ΜΕΤΑΠΤΥΧΙΑΚΟ ΠΡΟΓΡΑΜΜΑ
ΛΟΙΜΩΞΙΟΛΟΓΙΑ

Γρίπη-Πανδημική γρίπη-Γρίπη πουλερικών

Σωτήρης Τσιόδρας

Καθηγητής Παθολογίας-Λοιμώξεων

Ιατρική Σχολή ΕΚΠΑ

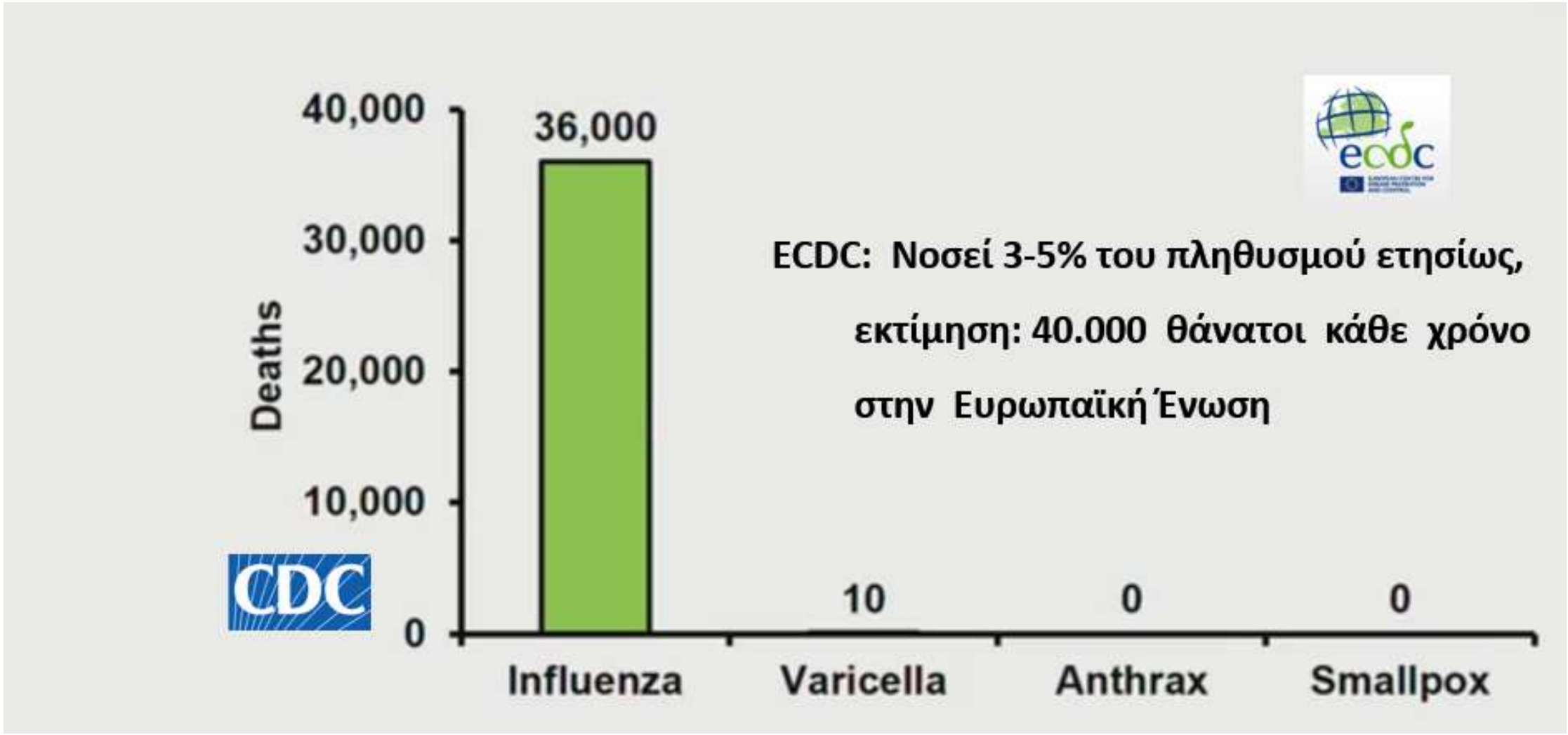
7/12/2021

Εποχική Γρίπη & συχνότητα
pre-COVID-19

- **το πιο συχνό νόσημα** που προλαμβάνεται με εμβολιασμό, προκαλεί επιδημίες κάθε έτος
  - 5-15% του πληθυσμού (S. Potkin 2016)

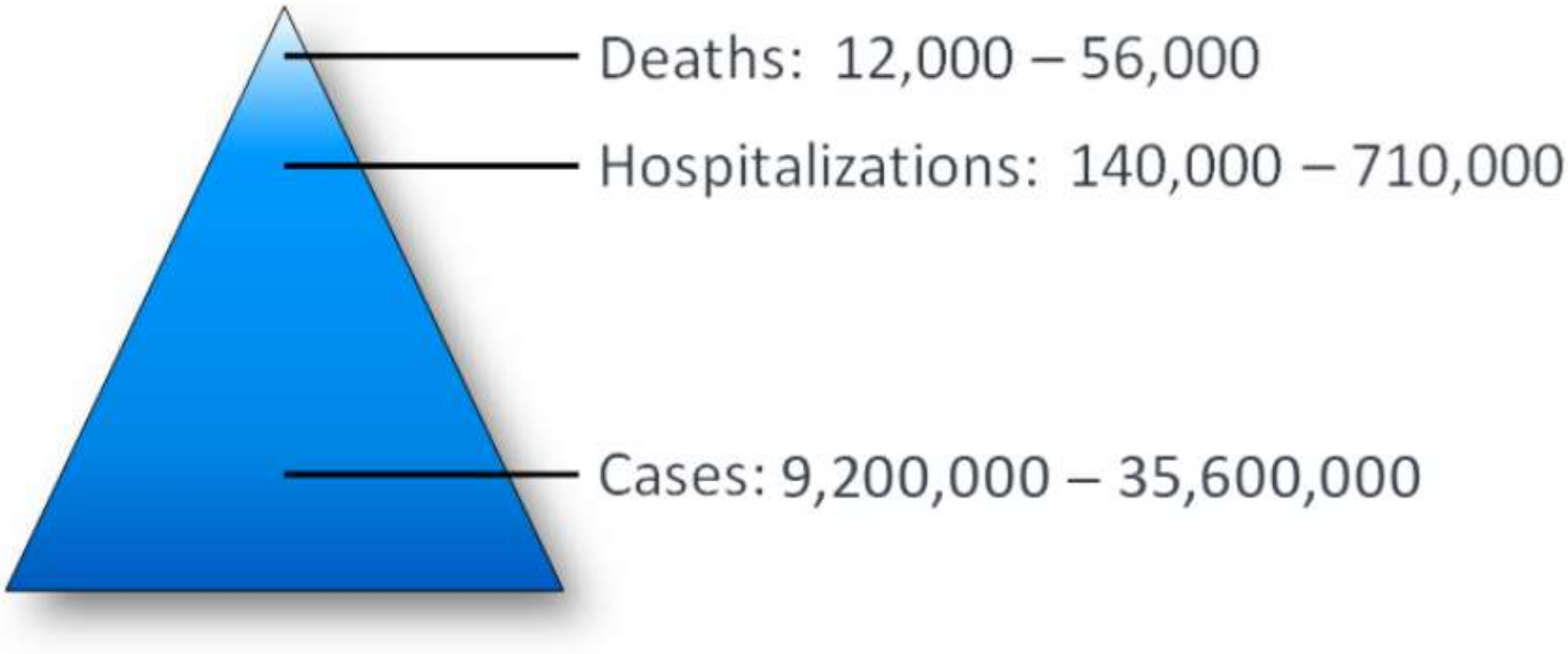
- **το πιο συχνό αίτιο θανάτου** από νόσημα που προλαμβάνεται με εμβολιασμό
  - εκτίμηση: 250.000- 500.000 θάνατοι ετησίως

