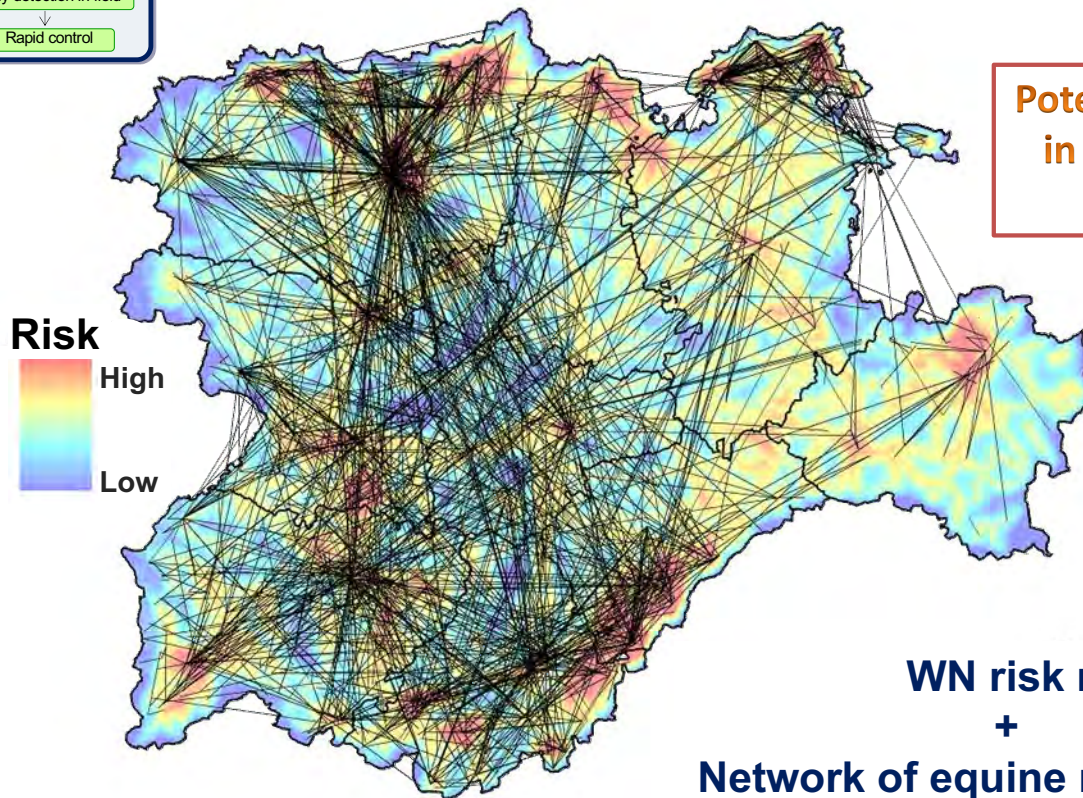


High risk areas/time periods/
individuals?

Method: MCDF (weighted overlay)
Disease: WN (zoonosis)
Study region: Castilla y León

Given the re-emergence of West Nile in Europe...

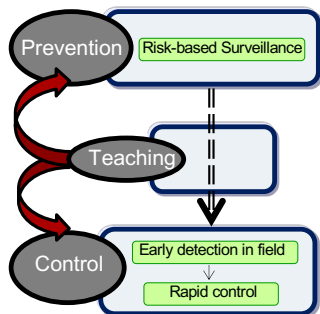
Which are areas at high risk for West Nile in Castilla y León?



Potential impact
in the equine
industry



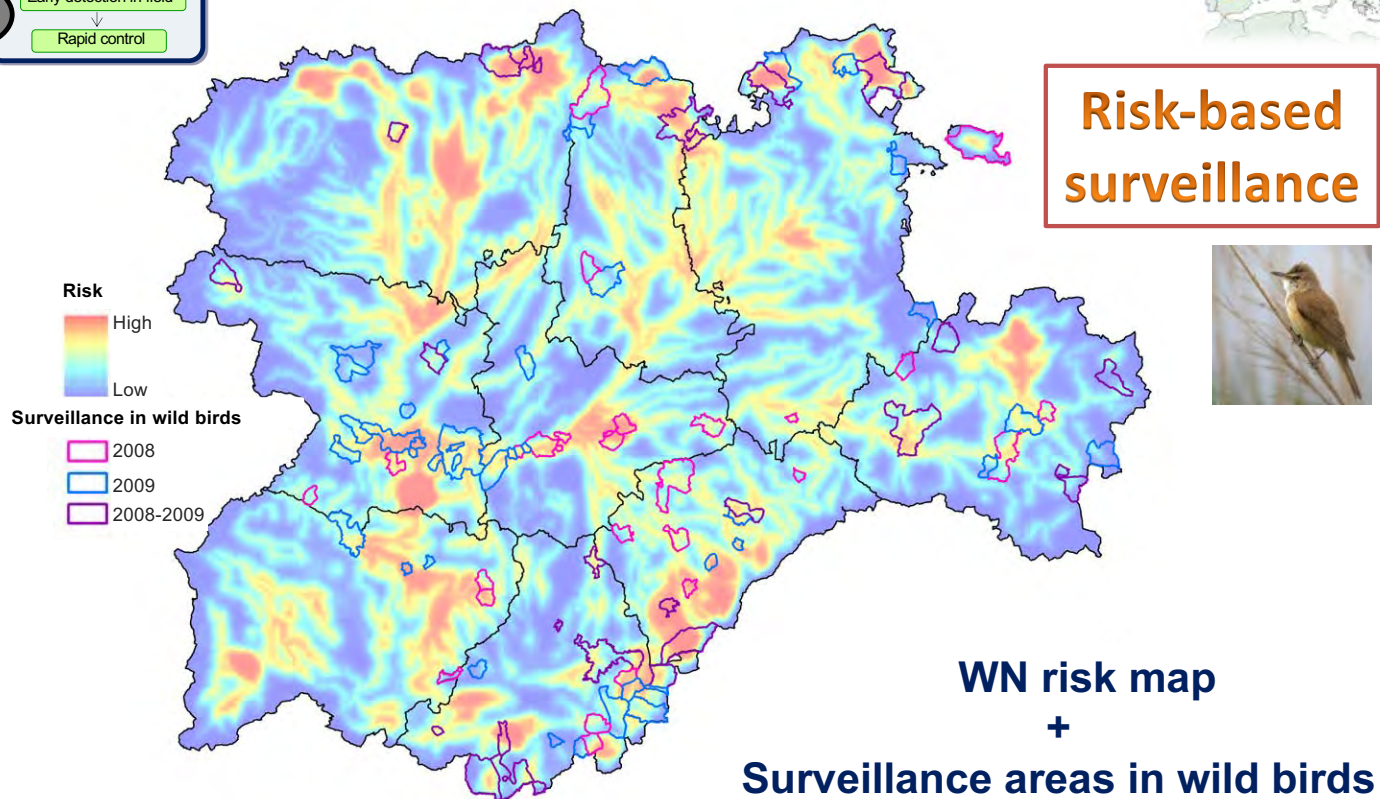
WN risk map
+
Network of equine movements

