

# **CONNECTING HUMAN AND ANIMAL HEALTH SURVEILLANCE SYSTEMS**



# Combating Global Infections

September 22, 2009

Irkutsk, Siberia

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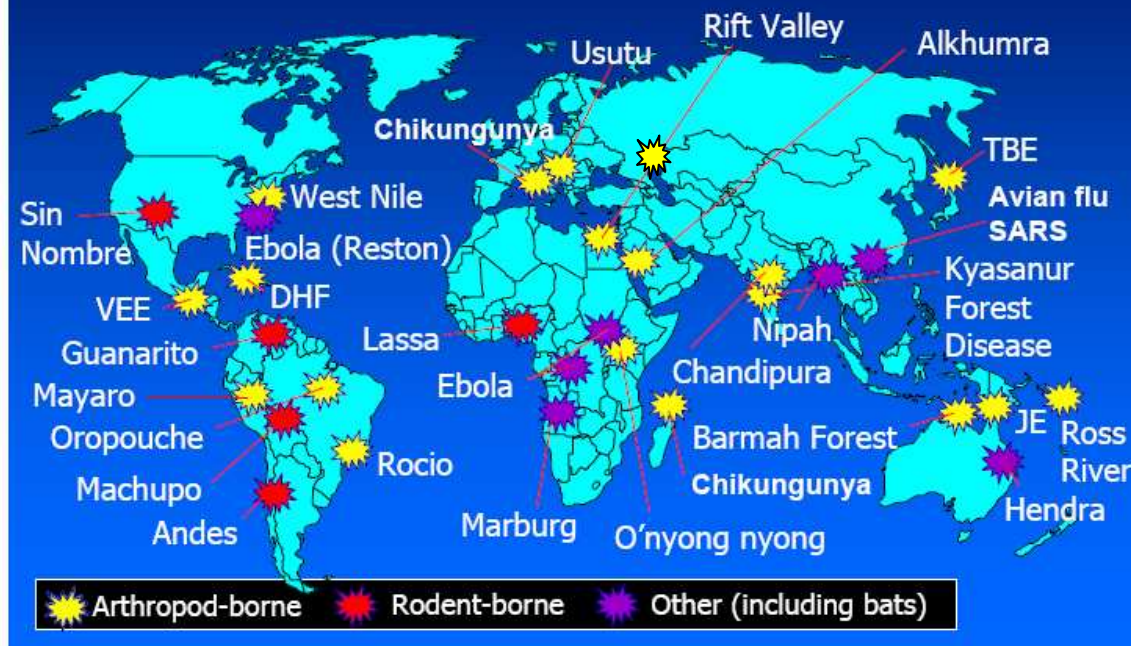
## **T. Elleman**

Program Associate  
NTI Global Health and Security Initiative



Central Research Institute of  
Epidemiology

## Emerging infections: concept becomes reality



**1,407 human pathogens**

**816 zoonotic**

**177 (re) emerging**

**Woolhouse et al., EID 11(12), 2005**

# Contributing to One World, One Health\*

## A Strategic Framework for Reducing Risks of Infectious Diseases at the Animal–Human–Ecosystems Interface

14 October 2008

Consultation Document

Produced by:



World Health  
Organization



UN System  
Influenza Coordination



THE WORLD BANK

agencies for interagency collaborations

## **Contributing to One World, One Health**

- **recommends a “more holistic, global approach was needed, taking into account the interfaces among human, animal and ecosystem health domains”**
- **“seamless information sharing among wildlife, animal, and public health sector teams”**
- **“Unusual disease events – including zoonoses – need to be addressed by an effective national strategy”**
- **“Since the cornerstone of the Strategic Framework is surveillance, there is a need to improve the coordination of the animal and public health surveillance systems”**
- **“Strengthening the expertise in wildlife biology in the veterinary services”**
- **“Harmonizing disease reporting capacities and procedures, and channels between human and animal health services”**

## The reality

- “ In most countries, sector-specific institutions have clear roles and responsibilities and budgets. But the mechanisms for cross-sectoral collaboration are not clearly identified; it is often considered to be difficult even when the need is identified, such as was the case of HPAI outbreaks in many countries. For the OWOH approach to be successful, the cross-sectoral collaborative activities for priority actions need to be better defined.” (Contributing to One World, One Health)
- Current organisational structures do not support the one-medicine approach...
- A more integrated approach to infectious diseases would lead to overall improvements in public health and decrease response times to major outbreaks.



***BRIDGING THE GAPS BETWEEN HUMAN AND  
ANIMAL DISEASE SURVEILLANCE SYSTEMS***

**Savoy Hotel, Moscow, Russia, July 8 -9, 2009**

**Co-chairs: Dr. Tracey McNamara  
and Dr. Alexander Platonov**

***УКРЕПЛЕНИЕ ВЗАИМОСВЯЗИ МЕЖДУ СИСТЕМАМИ  
НАДЗОРА ЗА ЗДОРОВЬЕМ ЛЮДЕЙ И ЖИВОТНЫХ***

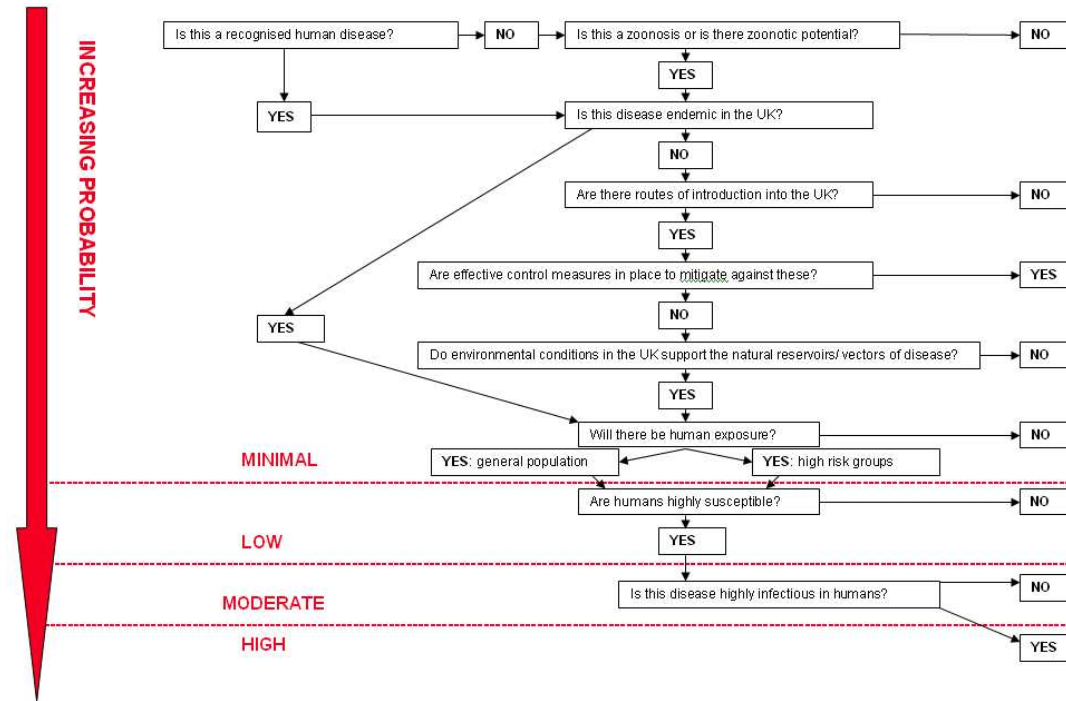
**Отель «Савой», Москва, Россия, 8-9 июля 2009 года**

