nothing in this guide is meant to override pre-existing local arrangements.

The expectation of the USAID Emerging Pandemic Threats Program is that PREDICT will assist if invited or offer assistance to the investigation team in the countries where the PREDICT Project is actively engaged in surveillance. PREDICT’s involvement must always first be approved by PREDICT Technical Management who will seek approval from USAID (Appendix A).

B. PREDICT Country Coordinator Responsibilities

The PREDICT Country Coordinator is responsible for planning and preparing for PREDICT response activities in the event of a zoonotic disease outbreak. Country Coordinators should consult with their supervisors regarding how much time, resources, and effort should be devoted to planning and preparing for a possible outbreak event. Similarly, once a request to support an outbreak response has been made by an affected country government or delegated authority, the PREDICT Country Coordinator and supervisors should consult with their organizational leads and PREDICT Technical Management to ensure that outbreak support is appropriate for PREDICT staff and will have the approval of USAID.

When it has been decided that PREDICT will assist with an outbreak, the Country Coordinator is the lead PREDICT contact unless or until PREDICT Management assigns another lead person.
C. Likely PREDICT Team Activities During an Outbreak

Under the supervision of the Country Coordinator or designated lead, the PREDICT Team may be called on during an outbreak to implement any of the activities listed below. See the PREDICT Outbreak Assistance Checklist in Appendix B. The PREDICT Team listed in parentheses should be consulted.

1. Conduct field investigations, surveys, and outbreak identification (Surveillance Team**). See Outbreak Investigation Summary Form in Appendix C.
2. Review and interpret clinical findings from wildlife or people (Surveillance Team).
3. Develop wildlife capture and animal sampling strategies (Surveillance Team and others).
4. Develop questionnaires to assist field investigations.
5. Manage logistics and PREDICT implementing partner activities, including government approvals and permits*.
6. Conduct epidemiological review of outbreak data (assistance available from the Epidemiology Team**).
7. Coordinate submission of samples for in-country laboratory analysis and testing, or outsourcing of diagnostics (assistance available from the Diagnostics Team**).
9. Manage site-level communication, outreach, and education.

*IRB and IACUC Protocols—Each PREDICT core partner organization has an approved IACUC protocol for animal sampling. PREDICT has IRB Summary of Determinations that indicate IRB protocols are not required for questioning humans about animals and animal samples.

** See Appendix A for Team Leader contact information.
SECTION 3. PRE-OUTBREAK PLANNING

PREDICT Country Coordinator’s should consult with their supervisors regarding how much time, effort, and resources should be devoted to planning and preparing for a possible outbreak event.

Effective outbreak response requires thorough planning.

PREDICT personnel are likely to assist national outbreak response efforts by:

- Assisting with or conducting animal case and field investigations.
- Conducting surveillance sampling of wild animals and/or domestic animals.
- Coordinating prompt testing of samples and reporting of results.
- Facilitating testing of archived samples of suspected reservoir species.

Prompt and efficient implementation of these functions requires planning.

The key planning and preparation tasks are:

A. Pre-outbreak coordination discussions with ministries, local authorities, and responsible government entities if appropriate.

B. Developing an outbreak investigation and communications plan and checklist for PREDICT activities.

A. Pre-Outbreak Coordination Discussions

PREDICT Country Coordinators should have discussions with relevant officials of the health, livestock, and wildlife ministries in the host country regarding the potential role of PREDICT during an outbreak event. Based on these discussions, it is recommended that all of the following be completed prior to an outbreak:

- Determine who to notify and who to coordinate with in country government ministries in the case of a PREDICT-discovered outbreak.
- Prepare a chart indicating relevant ministries and departments that may be involved in an outbreak response.
- Prepare an outbreak reporting and response contact list, with current contact information, of ministry officials and PREDICT supervisors (See Appendix A).
- Create a list of tasks with which the ministries may ask PREDICT to assist.
- Coordinate with EPT partners (if applicable) – What are the roles of other EPT programs in host countries during an outbreak (PREVENT, RESPOND, DELIVER, IDENTIFY).
- Confirm protocols for notifying ministry officials and PREDICT Technical Management of an outbreak discovered by PREDICT personnel (As determined in the pre-outbreak coordination discussions).
B. Developing a Management Plan for PREDICT Outbreak Response Tasks

Prepare a plan for management actions during an outbreak that considers the four elements below.

