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# Climate change and emerging risks for animal health and welfare

**CLEFSA Network event**  
**8<sup>th</sup> October 2020**

# Summary

- Climate change impact on animal health: OIE activities
- CLEFSA: what have we learned? Gathered information and opportunities
- Priority emerging risks: case studies
- Potential collaborations and synergies

# Climate change impact on animal health: OIE activities





1924

Creation of the  
Office International  
des Epizooties (OIE)

1945

Creation of the  
United Nations



2003

New Name:  
World Organisation  
for Animal Health (OIE)

We work to protect the health and welfare of animals globally, leading to economic prosperity as well as social and environmental well-being of populations

## Reinforcing trust through TRANSPARENCY and communication

**we are**

Spreading **scientific and technical knowledge** by:

- Providing technical **Veterinary expertise**
- Collecting and disseminating **disease data** notified by Member Countries

**we will**

- Improve governance to **strengthen science** and expert roles
- Share our expert **data analysis** through **WAHIS\***
- Modernise our external **communication tools**

\* The OIE World Animal Health Information System

## Improving animal health and welfare by appropriate RISK MANAGEMENT

**we are**

Developing **science-based guidelines and standards** to address:

- Antimicrobials use and alternatives**
- Global disease control and eradication**
- Climate change and biodiversity**
- Biothreat reduction**

**we will**

- Incorporate **social, economic and environmental sciences**
- Further implement the **One Health** concept
- Enhance countries' **official disease status recognition**
- Take into account **new technologies**

## Supporting and strengthening VETERINARY SERVICES at the front lines of public health

**we are**

- Addressing human-animal **health emergencies** with partners
- Enhancing **global governance** of animal health systems
- Improving capacities** of Veterinary Services in Member Countries

**we will**

- Highlight benefits** brought by sustainable Veterinary Services
- Adapt our capacity-building programmes to **fit local contexts**
- Further improve the **quality of Veterinary Services** through the **PVS Pathway\***

\*OIE Programme to improve the performance of Veterinary Services

## Excellence

quality, objectivity, knowledge transfer, new technologies, timeliness

## Engagement

Expert groups, Reference Centres, Specialist Commissions, diversity and selection, next generation scientists

## Management

regional adaptations, roles and responsibilities, financial resources, partnerships

# Health is complex

$$\left( \frac{\sqrt{3\sin^2\theta x^2}}{x^{z+\frac{1}{x}}} + \lim_{x \rightarrow y} \times \sum_{i=1}^{10} \frac{X_i}{i} \right)^{\frac{1}{3}}$$
$$\int_{-\frac{1}{2}}^{\pi} x^2 dx + \frac{1}{x^{\frac{1}{2}}}$$

Climate change adds complexity..

## What have we to offer?

- Climate sensitive diseases
- Animal welfare
- Strategic planning
- Capacity building
- Adverse events
- Natural Disasters