**Сопредседатели: д-р. Трейси Макнамара  
и д-р. Александр Платонов**

# **Human Animal Infections Risks and Surveillance (HAIRS)**

- **Multi-agency and cross-disciplinary horizon scanning group; met monthly since 2003**
- **Chaired by HPA's Dept of gastrointestinal, Emerging and Zoonotic Infections (GEZI)**
- **Health protection Agency (HPA)**
- **Dept for the Environment**
- **Food and Rural Affairs**
- **Veterinary Laboratories Agency (VLA)**
- **Department of Health**



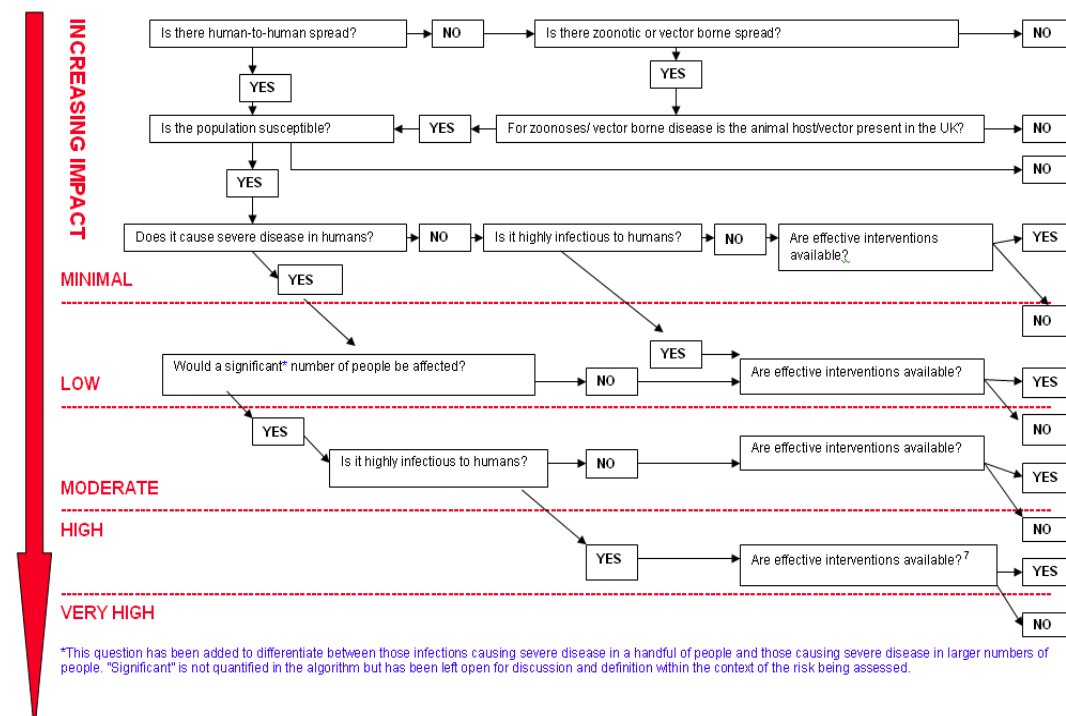


## Squirrel Parapoxvirus (SPPV)

SPPV infection is highly pathogenic in red squirrels, characterised by ulcerated and haemorrhagic scabs affecting the eyes, nose and lips, spreading to the ventral thorax, inguinal area and feet, with a high mortality rate.

**Process:** A risk assessment was carried out to assess the zoonotic potential of SPPV.

**Risk Assessment outcome:** Level 2: potential zoonosis. The recommended action at this level of risk assessment is to consider surveillance of exposed groups.



\*This question has been added to differentiate between those infections causing severe disease in a handful of people and those causing severe disease in larger numbers of people. "Significant" is not quantified in the algorithm but has been left open for discussion and definition within the context of the risk being assessed.





## Med-Vet -Net

- **Aims to develop a network of excellence for integration of veterinary, medical, and food scientists, in the field of food safety, at the European level, in order to improve research on the prevention and control of zoonoses, including food-borne diseases**

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Upcoming: 11 Jul 2009  
**American Society for  
Virology 28th Annual  
Scientific Meeting.**

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# The USA Reality



How can we detect biologically related but geographically separated “events” when it is still difficult to see human or animal data across state lines?