Element 1. Plan outbreak investigation/response communications & coordination

Consider developing a PREDICT in-country communications and coordination plan for an outbreak. This could be in the form of a checklist of communications that are important during an outbreak relevant to PREDICT’s case investigation and surveillance activities. The plan should include contact information and general guidance relevant to the following:

a. Daily briefings with government partners, PREDICT Management (Regional Coordinators and Technical Leads) and USAID (See Appendix A for contacts and Section 1, the Outbreak Report Short Form, for what to report).

b. Reporting on PREDICT outbreak response activities as part of daily briefings.

c. Coordinating with PREDICT’s Information Management Support Team: contact technology@gains.org regarding resources and information available.

d. It may be appropriate for PREDICT to communicate with WHO, CDC, OIE, and other health organizations. However, these coordinating communications will more likely occur through the national outbreak response task force or local government. This should be reviewed by PREDICT Management.

e. If requested to do so by national authorities, communicating with local stakeholders (e.g. the public – villagers, community leaders, etc.).

f. Reporting on PREDICT outbreak response activities.

Tips for Good Coordination and Communications

- Work as a team partner with other individual and organizational members of the national task force, ministries, and EPT partners working on an outbreak.

- Do not assume there is good communication between organizations such as human, agricultural, and wildlife ministries.

- Encourage a multi-disciplinary approach to outbreak investigation, engaging human and animal health ministries and organizations. If asked to engage in outbreak investigation or response, consider forming multidisciplinary subcommittees that are familiar with specific tasks such as case management, field investigations, surveillance, laboratory diagnostics, social mobilization, etc.

- Offer to assist with developing wildlife-related communication messages. Messages communicated to the outbreak-affected community and stakeholders must be carefully considered. For example, poor communications may lead the local community to conclude that all animals being investigated should be culled or destroyed. PREDICT should offer to provide guidance to the government partners on messaging with respect to wildlife that may be involved or implicated.
in the outbreak. In addition, the PREDICT outbreak team should be prepared to address the local communities in the area where our team is sampling wildlife in order to mitigate public fear and prevent retribution towards wildlife.

- Share training opportunities available to wildlife ministry personnel for outbreak investigation methods and animal surveillance techniques.

**Element 2. Identify personnel and response teams for PREDICT-led wildlife source investigations and surveillance sampling to be prepared to respond if PREDICT is asked to participate**

- Prepare a list, with contact information, of potential response team members, including their wildlife and investigation skills, safety training, and animal capture and sampling experience.

- Have planning discussions with all potential response team members.

- If some personnel may be contracted to assist with outbreaks, clarify how they can be contracted and paid.

- Plan ahead for any involvement of interns or contracted people from outside of PREDICT. The non-PREDICT personnel may need to participate in safety and protocol trainings first to be qualified to assist during an outbreak.

- Train potential PREDICT interns and contractors on PREDICT animal ethics and non-lethal sampling of animals per PREDICT policy. Communicate this policy in advance of an outbreak to government authorities.

**Element 3. Plan logistics for outbreak investigations and surveillance sampling**

The logistics component of the plan should:

- Describe how personnel, supplies, transportation, lodging, and funding will be handled.

- Describe how samples will be collected, packaged, and transported and to which labs they will be shipped, as well as explain any agreements that have been made with laboratories. To the extent possible, identify in advance what type of samples should be sent to which laboratories, especially to which BSL 3 and BSL 4 laboratories. Work with government authorities to ensure that they approve of use of the planned laboratories.

- Prepare or obtain an outbreak investigation form according to the specifications from local health authorities (or suggest the use of the draft form in Appendix C) for customizing and use in the event of an outbreak.

- Obtain permits in advance for collecting samples and shipping samples out of the country to regional laboratories.
Element 4. Confirm sources of supplies and prepare field kits to conduct field investigations, animal sampling, and diagnostic testing.

To help guide plans for organizing resources for a possible outbreak, describe and assess likely outbreak scenarios in-country and in-region. Based on those outbreak scenarios, do the following:

- Identify resources PREDICT will need in order to respond to each scenario. Prepare complete lists of needed resources, including a checklist of sampling supplies.
- Contact sources of supplies; confirm prices and availability and how to transport them during an outbreak. (Vehicles, dry ice, liquid nitrogen, sampling supplies, etc.).
- Prepare field kits or half kits (for supplies that store easily).
- Confirm what labs will accept what types of samples, and for which pathogens and how they want samples packed and delivered.
- Clarify how funds will be accessed to make special purchases, perform sampling and diagnostics, and to pay for personnel services during an outbreak.
SECTION 4. GUIDANCE FOR PREDICT ASSISTANCE DURING AND OUTBREAK

A. Follow the national leadership’s lead

- Be sure that all PREDICT activities are sanctioned by the national outbreak response task force or national health authorities and PREDICT-USAID Senior Management Team. Confirm PREDICT’s roles with the ministries in advance or at the beginning of outbreak response activities.

