Policy in the Making: Establishing Public Policy for Complex Animal Diseases

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Public Policy?
My knowledge of Policy and Public Health prior to my Field Experience...
The One Health Experience

- **Field Experience Site:**
  - One Health Coordination Center
  - USDA, APHIS, Veterinary Services
    - Surveillance, Preparedness, and Response Services unit
  - Riverdale, MD

- **Field Experience Mentor:**
  - Dr. Joseph Annelli, Director of the One Health Coordination Center

- **Field Experience Project:**
  - Defining how policy is established for complex animal diseases
One Health (OH) –
WHAT IS IT? WHAT DOES IT MEAN?
Between animal and human medicine there is no dividing line – nor should there be. The subject is different but the experience constitutes the basis of all medicine.

--RUDOLF VIRSCHOW, GERMAN SCHOLAR (1800S)
Healthy Pets → Healthy Livestock → Healthy Planet → Healthy People

= ONE HEALTH
Step 1:
DECIDING WHEN TO ACT
What becomes OH policy?

Figure 1: One Health engagement flowchart, created by APHIS, VS
<table>
<thead>
<tr>
<th>Species Involved</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle, sheep, swine, poultry</td>
<td>Horses, Farmed Cervids, Feral swine, wild fish, wild horses, domestic pets, zoo animals, insects</td>
<td>Wild cervids, feral swine, wild fish, wild horses, domestic pets, zoo animals, insects</td>
<td>Animals not involved</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Animal Prevalence</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent not thought to exist in susceptible population</td>
<td>Agent exist at low to moderate levels in population</td>
<td>Agent is endemic or highly prevalent in species</td>
<td>Agent is not found nor infectious in animal species</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Animal Transmissibility</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent highly transmissible within and between species</td>
<td>Moderate transmissibility within species</td>
<td>Animal transmission unlikely, limited or uncertain</td>
<td>No known animal transmission</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Animal Consequences</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>High mortality/morbidity in species of concern</td>
<td>Serious illness and moderate economic loss in species of concern</td>
<td>Little, unknown or uncertain illness in species of concern</td>
<td>Animal infection unlikely</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Host Species</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary host is &quot;farm&quot; species</td>
<td>Secondary host is farm species</td>
<td>Host range is unknown or uncertain OR VS-covered species are unlikely hosts</td>
<td>Exclusive human pathogen</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zoonotic Transmissibility</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoonotic transmission likely or common</td>
<td>Known zoonotic transmission of moderately transmissible agent</td>
<td>Zoonotic transmission unlikely, limited or uncertain</td>
<td>No known zoonotic transmission</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Human Consequences</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent is potentially fatal to humans</td>
<td>Agent causes serious illness in humans</td>
<td>Human illness asymptomatic or mild</td>
<td>Human infection unlikely</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stakeholder Interest/Concern</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>High pressure, interest, request expectation</td>
<td>Moderate level of pressure, interest, request for engagement</td>
<td>Little pressure, interest, request for engagement</td>
<td>No pressure, interest, request for engagement</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Possible Actions</th>
<th>Full Engagement</th>
<th>Moderate Engagement</th>
<th>Baseline Engagement</th>
<th>No Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveillance, Vaccination, Diagnostic Testing, Movement Restriction, Eradication</td>
<td>Gather Information (surveillance, epi investigation/study) Support</td>
<td>In Kind Support or Advisory Subject Matter Expert</td>
<td>No Activities</td>
<td></td>
</tr>
</tbody>
</table>
Step 2:

“GETTING IN THE KNOW” –BACKGROUND RESEARCH
Building the Epidemiologic Database...

- Time-consuming BUT important!
- MERS-CoV Story
- Current HPAI-H5N2 Outbreak
- Stakeholder Announcements

### States and Counties Currently Affected

<table>
<thead>
<tr>
<th>State/County</th>
<th>Backyard/RBV Species or Commercial (C) Species</th>
<th>NVRAL Confirmed Date (Type)</th>
<th>Infected Poultry Quarantine Date</th>
<th>Control Area Est. Date</th>
<th>Disinfestation Completed Date</th>
<th>Disposal Method Status &amp; Date</th>
<th>CID Date</th>
<th>Control Area Release Date</th>
<th>Final Release Date (Reconsideration Date)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ND/Ramson</td>
<td>C/Turkey/126,209</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
<tr>
<td>MN/Redwood</td>
<td>C/Turkey/157,549</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
<tr>
<td>MN/Redwood</td>
<td>C/Turkey/160,590</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
<tr>
<td>MN/Nisswa</td>
<td>C/Turkey/157,549</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
<tr>
<td>MN/Otter Tail</td>
<td>C/Turkey/157,549</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
<tr>
<td>MN/Meeker</td>
<td>C/Turkey/157,549</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
<tr>
<td>MN/Meeker</td>
<td>C/Turkey/20,050</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
<tr>
<td>MN/Meeker</td>
<td>C/Turkey/20,050</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
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<td>MN/Meeker</td>
<td>C/Turkey/20,050</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
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<td>MN/Meeker</td>
<td>C/Turkey/20,050</td>
<td>4/21/15 H5N2</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>Pending</td>
<td>No</td>
<td>Pending</td>
</tr>
</tbody>
</table>
Step 3:
ASSESSING AND COMMUNICATING RISK
Risk Assessment Model

Fig. 1. Structure of the O.I.E. risk analysis process (adapted from O.I.E. [12]).

