

Diagnostic activity in Italy, present and future perspectives

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WOAH Reference Laboratory
for swine influenza

Reference Centre



World Organisation
for Animal Health
Founded as OIE



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Introduction of IZSLER





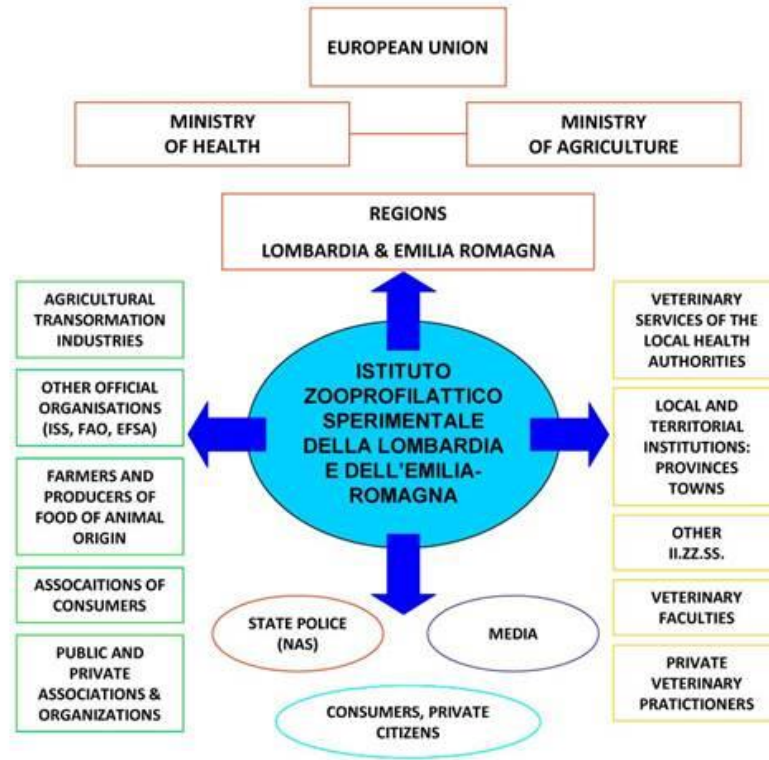
The Italian Experimental Zooprophyllactic Institutes (II.ZZ.SS) network, with their 10 headquarters and 90 peripheral diagnostic sections, are an important operational tool available to the National Health Service to ensure

- epidemiological surveillance,
- experimental research,
- training of personnel,
- laboratory support diagnostics in the context of official control of foodstuffs



IZSLER works for.....,,

- the **European Union, Ministries** and the **Regions** that issue guidelines which must be followed by the Institute



- the **Public authorities, the other Experimental Zooprohylactic Institutes, the Veterinary services of the local Health Authorities** which collaborate technically and scientifically with the Institute to complete functions related to hygiene and veterinary public health

- **private entities**, such as organizations and associations that are directly concerned with Institute activities and which benefit from the services provided

- **citizens and consumers** who are common stakeholders for the proper operation of the Institute and therefore the protection of the healthiness of foodstuffs, animal hygiene and health and animal products, as well as environmental hygiene



Area

Jurisdiction Area	LOMBARDIA	EMILIA ROMAGNA
Km ²	23,863	22,456
Municipalities	1527	334
Inhabitants	10,103,869	4,467,118
ASL (Sanitary Districts)	8	8

