Re-Designing Surveillance for an E-Health World

Collaboratively Defining Surveillance System Requirements for the Future

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New York State Department of Health
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Discussion Topics

– Project Purpose
– Approach
– Results
– Implications for surveillance community
Overall Questions

• What might notifiable condition surveillance look like in the next 5-10 years?
• What are/will be the main activities (business processes) for notifiable condition surveillance?
• What are the information system requirements to effectively support that work in the future?
Project Approach

• Engaged public health practitioners to examine and re-design surveillance processes
  – 11 participants from 10 local/state public health agencies
  – CDC liaisons from Surveillance and Informatics Office

• Applied the Institute’s Collaborative Requirements Development Methodology™ (CRDM) process
Project Approach

• Three 2½ day workgroup meetings
• Members asked to envision the world of surveillance in 5-10 years, with a focus perspective and attention to interaction with EHRs, LIMS and HIEs
• Funding from Robert Wood Johnson Foundation
“And, like the bottled water at grocery stores, intestinal remedies were in short supply at pharmacies. "We Have Imodium A-D," one Walgreen's store here proclaimed on a street sign.”

-NY Times, 4/9/1993
A sign promotes zombie preparedness in a hardware store in Omaha, Neb., in October. Nati Harnik, Associated Press

Daily Gazette, Schenectady, NY, 6/4/2012
Collaborative Requirements Development Methodology

- **Business Process Analysis**
  - think
  - How do we do our work now?

- **Business Process Redesign**
  - rethink
  - How should we do our work?

- **Requirements Definition**
  - describe
  - How can an information system support our work?
Premises of CRDM

• The way agencies across the country do their work is more similar than not
• Collective wisdom is better than working in isolation
• A freely-available set of functional requirements for surveillance systems will contribute to improved information system design and use
Project Results

• Created a framework for organizing the business processes for reportable conditions

• Defined 8 of 11 identified business processes
  – Business Process Matrix
  – Task Flows
  – Functional Requirements
**Case Investigation**

**Business Process Matrix**

<table>
<thead>
<tr>
<th>OBJECTIVE(S)</th>
<th>BUSINESS RULES</th>
<th>TRIGGER</th>
<th>TASK SET</th>
<th>INPUTS</th>
<th>OUTPUTS</th>
<th>MEASURABLE OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Gather additional information regarding the reportable condition to ascertain if it meets a case definition</td>
<td>- Public health law, regulations, and policies for reportable conditions</td>
<td>- Condition reported that requires case investigation/disease control measures</td>
<td>1. Request additional demographic, epidemiologic, laboratory and other information</td>
<td>- Condition reports</td>
<td>- Case classification</td>
<td>- Percentage of reports investigated</td>
</tr>
<tr>
<td>- Determine condition source</td>
<td>- HIPAA exemption for public health reporting</td>
<td>- Administrative decision</td>
<td>2. Provide available information</td>
<td>- Information regarding existing outbreaks, events and other disease trends</td>
<td>- Case investigation record</td>
<td>- Case count</td>
</tr>
<tr>
<td>- Determine appropriate interventions at an individual or community level, in a specified time frame</td>
<td>- State or local privacy/consent laws and regulations</td>
<td>- Condition reported that requires case investigation/disease control measures</td>
<td>3. Perform risk evaluation</td>
<td></td>
<td>- Percent of investigations completed with critical data elements</td>
<td></td>
</tr>
<tr>
<td>- Identify contacts</td>
<td>- Case definitions</td>
<td>- Determine if additional information is required</td>
<td>4. Determine if additional information is required</td>
<td></td>
<td>- Number of contacts, individuals and populations identified</td>
<td></td>
</tr>
<tr>
<td>- Identify individuals or populations at risk</td>
<td>- Public health investigation protocols</td>
<td>- Determine whether to trace contacts</td>
<td>5. Determine whether to trace contacts</td>
<td></td>
<td>- Number of cases possibly associated with a cluster or event</td>
<td></td>
</tr>
</tbody>
</table>

* Illustrated by: © 2011 Public Health Informatics Institute*
**Case Investigation**

1 of 3

**Reportable Conditions Surveillance**

**LHD/SHD**

1. **Request** 
   - demographic, clinical, epidemiologic, laboratory and other information

2. **Provide available information**
   - Care provider, client and laboratory provide LHD/SHD with any available information

3. **Perform risk evaluation**
   - Based on all data collected LHD/SHD determines the risk to the public

4. **Additional information required?**
   - LHD/SHD determines if additional information is required

5. **Trace contacts?**
   - LHD/SHD determines if condition report may have affected others and therefore requires contact tracing

6. **Contact tracing**
   - LHD/SHD completes the process to identify contact, determine exposure, and provide the best intervention, if contact has been exposed

7. **Update case record and complete investigation forms**

8. **Classify case**
   - LHD/SHD classifies cases into categories. Examples:
     - Confirmed
     - Probable
     - Suspect
     - Revoke

9. **Additional investigations needed?**
   - LHD/SHD determines if additional investigations are required

**General Process Notes**

**Objectives:**
- Gather additional information regarding the reportable condition to ascertain if it meets a case definition
- Determine condition source
- Identify potential interventions at an individual or community level in a specified time frame
- Identify contacts
- Identify individuals or populations at risk

**Measurable Outcomes:**
- Percentage of reports investigated
- Case count
- Percent of investigations completed with critical data elements
- Number of contacts, individuals and populations identified
- Number of cases possibly associated with a cluster or outbreak
- Number of individuals, populations or events in which a probable source was identified, where appropriate
- Initiation of investigation in a timely manner

**Other Notes:**
- All data entered into or uploaded in the surveillance system is maintained for statistical and other analytical reporting purposes

**Activity Description:**
1. **Request demographic, clinical, epidemiologic, laboratory and other information**
   - Most often, additional information on the patient or the circumstances of the exposure is required to more fully understand the event and the level of individual and/ or community risk

2. **Provide available information**
   - Care provider, client and laboratory provide LHD/SHD with any available information

3. **Perform risk evaluation**
   - Based on all data collected LHD/SHD determines the risk to the public

4. **Additional information required?**
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## Requirements

- The language of health users and experts in plain nontechnical language

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<thead>
<tr>
<th>ID</th>
<th>BUSINESS PROCESS</th>
<th>ACTIVITY</th>
<th>ENTITY / FUNCTIONAL ROLE</th>
<th>REQUIREMENT (The system must or should…)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1</td>
<td>Case Investigation</td>
<td>Update Case Record</td>
<td>Program Manager</td>
<td>Allow user to print the case record</td>
</tr>
<tr>
<td>1.1.2</td>
<td>Case Investigation</td>
<td>Update Case Record</td>
<td>Program Manager</td>
<td>Allow user to send case record through multiple distribution methods (i.e. fax, email…etc)</td>
</tr>
<tr>
<td>1.1.3</td>
<td>Case Investigation</td>
<td>Update Case Record</td>
<td>Program Manager</td>
<td>Allow user to save, modify or delete case record</td>
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Implications for Surveillance Community

• Identifies functional requirements for current and future surveillance systems

• Makes collective wisdom freely available to support improved practice and system design

• Complements the “Blueprint” paper by focusing on informatics aspects of surveillance trends
Implications for Local and State Health Departments

• “Checklist” to identify possible system enhancements
• Supports RFP process for procuring or developing new surveillance systems
• Provides task flows to support workflow review/redesign
• Helpful in identifying informatics training needs for surveillance staff
## Workgroup Members

<table>
<thead>
<tr>
<th>Workgroup Participant</th>
<th>Affiliation</th>
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<tbody>
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Questions