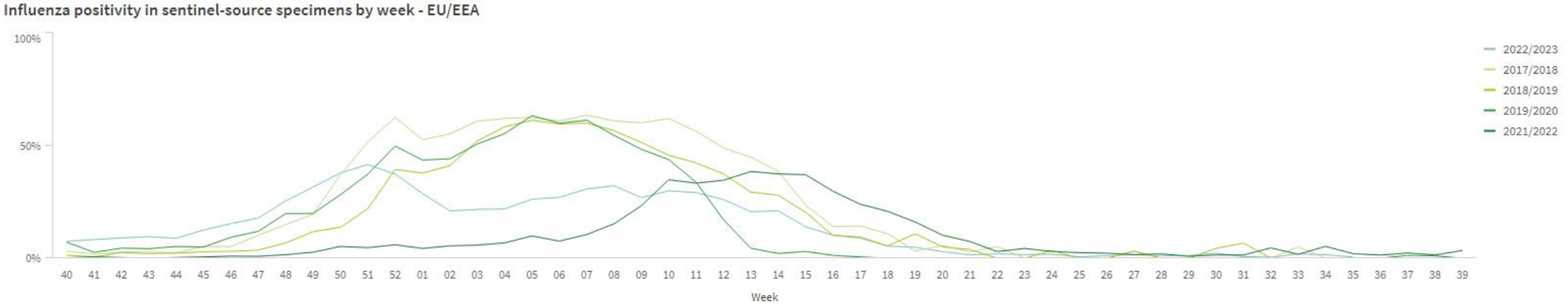
Flu is all around

Cornelia Adlhoch, Principal expert respiratory viruses, ECDC

EURL meeting, Parma, 2 October 2023

Seasonal influenza activity, EU/EEA 2017-2023

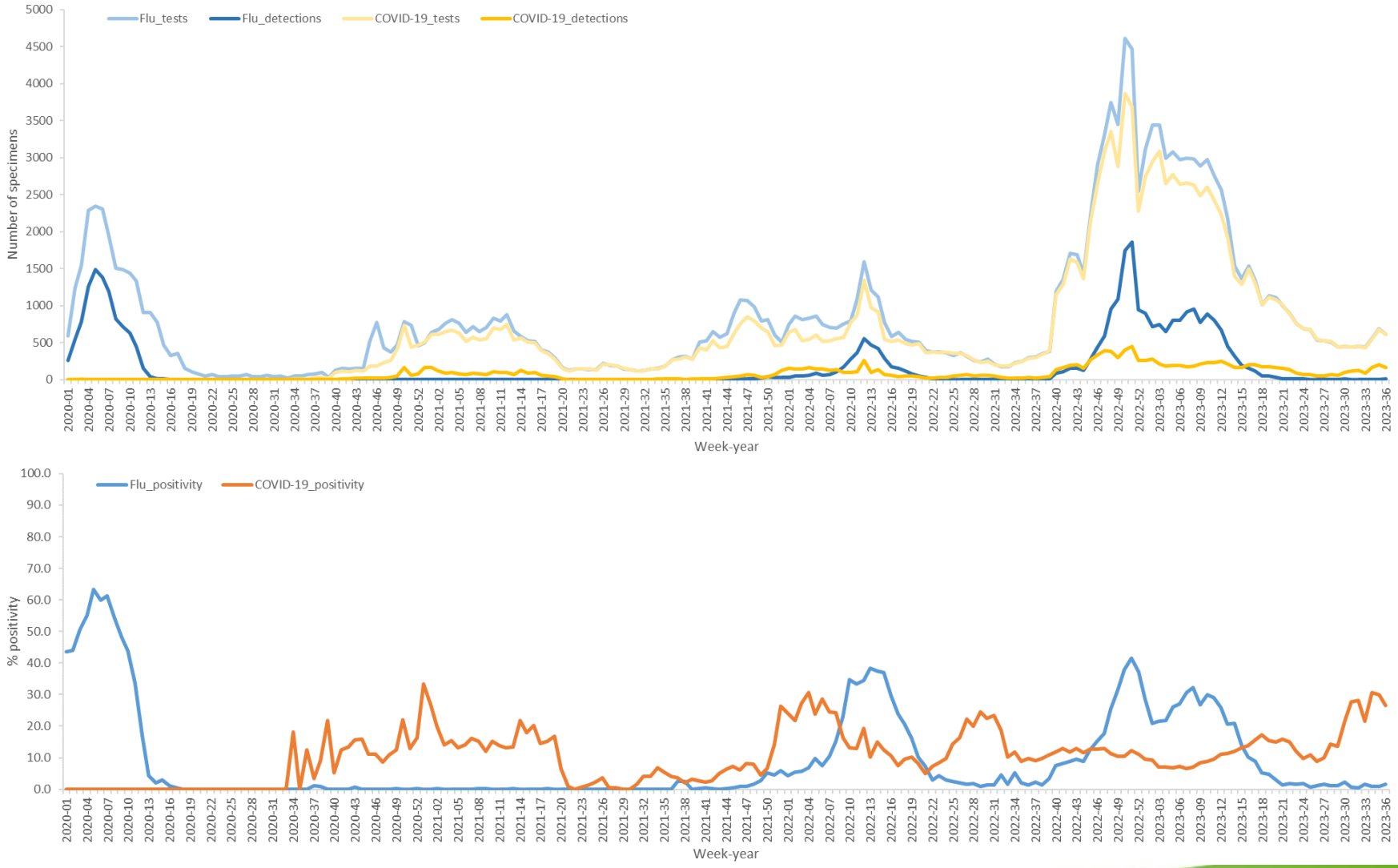
Slightly earlier seasonal influenza activity compared to seasons 2017 onwards
Lower positivity with only 42% maximum positivity compared to >60% in earlier seasons
Influenza activity returning to pre-COVID-19 pandemic timing



