

# RABIES: A NEGLECTED, RE-EMERGING ZOOONOSIS



Accessible version: [https://youtu.be/\\_NE\\_MLYadZ0](https://youtu.be/_NE_MLYadZ0)

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*Chief, Rabies Program*

Division of High Consequence Pathogens and Pathology  
National Center for Emerging and Zoonotic Infectious Diseases  
Centers for Disease Control and Prevention



# Myths about Rabies



**Rabies is rare**

**Rabies is not widespread**

**Nothing can be done to make an impact towards  
rabies elimination**

# Rabies 101

- ❑ **An acute, progressive viral encephalomyelitis**
- ❑ **The highest case fatality rate of any conventional etiological agent**
- ❑ **Leading viral zoonosis**
  - International burden
  - Veterinary and public health significance
- ❑ **Distributed on all continents but Antarctica**
- ❑ **One of the oldest described infectious diseases, known for more than 4 thousand years**

# Rabies: An Ancient Disease

## ❑ 2300 BC

- Dog owners in Babylon fined heavily for deaths caused by their dogs biting people

## ❑ 800–700 BC

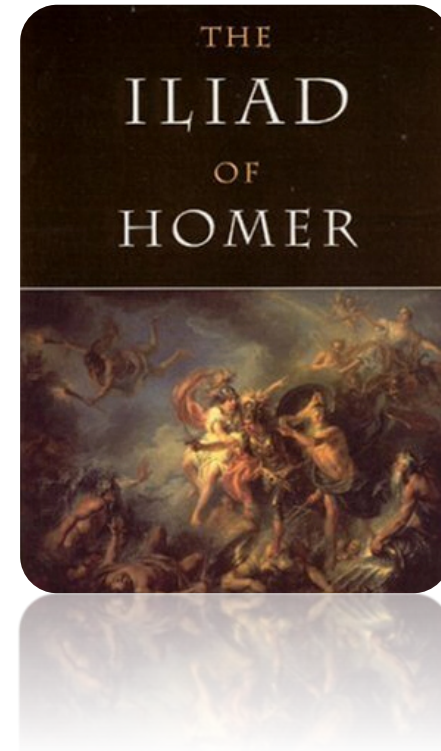
- Homer likens Hector to a “raging dog” in *The Iliad*

## ❑ 1271

- 1<sup>st</sup> large rabies outbreak reported (Germany)

## ❑ 1703

- 1<sup>st</sup> case of rabies reported in the Americas by a priest in Mexico



# Rabies: Etiology



## □ RNA viruses in the family *Rhabdoviridae*, genus *Lyssavirus*

- The type species of the genus is Rabies Virus
- Historically, at least 6 other lyssavirus species cause rabies, some lacking cross reactivity to commercial biologics
- Recently, the International Committee on Virus Taxonomy ratified 4 new lyssavirus species from Eurasian bats
- Additional pathogen discovery is expected

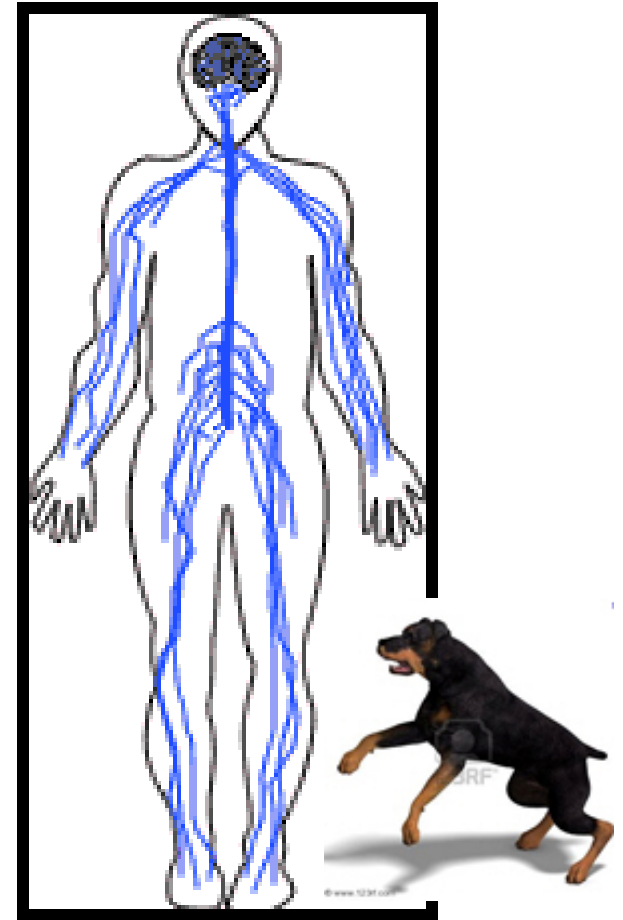
## □ All mammals appear susceptible; major reservoirs

- Carnivora: Dogs, foxes, raccoons, skunks, etc.
- Chiroptera: Insectivorous, hematophagous, and frugivorous bats



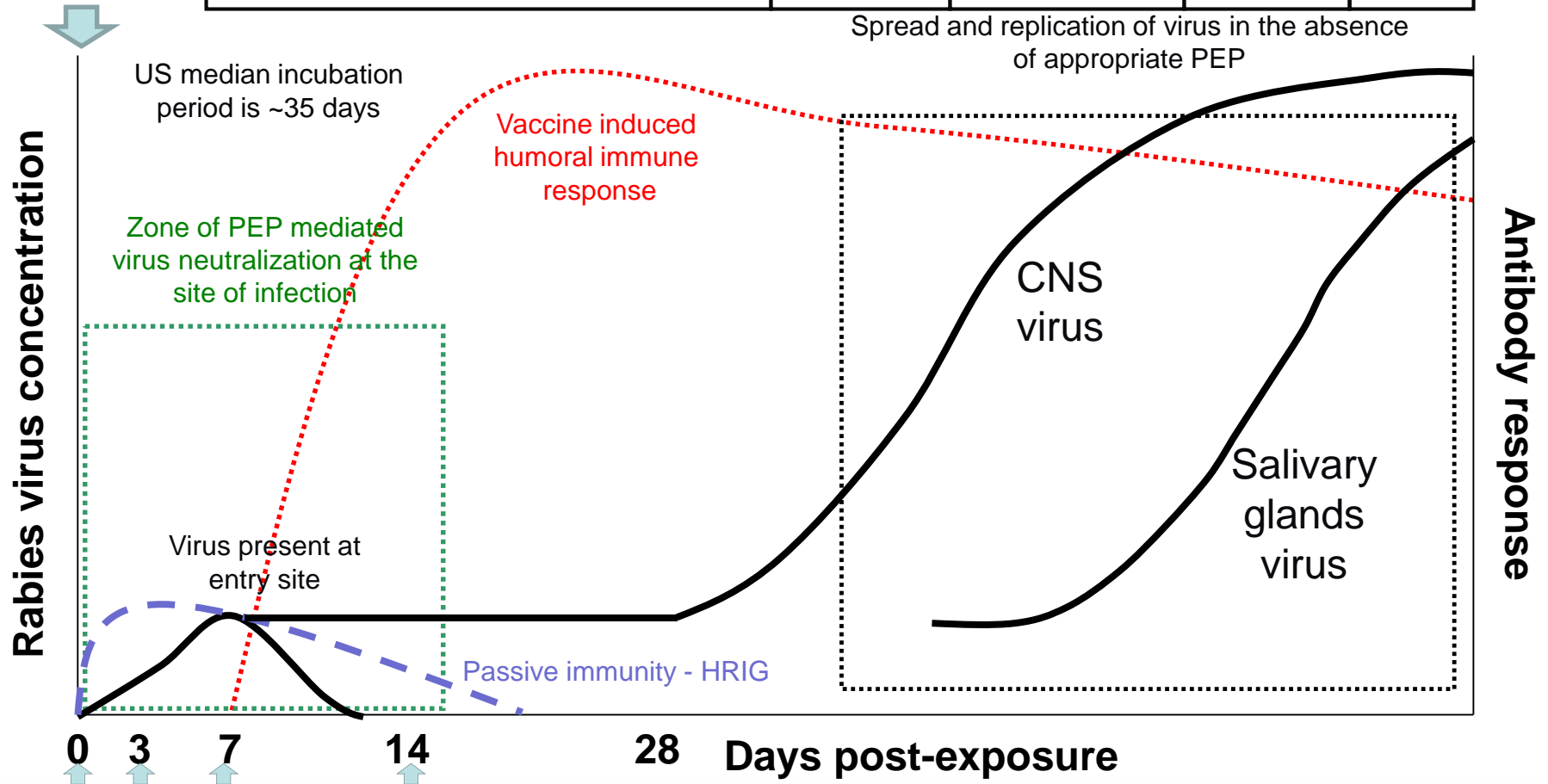
# Rabies: Pathogenesis

- ❑ **Transmission primarily via bite**
- ❑ **Viruses are highly neurotropic**
  - Enter peripheral nerves
  - Centripetal travel by retrograde flow in axoplasm of nerves
  - Replicate in CNS
  - Centrifugal flow to innervated organs, including the primary portal of exit, the salivary glands
- ❑ **Viral excretion in saliva**