## AGENCIES AND ORGANIZATIONS INVOLVED IN MANAGING WEST NILE VIRUS

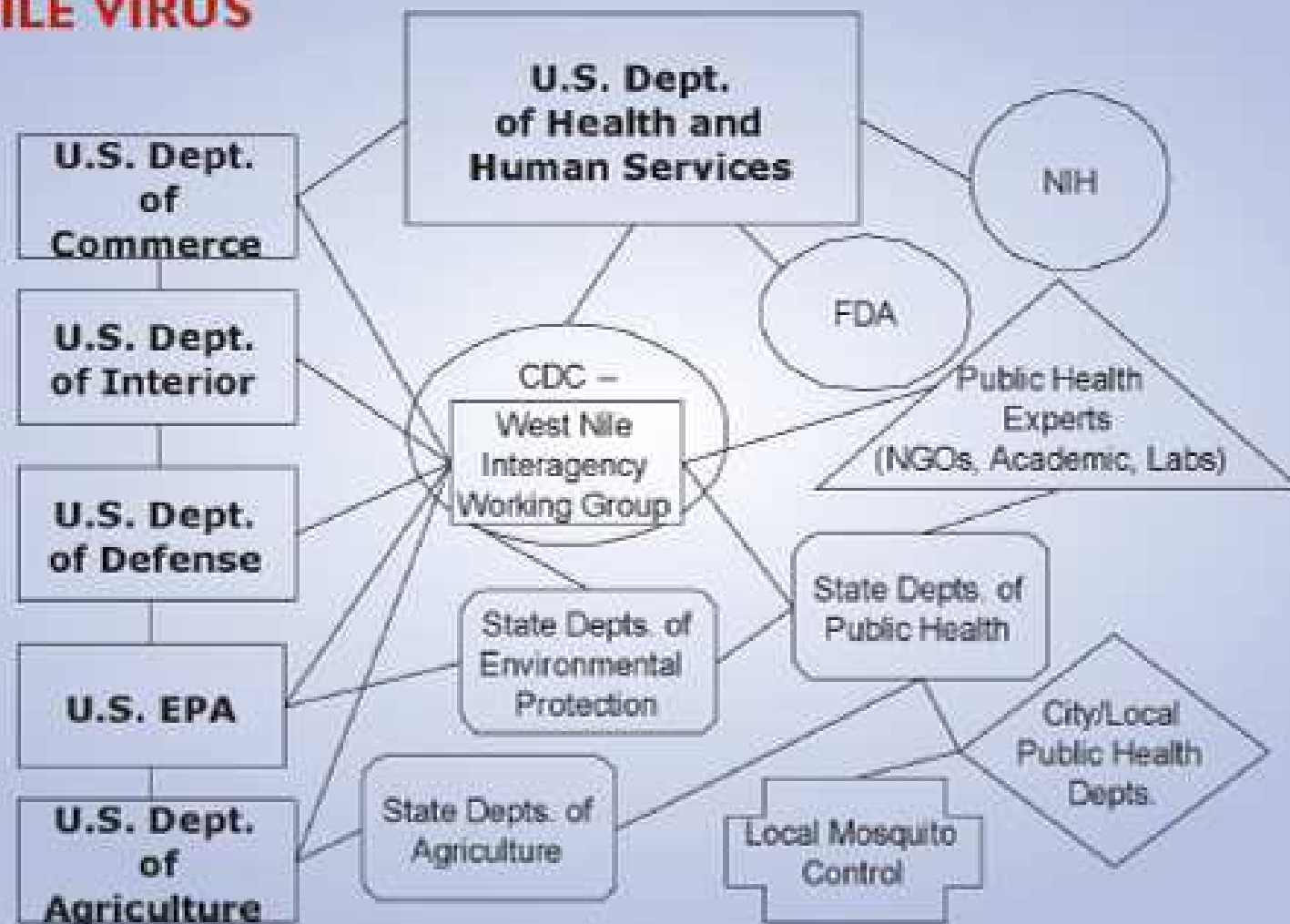
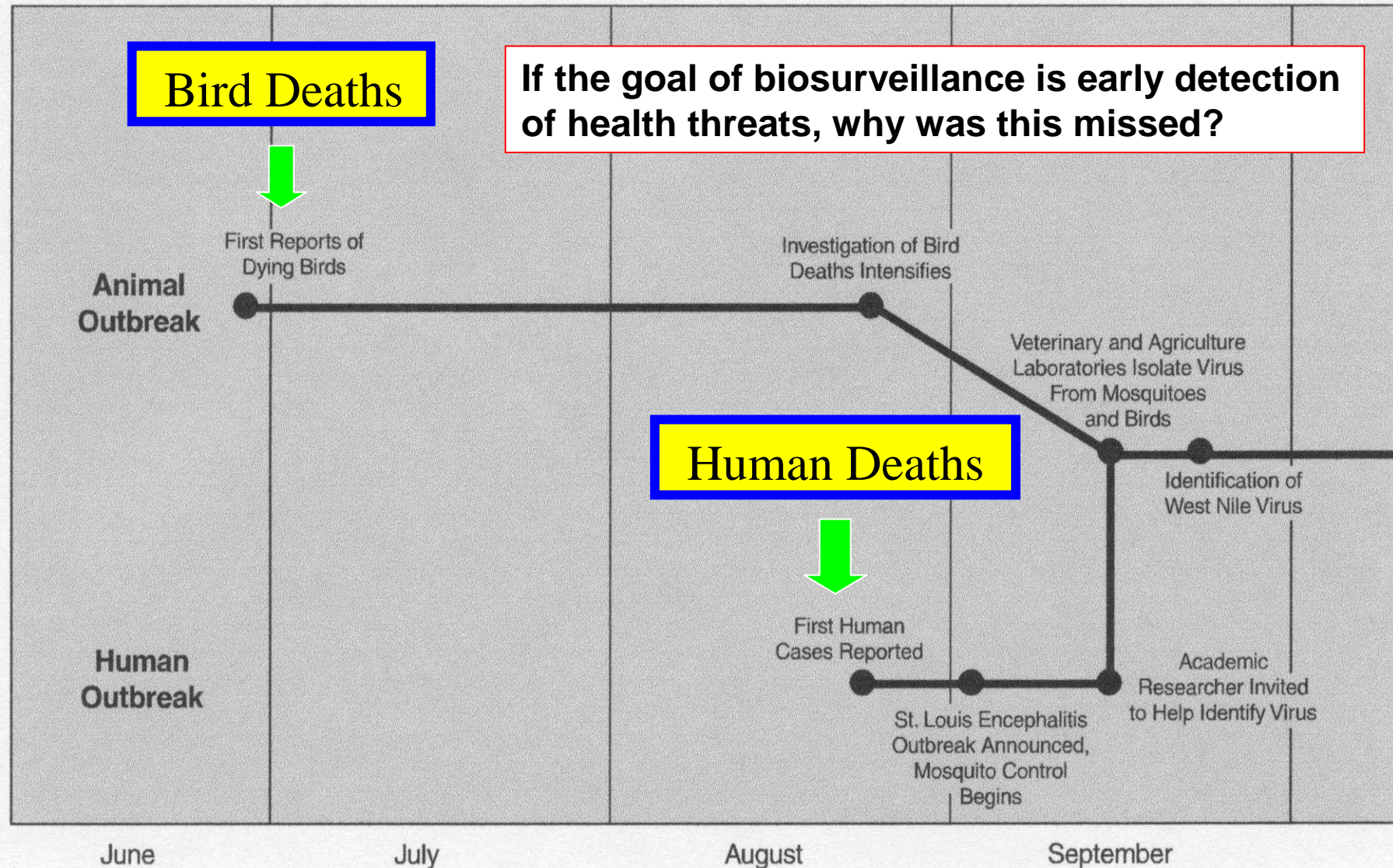


