



Biosurveillance

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**US-Taiwan Nonproliferation and Confidence Building Measures
Workshop**

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Biosurveillance

Biosurveillance is the monitoring of various information sources to help detect infectious outbreaks in humans, animals, or plants whether naturally occurring or the result of a bioweapon.





Why do biosurveillance?

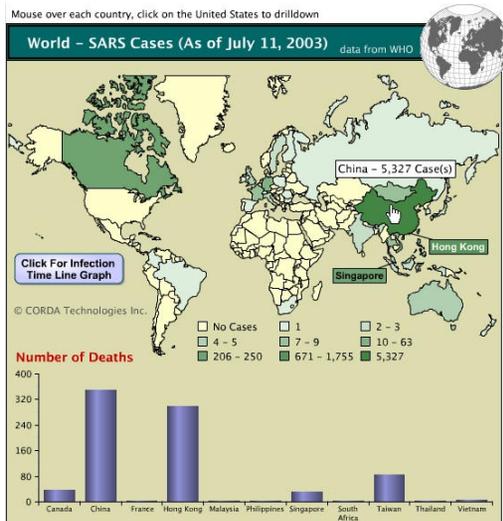
- **Enables timely response to:**
 - Bioweapon or other non-natural epidemic
 - Endemic disease
 - Non-endemic outbreak
- **Identification of potential sources of material**
 - Biosecurity
- **Precursor to a larger scale event**





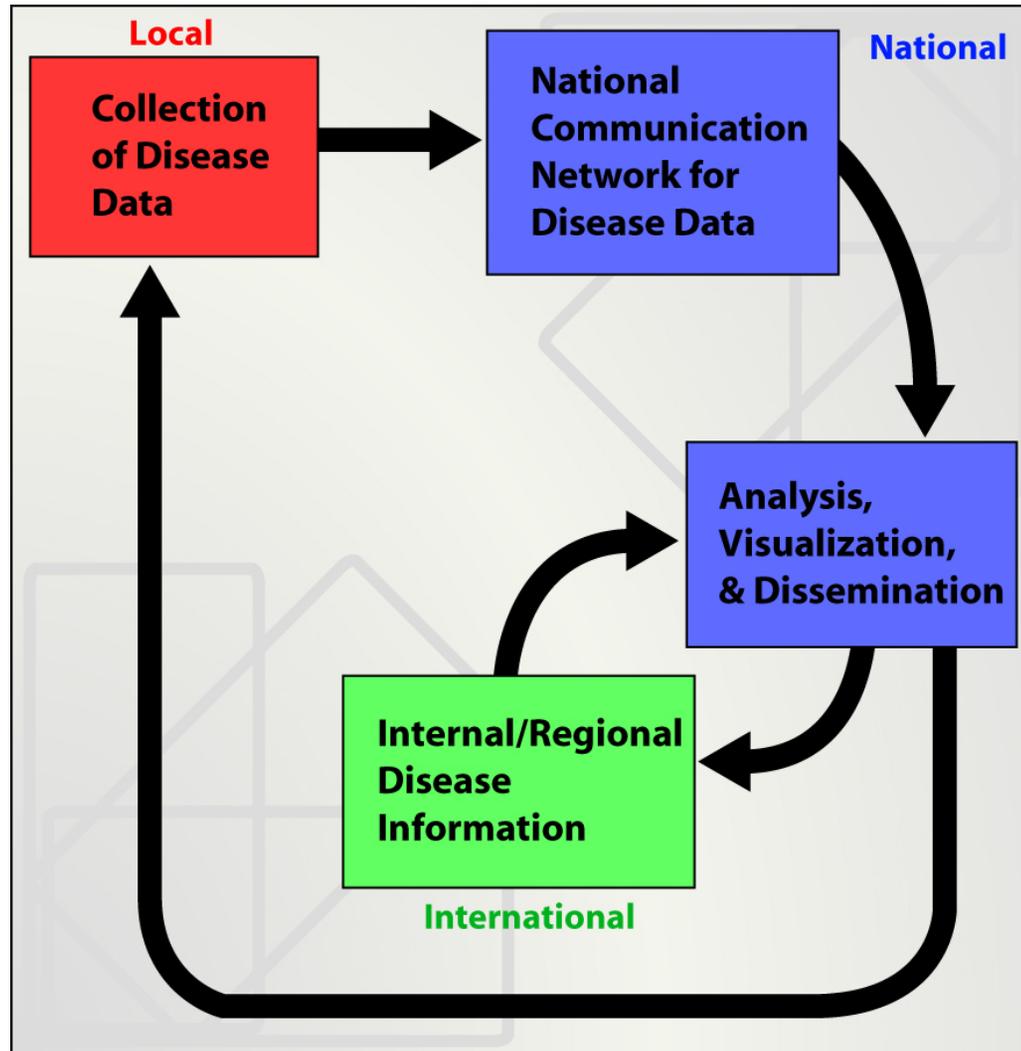
Why as a confidence building measure?

