World Veterinary Year 2011: 250 Years of Improving Animal and Human Health

Marguerite Pappaioanou, DVM, PhD
Bias to Presentation

- US Emphasis
- US Centers for Disease Control and Prevention
“Veterinary Public Health”

- “Comprises all the community efforts, influencing and influenced by the veterinary medical arts and sciences applied to the prevention of disease, protection of life, and promotion of the well-being and efficiency of man” (WHO, 1951)
- “A component of public health activities devoted to the application of professional veterinary skills, knowledge and resources to the protection and improvement of human health” (FAO/WHO, 1975)
- “The sum of all contributions to the physical, mental, and social well-being of humans through an understanding and application of veterinary science” (WHO, 2002)
- “Public health is what we, as a society, do collectively to assure the conditions in which people can be healthy” (IOM 1988)
17th-19th and turn of the 20th Century

- Human population increasing after devastating plague pandemic-- increased need for food/protein--hunger
- Multiple wars
- Human Disease -- typhus, dysentery, spotted fever, anthrax, tuberculosis
- Animal diseases-- Rinderpest, anthrax, swine erysipelas, more!
- Etiology- pathogenesis -- Koch, Pasteur, Salmon, Smith and Kilbourn, Ross, more!
20th and 21st Century Success Stories

- Food security, safety, systems, globalization of food systems
- Changing food animal production systems; implications for disease spread-prevention-control, population based health systems, issues of animal welfare, antibiotic use/resistance, sustainability
- Emerging Zoonotic Diseases
- Bioterrorism, and role of zoonotic agents (Anthrax-2001)
- Natural and human-made disaster preparedness and response
- Genetics, genomics, proteomics
- Evolving Human Animal Bond
Application of epidemiology, population medicine
Information pathways— the media, the internet, public and professional awareness
Organized veterinary public health
Growing visibility for One Health
Evolving and advancing veterinary medical education
Leaders Champions and Heroes
Success Story 1

FOOD SECURITY, SAFETY
Success Story-- Food Systems

- **7 Billion People and Growing-- Food security**
  - Eradication and control of major food animal diseases such as Tb, Brucellosis, Hog Cholera, Anthrax, Foot and Mouth Disease (14 diseases eliminated since 1892)
  - Disease surveillance
  - Development and production of diagnostics and vaccines
  - Food animal production, consolidation, population health, international trade
  - Nutrition, genetics, genomics, proteomics

- **Sustainability and Health**
  - Human, animal, ecosystem health; human under and over nutrition, poverty, climate change, ecosystem health, animal welfare
  - Use of antibiotics and growth promoters
Success Story -- Food Safety

- Milk regulations, pasteurization
- Meat Hygiene – Upton Sinclair, “The Jungle” – slaughterhouse and waste management
- Food processing
- Hazards Analysis Critical Control Points (HACCP)
- Globalization of food systems
- Population based health systems
- Silent human food borne pathogens in animals
  - Salmonella spp.
  - E coli 0157: H7
- Vaccine development
- Alternative antimicrobials/to antibiotics
- Surveillance systems for foodborne pathogens, outbreaks & antibiotic resistance— Foodnet; Pulsenet; Salmsurv
- Outbreak investigation methodology
GREATER VISIBILITY FOR LINKS BETWEEN AGRICULTURE, DEVELOPMENT, GLOBAL HEALTH
Health, Development, and Poverty

- Health
- Development (Livestock/Poultry)
- Reduce Poverty
Millenium Development Goals

MDGs

Goal 1: Eradicate Extreme Poverty and Hunger
Goal 2: Achieve Universal Primary Education
Goal 3: Promote Gender Equality and Empower Women
Goal 7: Ensure environmental Sustainability
County Specific

Main Themes

Agriculture, Rural Development and Poverty reduction
Education
Health and Population
Environment
Disaster Risk Management

Cross Cutting Issues

Gender equality
Human Rights
Civil Society Participation
Refugees

Goal 8: Develop a Global Partnership for Development

Source: UNDP
Greater Awareness of Connectedness Between Major Global Health Initiatives