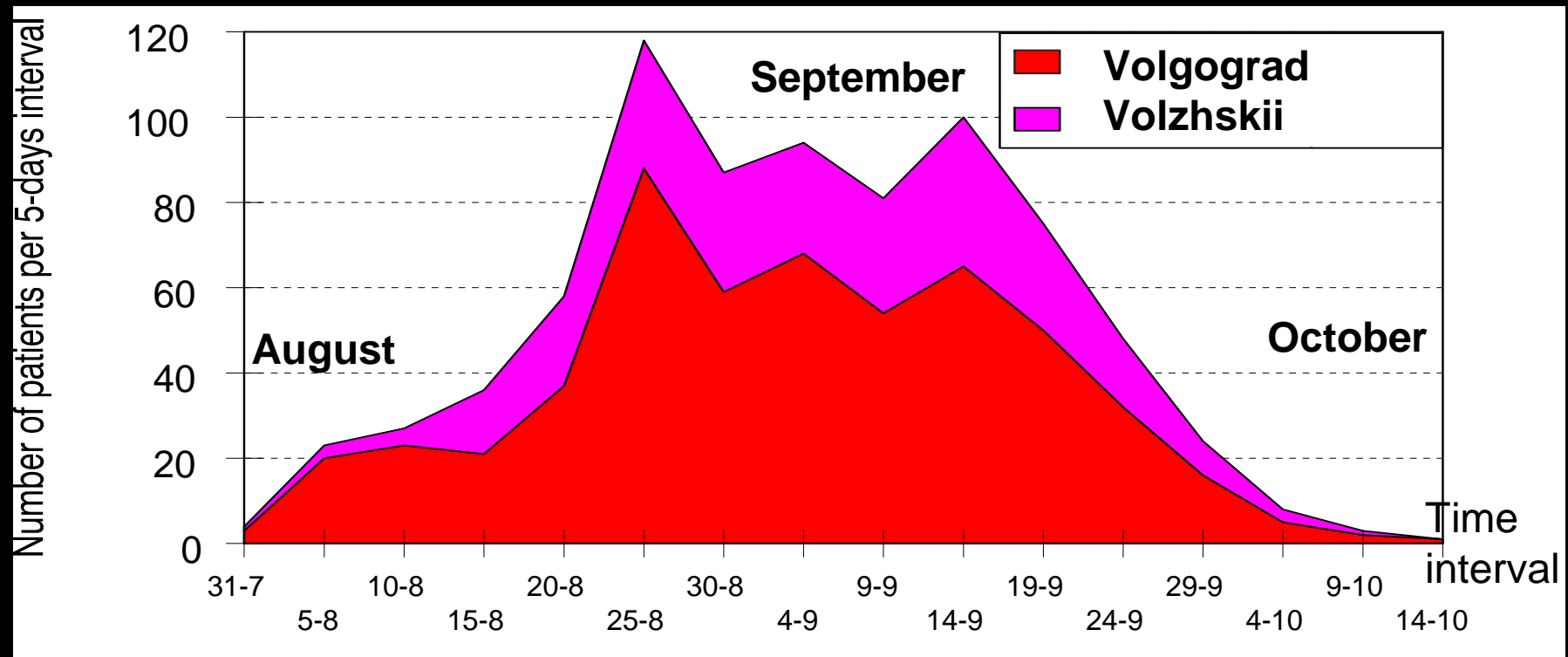


Figure 2: Timeline of 1999 West Nile Virus Outbreak



Avian sentinels gave early warning well in advance of human morbidity and mortality but were ignored – Why?

## Number of patients hospitalized with suspected encephalitis, meningitis or fever in Volgograd and Volzhskii City



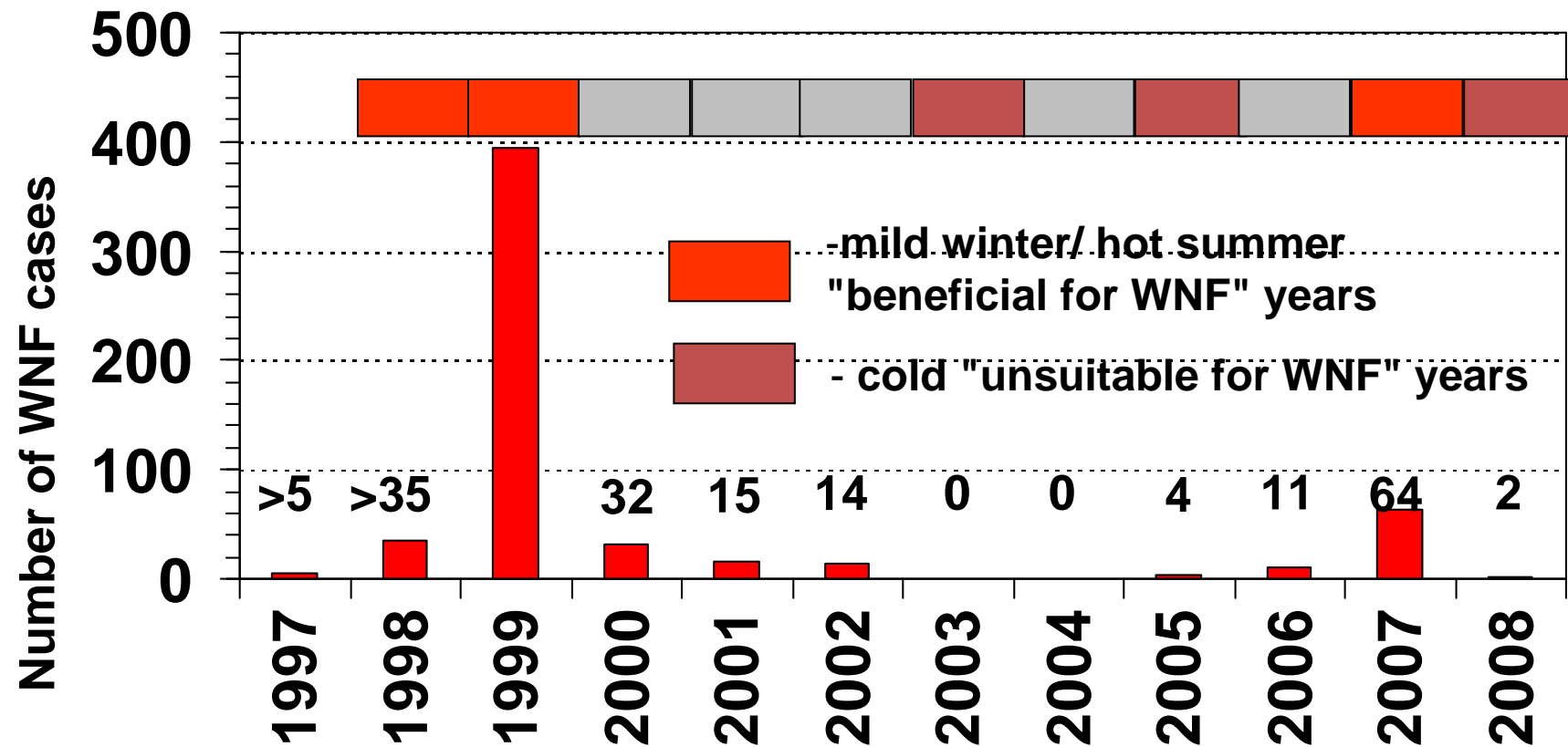
**Etiology unknown. Seasonal increase of enteroviral infection is suggested**