Reduce impact

# OIE Work

## OIE Technical item 2019

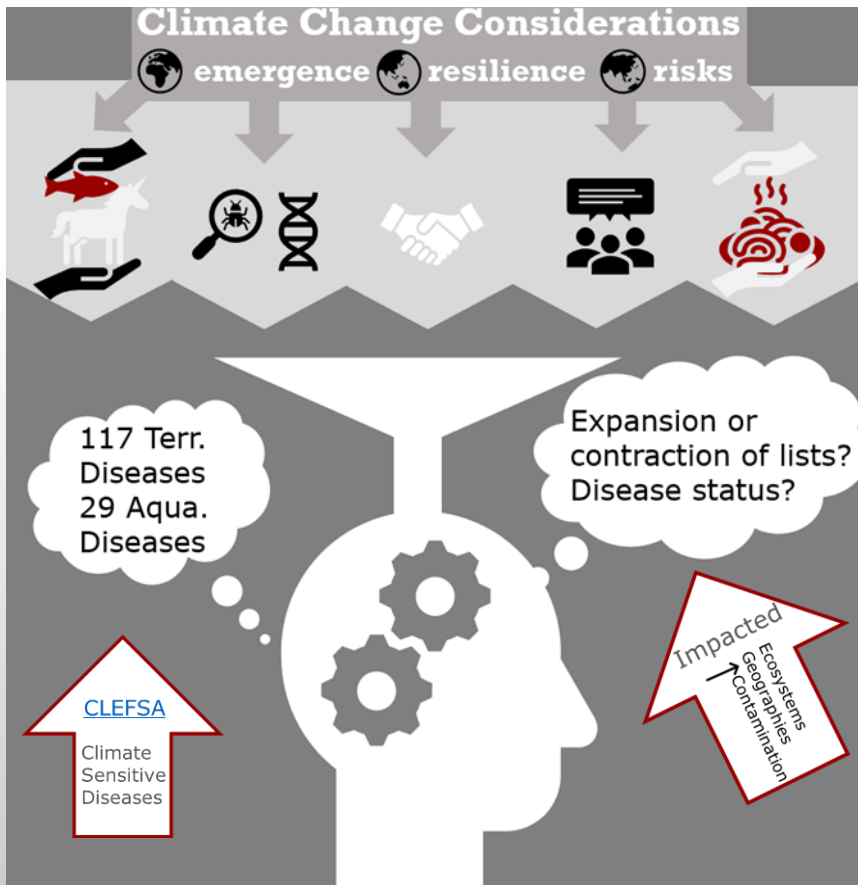
***“How External Factors (e.g. **climate change**, conflicts, socio-economics, trading patterns) will impact Veterinary Services, and the Adaptations required”***

[Conference Americas<sup>res</sup>](#)

[2016](#)

[STDF & WBG 2011](#)

# OIE Business model



How should OIE adapt to climate change?



- CLEFSA: what have we learned? Gathered information and opportunities



# Generic emerging issues related to animal health

- Impacts on livestock production
- (Re)Emergence of viruses and bacteria
- Ocean acidification
- Migrations
- Susceptibility to disease



# Identification of main issues to AH

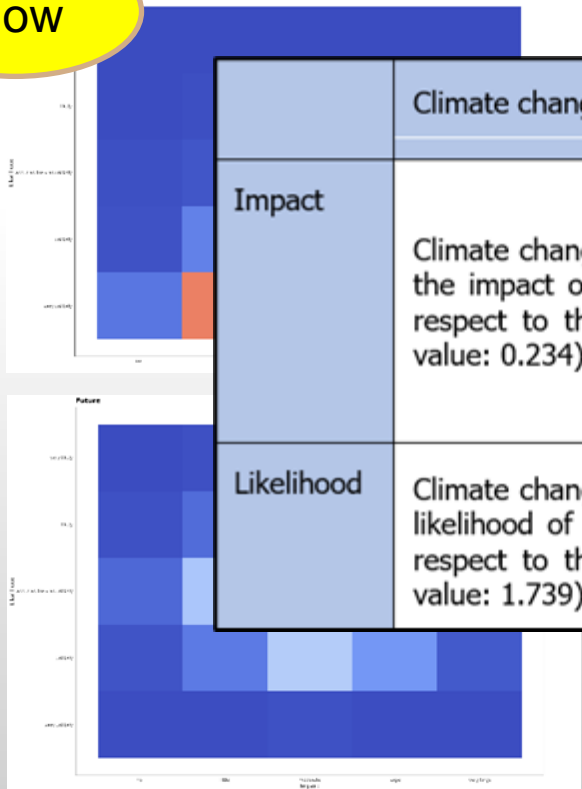
	Identified issues
1	Aedes albopictus, Culicoides imicola
2	Culex pipiens, C. obsoletus
3	Hyalomma marginatum (vector of Crimean-Congo hemorrhagic fever-CCHF)
4	Nipah virus
5	Influenza A viruses
6	Rift Valley Fever virus
7	Bluetongue virus-BTV
8	Lumpy skin disease virus-LSDV
9	Peste des Petits Ruminants (PPR) virus
10	Norovirus
11	Emergence of piscine reovirus (PRV) in France
12	Hepatitis E virus
13	Clostridium botulinum
14	Ehrlichia chaffeensis, E. ewingii, or E. muris
15	Salmonella
16	Yersinia
17	Brucella

