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”

ESNIP 1
Dec ‘00 – March ‘04
269 984 €
14 partners
coördinator Guus Koch

ESNIP 2
Jan ‘06 – March ‘09
300 000 €
11 partners
coördinator Kristien Van Reeth

ESNIP 3
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

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Vaccine 19 (2001) 4452–4464
ESNIP1 - Major achievements

1. Standardization of protocols for diagnosis
2. Selection of reference virus strains, production of hyperimmune sera
3. Establishment of a central virus bank and an electronic database
4. Antigenic & genetic characterization of some recent isolates
5. Preliminary picture of prevalence of different SIV subtypes in different countries
ESNIP2 – Work packages

WP1: Surveillance
  • Virological
  • Serological

WP2: Antigenic characterisation

WP3: Genetic characterisation

WP4: Updating of classical techniques for SIV diagnosis

WP5: Development of a novel, rapid test for SIV detection

WP6: Expansion of virus bank and electronic database

WP7: Serological screening of swine for avian influenza viruses

WP8: Interaction between swine, avian and human surveillance networks
Virological Surveillance and Preliminary Antigenic Characterization of Influenza Viruses in Pigs in Five European Countries from 2006 to 2008

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• 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 dele 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