- Diseases cross borders
- Increased travel
- Trade expansion
- Smuggling of livestock





Biosurveillance Methodology





What should biosurveillance be?

- **Surveillance information needs to be networked**
 - Integrate animal and human data
 - International or regional data needs to be shared
 - Data expurgated to protect privacy
 - Information communicated back to providers
- **Data analysis capabilities**
 - Geographic Information Systems (GIS)
 - Predictive modeling
 - Correlation between events
- **Biosurveillance should directly benefit long term human and animal health**





Types of Surveillance

- **Human**
 - **Health department infrastructure**
 - **Includes:**
 - **Notifiable disease reports**
 - WHO
 - **Laboratory specimens**
 - **Sentinel surveillance**
 - Syndromic
 - **Survey**
- **Animal**
 - **Veterinary infrastructure**
 - **Includes**
 - **Notifiable disease reports**
 - OIE
 - FAO
 - **Laboratory specimens**
 - **Farm, market or slaughter sampling**
 - **Sentinel surveillance**
 - Syndromic





International Systems

- WHO

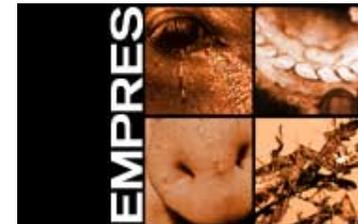
- Global (NCD) Noncommunicable Disease
- Regional Systems
 - African Integrated Disease Surveillance Unit (IDS)
 - Countrywide Integrated Noncommunicable Disease Intervention (CINDI) - Europe based
 - South-East Asia Network for Noncommunicable Disease (SEANET-NCD)
 - Focused on prevention

- OIE

- Global OIE Database

- FAO

- Food Borne Disease Surveillance
- Emergency Prevention system for transboundary animals and plant pests and diseases (EMPRES)





Examples of Local/National Systems

- **Human**
 - **CDC**
 - National Electronic Disease Surveillance System (NEDSS)
 - Early Aberration Reporting System (EARS)
 - Real-time Outbreak and Disease Surveillance (RODS)
 - **Australia**
 - Laboratory Surveillance (LabVISE)
 - National Notifiable disease surveillance system (NNDSS)
 - **SNL**
 - Rapid Syndrome Validation Program (RSVP)
- **Animal**
 - **USDA**
 - National Center for Animal Health Surveillance (NCAHS)
 - **UK**
 - Rapid Analysis & Detection of Animal-related Risks (RADAR)
 - **SNL**
 - Rapid Syndrome Validation Program - Animal (RSVP-A)