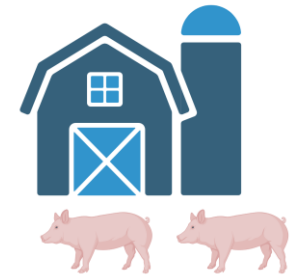
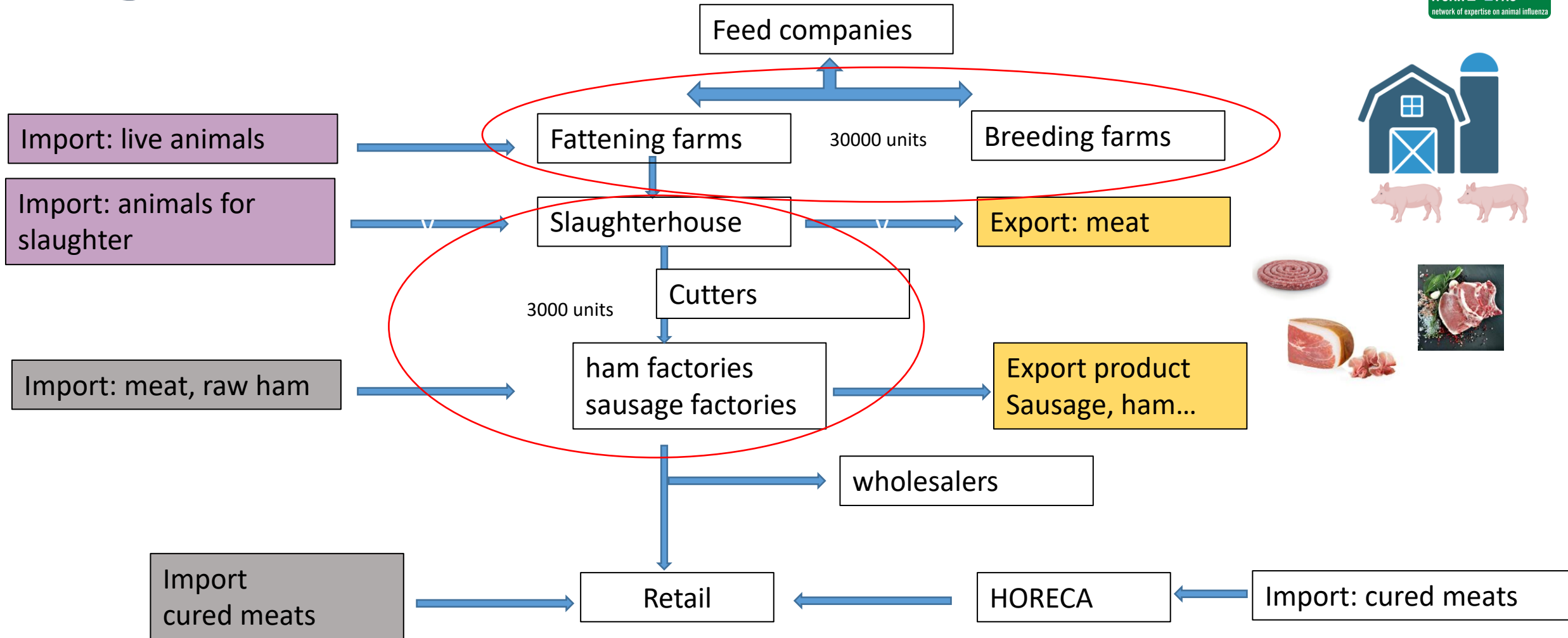


- × 15.6% of Italian territory
- × 22.7% of inhabitants
- × 24.5% of farmed animals (35% of cattle, **62% of pigs (5 million of pigs)**, 10% poultry)
- × 1.42 pigs/10000 inhabitants
- × **>70% pigs** e about 35% of bovine slaughtered at national level
- × About 40% of of Gross National Product (GNP)

https://www.infodata.ilsole24ore.com/2022/07/29/quanti-maiali-quante-mucche-ci-europa-2/?refresh_ce=1