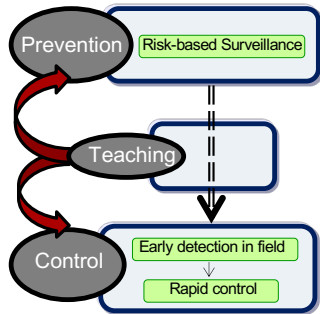


High risk areas/time periods/
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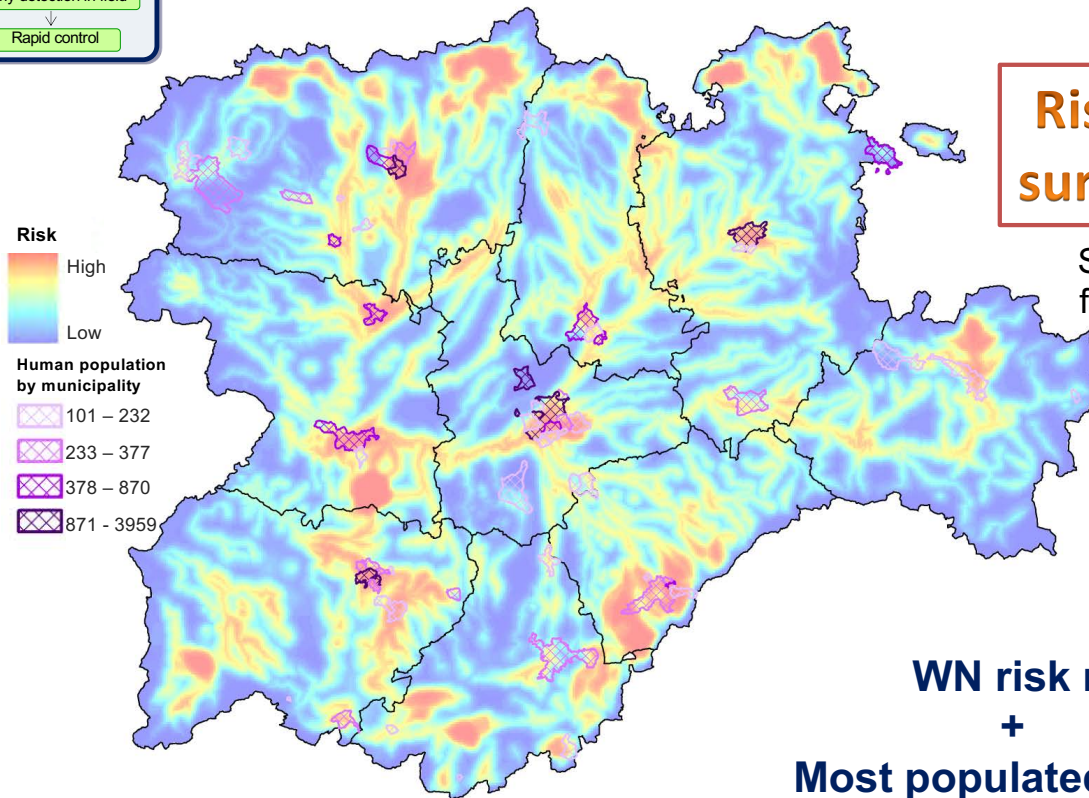




High risk areas/time periods/
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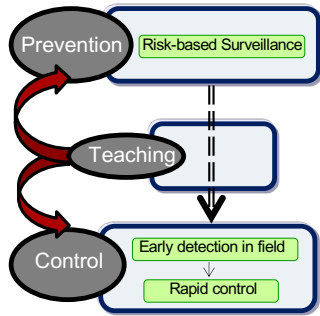


Risk-based surveillance

Setting priorities for public health



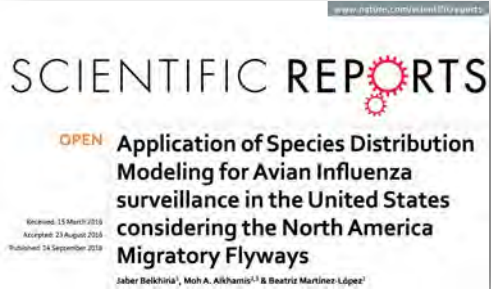
**WN risk map
+
Most populated areas**



High risk areas/time periods/ individuals?

