Public Health Opportunities and Challenges for the OFFLU SIV Group

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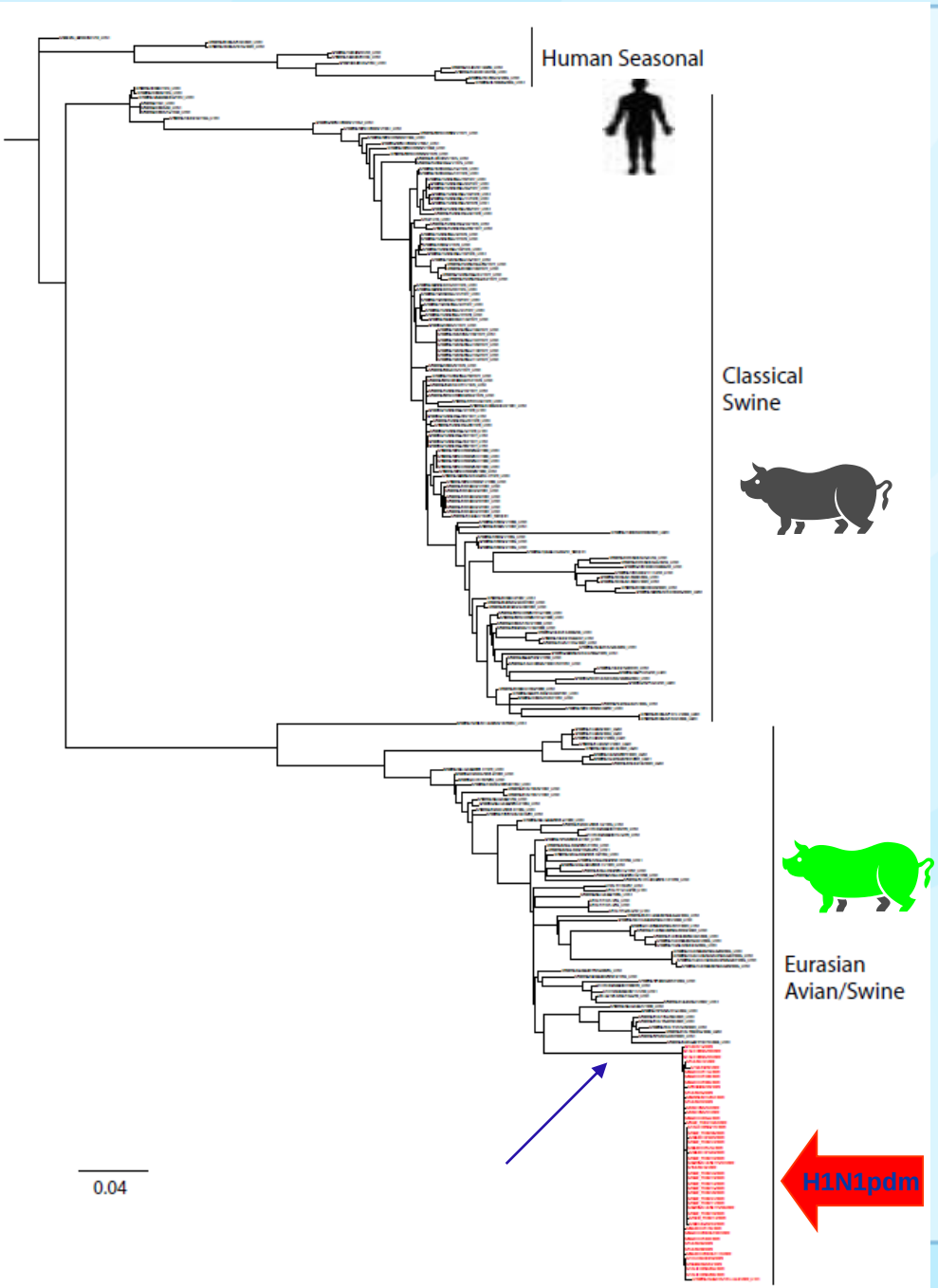
Public Health Opportunities for OFFLU SIV

- **Identify Risks**
  - Global virology surveillance networks
    - Swab locally and think globally
    - Diagnostics, reporting, data analysis
- **Assess Risks**
  - Risk assessment
    - Virus characterization
      - Genetic and antigenic analyses
- **Support Development of Effective Responses**
  - Diagnostics
  - Vaccines
    - Evaluate efficacy of vaccines against circulating strains
    - Support vaccine development and manufacturing

Response to 2009 H1N1 by CDC: Lessons Learned

- **Detection**
  - Surveillance: Epidemiology, diagnostics, etc.
    - Domestic and global
- **Intervention**
  - Pharmacologic
    - Antiviral drugs and Vaccines
  - Non-pharmacologic
    - Community mitigation (e.g. masks, school closure)
    - Travel restrictions, border controls, etc.
    - Hospital infection control, laboratory biosafety, etc.

