THE EVOLVING LANDSCAPE OF INFECTION PREVENTION: RISK MITIGATION THROUGH INFECTION SURVEILLANCE

Yves Crehore
Software Product Manager, R.N.
RL Solutions
Table 2. Distribution of reported A(H7N9) cases and fatalities by epidemic wave, weeks 7/2013 to 25/2017

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>135</td>
<td>320</td>
<td>223</td>
<td>120</td>
<td>750</td>
<td>1948</td>
</tr>
<tr>
<td>Deaths</td>
<td>43</td>
<td>134</td>
<td>98</td>
<td>45</td>
<td>245</td>
<td>565</td>
</tr>
<tr>
<td>CFR (%)</td>
<td>32%</td>
<td>42%</td>
<td>44%</td>
<td>38%</td>
<td>33%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Figure 3. Incidence of officially reported human cases by month, based on onset date as of 20 June 2017. Information provided corresponds to both high and low pathogenic H7N9 viruses.

Click to enlarge - Note: For cases with unknown onset dates from wave 1 (n=7), wave 2 (n=2), wave 3 (n=146), wave 4 (n=27) and wave 5 (n=377) reporting dates were used instead.
THE TWINS OF INFECTIOUS DISEASE

The 1st Twin
• New Threat
• Affects multiple geographic regions
• H1N1, Ebola, Zika, SARS and MERS CoV

The 2nd Twin
• Accounts for more disease & deaths
• Endemic pathogens
• Tuberculosis, STDs, CDI, MDROs (MRSA, VRE, ESBLs)
CRE, or carbapenem-resistant Enterobacteriaceae, have been deemed “nightmare bacteria” by CDC, which classified the pathogen as an urgent threat.

As of 2001, CRE was reported in one state.

As of early 2016, CRE was found in 48 states.
New colistin resistance gene identified in China

Researchers in China have discovered another gene that confers resistance to the last-resort antibiotic colistin.

In a study yesterday in mBio, the researchers report that the MCR-3 gene was discovered in a fecal sample obtained from an apparently healthy pig at a farm in China. The gene was detected in 8% of the pig samples tested. The gene was not found in any of the human samples tested.

The MCR-3 gene is similar to the MCR-1 gene, which was first discovered in China in 2015. The MCR-1 gene has been found in countries around the world and has raised concerns about the potential for antibiotic resistance.

The discovery of the MCR-3 gene highlights the ongoing threat of antibiotic resistance and the need for continued monitoring and research to prevent the spread of resistant bacteria.
"We are all in some state of transition from a volume- to value-based payment system. It takes an enormous amount of resources to track and improve on hundreds of core measures and outcome metrics. Prioritizing and focusing the team on the most critical elements requires great discipline."

Mary Lou Mastro Elmhurst (Ill.) Memorial Healthcare
INFECTION RISK MANAGEMENT

► Through applications of risk management concepts, Infection Control Teams assist healthcare leaders to set priorities

► Goals
• To identify hazardous practices and situations
• To identify cost effective preventive measures
• To intervene and or prevent infectious disease events
"It basically shows us that the end of the road isn't very far away for antibiotics — that we may be in a situation where we have patients in our intensive care units, or patients getting urinary tract infections for which we do not have antibiotics,"

*CDC director Tom Frieden, MD, The Washington Post, May 2017 after a strain of E.Coli resistant to last-resort antibiotics was discovered in the U.S.*
What is it that we’re doing to result in transmission?

1. How frequently is a risk occurring?

2. What are the likely consequences if the appropriate action is not taken?

3. How much is it likely to cost to prevent it?

4. Will face similar risks elsewhere?

RISK IDENTIFICATION
RISK FACTORS

**Patient**
- Duration of stay
- Admission Dx
- Immune capacity
- Socio-economic status

**Organizational**
- Cleanliness of facilities
- Occupied bed numbers
- Water systems
- Reprocessing of medical devices

**Iatrogenic**
- Hand hygiene compliance
- Use of antibiotics
- Back ground infection rates
- Invasive procedures
RISK CONTROL

Possible Solutions?

- Identify Risks
- Establish “Risk Reduction Plan”
- Eliminate risk, where possible
- Reduce risk to acceptable level
- Transfer risk to a third party
- Accept risk for short term
- On going risk monitoring

Possible Solutions?
"...and by tomorrow, I'll need a list of specific unknown risks that we'll encounter with this project."
FIDUCIARY RESPONSIBILITY
Risk & Infection

1. Risk Identification & Assessment
2. Risk Analysis
3. Risk Control
4. Monitoring and Reporting
Organisms continue to evolve, developing increasing resistance.

Interrupting the “Chain of Infection” remains complex and multifactorial.

Infection Prevention & Control can be a partner in risk mitigation & valuable resource.
RL SOLUTIONS’ CONTEXT BASED SYNDROMIC SURVEILLANCE

Context Based Syndromic Surveillance (CBSS) definition:
The continuous, systematic collection, analysis and interpretation of health-related data specific to a health care facility and the population presenting there.
Q & A
THANK YOU

Yves Crehore RN, ICP
Software Product Manager

ycrehore@rlsolutions.com
1416 410 8456 x481