**Serological investigation suggests West Nile etiology**

**Concern of clinicians and epidemiologists**

**West Nile etiology is confirmed by RT-PCR**

## West Nile fever in Volgograd Province in 1997-2008





# Biosurveillance

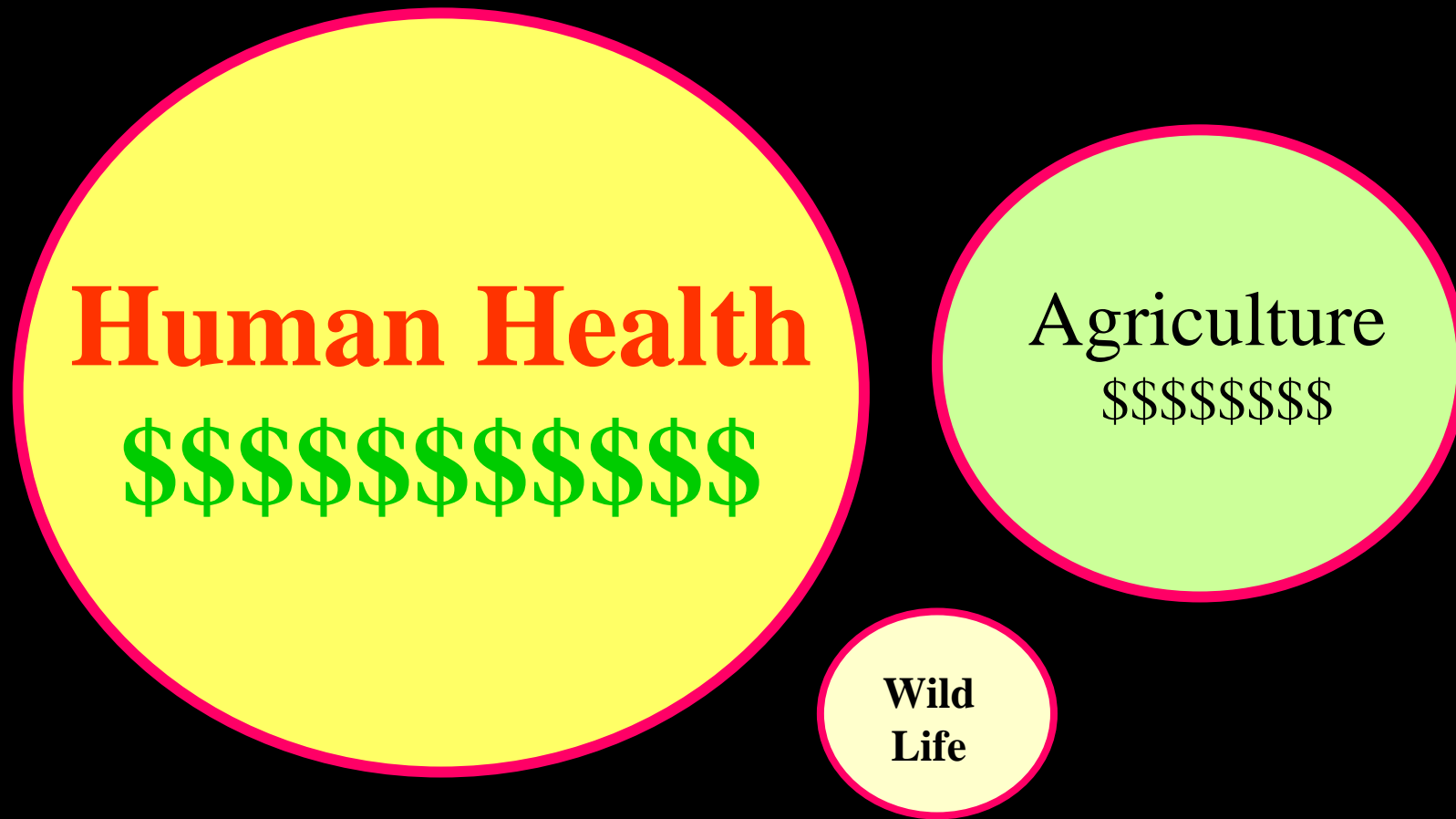
**“Active data-gathering, analysis, and interpretation of biosphere data related to disease activity and threats to human and animal health to achieve early warning, detection, and situational awareness”**



**HSPD-21 Definition of Biosurveillance**



# The Reality of Biosurveillance in the USA



With the exception of Rabies and WNV surveillance, there is little overlap between the human and animal sectors and a marked discrepancy in funding



**ZVED**

National Center for Zoonotic,  
Vector-Borne, and Enteric Diseases



**Lonnie King DVM**

**... a multidisciplinary strategy to prevent, control, and, where possible, eliminate infectious diseases within a larger ecological context that includes humans, animals, and plants interacting in a complex, ever-changing natural environment.**

**2007**



# **National Biosurveillance Strategy for Human Health**

**2008 - 2013**

**Version 1.0**

**December 2008**



**CDC**

## National Biosurveillance Advisory Subcommittee (NBAS)

- Homeland Security Presidential Directive HSPD-21
- Secy, HHS ICW Sec Def, Vet Affairs, and DHS,
- “ shall establish an epidemiologic surveillance federal advisory committee, including representatives from state and local government public health authorities and appropriate private sector health care entities, in order to ensure that the federal government is meeting the goal of enabling state and local government public health surveillance capabilities.”
- Produced a report on biosurveillance needs to the CDC in April 2009; being reviewed by the White House

Improving the Nation's Ability to Detect and Respond to 21<sup>st</sup> Century Urgent Health Threats: First Report of the National Biosurveillance Advisory Subcommittee

# ArboNET Background

National electronic surveillance system for arboviral diseases in the U.S.