Avian Influenza

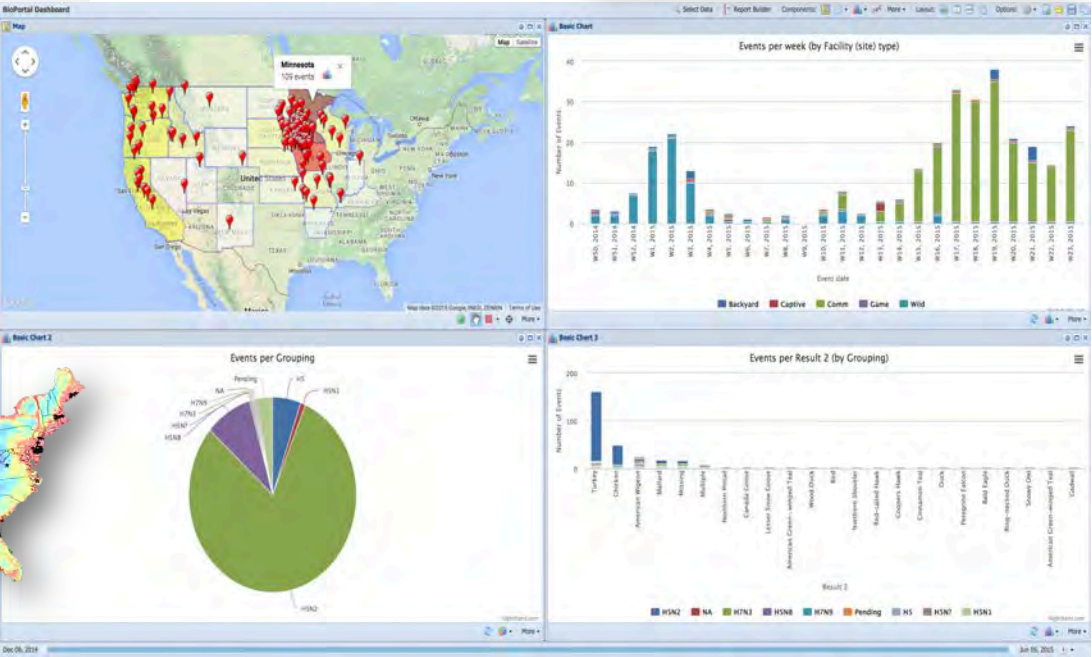
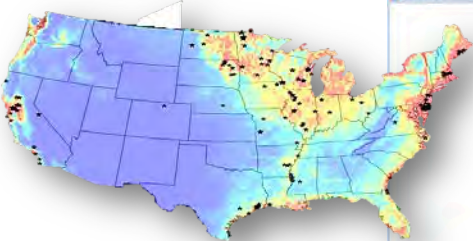
US,
California
South Korea
Globally

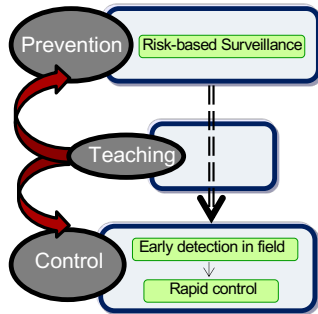


Methods:

- Network analysis
- Phylodynamics
- Biosecurity and risk assessment
- Data Mining and Machine Learning
- Prediction models

MaxEnt





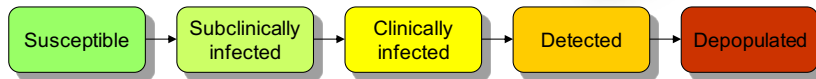
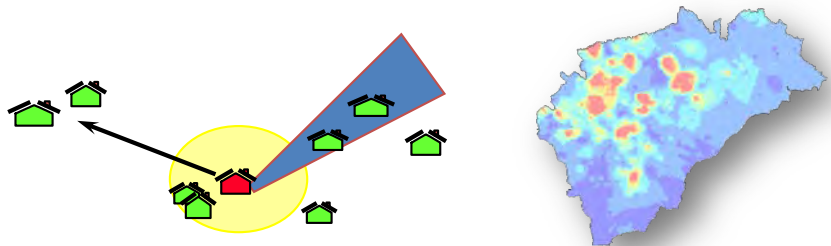
Disease spread?

Once a disease has been introduced into a region...

How disease will spread?
Which will be the most cost-effective control measures to control it?

“BeFAST” spread model

“Between -Farm -Animal spatial transmission” model was developed to simulate disease spread within and between herds (H)



SPATIAL AND STOCHASTIC DISEASE SPREAD MODEL

Veterinary Microbiology 147 (2011) 300–309

Contents lists available at ScienceDirect
Veterinary Microbiology
journal homepage: www.elsevier.com/locate/vetmic

Research article
A novel spatial and stochastic model to evaluate the within- and between-farm transmission of classical swine fever virus. I. General concepts and description of the model
B. Martínez-López^{a,*}, B. Ivorra^b, A.M. Ramos^b, J.M. Sánchez-Vizcaino^a

^a VSAVET, Animal Health Department, Veterinary School, Complutense University of Madrid, Av. Puerta de Hierro s/n, 28040 Madrid, Spain
^b Applied Mathematics Department, Mathematics School, Complutense University of Madrid, Plaza de Ciencias, 3, 28040 Madrid, Spain

Veterinary Microbiology 155 (2012) 21–32

Contents lists available at ScienceDirect
Veterinary Microbiology
journal homepage: www.elsevier.com/locate/vetmic

A novel spatial and stochastic model to evaluate the within and between farm transmission of classical swine fever virus: II Validation of the model[†]
B. Martínez-López^{a,b}, B. Ivorra^b, D. Ngom^{c,d}, A.M. Ramos^b, J.M. Sánchez-Vizcaino^a

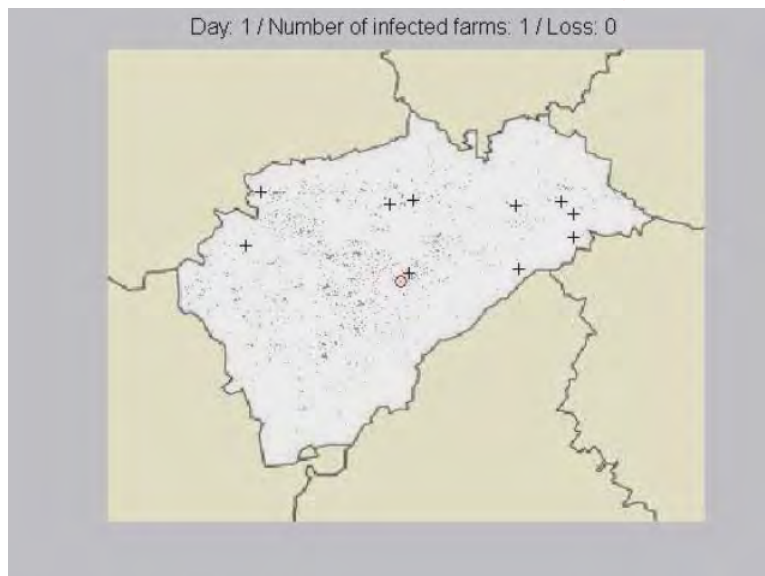
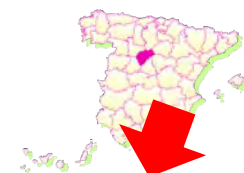
^a VSAVET, General and Animal Health Department, Veterinary School, Complutense University of Madrid, Av. Puerta de Hierro s/n, 28040 Madrid, Spain
^b SIMAMAT research group, IRI Institute and Applied Mathematics Department, Mathematics School, Complutense University of Madrid, Plaza de Ciencias, 3, 28040 Madrid, Spain
^c Mathematics Department, University of Ziguinchor, BP. 523, Ziguinchor, Senegal
^d IAVI (Gaston Berger University), BP. 234, Saint Louis, Senegal