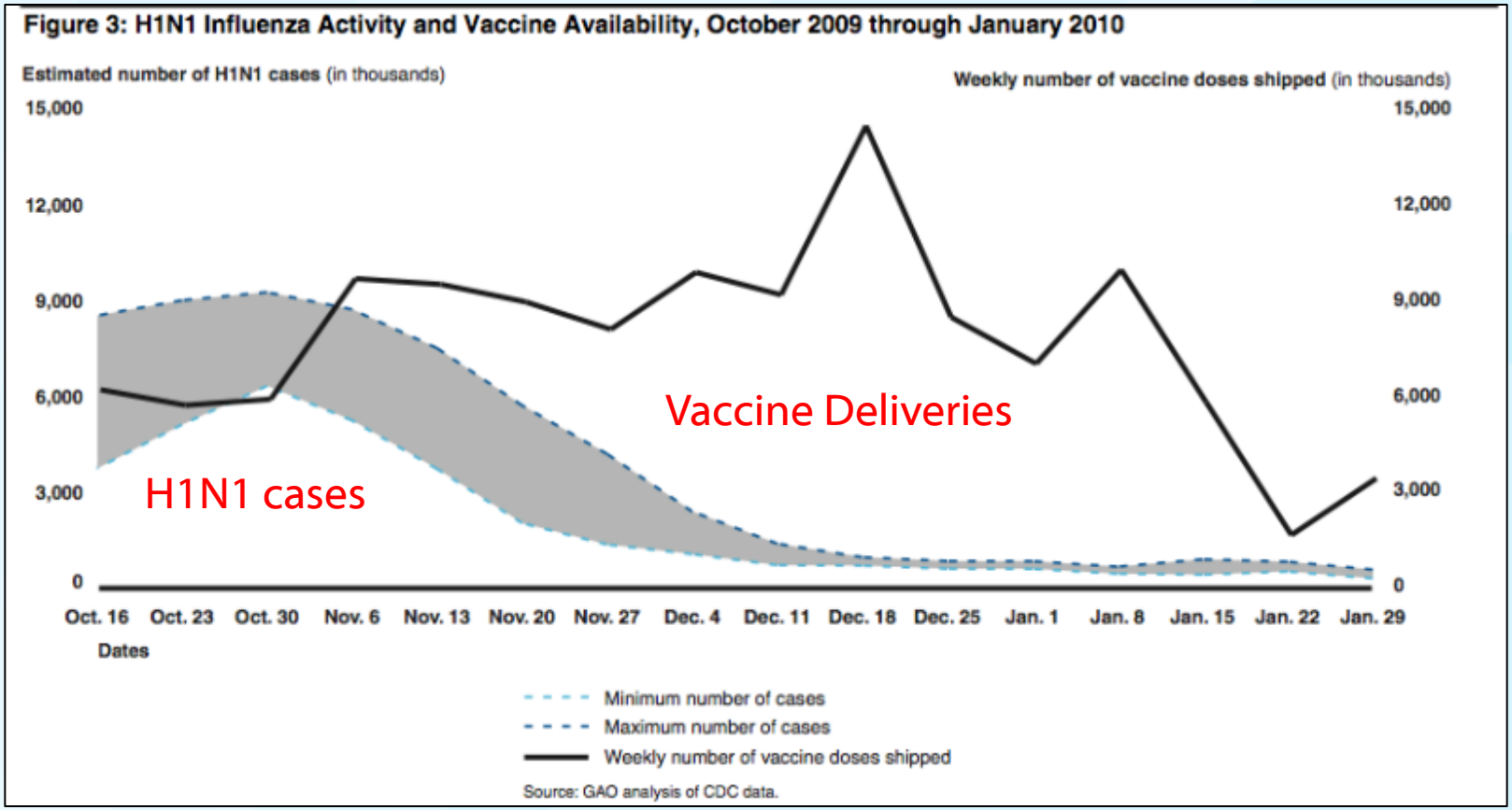


2009 Pandemic N1 NA

- Eurasian "avian-like" SIV lineage
- Long branch
- No recent ancestors available
- 17.1 years of unsampled evolution