- Be very sensitive to the government lead. The government will likely appreciate the support, but we work only at the request of the national government.

- Do not discuss the outbreak investigation with the news media. Refer all news media inquiries to the national task force or designated spokesperson for national health authorities.

B. Country Coordinator tasks

In the event of an outbreak and invitation for PREDICT participation by the government, the Country Coordinator is the lead PREDICT contact during an outbreak unless or until PREDICT Management assigns another lead person. The PREDICT lead for outbreak response is responsible for:

(See Appendix B for PREDICT Outbreak Assistance Checklist)

1. Starting and maintaining an Outbreak Action Timeline. The Timeline should be attached to the Outbreak Report Short Form and look something like the following format:

Example of Outbreak Action Timeline:

<table>
<thead>
<tr>
<th>Date</th>
<th>Day #</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/20/12</td>
<td>1</td>
<td>Was notified by district veterinarian about a high number of dead cattle at Village A.</td>
</tr>
<tr>
<td>1/20/12</td>
<td>2</td>
<td>I notified PREDICT supervisor and discussed next actions.</td>
</tr>
<tr>
<td>1/21/12</td>
<td>3</td>
<td>We met with district veterinary office to discuss circumstances of the cattle mortality and the need to discuss it with the Ministry of Livestock and Animal Health.</td>
</tr>
<tr>
<td>1/22/12</td>
<td>4</td>
<td>Discussed results of meetings with PREDICT Management Surveillance and Epi Teams.</td>
</tr>
<tr>
<td>1/23/12</td>
<td>5</td>
<td>Etc. Add rows as needed for all actions during the outbreak</td>
</tr>
</tbody>
</table>

2. Review the PREDICT Outbreak Response Management Plan.

3. Coordinate with your PREDICT Management (Regional Coordinator and Technical Leads), as well as USAID Mission or DC headquarters as directed by PREDICT Technical Management.
4. Coordinate with the national outbreak committee or task force, or with the ministry in charge of handling the PREDICT-assisted portion of the outbreak response.

5. Manage or supervise the PREDICT-led activities that may include any of the activities listed under Section 2C above.

6. Prepare all communications in accordance with direction given and national guidelines, using WHO and OIE guidelines as appropriate (See Appendices F & G).

7. Facilitate the post-outbreak review of the PREDICT Team’s implementation of case investigation, surveillance, communications, and coordination and other activities during the outbreak.

If an outbreak of unknown origin in wildlife or humans occurs and PREDICT is not invited to participate, the Country Coordinator should, to the extent that he or she can, maintain communication with the outbreak investigation team and offer support if appropriate and as instructed by PREDICT Management. Also, the PREDICT Country Coordinator should regularly communicate significant events and information related to the outbreak to the Regional Coordinator and PREDICT Technical Management.
APPENDIX A. IMPORTANT CONTACT LIST

PREDICT Technical Management:

Jonna Mazet
UC Davis, Email: jkmazet@ucdavis.edu Phone: +1-530-754-9035
During outbreak only, mobile for text alerts and updates: +1-530-304-1231

Billy Karesh
EcoHealth Alliance, Email: karesh@EcoHealthAlliance.org Phone: +1-212-380-4463

PREDICT Team Leaders:

Surveillance Team—Billy Karesh, Email: karesh@EcoHealthAlliance.org
Epidemiology Team – Christine Johnson, Email: ckjohnson@ucdavis.edu
Diagnostics Team – Tracey Goldstein, Email: tgoldstein@ucdavis.edu

In-Country Government Zoonosis Outbreak Contacts:

Health ministry or department:
Email: __________________________________________________________
Cell phone: ______________________________________________________

Animal ministry or department:
Email: __________________________________________________________
Cell phone: ______________________________________________________

Wildlife ministry or department:
Email: __________________________________________________________
Cell phone: ______________________________________________________

Other Key Contacts:
Name:
_____________________________________________________________ Organization __________________
Email: ____________________________Cell phone:
_____________________________________________________________

Name:
_____________________________________________________________ Organization __________________
Email: ____________________________Cell phone:
_____________________________________________________________
### APPENDIX B. OUTBREAK ASSISTANCE CHECKLIST