# Infection

Incubation period (5 days to > 2 years)	Prodrome (0-10 days)	Acute neurologic period (2-7 days)	Coma (5-14 days)	Death
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# Rabies: Clinical Stages

## ❑ Incubation period

- Range: 6 days to >2 years
- Average: 4–6 weeks

## ❑ Prodromal stage

- Nonspecific signs

## ❑ Acute neurologic phase

## ❑ Coma

## ❑ Death

- Vs. extremely rare reports of experimental treatment and recovery from rabies after the onset of clinical signs





# Rabies: Diagnosis

- ❑ **History of animal exposure and typical neurologic clinical signs**
- ❑ **Laboratory diagnosis**
  - Gold standard: Postmortem demonstration of viral antigens in CNS by DFA
  - National laboratory protocol in 2000
  - In humans, antemortem detection of virus or viral amplicons, antibodies, or antigens (sera, CSF, saliva, nuchal biopsy)



# Rabies: Global Burden

- ❑ **Human rabies exposures/year: Tens of millions**
- ❑ **Estimated human rabies deaths/year: >55,000**
  - Africa (rural): 3.6/100,000
  - India (rural): 2.5/100,000
  - Pakistan: 1.2/100,000
  - China: 0.2/100,000
- ❑ **Most cases occur in Africa and Asia, and in children**
- ❑ **Reservoirs**
  - **Domestic dog: Single most important animal reservoir**
  - **Wildlife important, especially in developed countries of Europe and North America**

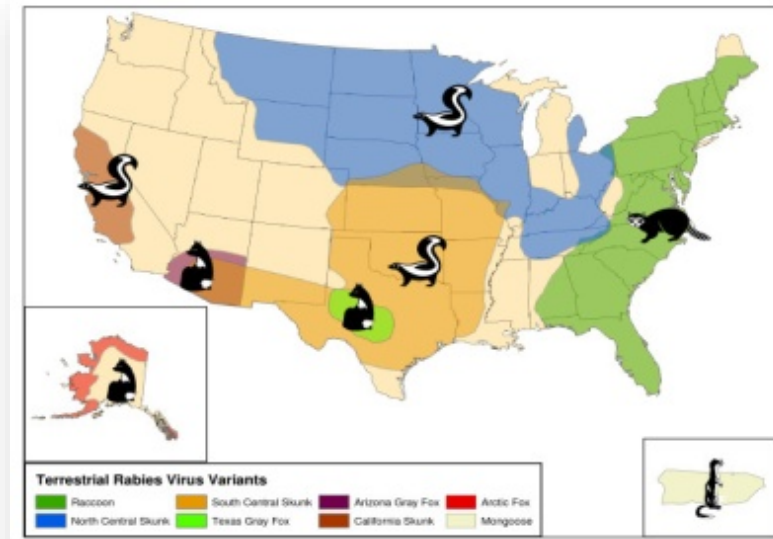
# Rabies in the United States

## ❑ Human rabies: Uncommon

- 20,000–40,000 exposures/year
- 1–8 cases/year

## ❑ Animal rabies

- 7,000 –10,000 cases/year
- Dog rabies transmission eliminated
- Wildlife hosts include raccoons, skunks, foxes, mongooses (Puerto Rico), and bats
- Distributed in every state but Hawaii

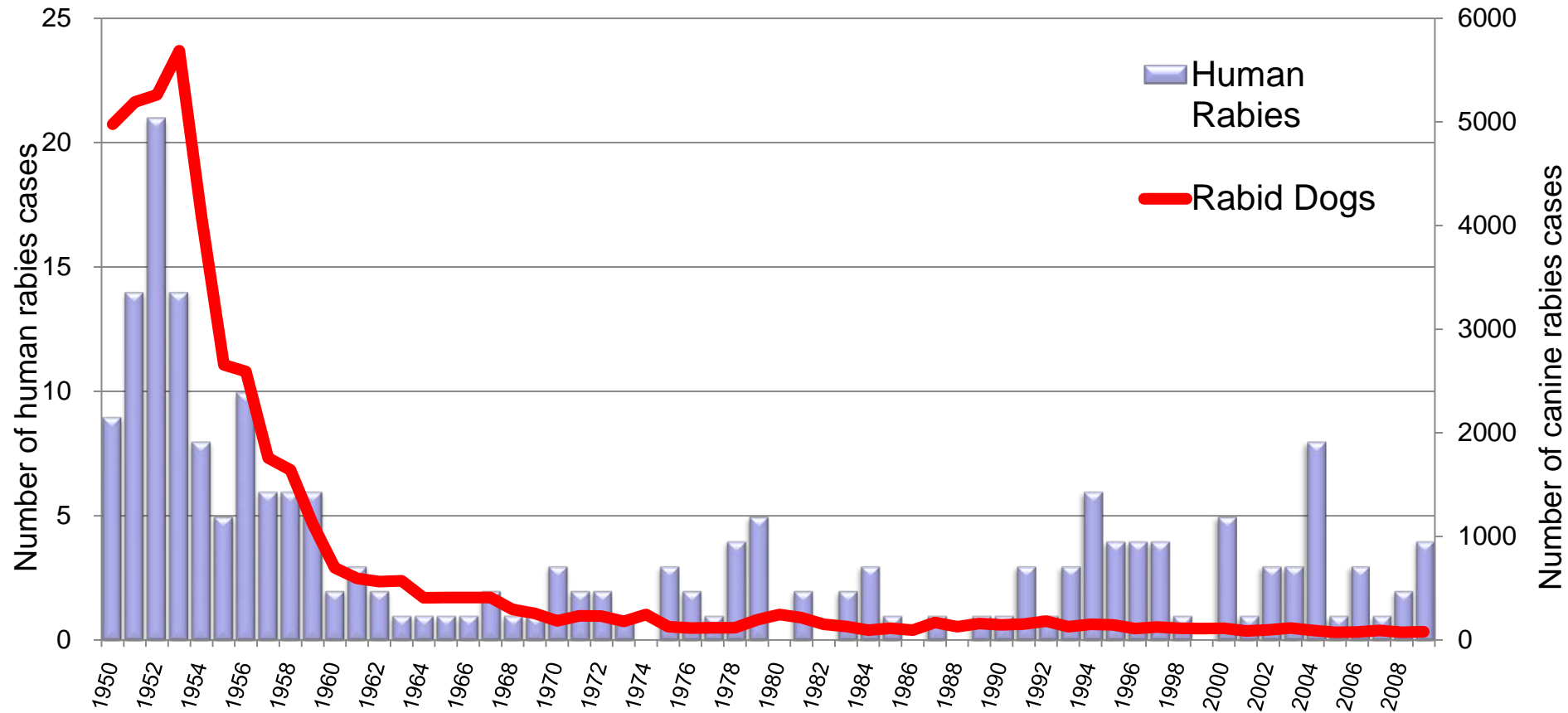


# Why Focus on Dogs?

- ❑ Worldwide >90% of rabies exposures are from dogs
- ❑ Worldwide >99% of human rabies deaths are via dogs
- ❑ Bite wounds, stress, and trauma from dogs rabies
- ❑ Rabies control and elimination is possible in dogs
- ❑ Roaming infected dogs are obstacles to success
- ❑ Oral Rabies Vaccination (ORV) and contraception hold promise to enhance rabies control