Smith GJ, et al (2009) Nature 459: 1122-1125

Lessons Learned from 2009 H1N1



- **GAO Report: The credibility of all levels of government was diminished when the amount of vaccine available to the public in October 2009 did not meet expectations set by federal officials.**

Lessons Learned from 2009 H1N1 pandemic

- Influenza will continue to be unpredictable
- Shorten vaccine deployment timelines
  - Early detection of pandemic threats
  - Rapid development and testing of vaccines

Strengthen Risk Identification and Assessment

AVIAN DISEASES 56:1058–1061, 2012

Research Note—

Development of an Influenza Virologic Risk Assessment Tool

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Influenza Risk Assessment Tool: Comprised of 10 Elements

1) The virus

- Receptor Binding
- Genomic Variation
- Transmission Animal Models
- Antiviral Susceptibility

2) The population

- Population Immunity
- Disease Severity
- Antigenic Relationship

3) Ecology and epidemiology

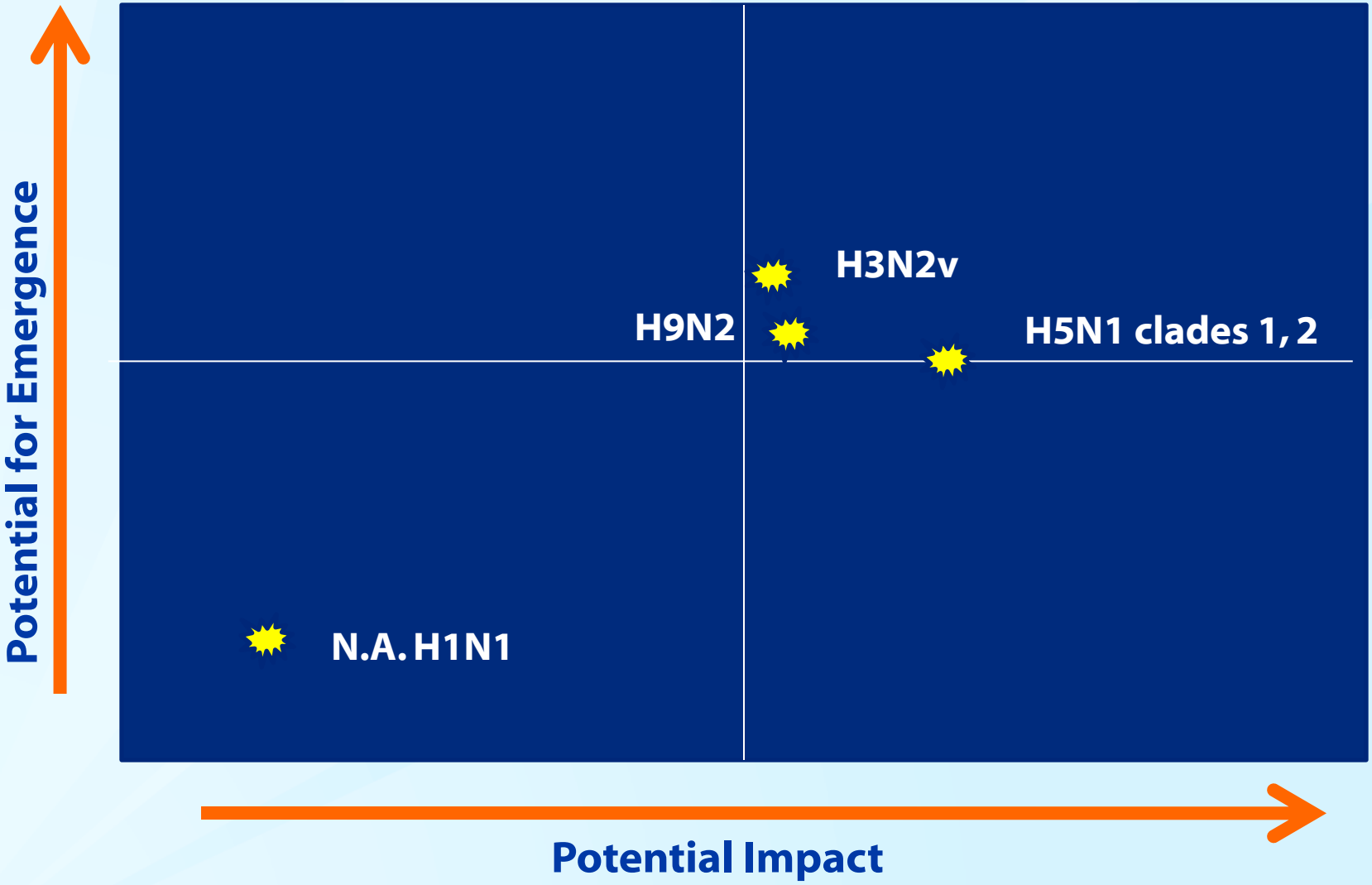
- Human Infections
- Global Distribution
- Infection in Animals

Risk Element Scoring with Regards To:

- What is the risk that a virus not currently circulating in the human population has **potential for sustained human-to-human transmission**?