Ann Oper Res
DOI 10.1007/s10479-012-1257-4

Mathematical formulation and validation of the Be-FAST model for Classical Swine Fever Virus spread between and within farms

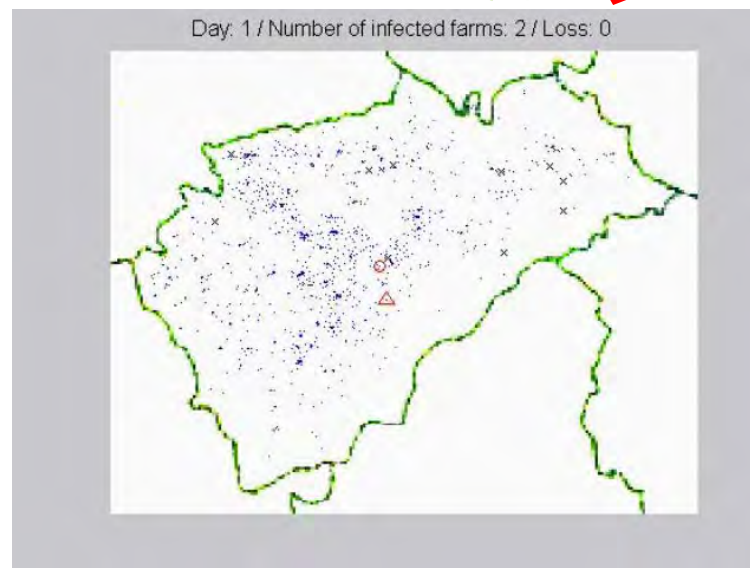
Benjamin Ivorra · Beatriz Martínez-López · José M. Sánchez-Vizcaino · Ángel M. Ramos

CSF model for Segovia (Spain)



Time to detection = 1 week

2,3 millions €

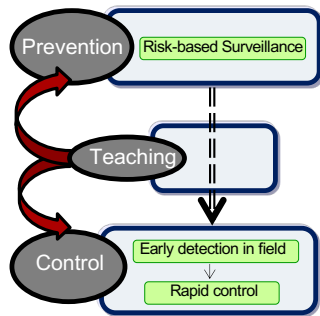


Time to detection = 2 weeks

21 millions €



**9.18 TIMES HIGHER COSTS
(EXPONENTIAL GROWTH)**



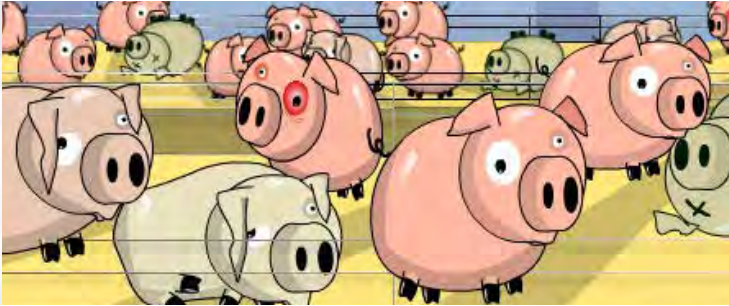
TEACHING

**Increase risk awareness and perception
Reduce the time to detection in the field
Rapid and effective response**

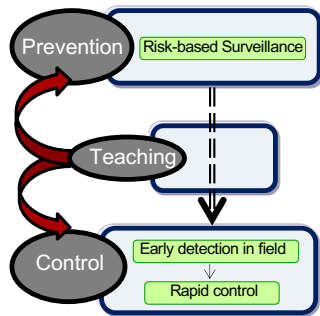


Suspicious symptoms

Alert !!!



EDUCATION AND TRAINING IS ESSENTIAL



TEACHING

Increase risk awareness and perception
 Reduce the time to detection in the field
 Rapid and effective response



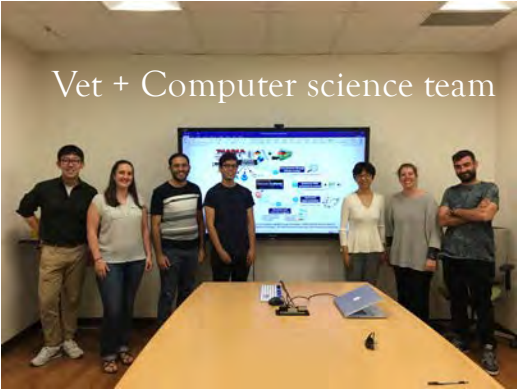
Training the next generation of vet-data-scientists



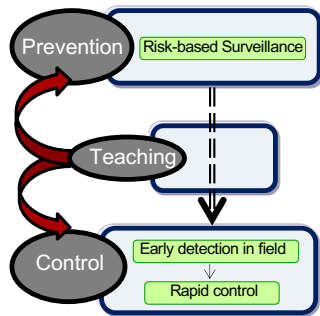
At
 UC Davis



Master of Preventive Veterinary Medicine (MPVM),
 Graduate Group of Epidemiology (GGE)



Vet + Computer science team



TEACHING

Increase risk awareness and perception
Reduce the time to detection in the field
Rapid and effective response

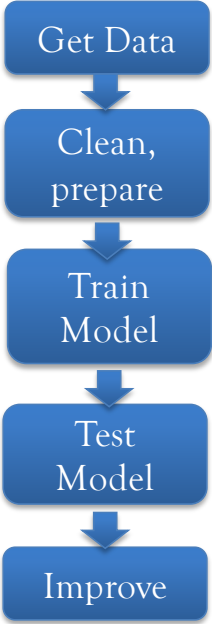


Training the next generation of vet-data-scientists



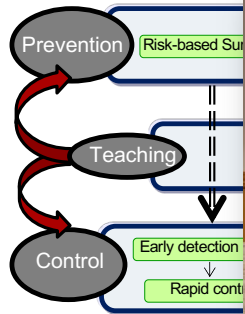
At
UC Davis

Master of Preventive Veterinary Medicine (MPVM),
 Graduate Group of Epidemiology (GGE)



