Challenges to State & Local Infectious Disease Surveillance & Response

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“Americans have always been able to handle austerity and even adversity. Prosperity is what is doing us in.”

James Reston
One View of Government Relationships
More Appropriate View of Government Relationships

Local ↔ Federal ↔ State
PA Department of Health Epidemiology

- Population 12.8 million (6\textsuperscript{th} nationally)
- 33 non-clerical Communicable Disease FTEs
  - 8 HIV specific; 3 HAI specific
  - 8 field support staff
- 25 (76\%) federally funded
- Federal personnel support
  - EIS officer, CSTE fellow, CEFOs (4)
Funding Source
2009 CSTE Epidemiology Capacity Assessment
51 Jurisdictions

- Federal: 72.5%
- State: 23.1%
- Other: 3.3%
Simultaneous Response Activities
1\textsuperscript{st} Week of September

- H3N2\textsubscript{v} agricultural fairs
- Hotel-associated legionellosis
  - 3,000 notifications
- Health care worker hepatitis C
  - 2,700 notifications
- Potential blood-borne pathogen transmission in a dental practice
- West Nile virus
- Hantavirus pulmonary syndrome
- Brucellosis in a dog kennel
- Cyanide in a water supply
- Cryptosporidiosis at a water park
- Smallpox vaccine adverse reaction
CSTE Epidemiology Capacity Assessments
51 jurisdictions (2004-2010)
The Good News

Number

Year

2004  2006  2009  2010

-2.5%  -9.8%  +12.9%
More Good News: 
Epidemiology Capacity Assessments, CSTE, 2004-2010 
Total No. and Infectious Disease Epidemiologists

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Infectious Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>34.8%</td>
<td>+16.1%</td>
</tr>
<tr>
<td>2006</td>
<td>41.4%</td>
<td>+15.8%</td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td>+16.1%</td>
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<tr>
<td>2010</td>
<td>47.2%</td>
<td>+15.8%</td>
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*Methodology did not permit this number to be derived
Not So Good News: Epidemiology Capacity Assessments, CSTE, 2004-2010
Total No. and BT/Preparedness Epidemiologists

<table>
<thead>
<tr>
<th>Year</th>
<th>Total No.</th>
<th>BT/Preparedness</th>
</tr>
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<tbody>
<tr>
<td>2004</td>
<td>2500</td>
<td>150</td>
</tr>
<tr>
<td>2006</td>
<td>2000</td>
<td>130</td>
</tr>
<tr>
<td>2009</td>
<td>1500</td>
<td>105</td>
</tr>
<tr>
<td>2010</td>
<td>2500</td>
<td>100</td>
</tr>
</tbody>
</table>

% change BT
15.0%  -13.3%  -20%

% total BT
13.3%  10.5%
The Bad News

- These surveys demonstrate a serious gap between current resources and full capacity
  - Gap lower in ID than other areas
- Limited surge capacity
- Limited ability to innovate
- Examples:
  - Measles
  - West Nile virus
  - Pertussis
Measles – United States 2011 (N = 222)

Source: MMWR

31 states

Import-associated
○ Unknown source

Source: MMWR
Measles Outbreaks
United States, 2011

- 17 outbreaks with 112 cases
- Median 6 cases (range 3-21)
- Median duration 18 days (6-69 days)

Source: MMWR 2012;61:253-7
Measles – Pennsylvania - 2011

Primary Case

Secondary Cases

Tertiary Case

Primary case traveled outside PA

Dec 31  Jan 7  Jan 14  Jan 21  Jan 28  Feb 3  Feb 10

Box – Infectious Period

+ Onset of rash
Measles Contact Investigations
N = 287 persons

- Susceptible: 56%
  - 29% One dose
  - 12% no documentation
  - 60% unvaccinated
- Immune: 44%
- Born pre-1957: 1%
- Hx measles: 6%
- Tested IgG (+):
  - 42%
- Quarantined: 21 days
  - (68 persons)
- Given IG: 30%
- Tested IgG (+):
  - 22%
- Documented 2-doses: 71%
- No documentation: 12%
- Unvaccinated: 60%
- One dose: 29%
Estimated Costs

- Direct: >$100,000
  - Personnel, vaccine, IG, lab testing, quarantine
- Indirect: ??
  - Physician office closure, hospital, time off from work, etc.