Source: www.flunewseurope.org

Sentinel surveillance system, EU/EEA 2020-2023

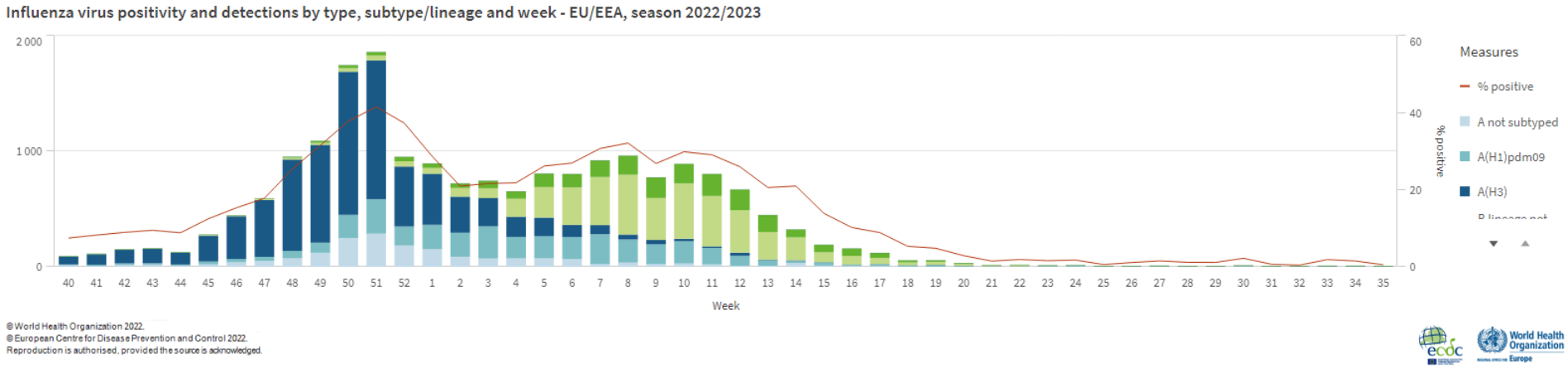
Sentinel influenza surveillance systems are based on syndromic influenza-like illness (ILI) or acute respiratory illness (ARI) case definition for testing. Countries integrated COVID-19 monitoring and testing but challenges remain