- Global Fund
- Global Health Initiative
- Emerging Pandemic Threats Program
- Feed the Future
- PEPFAR
- GAVI
Success Story 3

CONFRONTING EMERGING ZOONOTIC DISEASES

PROFESSIONAL AND PUBLIC AWARENESS OF THE ROLE OF VETERINARY MEDICINE
Emerging Zoonotic Diseases

- Rabies treatment, control, prevention
- BSE in UK, 1986
- Introduction of West Nile Virus into the Western Hemisphere, 1999
- Anthrax bioterrorism event, 2001
- SARS outbreak 2003
- FMD UK, 2001
- Highly pathogenic AIV H5N1, 1997 and 2003-now
- Pandemic H1N1 influenza virus, 2009
Rabies Treatment, Prevention, Control

- **Human vaccines- prevention, and treatment**
  - Nerve tissue derived vaccines (first in 1885, Pasteur and Roux)
  - Human diploid cell rabies vaccine (1967)
  - New less expensive purified chicken embryo cell vaccine and purified vero cell rabies vaccine now
  - Pre- and post exposure regimens
  - Human rabies immunoglobulin treatments

- **Long acting canine, feline, ferret vaccines**
  - Original vaccines needed to be administered every 6 months
  - Inactivated and modified live virus vectored products—1-3 years

- **Wildlife vaccines**
  - Recombinant oral vaccine to prevent outbreaks of rabies in wildlife

- **Bite management**

- **Management of animals that bite humans**
West Nile Virus Introduction in Western Hemisphere
Outbreak of West Nile-Like Viral Encephalitis -- New York, 1999

An outbreak of arboviral encephalitis was first recognized in New York City in late August and has since been identified in neighboring counties in New York state. Although initially attributed to St. Louis encephalitis (SLE) virus based on positive serologic findings in cerebrospinal fluid (CSF) and serum samples using a virus-specific IgM-capture enzyme-linked immunosorbent assay (ELISA), the cause of the outbreak has been confirmed as a West Nile-like virus based on the identification of virus in human, avian, and mosquito samples.

On August 23, 1999, an infectious disease physician from a hospital in northern Queens contacted the New York City Department of Health (NYCDOH) to report two patients with encephalitis. On investigation, NYCDOH initially identified a cluster of six patients with encephalitis, five of whom had profound muscle weakness (with axonal neuropathy by electromyelogram and requiring respiratory support in four). Testing of these initial cases by IgM-capture ELISA for antibodies to the common North American arboviruses was positive for SLE virus on September 3 at CDC. Eight of the earliest case-patients were residents of a 2-by-2-mile area in northern Queens. On the basis of these findings, aerial and ground applications of mosquito adulticides and larvacides were instituted in northern Queens and South Bronx on September 3.

To define the geographic extent of the outbreak, NYCDOH initiated active surveillance on August 30, and the Westchester County Department of Health and the Nassau County Department of Health initiated active surveillance on September 3. Surveillance is also ongoing in surrounding areas. A clinical case is defined as a presumptive diagnosis of viral encephalitis with or without muscle weakness or acute flaccid paralysis, Guillain-Barré syndrome, aseptic meningitis, or presence of the clinical syndrome characterizing the initial cluster of cases in a patient presenting after August 1.

Before and concurrent with this outbreak, local health officials observed increased fatalities among New York City birds, especially crows. During September 7-9, officials of the Bronx Zoo noted the deaths of a cormorant, two captive-bred Chilean flamingoes, and an Asian pheasant. Necropsies performed on these birds at the zoo revealed varying degrees of meningoencephalitis and severe myocarditis. Tissue specimens from these birds and a crow with pathologic evidence of encephalitis from New York state were sent to the U.S. Department of Agriculture National Veterinary Services Laboratories (NVSL) in Ames, Iowa, on September 10 to be tested for common avian pathogens and the equine encephalitis viruses; all tests were negative. NVSL isolated viruses from the birds' tissues and forwarded them to CDC on September 20 for identification and characterization.
Update: West Nile-Like Viral Encephalitis -- New York, 1999