	Identified issues
18	Campylobacter
19	Bacillus anthracis
20	Leishmania parasites
21	Toxoplasma gondii
22	Trichinella parasites
23	Echinococcus spp.
24	Roundworms
25	Dirofilaria spp.
26	Heartworms and lungworms
27	Flukes
28	Fasciola hepatica
29	CWD (chronic wasting disease) prion
30	Vespa velutina
31	Impact on wildlife distribution
32	Development of the proliferative kidney disease in Swiss trout
33	Heat stress in Swiss dairy cows
34	Climate change as a possible stressor for bee decline

# Scoresheets: Rift Valley Fever virus

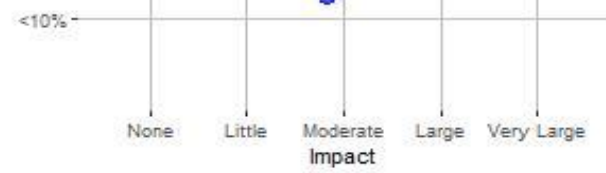
Now

Likelihood



	Climate change	Confidence level	
Impact	Climate change may moderately aggravate the impact of the considered hazard with respect to the reference condition (Delta value: 0.234)	Medium (Variance: 0.679)	
Likelihood	Climate change may seriously increase the likelihood of emergence of the issue with respect to the reference condition (Delta value: 1.739)	Medium (Variance: 0.42)	

Scenario  
 Future  
 Reference



Impact

# CLEFSA: opportunities

- **Driver analysis** is a useful tool for supporting preparedness for future challenges.
- Developed methodology and tool would make possible a **continuous updates of the list** of identified issues.
- **Citizen engagement:** allows integrating citizen science into the formal emerging issues reporting mechanisms.
- The developed model could be **scaled to other regions.**
- Useful tool to help **risk managers** taking more informed decisions.

- Priority emerging risks: case studies



# Vector Borne Diseases



- Increasing importance economically and to human and animal health.
- Global issue: not limited to tropical and subtropical areas only.
- Several factors may affect the distribution and impact of these diseases:
  - Environmental (e.g. **climate change**);
  - Sociological (e.g. urbanisation, social habits);
  - Economical (e.g. globalisation of trade).
- These factors are driving vector emergence in countries where they were previously absent.

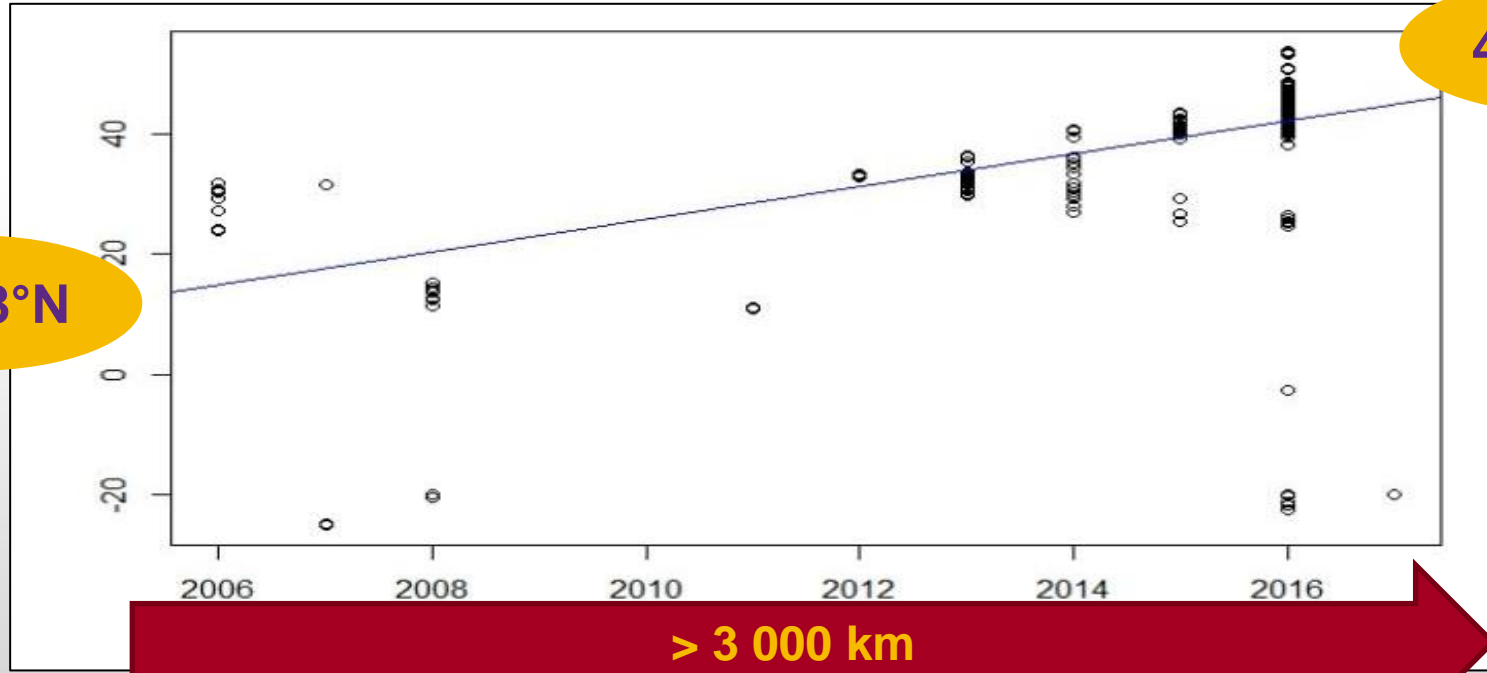
*Rev. Sci. Tech. Off. Int. Epiz.*, 2015, **34** (1), 123-137

