Istituto Zooprofilattico Sperimentale delle Venezie

H5N8 HPAI in Italy in 2017
October update

STANDING COMMITEE ON PLANTS, ANIMALS, FOOD AND FEED

Section Animal Health and Welfare

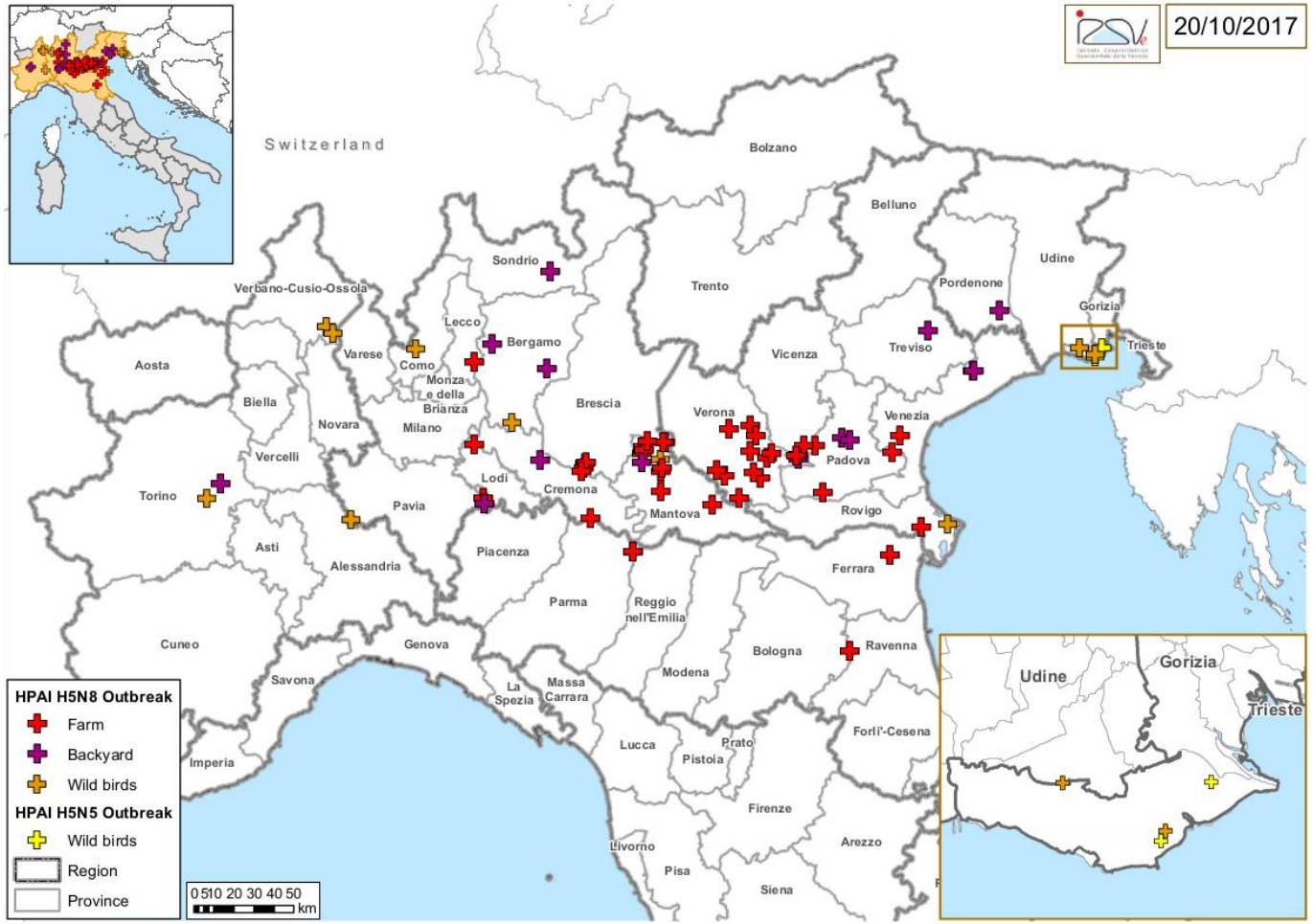
October 2017

HPAI H5 outbreaks in Italy 2016-2017

- Cases in wild birds:
  - 4 in Friuli Venezia Giulia
  - 4 in Lombardy
  - 3 in Piedmont
  - 1 in Veneto
- Cases in domestic poultry:
  - 4 in Emilia Romagna
  - 1 in Friuli Venezia Giulia
  - 27 in Lombardy
  - 1 in Piedmont
  - 25 in Veneto