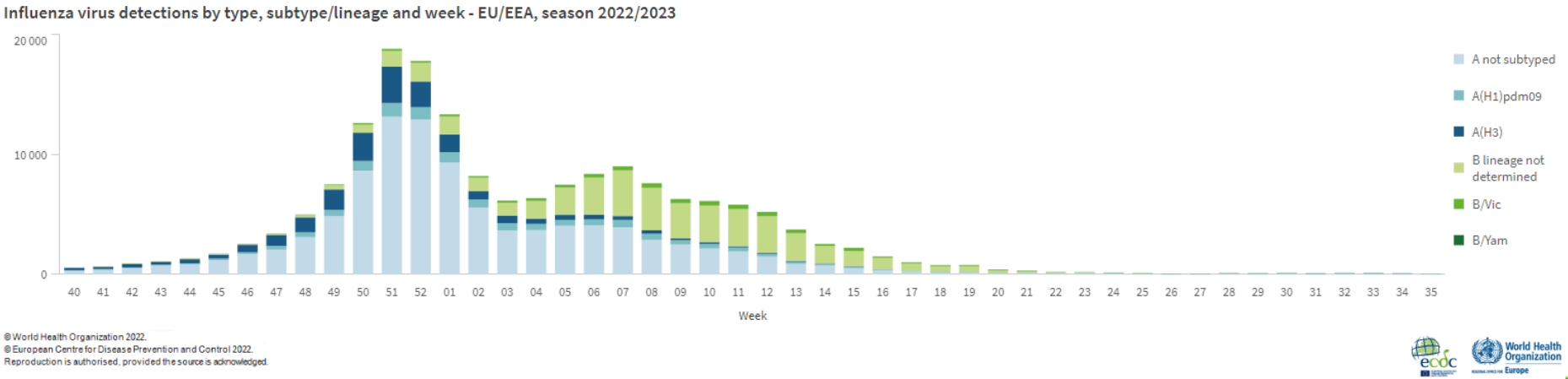


Source: TESSy data

Circulating types and subtypes/lineages, EU/EEA 2023/24

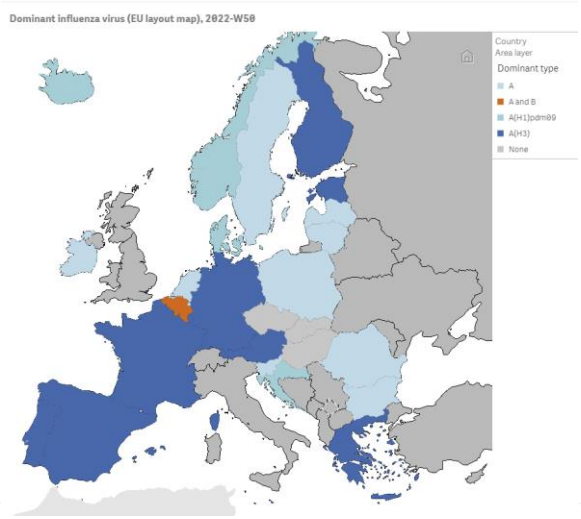
Early A/H3 season
Later and long H1/pdm09 and B/Vic circulation

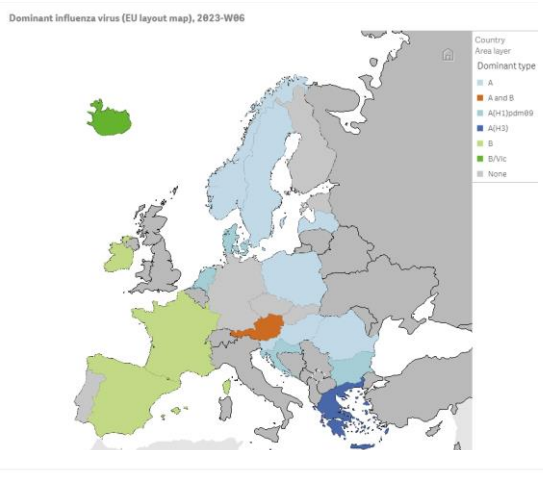


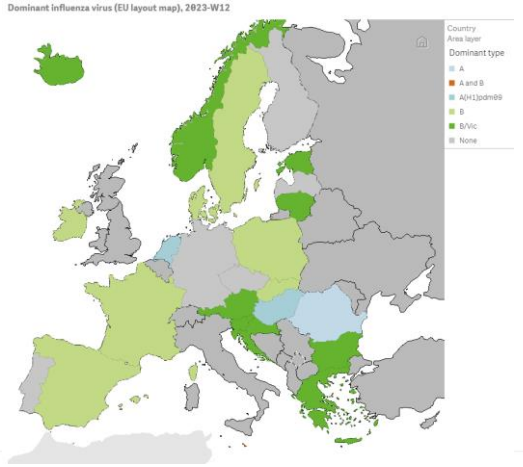


Source: www.flunewseurope.org

Dominant virus type, EU/EEA 2022/23







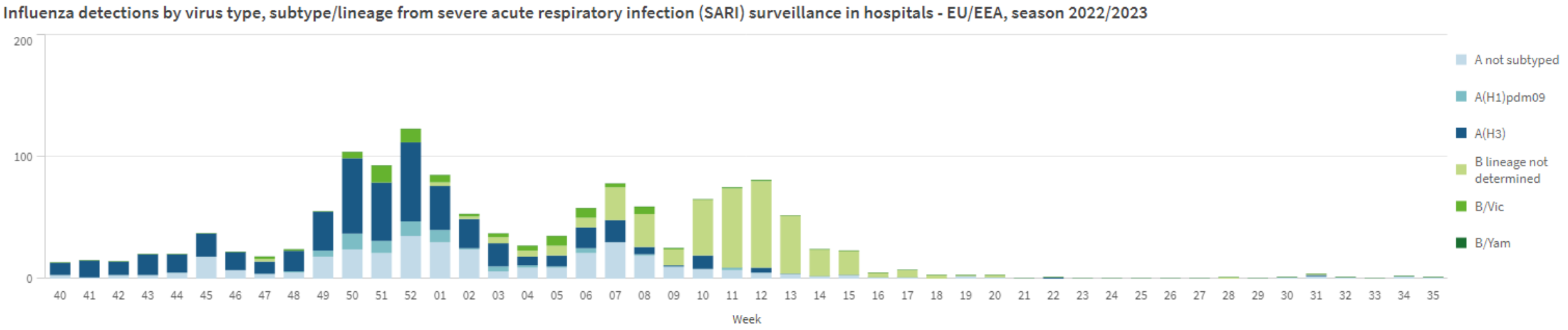
Dominant influenza virus type, subtype/lineage by country/territory, week and season