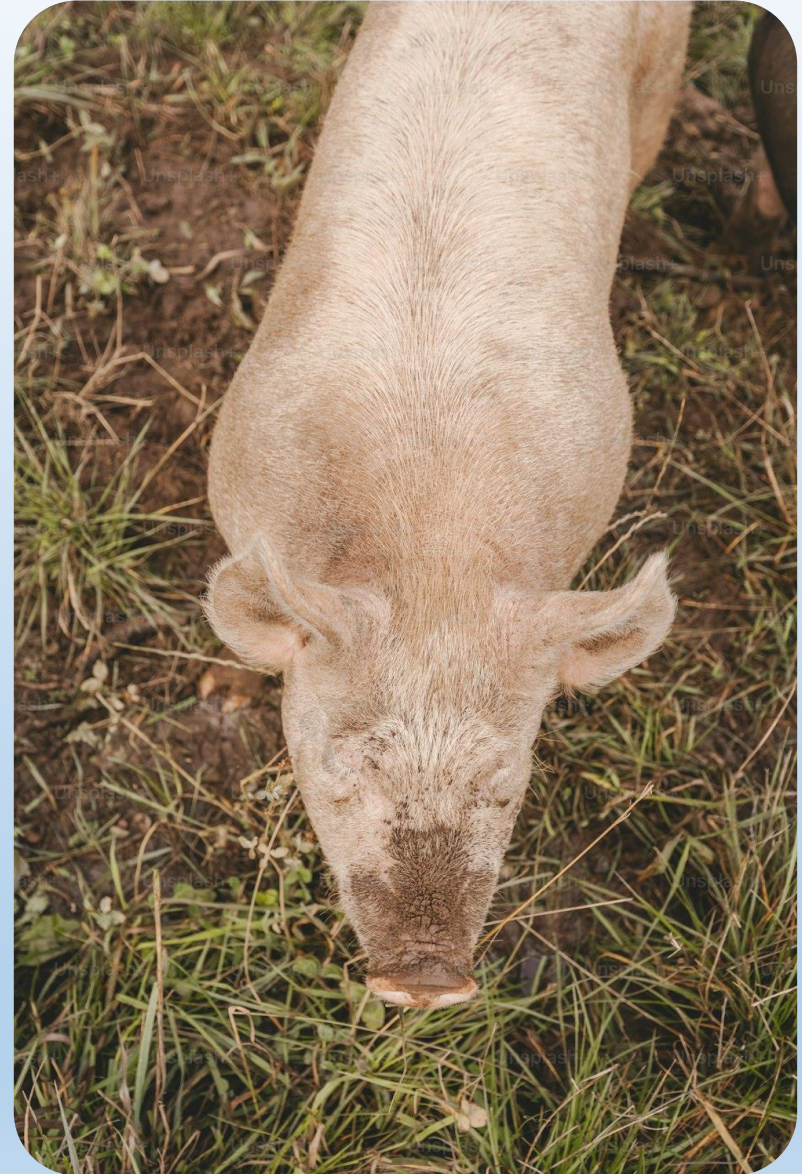


Pig production chain



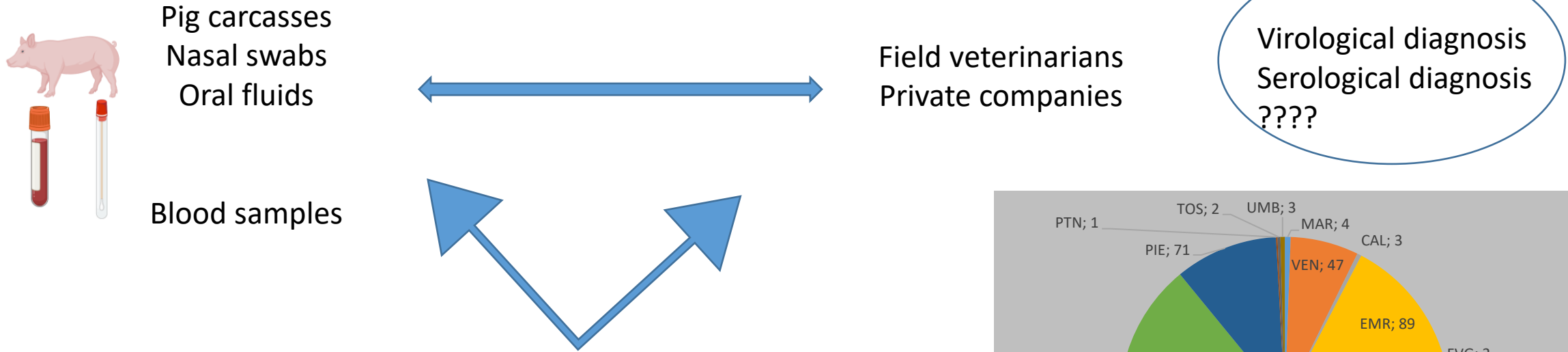
IZSLER

Diagnostic activity

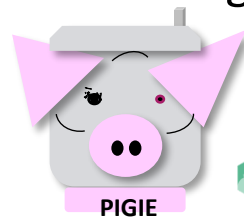