Total of 58 cases in the domestic poultry

H5N8 HPAI outbreaks in Italy 2016-2017



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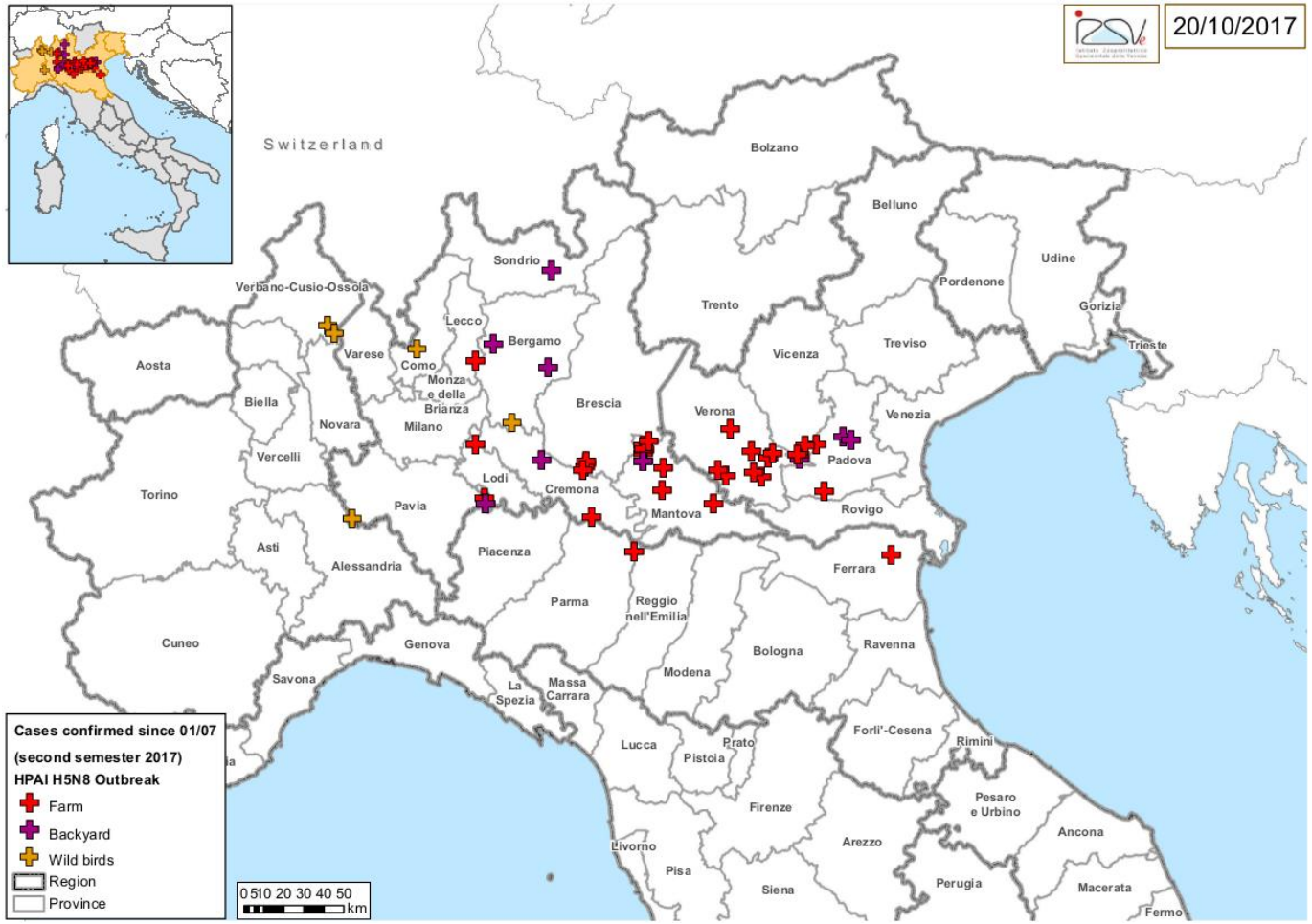
HPAI H5 outbreaks in Italy (2nd Semester)