Country	2022-W40	2022-W41	2022-W42	2022-W43	2022-W44	2022-W45	2022-W46	2022-W47	2022-W48	2022-W49	2022-W50	2022-W51	2022-W52	2023-W01	2023-W02	2023-W03	2023-W04	2023-W05	2023-W06	2023-W07	2023-W08	2023-W09	2023-W10	2023-W11	2023-W12	2023-W13	2023-W14	2023-W15	2023-W16	2023-W17	2023-W18	2023-W19	2023-W20	2023-W21	2023-W22	2023-W23	2023-W24	2023-W25
Austria	-	-	-	-	-	-	None	None	None	None	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A and B	A and B	A and B	B	B/Vic	B/Vic	B/Vic	B	B/Vic	B/Vic	B/Vic	-	-	-	-	-	-	-	-	-	-	-
Belgium	-	-	-	-	-	-	-	-	-	-	A and B	A(Hs)	A and B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	-	-	-	-	-	-	-	-	-	-	A	A	None	A	A(H1)pdm09	A	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	None	None	-	B/Vic	B/Vic	B/Vic	None	None	None	None	None	None	None	None	None	None	-	-
Croatia	-	-	-	-	-	-	-	-	-	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	-	B/Vic	-	-	-	-	-	-	-	-
Czechia	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Denmark	None	None	None	None	None	None	None	None	None	None	A(H1)pdm09	A(H1)pdm09	None	None	None	A(H1)pdm09	A(H1)pdm09	B	A(H1)pdm09	B	B	None	B	A(H1)pdm09	B	B	None	None	None	None	None	None	None	None	None	None	None	None
Estonia	-	None	None	None	None	None	A	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A	A	A	None	None	None	None	None	None	None	B/Vic	B/Vic	B/Vic	B/Vic	None	B/Vic	None	None	None	None	None	None	None	None
Finland	None	None	None	None	None	None	None	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A and B	A(Hs)	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
France	-	-	-	-	-	-	-	-	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A and B	A and B	B	B	B	B	B	B	B	B	B	B	-	-	-	-	-	-	-	-	-	-
Germany	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Greece	A(H1)pdm09	A(H1)pdm09	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	None	A(Hs)	B/Vic	A(Hs)	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	A(H1)pdm09	B/Vic	None	B/Vic	B/Vic	A(H1)pdm09
Hungary	None	-	None	None	None	None	-	None	None	None	None	None	None	A	None	A	A(H1)pdm09	A	A	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	None	None	None	-	-	-	-	-
Iceland	-	-	A	A	A	A	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	-	A(H1)pdm09	-	-	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	-	-	-	-	None	None	None	-	-
Ireland	None	None	None	None	None	None	None	A	A	A	A	A	A	A	A	A	A	None	B	B	B	B	B	None	B	B	None	None	None	None	None	None	None	None	None	None	None
Latvia	None	None	None	None	None	None	None	-	-	None	A	A	A(Hs)	A(Hs)	A(Hs)	A	A	A	A	A(H1)pdm09	A	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Lithuania	None	None	None	None	None	None	A(Hs)	A(H1)pdm09	A(H1)pdm09	A	A	A	A	A	A	A	A	A	-	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	None	None	None	None	None	None	None	None	None
Luxembourg	A	None	A	A	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	None	A and B	B	B	B	B	B	B	B	B	B	B	B	None	None	None	None	None	None	None	None	None
Malta	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(H1)pdm09	B	B	B	A and B	B	None	A(H1)pdm09	B	B	None	None	None	None	None	None	None	None
Netherlands	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A	A(Hs)	A	A(H1)pdm09	A(Hs)	A	A	A	A	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A	A	A and B	A	A	A	B	A	A	A	None	None	None
Norway	A	A	A	A	A	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A(H1)pdm09	A	A	A	A	A and B	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic
Poland	None	None	None	A	None	-	A(Hs)	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	None	B	B	None	None	None
Portugal	None	None	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	None	A(Hs)	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None
Romania	None	None	None	None	None	None	None	None	None	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	A and B	B	B	B	None	-	-	-	-
Slovakia	None	None	None	None	None	None	None	None	None	None	None	None	A	A	A	A	A	None	None	None	B	B	B	None	B	B	B	None	B	None	None	None	None	None	None	None	None
Slovenia	-	-	-	-	-	-	-	-	-	A(Hs)	A	A	A	A	A	A	A	A(H1)pdm09	A(H1)pdm09	A	A and B	B/Vic	A and B	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	B/Vic	-	-	B/Vic	-	-	-	-	-
Spain	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A(Hs)	A	A and B	A and B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A and B	None	None	None	None
Sweden	-	-	-	-	-	-	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A and B	A and B	A and B	A and B	B	B	B	B	B	B	B	-	-	-	-	-	-	-

