



Avian influenza in animals

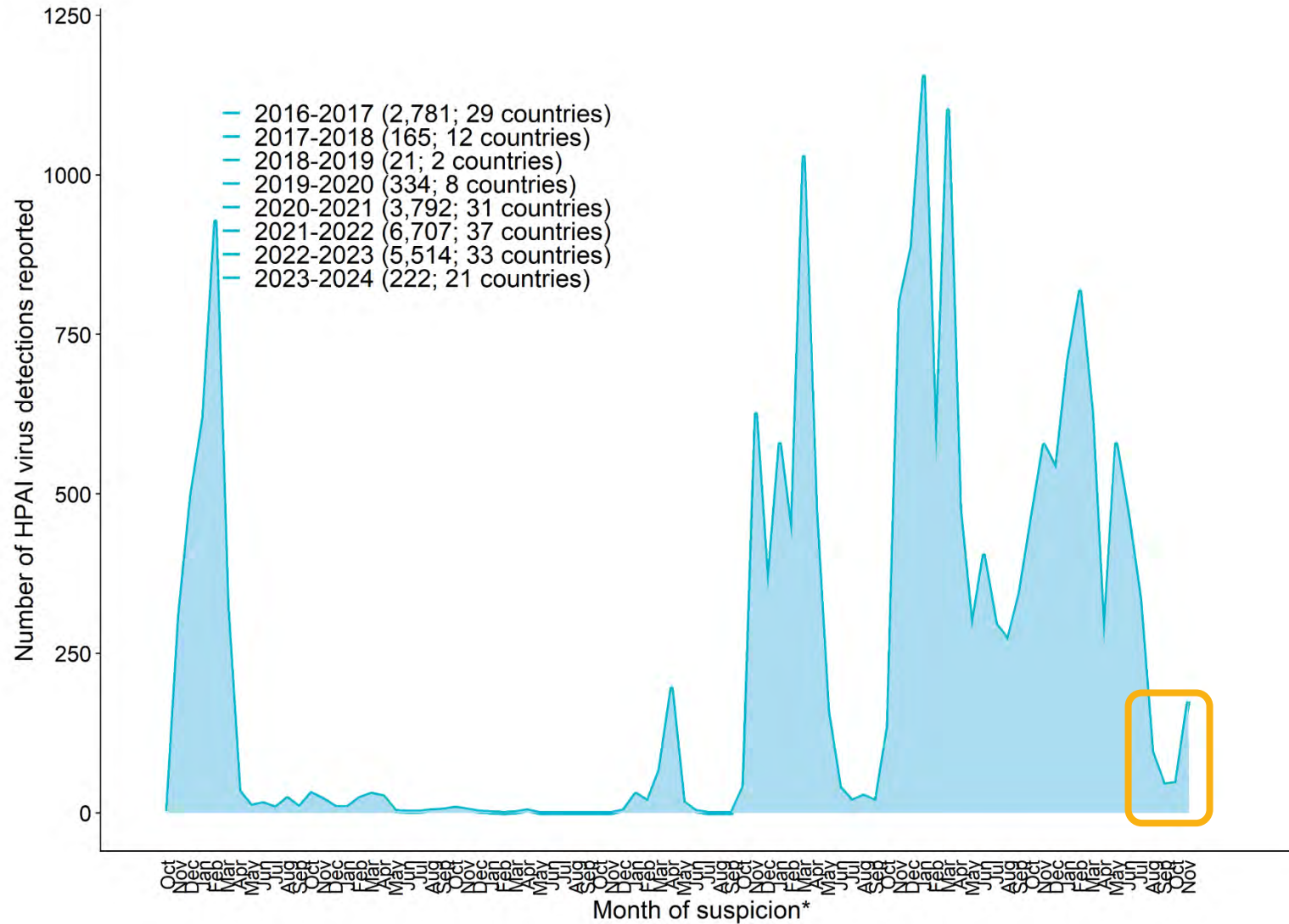
September-December 2023

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BIOHAW Unit

HPAI IN DOMESTIC AND WILD BIRDS IN EUROPE



2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
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HPAI IN BIRDS | SEPTEMBER – DECEMBER 2023

DOMESTIC BIRDS

77 poultry
11 captive birds
175 wild birds

- 43 (55.8%) Hungary
- 8 Bulgaria
- 5 United Kingdom
- 4 Denmark
- 4 Germany
- 4 Italy
- 2 Netherlands
- 2 Poland
- 2 Romania
- 1 Croatia
- 1 France
- 1 Kosovo*

HPAI virus subtype detections in domestic birds
 2 September 2023 - 1 December 2023

