Public Health
Prevent. Promote. Protect.

Public Health Preparedness for Pandemic Influenza

Mosier Hall N202
Kansas State University

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RILEY COUNTY
Healthy people in a healthy community

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Presentation Overview

- Experiences with local public health system
  - State and local health departments
  - Public health emergency preparedness
- Background on pandemic preparedness
  - Pandemic influenza
  - National preparedness and response strategies
  - Surveillance strategies
- Summary of Field Experience
  - Objectives and activities
  - Local perceptions on preparedness
  - Conclusions and Recommendations
- MPH Curricula

Local Public Health System

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Vision: *Healthy people in a healthy community*

10 Essential Public Health Services

1. Monitor the health of the community
2. Diagnose & investigate health problems
3. Develop policies that protect and promote the health of the community
4. Mobilize community partnerships
5. Inform, educate, & empower people
6. Enforce laws & regulations
7. Link to/provide health services
8. Assure a competent workforce
9. Evaluate quality of services & programs
10. Research for new insights into improving health

Core Functions of Public Health

- Assessment
- Policy Development
- Assurance

(System Management)

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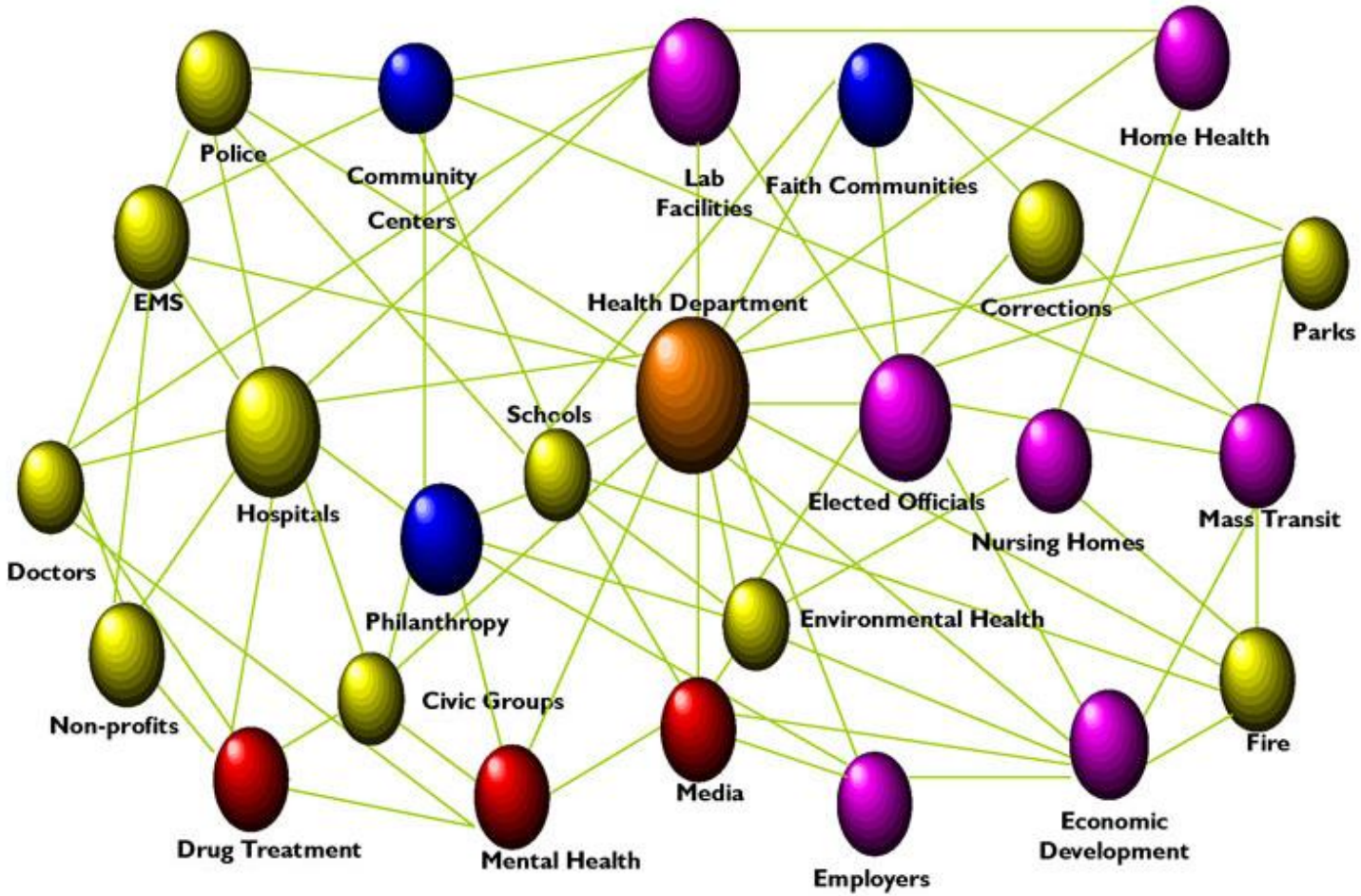
The Public Health System