- If the virus were to achieve sustained human-to-human transmission, what is the risk that a virus not currently circulating in the human population has the **potential for significant impact on public health**?

Likelihood of Emergence vs. Potential Impact



OFFLU Surveillance/Research Contributions to IRAT Risk Elements

1) The virus

- Receptor Binding
- Genomic Variation
- Transmission Animal Models
- Antiviral Susceptibility

2) The population

- Population Immunity
- Disease Severity
- Antigenic Relationship

3) Ecology and epidemiology

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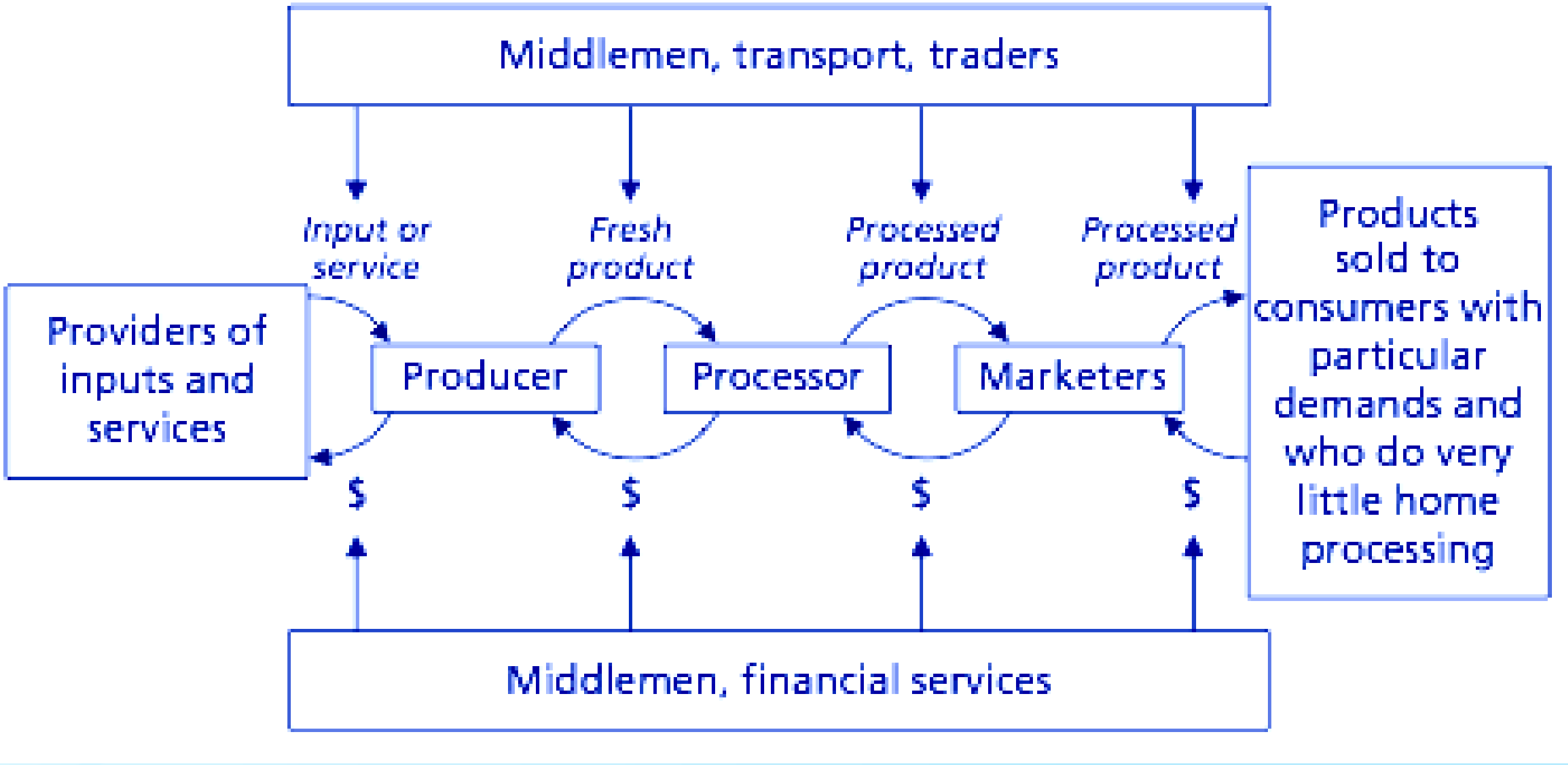
Challenges