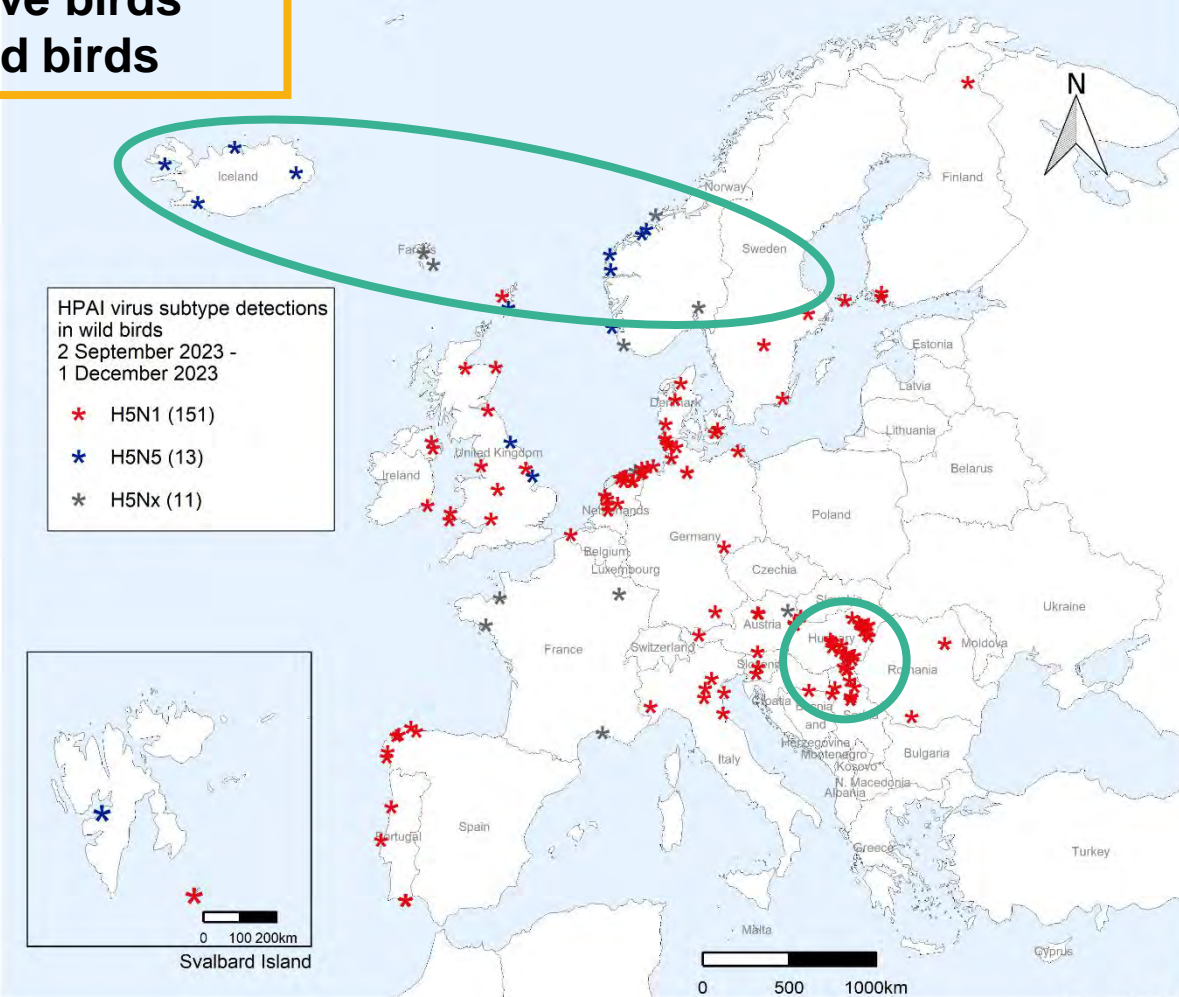
- △ H5N1, Captive birds (9)
- H5N1, Poultry (67)
- △ H5Nx, Captive birds (2)
- H5Nx, Poultry (10)



WILD BIRDS

HPAI virus subtype detections in wild birds
 2 September 2023 - 1 December 2023

- * H5N1 (151)
- * H5N5 (13)
- * H5Nx (11)



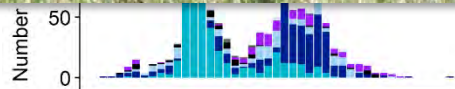
(a) All birds



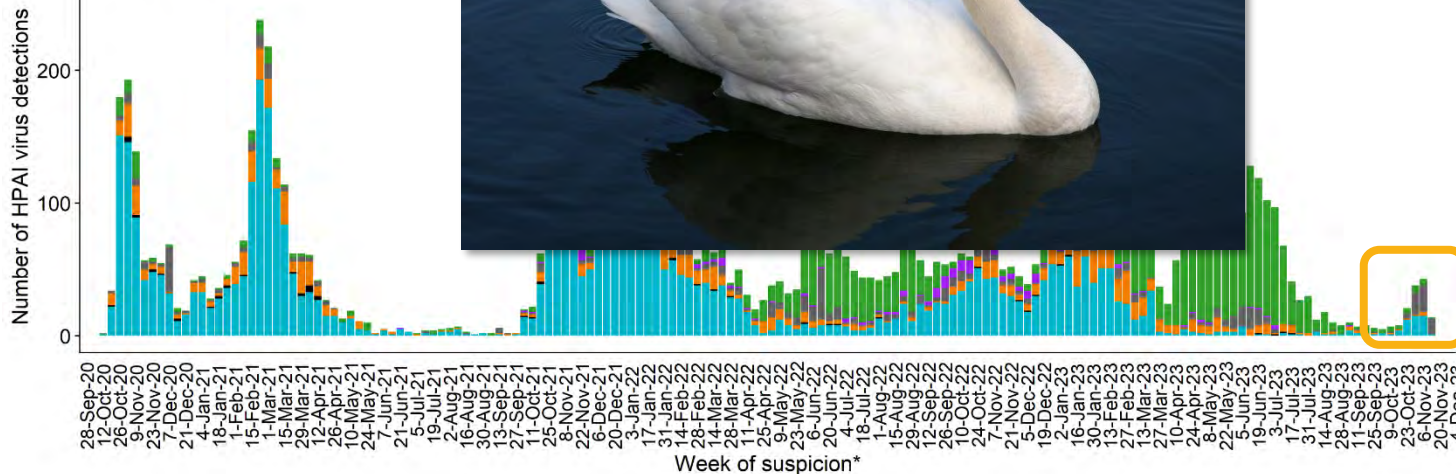
(642)
n (1 240)