The outbreak of human arboviral encephalitis attributable to a mosquito-transmitted West Nile-like virus (WNLV) continues to wane in the Northeast (Figure 1). As of October 5, the number of laboratory-positive cases had increased to 50 (27 confirmed and 23 probable), including five deaths. The increase in cases is mainly a result of completed retesting with West Nile virus antigen of specimens previously tested with the related St. Louis encephalitis virus antigen and to intensive retrospective case finding in the ongoing epidemiologic investigations (1,2).

Of the 50 case-patients, none had onset of illness after September 17. Thirty-eight resided within boroughs of New York City (NYC): 26 from Queens, 4 from the Bronx, two from Manhattan, and one from Brooklyn. An additional 12 cases were reported from the adjacent counties of Westchester (eight) and Nassau (four). In NYC, the earliest laboratory-positive case occurred in a patient on August 4, followed by 11 cases in patients from Queens with dates ranging from August 5 to August 18.

The association of WNLV with deaths in crows and domestic and exotic birds was confirmed during September. As a result, CDC, state wildlife veterinarians, and an expanding group of federal agencies are using deaths in crows as sentinel events to define the current geographic distribution of mosquitoes and birds infected with WNLV (1). As of October 5, results from selected bird tissue samples tested indicate that WNLV has been identified from 41 avian tissue specimens collected in NYC; Nassau, Suffolk, Rockland, and Westchester counties in New York; Fairfield County, Connecticut; and Bergen, Union, Middlesex, and Essex counties in New Jersey. No human cases of encephalitis attributable to WNLV have been reported from either Connecticut or New Jersey. Pools of Culex mosquitoes collected in localized areas of Queens, Brooklyn, and the Bronx in mid-September and a pool...
Time Line to Confirmation of WNV

1999

1st patient admitted to hospital, Queens

human sera tested positive for SLE

Veterinary pathologist suspects human and bird epidemics linked

CDC confirms WNV

Introduction

12-Aug

3-Sep

9-Sep

23-Sep

• ArboNET – integrated surveillance system launched
Severe Acute Respiratory Syndrome
Outcomes – SARS 2003

- 29 countries/areas
  - 8,098 cases
  - 774 deaths (9.6%)
- $1 Billion US to economies of Asia and Canada
- Importance of laboratories working together emphasized
The Reservoir of SARS Discovered 2005

- Chinese Horseshoe bats
- Civets
- Live animal markets
- Humans
Time Line to Confirmation of SARS 2002/2003

- November: Unusual respiratory disease detected in China
- December: Unusual cases of disease in China continue
- January: Unusual Cases of Disease in China Continue
- February: China notifies WHO
- March: WHO Issues Global Alert - International Response Begins
- April: Coronavirus ID’d
Unknovns at Start of Outbreak

- Who is affected/at risk of infection?
- What is the clinical picture?
- What is the incubation period?
- What is the source of infection?
- How and when is the infection transmitted?
- What is the etiology– is there a diagnostic test?
- How can transmission be prevented?
- How can transmission be contained?
- What are effective treatments?
CDC SARS Investigation 2003

May 1, 2003

Response Teams

- Clinical and Infection Control
- Epidemiology
- Laboratory
- Global Migration and Quarantine
- Information Technology
- Team “P”
- Team “B”
- Special Investigations
- International / WHO
- Occupational Health
- Communications
- Environmental
- Community Outreach

Field Teams

- Domestic
- Canada
- Singapore
- Thailand
- Vietnam
- China
- Hong Kong
- Taiwan
CDC’s Staff Deployed Internationally

- Assigned to and participated in WHO teams
- Disease surveillance
- Epidemiologic Studies
- Infection Control
- Occupational issues
- Environmental issues
- Training infection control personnel
CDC Response-- Team B