<table>
<thead>
<tr>
<th>Outbreak Assistance Task Checklist</th>
<th>Date completed or updated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Start Outbreak Report Short Form and Action Timeline</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2. Confirm assistance responsibilities and coordination</strong></td>
<td></td>
</tr>
<tr>
<td>a. Reviewed the PREDICT Outbreak Response Plan.</td>
<td></td>
</tr>
<tr>
<td>b. Discussed PREDICT assistance role with PREDICT Supervisors and regional leads.</td>
<td></td>
</tr>
<tr>
<td>c. Confirmed PREDICT roles with PREDICT Technical Management.</td>
<td></td>
</tr>
<tr>
<td>d. Confirm PREDICT role at request of National authorities.</td>
<td></td>
</tr>
<tr>
<td>e. Confirmed role as member of advisor to National Task Force (if appropriate).</td>
<td></td>
</tr>
<tr>
<td>f. Coordinated with EPT partners if appropriate.</td>
<td></td>
</tr>
<tr>
<td><strong>3. Prepare for fieldwork</strong></td>
<td></td>
</tr>
<tr>
<td>a. Purchased and assembled all field supplies:</td>
<td></td>
</tr>
<tr>
<td>b. Made payment arrangements for field staff and materials:</td>
<td></td>
</tr>
<tr>
<td>c. Made vehicle and driver arrangements:</td>
<td></td>
</tr>
<tr>
<td>d. Considered accommodation and other travel arrangements for fieldwork:</td>
<td></td>
</tr>
<tr>
<td>e. Contacted laboratories to prepare for receiving samples:</td>
<td></td>
</tr>
<tr>
<td><strong>4. Monitoring and reporting the course of the outbreak</strong></td>
<td></td>
</tr>
<tr>
<td>a. Updating summary of PREDICT assistance activities and results providing (daily) updates to supervisors and PREDICT Technical Management.</td>
<td></td>
</tr>
<tr>
<td>b. Checking with Task Force or appropriate ministry for latest outbreak updates (daily or frequent communications).</td>
<td></td>
</tr>
<tr>
<td>c. Set schedule for updating PREDICT Management.</td>
<td></td>
</tr>
<tr>
<td><strong>5. Handling and tracking samples</strong></td>
<td></td>
</tr>
<tr>
<td>a. Designated sample manager.</td>
<td></td>
</tr>
<tr>
<td>b. Confirmed to which labs samples will be sent for testing.</td>
<td></td>
</tr>
<tr>
<td>c. Assured proper transport and storage of samples.</td>
<td></td>
</tr>
<tr>
<td>d. Recorded and entered sample data into GAINS.</td>
<td></td>
</tr>
</tbody>
</table>
6. Communicate wildlife field investigations or surveillance findings to national task force (or lead ministry)
   a. Prepared findings report
   b. Obtained PREDICT Management review and approval of findings
   c. Deliver findings report to national task force or lead ministry:

7. Other tasks as needed (list any other needed tasks that are important for the specific outbreak assistance effort).

8. Post outbreak review and plan update
   a. Facilitated post-outbreak review of PREDICT Team’s implementation of the case investigation, surveillance, communications and coordination and other activities during the outbreak.
   b. Updated Outbreak Management Plan based on lessons learned from this outbreak.
APPENDIX C.  GENERAL GUIDELINES FOR OUTBREAK INVESTIGATION AND SUMMARY FINDINGS OF POST-OUTBREAK

(Customize this form for a particular outbreak)

1. Verify the diagnosis and identify the biological or chemical agent causing illness

<table>
<thead>
<tr>
<th>Describe the initial magnitude of the suspected outbreak and symptoms that have been noticed in animals or humans:</th>
</tr>
</thead>
<tbody>
<tr>
<td>What diagnosis has been established?</td>
</tr>
<tr>
<td>Sample type collected and tested and method of diagnosis (clinical signs, serology, PCR, etc.)</td>
</tr>
<tr>
<td>What agent has been identified? (bacterial, viral, toxin, other)</td>
</tr>
<tr>
<td>Develop the <strong>Case Definition</strong> for humans and animals (by species), if animals are likely to show clinical signs:</td>
</tr>
</tbody>
</table>

2. Confirm that an outbreak exists among humans and/or animals

**Human outbreak:** Use the human case definition to identify all cases.

<table>
<thead>
<tr>
<th>Based on your knowledge is the number of human cases above endemic levels?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td>Total number of cases so far:</td>
</tr>
<tr>
<td>Is this an outbreak?</td>
</tr>
</tbody>
</table>