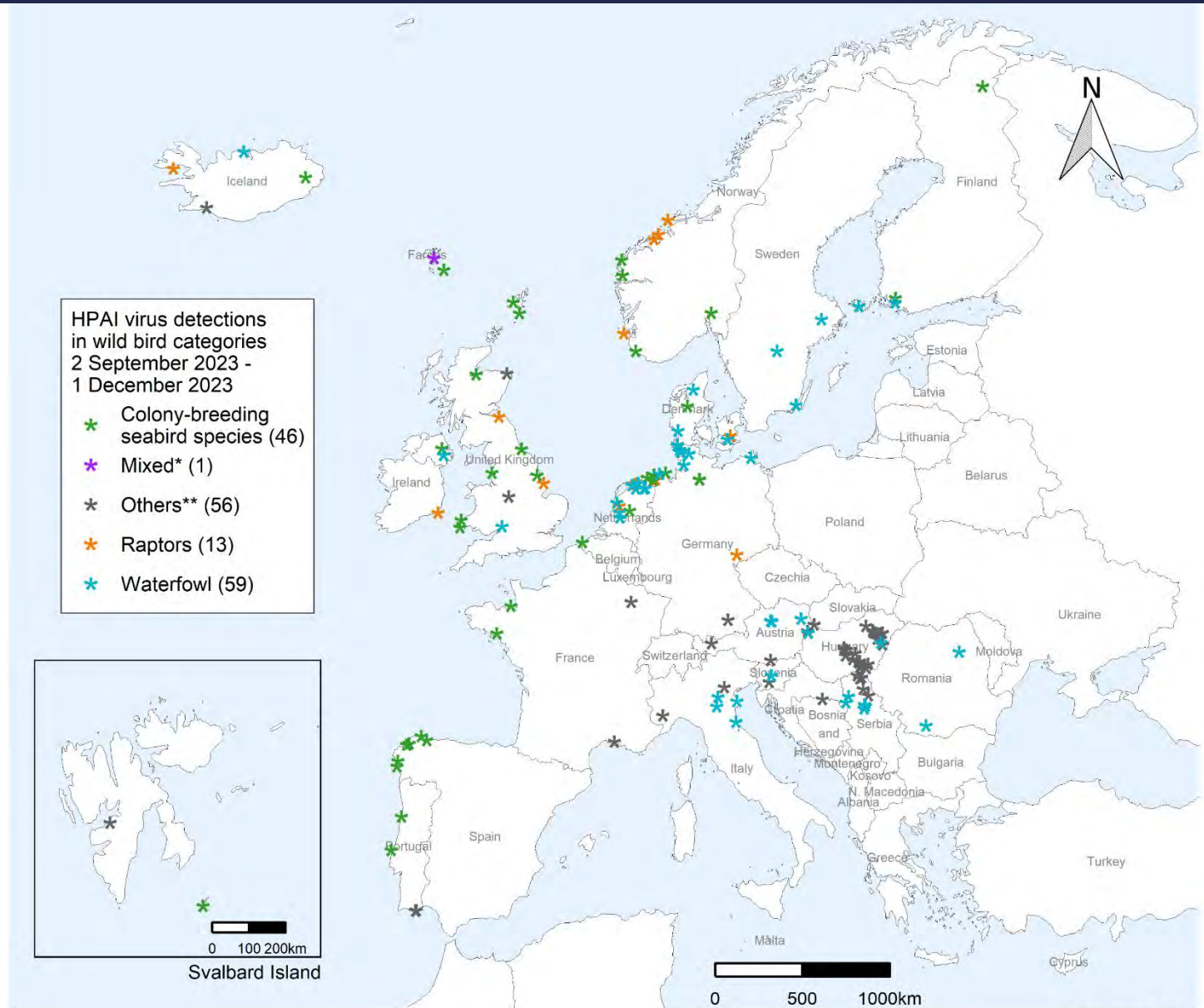
Temporal distribution in poultry and wild birds

