

Influenza Suina: clinica, dati epidemiologici
e diagnostica in un sistema produttivo integrato (30
anni di storia)

Riunione/Incontro GVS
Mantova, 01 dicembre 2023

Influenza suina (SIV); un breve background

- SIV è un patogeno respiratorio primario del suino
- SIV induce lesioni polmonari tipiche.
- In Europa e in **Italia** circolano tutti i 3(4) subtypes con differenti prevalenze.
 - H1N1 Eurasian “avian like” (EA H1avN1)
 - H1N1pdm09
 - H3N2 Reassortant “human like”
 - H1N2 “human-avian reassortant”
- L' infezione (o la vaccinazione) con i SIV subtypes H1N1, H3N2 and H1N2 solitamente induce una «buona protezione» nei confronti di un challenge omologo ma conferisce «minore protezione» nei confronti di ceppi eterologhi.

Influenza Suina

Forma Epizootica

- Colpisce animali adulti di varie età
- Inizio improvviso ed acuto
- Gli animali colpiti mostrano grande prostrazione, febbre, anoressia, tosse secca, dyspnea e scolo nasale

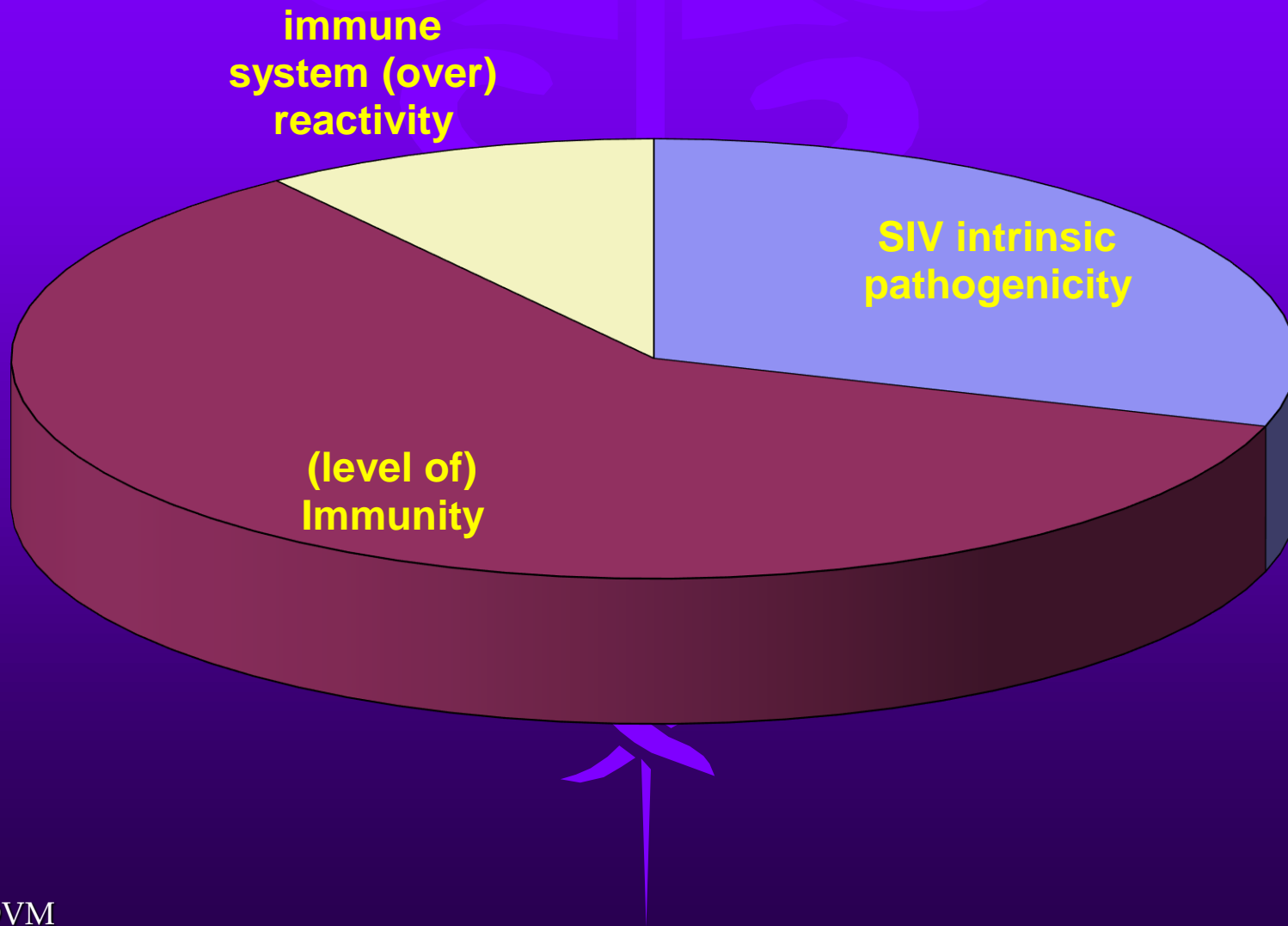
Forma Enzootica

- Primi casi riportati da colleghi in Francia e U.S.A.
- Colpisce di solito suinetti svezzati di 3-10 settimane di vita
- L'insorgenza e le manifestazioni cliniche sono grandemente influenzate dalla dinamica della immunità di popolazione (?)