RSVP: Monitoring Human Health



Undifferentiated Febrile Illness DR
Influenza-like Illness

History/Symptoms

Cough GI Symptoms

URI Symptoms Headache

Conjunctivitis Myalgia

Signs

Temperature < 36 36 37 38 39 40 41 > 41

Increase Respiratory Rate Stiff Neck

O² Sat. < 75 75-80 80-85 85-90 90-95 95-100 Rash

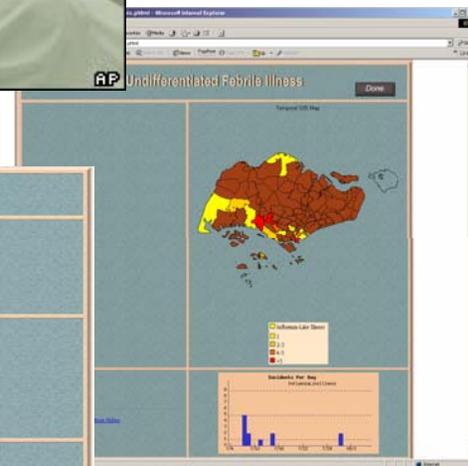
Abnormal Lung Sounds

Labs

Platelet < 50 50-100 100-150 > 150

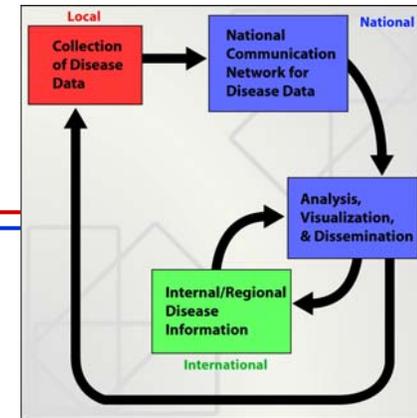
WBC < 2,000 2,000 - 5,000 5,000 - 10,000 10,000 - 15,000 15,000 - 20,000 > 20,000

Chest X-Ray Normal Abnormal Focal infiltrates Diffuse infiltrates





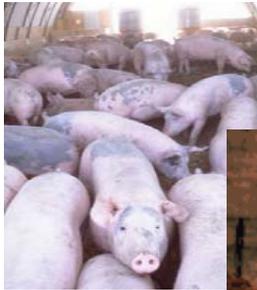
RSVP



- **Web based surveillance application**
- **3 Distinct modules**
 - **Syndromic information collection module**
 - Doctors
 - Nurses
 - Other health care providers
 - **Communication module**
 - Public health department
 - **Data visualization module**
 - Review by public health department
- **Status**
 - Tested in 4 states in US
 - Tested in Singapore
 - Ongoing study in Texas

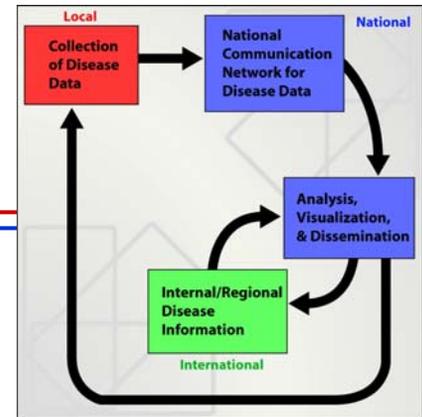


RSVP-A (Animal): Monitoring Animal Health





RSVP-A



- **Local data collection system**
- **Uses internet or cell system to network data**
- **Communication from regional or state veterinary office to local vets**
- **Data visualization through GIS**
- **Status**
 - **Partners:**
 - **Kansas State University**
 - **NM State University along with the NM state veterinary office**
 - **Coverage:**
 - **Kansas beef cattle with 11 vets started in 2003**
 - **NM to be deployed to dairy cattle with 15 vets in 2004**
 - **Texas panhandle to be deployed to multiple cattle ranches in conjunction with a human study in 2004 (human study started in 2001)**



Summary

- **Effect disease surveillance depends on an open exchange of data**
 - **Data collected locally**
 - **Analyzed nationally**
 - **Shared internationally**
 - **Analyzed reports back to the local care givers**

Integrated international disease surveillance