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State Health Departments

- Largely regulatory and liaison roles
  - State Health Officer follows public health legal authorities; some delegation to Local Health Officers
  - The "bridge" between localities and Federal agencies
- Awardees for Federal grant funds
  - Subawardees (LHDs, Hospitals) apply for allocations

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Local Health Departments

- Provides services to jurisdiction to meet essential public health functions
- Keep public health in focus via partnerships, linking to care, prevention activities, and providing to the underserved
- "Boots on the ground"

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Riley County Health Department

Riley County Health Department

- PHEP Coordinator ("est. Oct 2012")
  - Public Health Emergency Preparedness (PHEP) Capabilities
  - Emergency Support Function 8 – Health & Medical
- Northeast [KS] Healthcare Coalition
  - Planning Committee: stockpiling, hazard vulnerability analysis
- Wildcat Region PHEP
- RCHD Epi Team

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Pandemic Preparedness

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Pandemic Influenza

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Risk of Pandemic

- Not a question of IF but a question of WHEN.
- **Influenza**: A vs B vs C
  - *Influenzavirus A*: most virulent and mutable
  - *Influenzavirus B*: moderately virulent/mutable
  - *Influenzavirus C*: infrequent
- Emerging strains are reportable, if confirmed.
- **Annual**: 3-5 million severe cases, 250-500 thousand deaths

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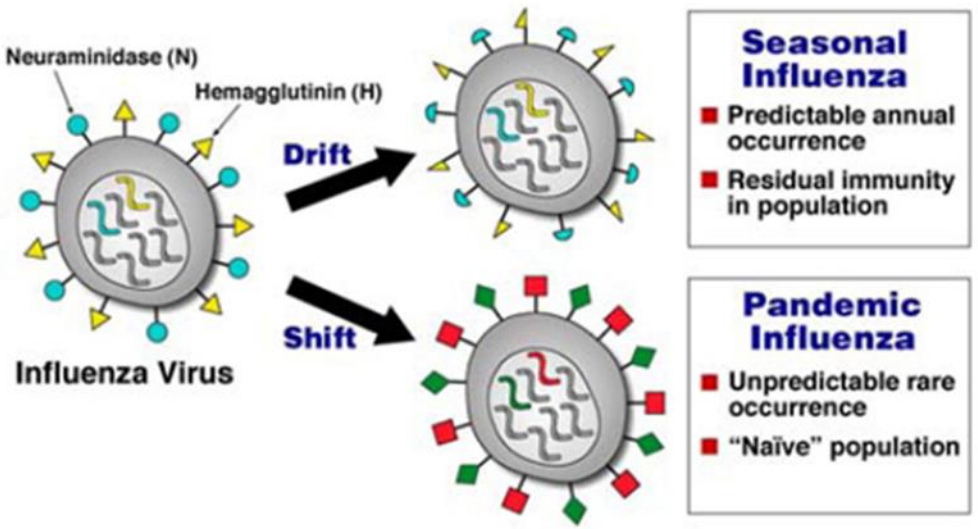
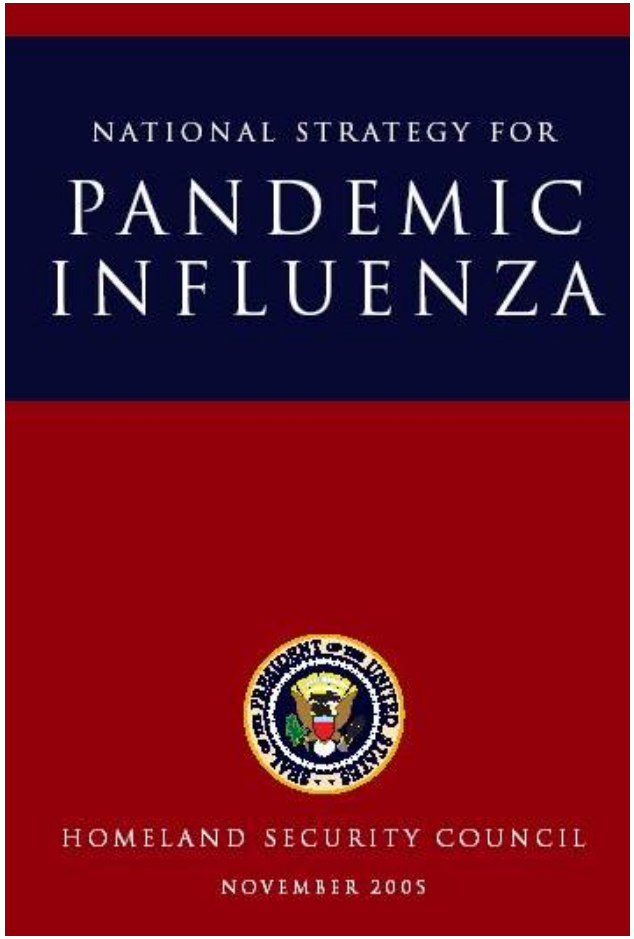
Spread of Pandemic