- Team to think “outside of the box” apart from immediate response efforts
- Etiology, prevention, response, treatment
- Animal Coronavirus Experts consulted
  - Niels Pederson, UC Davis, feline coronaviruses
  - Linda Saif – bovine coronaviruses
  - Swine coronavirus
HP AIV H5N1
Isolation of Avian Influenza A(H5N1) Viruses from Humans -- Hong Kong, May-December 1997

A strain of influenza virus that previously was known to infect only birds has been associated with infection and illness in humans in Hong Kong. The first known human case of influenza type A(H5N1) occurred in a 3-year-old child who died from respiratory failure in May 1997. In Hong Kong, the virus initially was identified as influenza type A, but the subtype could not be determined using standard reagents. By August, CDC; the National Influenza Center, Rotterdam, the Netherlands; and the National Institute for Medical Research, London, United Kingdom, had independently identified the virus as influenza A(H5N1). An investigation conducted during August-September by the Hong Kong Department of Health and CDC excluded the possibility of laboratory contamination. Since this initial case was identified, six additional persons in Hong Kong have been confirmed to have influenza A(H5N1) infection, and two possible cases have been identified. This report summarizes the nine cases identified thus far and describes preliminary findings from the ongoing investigation, which indicate that multiple influenza A(H5N1) infections have occurred and that both the source and mode of transmission are uncertain at this time. Confirmed Cases

Patient 1. On May 9, 1997, a previously healthy 3-year-old boy developed fever, sore throat, and cough. The child's symptoms persisted, and on May 15, he was hospitalized. His illness progressed, and on May 18, he was admitted to the pediatric intensive care unit (ICU). On May 21, the child died from acute respiratory distress secondary to viral pneumonia. Influenza A(H5N1) virus was isolated from a tracheal aspirate collected on May 19. The child may have been exposed to ill chickens before he became ill.
Avian Influenza 2003-2004

- Sudden death of chickens near Seoul
  - H5N1 formally reported on S. Korean farm
- WHO informed 11 children in Hanoi ill with severe respiratory disease
- Press informs WHO of chicken deaths in South Vietnam
- WHO alerts public health officials worldwide
- Authorities report HPAI in VN farms
- H5N1 confirmed in VN
- Thailand reports HPAI on farms; 2 human cases reported

12-Dec 17-Dec 5-Jan 6-Jan 7-Jan 8-Jan 12-Jan 23-Jan
Global Distribution of Reported HP AIV H5N1

2011 (human)
2010 (animal)
FMD UK February-October 2001

- Followed
  - Widespread BSE in cattle (1985-early 1990s)
  - Drop in agricultural income 1995-2000 by 64%

- Trade implications→ eradication
  - Movement restrictions (people and animals)
  - Slaughter on suspicion (clinical signs only)
  - All animals on contiguous farms within 3 km of infected area slaughtered
  - 4-10 M animals slaughtered over 6-8 months

- Agriculture, Service Industry, Tourism, other sectors affected

- Multidisciplinary US team visits Department of Health in the UK regarding public health concerns
Public Health Concerns

- Majority of Concerns Related to Animal Disease Control Options and Carcass Management
  - Environmental Health
  - Occupational Health
  - Behavioral / Mental Health
  - Food Safety and Security
  - Human Disease/Injury/Exposure Surveillance
  - Risk Communication
  - Emergency Preparedness
Lessons Observed

- Public health concerns will arise with an FMD outbreak
- Public health needs to be at the decision-making table on disease control from the start
- Coordination needed among agricultural & public health agencies
- Regional and local input critical at all stages of decision-making
- Standardized approaches to disease control and response needed across country
- Provide media training on FMD to human and animal health personnel
H.R. 3858: Pets Evacuation and Transportation Standards Act of 2006

To amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act to ensure that State and local emergency preparedness operational plans address the needs of individuals with household pets and service animals following a major disaster or emergency.
Success Story 5

EVOLVING HUMAN ANIMAL BOND AND IMPORTANCE TO PUBLIC HEALTH
Introduction

Pets provide many benefits to humans. They comfort us and they give us companionship. However, some animals can also pass diseases to people. These diseases are called zoonoses.