**Animal outbreak:** Use the species-specific case definition to identify all cases.

<table>
<thead>
<tr>
<th>Based on your knowledge is the number of animal cases above endemic levels?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td>Total number of animal cases so far:</td>
</tr>
<tr>
<td>Is this an outbreak?</td>
</tr>
</tbody>
</table>

3. Search for additional animal cases

Request that all livestock owners and wildlife managers report any current animal cases. Search for retrospective cases by interviewing livestock owners and wildlife managers.
4. Characterize the cases by animal, conditions, place, movement, time, exposures

Animal: (species, age, sex, nutritional status, reproductive status, potential exposures, feeds, water sources, treatments)

Place: (GIS locations, including maps, land use types, facilities, stalls, cages, range, conditions)

Recent movements: (areas transported from, recent movements of animals by transport vehicles, migration or other means)

Time: What is the period of the outbreak?

Possible exposure sources:

Record dates of onset of outbreak and draw epidemic curve.

5. Develop a tentative hypothesis (best idea based on preliminary assessment)

Review data collected to determine common host factors and exposures. Develop best ideas that explain the outbreak in humans and animals.

<table>
<thead>
<tr>
<th>Reservoir</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td></td>
</tr>
<tr>
<td>Mode of Transmission to humans</td>
<td></td>
</tr>
<tr>
<td>Mode of transmission to animals</td>
<td></td>
</tr>
</tbody>
</table>
6. Propose control measures based on initial hypothesis

Initiate control measures based on what you know. (Animal handling, isolation, slaughtering practices, culling, hygiene, alternative water sources, etc.)

<table>
<thead>
<tr>
<th>Proposed Control Measure:</th>
<th>Reason:</th>
<th>Where to be implemented:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Test the hypothesis and revise the hypothesis

(The outbreak investigation may not get to this item.) Develop and implement procedures to test the hypothesis. Testing the hypothesis requires a thorough epidemiological analysis. Based on results from the test procedures, determine if the hypothesis should be amended.

8. Monitor and evaluate control measures.

If control measures are implemented that affect the handling of animals, monitor those control measures to evaluate their effectiveness.

Did cases cease? If so, continue control measures as appropriate or practical.

If cases did not cease, reconsider outbreak hypothesis and proposed control measures.
APPENDIX D. OUTBREAK INVESTIGATION ELEMENTS

PREDICT personnel may only be involved in a few specific tasks to assist with an outbreak investigation, i.e. wildlife and sometimes domestic animal sampling. Nevertheless it is important to understand all of the elements of an outbreak investigation.

The purpose of an outbreak investigation is to determine:

1. Cause of disease  
2. Source of disease  
3. Mode of transmission  
4. What groups of people or types of animals are at risk for developing the disease  
5. What are the likely sources of exposures and risk factors for developing disease  
6. Identify possible intervention and outbreak control strategies

Detailed descriptions of steps that may be implemented during an outbreak investigation may be found at several online resources.

For descriptions of the elements of an outbreak investigation, see:


• CDC: http://www.cdc.gov/excite/classroom/outbreak/index.htm

• Center for Infectious Disease Preparedness, UC Berkeley School of Public Health, http://www.idready.org/materials.html#CIDER
APPENDIX E. OUTBREAK INVESTIGATION FORMS & RESOURCES

For examples of outbreak investigation forms and report forms see CDC site:
http://www.cdph.ca.gov/pubsforms/forms/Pages/CD-Report-Forms.aspx

For guidance on national outbreak preparedness planning, see:
FAO Animal Disease Outbreak Preparedness Guidance -- The United Nations Food and Agricultural Organization (FAO) works with developing countries to improve capacity to prevent and respond to animal disease outbreaks. FAO publishes the Manual on the Preparation of National Animal Disease Preparedness Plans. It would be useful to be familiar with this manual to know what guidance FAO is giving to countries regarding animal disease outbreaks. The Manual maybe accessed online at: http://www.fao.org/DOCREP/004/X2096E/X2096E00.HTM

FAO established the Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) Program to promote the effective containment and control of the most serious epidemic pests and diseases and food safety threats through international collaboration.
The World Health Organization (WHO) and the World Organization for Animal Health (OIE) have specific standards and requirements regarding surveillance and outbreak reporting. **All of the PREDICT countries are members of both WHO and OIE.** It is important that PREDICT personnel understand the WHO and OIE standards and requirements and how they affect the national outbreak response protocols, procedures, communications and reporting.