- Emergence of virulent strain
  - Antigenic shift
  - Zoonotic transmission
- Wavelike tendency (6-8 wk.)
- Widespread outbreaks
  - Resource allocation & mobilization issues





Response Strategies

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National Strategies

- National Strategy for Pandemic Influenza (2005)
  - Implementation Plan for the National Strategy for Pandemic Influenza
- HHS Pandemic Influenza Plan (2005)
  - Strategic Plan
  - Public Health Guidance for State and Local Partners
  - HHS Agencies' Operational Plans
- Pandemic and All-Hazards Preparedness Act (2006)
  - Biomedical Advanced Research and Development Authority (BARDA)
  - Emergency Support Function (ESF)-8 support
  - Public Health Emergency Preparedness (PHEP) and Hospital Preparedness Program (HPP) funding
- Pandemic and All-Hazards Preparedness Reauthorization Act (2013)
  - Public Health Emergency Preparedness (PHEP) and Hospital Preparedness Program (HPP) funding reauthorization

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Emergency Support Function 8 – Health & Medical

- The nation and each state, county, and (sometimes) city has an emergency operations plan
- Annexes allow for function-specific information
  - Assessment of public health/medical needs
  - Health surveillance
  - Blood and blood products
  - Food safety and security
  - Behavioral health care
  - Public health and medical information
  - Vector control
  - Mass fatality management, victim identification, and decontaminating remains
  - Veterinary medical support

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CDC Preparedness Capabilities Standards

- CDC developed 15 capabilities as national public health preparedness standards
- Each standard comes equipped with:
  - **Functions**: critical elements of capability
  - **Performance Measures:** guides for completion
  - **Tasks**: steps to complete functions

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CDC Preparedness Capabilities Standards

- Biosurveillance
  - Public Health Laboratory Testing
  - Public Health Surveillance and Epidemiological Investigation
- Incident Management
  - Emergency Operations Coordination
- Surge Management
  - Fatality Management
  - Mass Care
  - Medical Surge
  - Volunteer Management
- Information Management
  - Emergency Public Information and Warning
  - Information Sharing
- Community Resilience
  - Community Preparedness
  - Community Recovery
- Countermeasures and Mitigation
  - Medical Countermeasure Dispensing
  - Medical Materiel Mangt. & Dist.
  - Non-Pharmaceutical Interventions
  - Responder Safety and Health

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Local Strategies

- Kansas Pandemic Influenza Preparedness and Response Plan (KDHE)
  - Kansas Response Plan – Biological Incident Annex (Att. 1)
- Riley County Emergency Operations Plan
  - Emergency Support Function 8 Annex – Health & Medical
- Riley County Health Department Emergency Operations Plan
  - Biological Incident Annex
  - Community Disease Containment Annex