Εποχική Γρίπη & συχνότητα



USA 2010-18, estimates pre-COVID-19

Most frequent illness - preventable by vaccination



While the impact of flu varies, it places a substantial burden on the health of people in the United States each year. CDC estimates that influenza has resulted in between 9.2 million and 35.6 million illnesses, between 140,000 and 710,000 hospitalizations and between 12,000 and 56,000 deaths annually since 2010.

Flu-linked mortality

Πιο συχνή αιτία θανάτου που προλαμβάνεται με εμβόλιο, pre-COVID-19

World Health Organization

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Home / News / Detail / Up to 650 000 people die of respiratory diseases linked to seasonal flu each year

Up to 650 000 people die of respiratory diseases linked to seasonal flu each year

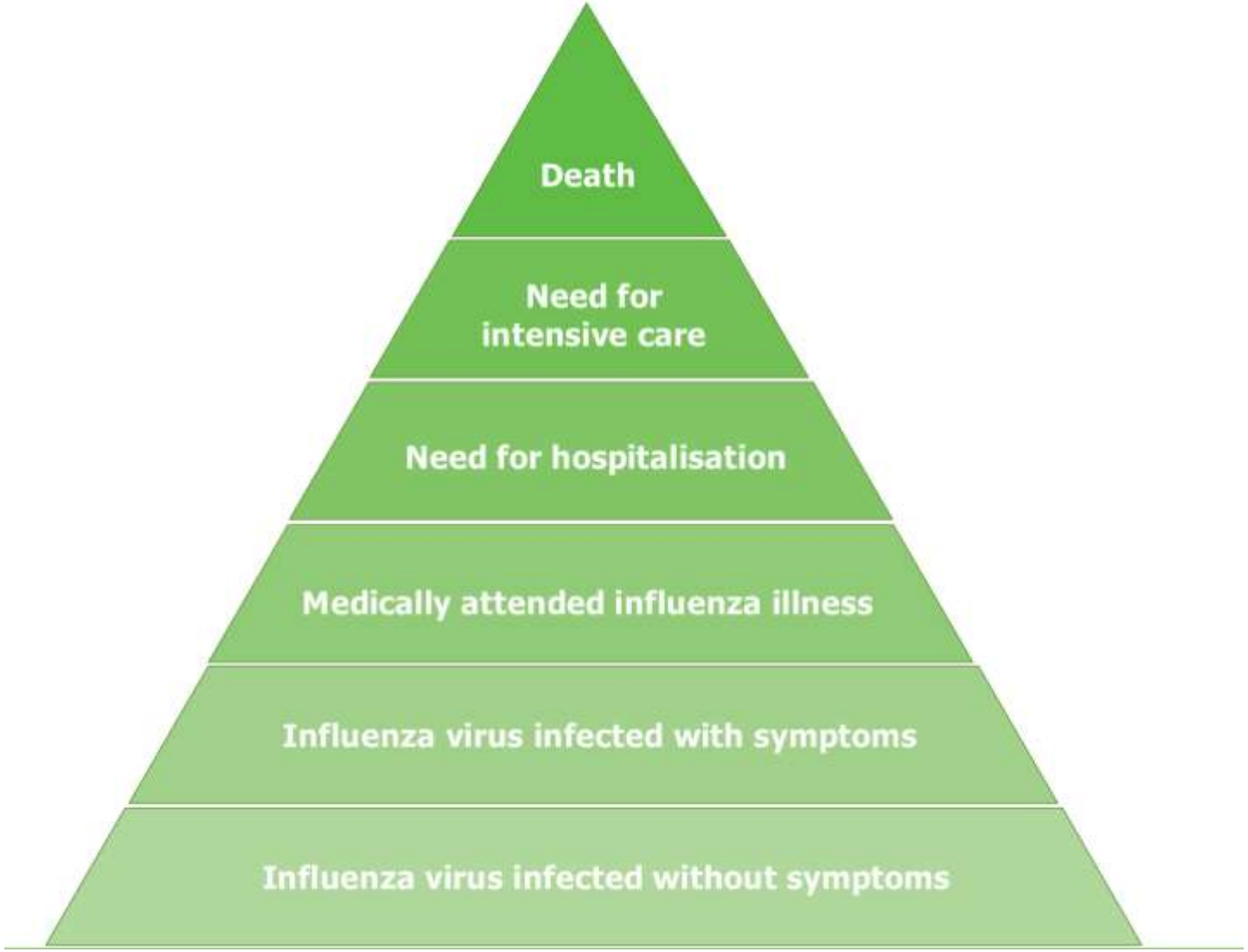
العربية | 中文 | Français | Русский | Español

