

The European Surveillance Network for Influenza in Pigs: ESNIP

Prof Kristien Van Reeth
Ghent University, Belgium

OFFLU Technical Meeting, Paris 6-7 April 2011

ESNIP's are EC-funded “co-ordination actions”



Dec '00 – March '04
269 984 €
14 partners
coördinator Guus Koch



Jan '06 – March '09
300 000 €
11 partners
coördinator Kristien Van Reeth



Nov '10 – Nov '13
1 000 000 €
23 partners
coördinator Ian Brown

Swine influenza situation in 1999

- Antigenic drift in H3N2 SIVs from The Netherlands and Belgium reported by some researchers, not by others
- Emergence of a novel H1N2 reassortant (with human-like HA) in the UK in 1994
- Sudden change in SI epidemiology in the US in 1998: triple reassortant H3N2 viruses
- Cases of H5 and H9 avian influenza humans in Hong Kong; growing concerns about potential role of pigs as intermediate hosts

Antigenic drift in swine influenza H3 haemagglutinins with implications for vaccination policy

J.C. de Jong^{a,*}, A.P. van Nieuwstadt^b, T.G. Kimman^a, W.L.A. Loeffen^c,
T.M. Bestebroer^a, K. Bijlsma^a, C. Verweij^a, A.D.M.E. Osterhaus^d, E.C.J. Claas^d

Vaccine 17 (1999) 1321–1328

Antigenic and molecular heterogeneity in recent swine influenza A(H1N1) virus isolates with possible implications for vaccination policy

J.C. de Jong^{a,d,*}, P.P. Heinen^b, W.L.A. Loeffen^c, A.P. van Nieuwstadt^b,
E.C.J. Claas^{d,1}, T.M. Bestebroer^{a,d,2}, K. Bijlsma^a, C. Verweij^a, A.D.M.E. Osterhaus^d,
G.F. Rimmelzwaan^d, R.A.M. Fouchier^d, T.G. Kimman^a