- Cases in wild birds:
  - 3 in Lombardy
  - 2 in Piedmont
  - 1 in Veneto

- Cases in domestic poultry:
  - 2 in Emilia Romagna
  - 24 in Lombardy
  - 16 in Veneto

Total of 42 cases in the domestic poultry

H5N8 HPAI outbreaks in Italy
2nd epidemic wave



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H5N8 HPAI outbreaks in Italy - 2nd epidemic wave

Wild birds

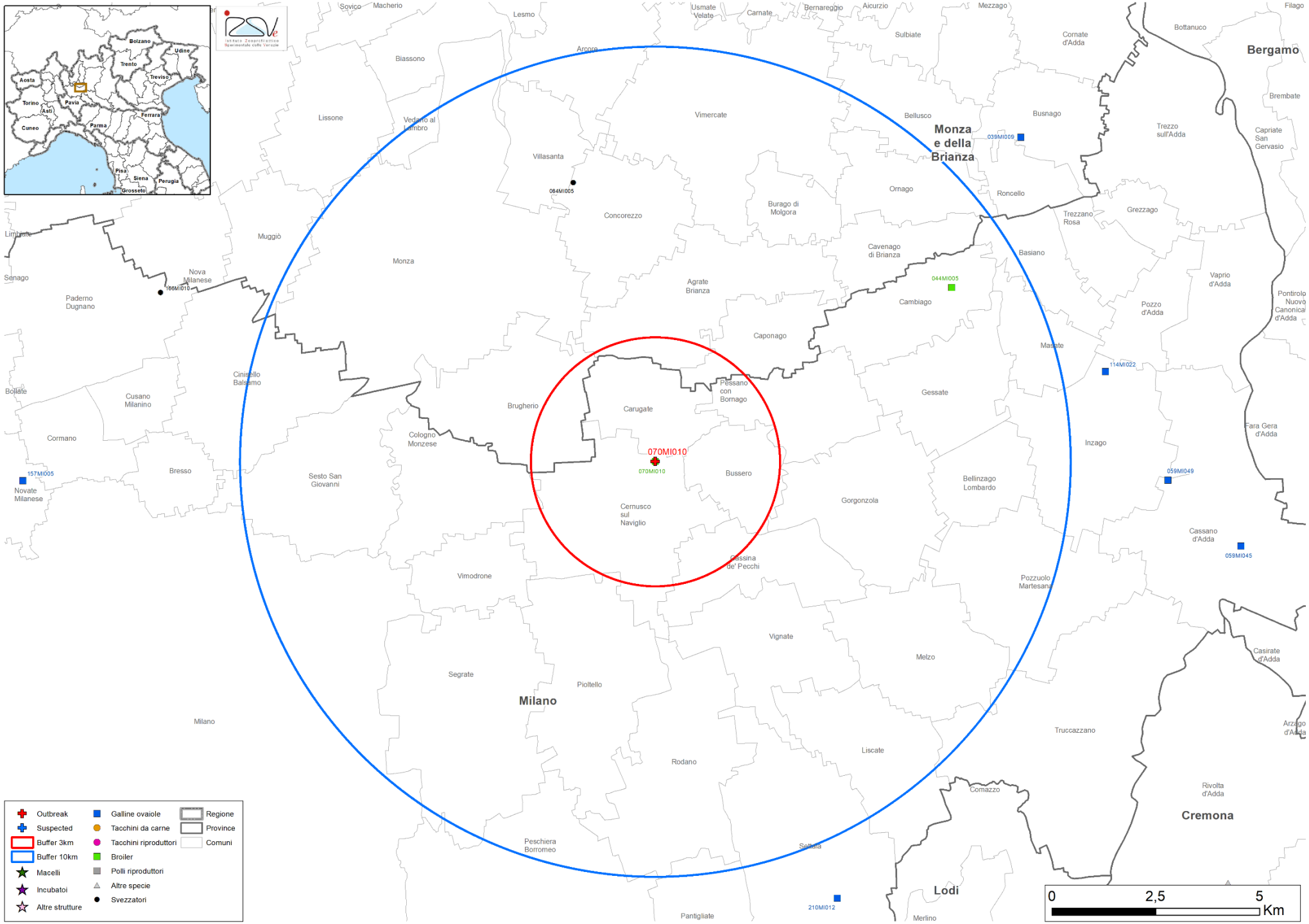
Region	Province	Species	No. Birds	Subtype
Lombardy	Pavia	Mallard duck (*Anas platyrhynchos*)	10	H5N8
Lombardy	Bergamo	Mute swan (*Cygnus olor*)	1	H5N8
Lombardy	Como	Mute Swan (*Cygnus olor*)	1	H5N8
Piedmont	Verbano-Cusio-Ossola	Mute Swan (*Cygnus olor*)	1	H5N8
Piedmont	Verbano-Cusio-Ossola	Mute Swan (*Cygnus olor*)	1	H5N8
Veneto	Padua	Mute Swan (*Cygnus olor*)	2	H5N8