**A. WHO International Health Regulations Relevant to PREDICT**

The World Health Organization (WHO) is the intergovernmental organization responsible for improving human health worldwide. Member countries have certain binding obligations with regard to the reporting of disease outbreaks.

A central and historic responsibility for the WHO has been the management of the global regime for the control of the international spread of disease. The WHO has adopted International Health Regulations (IHR) for this purpose. This legally binding agreement, last updated in 2005, provides the framework for the coordination of the management of events that may constitute a public health emergency of international concern.

The purpose and scope of the IHR (2005) are “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.” The 2005 updated IHR contains several innovations, including:

- a. The scope of WHO is not limited to any specific disease or manner of transmission, but instead covers all illness or medical condition, irrespective of origin or source, that presents or could present significant harm to humans;
- b. Country obligations to develop certain minimum core public health capacities;
- c. Country obligations to notify WHO of events that may constitute a public health emergency of international concern according to defined criteria;
- d. Provisions authorizing WHO to take into consideration unofficial reports of public health events and to obtain verification from States Parties concerning such events;
- e. Procedures for the determination by the Director-General of a “public health emergency of international concern” and issuance of corresponding temporary recommendations, after taking into account the views of an Emergency Committee;
- f. Protection of the human rights of persons and travelers; and
g. The establishment of National IHR Focal Points and WHO IHR Contact Points for urgent communications between States Parties and WHO.

Each Country shall designate or establish a National IHR Focal Point and the authorities responsible within its respective jurisdiction for the implementation of health measures under these Regulations.

PREDICT personnel should know who serves as the National IHR Focal Point and which authorities have been charged with responsibility to implement the health measures required by the IHR (The health ministry can provide this information).

**WHO Required Surveillance Capacity**

Each country shall develop, strengthen and maintain the capacity to detect, assess, notify and report disease events. WHO shall assist member countries, upon request, to develop, strengthen and maintain the capacities to detect and respond to a disease outbreak.

**WHO Required Notification of a Disease Event**

Each country shall assess potential disease events occurring within its territory by using the decision instrument in Annex 2 of the IHRs, and notify WHO within 24 hours of assessment of public health information, of all events which may constitute a public health emergency of international concern within its territory in accordance with the decision instrument, as well as any health measure implemented in response to those events.

Following a notification, a country shall continue to communicate to WHO timely, accurate and sufficiently detailed public health information available to it on the notified event, where possible including:

1. Case definitions.
2. Laboratory results.
3. Source and type of the risk.
4. Number of cases and deaths.
5. Conditions affecting the spread of the disease and the health measures employed.
6. Report, when necessary, the difficulties faced and support needed in responding to the potential public health emergency of international concern.

**Public Health Response Capacity**

Each country shall develop, strengthen and maintain the capacity to respond promptly and effectively to public health risks and public health emergencies of international concern as set out in Annex 1 (See below). WHO provides guidelines to support countries in the development of public health response capacities.

**Source: IHR 2005**
APPENDIX F continued

IHR ANNEX 1

CORE CAPACITY REQUIREMENTS FOR SURVEILLANCE AND RESPONSE

1. States Parties shall utilize existing national structures and resources to meet their core capacity requirements under these Regulations, including with regard to:
   a. Their surveillance, reporting, notification, verification, response and collaboration activities; and
   b. Their activities concerning designated airports, ports and ground crossings.

2. Each State Party shall assess, within two years following the entry into force of these Regulations for that State Party, the ability of existing national structures and resources to meet the minimum requirements described in this Annex. As a result of such assessment, States Parties shall develop and implement plans of action to ensure that these core capacities are present and functioning throughout their territories as set out in paragraph 1 of Article 5 and paragraph 1 of Article 13.

3. States Parties and WHO shall support assessments, planning and implementation processes under this Annex.

4. At the local community level and/or primary public health response level

The capacities:
   a. To detect events involving disease or death above expected levels for the particular time and place in all areas within the territory of the State Party; and
   b. To report all available essential information immediately to the appropriate level of healthcare response. At the community level, reporting shall be to local community health-care institutions or the appropriate health personnel. At the primary public health response level, reporting shall be to the intermediate or national response level, depending on organizational structures. For the purposes of this Annex, essential information includes the following: clinical descriptions, laboratory results, sources and type of risk, numbers of human cases and deaths, conditions affecting the spread of the disease and the health measures employed; and
   c. To implement preliminary control measures immediately.

5. At the intermediate public health response levels

The capacities:
   a. To confirm the status of reported events and to support or implement additional control measures; and
   b. To assess reported events immediately and, if found urgent, to report all essential information to the national level. For the purposes of this Annex, the criteria for urgent events include serious public health impact and/or unusual or unexpected nature with high potential for spread.