# Rabies in the United States: Effect of Animal Control on Human Fatalities



# Rabies: Foundations of Prevention and Control

- ❑ Dog rabies vaccination, *en masse*
- ❑ Minimization of human exposures to infected animals
- ❑ Prompt wound care and prophylaxis with vaccine and rabies immune globulin after exposure
- ❑ Regulations to support the disease-free status of many localities, due to the introduction of rabid animals (e.g., Bali)



# Goals Towards Global Rabies Prevention and Control in the 21<sup>st</sup> Century

- ❑ **Counter viral emergence from wildlife reservoirs**
- ❑ **Develop humane methods for population management of free-ranging animals**
- ❑ **Translate progress in canine rabies elimination**
  - From developed to developing countries
  - On a realistic, sustainable, regional basis
  - Based upon ideal models
- ❑ **Create of new international advocacy and effective blueprints for rabies prevention and control**
- ❑ **Establish dynamic, multidisciplinary partnerships via renewed intersectoral cooperation**

# RABIES MANAGEMENT AT THE HUMAN-ANIMAL INTERFACE



**Dennis Slate, MS, PhD**  
*National Rabies Management Coordinator*  
US Department of Agriculture  
Animal and Planet Health Inspection Service  
Wildlife Services





# Impact of Dog Rabies on Humans

- ❑ Worldwide, 90% of rabies exposures are from dogs
- ❑ Worldwide, 99% of human rabies deaths are from dogs
- ❑ Bite wounds, stress, and trauma from dogs rabies



- ❑ Burden of coexistence with dog rabies
- ❑ Rabies transmission at the dog–wildlife interface

# Dog Subpopulations: A Challenge to Achieving Control of Dog Rabies



## Home- Owned Pet

Specific owner: 72 million dogs in the US (2007)  
Generally accessible for vaccination by injection

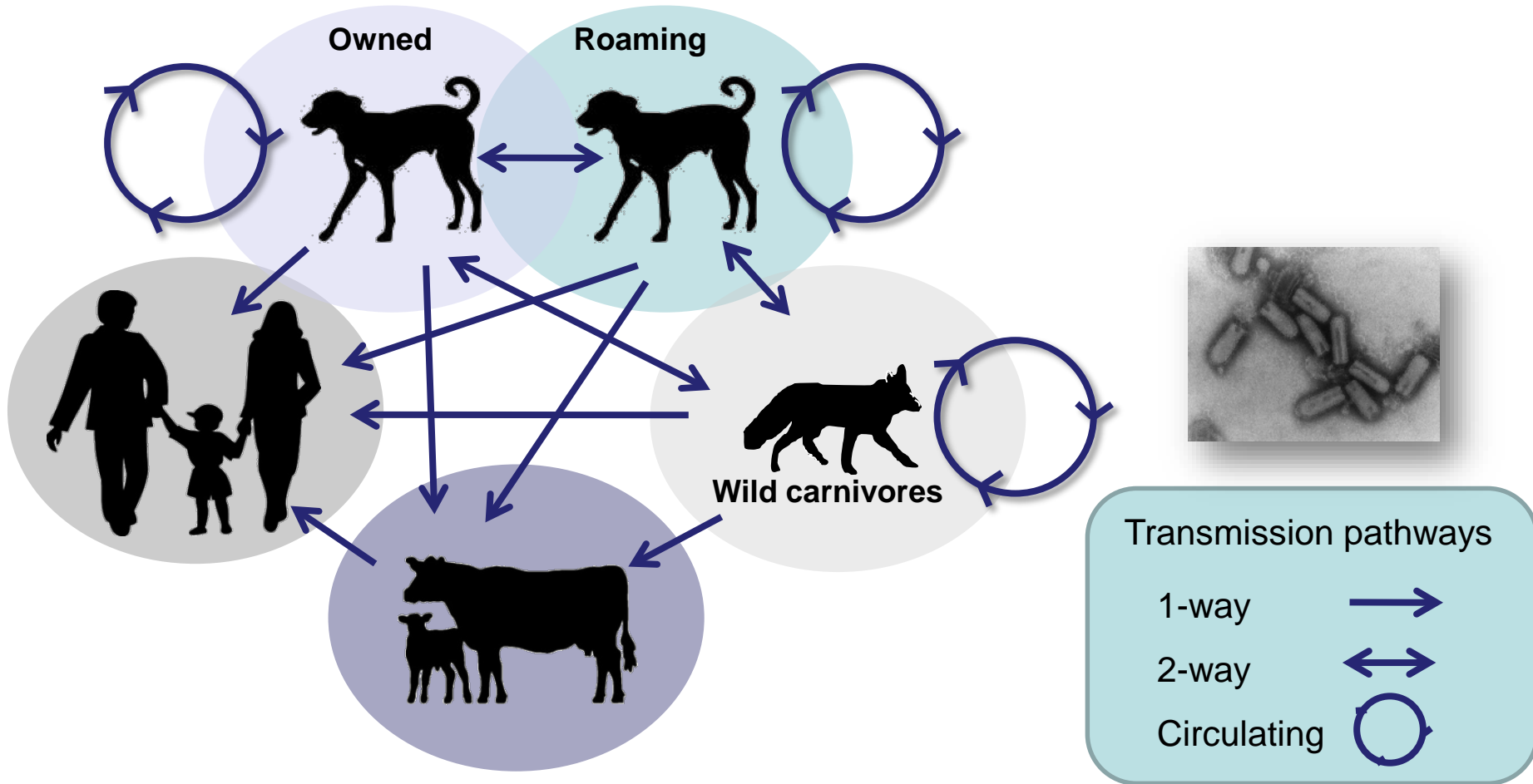


## Feral Roaming Street Community

No specific owner  
Not easily accessible for vaccination by injection



# Dog Rabies: Dynamics of Virus Transmission and Exposure



# Challenges for Control of Dog Rabies

- ❑ **Achieving adequate immunity in owned-dog population (50-70% level)**
- ❑ **Vaccination of free-roaming dogs**
- ❑ **Dog overpopulation may impede or prevent rabies control success**
- ❑ **Virus spillover at the dog-wildlife interface may confound success of dog and wildlife rabies control**

# Dog-Wildlife Interface

## Achieving objectives of dog and wild carnivore rabies control Profound conservation impacts

Species	Interface Event	Consequence
*African wild dog 	Spillover of canine variant into African wild dog	Threatens local extirpation
*Ethiopian wolf 	Spillover of canine variant into Ethiopian wolf	Threatens species extinction
Coyote 	Spillover of canine variant from Mexico into coyote	Creates a public health emergency in south Texas
Gray fox 	Spillover of gray fox variant into dog	Confounds success of ORV in gray foxes

\* Endangered species



# Effective Control of Dog Rabies May Require Integration of Additional Tools

- ❑ Education
- ❑ Quarantine
- ❑ Injectable vaccination campaigns
- ❑ Oral Rabies Vaccination (ORV)
- ❑ Contraception

**MMWR™**

*Recommendations and Reports*

April 18, 2008 / 57(RR02);1-9

Compendium of Animal Rabies Prevention and Control, 2008\*  
National Association of State Public Health Veterinarians, Inc. (NASPHV)



# Oral Rabies Vaccination Basics

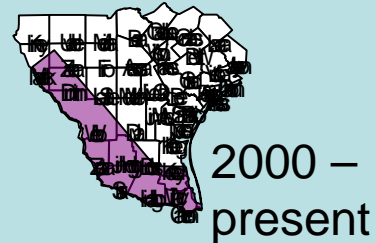
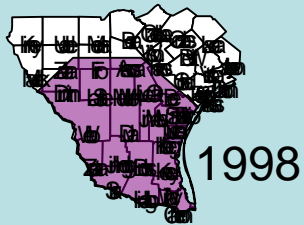
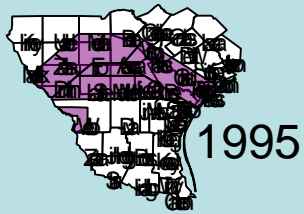
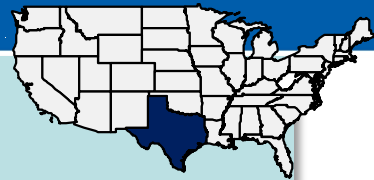
- ❑ **Delivering a vaccine-bait to a target species for consumption to create herd immunity**
- ❑ **Canada, Europe, and the United States are primary users**
  - 42,166,134 ORV doses in 2009
- ❑ **Cost is a potential limiting factor (\$1.23/dose)**
- ❑ **Led to elimination of specific rabies variants at the landscape scale**