14 December 2017 |News Release |GENEVA

Media Contacts

Seasonal influenza & complications

More often in elderly



Influenza & οξύ έμφραγμα μυοκαρδίου

The New England Journal of Medicine

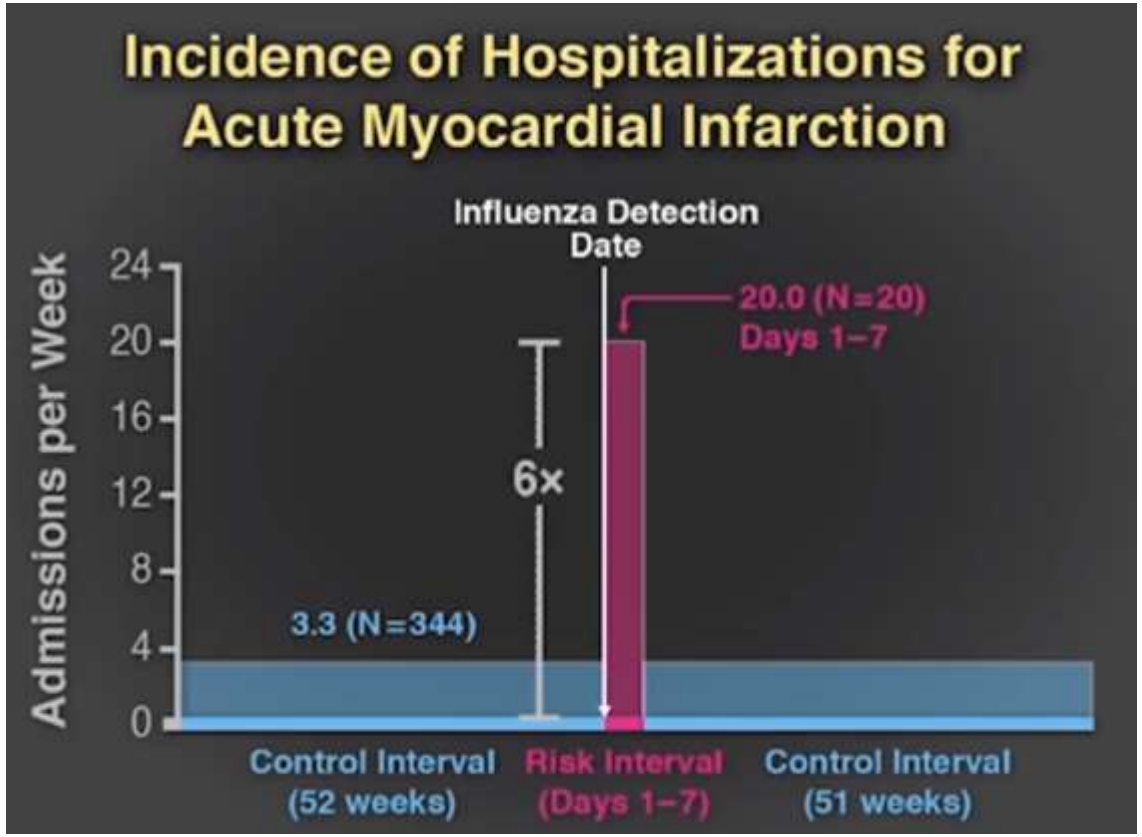
Myocardial Infarction after Influenza Infection

KEY POINTS FROM

Acute Myocardial Infarction after Laboratory-Confirmed Influenza Infection

by J.C. Kwong et al.

JANUARY 25, 2018



Kwong,et al, NEJM 2018

Flu-CDC estimates 2018-19, USA

pre-COVID-19, significant under-estimation w surveillance

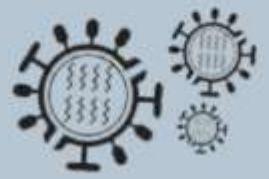
CDC estimates that, from **October 1, 2018,** through **May 4, 2019,** there have been:

37.4 million – 42.9 million
flu illnesses

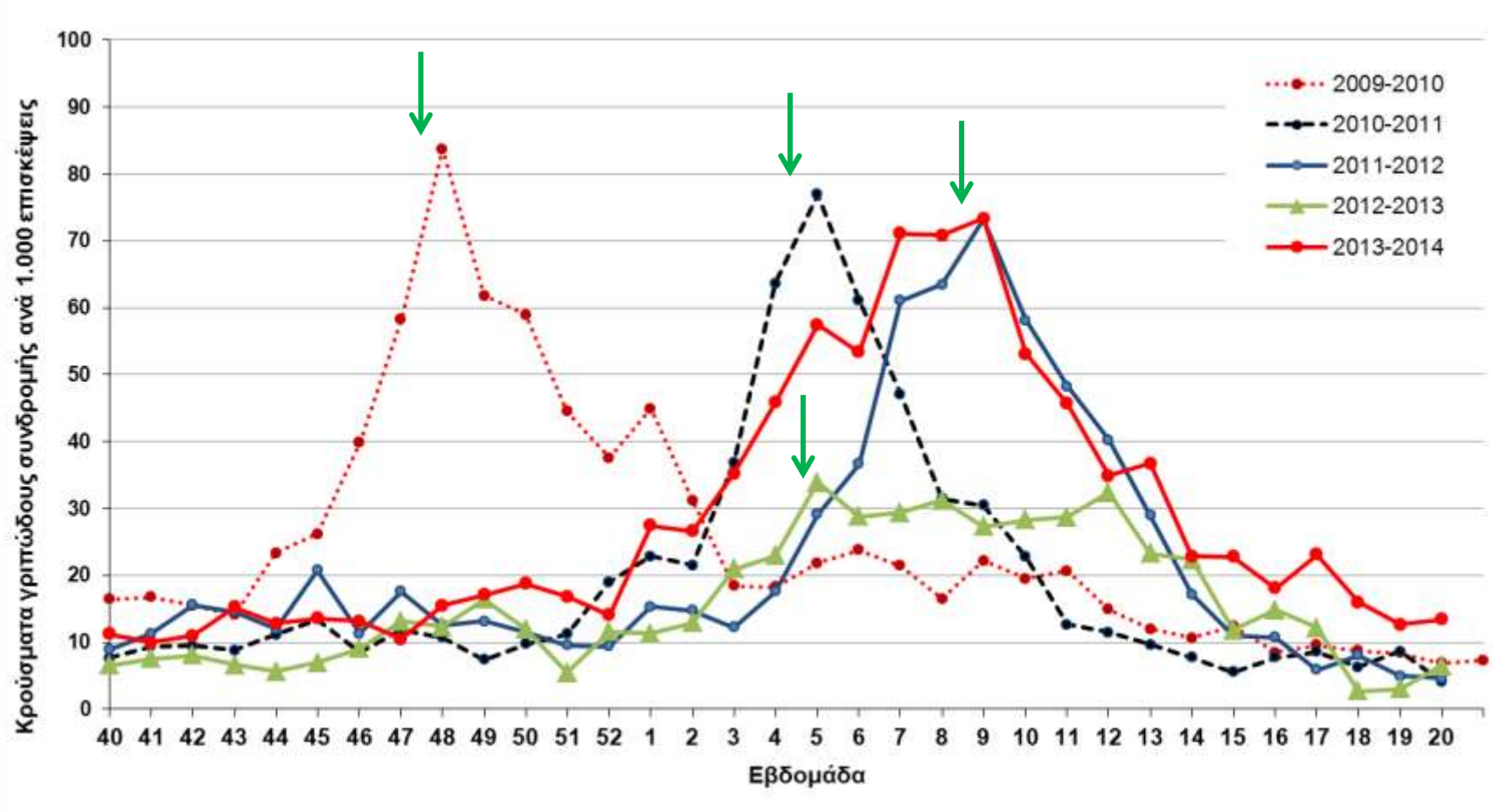
17.3 million – 20.1 million
flu medical visits