H5N8 HPAI outbreaks in Italy - 2nd epidemic wave

- Distribution and type of affected farms

Region	Meat turkeys	Laying hens	Broilers	Geese	Ducks	Game birds	Grower	Backyard	Captive birds	Tot
Emilia-Romagna	1	1	0	0	0	0	0	0	0	2
Lombardy	11	2	0	1	0	1	1	7*	1*	24
Veneto	10	0	1	1	1	0	0	3	0	16
TOTAL	**22**	**3**	**1**	**2**	**1**	**1**	**1**	**10***	**1***	**42**

* **1 Backyard farm** in Milan Province, and **1 Captive bird** in Bergamo Province have been indicated as suspected outrbreaks on Oct 24°. Tests for confirmation are still ongoing



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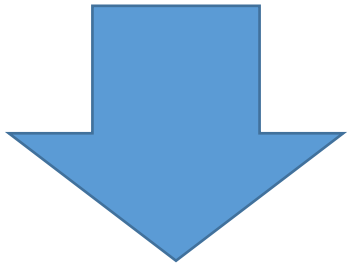
Epidemiological investigations

- Contact tracking activities allowed identifying premises with at-risk contacts
  - Strict control measures and enhanced surveillance
  - All the identified contact farms tested negative for HPAI viruses
  - The maority of the H5N8 HPAI affected industrial poultry farms had no epidemiological contacts with previously infected poultry premises
- Most of the infected farms were located in proximity of wetlands
- Substantial populations of wild water birds have been reported near some of the outbreak sites

Epidemiological investigations

Continuous introduction of virus in the domestic poulation

Involvement of both commercial and rural poutry sectors



Increased risk of lateral spread → potential occurrence of secondary outbreaks

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Secondary cases - Mantua

- Culling activities for 19th outbreak underwent logistical issues that delayed the ending of the culling procedures
  - Approximately 480,000 laying hens
  - Housing type (Housed in modified cages)
  - Extreme climatic condition (increased mortality due to heath wave and saturation of rendering plants)
- Depopulation activities took about 15 days to be concluded.
- Spread to other turkey farms, the 25th, 26th, 27th and 29th outbreaks (two of them were waiting to be preventively emptied)
- Phylogenetic analyses corroborated the hypothesis of inter-farm spread (similarity between 99.92% and 99.95%, 6-10 nucleotide differences)

Vicenza province

- September 26th – A fattening duck farm confirmed positive for H5N8 HPAI virus in Vicenza province (Veneto region)
  - In the same courtyard a grower farm was present
- October 6th – H5N8 HPAI virus confirmed in a broiler farm located about 1 km from the previous outbreak
- October 10th – A third H5N8 HPAI case confirmed in a backyard farm, in the same municipality
  - A week before the symptoms appeared, birds were introduced from the infected grower farm
- Phylogenetic analyses indicated the viruses had a level of similarity of 99.9-100% for both the HA and NA genes
  - Lateral spread between farms

Bergamo province

- October 10th – A backyard flock in Bergamo province (Lombardy region) is confirmed positive for a H5N8 HPAI virus
  - 10 days before the beginning of symptoms four laying hens were introduced from a Live Bird Market in Bergamo province
- Epidemiological investigations traced back to a grower farm, in the same province
  - Official controls confirmed the presence of H5N8 HPAI virus n the grower farm
- October 13th and 16th, two outbreaks were detected in two rural farms in Bergamo and Sondrio provinces; birds were introduced from the same grower farm
- Phylogenetic analyses indicated a similarity between 99.9-100% and 99.8-99.9% for the HA and NA genes