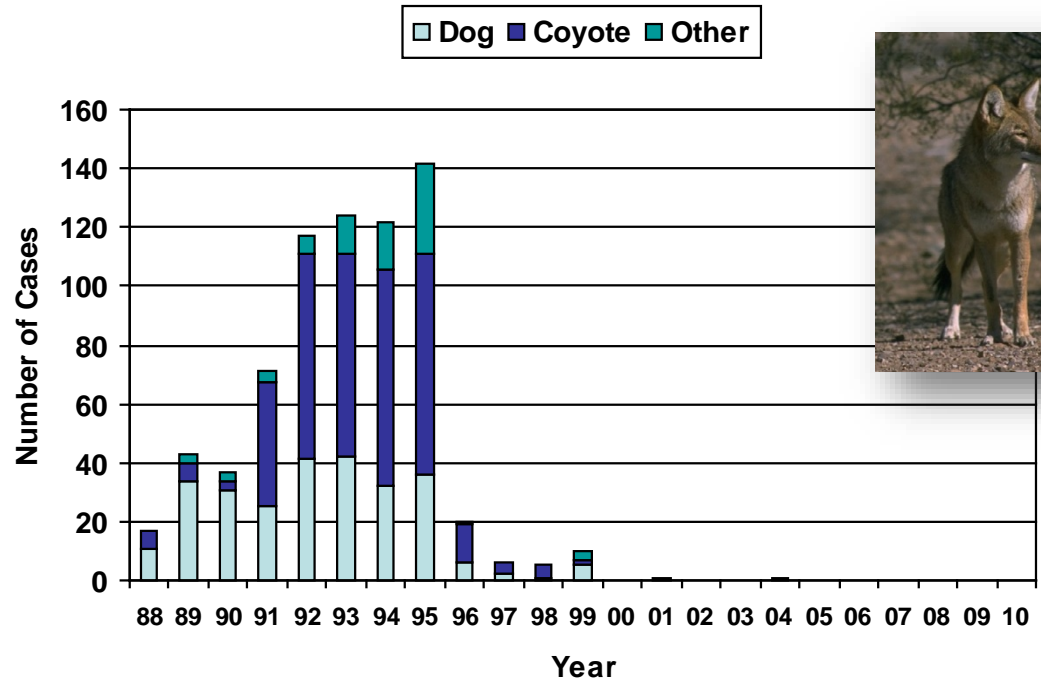
ORV, Oral rabies vaccination



# Strategic Application of ORV in Texas



South Texas ORV zones



Canine variant rabies cases in south Texas: 1988-2010.

**Canine rabies spillover into coyotes**  
**Integration of ORV contributed to canine rabies elimination**  
**US declared free of canine rabies in 2007**

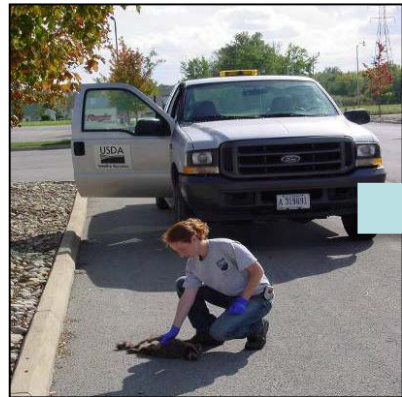
ORV, Oral rabies vaccination





# Enhanced Rabies Surveillance

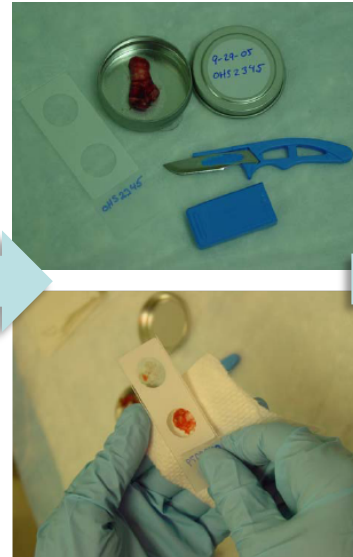
## dRIT- direct Rapid Immunohistochemistry Test



Road kill sample



Collecting brainstem sample



Slide preparation

Test determination via light microscope



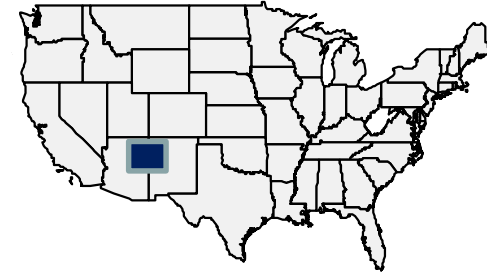
negative

positive

**Inexpensive, quick and accurate test for detecting rabies**  
**Used in the US to enhance rabies surveillance to support ORV**

# ORV Handout Trails to Vaccinate Free-ranging Dogs on Navajo Lands, Arizona 2006

- ❑ 373 dogs hand baited with Raboral V-RG
- ❑ 33/104 dogs tested had rabies virus neutralizing antibodies



ORV, Oral rabies vaccination



# Current and Future Contraceptive Approaches

## ❑ Surgery

- Intrusive, expensive, time-consuming, postoperative infections
- High efficacy

## ❑ Injectable EsterilSol™ (zinc gluconate)

- Males only, anesthetic to inject testicles, permanent contraceptive
- Currently not licensed in the United States

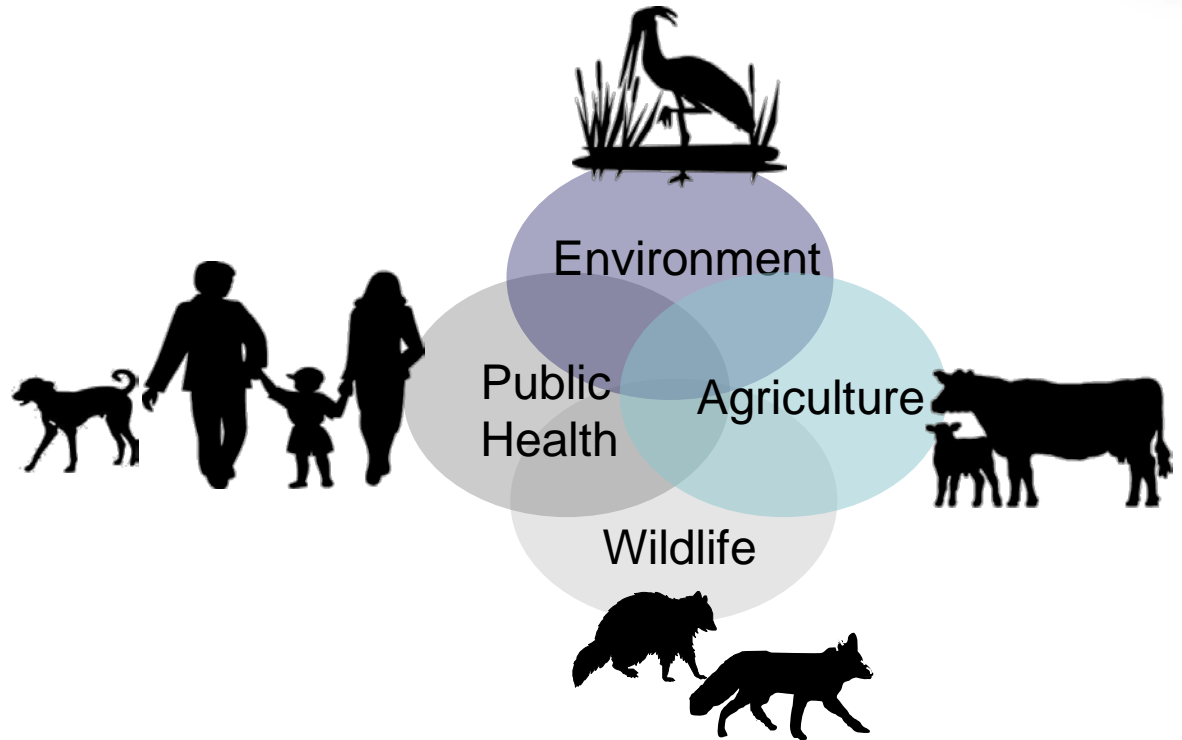
## ❑ Injectable GonaCon™ (GnRH vaccine)