Figure 3: OIE risk analysis process (taken from Voss, 2012)
Determining Risk for an Emerging Infectious Disease

I. Background
II. Methodology
   - Risk Assessment methods
   - Data collection and limitations
III. Hazard Identification and Characteristics
IV. Pathways assessment
V. Animal Product Pathways
   - Trade (Import and Export)
VI. Zoonotic potential and Passenger Traffic
VII. Direct importation, Permits, and Containment

Figure 4: Generalized template of the Risk Identification and Assessment Process, APHIS-VS
Step 4: POLICY DEVELOPMENT
What is the goal?

- Prevention and Control
  - PEDv
  - MERS-CoV
- Eradication
  - Pseudorabies
  - HPAI
When Bills Become Laws, Laws Become Acts...

Figure 6: Diagrammatic Representation of Federal Policy Development
Implementation and Education...

- Memorandums of Understanding (MOUs)
  - APHIS and FSIS
- Standard Operating Procedures (SOPs)
  - MERS-CoV
- Technical Fact Sheets
Is it effective?

- Regulation analysis
  - Administrative review – internal
    - Annual
  - Program review
    - Annual or as needed
      - States previously identified with issues
      - States that have not been reviewed for several years
Social Media and Policy...

Office of Public Health Preparedness and Response

Zombie Novella

Preparedness 101: Zombie Pandemic

CDC has a fun way of teaching about emergency preparedness. Our graphic novel, "Preparedness 101: Zombie Pandemic" demonstrates the importance of being prepared in an entertaining way that people of all ages will enjoy. Readers follow Toddy, Julie, and their dog Max as a strange new disease begins spreading, turning ordinary people into zombies. Stick around to the end for a surprising twist that will drive home the importance of being prepared for any emergency. Included in the novel is a Preparedness Checklist so that readers can get their family, workplace, or school ready before disaster strikes. Click on the image below to view the novella. A transcript can be found by clicking on the "accessible text" PDF. You can also download the novella on Google books [here] or download a printable pdf version [here].
Step 5: REGULATORY AFFAIRS
To Report or Not to Report…

- **OIE – World Animal Health Organization**
- **OIE-listed diseases**
- **Maintaining a national disease status**

- **State reporting**
- **Nebraska and Cattle Trichomoniasis**

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**Figure 9: 2014 OIE-listed multiple species diseases, infections, and infestations**

<table>
<thead>
<tr>
<th>Disease/Infestation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax</td>
</tr>
<tr>
<td>Bluetongue</td>
</tr>
<tr>
<td>Brucellosis (B. abortus, melitensis, and suis)</td>
</tr>
<tr>
<td>Crimean Congo hemorrhagic fever</td>
</tr>
<tr>
<td>Epizootic hemorrhagic disease</td>
</tr>
<tr>
<td>Equine encephalitis, specifically Eastern Foot and mouth disease</td>
</tr>
<tr>
<td>Heartwater</td>
</tr>
<tr>
<td>Infection with Aujeszky’s disease virus</td>
</tr>
<tr>
<td>Echinococcus granulosus, multilocularis</td>
</tr>
<tr>
<td>Rabies</td>
</tr>
<tr>
<td>Rinderpest</td>
</tr>
<tr>
<td>Trichinella spp.</td>
</tr>
<tr>
<td>Japanese encephalitis</td>
</tr>
<tr>
<td>Cochliomyia hominivorax (New world screwworm)</td>
</tr>
<tr>
<td>Chrysomyia bezziana (Old world screwworm)</td>
</tr>
<tr>
<td>Paratuberculosis</td>
</tr>
<tr>
<td>Coxiella burnetti</td>
</tr>
<tr>
<td>Rift valley fever</td>
</tr>
<tr>
<td>Trypanosoma evansi</td>
</tr>
<tr>
<td>Tularemia</td>
</tr>
<tr>
<td>Vesicular Stomatitis *To be removed starting Jan 1, 2015</td>
</tr>
<tr>
<td>West Nile Virus</td>
</tr>
</tbody>
</table>
Who are the Stakeholders?

- **State and Local Level:**
  - Local industry groups
  - Producers
  - Local and state veterinarians
  - Public Health Veterinarians
  - State Animal Health Officers

- **National Level:**
  - Federal agencies
  - Public organizations
Take Home Message

- **NO** one size fits all approach to policy
- Clear cut definitions **do not** exist
- Money is often a driving factor
- One Health is a **team** effort
- Policy making is dynamic
Acknowledgements

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- Ryan Freed

My MPH Team:
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- Dr. Robert Larson
- Dr. David Renter
- Dr. Mike Cates
- Barta Stevenson
References

(1) APHIS, VS, Conference Call with State Veterinarians, June 17, 2014.


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(10) J. Annelli, Personal Communication, One Health Coordination Center, Riverdale, MD, June 16, 2014.

(11) J. Annelli, Personal Communication, One Health Coordination Center, Riverdale, MD, June 18, 2014.

(12) M. Romano, Personal Communication, One Health Coordination Center, Riverdale, MD, June 30, 2014.

(13) M. Romano, Personal Communication, One Health Coordination Center, Riverdale, MD, June 25, 2014.


References


References


Questions?