- Over next three months, two additional clusters:
  - One involving high school with approx 2000 contacts & families
  - One involving a camp with >400 contacts
Health Care-Associated Measles, AZ
Chen, et al. JID 2011; 203:1517-25

Costs:
$799,136 to two hospitals

Primarily personnel time for furloughs, record review, and lab costs

Did not attempt to estimate costs to public health for surveillance, investigation, and screening.
Measles - 2011

- A number of states suggested they lacked resources to conduct extensive contact investigations for measles cases

- Alternatives:
  - Limited or tiered contact tracing?
  - Contact tracing in specific settings?

- This happened with “only” 200+ cases

- What if there were more?
Missed Opportunities in Fight Against West Nile Virus

Dallas lacks resources, plans to fight virus as aggressively as other cities

In the months leading up to this year's West Nile virus epidemic, Dallas and Dallas County did not have the people, money or resources to fight the virus like cities with the most aggressive plans do, an NBC 5 investigation has found.

West Nile Hits Hard Around Dallas, With Fear of Its Spread

By MANNY FERNANDEZ and DONALD G. McNEIL Jr.
Published: August 16, 2012

DALLAS — An outbreak of West Nile virus has engulfed Dallas County, with nearly 200 cases of human infection and 10 deaths, leading the mayor of Dallas to declare a state of emergency and to authorize the first aerial spraying of a pesticide in the city since 1966.
West Nile Virus, United States
Annual Cases vs. Annual Funding to States
through CDC ELC Cooperative Agreement

Through Sept 6.

[Bar chart showing annual cases vs. annual funding to states through CDC ELC Cooperative Agreement.]

# of cases
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

Million $
0 5 10 15 20 25 30 35
West Nile Virus Surveillance, 2011

* As reported by state health departments in a survey conducted in October 2010. Surveillance for human disease and infection is performed in all counties.
† Includes WNV veterinary disease cases and WNV infections in mosquitoes, birds, and sentinel animals.
¶ WNV activity in non-human species also might have been reported.
Options to Sustain WNV Surveillance
2011 discussion

- In light of declining funding
  - Attempt to maintain & support basic surveillance at all sites (Epi and Lab)
  - Surveillance and research in selected sites
  - Some combination of above
Horizon

- Continued declines in state support
- Erosion of federal budget
- Sequestration
- Need to examine alternatives to current approaches for some diseases and data collection efforts
GET ALL THE INFORMATION YOU CAN, WE'LL THINK OF A USE FOR IT LATER.
Reported Cases of Lyme Disease -- United States, 2010

1 dot placed randomly within county of residence for each confirmed case
Lyme Disease

Pennsylvania 2011: 5,362 confirmed/probable cases (22%) from 24,841 ELR reports
Lyme Disease

- Complex case definition
  - Lab criteria
  - EM lesion
  - Signs/symptoms absent EM

- Requires follow-up of ELR reports
  - Lab diagnostic criteria
  - Health care provider

- Estimated time
  - Allegheny County 2011 - one hour *per report*

- Limited to no individual public health intervention

- Limited federal support ($434,000 in 2012 for 13 states combined) for surveillance
Lyme Disease

- **Wisconsin document:**
  - “Lyme disease surveillance is not sustainable using current methods, particularly in high incidence areas. Lyme disease surveillance is not a good use of limited public health resources, and follow-up is given a low priority.”

- **Innovations:**
  - NY State – follow-up of a 20% sample in high incidence counties
  - Wisconsin – counting of EM cases only for reporting purposes
  - Alternatives being explored in MN and CT

- **Importance of national consensus on approaches in order to interpret national data.**

- **Remove from “notifiable” disease list and transition to “disease under surveillance”**
Observations In a Period of Austerity

- Resources are very tight and declining
  - Impact likely greatest at local level
  - “Surge” capacity easily stretched
- Information technology (EHR, ELR, social media, etc.) offers opportunities
  - Offers challenges to interpretation and use
- Prioritize surveillance and investigation activities and approaches
- Properly resource priority activities
  - Consider eliminating or modifying lower priorities