- Immunocontraceptive effect persists 3–4 years in some species
- Effective in males and females for population control effects
- Captive dog trials underway with new formulation to evaluate adverse local immune reactions (e.g., granulomas)

# North American Rabies Management Plan

## International Collaboration and Coordination

- ❑ Information transfer
- ❑ Surveillance and monitoring
- ❑ Rabies control
- ❑ Research



# Successful Dog Rabies Control

## □ Injectable vaccination campaigns for companion dogs

- Integrates:
  - Contraception to reduce dog fecundity
  - ORV targeting free roaming dogs and wildlife



# NEW APPROACHES TO RABIES ELIMINATION IN LATIN AMERICA



**Luis Fernando Leanes, MVD, MSc**

*Regional Advisor*

Zoonosis Diseases – Veterinary Public Health

Pan American Health Organization (PAHO)

World Health Organization





**Pan American  
Health  
Organization**



Regional Office of the  
World Health Organization



**World Health  
Organization**

- |  |  |
|--|--|
|  Anguilla               |  Cayman Islands                     |
|  Antigua and Barbuda    |  Chile                              |
|  Argentina              |  Colombia                           |
|  Aruba                  |  Costa Rica                         |
|  Bahamas                |  Cuba                               |
|  Barbados               |  Dominica                           |
|  Belize                 |  Dominican Republic                 |
|  Bermuda                |  El Salvador                        |
|  Bolivia                |  Ecuador                            |
|  Brazil                 |  US/MEX Border                      |
|  British Virgin Islands |  French Guiana                      |
|  Canada                 |  Grenada                            |
|  Guadalupe              |  Paraguay                           |
|  Guatemala              |  Peru                               |
|  Guyana                 |  Puerto Rico                        |
|  Haiti                  |  Saint Kitts and Nevis              |
|  Honduras              |  Saint Lucia                       |
|  Jamaica              |  Saint Vincent and the Grenadines |
|  Martinique           |  Suriname                         |
|  Mexico               |  Trinidad and Tobago              |
|  Montserrat           |  Turks and Caicos Islands         |
|  Netherlands Antilles |  Uruguay                          |
|  Nicaragua            |  US                               |
|  Panama               |  Venezuela                        |



# Overview

- ❑ Political decisions and mandates
- ❑ Epidemiological trends and progress made
- ❑ Remaining challenges
- ❑ Strategy for elimination and prevention of human rabies



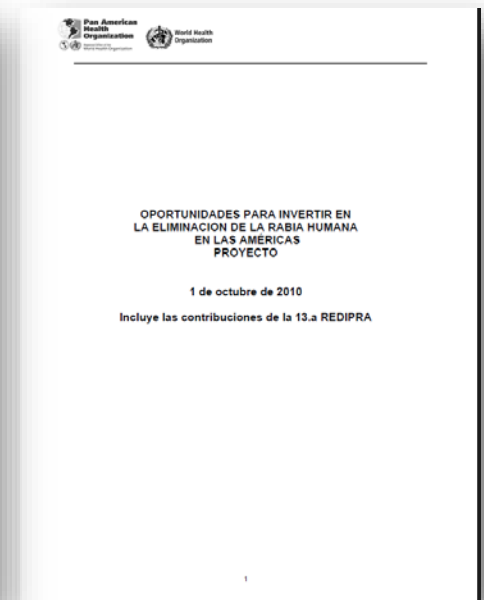
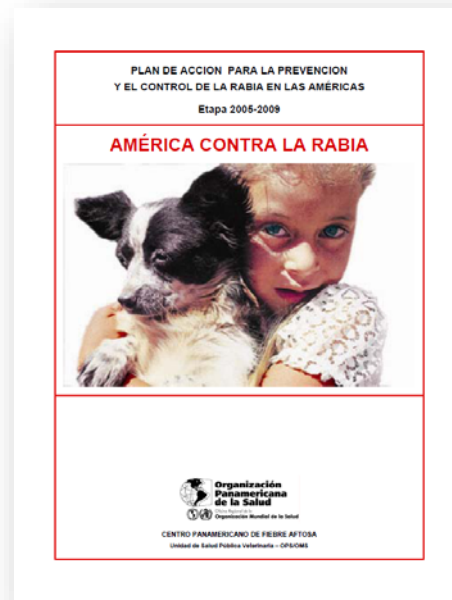


# Political Decision and Mandates

- ❑ **1983: 3<sup>rd</sup> Ministries of Health and Agriculture and PAHO Directive Council**
  - Launched rabies elimination initiative fostering National Plans
- ❑ **2008: PAHO Directing Council**
  - Elimination of human rabies transmitted by dogs by 2012
- ❑ **2010: Regional Meeting of the National Directors of Rabies Control Programs in Latin America (REDIPRA)**
  - Follow up of National Plans through 13 PAHO-sponsored meetings of National Rabies Directors with OIE, WSPA, GARC, and CDC

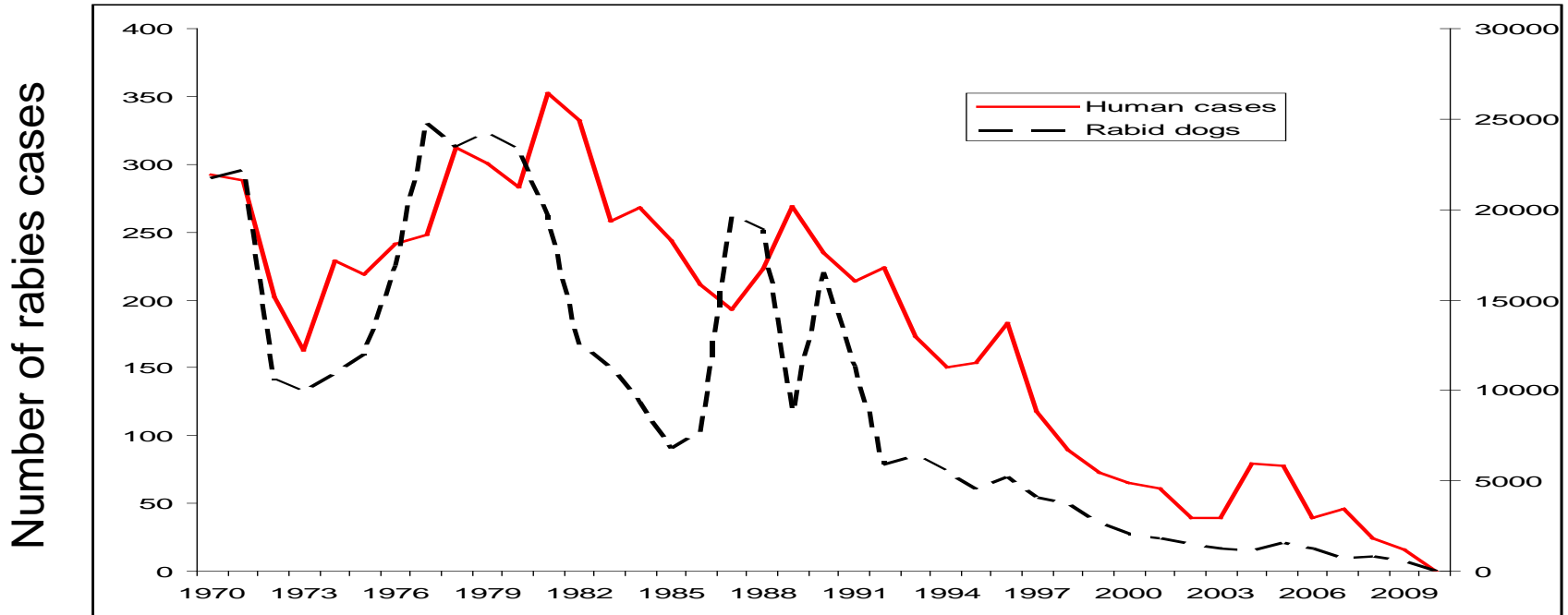
# National Plans

- ❑ Surveillance
- ❑ Pre- and post-exposure prophylaxis
- ❑ Veterinary vaccination schemes and dog population control