## Mosquitoes and *Culicoides* biting midges: vector range and the influence of climate change

A.R.W. Elbers <sup>(1)\*</sup>, C.J.M. Koenraadt <sup>(2)</sup> & R. Meiswinkel <sup>(3)</sup>

# The case of lumpy skin disease

Trend in the average latitude of LSD outbreaks between 2005 and 2016



Significant increase of average latitude (p-value < 0.001; rho=0.8)



# Climate change and avian influenza

M. Gilbert<sup>(1, 2)</sup>, J. Slingenbergh<sup>(3)</sup> & X. Xiao<sup>(4)</sup>

(1) Biological Control and Spatial Ecology, Université Libre de Bruxelles CP160/12, avenue Franklin D. Roosevelt 50, B1050, Brussels, Belgium. E-mail: mgilbert@ulb.ac.be (corresponding author)

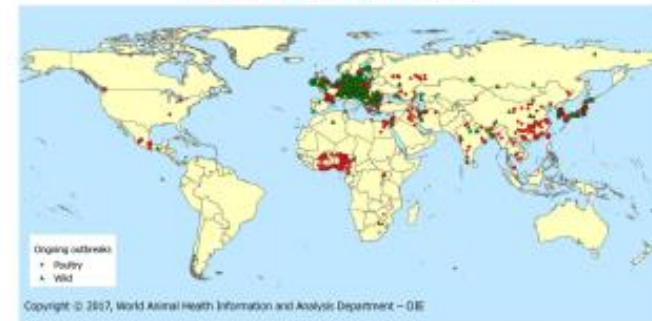
(2) Fonds National de la Recherche Scientifique, rue d'Egmont 5, B1000, Brussels, Belgium

(3) Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla 00100, Rome, Italy

(4) Institute for the Study of Earth, Oceans and Space, University of New Hampshire, 39 College Road, Durham, NH 03824, USA

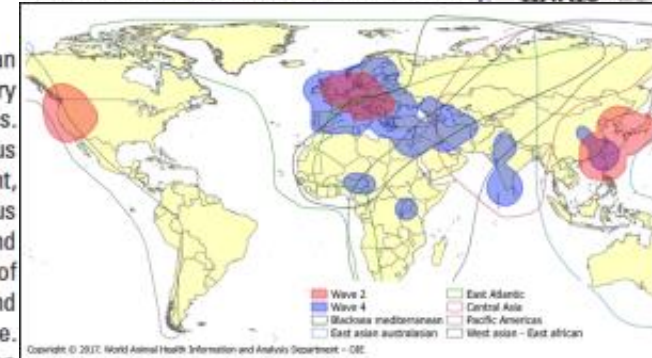
## Summary

This paper discusses impacts of climate change on the ecology of avian influenza viruses (AI viruses), which presumably co-evolved with migratory water birds, with virus also persisting outside the host in subarctic water bodies. Climate change would almost certainly alter bird migration, influence the AI virus transmission cycle and directly affect virus survival outside the host. The joint, net effects of these changes are rather unpredictable, but it is likely that AI virus circulation in water bird populations will continue with endless adaptation and evolution. In domestic poultry, too little is known about the direct effect of environmental factors on highly pathogenic avian influenza transmission and persistence to allow inference about the possible effect of climate change. However, possible indirect links through changes in the distribution of duck-crop farming are discussed.