- **SIV media reports may cause drop in consumer demand for pork**
- **US National Pork Producers Council reported $1.3 billion loss during the 2009 H1N1 pandemic**
  - Pig farmers (Producers)
  - Processors
  - Marketers
  - Providers of inputs and services to the industry
  - Middlemen, finanacial services sector
- **Anticipate and neutralize consequences for agriculture**
  - Identify and assess risks to agricultural economies
  - Develop interventions to prevent and mitigate economic impact

Butler D. 2009. National Pork Producers Council (http://agriculture.house.gov/testimony/111/h102209/ Butler.pdf)

Interventions Based on Value Chain Analysis

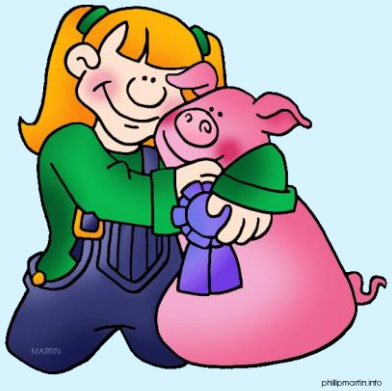


National Swine Surveillance Program

- Can be mutually beneficial
  - Allows PH to conduct risk assessment of viruses for pandemic potential
  - Information shared with Agriculture
    - Vaccine development
    - Diagnostics – primer/probes
    - Global market and consumer reassurance

H3N2v Outbreak Investigations at State and Country Fairs in the United States

- **Goals**
  - Characterize the outbreak
    - Prevalence of H3N2v infections
    - Severity
    - Risk factors
    - Attack rates
  - Human-to-human transmission
- **Methods**
  - Case finding among fair participants
    - Visitors
    - Exhibitors (swine in particular)



Win-Win Results

- **Public health sector goals**
  - Contain public health threats with the least economic disruption
  - Outbreak investigations were complete and timely
  - Prevention recommendations were implemented promptly
  - Communicating risk to the public was effective and balanced
    - Public health messages did not impart unfounded fear
- **Animal production and health sector goals**
  - Swine shows at fairs remained open
  - Attendance to fairs was not severely impacted
  - Demonstrate pro-active consumer protection:
    - Voluntary temperature checks before unloading pigs at fairs
    - Strengthened health status monitoring of swine at fairs

International Health Regulations

- Under IHR (2005), Member States must report to WHO any cases within their borders of specific diseases: smallpox, polio caused by a wild-type poliovirus, human influenza caused by a new subtype, and SARS.
- H3N2v cases in the USA were reported to WHO in compliance with IHR requirements

World Health Organization

NASPHV, NASAHO, CSTE, CDC collaborations

National Assembly of State Animal Health Officials (NASAHO)
National Association of State Public Health Veterinarians (NASPHV)

Measures to Minimize Influenza Transmission at Swine Exhibitions, 2013

http://www.nasphv.org/Documents/NASAHO-NASPHV-InfluenzaTransmissionAtSwineExhibitions2013.pdf

Guidance for State and Local Health Departments for the Investigation of Human Infections with Novel Influenza A Viruses at the Animal-Human Interface

A. EXECUTIVE SUMMARY

One of the most important aspects of preparing for a pandemic is ensuring that procedures for a rapid and com
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A Success Story in Intersectoral Collaboration

commitment

shared vision

communication

mutual benefits

purpose

TRANSPARENCY

TRUST

Summary

- **Strengthen Surveillance and Pandemic Risk Assessment**
  - Global networks, diagnostics, intersectoral collaboration
  - Attributes of the virus, host and environment (epidemiology)
- **Develop PH Detection and Response Capacity**
  - Laboratory and point of care diagnostics
  - Rapid vaccine development and manufacturing
- **Anticipate and neutralize consequences for agriculture**
  - Identify and assess risks to agricultural economies
  - Develop interventions to prevent and mitigate economic impact

Acknowledgments

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