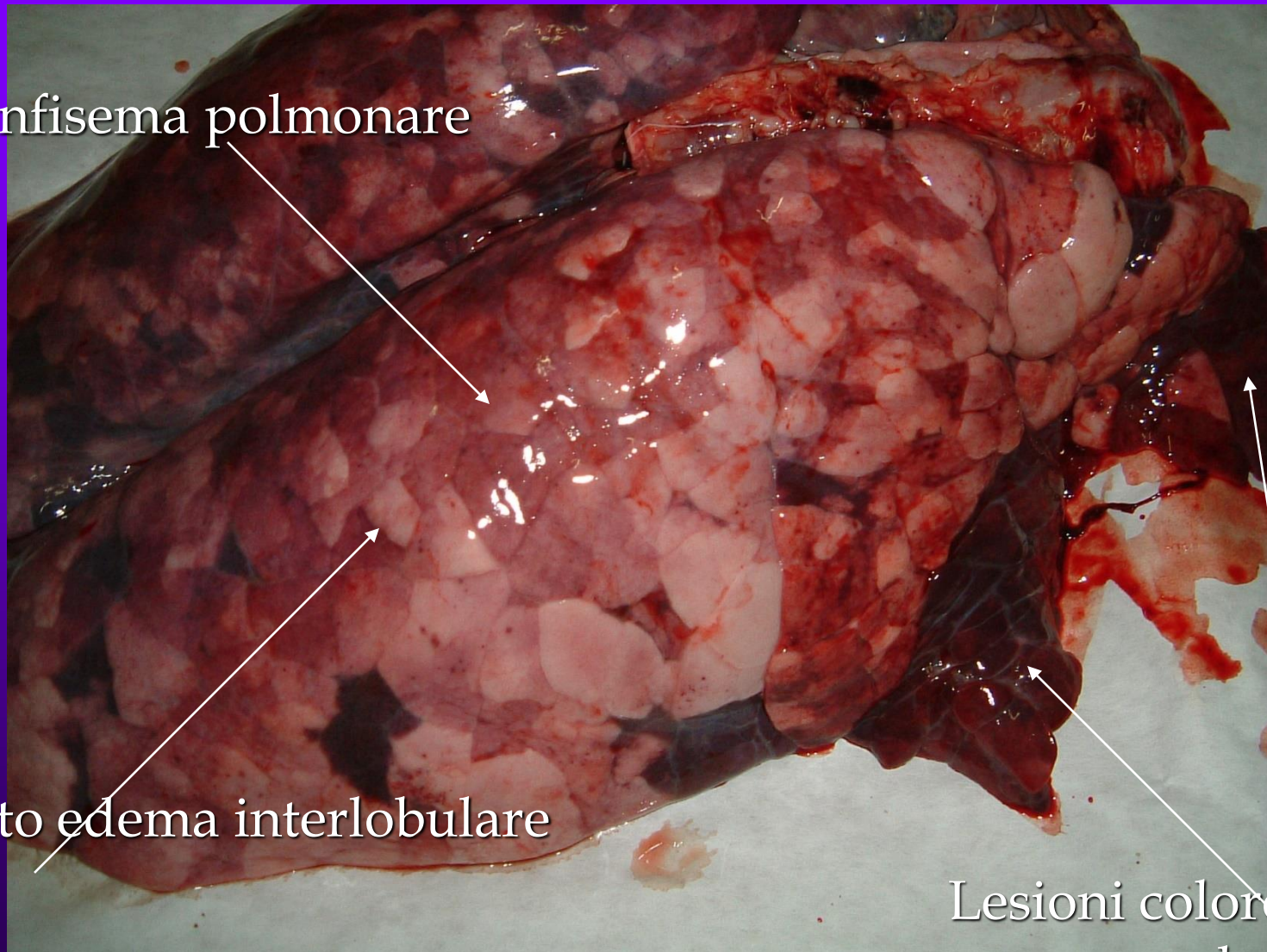
FAQ

- **Perché vediamo diverse (gravità) forme cliniche/quadri patologici ?**
- Esistono ceppi di diversa virulenza?
- Sono forse le «host-virus relationships» ad influenzare la severità del quadro clinico ?

Manifestazioni cliniche come risultato di ...



Flu ; post mortem («normale»)