Although animals can carry germs, it is important to know that you are more likely to get some of these germs from contaminated food or water than from your pet or another animal you encounter. CDC has created this Web site to provide you with information about the health-related risks of owning and caring for animals. We encourage you to follow the links located throughout this Web site for general information about companion and wild animals and the diseases they can carry.

Many groups encourage people to enjoy the benefits of common household pets. By following CDC’s simple tips on the Healthy Pets, Healthy People Web site, you can enjoy your pets while protecting yourself against diseases they carry.

Because wild animals can carry diseases that are dangerous to people, CDC discourages direct contact with wildlife. You should never adopt wild animals as pets or bring them home. Teach children never to handle unfamiliar animals, wild or domestic, even if the animals appear to be...
HUMAN-ANIMAL MEDICINE
Clinical Approaches to Zoonoses, Toxicants and Other Shared Health Risks

PETER M. RABINOWITZ
LISA A. CONTI

HUMAN-ANIMAL MEDICINE
A Clinical Manual for “One Health”

The unprecedented convergence of human, animal, and environmental health requires new clinical approaches to address global pandemics and emerging disease threats. The “One Health” approach calls for greater communication and cooperation among human health care providers, public health professionals, and veterinary staff to most effectively prevent and control disease. This manual provides practical guidelines for “One Health” collaborations in a wide range of clinical settings. It covers such current topics as zoonoses, the H1N1 virus, the human-animal bond, animal allergy, bites and stings, and animals as “sentinels” for toxic environmental health hazards.

TOOLS FOR INCORPORATING “ONE HEALTH” PRINCIPLES INTO DAILY PRACTICE

- Concise clinical tips for prevention and treatment of the H1N1 virus, zoonoses, animal allergy, bites and stings, psychosocial issues, and toxic exposures shared by humans and animals
- Protocols and sample forms for professional collaboration among human health clinicians, veterinarians, and public health professionals
- Occupational health guidelines for preventive care of animal workers, including veterinary personnel, farmers, pet store employees, and zoo workers
- History forms and checklists for primary care, hospital, home health care, and specialist providers regarding human-animal medicine issues
- Comparative tables of disease signs, diagnoses, and treatment in humans and animals
- Guidelines to detect and improve environmental factors affecting the health of humans and animals
- Legal and ethical aspects of “One Health” that human health providers and veterinarians need to know
Healthy You

Pets can be a prescription for happier, healthier life

By Todd Emery Johnson

We include them in our family portraits, make room for them on our beds, tell them our deepest health and life worries; work with them when they’re sick. And whether they run, fly or swim their way into our hearts, pets are an important part of our lives.

America is a nation of animal lovers. According to the National Pet Owners Survey, about two-thirds of U.S. households own at least one pet, which means 71 million homes provide shelter for at least one furry, feathery or scaly creature. We take good care of our pets, but did you know that our pets also take care of us? A growing body of research suggests that owning and interacting with a pet can improve our health.

Studies show unconditionally, studies show that those wagging pets, purring or hopping bundles of love can reduce your stress levels, lower your blood pressure, curb your depression, reduce feelings of loneliness, keep you physically fit and even help you live longer. Some studies suggested that children who are exposed to furry pets as infants are less likely to develop allergies.

“These are lots of studies showing that pets are good for our health,” says Rebecca Johnson, PhD, RN, director of the Research Center for Human-Animal Interaction at the University of Missouri College of Veterinary Medicine.

Enjoying passive energy

Researchers are busy studying the many ways our pets can benefit our health. Several large studies suggest that PUPS and kids — in addition to having a pet — can improve the way you heart works. A National Institutes of Health study of 430 adults who had suffered heart attacks showed that people owners were significantly more likely to be kicking — and those dogs still kicking — one year later than were petless patients, regardless of how serious the heart attack. In another study of 249 married couples, those owners pets had lower heart rates and blood pressure, both at rest as well as under stress. You best bet can also improve your circulation. A study involving cat owners found they have lower strokes than their feline-fine counterparts.