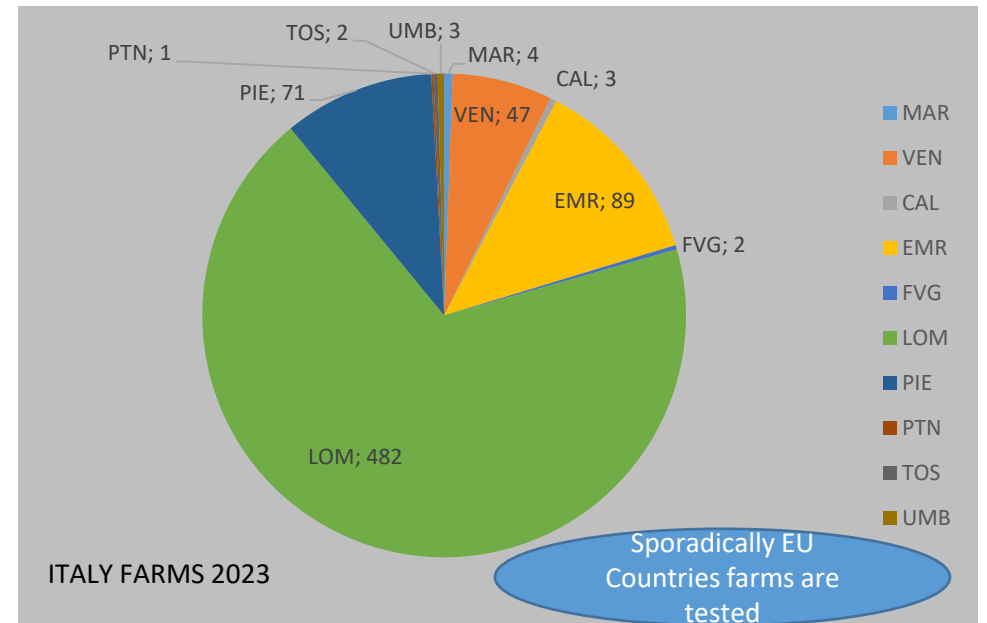


Swine influenza viruses sources

Routine diagnostic submissions to IZSLER laboratories: NO National surveillance plan in pigs