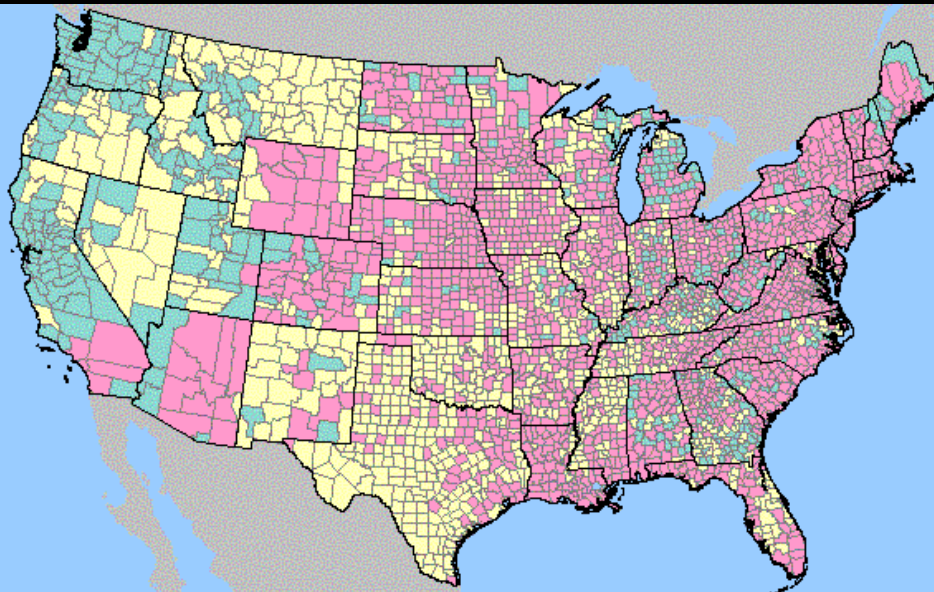
Developed in 2000 in response to the detection of WNV in the U.S. in 1999

Non-WNV arboviral diseases added to the system in 2003

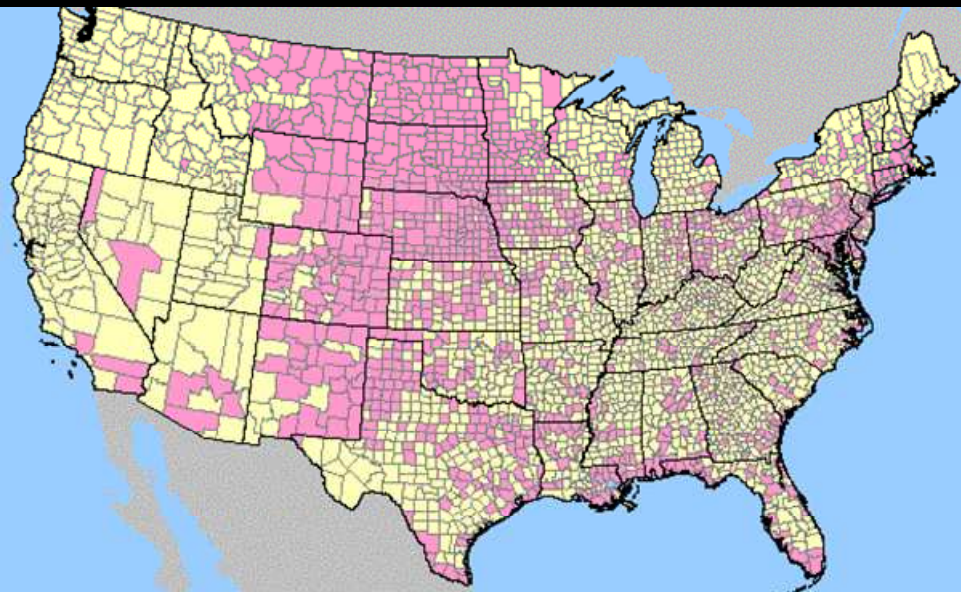
Human disease cases

Veterinary/Avian/Sentinelchickens/Mosquitoes

Presumptive viremic donors (PVDs) from routine blood donor screening




2003 West Nile Virus Activity, birds



2003 West Nile Virus Activity, humans




# Syndromic Reporting Information System

 **SYRIS**

File Help

Login Public Health Alerts

 **SYRIS**<sup>TM</sup>  
SYndrome Reporting  
Information System

Information of Immediate Local Importance

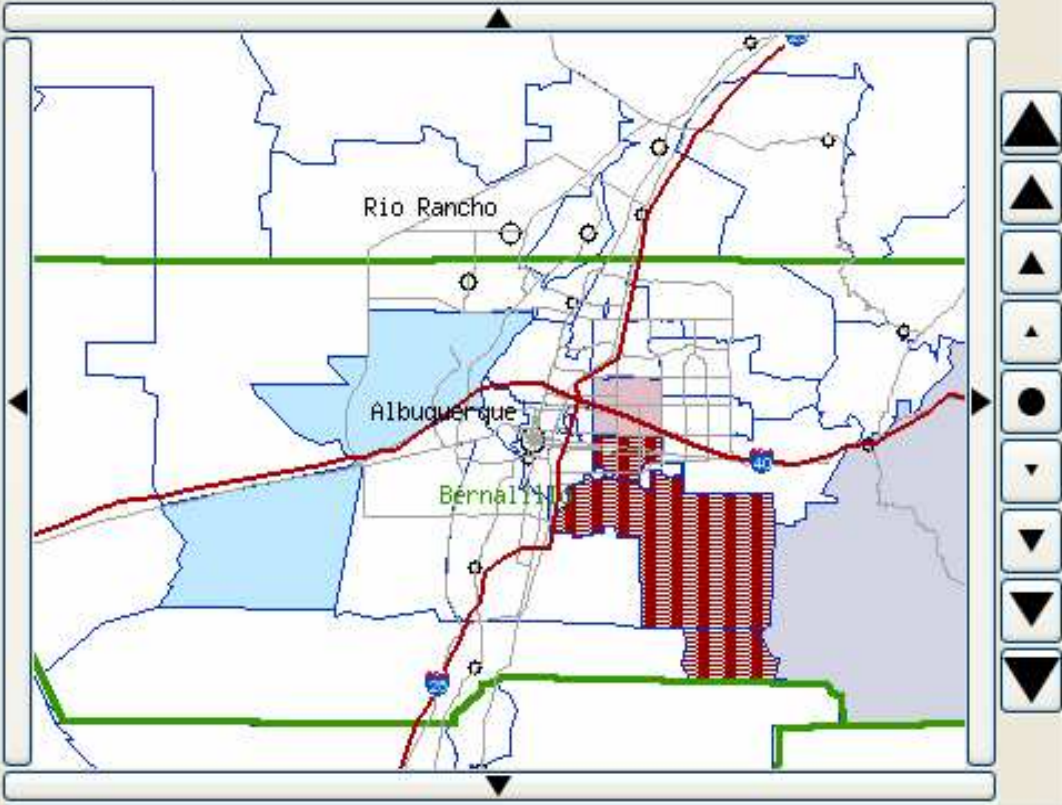
8/19/04: There are definite reports of feline plague (culture proven) from the foothills area of eastern Albuquerque. We are concerned that human respiratory illness might be human plague, although we would actually expect bubonic plague (which may manifest as a "flu-like illness" with lymphadenopathy) after a flea bite.