6. At the national level

Assessment and notification. The capacities:
   a. To assess all reports of urgent events within 48 hours; and
   b. To notify WHO immediately through the National IHR Focal Point when the assessment indicates the event is notifiable pursuant to paragraph 1 of Article 6 and Annex 2 and to inform WHO as required pursuant to Article 7 and paragraph 2 of Article 9.

Public health response. The capacities:
   a. To determine rapidly the control measures required to prevent domestic and international spread;
   b. To provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centres) and logistical assistance (e.g. equipment, supplies and transport);
   c. To provide on-site assistance as required to supplement local investigations;
   d. To provide a direct operational link with senior health and other officials to approve rapidly and implement containment and control measures;
   e. To provide direct liaison with other relevant government ministries;
f. To provide, by the most efficient means of communication available, links with hospitals, clinics, airports, ports, ground crossings, laboratories and other key operational areas for the dissemination of information and recommendations received from WHO regarding events in the State Party’s own territory and in the territories of other States Parties;

g. To establish, operate and maintain a national public health emergency response plan, including the creation of multidisciplinary/multisectoral teams to respond to events that may constitute a public health emergency of international concern; and

h. To provide the foregoing on a 24-hour basis.
APPENDIX G. OIE TERRESTRIAL ANIMAL HEALTH CODE RELEVANT TO PREDICT

The World Organization for Animal Health (OIE) is the intergovernmental organization responsible for improving animal health worldwide. Member organizations have certain binding obligations with regard to the import and export of animals and the reporting of animal diseases.

Purpose of the OIE Terrestrial Animal Health Code
The OIE Terrestrial Animal Health Code (Terrestrial Code) sets out standards for the improvement of terrestrial animal health and welfare and veterinary public health worldwide, including thorough standards for safe international trade in terrestrial animals (mammals, birds and bees) and their products. The health measures in the Terrestrial Code should be used by the veterinary authorities of importing and exporting countries to provide for early detection, reporting and control of agents pathogenic to terrestrial animals and, in the case of zoonoses, for humans, and to prevent their transfer via international trade in terrestrial animals and terrestrial animal products, while avoiding unjustified sanitary barriers to trade. (There is a similar Aquatic Animal Health Code that should be referenced with regard to diseases in aquatic species).

The intent of OIE recommendations in the Terrestrial Code is to provide for trade in animals and animal products to take place with an optimal level of animal health security, based on the most up to date scientific information and available techniques.

In many of the Terrestrial Code chapters, the use of specified diagnostic tests and vaccines is recommended and a reference made to the relevant section in the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals.

The Terrestrial Code may be accessed online at: http://www.oie.int/en/international-standard-setting/terrestrial-code/access-online/

OIE publishes a Manual of Diagnostic Tests and Vaccines for Terrestrial Animals as a resource for implementing the Terrestrial Code. OIE also publishes a Manual for Diagnostic Tests for Aquatic Animals as a resource for implementing the Aquatic Code.

Reporting to OIE is the sole responsibility of the individual country or governing body (referred to as an OIE Member). OIE cannot accept reports from other parties, but may request official clarification from the delegate to resolve media reports or rumors.

Portions of the OIE Terrestrial Code and Aquatic Code are particularly relevant to PREDICT. They include the requirements of OIE Members regarding notification of disease outbreaks, reporting, and animal surveillance activities. Those relevant sections are below:
OIE Reporting and Notification Requirements of OIE Members:

Reporting Requirements:
1. Members shall make available to other Members, through the OIE, whatever information is necessary to minimize the spread of important animal diseases and to assist in achieving better worldwide control of these diseases.
2. To achieve this, Members shall comply with the notification requirements specified in Article 1.1.3.
3. To assist in the clear and concise exchange of information, reports shall conform as closely as possible to the official OIE disease reporting format.
4. Recognizing that scientific knowledge concerning the relationship between disease agents and diseases is constantly developing and that the presence of an infectious agent does not necessarily imply the presence of a disease, Members shall ensure through their reports that they comply with the spirit and intention of point 1 above.
5. In addition to notifying new findings in accordance with Article 1.1.3., Members shall also provide information on the measures taken to prevent the spread of diseases; including quarantine measures and restrictions on the movement of animals, animal products and biological products and other miscellaneous objects which could by their nature be responsible for transmission of disease. In the case of diseases transmitted by vectors, the measures taken against such vectors, shall also be specified.