Source: www.flunewseurope.org

Influenza types, subtypes/lineages in hospitals, EU 2023/24

Early A/H3and later H1/pdm09 and B/Vic circulation reflected in hospital data with substantial hospitalisations due to influenza B



Human cases due to avian influenza

Subtype	Cases detected in 2023	Total cases (deaths)	Countries reporting human cases
A(H3N8)	1 case, China	3 (1) since 2022	China
A(H5N1)	8 cases/detections: **Clade 2.3.4.4b:** United Kingdom (4), Chile (1), China (1) **clade 2.3.2.1c:** Cambodia (2)	**878*(458)** Since 2004 **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)*	**23 countries, including one EU/EEA country: Spain*.**
A(H5N6)	4 cases, China	88 (34) Since 2014	No EU/EEA country; China (84), Laos (1)
A(H9N2)	5 H9N2 cases, China 1 H9Nx case, China	126 (2) Since 1998	No EU/EEA country; China (113), Egypt (4), Bangladesh (3), Cambodia (2), Oman (1), Pakistan (1), India (1), Senegal (1)

Source: WHO, ECDC line list, Investigation into the risk to human health of avian influenza (influenza A H5N1) in England: technical briefing 5 - GOV.UK (www.gov.uk); cumulative-number-of-confirmed-human-cases-for-avian-influenza-a(h5n1)-reported-to-who--2003-2023.pdf; CHP closely monitors human case of avian influenza A(H5N6) in Mainland (info.gov.hk))

Symptoms of human cases (truly*) infected with avian influenza H5N1 (clade 2.3.4.4b,) reported 2022-2023

Chile: 53year old man, exposure unclear (environmental? to infected birds/seals close to his home), no comorbidities, cough, sore throat, and hoarseness, hospitalised with worsening symptoms, dyspnoea, pneumonia, admitted to ICU and mechanical ventilation

China:

- 38year old female, exposure to backyard poultry, hospitalised with severe pneumonia, passed away
- 53year old female, exposure to backyard poultry, hospitalised with severe pneumonia, recovered

Ecuador: 9year old girl, contact with backyard poultry (chickens and ducks), no comorbidities, conjunctival pruritus and coryza, hospitalised persistent symptoms including nausea, vomiting and constipation, treatment for encephalitis, admitted to ICU, non-invasive mechanical ventilation

Vietnam: 4year old girl, exposure to backyard chicken and ducks, symptoms cough, fever and jaundice, hospitalised, developed renal and liver failure, admitted to ICU

*excluding H5N1 detections in people involved in culling operations in the US, UK and Spain where contaminations are more likely, and cullers did not report symptoms or very mild symptoms (fatigue, sore throat)

Source: Human infection caused by avian influenza A(H5) - Ecuador (who.int); Human Infection caused by Avian Influenza A (H5N1) - Chile (who.int) ; Assessment of risk associated with recent influenza A(H5N1) clade 2.3.4.4b viruses (who.int) ; influenza-at-the-human-animal-interface-summary-and-assessment--from-6-october-to-11-november-2022.pdf (who.int)
Full article: Clinical features of the first critical case of acute encephalitis caused by the avian influenza A (H5N6) virus (tandfonline.com) ; https://cdn.who.int/media/docs/default-source/influenza/who-influenza-recommendations/vcm-northern-hemisphere-recommendation-2023-2024/20230224_zoonotic_recommendations.pdf?sfvrsn=38c739fa_4 MEDIA: https://bnonews.com/index.php/2023/03/china-reports-human-case-h5n1-bird-flu/; influenza-at-the-human-animal-interface-summary-and-assessment--from-27-january-to-3-march-2023.pdf (who.int)

ECDC Public Health Risk Assessment for A(H5N1)

- **Transmission to humans are rare events**
- No human-to-human transmission
- Sporadic human infections with severe disease cannot be excluded

<u>ECDC risk assessment:</u>

The risk of human infection due to avian influenza viruses of the currently circulating clade 2.3.4.4b in Europe is assessed as **low** for the general population and **low to moderate** for people occupationally or otherwise exposed (including exposed to infected domesticated pets).