Please keep in mind the possibility of plague in patients with compatible symptoms. We will continuously update this page.

User name:

Password:

Local Map of Syndromes



**National Biosurveillance System**  
**National Biosurveillance Center**



## Biosurveillance Common Operating Picture

# **One Health Commission Formed to Promote Collaboration Across Human, Animal, and Environmental Health Sciences**

*One Health Commission Formed to Promote Collaboration Across Human, Animal, and Environmental Health Sciences*

Washington, DC ([PRWEB](#)) August 27, 2009 -- A new national commission, the One Health Commission, has been established to spotlight the connections between human, animal, and environmental health, as well as the benefits of proactive and collaborative approaches toward better health for all.

The formation of the Commission comes at a time of heightened concern by policy makers and public health officials about the potential spread of newly emerging infectious diseases such as H1N1 Influenza, as well increasing threats posed by other emerging zoonotic diseases, food- and water-borne diseases, and environmental change.





Volume 19 | [Issue 19](#) | Page 60 | Oct. 10, 2005

## To Fight Plague, Look to Russia's Past



*The Tsars, and then the Soviets, created a *Yersinia pestis* surveillance system that today's epidemiologists should envy*

**By Janet Ginsburg**

Center for Nonproliferation Studies, Monterey Institute of International Studies

## The Russian System

- An RU participant noted a need for harmonization of national and various international regulations on disease surveillance.
- Also, on the federal level, there are very few interagency documents mandatory for both veterinary and sanitary services.
- Lack of joint training of medical, epidemiological and veterinarian experts was mentioned as another important issue.
- Need for research strength in vector biology and entomology

# Russian State System of Sanitary and Epidemiological Regulation

## Russian State System of Veterinary Regulation

### PREVENTION OF COMMUNICABLE DISEASES

## Prevention and Control of Communicable Diseases Common to Humans and Animals

### 13. RABIES

- 5.4 When case of rabies among animals is reported to local veterinary officer, the officer must: visit the site with state sanitary and epidemic surveillance service representative, draw up documents for quarantine and forward them to local administrative authorities for approval. ...
- 5.6 Staff from veterinary, sanitary-epidemiological and wildlife protection services take all possible measures (hunting, capturing, hole poisoning) to decrease the wild predators population, regardless of official hunting season in the area.

5.4. Главный государственный ветеринарный инспектор района (города) при получении информации о выявлении случая бешенства у животных обязан:

- немедленно сообщить о заболевании животных территориальному центру госсанэпиднадзора, главным государственным ветеринарным инспекторам соседних районов и вышестоящему ветеринарному органу;
- совместно с представителем службы госсанэпиднадзора выехать на место...
- оформить материалы по установлению карантина и внести их для утверждения в органы местной администрации.

5.6. Специалисты ветеринарной и санитарно-эпидемиологической служб организуют в неблагополучных по бешенству пунктах следующие мероприятия:

при выявлении случаев бешенства диких животных совместно с органами охраны природы и охотничьего хозяйства принимают все доступные меры (отстрел, отлов, затравка в норах) к снижению численности диких хищников, независимо от сроков охоты, установленных в данной местности.

# Russian State System of Sanitary and Epidemiological Regulation

## Russian State System of Veterinary Regulation

### PREVENTION OF COMMUNICABLE DISEASES

#### Prevention and Control of Communicable Diseases Common to Humans and Animals

##### 16. HEMORRHAGIC FEVER WITH RENAL SYNDROME

Hold meetings on HFRS prevention with professionals from the healthcare, veterinary, wildlife protection, community service, trading, public catering, leisure and health-improving facilities, with chairmen of gardening associations etc

3.2.6. Мероприятия, проводимые территориальным центром Госсанэпиднадзора по локализации природного очага в случае активизации эпизоотического процесса и роста заболеваемости ГЛПС:

- организация работы санитарно-противоэпидемических комиссий с заслушиванием на заседаниях работы всех заинтересованных ведомств и служб и решением неотложных задач по локализации очагов ГЛПС;
- проведение совещаний с работниками учреждений здравоохранения, ветеринарной службы, лесхозов, коммунальной службы, торговли, общепита, оздоровительных учреждений, председателями садово-огородных товариществ и др. по вопросам профилактики ГЛПС;

## Appendix № 1

### RU Procedure for special reporting on sanitary and epidemic health emergencies

- The medical and preventive treatment facility, regardless of its form of ownership, sends an emergency special report to local state sanitary and epidemic surveillance institutions within two hours of the time of emergency detection, and informs the local healthcare authority.
- The local healthcare authority reports the emergency to the healthcare authorities of the (*affected*) RF constituent within 2 hours of the time of receiving the emergency report.
- The Rospotrebnadzor authority of the (*affected*) RF constituent reports the emergency to the Federal Rospotrebnadzor office within 24 hours from the time of emergency detection.

Лечебно-профилактическое учреждение независимо от формы собственности направляет внеочередное донесение о возникновении чрезвычайной ситуации в течение 2-х часов после установления факта чрезвычайной ситуации в территориальные органы и учреждения, осуществляющие государственный санитарно-эпидемиологический надзор, и информирует муниципальный (ведомственный) орган управления здравоохранением.

Муниципальный (ведомственный) орган управления здравоохранением в срок не позднее 2-х часов после получения донесения о возникновении чрезвычайной ситуации информирует орган управления здравоохранением субъекта РФ о возникновении чрезвычайной ситуации.

Управление Федеральной службы по надзору в сфере защиты прав потребителей и благополучия человека по субъекту Российской Федерации направляет внеочередное донесение о возникновении чрезвычайной ситуации в срок не позднее 24 часов после установления факта чрезвычайной ситуации в Федеральную службу по надзору в сфере защиты прав потребителей и благополучия человека.

# **О представлении внеочередных донесений о чрезвычайных ситуациях в области общественного здравоохранения санитарно-эпидемиологического характера**

## **Appendix № 2**

**4.23. инфекционные и  
неинфекционные болезни  
установленной и неустановленной  
этиологии с нетипичным клиническим  
течением, тяжелым клиническим  
течением и летальными исходами**

**4. Выявление среди  
населения случаев инфекционных  
и паразитарных болезней или  
подозрений на инфекционные и  
паразитарные болезни, возникшие  
в пределах одного инкубационного  
периода, на одной территории или  
среди членов одного коллектива  
(далее – групповые заболевания):**

**внеочередное  
донесение о  
10 и более случаях**

## **RU Special Antiepidemic and Antiepzootic Commissions** **Emergency Committees**

- May be organized by Russian Government or by regional Governments of Provinces (Oblasts and Republics) on permanent or temporary basis.
- They meet according to annual plans, regularly or irregularly, or in emergencies.