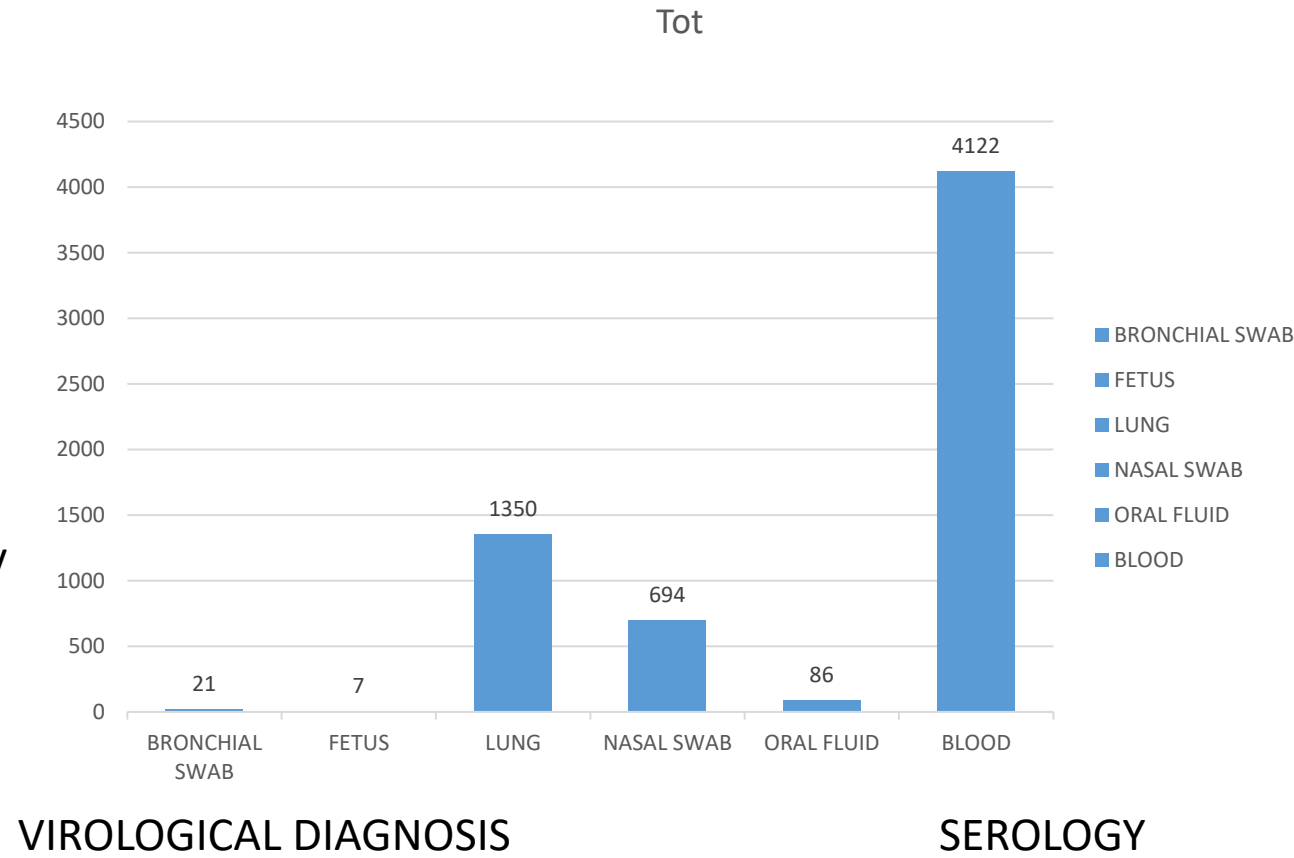
Deep virological investigations
 Italian/EU National funding for research purpose



Swine influenza viruses sources: passive surveillance

Analyzed Samples
2023

10% lung positivity
30% swabs positivity



Laboratory diagnosis



Sampling

**One-step
real-time
RT-PCR -
Screening**



Serum

histopathology

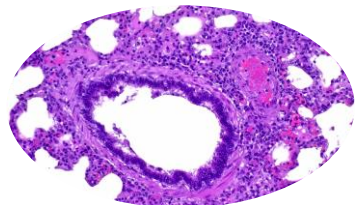


virus
Isolation

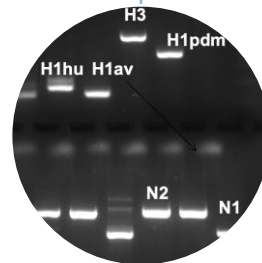
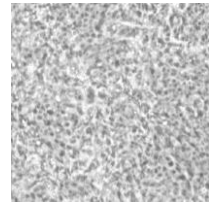
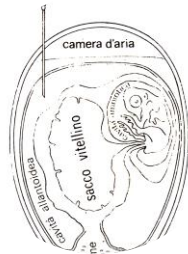
Molecular
characterization