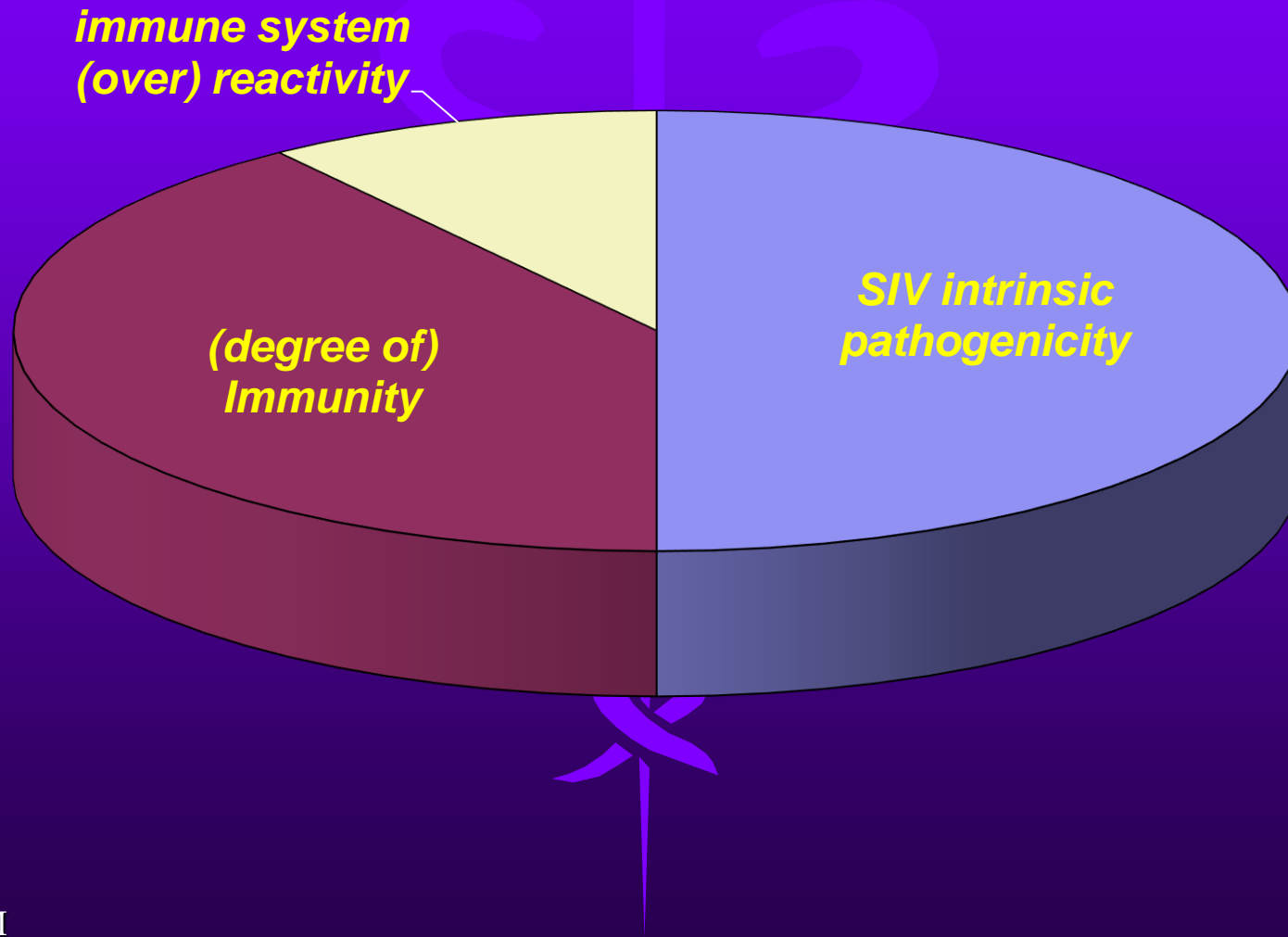


Area di enfisema polmonare

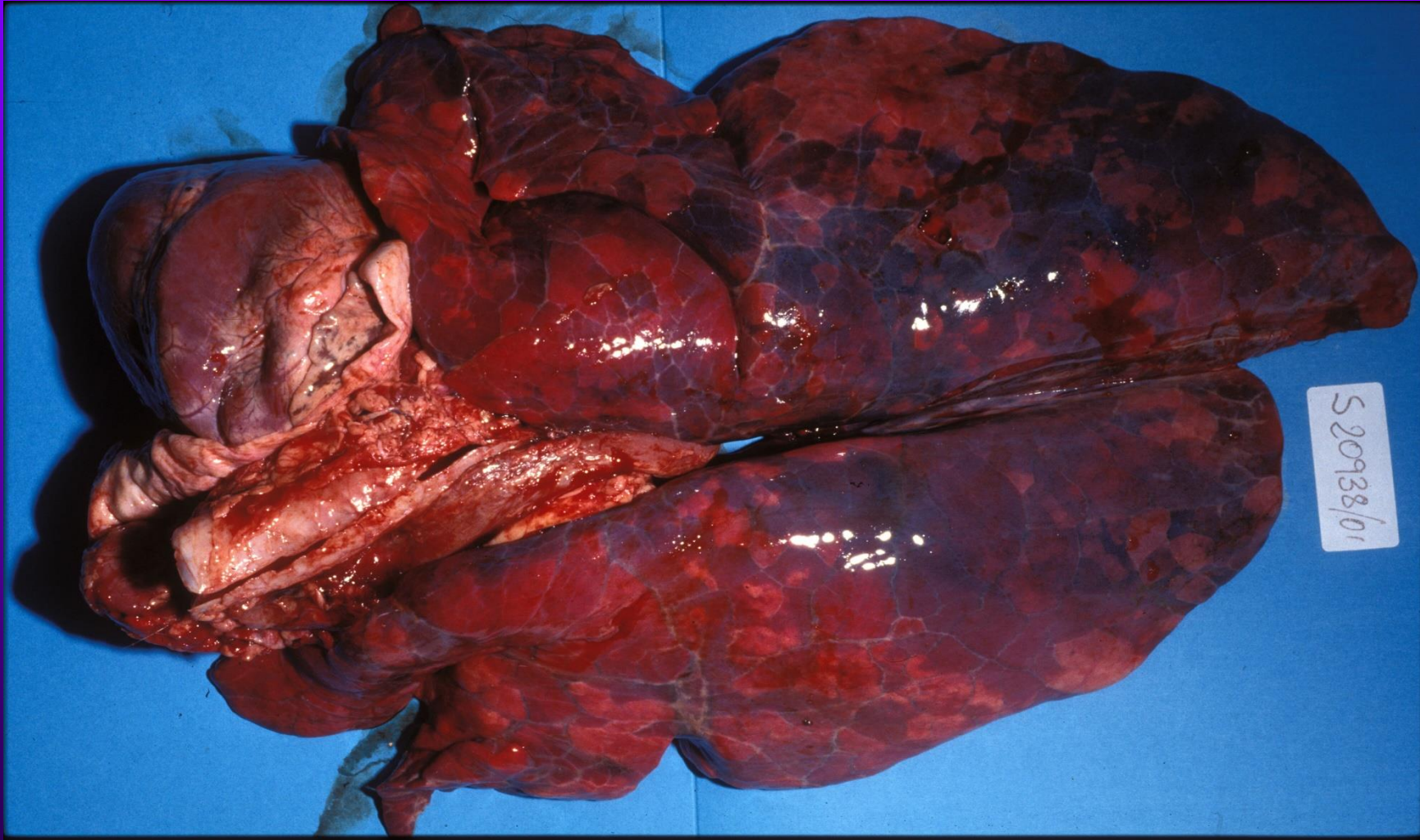
Moderato edema interlobulare

Lesioni colore rosso
porpora e depressed

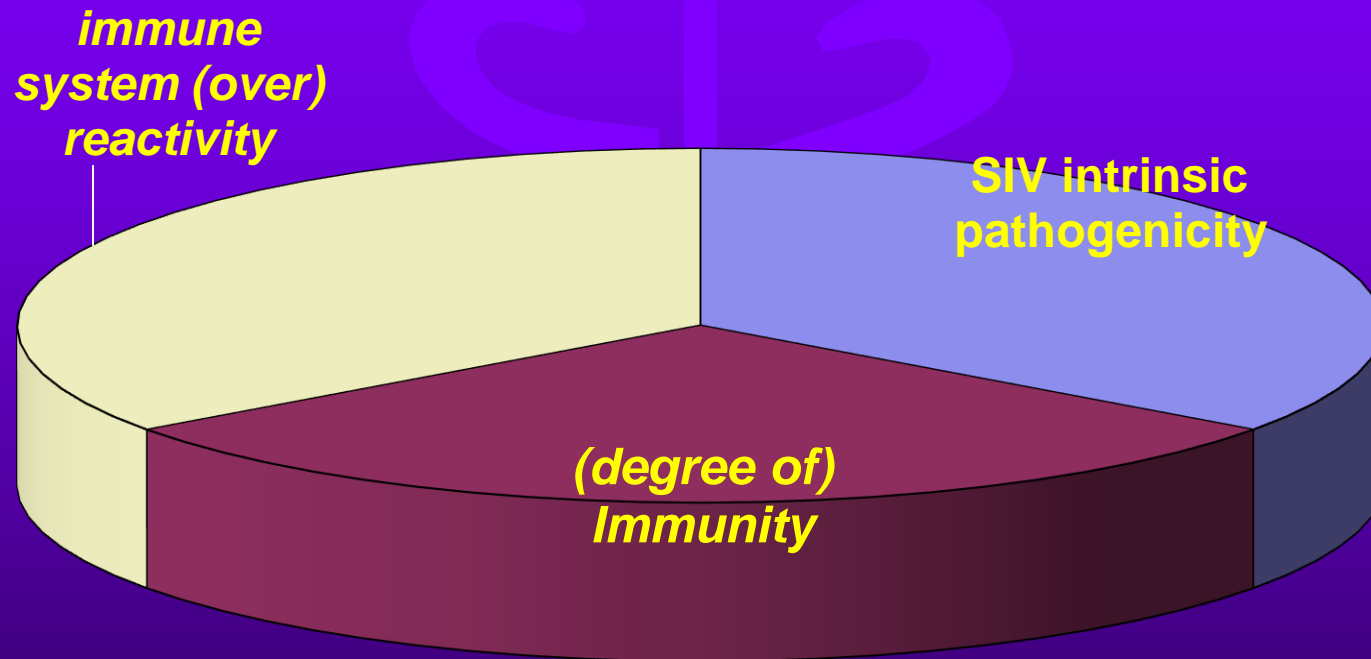
Manifestazioni cliniche come risultato di ...



Flu ; post mortem (gravità intermedia)



Manifestazioni cliniche come risultato di ...



Flu (grave) ; post mortem

Pneumonic areas
of consolidation.
Plum colored and slightly firm

>60% of lung
tissue involved



CYTOKINE STORM and the INFLUENZA PANDEMIC

Angela L. Petrosino, MPH, [CHES](#) (Northwest Ohio Consortium for Public Health)

A [cytokine storm](#) is the systemic expression of a healthy and vigorous immune system resulting in the release of more than 150 inflammatory mediators (cytokines, oxygen free radicals, and coagulation factors). Both pro-inflammatory cytokines (such as Tumor Necrosis Factor-alpha, InterLeukin-1, and InterLeukin-6) and anti-inflammatory cytokines (such as interleukin 10, and interleukin 1 receptor antagonist) are elevated in the serum, and the fierce and often lethal interplay of these cytokines is referred to as a "Cytokine Storm". The primary contributors to the cytokine storm are **TNF-a** (Tumor Necrosis Factor-alpha) and **IL-6** (Interleukin-6). The cytokine storm is an inappropriate (exaggerated) immune response that is caused by rapidly proliferating and highly activated T-cells or natural killer (NK) cells. These cells are

Viral Immunol. 2002;15(4):583-94.