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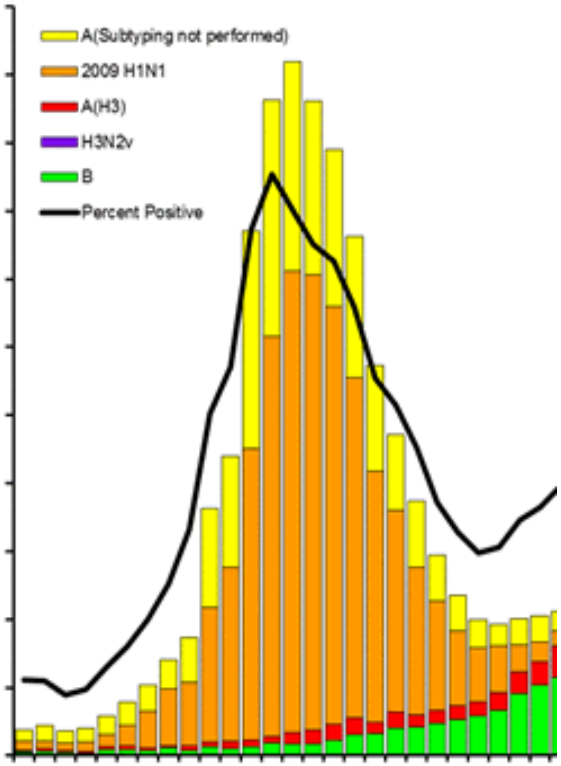

Surveillance Strategies

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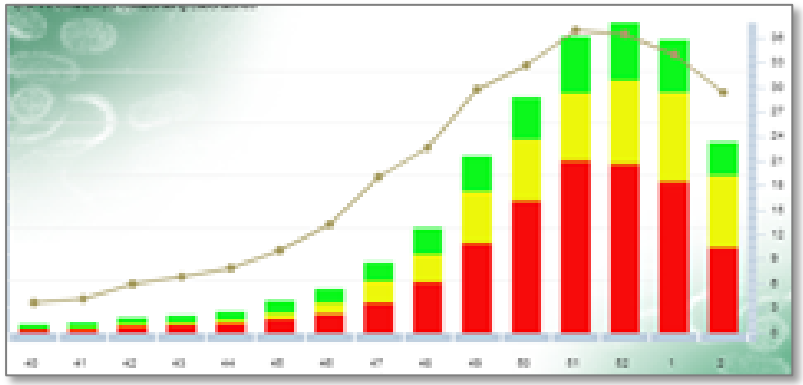
National Integration

- Virological Surveillance (laboratory)
  - **85** World Health Organization (WHO) Collaborating Laboratories
  - **60** National Respiratory and Enteric Virus Surveillance System (NREVSS) laboratories
  - CDC FluView
- Outpatient Illness Surveillance (providers)
  - U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet)
    - **2,900** outpatient healthcare providers
  - ILI Activity Indicator Map



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National Integration

- Mortality Surveillance
  - 122 Cities Mortality Reporting System
  - Influenza-Associated Pediatric Mortality Surveillance System
  - Elevated: 1.645 st. dev. above national baseline
- Hospitalization Surveillance (hospitals)
  - Influenza Hospitalization Surveillance Network (FluSurv-NET)
  - SARI cases (reliable due to lab results)
- Summary of the Geographic Spread of Influenza
  - State and Territorial Epidemiologists Reports

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Kansas Department of Health and Environment

- Bureau of Epidemiology and Public Health Informatics (BEPHI)
  - Infectious Disease Epidemiology & Response (IDE&R)
    - Disease reporting, investigation
    - EpiTrax

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Field Experience

Goals of Field Experience

- **Short Term**: To develop a report by end of summer which may communicate medical surge vulnerabilities (HVA) of Riley County, outline current capacities (resources) and capabilities (evaluations) within the jurisdiction, and summarize any recommendations for improvement.
- **Long Term**: Countywide improvement in preparedness and self-efficacy to respond to a large-scale public health emergency.

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Learning Objectives

1. (Completed) Understand public health agencies within Riley County and collaborating jurisdictions
   a) LPHSA, ESF-8, Wildcat Region PHEP
2. (Completed) Understand existing emergency standards and evaluation tools for preparedness and response
   a) Target & Core Capabilities, Project Public Health Ready, Public Health Accreditation Board, Preparedness Capabilities
3. (Unable to Execute) Determine use of Riley County's Hazard Vulnerability Analysis within context of field work
4. (Completed) Become familiar with Riley County response capacities (comparison-contrast with other systems)
5. (Completed) Apply MPH curricula topics to activities