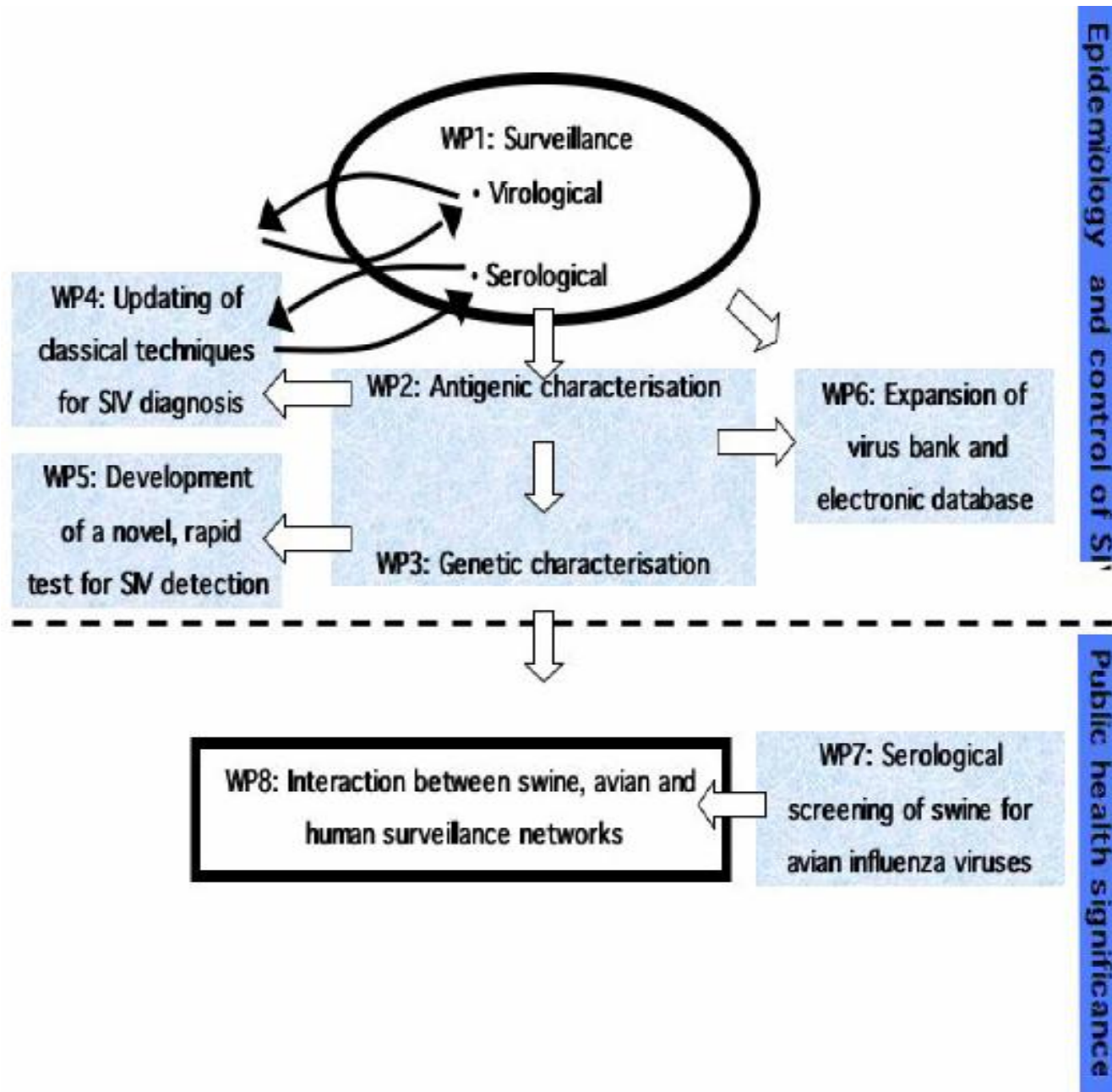
Vaccine 19 (2001) 4452–4464

ESNIP1 - Major achievements

- 1 Standardization of protocols for diagnosis
- 1 Selection of reference virus strains, production of hyperimmune sera
- 2 Establishment of a central virus bank and an electronic database
- 3 Antigenic & genetic characterization of some recent isolates
- 4 Preliminary picture of prevalence of different SIV subtypes in different countries



ESNIP2 – Work packages



ORIGINAL ARTICLE

Virological Surveillance and Preliminary Antigenic Characterization of Influenza Viruses in Pigs in Five European Countries from 2006 to 2008

C. S. Kyriakis¹, I. H. Brown², E. Foni³, G. Kuntz-Simon⁴, J. Maldonado⁵, F. Madec⁴, S. C. Essen², C. Chiapponi³ and K. Van Reeth¹

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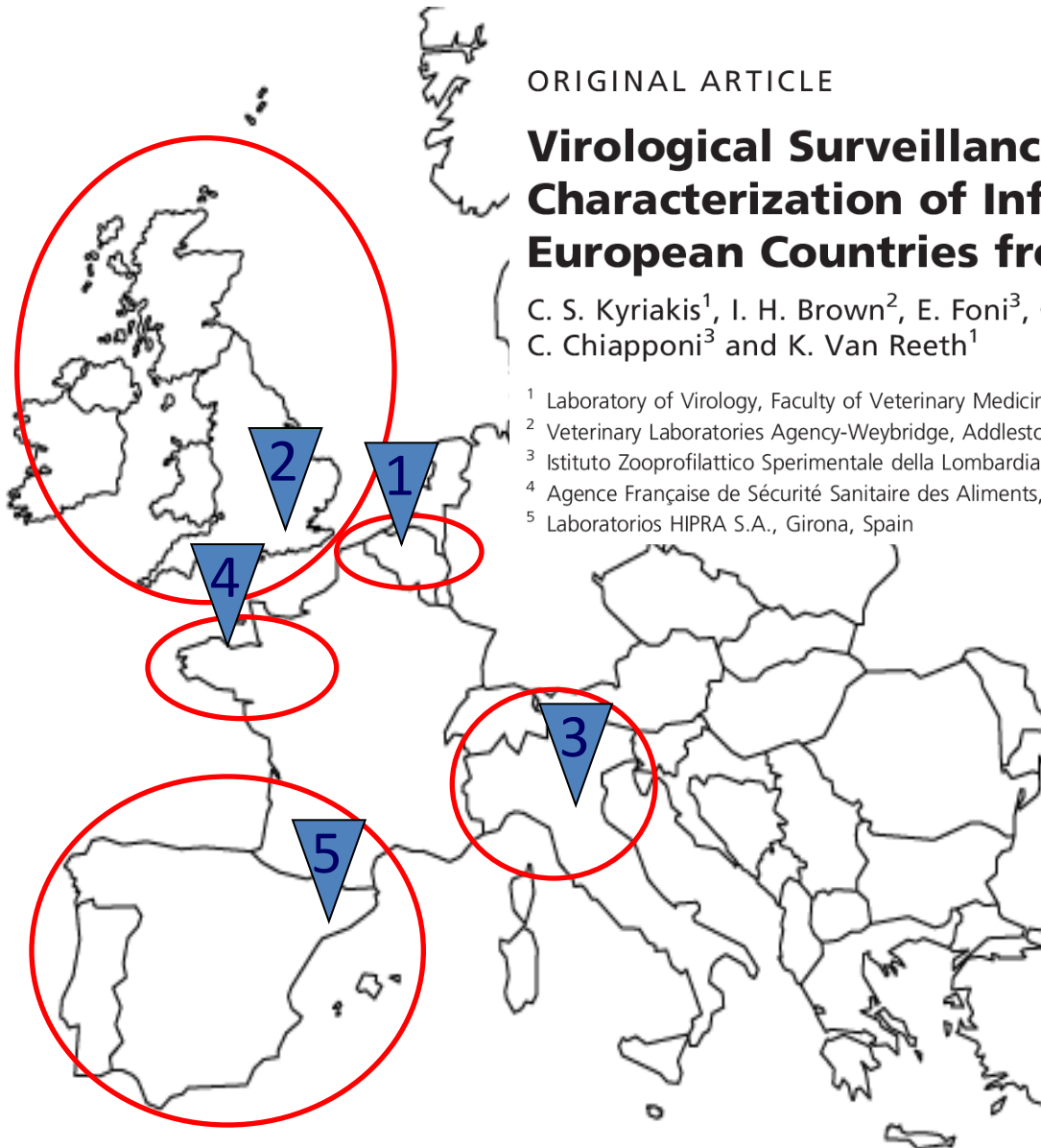
² Veterinary Laboratories Agency-Weybridge, Addlestone, Surrey, UK

³ Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, Parma, Italy

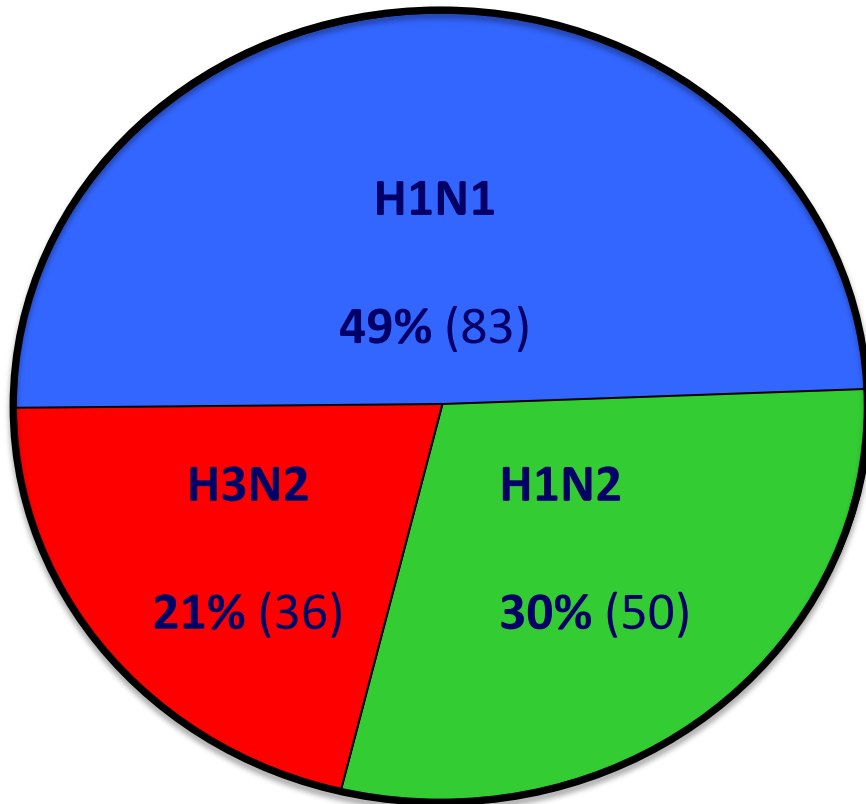
⁴ Agence Française de Sécurité Sanitaire des Aliments, Ploufragan, France

⁵ Laboratorios HIPRA S.A., Girona, Spain

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ESNIP2



- 169 SIVs isolated (2006 to 2008)
- H1N1, H3N2 and H1N2 in Belgium, Italy, Spain
- **No** H3N2 in UK or France
- 97% “prototype” European SIVs
- only 5 “novel” reassortants (2 H1N1 and 3 H1N2)

Strong antigenic relationship between older human H1N1 and H3N2 viruses (1980s) and current swine H1N2 and H3N2 (common origin!), but not with more recent human viruses.