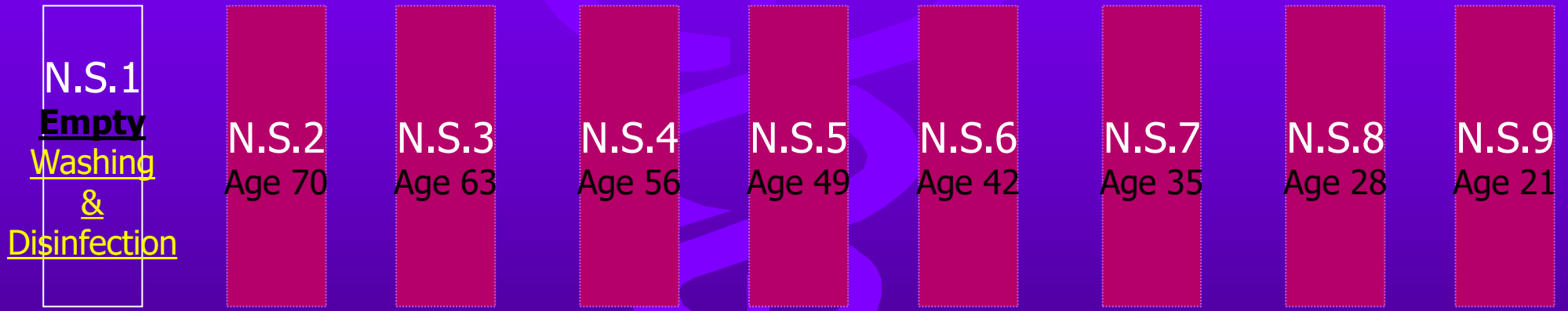
Correlations between lung proinflammatory cytokine levels, virus replication, and disease after swine influenza virus challenge of vaccination-immune pig

[Van Reeth K](#), [Van Gucht S](#), [Pensaert M](#).

Laboratory of Virology, Faculty of Veterinary Medicine, Ghent University, Merelbeke, Belgium. kristien.vanreeth@rug.ac.be

System description and FLU Monitoring Program





Week 9



Sospetto caso di FLU



Tamponi nasali e/o
Fl.oralis



Inviati al Lab per
Directigen®/PCR & identificazione

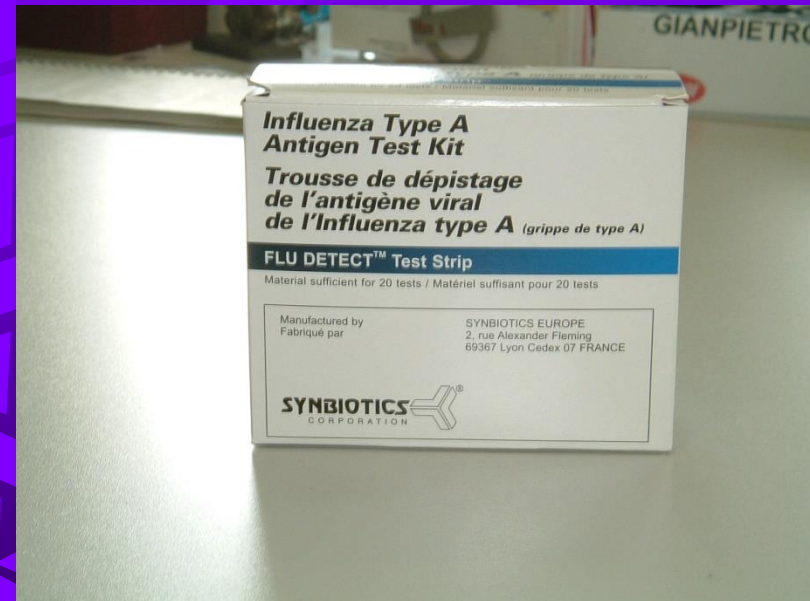
Matrici per conferma diagnostica
(PCR & colture + typing + genetic sequence)

