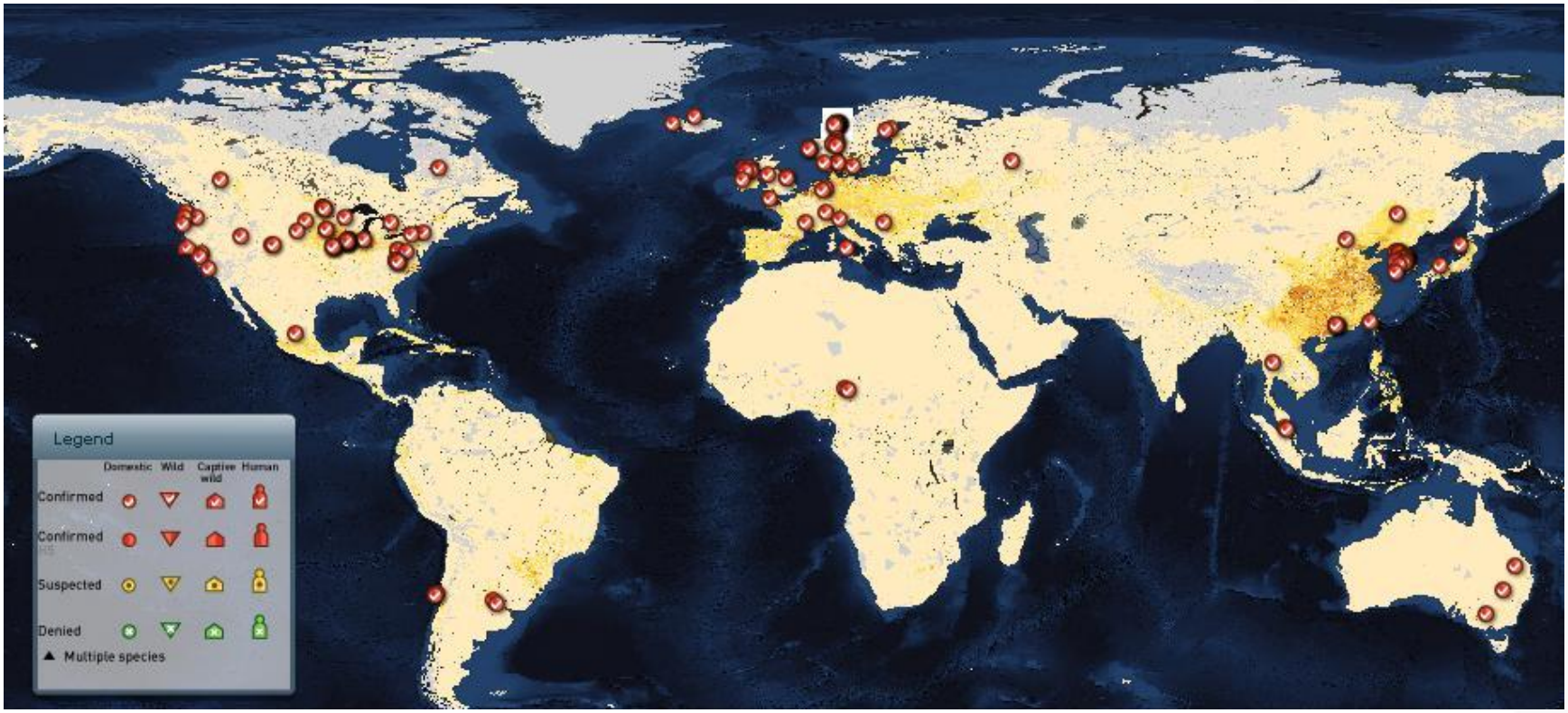
FAO contribution to the OFFLU swine influenza group