Avian influenza A(H5N1) clade 2.3.4.4b

- With autumn bird migration, avian influenza A(H5N1) clade 2.3.4.4b virus outbreaks are expected to continue and spread geographically across the EU/EEA.
- Transmission of avian influenza viruses to poultry farms and sporadic infections among various wild, domesticated and farmed mammals will likely continue.
- Whenever avian influenza viruses are present the possibility of **transmission to humans cannot be excluded**, particularly for directly exposed people not wearing protective equipment.
- **No human infection identified in EU/EEA.**

Guidance for surveillance on avian influenza in humans during the summer 2023 and winter epidemic 2023/24

Recommendation on enhanced hospital surveillance for detecting avian influenza infections – summer 2023

Overall strengthening surveillance for sporadic severe human infections with avian influenza virus in hospital during summer period 2023 (weeks 21-39):

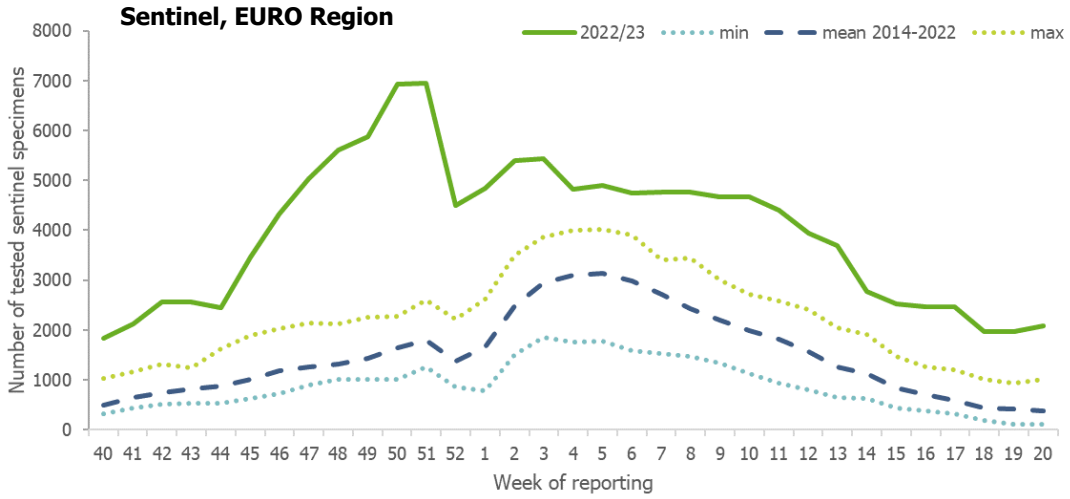
- Hospitalised patients with unexplained viral encephalitis/meningoencephalitis lacking the aetiological agent should be considered for testing for influenza virus.
- All influenza A positive samples from hospitalised patients should be subtyped for seasonal influenza viruses (H1N1pdm09 and H3N2).
- Samples positive for influenza type A virus but negative for A(H1N1)pdm09 or A(H3N2) should be immediately sent to the national influenza reference laboratories for further analysis and H5 testing.

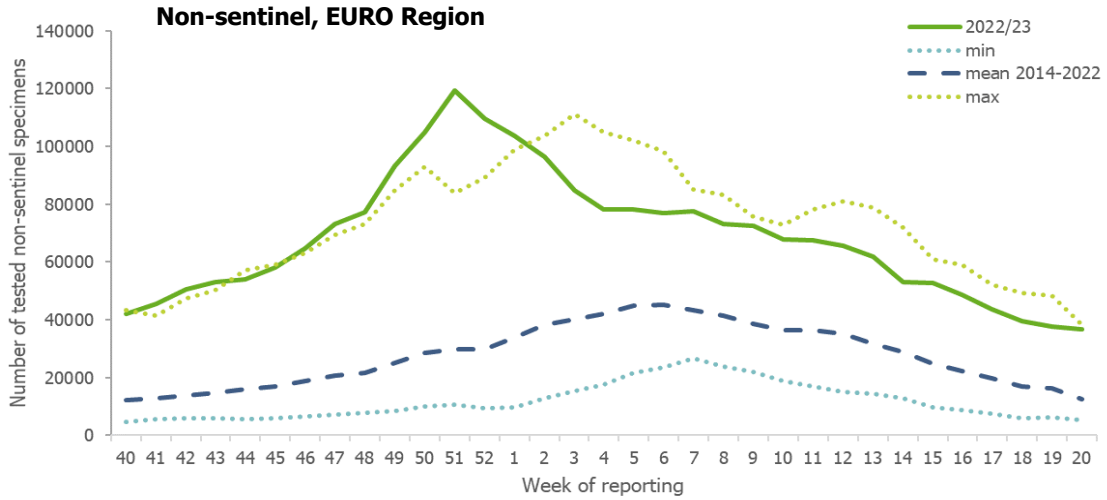
Source: Enhanced surveillance of severe avian influenza virus infections in hospital settings (europa.eu)

Influenza testing and outlook to 2023/24 season

During the winter months when seasonal influenza viruses are circulating in the population, testing and sub-typing approaches for avian influenza virus need to be **proportionate** to the epidemiological situation and the capacities of reference laboratories.

EU/EEA 2022/23 Sentinel tested: 90 000 Non-sentinel tested:1.9 mio





Source: https://www.ecdc.europa.eu/en/publications-data/avian-influenza-infections-surveillance-eu-eea

Suggested overall surveillance approach

In areas with ongoing avian influenza outbreaks,

a risk-based targeted approach is proposed,

focussing on outbreaks and severe respiratory or unexplained neurological disease.