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Activities Performed

1. (Completed) Compile list of key public health stakeholders to be affected by a medical surge
2. (Completed) Determine Riley County public health response capacities
   a) ESF-8 activities, Northeast [KS] Healthcare Coalition
3. (Partially Completed) Evaluate Riley County by available capability standards
   a) Riley County EOC (*2013 KDA FAD Exercise*), LPHSA
4. (Partially Completed) Assess Riley County vulnerability to medical surge
5. (Partially Completed) Perform systematic review on basis of research question developed

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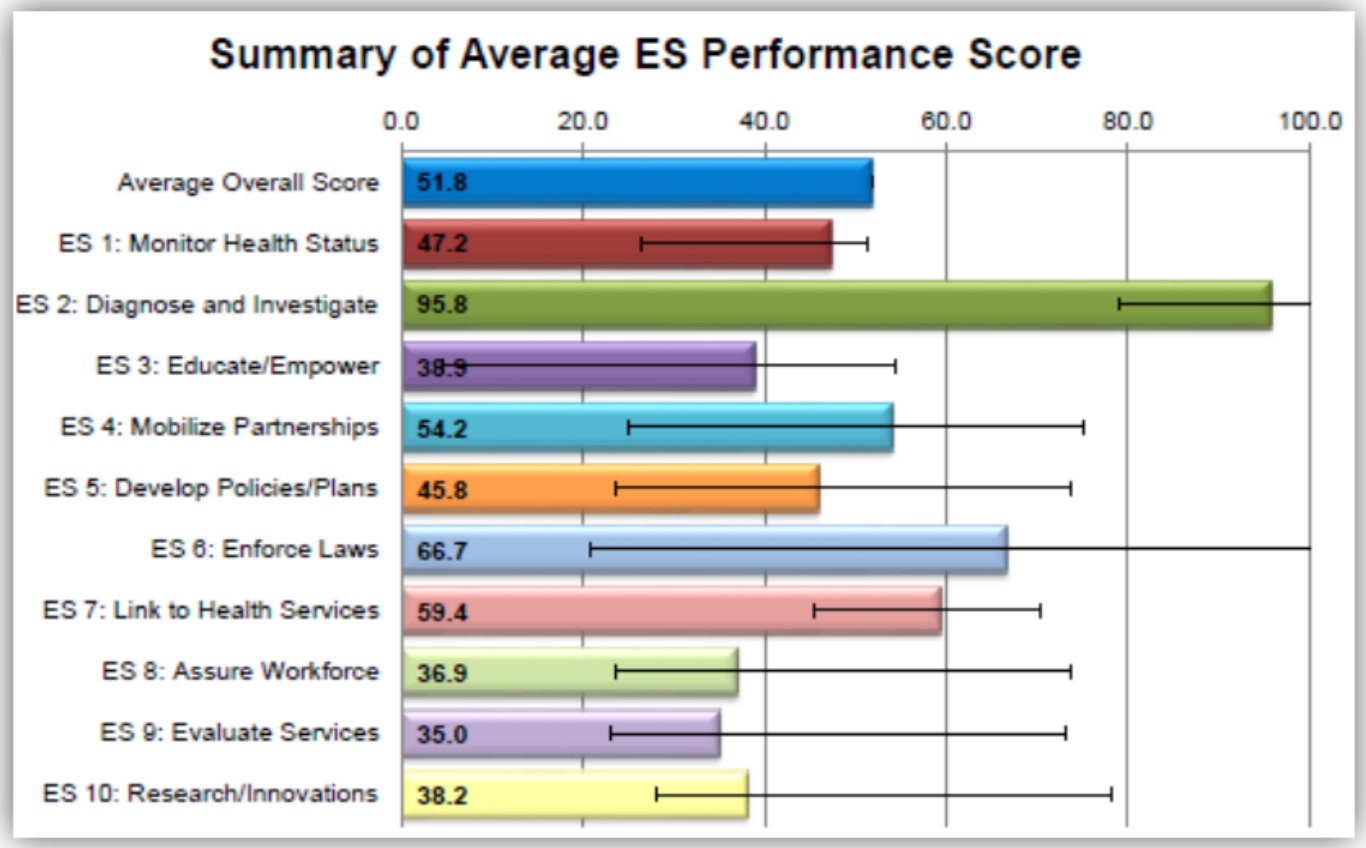
Activities Performed (LPHSA)



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Activities Performed (Vulnerability)