# Epidemiological Trends of Human and Canine Rabies Cases (N=7,228)

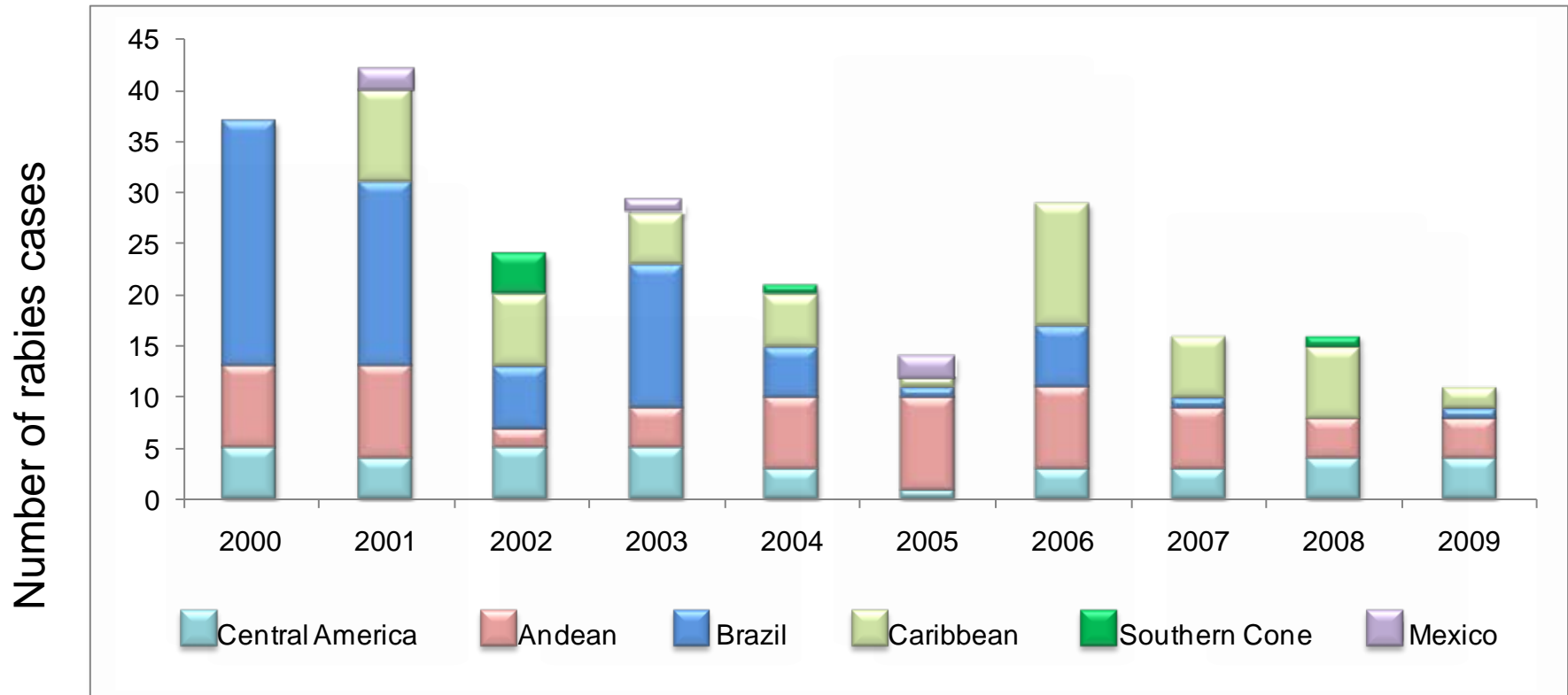
## Latin America, 1970–2009






1984: >300 human cases

2009: 19 human cases; 95% reduction of human and dog cases

# Epidemiological Trends: Human Rabies Cases Transmitted by Dogs (N=239) Latin America, 2000–2009



# Circulation of Rabies among Dogs Latin America, 2010

-  **Areas of low risk:**  
Achieved interruption of circulation  
of rabies among dogs
-  **Areas of moderate risk:**  
Non sustained circulation of rabies  
among dogs
-  **Areas of high risk for human rabies:**  
Sustained circulation of rabies among  
dogs



# Remaining Challenges: Human Rabies Transmitted by Dogs

- ❑ **Inadequate supply for canine vaccination**  
ELS, HON, DOR, HAI, CUB, BOL
- ❑ **Limited capacities for PEP**  
GUT, ARG, DOR
- ❑ **Coordination at local level**  
GUT, MEX, VEN, BRA
- ❑ **Coordination at borders**  
ELS-HON, HAI-DOR, ARG-BOL, PER-BRA



# Remaining Challenges: Wild Reservoirs – Human Cases

## Latin America, 2000–2009

Transmission by	Mexico	Cent- Am	Andean	Caribbean	Brasil	South- Cone	Total
Dogs	5	37	61	54	76	6	239
Vampire bats	4	3	69	0	73	0	149
Non-haematophagous bats	7	0	0	3	0	1	11
Non-specified bats	10	0	3	0	1	1	15
Cats	0	2	3	1	3	0	9
Cattle and horses	1	0	1	0	2	0	4
Wild carnivora	8	1	0	1	0	0	10
Not specified	0	4	10	2	8	1	25
<b>Grand Total</b>	<b>35</b>	<b>47</b>	<b>147</b>	<b>61</b>	<b>163</b>	<b>9</b>	<b>462</b>

# REDIPRA Strategies to Prevent Human Rabies

## Strengthen National Programs

- ❑ **Avoid relaxation when there are no human cases**
- ❑ **Manage urban transformations**
  - Stray dogs and migration
- ❑ **Prevent circulation of rabies among dogs and wild *Carnivora***
- ❑ **Ensure access to health care and human pos- and pre-exposure prophylaxis**



# One Health Approach

- ❑ **Veterinary vaccination schemes**
- ❑ **Diagnostic surveillance based on CDC monoclonal antibodies and molecular typing**
- ❑ **Animal control and welfare**
- ❑ **Post-exposure and pre-exposure prophylaxis**



**Interdisciplinary collaborations in all aspects of health care  
for humans, animals and the environment**

<http://onehealthinitiative.com>



# RENEWED ADVOCACY AND EFFECTIVE PARTNERSHIPS FOR RABIES PREVENTION AT THE COMMUNITY LEVEL



**Deborah J. Briggs, PhD**  
*Director*  
Global Alliance for Rabies Control



# Why Do People Still Die of Rabies?

- ❑ **Lack of awareness on all levels about**
  - Responsible pet ownership – vaccinating pets
  - Need for post-exposure prophylaxis (PEP)
  - Primary wound care
- ❑ **Rabies immunoglobulin (RIG) not available**
- ❑ **Rabies vaccines not available**
  - Greater cost of travel
  - Increased risk of rabies onset
- ❑ **Rabies vaccines are too expensive**
  - Likelihood of giving up
  - Delays because of need to raise money



# Overview

- ❑ **Global partnerships and efforts for rabies prevention**
- ❑ **From blueprint to local implementation**