Source: https://www.ecdc.europa.eu/en/publications-data/avian-influenza-infections-surveillance-eu-eea

Suggestions for avian influenza surveillance

- Include recall of **exposure** to sick or dead animals in **clinical history** for patients hospitalised with respiratory symptoms. Exposure risk assessment by the clinician to inform testing decision. Specimens from hospitalised patients with very severe influenza virus infection considered for sub-typing, particularly if nosocomial outbreak.

- Test hospitalised patients with **unexplained viral encephalitis/meningo-encephalitis** for seasonal influenza virus. Subtype type A virus positive specimens to rule out avian influenza.

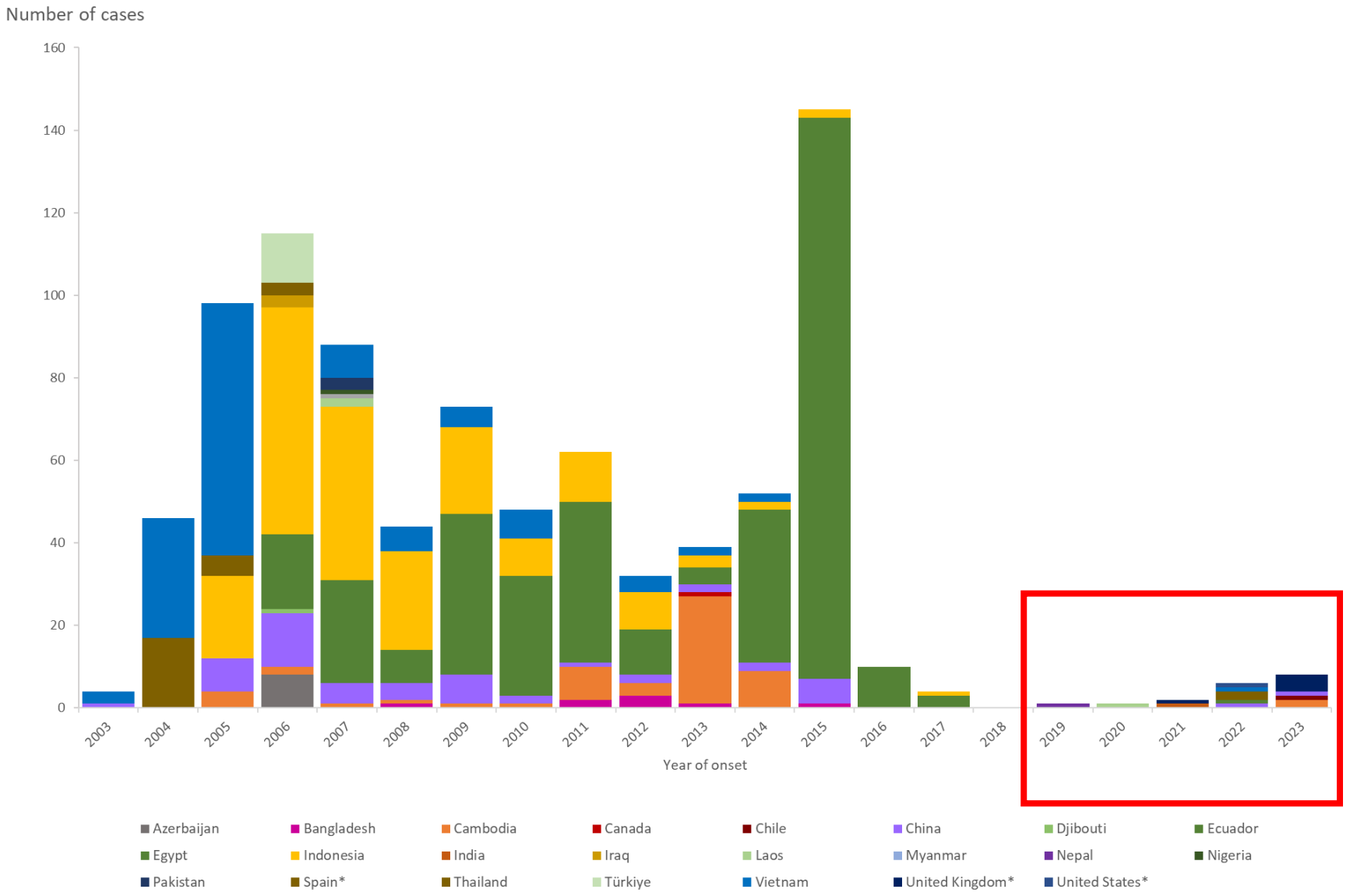
- Investigate **clusters** of severe respiratory infections requiring hospitalisation and test for avian if routine testing for respiratory pathogens is inconclusive.