ESNIP2 - Major achievements

- 1 Antigenic and genetic characterization of a (limited) number of European SIVs
- 2 Serological profile of fatteners in 80 farrow-to-finish herds (Belgium, France, Italy, Spain) to determine infection pattern
- 3 M gene-targeted real time RT-PCR for SIV established
- 4 Expansion of virus bank
- 1 Serologic investigations to determine cross-reactivity between 2009 pH1N1 virus and existing European SIVs

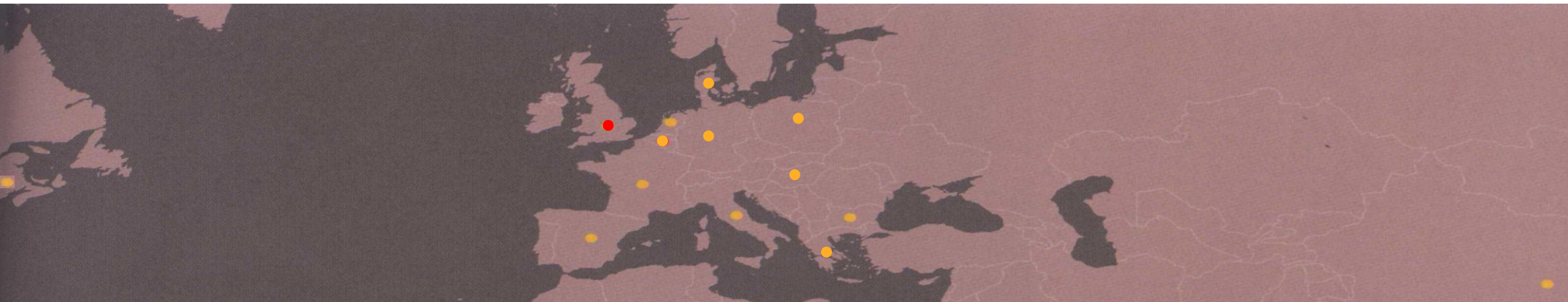


ESNIP3 – What next?

1. Whole genome sequencing
2. Antigenic mapping using cartography
3. Virus bank will be made publicly available at end of project

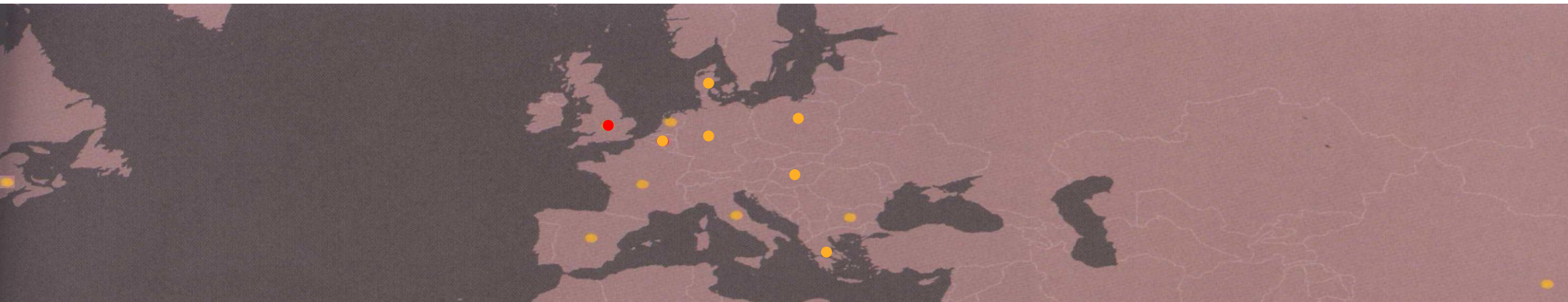
ESNIP3 - participants

- P1: Veterinary Laboratories Agency (VLA) UK
- P2: Ghent University (UGent) BELGIUM
- P3: French Agency for Food, Environmental and Occupational Health (AFSSA) FRANCE
- P4: Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (IZSLER) ITALY
- P5: Technical University of Denmark DENMARK
- P6: Panstwowy Instytut Weterynaryjny POLAND
- P7: Laboratorio Central Veterinario-Sanidad Animal SPAIN
- P8: IDT Biologika GmbH GERMANY
- P9: Finnish Food Safety Authority EVIRA FINLAND
- P10: Kimron Veterinary Institute ISRAEL
- P11: Veterinary Diagnostic Directorate HUNGARY



ESNIP3 - participants

- P12: Central Veterinary Institute of Wageningen THE NETHERLANDS
- P13: University of Thessaly GREECE
- P14: Wellcome Trust Sanger Institute UK
- P15: University of Cambridge UK
- P16: University of Oxford UK
- P17: Friedrich Loeffler Institute GERMANY
- P18: Istituto Zooprofilattico Sperimentale delle Venezie ITALY
- P19: St. Jude Children's Research Hospital USA
- P20: United States Department of Agriculture USA
- P21: Harbin Veterinary Institute CHINA
- P22: MERIAL, Virology Department (MERIAL) FRANCE
- P23: Laboratorios HIPRA S.A. (HIPRA) SPAIN
- P24: Animal Health Trust UK



Challenges to surveillance

- **Difficult access to samples**, passive >> active surveillance, fragmented data analysis
- Standardization of protocols is a must
- **Resources** and time
- More international harmonization and coordination of surveillance needed

Thanks to the European Commission
and all ESNIP partners