# Recent Examples of Innovative Programs for Global Rabies Prevention and Control

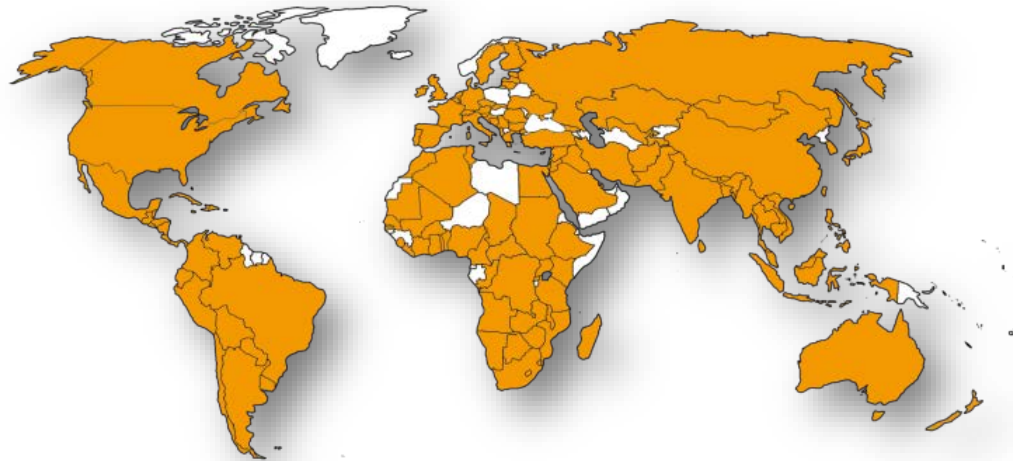
- ❑ **World Rabies Day, launched 2007**
  - Focal point for increasing global awareness
- ❑ **Global Alliance for Rabies Control, established 2007**
  - Registered 501 c3 in US; registered charity in Scotland
- ❑ **Partners for Rabies Prevention, established 2008**
  - Informal group of global stakeholders
  - Public, private, NGOs, funding organizations
- ❑ **E-global communications**
  - Bank of free educational materials
- ❑ **Pilot projects for One Health rabies control**
  - Example: Bohol Philippines, 2007–2011

# World Rabies Day September 28



## □ Since September 2007...

- 135 participating countries
- 150+ participating schools of public health, veterinary and medical colleges have hosted one or more 'rabies-awareness' events
- ~300K Web visitors, 214 countries/territories



GLOBAL ALLIANCE  
FOR  
RABIES CONTROL

World Rabies Day is an  
initiative of the Global Alliance  
for Rabies Control

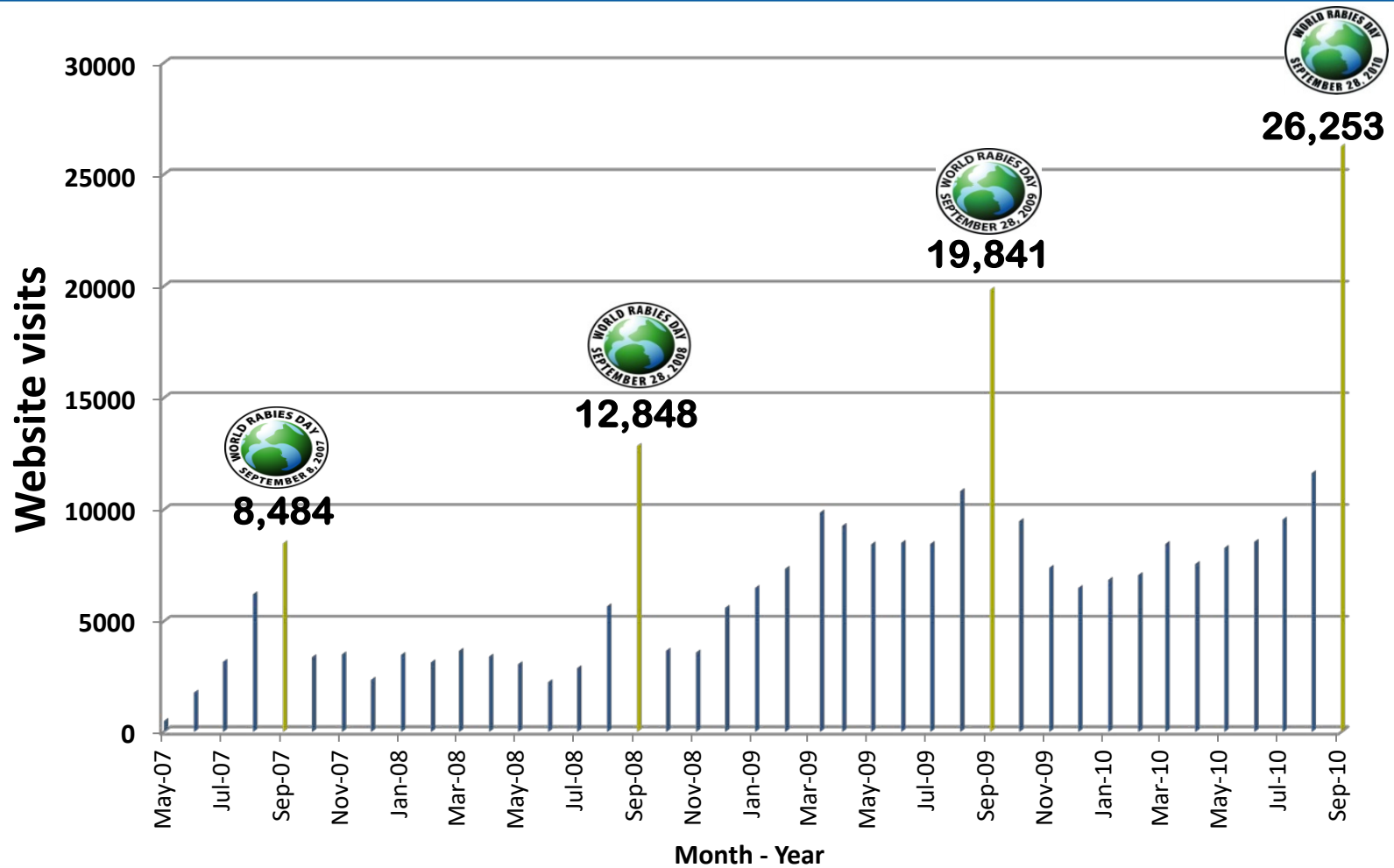
### Find out more:

- > Our Mission
- > Plan an Event
- > Perspectives
- > Veterinary Resources
- > Latin America Best Event
- > Rabies Vacc. Guide

**New Video!**  
"Understanding Rabies"

[www.worldrabiesday.org](http://www.worldrabiesday.org)





# Impact of World Rabies Days

- **Since September 2007...**
  - >1,200 reported events
  - 4.6 million animals vaccinated
  - 150 million people educated

Children bringing pets to be vaccinated  
in Napak, Uganda during WRD 2010  
Photo: Dr Inangolet Francis Olaki





# Impact of World Rabies Days

- ❑ New animal vaccination programs in endemic countries
- ❑ New and invigorated educational programs
- ❑ Global community networks
- ❑ Listed on UN website of globally observed health days



Classroom education in Iraq



Vaccination clinic in Mozambique

# Impact of World Rabies Day: Mozambique

## ❑ Prior to World Rabies Day 2007

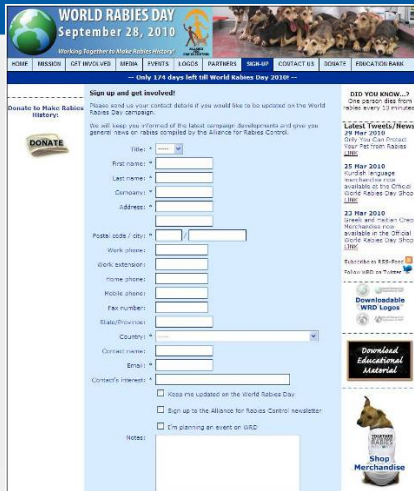
- Dogs unvaccinated due to local superstition
- Lack of support from government
- Basic educational materials not available

## ❑ As of World Rabies Day 2010

- Partnership between veterinary clinics and Maputo Veterinary University
- Multiple vaccination clinics held throughout Mozambique
- National government funding rabies vaccinations on WRD
- Education of locals; construction of animal record database



# Communications Outreach From First Contact to Action



**WORLD RABIES DAY**  
September 28, 2010

Working Together to Never Allow Rabies History

HOME | MISSION | GET INVOLVED | MEDIA | EVENTS | LOGOS | PARTNERS | BACKUP | CONTACT US | DONATE | EDUCATION BANK

Only 172 days left till World Rabies Day 2010!

Sign up and get involved!  
Please send us your contact details if you would like to be updated on the World Rabies Day 2010 history.

**DONATE**

Did you know...? One 2010 USD from every 100 USD donated every 10 minutes goes to support the Alliance for Rabies Control.