Brescia province

- October 9th – A fattening turkey farm tested positive for H5N8 HPAI
  - Birds were tested on October 6th and clinically inspected on Sunday, October 8th , 24 hours before transportation to the slaughterhouse
  - Increased mortality was observed on Monday
  - Part of the birds had already been moved to the slaughterhouse, where the measures provided for in the Council Directive 94/2005 were applied
  - Two fattening turkey farms belonging to the same owner were indicated to be preventively culled

Secondary outbreaks - Brescia

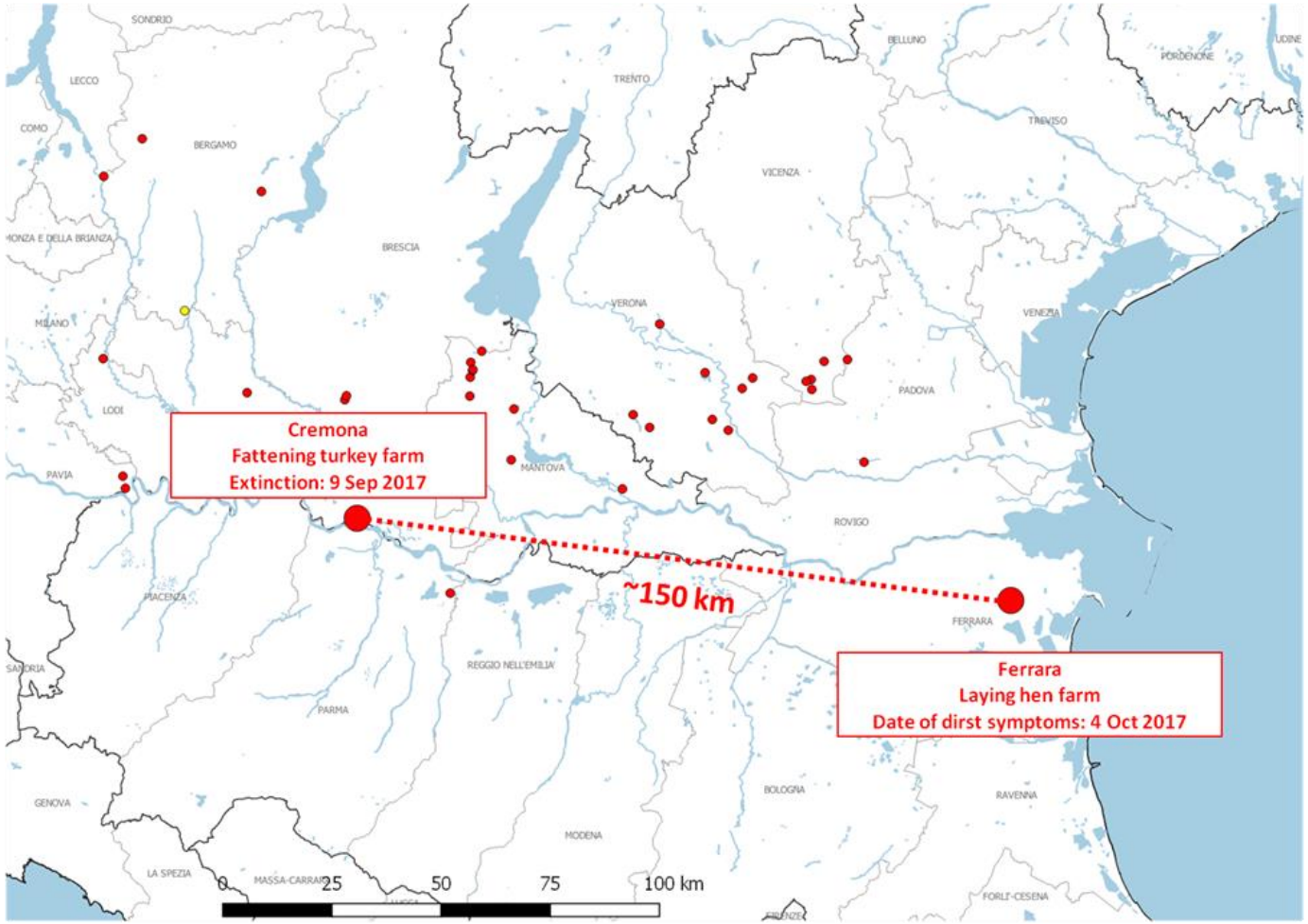
- October 13th – Before the beginning of culling operations, increased mortality was observed in the farm located within 1 km from the outbreak
  - H5N8 HPAI was confirmed on the same day
- October 19th – a turkey farm located in proximity to the outbreak site was confirmed as infected
  - On Sunday October 8th, the lorry that transported to the abattoir the batch of meat turkeys from the infected holding followed a road that passed by the premises (100 meters far from the sheds)
  - Phylogenetic analyses indicated high level of similarity among the detected viruses (99.9-100% for both the HA and NA genes)