- Dealing with dirty data
- Develop analytical skills
- Real-world experimentation







29 participants
(all provinces of China)






Training course on African swine fever (ASF) Epidemiology and Diagnosis, 20-24 September 2010
DOCUMENTATION
 (click on the lecture you want to see)

DAY I: Monday Sep. 20th. SUBJECT: ASF GENERAL OVERVIEW

- 8:30 - 10:30 - Lecture I: ASF general overview and updates (Prof. Carlos Martinez, ASFZSC Coordinator, INIA/VTG, Portugal)
- 10:30 - 11:30 - Lecture II: Actual situation of the epidemiology of ASF and risk factors (Dr. Luis Mateo, UCM, Spain)
- 14:00 - 15:00 - Lecture III: Key points on diagnosis of ASF (Dr. Carmen Galindo, CIA-INDA, Spain)
- 15:00 - 18:00 - Lecture IV: Applications of epidemiology into laboratory tests (Dr. Beatriz Martínez López, UCM, Spain)

DAY II: Tuesday Sep. 21st. SUBJECT: ASF EPIDEMIOLOGY AND RISK ASSESSMENT

- 9:00 - 10:30 - Lecture V: New tools for epidemiology control (Dr. Beatriz Martínez López, UCM, Spain)
- 10:30 - 12:00 - Lecture VI: Risk factors of ASF: routes of entrance and potential spread (Dr. Luis Mateo, UCM, Spain)
- 14:00 - 15:30 - Lecture VII: Field programs for early detection (Dr. Beatriz Martínez López, UCM, Spain)
- 15:30 - 17:00 - Lecture VIII: Different models for ASF control and eradication (Dr. Luis Mateo, UCM, Spain)

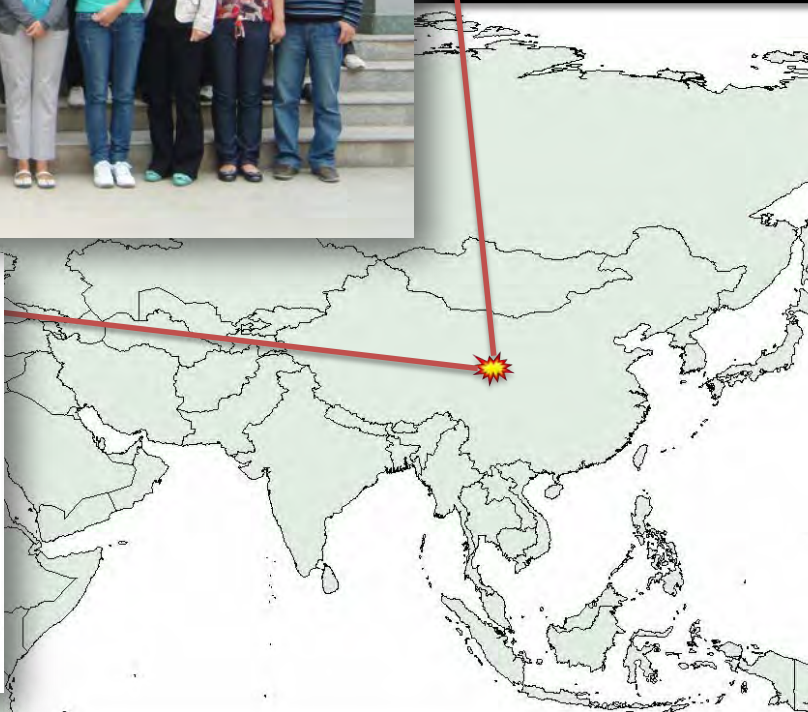
DAY III: Wednesday, September 22nd. LABORATORY PRACTICES: Hands-on diagnostic simulations on real suspicious samples

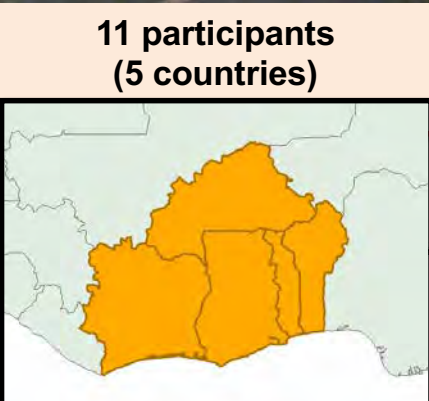
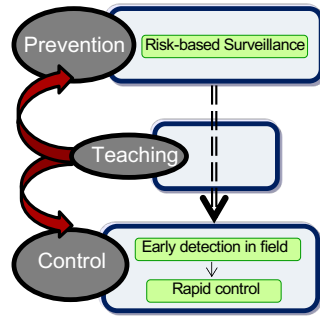
- 8:00 - 8:45 - Lecture IX: ASF diagnosis: an introduction to laboratory practices (Dr. Javier Fernández, CIA-INDA)
- 8:45 - 10:30 - Lecture X: ASF antibody detection techniques (Dr. Carmen Galindo, CIA-INDA)
- 10:30 - 11:00 - Training I: ASF antibody detection techniques: ASF antibody detection by GIE method/ZZJL test
- 14:00 - 17:00 - Training II: ASF antibody detection techniques: ASF antibody detection by GIE method/serological immunization test (Dr. Carmen Galindo, Dr. Javier Fernández, CIA-INDA)
- 17:00-18:00 - Lecture XI: A general view on different ASF molecular diagnosis tests (Dr. Javier Fernández CIA-INDA)

DAY IV: Thursday Sep. 23rd. LABORATORY PRACTICES: Hands-on Diagnostic Simulations on ASF suspicious samples

- 8:00 - 12:00 - Training III: ASF viral detection techniques: ASF virus detection by conventional and real-time PCR, DNA extraction and PCR set up
- 13:00 - 14:00 - Lecture XII: Characteristics of ASF isolates (Dr. Carmen Galindo, CIA-INDA)
- 14:00 - 17:00 - Training IV: ASF viral detection techniques: ASF and ASF virus detection by multiplex PCR, differential diagnosis, nucleic acid extraction and PCR set up (Dr. Javier Fernández, Dr. Carmen Galindo, CIA-INDA)

[PROTOCOLS, DATA SOURCES AND REFERENCES.](#) [INSTRUCTORS](#) [PARTICIPANTS](#)





Training course on African Swine Fever (ASF) Epidemiology
 1-5 November 2010 - LAMADA/Laboratoire Central de Pathologie Animale, Bessières (Côte d'Ivoire)
 Funded through the Project #211691, FP7-KBBE-2007-1, Evaluating and controlling the risk of African swine fever in the EU

Introduction | Lecturers | Participants | Programs | Software | Photo gallery

Objectives

The main purpose of this Training course on African swine fever (ASF) Epidemiology, is to cover different questions related with the epidemiology of ASF and the tools that may be useful to better prevent and control ASF spread into the West African countries. The main aspects to be covered in the course will be:

1. What is ASF and what is the current situation of the disease in the world?
2. Which are the main risk factors of ASF in West African countries?
3. Which are the epidemiological tools that could help us to better prevent and control ASF?