ECE

CC

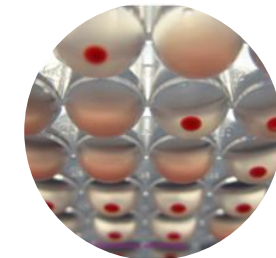


VS



Subtyping
PCR/NGS

Genomic
sequencing



ELISA

HI

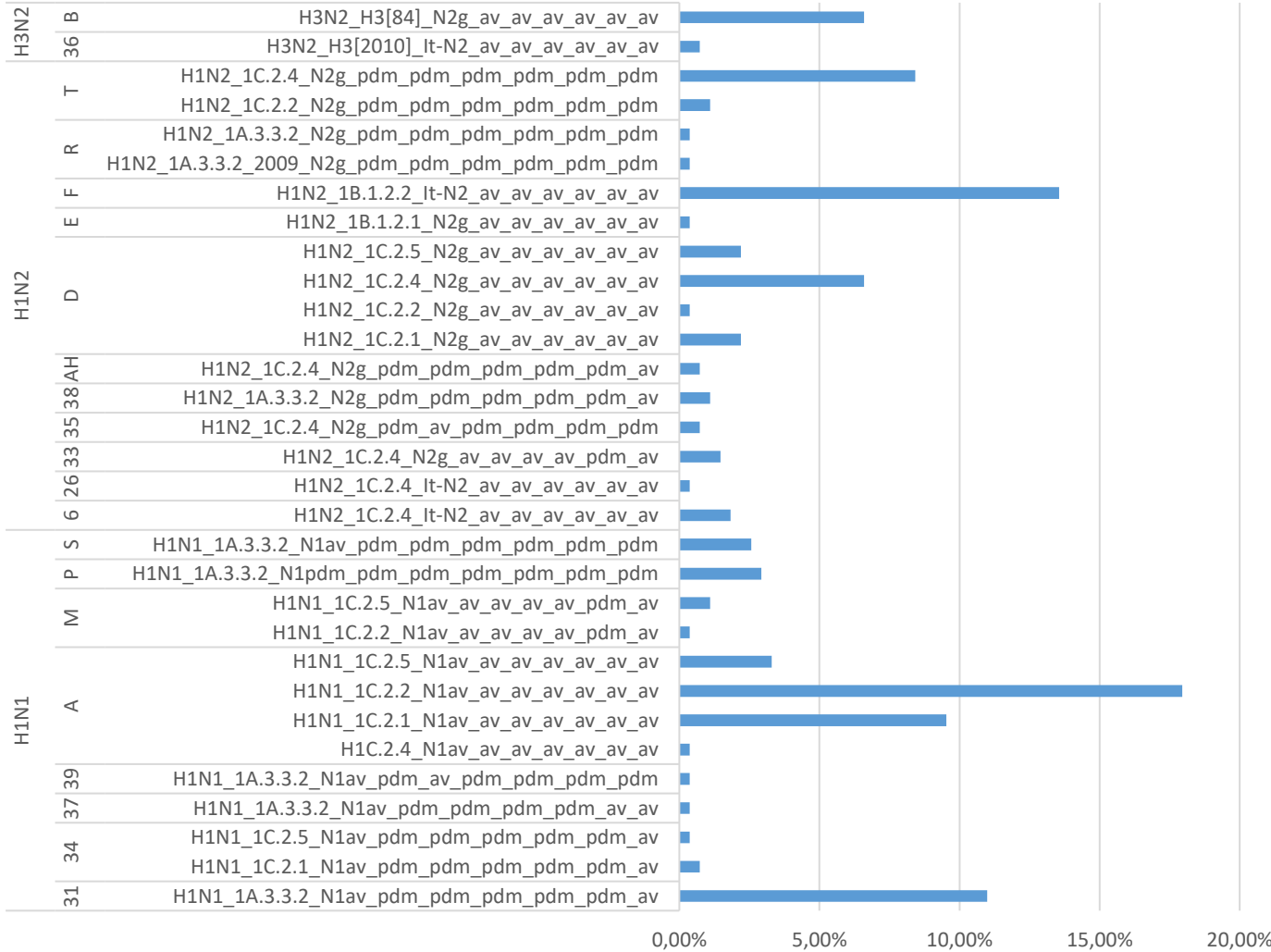
VN

- ▶ Confirmation
- ▶ HA/ELISA
- ▶ HI
- ▶ PCR/NGS

Which antigen?