The reduction in blood pressure through interaction with a companion animal has been shown in many studies,” Johnson says. “We practically the oldest finding we have.”

The “relaxation response” has even been shown when people kiss back and watch their fish swim.

Happy tails

At the end of a long day, who doesn’t enjoy coming home to a cold nose, a wagging tail and a friendly lick? But is it okay to kiss our pets?

It’s not a good idea to let your pets lick you on the mouth, says Jennifer Wright, DVM, a veterinary epidemiologist at the U.S. Centers for Disease Control and Prevention. If you want to kiss your dog or cat, the top of her or his head is the preferred place to plant kisses.

“The rewards you get from your pets American Public Health Association

APHA, The Nations Health, January 2011

Download free copies of Healthy You at www.thenationshealth.org
Success Story #6

THE MEDIA - THE INTERNET

PUBLIC AND PROFESSIONALS OF MULTIPLE DISCIPLINES BECOME AWARE OF LINKS BETWEEN HUMAN, ANIMAL, ENVIRONMENTAL HEALTH

ONE HEALTH
Beef recall hits record 1.2 million pounds
USDA questions delay in recall of E. coli-tainted meat
August 15, 1997
Web posted at: 6:14 p.m. EDT (2214 GMT)
WASHINGTON (CNN) -- The
One Health Initiatives
One Health - Definition

Is the Collaborative Effort of Multiple Disciplines

– working locally, nationally, and globally– to attain optimal health for people, animals, and our environment.

AVMA-AMA One Health Task Force, 2007
National Academy of Science Becomes Aware
Integrated Zoonotic Disease Early Detection and Response System

Adapted from graph in “Sustaining global surveillance and response to emerging zoonotic diseases,” IOM/NRC 2009
US Agencies Take Action

Veterinary Services
2015 Project
One Health
Strategic Direction
CDC Interim Guidance for Workers who are Employed at Commercial Swine Farms: Preventing the Spread of Influenza A Viruses, Including the 2009 H1N1 Virus

This website is archived for historical purposes and is no longer being maintained or updated. For updated information on the 2010-2011 flu season, see the CDC Seasonal Flu website.

November 3, 2009 1:00 PM ET

In April 2009, an outbreak of 2009 H1N1 influenza virus infections were detected in people in North America and then spread around the world. In October 2009, the first case of 2009 H1N1 influenza virus in a pig in the United States was confirmed. Additionally, pig infections with 2009 H1N1 influenza virus have been found in other countries. This interim guidance is current as of the publication date.

On this Page
- Background
- Recognizing the flu in pigs

CDC Interim Guidance for People who have Close Contact with Pigs in Non-commercial Settings: Preventing the Spread of Influenza A Viruses, Including the Novel Influenza A (H1N1) Virus

This website is archived for historical purposes and is no longer being maintained or updated. For updated information on the 2010-2011 flu season, see the CDC Seasonal Flu website.

August 5, 2009 5:00 PM ET

This document has been updated in accordance with the CDC Recommendations for the Amount of Time Persons with Influenza-Like Illness Should Be Away from Others. This document provides interim guidance and will be updated as needed.

On this Page
- Signs of flu in pigs
- Signs of flu in people
- Preventing spread from...
Global Health Careers

Make a World of Difference

www.cdc.gov/globalhealth

The Center for Global Health (CGH) in the Centers for Disease Control and Prevention (CDC) is inviting qualified licensed Physicians and Veterinarians to join us for a hiring event on July 15th 2011 in Atlanta, GA.
International Agencies Take Action
International Agencies Take Action

Strong intersectoral partnerships in health
Managing zoonotic public health risks at the human–animal–ecosystem interface

- Why invest in public health risks at the human–animal–ecosystem interface?
  Domestic and wild animals, and their ecosystems, contribute to the health and well-being of people, the economy, and ecosystems. This area of work requires sharing of responsibilities and coordinating global activities to address health risks at the animal-human-ecosystem interfaces and shifts the focus from mostly short-term intervention to medium and long-term solutions.