- Wildcat Region has an atypically mobile population (student and military)
- Riley County's population significantly grows for special events
  - Basketball home game attendance (12,000 coliseum capacity)
  - Football home game attendance (50,000 stadium capacity)
  - Pott. Co. Country Stampede (approx. 50,000 per day, 4 days)
  - Fake Patty's Day (unknown; may be 10,000-50,000 persons)
- K-State's Biosecurity Research Institute (BRI), Veterinary Diagnostic Lab (VDL), and future National Bio and Agro-Defense Facility (NBAF) may increase risks
- General planning, training, coordination difficulties

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Activities Performed
(interviews, 2009 H1N1 pandemic)

- 2009 H1N1 Influenza Pandemic
  - Michael McNulty, KDHE Homeland Security Coordinator
  - Cary Herl, RCHD Medical Director & local physician
  - Michelle Rutherford, RCEMS Assistant Director
- General understandings:
  - 2009 H1N1 outbreaks were not as bad as potential
  - Kansas response was "overreaction"; plan very robust and needed to be scaled
  - Communications (internal & public) needed to be improved
  - Coordination of service delivery proved difficult

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Activities Performed
(interviews, 2009 H1N1 pandemic)

- High-profile: tendency to affect younger, healthier populations
- Summary of Kansas Activity
  - 1,201 Total Confirmed Cases of H1N1
    - 115,318 nationally confirmed H1N1 cases within pandemic
    - Probably higher; Wyandotte & Johnson counties only instructed testing of hospitalized patients
  - 29 deaths attributed to H1N1 (several young, healthy people)
    - 3,433 nationally confirmed deaths contributed to pandemic

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Activities Performed
(interviews, 2009 H1N1 pandemic)

Pandemic	Year(s)	Virus type	Estimated Infection Rates (worldwide)	Estimated Deaths (worldwide)	Case Fatality Rate (worldwide)
Seasonal flu	*Annual*	InfluenzavirusA (H3N2, H1N1) and InfluenzavirusB	5–15% (340 million – 1 billion)	250,000–500,000 per year	<0.1%
Spanish flu	1918–1919	InfluenzavirusA (H1N1)	33% (500 million)	20–100 million	>2.5%
Swine flu	2009–2010	InfluenzavirusA (H1N1)	> 622,482 (lab-confirmed)	14,286 (ECDC-confirmed) 18,036 (WHO-confirmed)	0.03%