Subtype_HAclade_NA_PB2_PB1_PA_NP_MP_NS

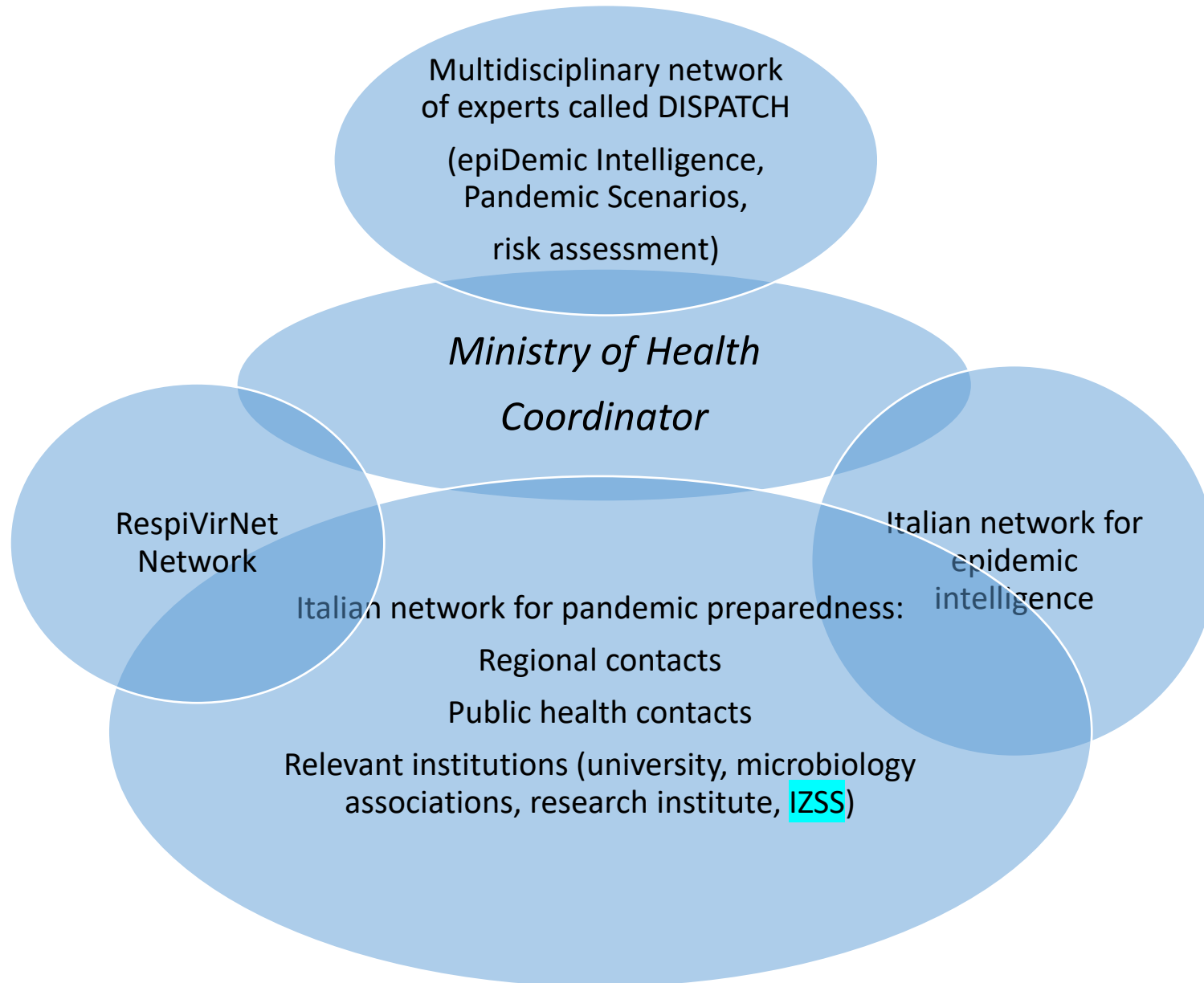


~100 sequenced strains/year
 Deep investigation allow us
 to identify high variability

What about serological
 investigation?