Filip Claes, Gwenaelle Dauphin
EMPRES laboratory unit

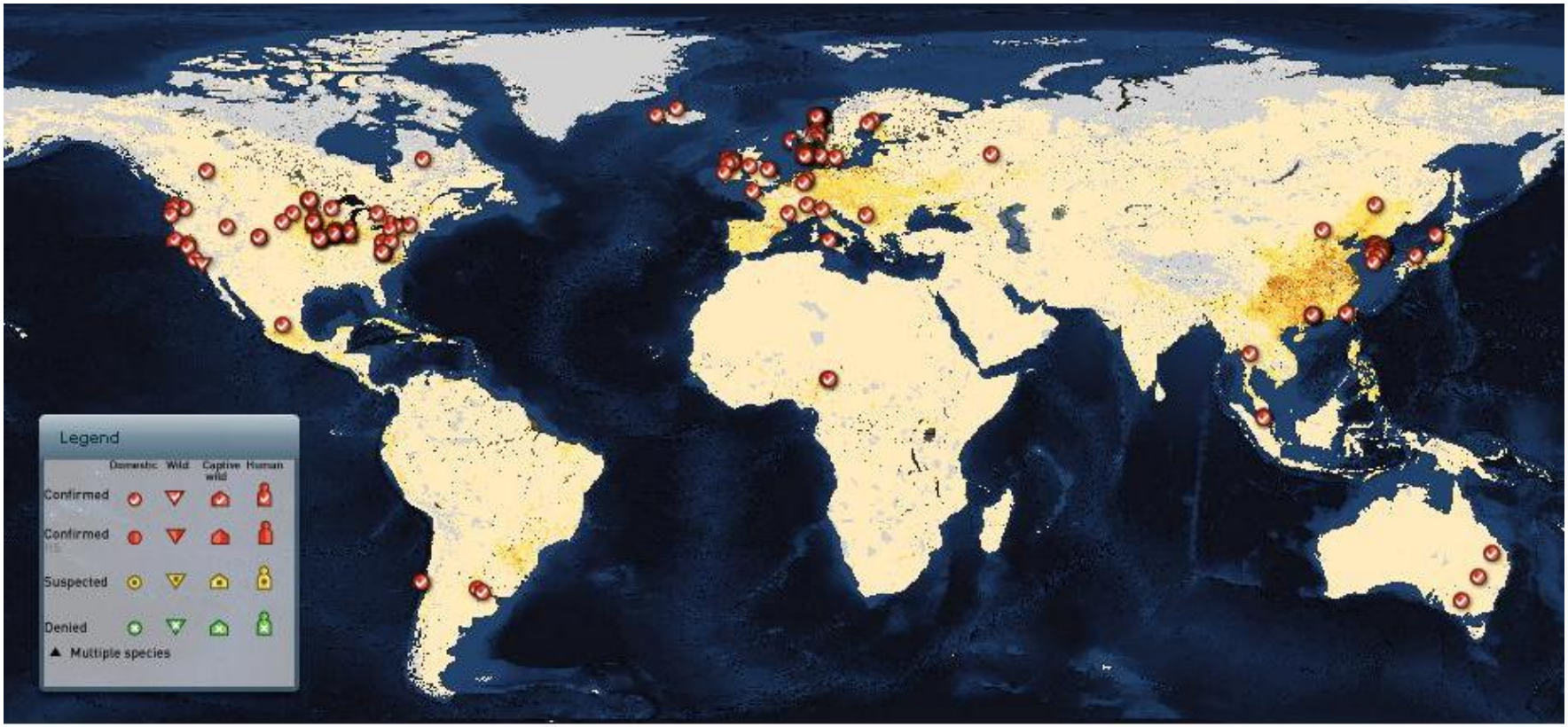
Paris, 27-28 March 2012

Food and Agriculture Organization of the United Nations
for a world without hunger

2011


Legend
Domestic
Wild
Captive wild
Human
Confirmed
Confirmed
Suspected
Denied
Multiple species

2012



Spotted any difference?

Content

- Contribution to SIV surveillance
- FAO tools for a better surveillance
- A revised model for the SIV group

Contributions to SIV surveillance

- Technical Cooperation Projects (TCP)
- FAO field offices, networks and parterschips
- EPT+

  Discussion and interaction between scientists, national authorities, international organizations and policy makers to gain better understanding and knowledge on SIV

H1N1 Technical Cooperation Projects

- Global coordination (FAO HQ)
- Regional participation
  - Regional FAO office and national labs
  - 2010-2011
  - South-East Asia, Caribbean, Latin America
- Serological and virological surveillance

Surveillance South East Asia

Table 2: Summary of approaches used for surveillance of swine influenza in SEA in 2010 (with exceptions as noted)