IZS
Parma/Padova



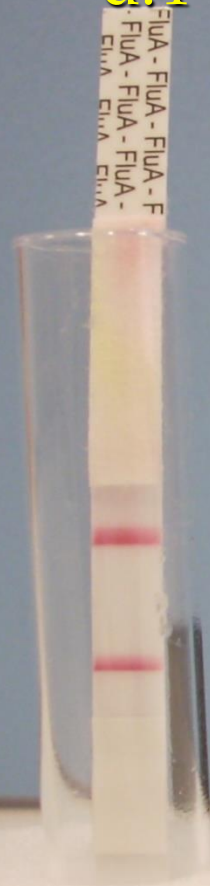
FLU diagnostica

- Clinica
- PCR
- Culture cellulari (SIV-isolation)
- Rapid FLU detection kit



From nasal swab

d.4

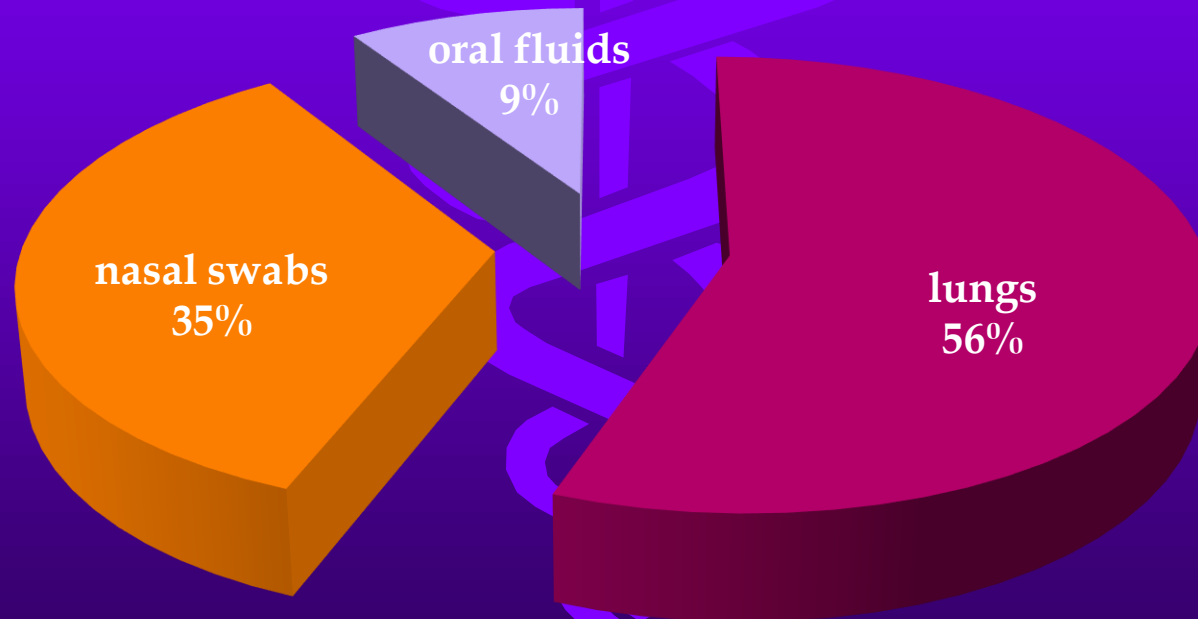


From tracheal swab

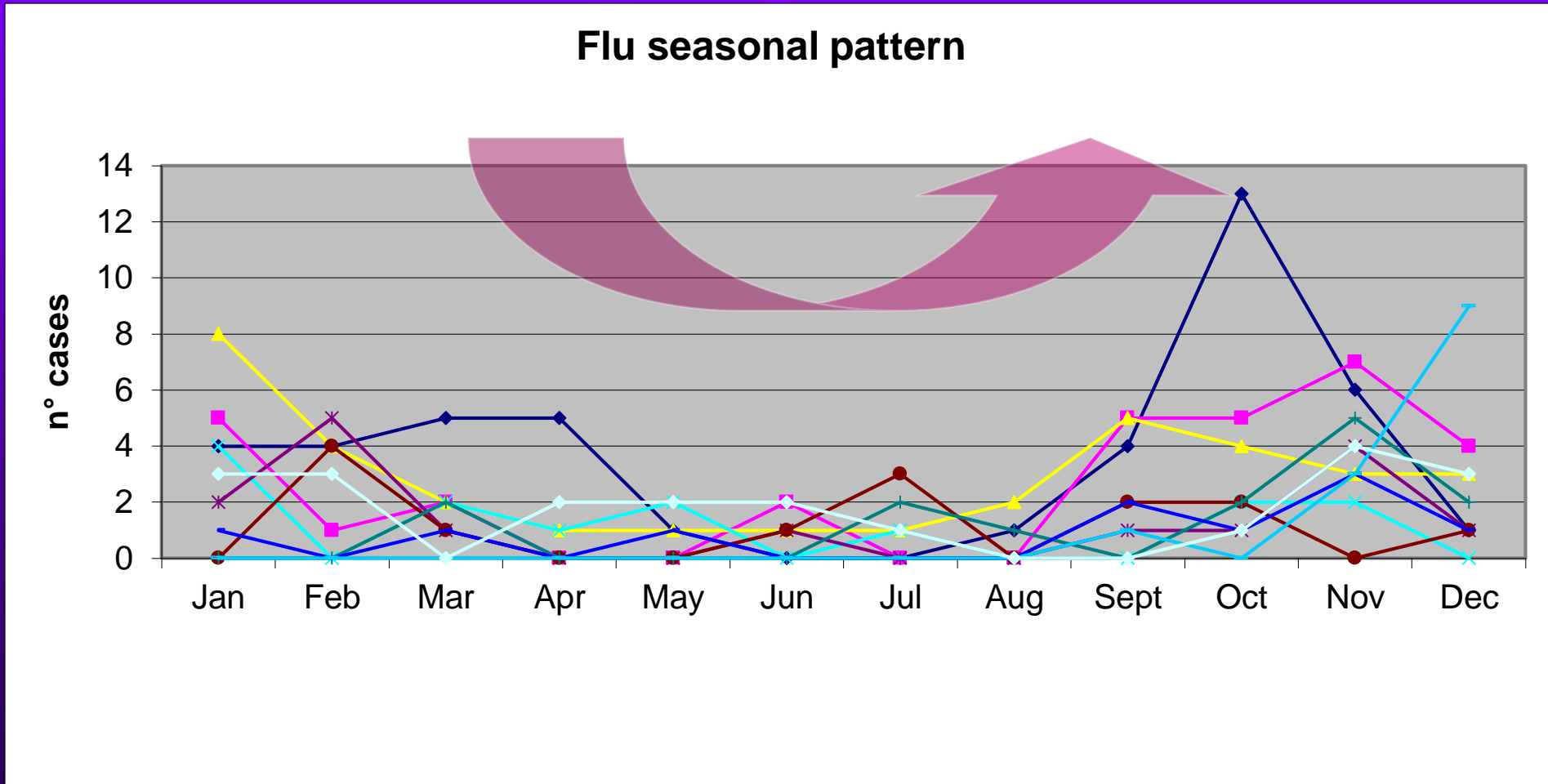
Post mortem



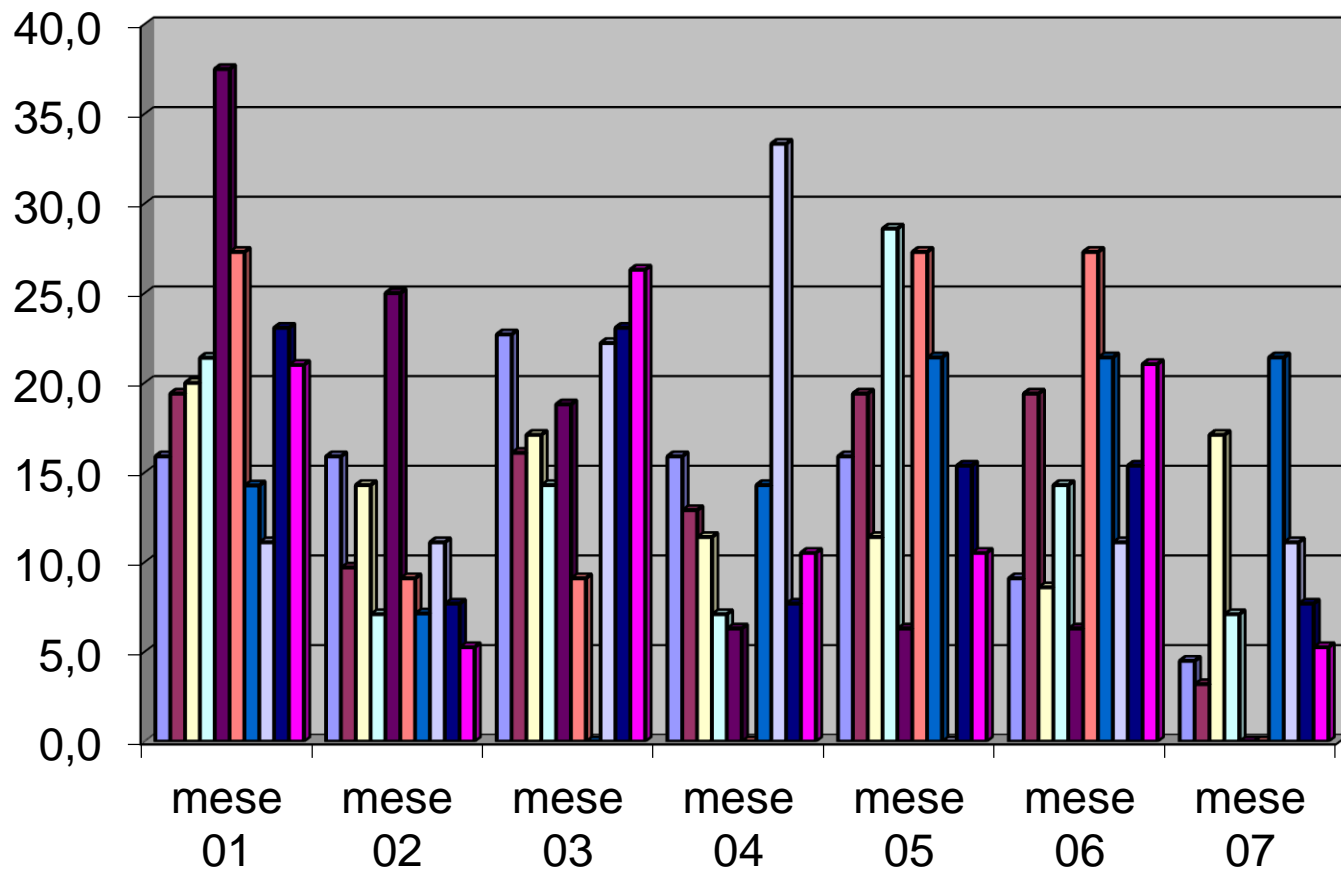
FLU pos. da dove ?



Andamento stagionale dei casi di FLU




Quando durante il corso del ciclo ?



ORIGINAL ARTICLE

Genetic analysis of human and swine influenza A viruses isolated in Northern Italy during 2010–2015

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Summary

Influenza A virus (IAV) infection in swine plays an important role in the ecology of influenza viruses. The emergence of new IAVs comes through different mechanisms, with the genetic reassortment of genes between influenza viruses, also originating from different species, being common. We performed a genetic analysis on 179 IAV isolates from humans (n. 75) and pigs (n. 104) collected in Northern Italy between 2010 and 2015, to monitor the genetic exchange between human and swine IAVs. No cases of human infection with swine strains were noticed, but direct infections of swine with H1N1pdm09 strains were detected. Moreover, we pointed out a continuous circulation of H1N1pdm09 strains in swine populations evidenced by the introduction of internal genes of this subtype. These events contribute to generating new viral variants—possibly endowed with pandemic potential—and emphasize the importance of continuous surveillance at both animal and human level.