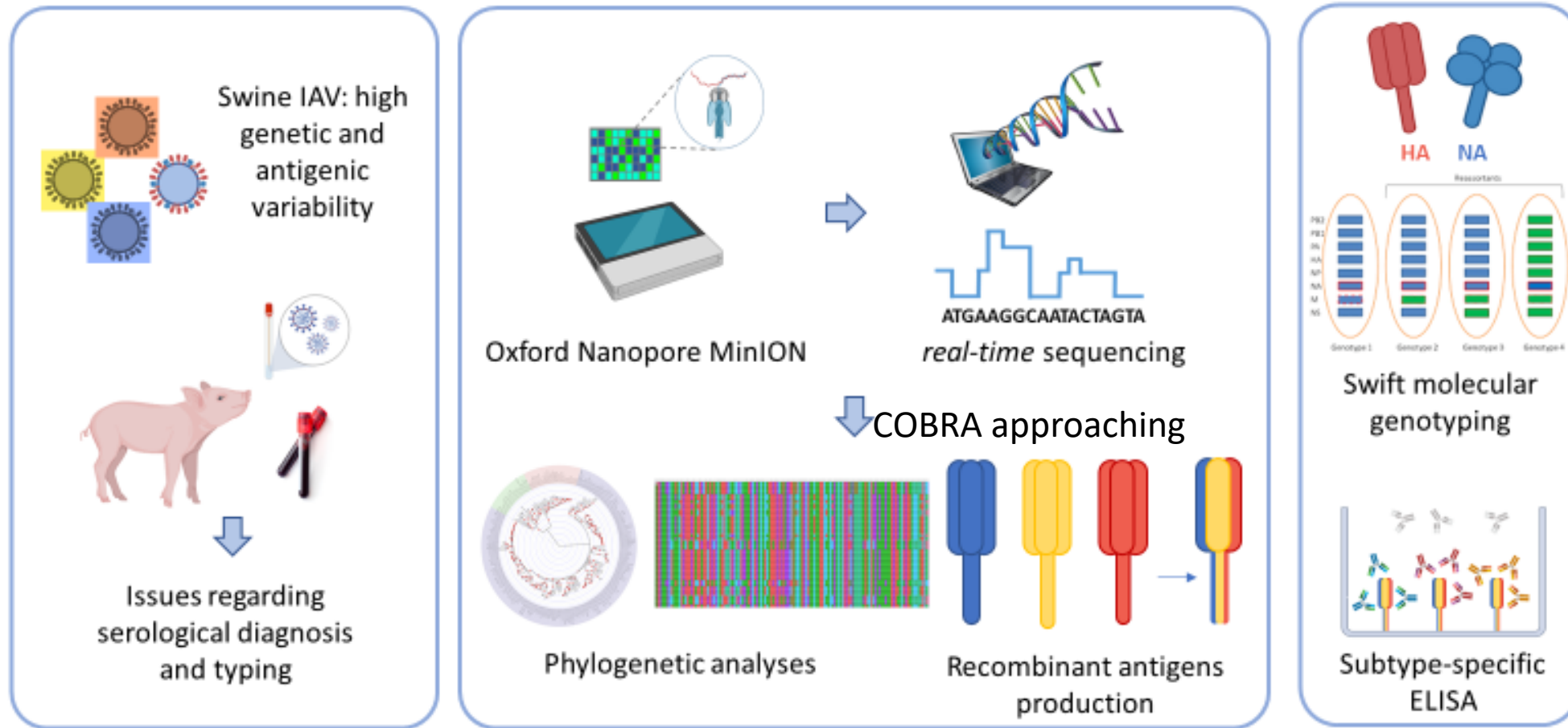
The National influenza pandemic plan



Future perspectives



Chasing variability: development and application of new diagnostic strategies of molecular and serological genotyping for swine influenza viruses



computationally optimized broadly reactive antigen



Thank you

Special thanks to the swine influenza team:

Alice Prosperi

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Laura Baioni

Andrea Luppi