The FAO-OIE-WHO Collaboration
A Tripartite Concept Note

Human and Animal Vaccination Delivery to Remote Nomadic Families, Chad
Esther Schelling,*1 Mahamat Bechir,† Mahamat Abdoulaye Ahmed,† Kaspar Wyss,* Thomas F. Randolph,‡ and Jakob Zinsstag*
Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 13, No. 3, March 2007
GLEWS - Global Early Warning and Response System for Major Animal Diseases, Including Zoonoses

Global Early Warning and Response System (GLEWS)

Early Warning
- Disease Alerts
- Trends and Analysis
- Climate change

Emergency Response
- Urgent Intervention
- Coordinated response
- Rehabilitation

FAO | OIE | WHO

Analysis

Additional data
- Other FAO and OIE data
- Refuges
- Climatic data
- Production, Economic data

OIE, FAO, WHO

Disease Tracking Systems
Success Story #7

CAPACITY BUILDING IN ONE HEALTH
Innovations in Veterinary Education

Veterinarians and Public Health: The Epidemic Intelligence Service of the Centers for Disease Control and Prevention, 1951–2002*

Marguerite Pappalooanou ■ Paul L. Garbe ■ M. Kathleen Glynn ■ Stephen B. Thacker

JVME 30(4) © 2003 AAVMC
One Medicine, One Health: Multidisciplinary Research Teams Are Critical to Scientific Discovery

The phrase “one medicine” embodies the view that advances in both human and veterinary medicine depend on overlapping technologies and research discoveries. The concept is not new. The 19th-century German physician Rudolf Virchow, also known as “the father of pathology,” wrote, “Between animal and human medicine, there is no dividing line — not should there be. The object is different, but the experience obtained constitutes the basis of all medicine.”

In recent years, the concept of one medicine has gained momentum, driven by scientific advances that underscore the close connection between human and animal health.

We now know that 60 percent of all infectious diseases in humans are caused by pathogens that cross species lines. Moreover, the ability to sequence entire genomes has revealed that some organisms have roughly the same number of nucleotides — about three billion base pairs — in their genomes and thus more or less the same number of genes. We also know that there is more than 85 percent to 98 percent similarity between related genes in humans and apes, and similarities between mouse and human genes range from about 70 percent to 90 percent.

NCRR has been a steady supporter of one medicine. Our programs are helping veterinarians to participate in translational research teams along with basic scientists and clinicians — their research being driven by the same goals and bound by the same ethical concerns.

In the following pages, you will read about the insights NCRR-supported veterinary scientists are gaining into complex medical problems, such as metabolic disorders, osteosarcoma, multiple sclerosis and hormone replacement therapy. These are exciting stories of scientific discovery that illustrate why collaborative, multidisciplinary teams are critical to addressing the complexity of modern biomedical problems.

NCRR is not alone in recognizing the value of one medicine. Both the American Medical Association and the American Veterinary Medical Association have passed resolutions to unite human and veterinary medicine to improve animal and human health. In addition, two recent National Research Council reports have lauded the concept of one medicine, calling attention to the pressing need for veterinary sciences in biomedical research.

We hope you will enjoy reading this latest issue of the NCRR Reporter and the exciting advances made possible by these and other NCRR programs — each one bringing us a step closer to understanding disease and developing diagnostic tests and treatments for both animals and humans.

Barbara Alving, M.D.
Director, NCRR
Ecology of Infectious Diseases Initiative (EID)

STATUS: Open for applications

Announcement
This joint NIH-NSF program is currently being competed under an NSF program announcement.