Notification of Disease Outbreaks:
Veterinary Authorities shall send to OIE headquarters:
1. in accordance with relevant provisions in the disease specific chapters, notification through the World Animal Health Information System (WAHIS) or by telegram, fax or e-mail, within 24 hours, of any of the following events:
   a. first occurrence of a listed disease and/or infection in a country, a zone or a compartment;
   b. re-occurrence of a listed disease and/or infection in a country, a zone or a compartment following a report declared the outbreak ended;
   c. first occurrence of a new strain of a pathogen of a listed disease in a country, a zone or a compartment:
   d. a sudden and unexpected increase in the distribution, incidence, morbidity or mortality of a listed disease prevalent within a country, a zone or a compartment;
   e. an emerging disease with significant morbidity or mortality, or zoonotic potential;
   f. evidence of change in the epidemiology of a listed disease (including host range, pathogenicity, strain) in particular if there is a zoonotic impact;
2. weekly reports by telegram, fax or e-mail subsequent to a notification under point 1 above, to provide further information on the evolution of an incident which justified urgent notification; these reports should continue until the situation has been resolved through either the disease being eradicated or it becoming endemic so that six-monthly reporting under point 3 will satisfy the obligation of the Member to the OIE; in any case, a final report on the incident should be submitted;
3. a six-monthly report on the absence or presence, and evolution of listed disease and information of epidemiological significance to other Members;
4. an annual report concerning any other information of significance to other Members.

Notification regarding Infected Zones
1. The Veterinary Authority of a territory in which an infected zone was located shall inform the OIE Headquarters when this zone is free from the disease.
2. An infected zone for a particular disease shall be considered as such until a period exceeding the infective period specified in the Terrestrial Code has elapsed after the last reported case, and when full prophylactic and appropriate animal health measures have been applied to prevent...
possible reappearance or spread of the disease. These measures will be found in detail in the various chapters of Volume II of the Terrestrial Code.

3. A Member may be considered to regain freedom from a specific disease when all conditions given in the relevant chapters of the Terrestrial Code have been fulfilled.

4. The Veterinary Authority of a Member which sets up one or several free zones shall inform the OIE giving necessary details, including the criteria on which the free status is based, the requirements for maintaining the status and indicating clearly the location of the zones on a map of the territory of the Member.
OIE Guidance Regarding Animal Surveillance

1. In general, surveillance is aimed at demonstrating the absence of disease or infection, determining the occurrence or distribution of disease or infection, while also detecting as early as possible exotic or emerging diseases. The type of surveillance applied depends on the desired outputs needed to support decision-making. The following recommendations may be applied to all diseases, their agents and all susceptible species (including wildlife) as listed in the Terrestrial Code, and are designed to assist with the development of surveillance methodologies. Except where a specific surveillance method for a certain disease or infection is already described in the Terrestrial Code, the recommendations in this chapter may be used to further refine the general approaches described for a specific disease or infection. Where detailed disease/infection-specific information is not available, suitable approaches should be based on the recommendations in this chapter.

2. Animal health surveillance is an essential tool to detect disease or infection, to monitor disease trends, to facilitate the control of disease or infection, to support claims for freedom from disease or infection, to provide data for use in risk analysis, for animal and/or public health purposes, and to substantiate the rationale for sanitary measures. Both domestic animals and wild animals are susceptible to certain disease/infection. However, disease/infection in wild animals does not mean that the same disease/infection is necessarily present in domestic animals in the same country or zone or vice versa. Surveillance data underpin the quality of disease status reports and should satisfy information requirements of risk analysis for international trade and for national decision-making. Wildlife may be included because they can serve as reservoirs and as indicators of human and domestic animal and wildlife disease. Wildlife disease/infection surveillance presents specific challenges that may differ significantly from surveillance in domestic animals.

3. Prerequisites to enable an OIE Member to provide information for the evaluation of its animal health status are:
   a. that the Member complies with the provisions of Chapter 3.1. of the Terrestrial Code;
   b. that, where possible, surveillance data be complemented by other sources of information (e.g. scientific publications, research data, documented field observations and other non-survey data);
   c. that transparency in the planning and execution of surveillance activities and the analysis and availability of data and information, be maintained at all times, in accordance with Chapter 1.1. of the Terrestrial Code.

4. The objectives of this chapter are to:
   a. provide guidance to the type of outputs that a surveillance system should generate;
   b. provide recommendations to assess the quality of disease/infection surveillance systems.

Source: OIE Terrestrial Code