OIE Global Situation Report for Avian Influenza

WAHIS



Climate change impacts avian migration patterns, overlap of species, and AIv shedding and reassortment



- Potential collaborations and synergies



# A busy arena

FAO's resources on climate change

## CGIAR

Climate and livestock disease  
vulnerability of agricultural systems  
under climate change scenarios

## CABI

Climate change and non-infectious

## USDA APHIS

Predicted Wildlife Disease-Related  
Services  
USDA Climate Change Science

World Bank Group

change: what if the key actors  
cows, pigs, and chickens?

national adaptation  
(23)

Work Assessment 2017  
assessment: Government

Reporting: second round

to USDA APHIS Wildlife

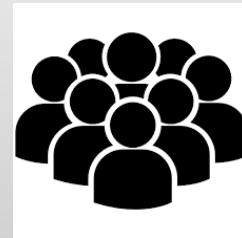


# CLEFSA: challenges

- Considering the issues with a **One Health** approach (consider interconnections among issues, and common scoring)
- Ensuring robustness of collected **data** (systematic literature review?)
- Enlarging the **expert base** (establish new partnerships?)
- Refining the **methodology** (improve clarity and explore different analysis?)
- Continuing to **keep updated** the list of identified issues (IT solutions?)

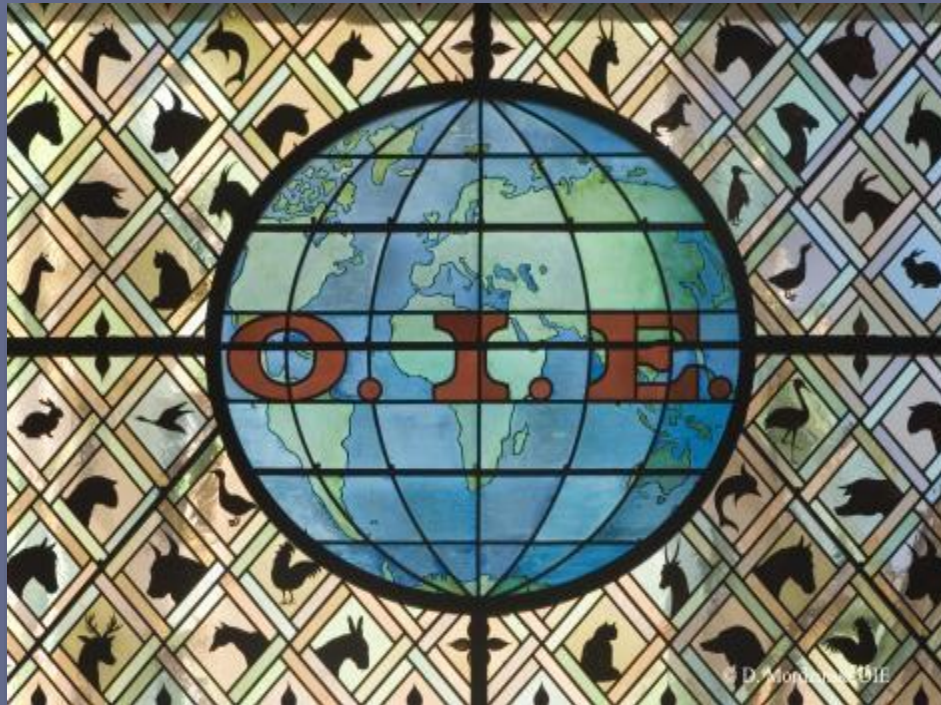


# CLEFSA





**WORLD ORGANISATION FOR ANIMAL HEALTH**  
*Protecting animals. preserving our future*



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