- a) HPAI virus subtypes
- b) Poultry categories
- c) Wild bird categories



(c) Wild birds





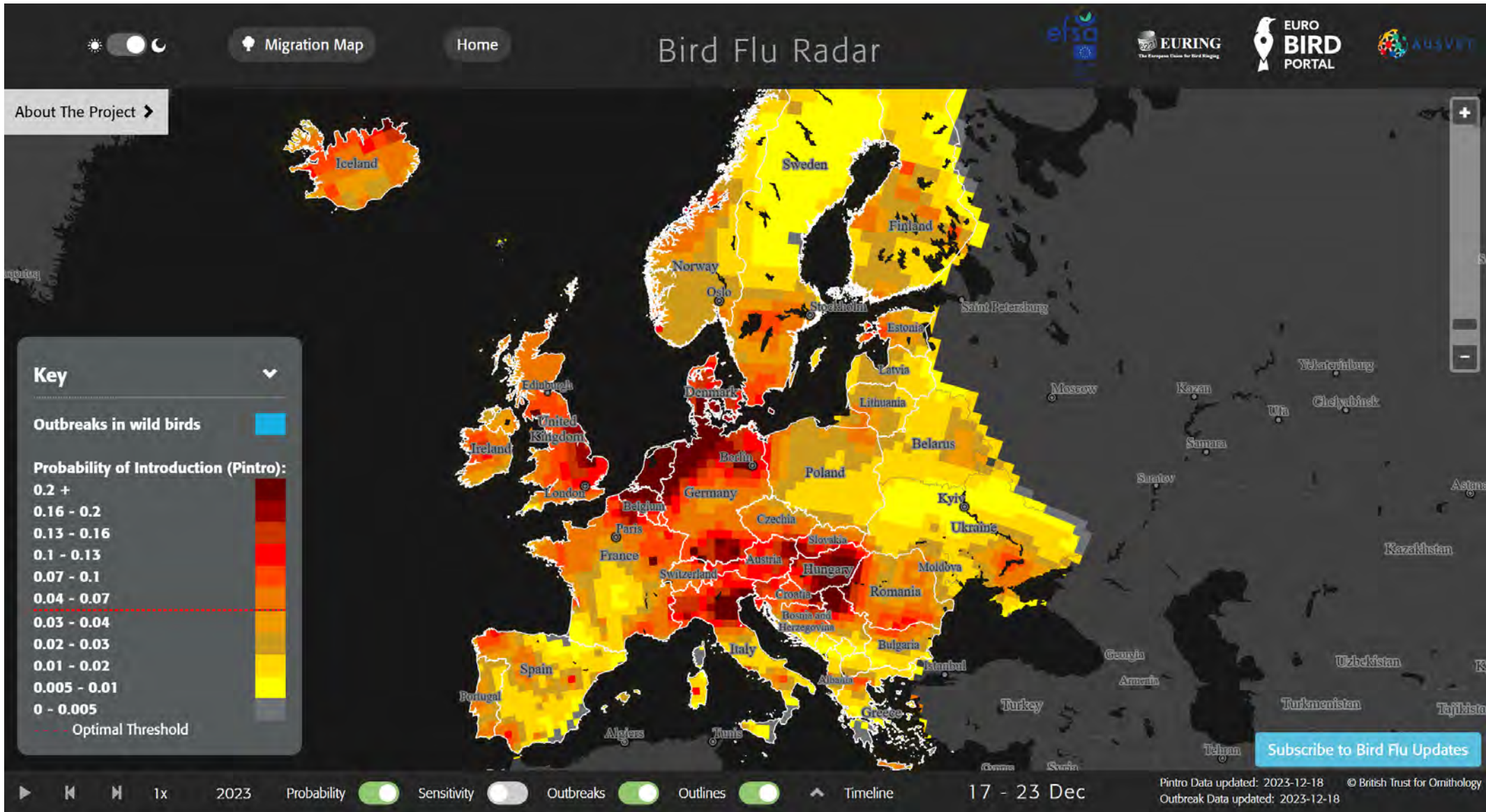
Spatial distribution in wild birds

- Colony-breeding seabirds along coastlines
- Waterfowl and 'other' wild birds species in Southeast Europe



EFSA'S BIRD FLU RADAR

<https://app.bto.org/hpai>



Genetic diversity

September 2022 - August 2023

	PB2	PB1	PA	HA	NP	NA	MP	NS	%
BB	31	1	43	20	43	1	20	43	49,8
AB	31	1	3	20	38	1	20	1	37,4
CH	31	1	3	20	26	1	20	1	7,7
CC	12	1	8	20	38	1	20	1	1,73
AF	12	6	1	20	50	1	20	29	0,87
C	1	1	1	20	1	1	20	1	1,2
I	25	14	25	20	26	27	20	28	0,1
CB	32	1	3	20	38	1	20	1	0,1
CU		29		20	37	1	20	27	0,1
CA	31	1	3	20	7	1	20	1	0,05
CD	31	1	3	20	37	1	20	29	0,05
CF	31	1	3	20	45	1	20	1	0,05
CG	4	1	3	20	26	1	20	1	0,05
CI	10	1	12	20	38	1	20	1	0,05
CJ	46	6	32	20	26	22	47	1	0,05
CK	4	1	3	20	38	1	20	1	0,05
CM	31	49	3	20	38	1	20	1	0,05
CN	31	31	3	20	26	1	20	1	0,05
CP	31	31	3	20	38	1	20	1	0,05
CR	31	1	3	20	38	1	20	28	0,05
CS	34	1	3	20	38	1	20	51	0,05
CT	31	1	43	20	43	1	20	1	0,05
CE	44	1	3	20	38	1	20	1	0,24
CL	31	1	48	20	38	1	20	1	0,05
CQ	31	1	3	20	37	1	20	1	0,05