Country	Sampling location		Number of samples	Sample type				Target location	Target population	Diagnosis	
	On-farm	Slaughterhouse		Blood	Serum	Swab	Other			Antigen	Antibody
Cambodia	✓	✓	1,200		✓	✓	✓	- Kg Cham (300) - Takeo (300) - Phnom Penh (600)	- Smallholder farm (Kg Cham and Takeo) - Slaughterhouses (PP)	✓	✓
Lao PDR	✓		2,340		✓	✓		- Vientiane Capital - Luangprabang - Savannakhet - Champasak	- Village/smallholders - Commercial farms	✓	✓
Malaysia[1]	✓		17,708		✓	✓		Throughout the country	- All commercial farms	✓	✓
Myanmar	✓		2,800		✓			70 randomly chosen townships	- 1st priority-commercial farms - 2nd priority-smallholders		✓
Thailand[1]	✓	✓	1st-18,654 2nd-20,278			✓	✓	Throughout the country	- All pigs	✓	
Vietnam[2]	✓		759			✓		- Hanoi and Nam Dinh (384) - Long An, Binh Duong, Soc Trang (375)	- Commercial farms	✓	
		✓	150		✓			- Hanoi and Nam Dinh			✓
Philippines[2]	✓	✓	3,500		✓				- Adult pigs - Commercial farms		✓

[1] Information on surveillance activities conducted in 2009; solely financially supported by respective country governments
[2] Surveillance activities conducted under other complementary projects; but all or part of the samples were also tested for SIV

SEA: Preliminary results

country	ELISA	PCR
Lao PDR	149/2019 (7%)	All negative
Philippines	562/920 (61%)	Not performed
Thailand		All negative
Viet Nam	106/162 (65%)	All negative
Myanmar	Pending	Not performed
Cambodia	Pending	All negative

FAO field offices, networks and partnerships

- FAO country level representation
- FAO Ref. Centers on Animal Influenza
  - FLI, IZSVe, AAHL (NVSL, AHVLA, AIL)
- Network of regional laboratories
- National Veterinary Services
  - National labs
  - Epidemiological units

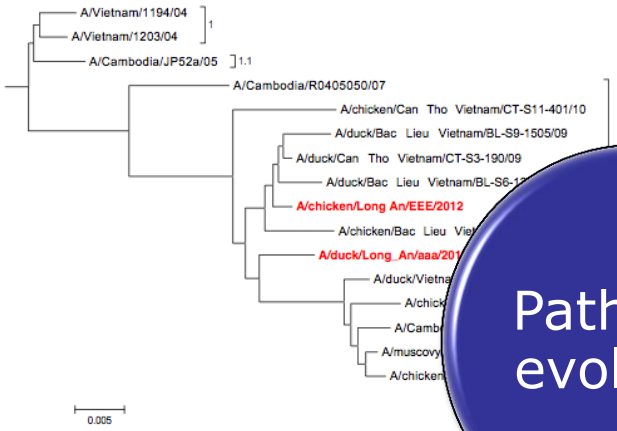
EPT+

- USAID funded project - part of the broader EPT program
- Focus: understanding the role of livestock as a potential reservoir for pandemic disease threats initially focused influenza
- 4 major elements
  - **1) Risk Modeling**
  - **2) Influenza Surveillance in Farmed Animals (swine>aquatic waterfowl>other)**
  - **3) Conduct concurrent Market trade and Commodity Networks assessments**
  - **4) Contribute to broader global influenza initiatives such as the EMPRES-I genetic module, OFFLU, and Risk Assessment Frameworks (FLURISK, CDC)**
- Geographic Scope
  - **Initially, Vietnam, China, Thailand, & Bangladesh**