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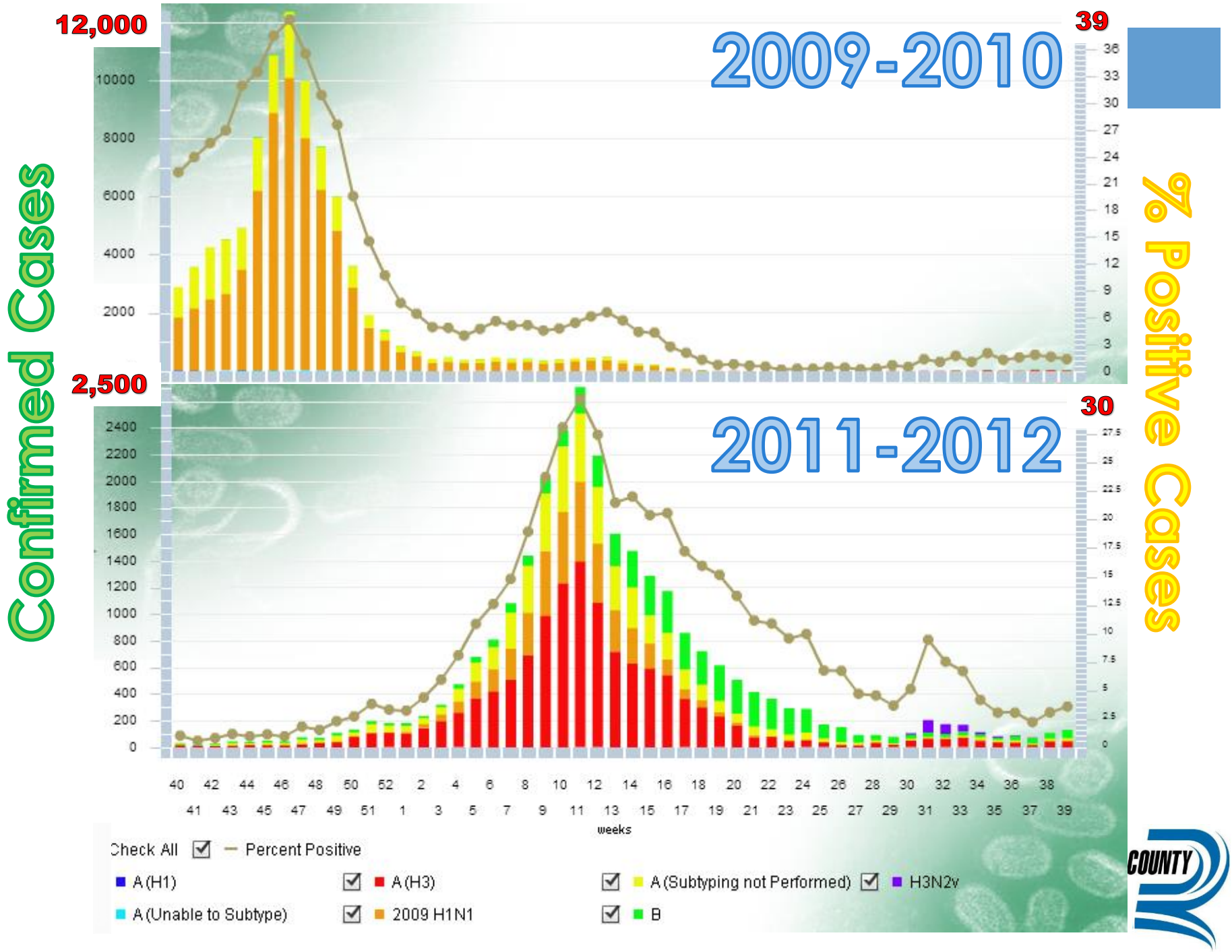
Confirmed Cases
% Positive Cases
12,000
39
2009-2010
10000
8000
6000
4000
2000
36
33
30
27
24
21
18
15
12
9
6
3
0
2,500
30
2011-2012
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
27.5
25
22.5
20
17.5
15
12.5
10
7.5
5
2.5
0
40 42 44 46 48 50 52 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38
41 43 45 47 49 51 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
weeks
Check All
Percent Positive
A (H1)
A (H3)
A (Subtyping not Performed)
H3N2v
A (Unable to Subtype)
2009 H1N1
B
COUNTY

Products Developed

1. (Completed) List of public health stakeholders to be affected by a medical surge
2. (Partially Completed) Evaluation of Riley County by pertinent capability standards
3. (Completed) MPH Report on Riley County's vulnerability to medical surge and the available public health response capabilities
4. (Partially Complete) Systematic review of literature pertaining to a medical surge caused by increases in influenza-like illness in Kansas

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Conclusions and Recommendations

Conclusions

- A pandemic (or at least a smattering of virulent outbreaks) is just on the horizon.
- Emergency response agencies are excellent within their own domain.
  - Riley County disease identification, epidemiology, and investigation was found to be a strength.
  - Riley County emergency response agencies work well together.
- The public health system (as a whole) is not prepared or capable of addressing complex public health emergencies.
  - Emergency preparedness funding decreases.

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County Recommendations

- An update of Riley County Hazard [Vulnerability] Analysis may be performed to address public health risks.
- Any one of the available public health capability tools may be used to evaluate the Riley County public health system.
- Focused planning could be performed on Riley County's vulnerability to medical surge, to include alternate care site facility considerations, medical materials/countermeasures, and support.

Other Recommendations

- The partially complete systematic review could be continued by a future team.

MPH Curricula

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Most Beneficial Courses

- HMD 720 – Administration of Healthcare Organizations
  - Healthcare system agencies
  - Factors and trends in healthcare
- Disease-Specific Courses
  - BIOL 530 – Pathogenic Microbiology
  - DMP 770 – Emerging Diseases
- Epidemiology/Immunology
  - BIOL 670 – Immunology
  - DMP 754 – Intro. to Epidemiology

MPH Program Opportunities

- Need more opportunities to bring MPH students together (0-1 CRHR course)
  - Job opportunities available with masters
- Practical opportunities to use techniques & skills
  - Epidemiology, statistics, or other analytical techniques to prepare for public health research (ES#10)
  - Internships/projects (paid or unpaid) with local public health
- Peer mentoring in course selection

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Questions?

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Acknowledgements to my wonderful committee and preceptor!!!

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Thank you!!

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