- Consider **wastewater** surveillance as an additional monitoring system locally, although very limited experience so far to identify low-level circulation of zoonotic influenza virus infections in the population.

Source: https://www.ecdc.europa.eu/en/publications-data/avian-influenza-infections-surveillance-eu-eea

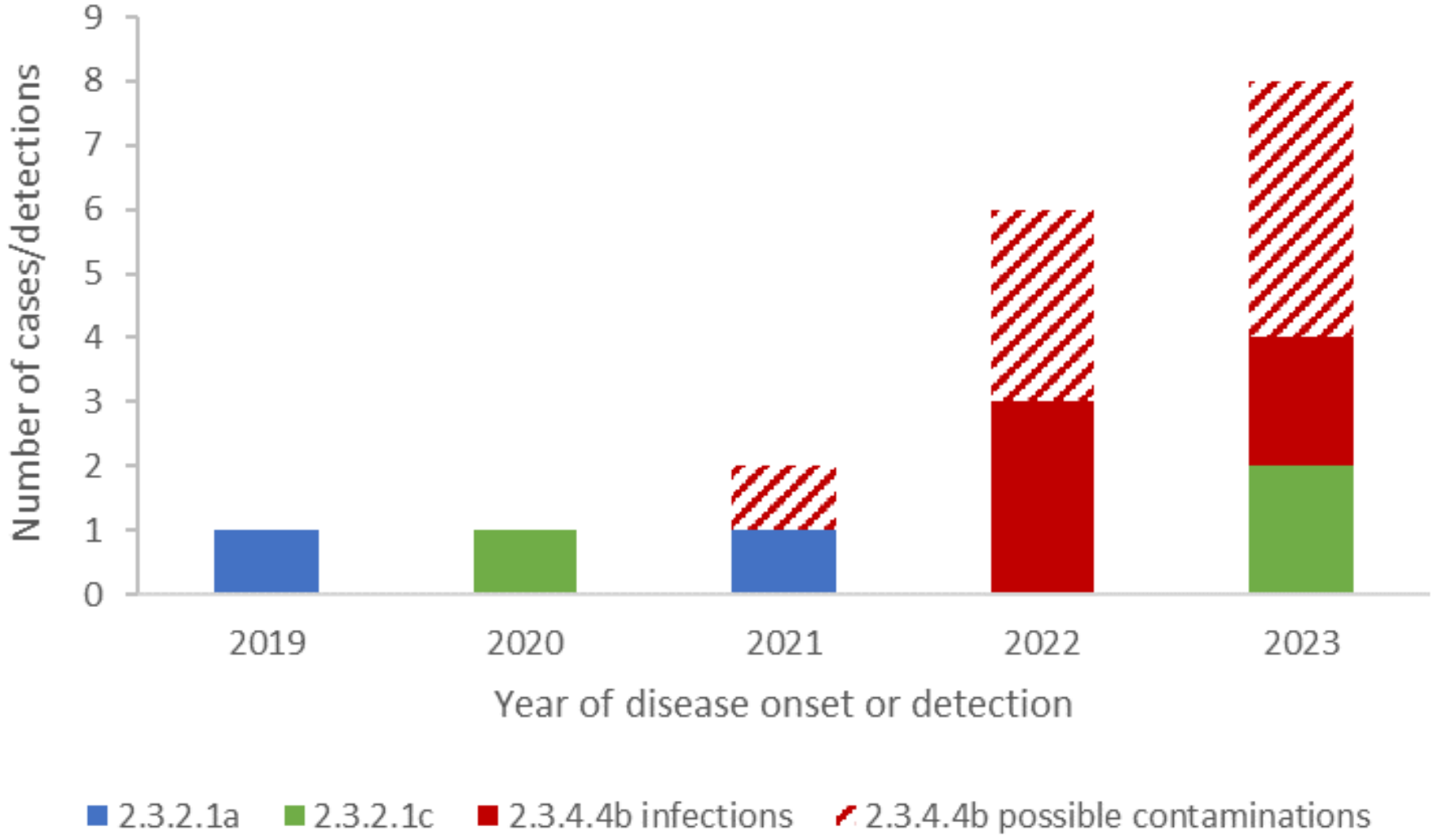
Questions?

Human A(H5N1) cases and detections reported, 2003-2023 n=(878)



Source: WHO, ECDC line list, Investigation into the risk to human health of avian influenza (influenza A H5N1) in England: technical briefing 5 - GOV.UK (www.gov.uk); cumulative-number-of-confirmed-human-cases-for-avian-influenza-a(h5n1)-reported-to-who--2003-2023.pdf

Human A(H5N1) cases and detections by clade, 2019-2023



Source: WHO, ECDC line list, Investigation into the risk to human health of avian influenza (influenza A H5N1) in England: technical briefing 5 - GOV.UK (www.gov.uk); cumulative-number-of-confirmed-human-cases-for-avian-influenza-a(h5n1)-reported-to-who--2003-2023.pdf