In order to answer these questions, the following training program will be performed in Côte d'Ivoire between 1st and 5th of November 2010:

Training course on African Swine Fever (ASF) Epidemiology
 1-5 November 2010 - LAMADA/Laboratoire Central de Pathologie Animale, Bessières (Côte d'Ivoire)
 Funded through the Project #211691, FP7-KBBE-2007-1, Evaluating and controlling the risk of African swine fever in the EU

Digital simulations (CSF, FMD, BT, AI, WN)



MINISTERIO DE AGRICULTURA PESCA Y ALIMENTACION



Universidad Complutense de Madrid

Trabajo realizado en el marco del convenio de colaboración entre el Ministerio de Agricultura, Pesca y Alimentación y la Universidad Complutense de Madrid, y dirigido por el profesor J.M. Martínez-Vizcaino

Entrar



EJERCICIOS DE SIMULACIÓN SANITARIA / RASVE CASO CLÍNICO: TOLEDO, CAMARENILLA

El siguiente ejercicio de simulación, corresponde a un problema sanitario en una explotación intensiva de genética porcina en ciclo cerrado con 500 madres.

Está situada en Camarenilla (Toledo) en la región de Torrijos a 8 Km de la granja más cercana.

Más información RASVE sobre la comarcalización de Toledo




EJERCICIOS DE SIMULACIÓN SANITARIA / RASVE CASO CLÍNICO: TOLEDO, CAMARENILLA

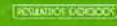
1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21

Inspección de la sala. Conversación telefónica ganadero-veterinario



En la siguiente escena presenciara una conversación entre un ganadero y un veterinario.

Esté atento para identificar las frases clave, y vaya pensando que cuestiones importantes no fueron tratadas durante el diálogo.




EJERCICIOS DE SIMULACIÓN SANITARIA / RASVE CASO CLÍNICO: TOLEDO, CAMARENILLA

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21

Ejercicio: Elección de los materiales y el instrumental

CORRECTO




INCORRECTO





EJERCICIOS DE SIMULACIÓN SANITARIA / RASVE CASO CLINICO. ALICANTE. SANTA ÁGUEDA

1 2 3 4 5 6 7 8 9 10 Ejercicio: Selección, toma y envío de muestras al laboratorio 11 12 13 14 15 16 17 18 19 20 21

Lo situación más grave es detectado en la zona de transición.



Intente identificar los síntomas y lesiones más significativos.



Resultado Ejercicio

MINISTERIO DE AGRICULTURA, PESCA Y ALIMENTACIÓN

EJERCICIOS DE SIMULACIÓN SANITARIA / RASVE CASO CLINICO. ALICANTE. SANTA ÁGUEDA

1 2 3 4 5 6 7 8 9 10 Observación de los animales y necropsia 11 12 13 14 15 16 17 18 19 20 21

A continuación intente identificar las actividades en la explotación más significativas.



¿Que muestras deberá tomar durante la visita?

Toma de muestras. Selección.

Animales vivos	Animales muertos
Cerebro	Cerebro
Pulmón	Pulmón
Huero	Huero
Medula Osea	Medula Osea
Nódulos linfáticos	Nódulos linfáticos
Riñón	Riñón
Hígado	Hígado
Ganglios	Ganglios
Yngre	Yngre
Bazo	Bazo
Músculo	Músculo
Esperma	Esperma
Hece	Hece

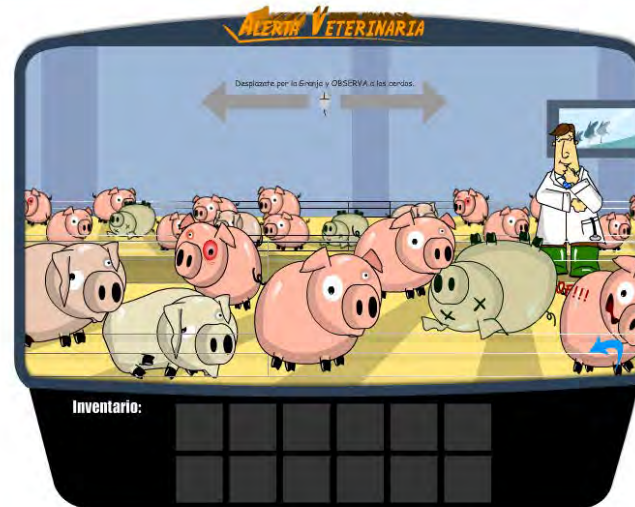
Comprobar



Resultado Ejercicio

MINISTERIO DE AGRICULTURA, PESCA Y ALIMENTACIÓN

Graphic adventure



Simulation exercise (field)



FOOT-AND-MOUTH DISEASE
TENERIFE, JUNE 2008

Simulation exercise (field)

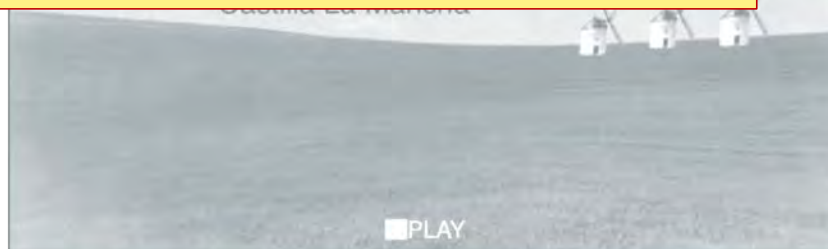


Simulation exercise (field)