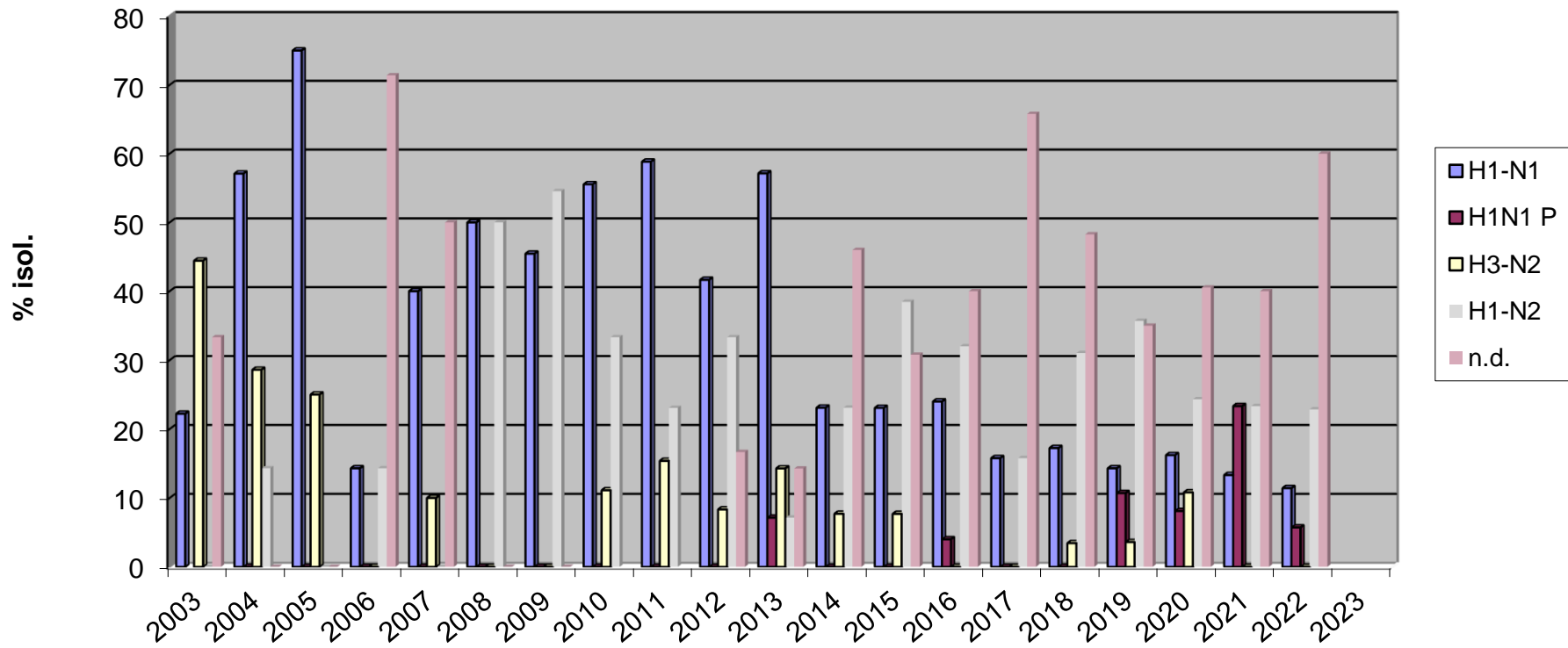
KEYWORDS

human, influenza A virus, swine

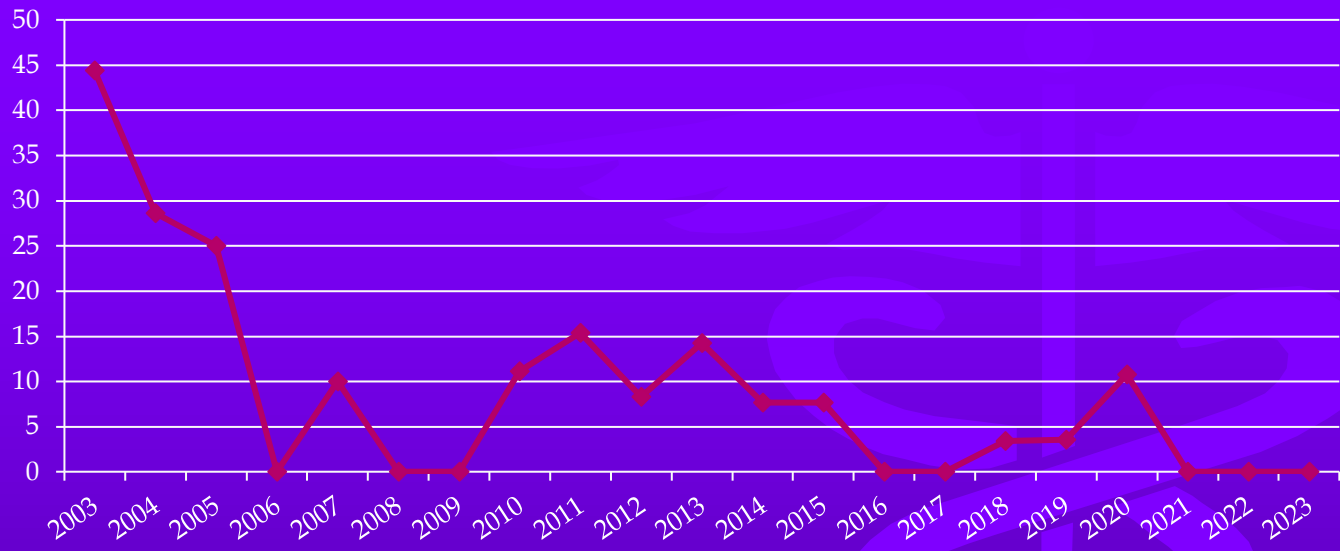


FIGURE 2 Lineages and gene constellation of IAV strains of the study. The genotypes 1–13 were assigned to each genetic combination. The origin of each segment was assigned on the basis of genetic clustering with reference strains