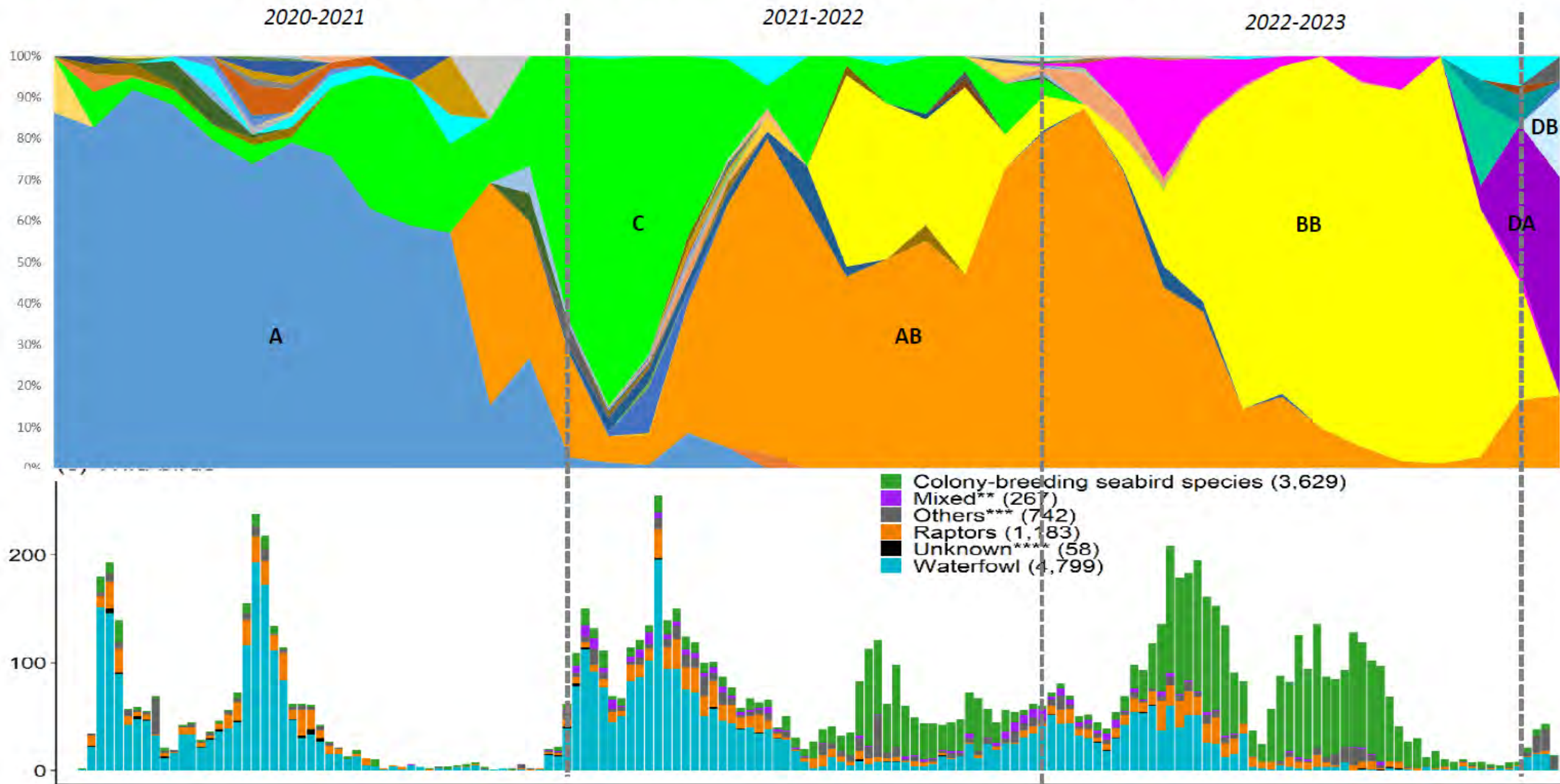
September 2023 - November 2023

	PB2	PB1	PA	HA	NP	NA	MP	NS	%
DA	4	52	3	20	38	1	20	27	34,4
AB	31	1	3	20	38	1	20	1	13,3
BB	31	1	43	20	43	1	20	43	25,8
DB	31	53	3	20	38	1	20	1	8,59
I	25	14	25	20	26	27	20	28	3,91
DE	41	53	54	20	55	1	20	56	3,91
DG	57	1	14	20	38	1	20	1	2,34
CH	31	1	3	20	26	1	20	1	0,78
DC	41	53	32	20	36	1	20	1	0,78
DF	31	1	25	20	43	1	20	43	0,78
DD	41	1	54	20	55	1	20	56	5,47