531,000 – 647,000
flu hospitalizations

36,400 – 61,200
flu deaths



Εκτίμηση ILI/1.000 επισκέψεις & εβδομάδα, Ελλάδα (2009-2014)



ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν (!)

ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν για EU/EEA (!)

- **influenza activity remained at or below inter-seasonal levels**
- throughout the 2020–21 season
  - probably due to the impact of the various public health & social measures implemented to reduce transmission of SARS-CoV-2

ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν για EU/EEA (!)

Figure 1. Number of tested specimens from sentinel surveillance, week 40/2020 to week 20/2021, compared to minimum, mean and maximum values from seasons 2015-16 to 2019-20, EU/EEA

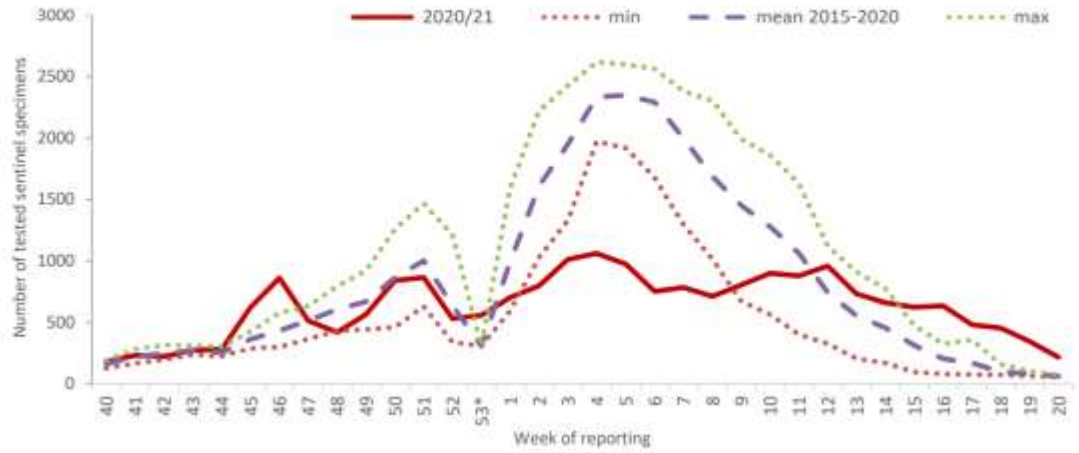


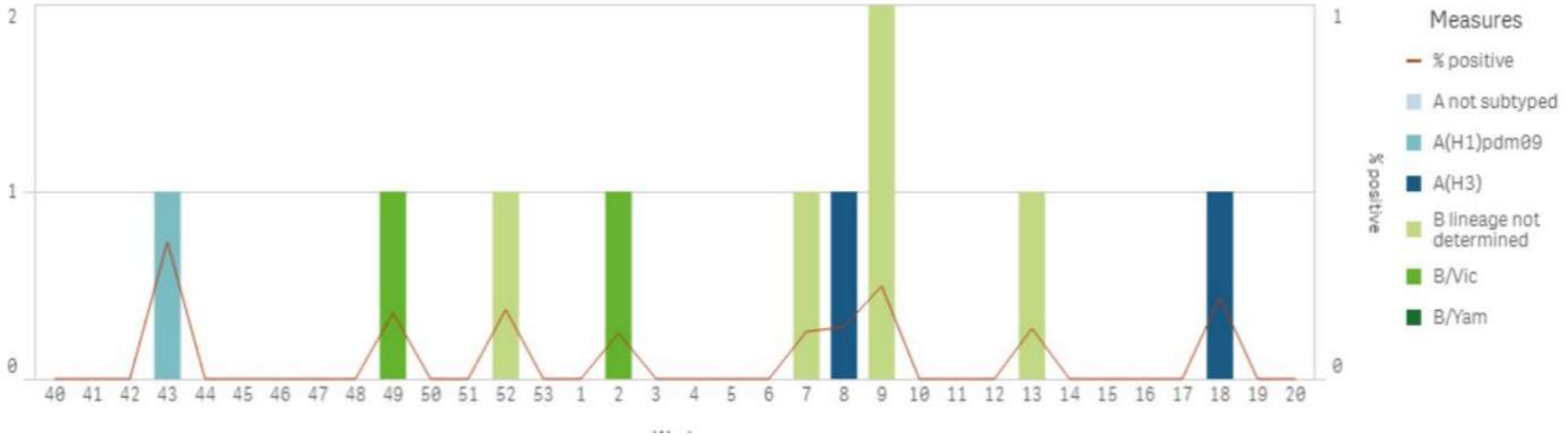
Table 1. Number of positive tested sentinel and non-sentinel specimens by type and subtype/lineage, EU/EEA countries, 2020-21

Virus subtype	Number of positive tested sentinel specimens (number tested)	%	Number of positive tested non-sentinel specimens (number tested)	%
Type A total	3	30	65	41
Influenza type A not subtyped	0		36	
A(H1)pdm09	1		8	
A(H3)	2		21	
Influenza type B total	7	70	93	59
B lineage not determined	5		79	
B/Vic	2		11	
B/Yam	0		3	
Total	**10 (21 442)**		**158 (577 476)**	

ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν για EU/EEA (!)