FAO FP: Scott Newman

EPT+

Livestock and agro-ecology



Pathogen evolution

Disease dynamics

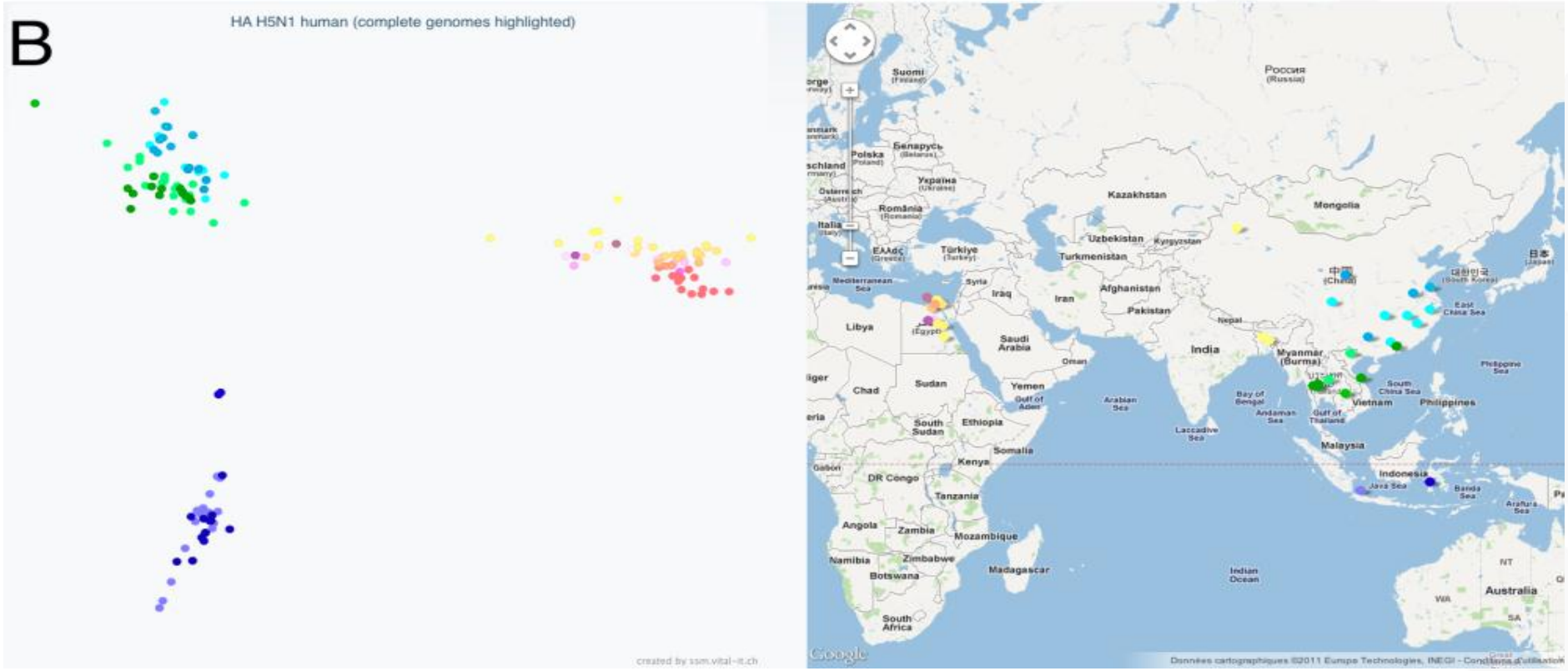
Characterization of livestock farming systems, risk of virus introduction, transmission & persistence

Livestock Production System Characteristics	Fully confined vs partially confined vs least confined	Introduction	Farm to Farm Spread	Persistence
Swine Backyard	Least confined/Open	+/- (Human Viruses) +/- (Avian Viruses) +/- (Swine Viruses)	- (Human Viruses) +/- (Avian Viruses) +/- (Swine Viruses)	- (Human Viruses) +/- (Avian Viruses) +/- (Swine Viruses)
Swine Small Holder (5-50 pigs)	Partially confined/ Open	+/- (Human Viruses) + (Avian Viruses) + (Swine Viruses)	- (Human Viruses) +/- (Avian Viruses) +/- (Swine Viruses)	- (Human Viruses) - (Avian Viruses) +/- (Swine Viruses)
Swine Intensive (hundreds)	Partially confined/ Open	+ (Human Viruses) ++ (Avian Viruses) +++ (Swine Viruses)	+ (Human Viruses) + (Avian Viruses) +++ (Swine Viruses)	+ (Human Viruses) + (Avian Viruses) ++ (Swine Viruses)
Swine Industrial (thousands)	Closed system/Fully confined	+/- (Human Viruses) +/- (Avian Viruses) ++ (Swine Viruses)	- (Human Viruses) - (Avian Viruses) +/- (Swine Viruses)	- (Human Viruses) - (Avian Viruses) - (Swine Viruses)
Domestic Duck Backyard	Least confined/Open	++	+/-	++
Domestic Duck Intensive	Partially confined/ Open	+++	+++	+++
Farmed Wild Bird Intensive	Partially confined/ Open	+++	+++	+++
Domestic Duck Intensive	Fully confined/closed	+/-	+/-	-
Domestic Chicken Backyard	Least confined/Open	++	+	-
Domestic Chicken Intensive	Partially confined/ Open	++	++	-
Domestic Chicken Intensive	Fully confined/closed	+	+/-	-
Live Bird Markets	Open and Closed	++	+++	++