Ferrara province

- October 5th – A large layer operation in Ferrara province (Emilia Romagna region) is confirmed infected
  - 850,000 birds present at the moment of confirmation
  - Entering of external crew for loading birds to slaughtering (September 14th-21st)
  - The farm is located in the Po Delta, one of the largest wetlands in Italy, where two H7N7 HPAI epidemics occurred in 2013-2016

- The virus belonged to the Italy-B group, being the first time it was detected in the eastern part of the affected Italian regions
- The only other outbreak in industrial poultry farms, due to viruses belonging to the Italy-B group was detected in Cremona province (Lombardy region)
- Timing, different production company, and geographical location of the farms indicated that contacts were unlikely

H5N8 HPAI in Ferrara province



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Padova province

- October 11th – A fattening turkey farm in Padova province (Veneto region) tested positive for H5N8 HPAI
  - 9,000 female turkeys
  - Increased mortality and nervous symptoms reported on Oct 11th

Padova province

- October 17th – H5N8 HPAI virus was found in a backyard flock
  - 5 laying hens present at the confirmation
  - 6 mute swans resident in the property pond, frequently visited by wild mallard ducks (*Anas platyrhyncos*)
  - Mortality was observed since Oct 13th, when 2 swans were found dead
  - Virus identified in the laying hens was highly correlated to that in swans (99.9% and 100% similarity for HA and NA gene respectively)
- October 17th – a second backyard flock was confirmed positive
  - 8 geese and 34 ducks
  - Wild mallards were frequently present in the property ponds
  - Increased mortality in ducks observed since Oct 13th

Preventive culling

Region	Province	Production Type	No. Culled farms	No. Culled birds
Veneto	Verona	Fattening turkey	9	97,528
		Broiler	4	209,421
	Vicenza	Fattening turkey	5	46,573
		Broiler	3	190,480
	Padua	Fattening turkey	1	19.500
Lombardy	Brescia	Fattening turkey	7	121,190
	Mantua	Fattening turkey	1	18,660
		Broiler	3	160,560