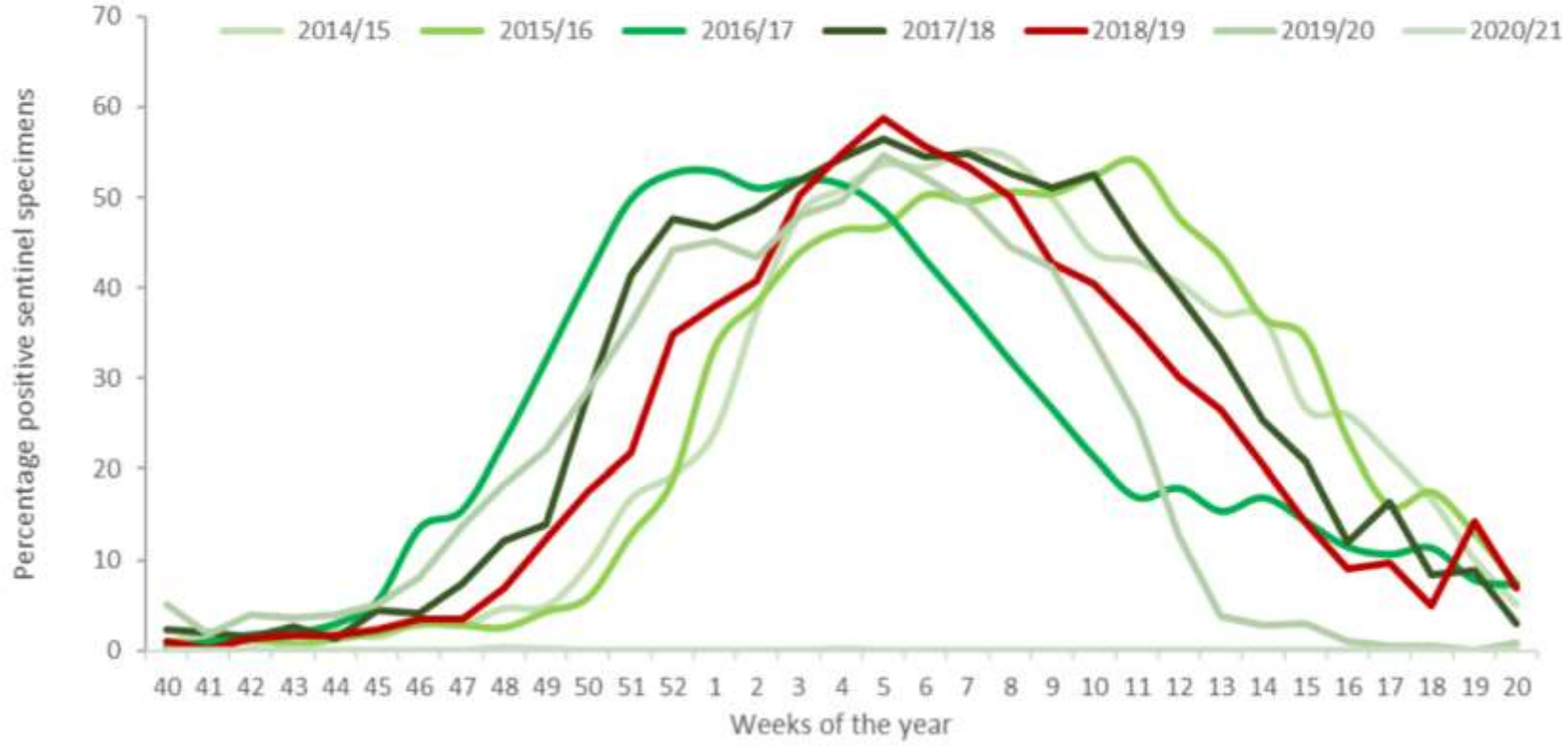
Figure 2. Weekly proportion of sentinel specimens positive for influenza virus and number of detections by virus type, subtype/lineage and week of reporting, EU/EEA, 2020-21



ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Σε σχέση με προηγούμενες σεζόν απειροελάχιστη κυκλοφορία (!)

Figure 3. Weekly proportion of sentinel specimens positive for influenza virus by season and week of reporting, EU/EEA, 2015-16 to 2020-21



ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν για EU/EEA (!)

- Only 10 sentinel and 158 non-sentinel specimens tested positive for influenza during the 2020–21 season.
- no hospitalized cases of influenza reported by EU/EEA
- neither were there any fatalities from influenza reported

ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν για EU/EEA (!)

Figure 5. Number of influenza viruses attributed to genetic groups, EU/EEA, 2020/21

	Number of influenza viruses attributed to genetic groups 2020/2021
Total	**14**
Influenza A	**9**
A(H1)pdm09	**1**
A/Guangdong-Maonan/SWL1536/2019(H1N1)pdm09	1
A(H3)	**8**
A/Bretagne/1323/2020(H3N2)_3C.2a1b+T131K-B	1
A/Denmark/3264/2019(H3N2)_3C.2a1b+T135K-A	1
A/Slovenia/1637/2020(H3N2)_3C.2a1b+T131K-A	6
Influenza B	**5**
B/Vic	**5**
B/Washington/02/2019(Victoria lineage_1A(del162-164))	5

Very few viruses were sent for characterization this season, which has hampered the decision on vaccine composition for the coming season.

Recommended vaccine composition
6 months before!

World Health Organization

Health Topics | Countries | News | Emergencies | About Us

Influenza

Recommended composition of influenza virus vaccines for use in the 2018-2019 northern hemisphere influenza season

February 2018 - WHO convenes technical consultations in February and September each year to recommend viruses for inclusion in influenza vaccines for the northern and southern hemisphere influenza seasons, respectively. This recommendation relates to the influenza vaccines for use in the forthcoming northern hemisphere 2018-2019 influenza season. A recommendation will be made in September 2018 relating to vaccines that will be used for the southern hemisphere 2019 influenza season.

Read the recommendations

Annual composition of vaccine…

for the other hemisphere

It is recommended that **quadrivalent vaccines** for use in the 2022 southern h following:

Egg-based vaccines

- an A/Victoria/2570/2019 (H1N1)pdm09-like virus;
- an A/Darwin/9/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus; and
- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

Cell- or recombinant-based vaccines

- an A/Wisconsin/588/2019 (H1N1)pdm09-like virus;
- an A/Darwin/6/2021 (H3N2)-like virus;
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus; and
- a B/Phuket/3073/2013 (B/Yamagata lineage)-like virus.