- 95% of the characterized viruses during the 2022-2023 epidemic wave belong to three major genotypes (BB, AB and CH)
- These three genotypes are still circulating in Europe
- Since September 2023, 7 new genotypes have been identified. Whether these new genotypes originated in Europe or represent new virus introductions cannot be assessed given the limited data available from other countries outside Europe.
- >80% of the viruses collected in September-November 2023 belong to 4 genotypes (based on available data)

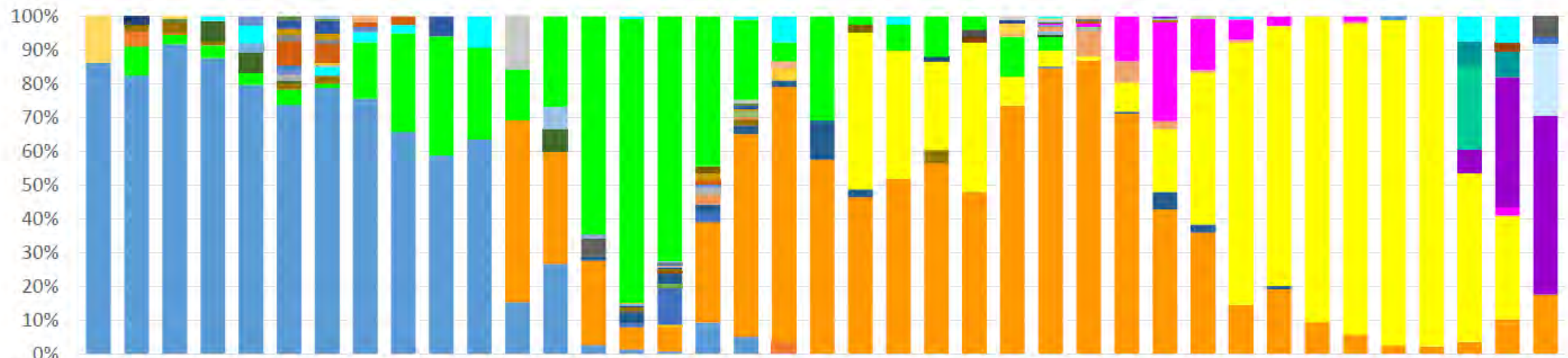


Temporal dynamics of the virus genotypes in Europe: 2020-2023

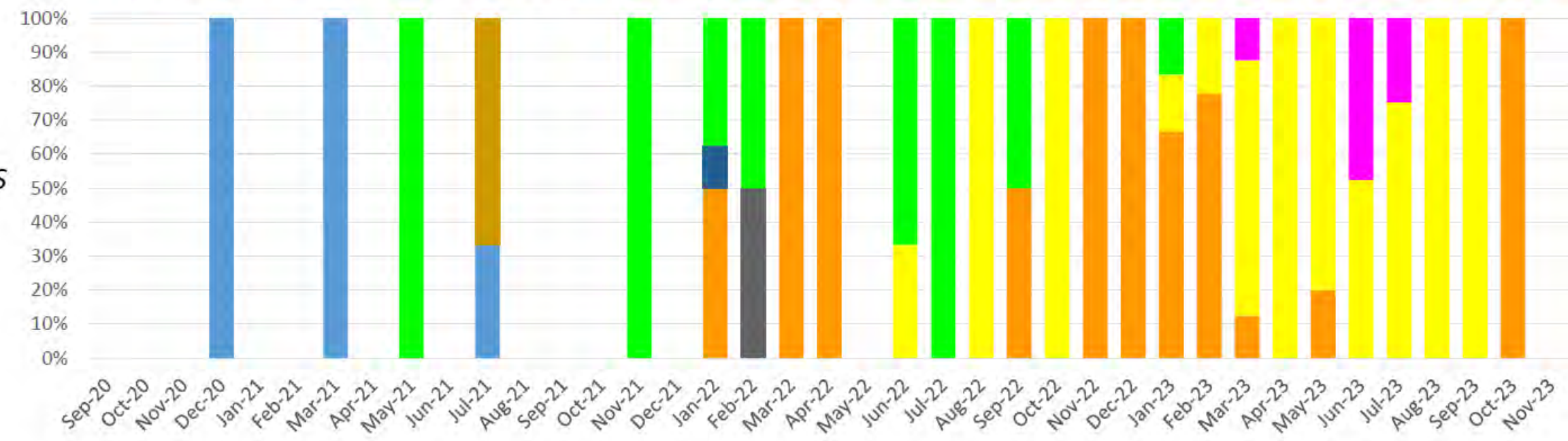


Which genotypes infected mammalian species in Europe?