33 preventively culled farms

- 23 Fattening turkey
- 10 Broiler

Around a total of 860.000 birds

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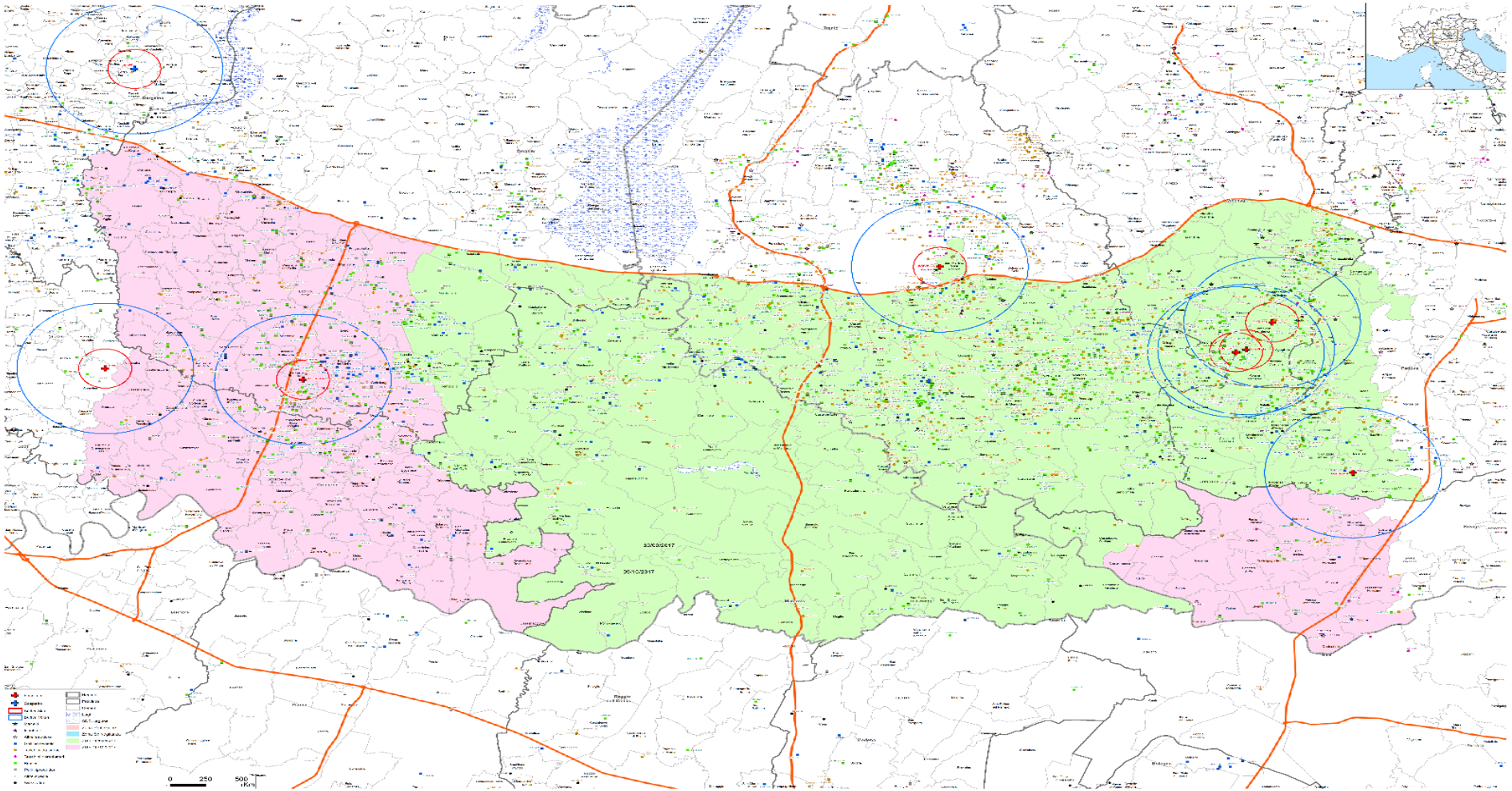
Further Restricted Zone

- A Further Restricted Zone has been established (Ministerial provision n°18012 of 28 July, as amended by Ministerial provision n°24016 of 20 October)



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Further Restricted Zone

- Measures applied within the Further Restricted Zone:
  - Census of industrial poultry holdings
  - Birds shall be kept inside closed buildings and measures should be taken to reduce the risk of direct/indirect contacts with wild birds
  - Pre-movement clinical inspection and virological testing
  - Enforcement of increased biosecurity measures (vehicles, personnel, etc.)
  - Gathering of domestic birds for fairs, exhibitions and live-bird markets is banned
  - Re-stocking of meat turkey farms is prohibited
    - A derogation can be authorised, following verification of compliance with biosecurity standards, and evaluation of geographical risk (according to the location of the farm within densely populated poultry areas)

Phylogenetic analyses

- Viruses isolated in the second semester 2017 belong to Poland-like group, which has been circulating in wild and domestic birds in Italy since January 2017.
- The phylogenetic analyses indicate that the viruses identified in the second semester of 2017, groups into two distinct clusters (Figure 3):
- **Italy-A**, circulating in the eastern part of the affected areas (Verona, Mantua, Parma, Padua and Vicenza provinces)
- **Italy B**, detected in the western part of Lombardy region (Cremona, Lodi, Pavia, Bergamo, Brescia) and in the province of Ferrara (Emilia-Romagna region)

The preliminary phylogenetic tree including the HA-NA genes of the most recent outbreaks shows a clear clustering among viruses collected from epidemiologically linked outbreaks (secondary outbreaks).

HA-NA concatenated genes

2016-2017 Italian HPAI H5N8 from poultry

2016-2017 talian HPAI H5N8 from wild birds

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Thanks for the attention

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