Γρίπη – Ελλάδα, 2020-21

27 Μαΐου 2021

ΕΘΝΙΚΟΣ ΟΡΓΑΝΙΣΜΟΣ
ΔΗΜΟΣΙΑΣ ΥΓΕΙΑΣ

Εβδομαδιαία Έκθεση
Επιδημιολογικής Επιτήρησης της Γρίπης
Εβδομάδα 20/2021 (17–23 Μαΐου 2021)

Η επιτήρηση της γρίπης για την περίοδο 2020 - 2021 σε Ευρωπαϊκό επίπεδο και στην Ελλάδα ξεκίνησε την εβδομάδα 40/2020 (28 Σεπτεμβρίου – 04 Οκτωβρίου 2020) και θα ολοκληρωθεί την εβδομάδα 20/2021 (17–23 Μαΐου 2021).

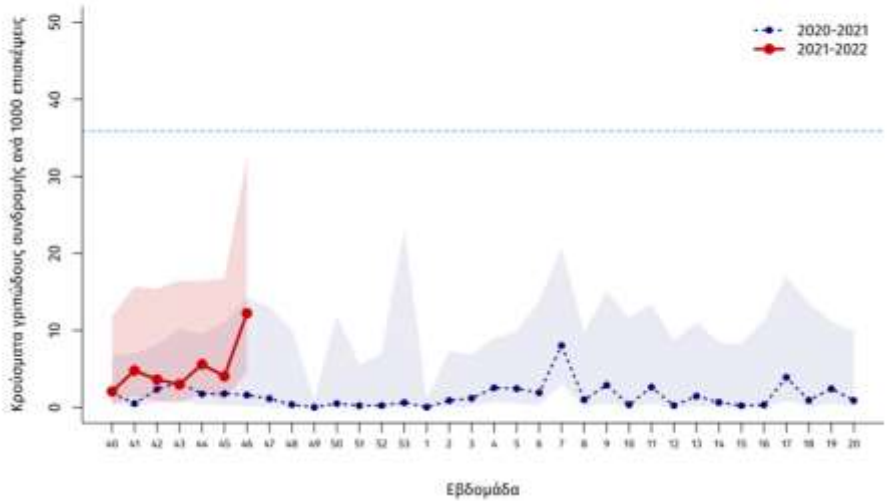
Γρίπη – Ελλάδα, 2021-22

25 Νοεμβρίου 2021

ΕΘΝΙΚΟΣ ΟΡΓΑΝΙΣΜΟΣ
ΔΗΜΟΣΙΑΣ ΥΓΕΙΑΣ

Εβδομαδιαία Έκθεση
Επιδημιολογικής Επιτήρησης της Γρίπης
Εβδομάδα 46/2021 (15–21 Νοεμβρίου 2021)

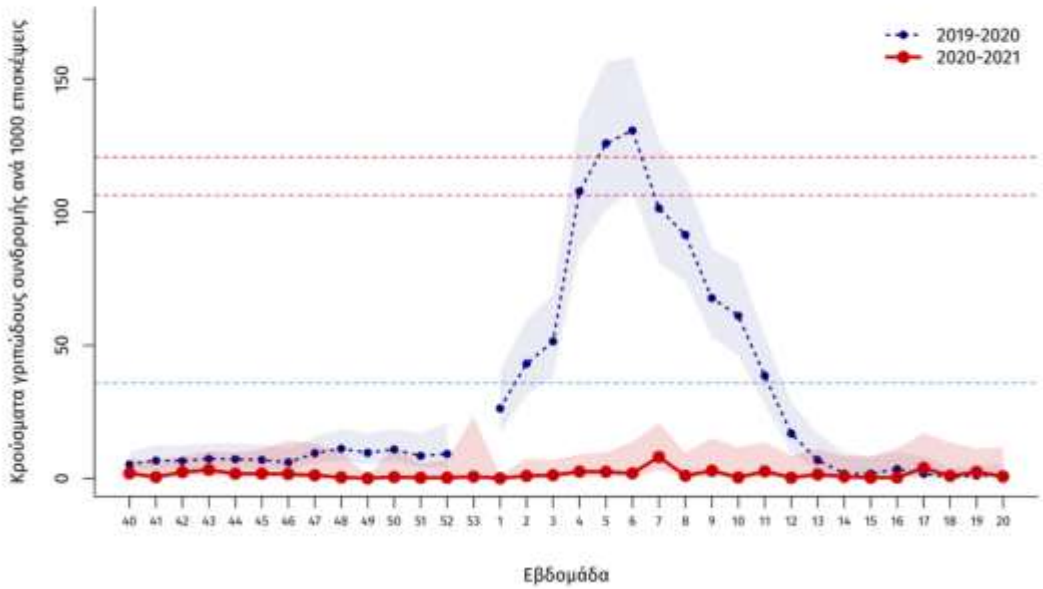
Διάγραμμα 1: Εκτίμηση αριθμού κρουσμάτων γριπώδους συνδρομής ανά 1.000 επισκέψεις, κατά εβδομάδα. Σύνολο χώρας, περίοδοι γρίπης: 2020-2021, 2021-2022.



