

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES



ANIMAL HEALTH AT THE CROSSROADS

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PREVENTING,
DETECTING,
AND
DIAGNOSING
ANIMAL
DISEASES

Committee on Assessing the Nation's Framework for Addressing Animal Diseases: Phase One

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About the Study

Envisioned as a 3-phase analysis of the U.S. framework for safeguarding animals from disease

Phase One: Prevention, Detection, Diagnosis

Phase Two: Surveillance and Monitoring

Phase Three: Response and Recovery

Statement of Task

- Each phase of the study will
 - (1) review the state and quality of the current system for dealing with animal disease;
 - (2) identify key opportunities and barriers to successfully preventing and controlling animal diseases; and
 - (3) identify immediate courses of action for those on the front lines.

Statement of Task

- **Study will examine elements of the animal health framework:**
 - Scientific preparedness for action “on the ground”
 - Technologic tools and scientific applications
 - Social and economic effects
 - Reporting linkages and communications
 - System components (federal, state, local, public and private)
 - Supporting systems (research, education, and training).

Why examine the animal health framework?

- **The nature and degree of disease risk are changing, due to:**
 - Global trade and travel
 - Intensification of agriculture
 - Growing interface with wildlife
 - Emerging diseases (SARS, WNV, AI....etc.)
 - Threat of bioterrorism

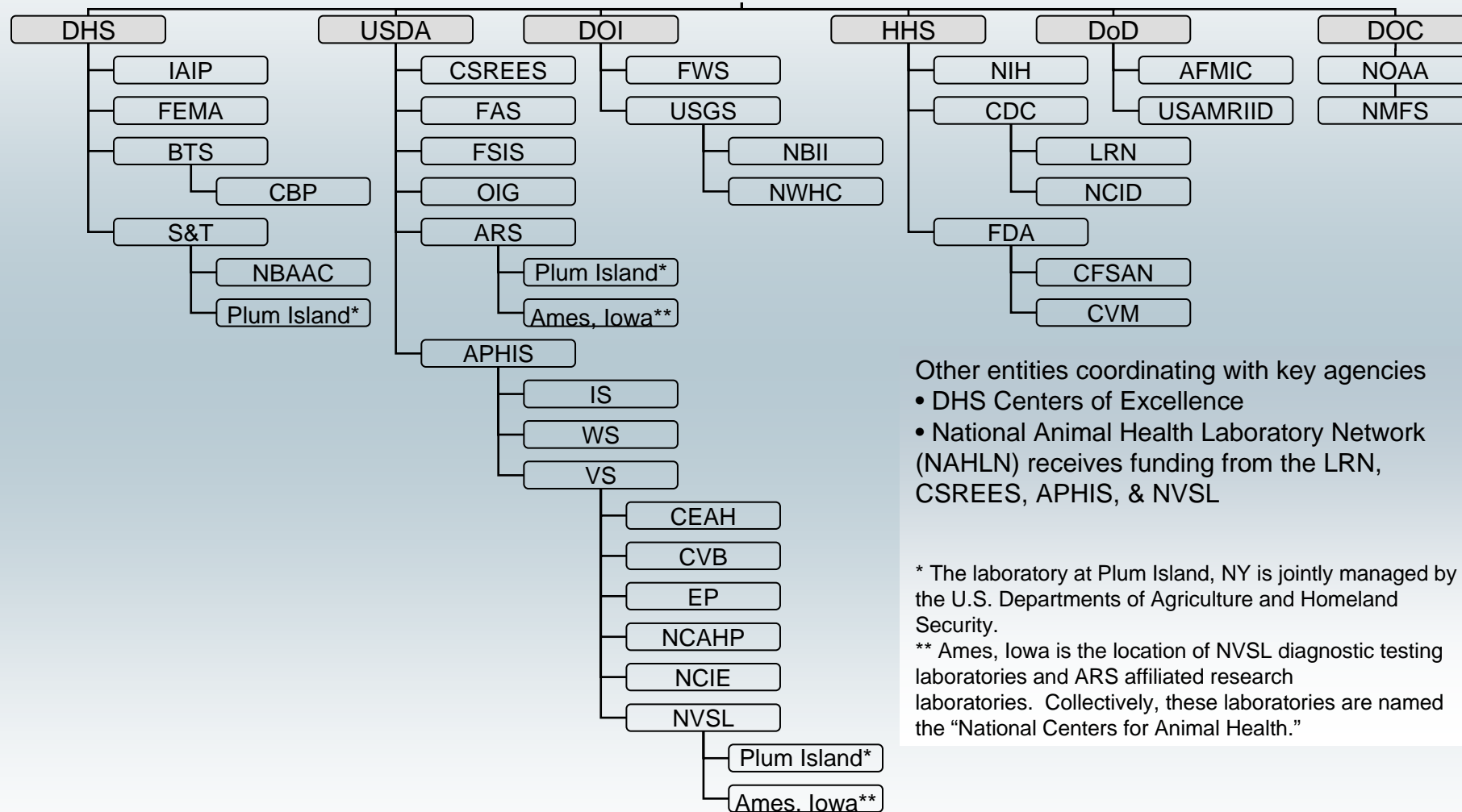
Components of the framework include:

- People who handle animals on a daily basis: Ranch and farm workers, animal producers, feeders, breeders, park rangers, companion animal owners, wildlife rehabilitators, and zoo keepers
- Private veterinarians and other sources of professional advice and care for health-related issues (such as universities and diagnostic laboratories)

Components of the framework also include:

- Federal, state, and local animal health and public health agencies (mainly state departments of agriculture and state diagnostics laboratories within universities and elsewhere in state governments and numerous bureaus and offices within over 10 federal departments, but primarily within the U.S. Departments of Agriculture, Homeland Security, and Health and Human Services)
- International collaborations among agencies, organizations, and governments (such as the World Organization for Animal Health and the World Health Organization)
- Supporting institutions, industries, and organizations (including educators, researchers, and the public health and intelligence communities)

Key Federal Agencies Addressing Animal Diseases



Other entities coordinating with key agencies

- DHS Centers of Excellence
- National Animal Health Laboratory Network (NAHLN) receives funding from the LRN, CSREES, APHIS, & NVSL

* The laboratory at Plum Island, NY is jointly managed by the U.S. Departments of Agriculture and Homeland Security.
 ** Ames, Iowa is the location of NVSL diagnostic testing laboratories and ARS affiliated research laboratories. Collectively, these laboratories are named the "National Centers for Animal Health."