ASF

OBJECTIVES

- **Assessment of the response** by the Veterinary Services (at different levels) in case of a suspicion of an infectious disease.
- Identification of the **strengths and weaknesses** of the contingency plan in Spain
- **Recommendations** to improve the rapid response

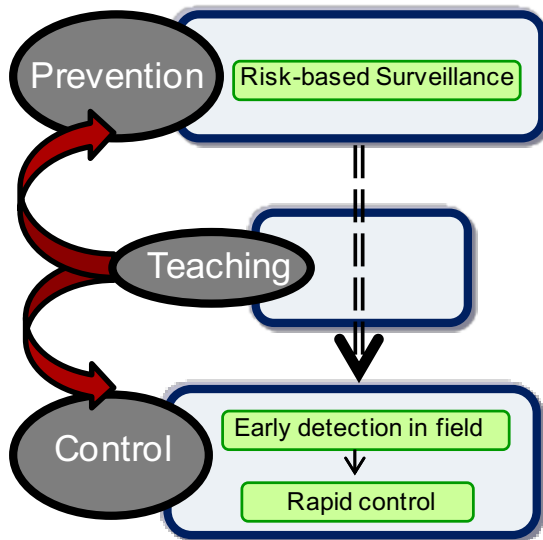


CADMS PERSPECTIVE

Global strategy

+

Networking



“CADMS overarching goal is to develop methods, tools and systems that can be used to prevent, control, or eradicate animal diseases and their adverse associated health and economic impacts in animals and human populations”

**INTERDISCIPLINARY
PROBLEM SOLVING APPROACH**

Research + Teaching + Service



People

Leadership



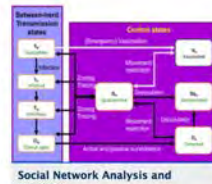
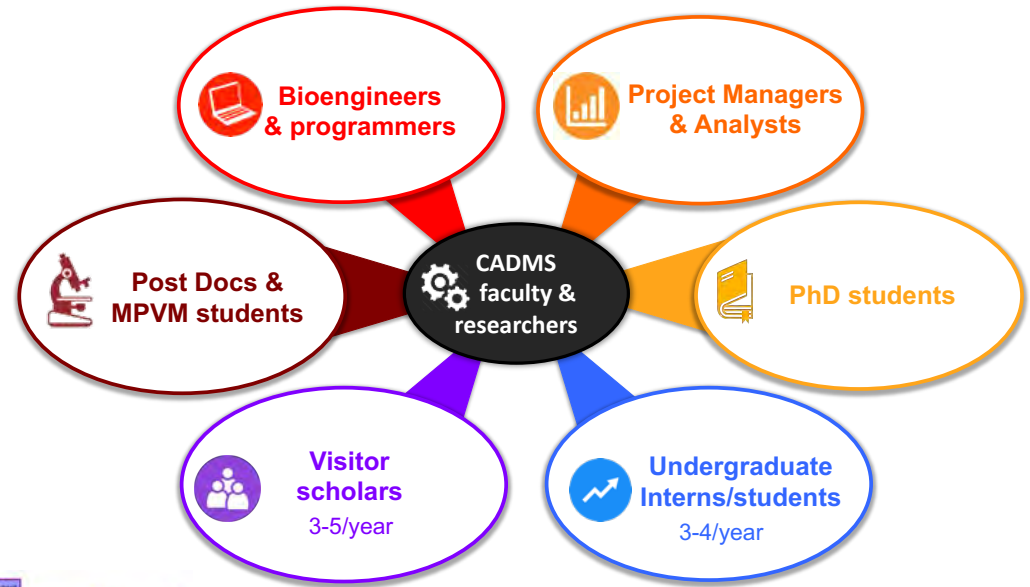
Director

Beatriz
Martinez-Lopez
DVM, MPVM, PhD



Professor
of Infectious Disease
Epidemiology and AES (20%)

Spatial epidemiology,
risk assessment and
modeling
Laboratory



- ✓ Cross-disciplinary
- ✓ Research-extension
- ✓ Multi-cultural diverse center: 7 languages, 9 different countries, 53% woman

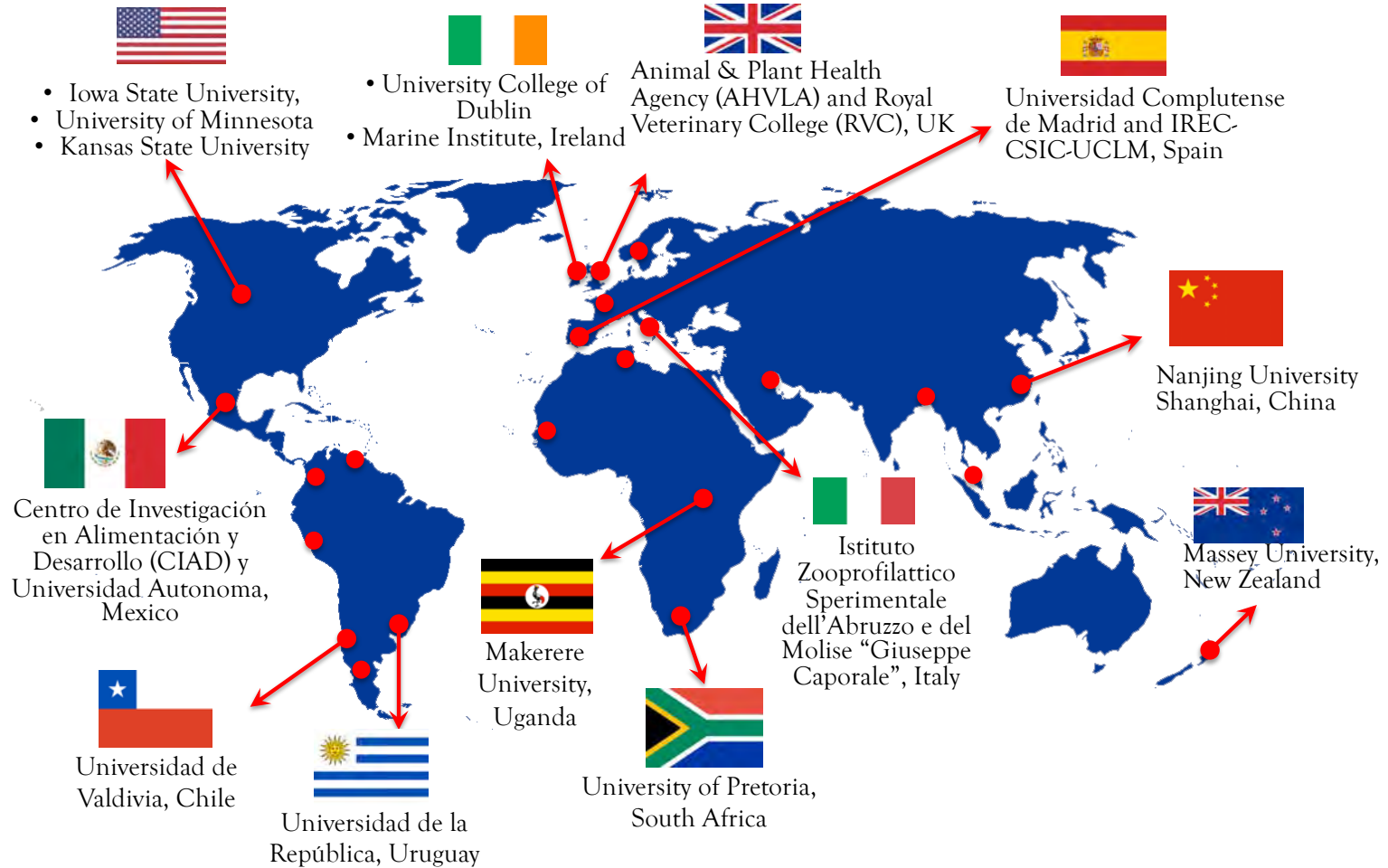
FAO Reference Center for Epidemiology and Animal Disease surveillance