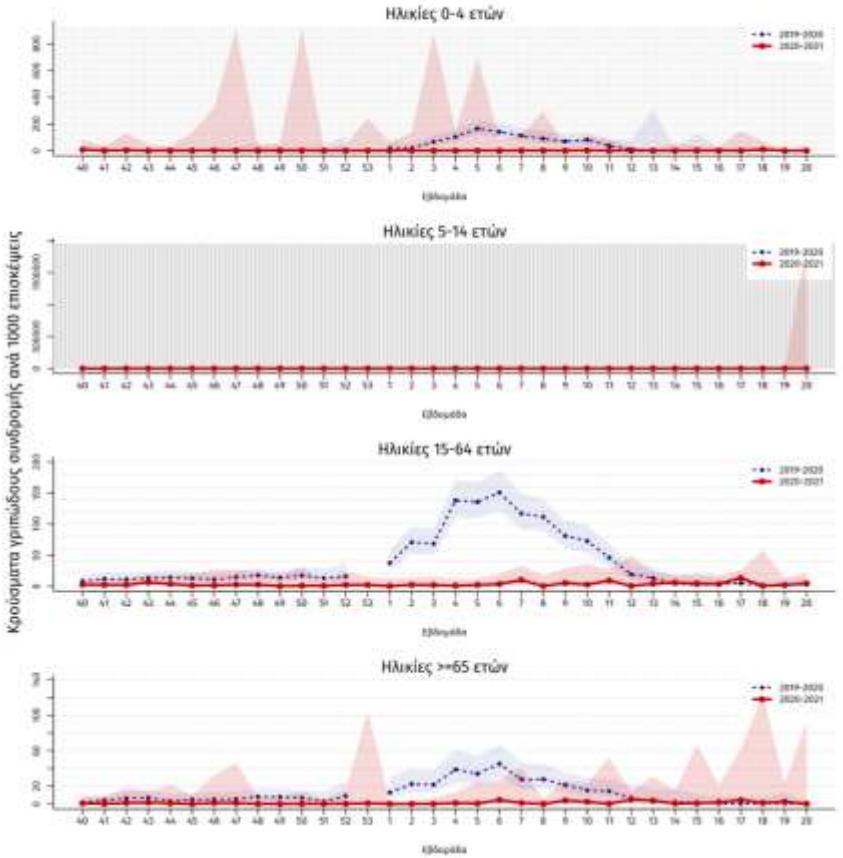
- Κατά την εβδομάδα 46/2021 (15–21 Νοεμβρίου 2021) οι επισκέψεις σε ιατρό για γριπώδη συνδρομή παραμένουν σε χαμηλά επίπεδα (Διάγραμμα 1 και 2).
- Κατά την εβδομάδα 46/2021 (15–21 Νοεμβρίου 2021) στα δύο Εθνικά Εργαστήρια Αναφοράς Γρίπης (Τμήμα Ιολογίας, Ελληνικό Ινστιτούτο Παστέρ, και Β' Εργαστήριο Μικροβιολογίας, Ιατρική Σχολή Α.Π.Θ.), ελέγχθηκαν για ιούς γρίπης συνολικά 22 κλινικά δείγματα και συγκεκριμένα 8 από νοσοκομεία και 14 από τα δίκτυα Sentinel. Κανένα δείγμα δεν ήταν θετικό για ιούς γρίπης (Διάγραμμα 3).
- **Με βάση τα ανωτέρω, η δραστηριότητα της γρίπης στην Ελλάδα παραμένει σε χαμηλά επίπεδα. Τονίζεται η σημασία του αντιγριπικού εμβολιασμού ως ο καλύτερος τρόπος προφύλαξης από τη γρίπη.**

Γρίπη – Ελλάδα, 2020-21

Διάγραμμα 1: Εκτίμηση αριθμού κρουσμάτων γριπώδους συνδρομής ανά 1.000 επισκέψεις, κατά εβδομάδα. Σύνολο χώρας, περίοδοι γρίπης: 2019-2020, 2020-2021.

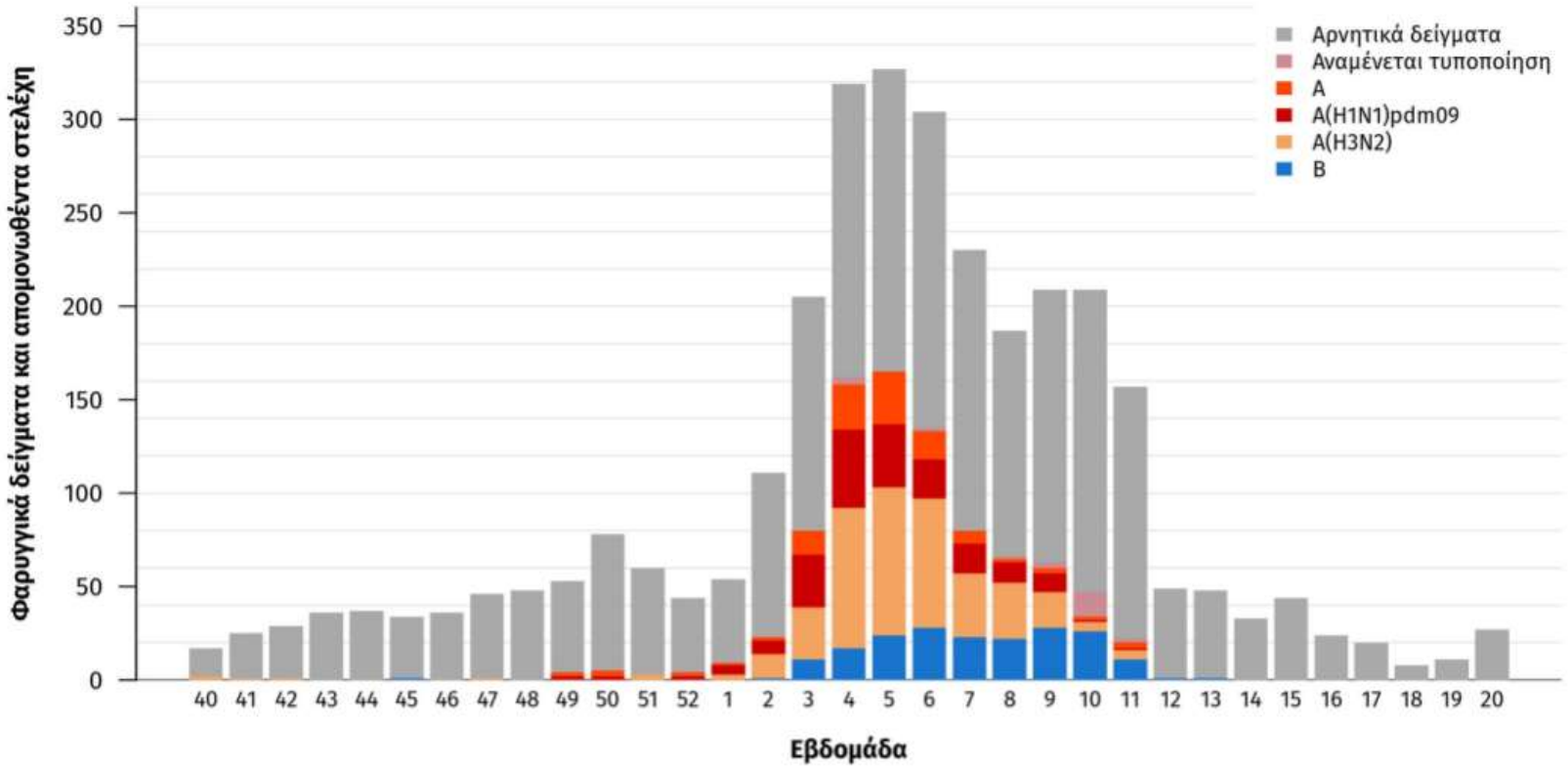


Διάγραμμα 2: Εκτίμηση αριθμού κρουσμάτων γριπώδους συνδρομής ανά 1.000 επισκέψεις, κατά εβδομάδα, ανά ηλικιακή ομάδα. Σύνολο χώρας, περίοδοι γρίπης: 2019-2020, 2020-2021.