Future linkages to human health & other international partners

- WHO, CDC and others (e.g. Dutch VN project) to support complimentary human influenza surveillance and other collaborative activities
- Connectivity with the OFFLU network and hopefully the broadening of OFFLU meeting participation to include national partners from the EPT+ collaborations
- Linkages to aspects of lab training, **IDENTIFY**, capacity development, etc.
- Linkages to other risk modeling activities
- Linkages identified during this and future workshops

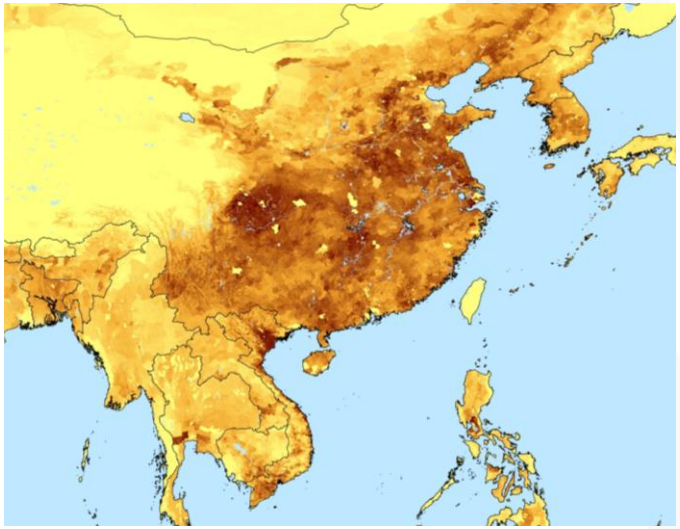
FAO tools for SIV studies



- http://empres-i.fao.org/eipws3g/

FAO tools for SIV studies

- GLiPHA : Global Livestock Production and Health Atlas
  - Agro-ecological data
  - Population data
  - Production data
  - Updated maps



- http://kids.fao.org/glipha/

FAO Risk Modeling and RA

- Risk Modeling
  - H5N1 HPAI
    - Agro-ecological factors
    - Landscape and migration ecology
  - EPT+
- Risk Assessment
  - 4-way linking (Tripartite)
  - FLURISK (EFSA)*
  - CDC RA Framework*

* FAO Support

Expert contributions

- Harmonization of approaches
- Addressing capacity needs
  - Epidemiological and laboratory
- Optimize surveillance approach
  - Advice on sampling strategies
  - Integration of various disease-surveillance
- Contribution to Risk Modeling
  - Knowlegde-based

OFFLU's role

- Advocacy for political engagement
  - Overcome reporting reluctance
- Manage, coordinate and facilitate specific Technical Activities for SIV
- Link and communication with PH side
  - One Health concept
- Transparent communication to general public

FAO suggestion for a revised 'SIV' group model

- An open network, free to expand
- Overall management by OFFLU EC
- Split group into several technical activities, by expert decision, e.g.
  - Diagnosis
  - Surveillance
  - Risk Modeling
- In analogy to avian influenza network

FAO animal health 'policy'

Questions to SIV experts - EPT+ -

- Sampling type (lung samples? yield/time-effort)
- Optimal age of pigs for sampling
- Virus culture (MDCK+.15trypsin vs. eggs)
- Virus typing
  - HA/NA
  - Full Genome Sequencing: selection criteria (expert input welcome)
- Sero-surveillance
  - Initial screening with IDEXX
  - HI with defined panel (SIV group input in choice of panel)
- Participation to MCDA (Risk Modeling)
  - Multi-Criterion Disease Analysis (viro, epi, livestock, and RM experts)
  - Ranking of mappable risk factors based on expert consultation
  - WEBEX meeting, questionnaire and TC

Acknowledgments

- FAO colleagues
- OIE and WHO
- OFFLU
- USAID
- CIDA