**Labels, Tweets/News:** Only You Can Prevent Your Pet From Getting Rabies

**28 Mar 2010:** Journal: engage with the world's rabies experts available on the official World Rabies Day blog

**23 Mar 2010:** Events and activities available on the official World Rabies Day blog

Registration is now open! Release it to Twitter

**Downloadable WVD Logos**

**Download Educational Material**

**Shop Merchandise**

Fields: First Name, Last Name, Company, Address 1, Address 2, Postalcode, City, Workphone, Work extension, Home phone, Mobile phone, Fax Number, Email, Contact's interest, News!

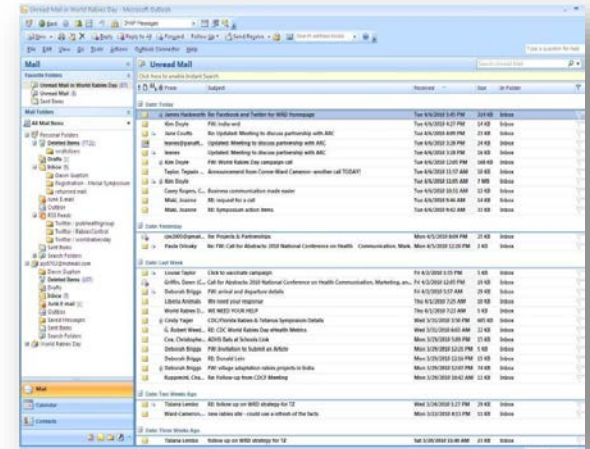


**FORM SUBMISSION**

back to search results next >

FIELD	VALUE
ID	776
Title	Dr
Firstname	HTSHAM
Lastname	UL-HAQ
Company	Govt Hospital
Address1	HI-532 MAIN ROAD, SECTOR Q6-1
Address2	
Postalcode	ISLAHABAD
City	ISLAHABAD
Workphone	
Workextension	
Homephone	0092527002429
Mobilephone	00923218-37939
Fax	
State	
Country	PAKISTAN
Contactname	
Email	htsham@doctor.com
Interest	Anaesthesia, Intensive care & Pain
Keptupdated	yes
Newswalter	yes
Event	yes
Note	interesting in eradicating rabies from Pakistan. Guide me how we can get started, provide me contacts of people are in my country fighting for the cause. save our children
Send	
Date	Jan 28th, 10:57 PM

**EDIT SUBMISSION** **DELETE**



**WORLD RABIES DAY**  
September 28, 2010

Working Together to Never Allow Rabies History

HOME | MISSION | GET INVOLVED | MEDIA | EVENTS | LOGOS | PARTNERS | BACKUP | CONTACT US | DONATE | EDUCATION BANK

Only 172 days left till World Rabies Day 2010!

Find out more:  
• Rabies 101  
• Rabies 101  
• Rabies 101  
• Rabies 101  
• Rabies 101  
• Rabies 101

World Rabies Day 2010 Event Submissions

YOUR ENTRY FORM WILL NOT BE PROCESSED IF ANY REQUIRED INFORMATION IS MISSING

indicates REQUIRED information

**COORDINATOR INFORMATION**

Contact name: [input]  
Contact email: [input]

Show name and email on events page: YES/NO

**EVENT INFORMATION**

Event title: [input]  
Team: [input]  
Country: [input]  
Region: [input]  
Consider this event for the Latin America Caribbean Area: YES/NO

Scope: Local event / Regional event

**Did you know...?**  
One person dies from rabies every 10 minutes

**Labels, Tweets/News:**  
28 Mar 2010: Only You Can Prevent Your Pet From Getting Rabies

**23 Mar 2010:** Events and activities available on the official World Rabies Day blog

**Downloadable WVD Logos**

**Download Educational Material**



# The World Rabies Days: Evaluation of the Impact

- ❑ **Continuous evaluation of global programs**
- ❑ **Annual evaluation of World Rabies Day campaign**
- ❑ **In 2010, questions about the effort as a whole were included**
  - 213 surveys returned: English, French, Portuguese, and Spanish
  - 96.3%: “Rabies Education Programs Are Saving Lives”
  - 89.6%: “World Rabies Day Is Making a Difference”
  - 95.0%: “Will Host a World Rabies Day Event in 2011”

# Partners for Rabies Prevention (PRP)



## □ Informal group of stakeholders

- Public and private: Bring time, talent, treasure to table
- GARC, CDC, FAO, OIE, PAHO/WHO, WSPA, etc.
- Discuss common strategies
- Evaluate needs, timelines, deliverables

## □ Secretariat: Global Alliance for Rabies Control (GARC)

## □ Activities

- Road map: 2008
- Blueprint for Canine Rabies Control: 2009–2010
- Next step: Evaluate the global burden of rabies



- ❑ Free access on line
- ❑ Examples of ongoing programs
- ❑ Links to documents
- ❑ Information on
  - Cost
  - Planning
  - Funding



# Blueprint: The Concept



- ❑ Aimed at assisting and guiding individual countries on implementation of canine rabies control programs
  - If rabies is present
  - If rabies is reintroduced after a period of absence
- ❑ New concept – not meant to replace existing documents



# Overview

## ❑ Global partnerships and efforts for rabies prevention

## ❑ From blueprint to local implementation

- Istanbul and India: International workshops on development and implementation of the communications plan delineated in the Blueprint
- India: The Blueprint is a source of reference for human rabies prevention
- West Africa: The Blueprint used to improve communications networking and to set up dog vaccination programs
- Requests for translation into several different languages





# Bohol, Philippines: Controlling Canine Rabies and Preventing Human Deaths

- ❑ Partnership with government and the Global Alliance for Rabies Control
- ❑ Additional funds from WHO and other NGOs
- ❑ Initiated in 2007
- ❑ Cost
  - Estimated \$2.5 million/year in cost-savings by eliminating dog rabies in Philippines
  - Costs would be repaid in 4–11 years



# Bohol Philippines: Controlling Canine Rabies and Preventing Human Deaths

## ❑ **Community mobilization**

- 140 to >15,000 persons involved in program

## ❑ **Vaccination**

- 70% of dog population

## ❑ **Increased access to postexposure prophylaxis (PEP)**

- New clinics
- Expanded training

## ❑ **Integration of rabies education into school curriculum**

- 182,000 children educated

## ❑ **CDC training of direct Rapid Immunohistochemical Test (dRIT) and evaluation of diagnostics**



# Bohol Philippines: Controlling Canine Rabies and Preventing Human Deaths

## HEALTH IMPACT

- ❑ **No human or dog rabies deaths reported since Oct 2008**
  - In 2 prior years 10 cases/year reported
- ❑ **Currently undergoing evaluation by the Philippine Ministry of Health for rabies-free status**

# Lessons Learned

## ❑ Rabies prevention is possible

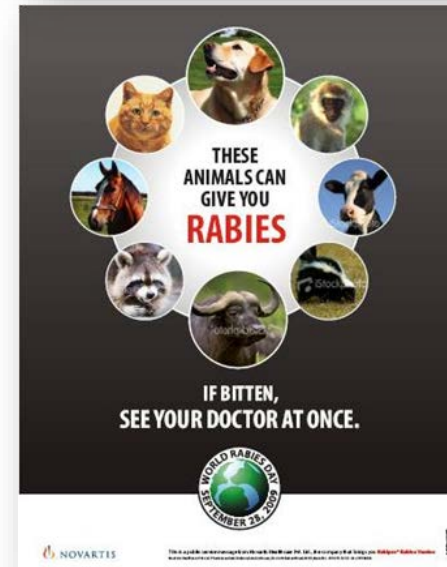
- Need support from multiple sectors
- Public/private partnerships are critical – pooling of resources

## ❑ Communication networks are powerful

- World Rabies Day
- First global webinar included >2,000 participants from 34 countries

## ❑ Many tools are already in place

- Vaccines, reduced regimens, dRIT, websites, etc.



# Needs, Challenges, and Way Forward

- ❑ **Investment in new tools (dog population control)**
- ❑ **Shorter pre-exposure vaccination regimens**
  - Especially important to vulnerable or isolated populations  
e.g., Amazonia
- ❑ **Improved global and national surveillance**
- ❑ **Reassessment of global burden to fully understand burden of rabies and to develop impact models that assess strategic interventions**
- ❑ **Novel strategies and methods to ensure sustainability to prevent reintroduction**



# PUBLIC HEALTH GRAND ROUNDS

Office of the Director

January 20, 2011