7.2. Для оперативного руководства и координации деятельности организаций, предприятий и граждан по предупреждению возникновения и ликвидации очагов заразных болезней, общих для человека и животных, Совет Министров – Правительство РФ, органы исполнительной власти национально-государственных и административно-территориальных образований могут в установленном порядке создавать Чрезвычайные противоэпизоотические и противоэпидемические комиссии.

## **Ministry of Agriculture**

Russian veterinary services do not distinguish between domestic and wild animals

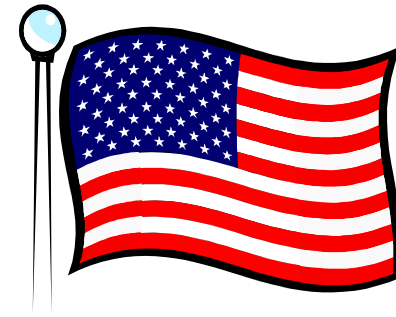
KZ law on veterinary medicine 10 July 2002 –“protection of public health from diseases, which are common for both animals and humans”

## Data sharing between sanitary and veterinary services on zoonoses in Kazakhstan

- Joint orders, sanitation rules and code
- Joint data collection form is mandatory (#329)  
(brucellosis, anthrax, hemorrhagic fevers (CCHF), tick encephalitis, and highly virulent avian influenza, etc.)
- Joint decrees (Ministry of Health and Ministry of Agriculture)

*Information provided by: L. Nekrassova, KSCQZI, S. Kazakov, K. Ospanov, A. Myrzabekov; Kazakh Republican Sanitary Epidemiological Station (RSES) of the Committee of the State Sanitary Epidemiological Surveillance of the Republic of Kazakhstan*





# Potential areas of Collaboration

Directly prior to our convening the United States and Russia signed a memorandum of understanding on cooperation in public health including "Improving Global Health, including facilitating international cooperation on the surveillance and monitoring of infectious diseases, promoting implementation of the International Health Regulations, supporting the Millennium Development Goals, and strengthening health systems in developing countries, including public health emergency preparedness and response."



The University of  
Nottingham

# Novel Technologies for Wildlife Disease Diagnostics

WildTech Consortium  
Presented by Duncan Hannant



School of Veterinary Medicine and Science

## Framework 7 EU Grant



The University of  
Nottingham

*"Novel technologies for surveillance of  
emerging and re-emerging infections  
of wildlife"*

Fully funded: 6 million euros

13 partners

22+ associate partners

## NATIONAL FISH AND WILDLIFE HEALTH INITIATIVE FOR THE UNITED STATES



INTERNATIONAL ASSOCIATION OF FISH AND WILDLIFE AGENCIES

### An Early Detection System for Highly Pathogenic H5N1 Avian Influenza in Wild Migratory Birds U.S. Interagency Strategic Plan

## National Fish & Wildlife Health Initiative TOOLKIT



The Association of Fish and Wildlife Agencies...the organization that represents North America's fish and wildlife agencies—promotes sound management and conservation, and speaks with a unified voice on important fish and wildlife issues.

# Contributing to One World, One Health

Specific actions to enhance the collaboration between public health, animal health and wildlife institutions at the national level would include:

Adapting medical and veterinary curricula to strengthen initial and continuing training of officials for human and animal health services



There is scope for better integration in the teaching of medical and veterinary students.

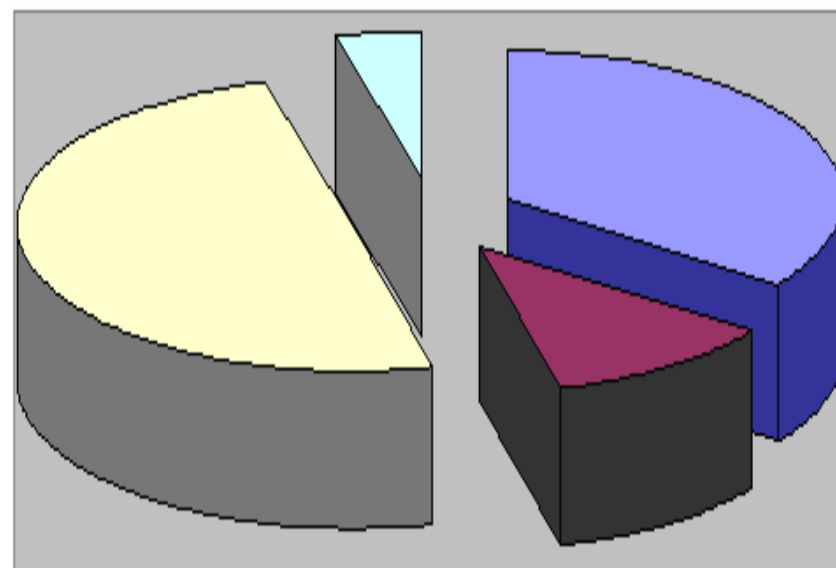
This might be addressed through the teaching of 'one-health' modules or a national summer school for veterinary, medical and science students in infectious disease

# Specialists' Education

- Since 1948 – biologists
- Since 1953 – doctors

## Total for all years:

- Graduate education for MD - 1045
- Advanced education for MD - 326
- Graduate education for biologists- 1484
- Advanced education for biologists- 126



■ Специализация врачей	■ Усовершенствование врачей
■ Специализация биологов	■ Усовершенствование биологов

Crisis Scenario  
(unexpected outbreak  
of unknown/unusual zoonotic disease)

- Participants offered their thoughts on how their countries or services would act.
- UK/ USA/ RU participants felt the connection between the animal and human cases would be missed
- Kazakh participant was confident that an outbreak would be detected before the infection jumped to humans, since all dead animals are sent for analysis to their institute, as well as a number of other laboratories.



## **BRIDGING THE GAP BETWEEN HUMAN AND ANIMAL DISEASE SURVEILLANCE SYSTEMS: CONCLUSIONS AND RECOMMENDATIONS**

- **Work of the WildTech project, in particular – microarray technology needs further exploration. A cooperation of Russian and Kazakh institutes with WildTech may help close gaps in wildlife surveillance and increase interactions in molecular diagnostics and technology transfer.**
- **The world can learn from many features of the Antiplague system and the Sanitary Surveillance System that lend themselves to the “One World One Health” discussion, such as active surveillance, species neutral and ecosystem approach to zoonotic threats.**
- **Joint training of veterinary, medical and science students studying infectious disease surveillance needs to be encouraged**
- **Initiative to look into unknown emerging diseases in Russia is needed.**
- **Horizontal communication should be encouraged (regional networks)**
- **Surveillance of zoonoses needs improvement especially in the area of interministerial and intersectoral coordination**



We need the integrated  
approach  
...  
to the zoonotic diseases