- Ecology of Infectious Diseases (EID) Announcement on National Science Foundation Web site
- Full Proposal Deadline: December 14, 2011
  Second Wednesday in December, Annually Thereafter

Purpose
This joint National Institutes of Health (NIH)-National Science Foundation (NSF) initiative supports efforts to understand the underlying ecological and biological mechanisms that govern relationships between human-induced environmental changes and the emergence and transmission of infectious diseases. The highly interdisciplinary research projects funded under this program apply both ecological and biomedical methods, and study how environmental events such as habitat alteration, biological invasion, climate change, and pollution alter the risks of emergence and transmission of viral...
Success Story #8

VETERINARY PUBLIC HEALTH ORGANIZES
Veterinary Public Health Organizes

- OIE
- US Army Veterinary Medical Corps
- US Public Health Service (1945)-Veterinary Category (1947)
- Veterinary Public Health unit at PAHO, 1949
- Veterinary Public Health Unit at WHO, 1950
- FAO, 1945
- Veterinary Public Health Unit at CDC
- American College of Veterinary Preventive Medicine
- National Association of State Public Health Veterinarians
- USAHA
Success Story 9

VISIONARY LEADERS, CHAMPIONS, HEROES
Daniel Elmer Salmon

- First director of Bureau of Animal Health in USDA (1884-1905)
- He gave his name to the *Salmonella* genus of bacteria, which were discovered by Dr. Theobald Smith, and named in his honor
- Eradicated contagious pleural-pneumonia of cattle in the U.S.
- Studied and controlled Texas fever (*Babesia*)
- Established the federal meat inspection program (Upton Sinclair, The Jungle, led to his dismissal– non federal slaughterhouse conditions
- Began inspecting exported livestock and the ships carrying them, began inspecting and quarantining imported livestock
- Studied the effect of animal diseases on public health.
Dr. K.F. Meyer

- Graduate of Veterinary Medical and Medical School
- One of the world's most prodigious investigators in animal diseases and public health
- Zoonoses, foodborne pathogens and protections
- Mentor to other leaders
Dr. Martin Kaplan

- Sole and first veterinarian on staff at WHO – 1949
- Veterinary Public Health Unit at WHO
- Organized, led, expert groups, reports
- Mentor to other leaders
“Human health provides the most logical unifying or apical cause in veterinary medicine’s hierarchy of values”
Figure 1.2. The multiple links veterinary medicine provides between medical sciences and agricultural sciences not only promote man's health in a variety of specific ways, but also provide a basis for more general cross-sectoral cooperation between health and food programs in government.
Dr. James Steele

- Helped establish Veterinary Category in the US Public Health Service
- Integrated veterinary public health into public health programs at US CDC
- Consulted on VPH program – WHO Organizing Committee
- Raised visibility of zoonotic diseases to leaders in human health
I would like to put forth the notion that the veterinary profession should serve humanity.

Those who are responsible for the professional education in the veterinary sciences should grasp this idea and begin to guide our training centers to the three principal services benefiting humankind:

Agriculture, biology and public health.

I believe that if we were to do any less, we would fail in our mission...
The work of the veterinary profession and veterinary services... now recognized as a global public good.

Support for them in developing and transitional countries is a priority .. to promote development around the world, .. to protect the world against the spread and the re-emergence of animal diseases and zoonoses.”

- Stresses importance of sharing scientific information
- Promotes veterinary services and a continued commitment to food safety and animal welfare.
- Gives visibility to positive impact of animal health policies on poverty reduction and public health.

Dr. Bernard Vallat
Summary

20th and early 21st Century Successes

- Eradication and control of major food animal diseases
- Globalization, One Health, Sustainability
- Public health officials sensitized to importance of information from animal and environmental health experts
- Public and policy-makers begin to understand links between development, agriculture, health, ecosystem health
- Food security, safety, defense, emerging diseases, emergency response, national defense (soft power)
Summary
20th and early 21st Century Successes

- Accounting for Human animal bond – changing relationships with animals
- Animal Welfare Considerations, all animals
- Strengthened cooperation across WHO, OIE, FAO
- Cooperation among laboratories, disciplines
- Comparative medicine approaches to research
- Integration of education, training programs across sectors and disciplines
- Science– genetics, diagnostics, vaccines, alternatives to antimicrobials
Thank you!