Case studies examined by the committee

- **Exotic Newcastle disease (END)**
- **Foot-and-mouth disease (FMD)**
- **Monkeypox**
- **Bovine spongiform encephalopathy (BSE)**
- **Severe acute respiratory syndrome (SARS) coronavirus**
- **Avian influenza**
- **Chronic wasting disease**
- **West Nile virus**
- **Novel, naturally occurring and bioengineered pathogens**

Findings from the case studies

- The existing animal health infrastructure was designed to detect and respond to disease in commercial agriculture production systems, and is not appropriate for non-traditional species, management, or environments.
- The system lacks surge capacity and is ill-prepared to respond (in terms of detection and diagnosis) for emerging or intentionally introduced pathogens.
- The broad capabilities that exist in universities, industry, state entities, veterinary diagnostic laboratories, and other local animal health infrastructure are underutilized.

More findings...

- The development of diagnostics, vaccines for known pathogens is too slow. Better risk assessment methods are needed for planning and to anticipate threats.
- There is a need for state-of-the-art equipment and biocontainment facilities for both research and diagnostics.
- There is a need for a different kind of system of disease surveillance.

More findings from case studies

- Greater collaboration between public health and animal health officials can accelerate the detection and diagnosis of animal diseases.
- The lack of collaboration in research between the biomedical and veterinary communities is a lost opportunity that impedes the effectiveness of the framework.
- The past success of international collaboration in responding to animal disease demonstrates its importance in addressing animal diseases.
- The workforce on the front lines of animal care needs adequate training in infectious disease

Coordination of Framework Components

Recommendation 1: The nation should establish a high-level, centralized, authoritative, and accountable coordinating mechanism or focal point for engaging and enhancing partnerships among local, state, and federal agencies and the private sector.

Technological Tools for Preventing, Detecting, and Diagnosing Animal Diseases

Recommendation 2: Agencies and institutions— including USDA and DHS— responsible for protecting animal industries, wildlife, and associated economies should encourage and support rapid development, validation, and adoption of new technologies and scientific tools for the detection, diagnosis, and prevention of animal diseases and zoonoses.

Scientific Preparedness for Diagnosing Animal Diseases: Laboratory Capacity and Capability

Recommendation 3: The animal health laboratory network should be expanded and strengthened to ensure sufficient capability and capacity for both routine and emergency diagnostic needs, and to ensure a robust linkage of all components (federal, state, university, and commercial laboratories) involved in the diagnosis of animal and zoonotic diseases.

Animal Health Research

Recommendation 4: Federal agencies involved in biomedical research (both human and veterinary) should establish a method to jointly fund new, competitive, comprehensive, and integrated animal health research programs; ensure that veterinary and medical scientists can work as collaborators; and enhance research, both domestically and internationally, on the detection, diagnosis, and prevention of animal and zoonotic disease encompassing both animal and human hosts.

Animal Health Research (cont.)

Recommendation 5: To strengthen the animal health and zoonotic disease research infrastructure, the committee recommends that competitive grants be made available to scientists to upgrade equipment for animal disease research and that the nation construct and maintain government and university biosafety level 3 (BSL-3 and BSL-3 Ag) facilities for livestock (including large animals), poultry, and wildlife.

International Issues

Recommendation 6: The United States should commit resources and develop new shared leadership roles with other countries and international organizations in creating global systems for preventing, detecting, and diagnosing known and emerging diseases, disease agents, and disease threats as they relate to animal and public health.

International Issues (cont.)

Recommendation 7: Integrated and standardized regulations should be developed and implemented nationally to address the import, sale, movement, and health of exotic, non-domesticated, and wild-caught animals.

Addressing Future Animal Disease Risks

Recommendation 8: The U.S. Department of Agriculture, Department of Homeland Security, Department of Health and Human Services, and state animal and public health agencies and laboratories should improve, expand, and formalize the use of predictive, risk-based tools and models to develop prevention, detection, diagnostic, and biosecurity systems and strategies for indigenous, exotic, and emerging animal diseases.

Education and Training

Recommendation 9: Industry, producers, the American Veterinary Medical Association, government agencies, and colleges of veterinary medicine should build veterinary capacity through both recruitment and preparation of additional veterinary graduates into careers in public health, food systems, biomedical research, diagnostic laboratory investigation, pathology, epidemiology, ecosystem health, and food animal practice.

Education and Training (cont.)

Recommendation 10: The USDA, state animal health agencies, the American Veterinary Medical Association, and colleges and schools of veterinary medicine and departments of animal science should develop a national animal health education plan focusing on education and training of individuals from all sectors involved in disease prevention and early detection through day-to-day oversight of animals.

Improving Public Awareness of the Economic, Social, and Human Effects of Animal Diseases

Recommendation 11: The government, private sector, and professional and industry associations should collectively educate and raise the level of awareness of the general public about the importance of public and private investment to strengthen the animal health framework.

Summary