AVIAN

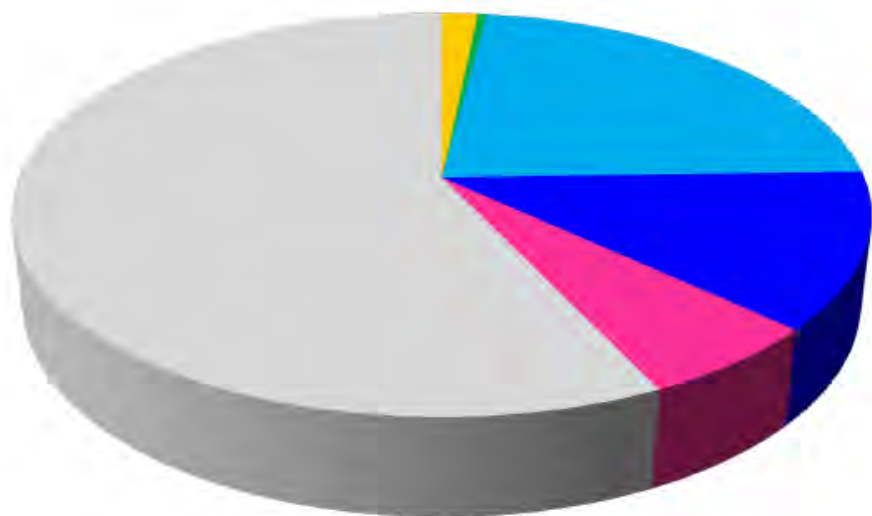


MAMMALS



Molecular markers of virus adaptation to mammals in Europe

Mammals



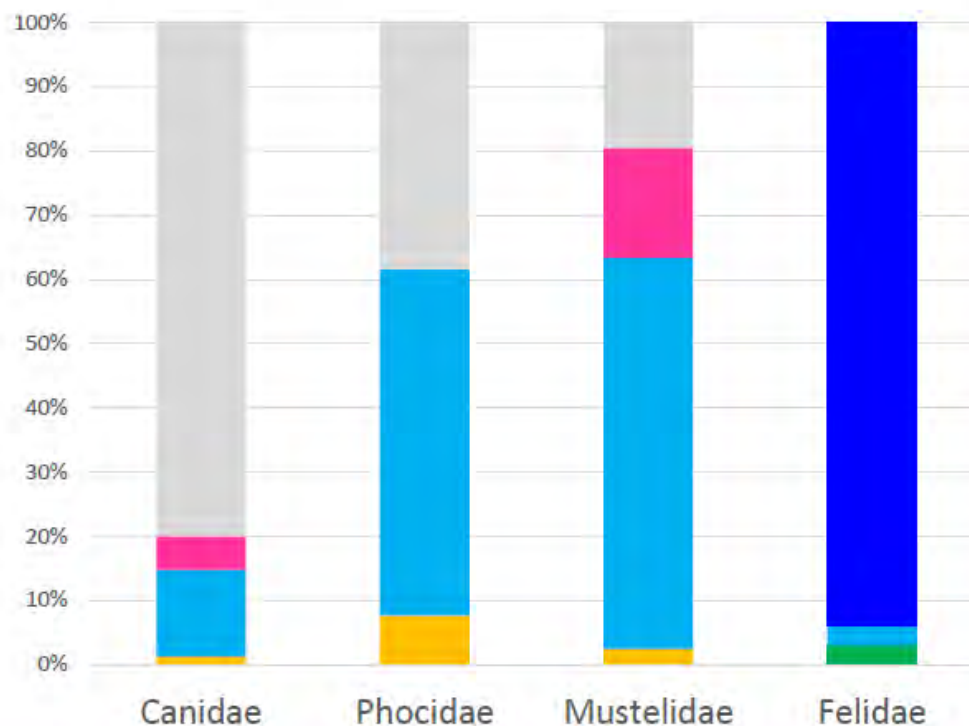
N. sequences

155

13

41

33



Mutations in the PB2 protein

701N

627K-701N

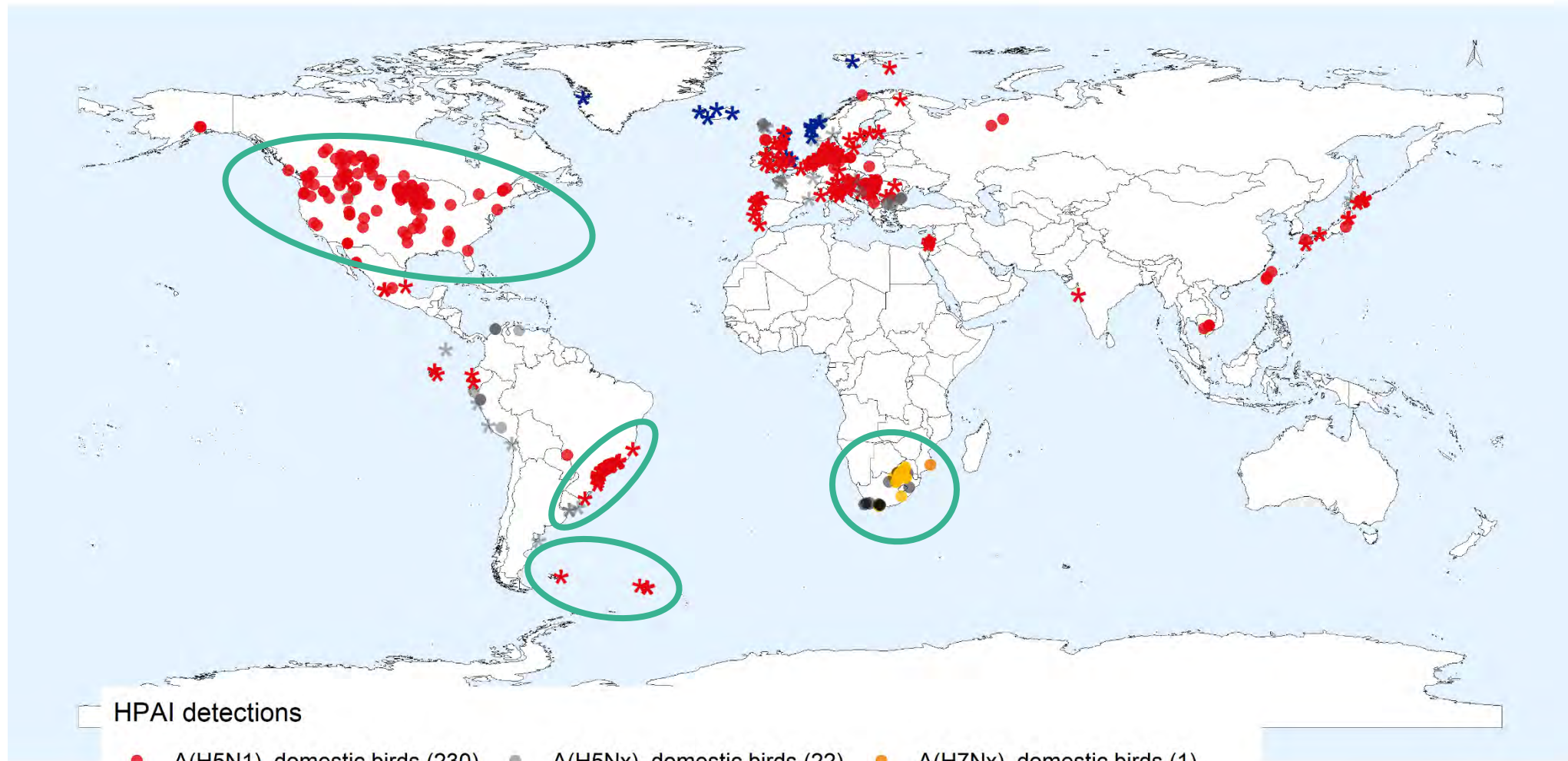
627K

526R-627K

271A

no mut

HPAI IN BIRDS | SEPTEMBER – DECEMBER 2023



HPAI detections

- A(H5N1), domestic birds (230)
- * A(H5N1), wild birds (236)
- * A(H5N5), wild birds (14)
- A(H5Nx), domestic birds (22)
- * A(H5Nx), wild birds (20)
- A(H7Nx), domestic birds (1)
- A(Not typed), domestic birds (10)
- A(H7N6), domestic birds (60)

Author: EFSA
Data sources: ADIS, WOA
Date updated: 01/12/2023



HPAI IN MAMMALS | SEPTEMBER – DECEMBER 2023

FARMED

- Fur farms (Finland):
Arctic fox, red fox,
American mink, common
raccoon dog, sable



PET

- Cat (United States of
America)

WILD

- Eurasian lynx (Finland)
- Eurasian otter (Finland)
- Harbour seal (Denmark)

- South American fur seal
(Brazil, Uruguay)
- South American sea lion
(Argentina, Brazil,
Uruguay)
- Southern elephant seal
(Antarctic region,
Argentina)



Human cases due to avian influenza as of 1 Dec 2023



Subtype	Cases detected in 2023	Total cases (deaths)	Countries reporting human cases
A(H3N8)	1 case, China	3 (1) since 2022	China