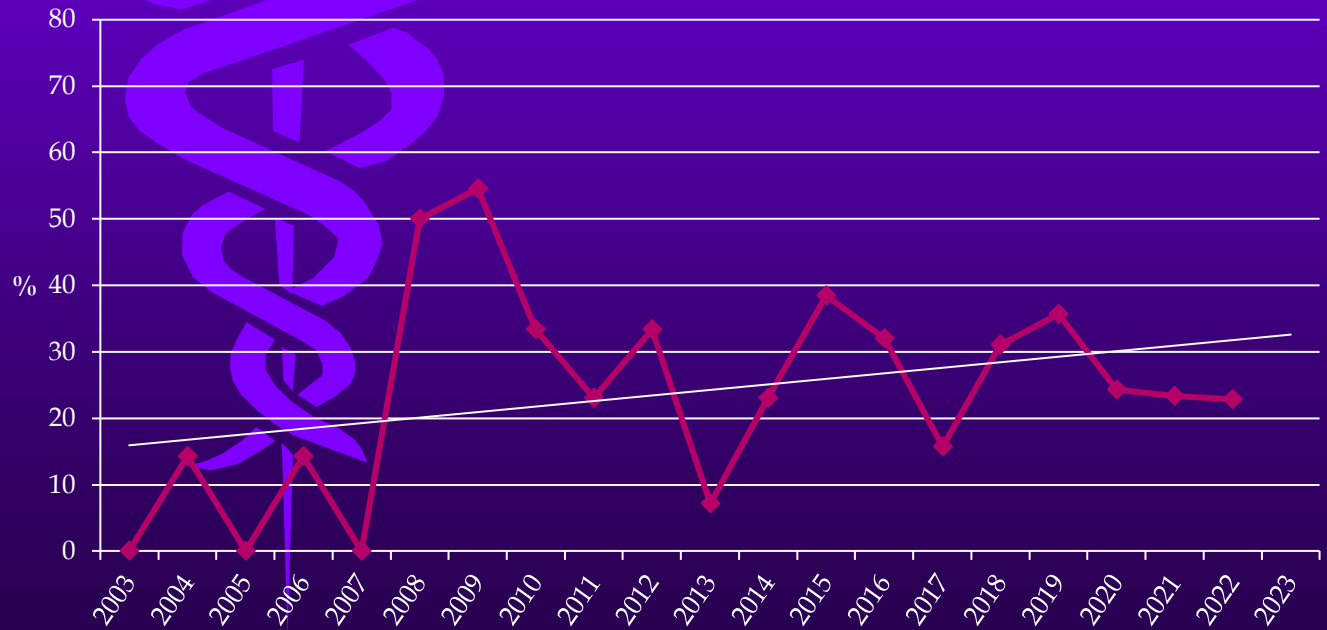
Tipologia FLU 2003-23



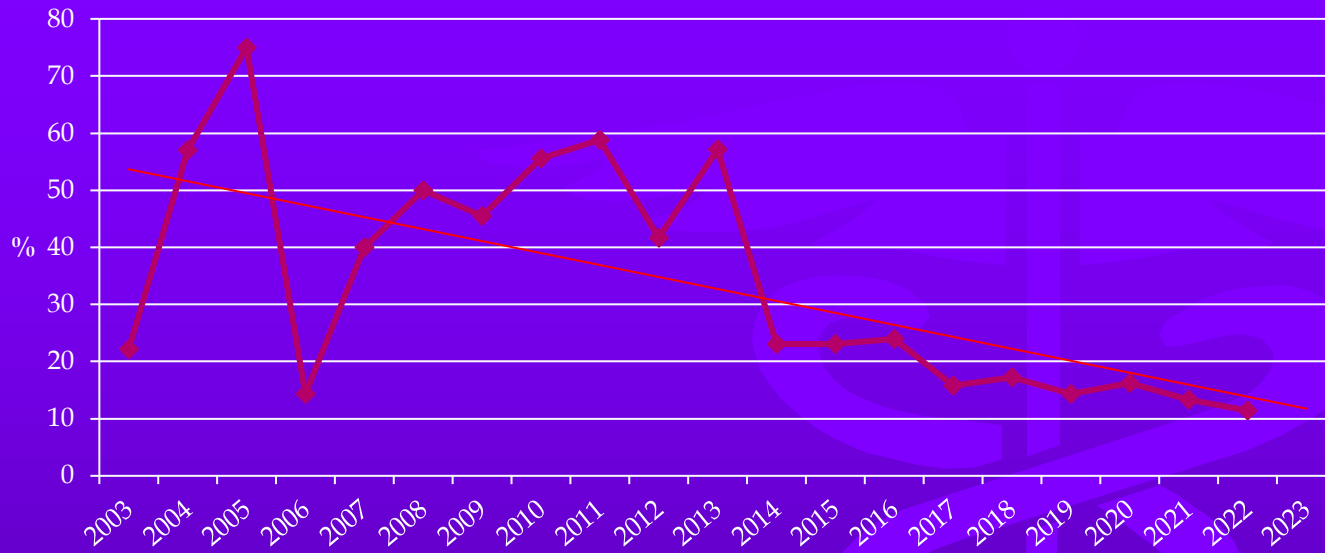
H3-N2



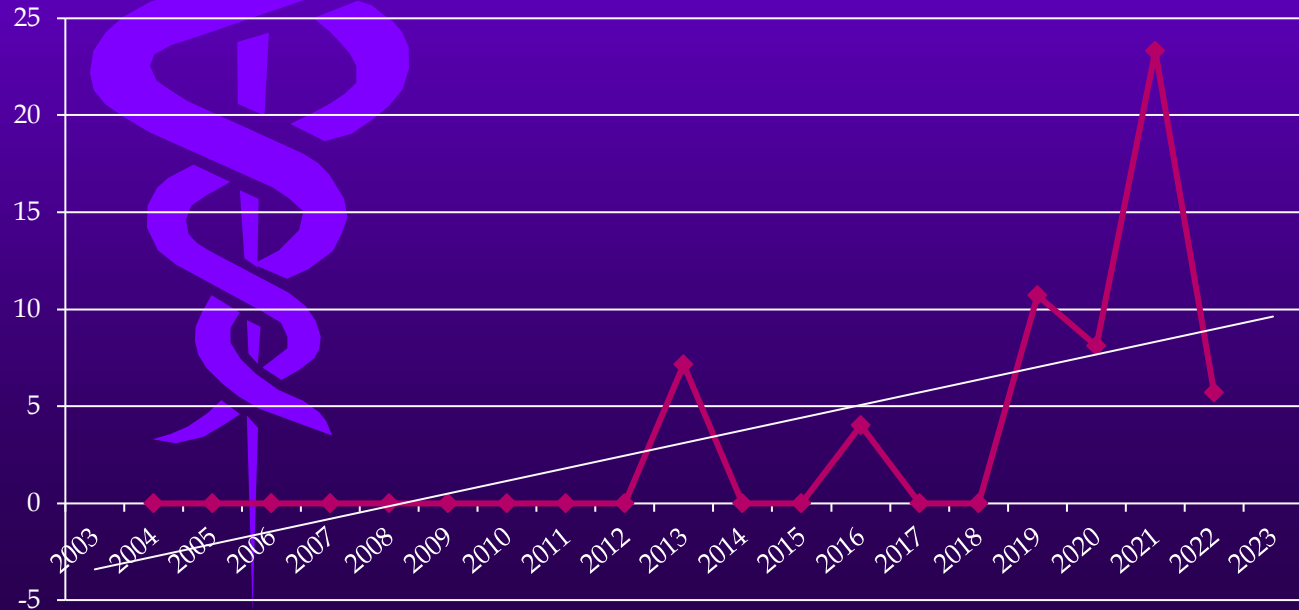
H1-N2



H1-N1

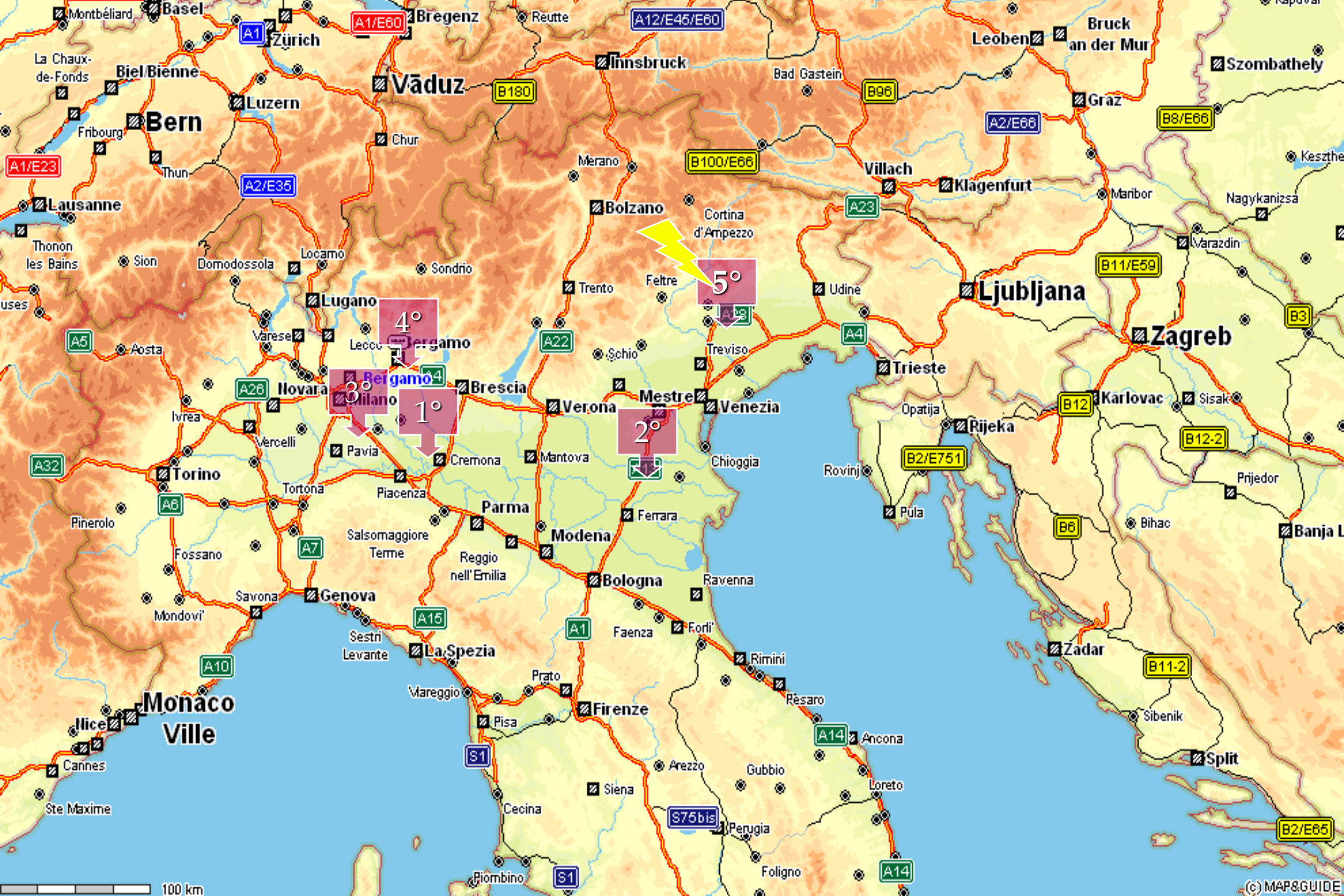


H1N1 P



FLU negli allevamenti scrofe



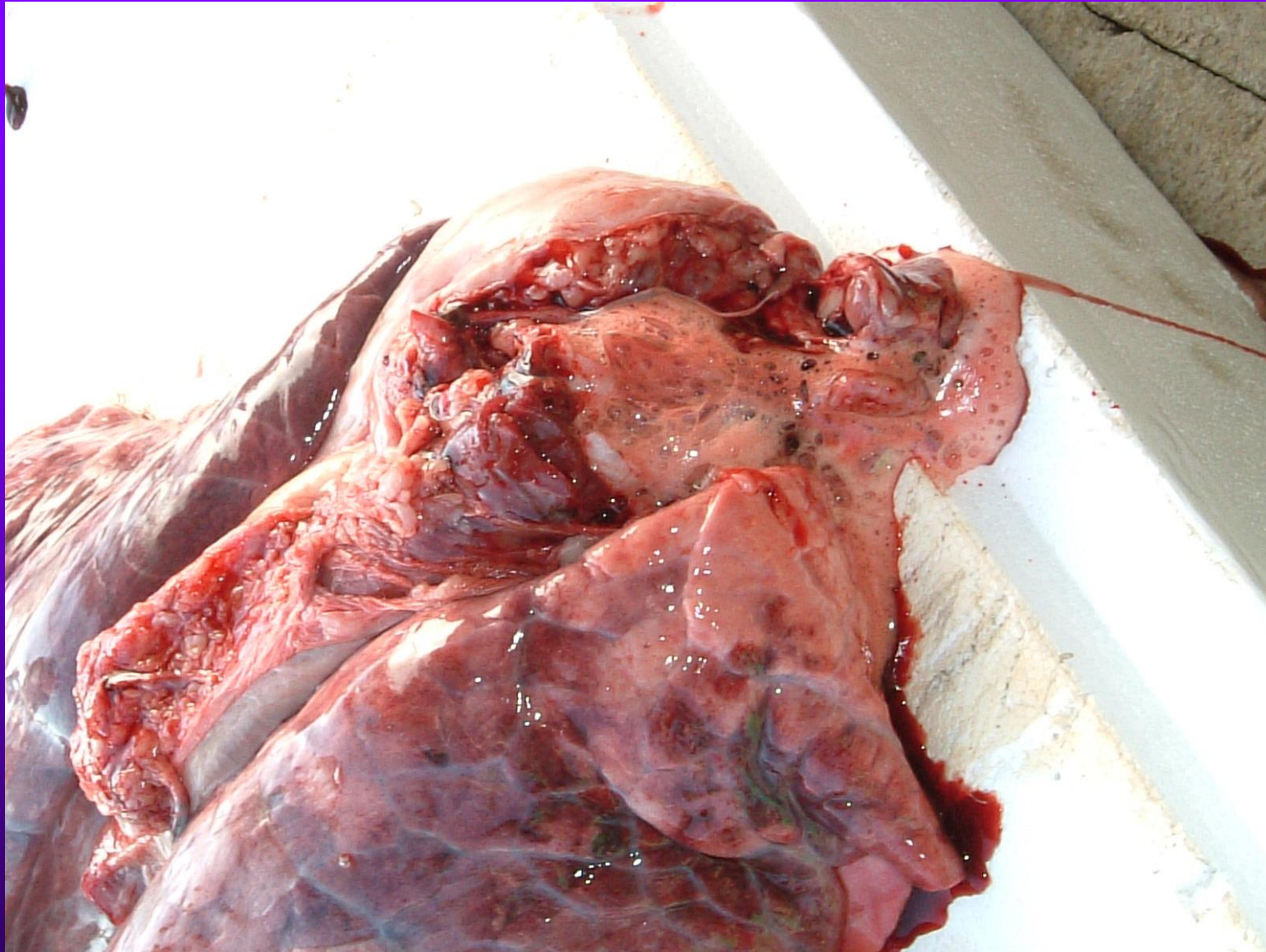


100 km

(c) MAP&GUIDE

	# 1	# 2	# 3	# 4	# 5
herd size	800	1.700	2.000	7.500	4.500
date	Nov. 2005	Gen. 2006	Feb.2006	Feb.2006	Jan/feb.2007
duration	15 d.	15 d.	15 d.	15 d.	15 d.
morbidity	20%	15%	10-15%	20%	20%
mortality % (n°)	4,8% (38)	2,5% (40)	1,5% (40)	1,5% (110)	0,65 (28)
diagnostic	A/swine/H1N2	PCR pos. A/swine	A/swine/H1N2	A/swine/H1N2	A/swine/H1N2





Estremamente grave in alcuni soggetti