People

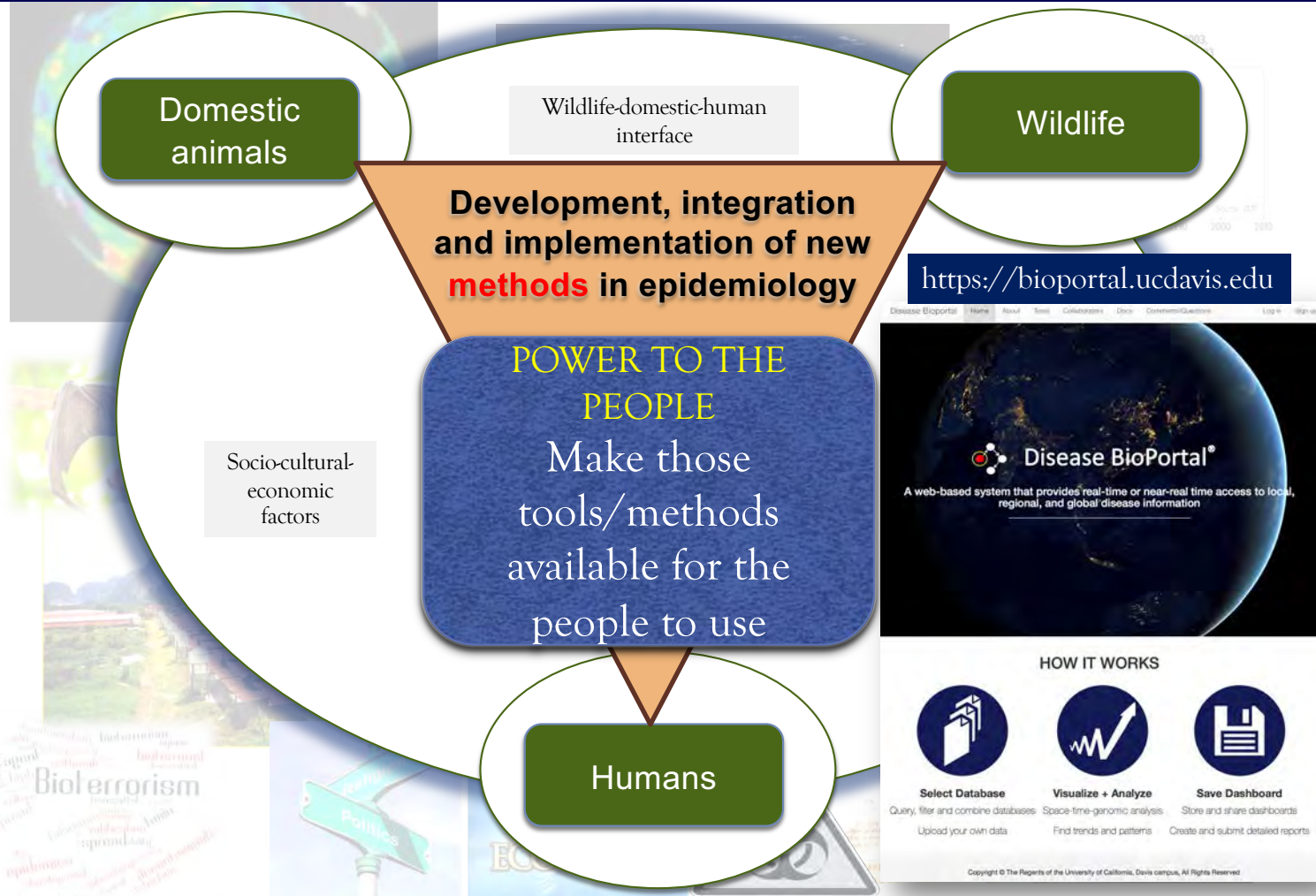


National and International Collaborators

More than 20 countries



CADMS PERSPECTIVE



Collaborative program

Welcome new partners!

Labs, industry, livestock producers, private practitioners, official vets, epidemiologists



Boehringer
Ingelheim



Veterinærinstituttet
Norwegian Veterinary Institute



UNIVERSIDAD COMPLUTENSE
MADRID



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

GlobalVetLINK



UCDAVIS
VETERINARY MEDICINE



OIE Ref Labs



KANSAS STATE
UNIVERSITY



TARGETED RESEARCH EFFORT
ON AFRICAN SWINE FEVER



Ministerio de Agricultura
SENASA
Servicio Nacional de Sanidad Agraria
PERU

UCDAVIS
UNIVERSITY OF CALIFORNIA



Thanks for your attention!



beamartinezlopez@ucdavis.edu
<https://cadms.vetmed.ucdavis.edu>