A(H5N1)	12 cases/detections: Clade 2.3.4.4b: United Kingdom (4), Chile (1), China (1) clade 2.3.2.1c: Cambodia (6)	882*(462) Since 2004 <i>*includes detections due to suspected environmental contamination in 2022 from Spain (2) and the United States (1) and in 2023 from the United Kingdom (3)</i>	23 countries, including one EU/EEA country: Spain*.
A(H5N6)	4 cases, China Clade 2.3.4.4b: 3 cases	88 (34) Since 2014	No EU/EEA country; China (84), Laos (1)
A(H9N2)	7 H9N2 cases, China	128 (2) Since 1998	No EU/EEA country; China (115), Egypt (4), Bangladesh (3), Cambodia (2), Oman (1), Pakistan (1), India (1), Senegal (1)

OPTIONS FOR RESPONSE

- Accurate and comprehensive recording and reporting of HPAI-associated **mortality events**
- Prompt **removal of** HPAI-affected **carcasses**
- **Preventing disturbance** of HPAI-affected areas
- **Surveillance**: active surveillance in wild birds, inclusion of farmed mammals in national surveillance programmes for avian influenza
- **Preventing introduction** of HPAI **into poultry and fur farms**
- **Prohibiting feeding** of raw poultry or pig by-products to farmed mammals
- **Culling** of all animals present in HPAI-affected fur farms
- Monitoring of **common cranes** and the dynamics of **HPAI A(H5N5) virus**