Γρίπη – Ελλάδα, 2019-20

Διάγραμμα 3: **Συνολικός αριθμός φαρυγγικών δειγμάτων και απομονωθέντων στελεχών ιού γρίπης στα Εργαστήρια Αναφοράς Γρίπης. Σύνολο χώρας, περίοδος γρίπης 2019 - 2020.**



Γρίπη – Ελλάδα, 2020-21
δεν χαρακτηρίστηκαν στελέχη

- Κατά την εβδομάδα 20/2021 (17–23 Μαΐου 2021) στα δύο Εθνικά Εργαστήρια Αναφοράς Γρίπης (Τμήμα Ιολογίας, Ελληνικό Ινστιτούτο Παστέρ, και Β' Εργαστήριο Μικροβιολογίας, Ιατρική Σχολή Α.Π.Θ.), ελέγχθηκαν για ιούς γρίπης συνολικά 3 κλινικά δείγματα όλα από τα δίκτυα Sentinel. Κανένα δείγμα δεν ήταν θετικό για ιούς γρίπης (Διάγραμμα 3).

- **Με βάση τα ανωτέρω, η δραστηριότητα της εποχικής γρίπης στην Ελλάδα παρέμεινε σε χαμηλά για την εποχή επίπεδα καθ'όλη την διάρκεια επιτήρησης. Η πανδημία από τον ιό SARS-CoV-2 επηρέασε συνολικά τις επισκέψεις στις δομές για αναζήτηση υγειονομικής περίθαλψης. Τονίζεται η σημασία του αντιγριπικού εμβολιασμού ως ο καλύτερος τρόπος προφύλαξης από τη γρίπη.**

Influenza transmission zones

Influenza Transmission Zones

The Influenza Transmission Zones are geographical groups of countries, areas or territories with similar influenza transmission patterns. Below is a map showing the borders of the Influenza Transmission Zones as well as the list of countries, areas or territories by zone.

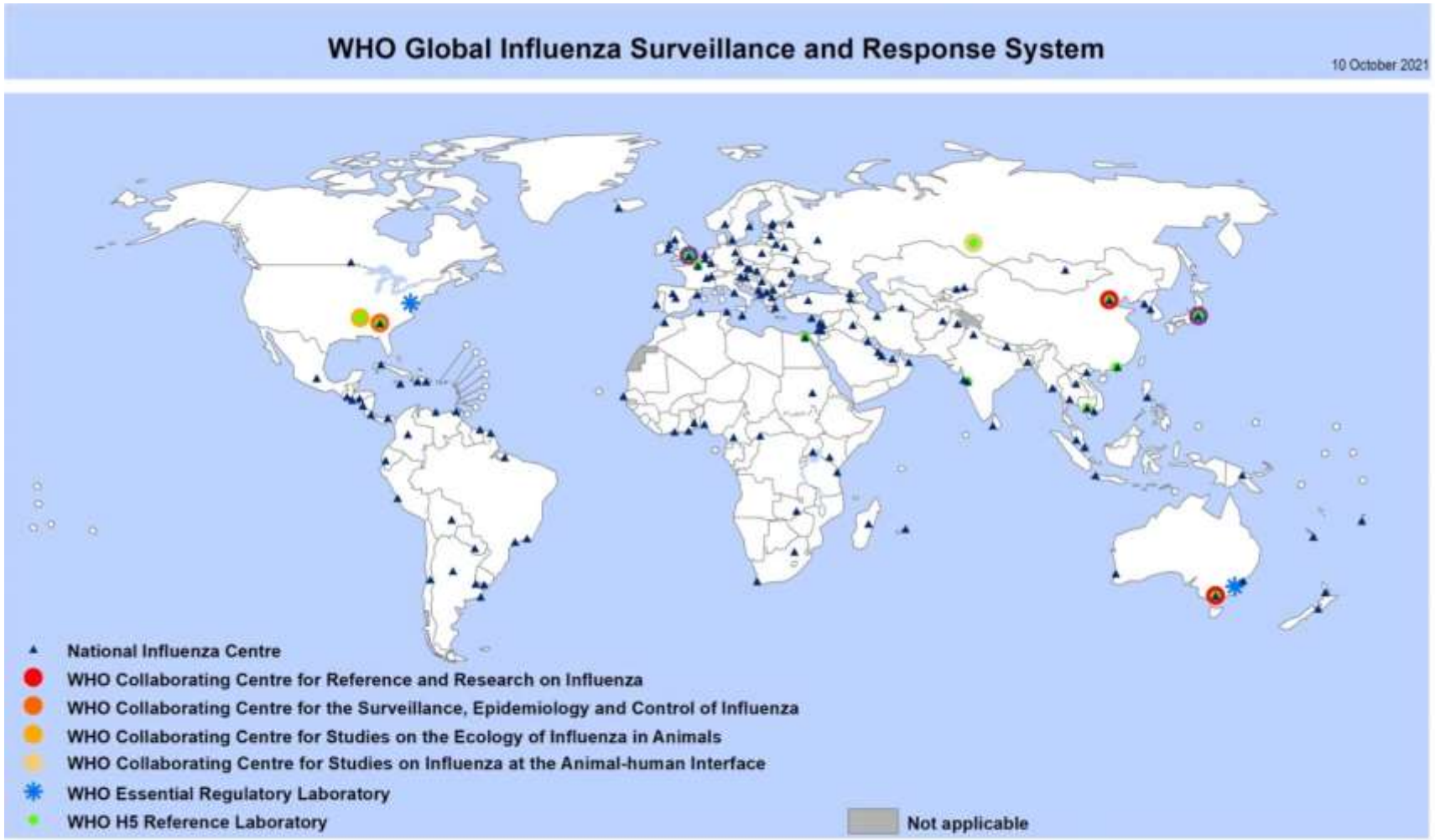
Global influenza surveillance & response

Influenza - COVID-19 Interface

(COVID-19) Pandemic
Coronavirus disease

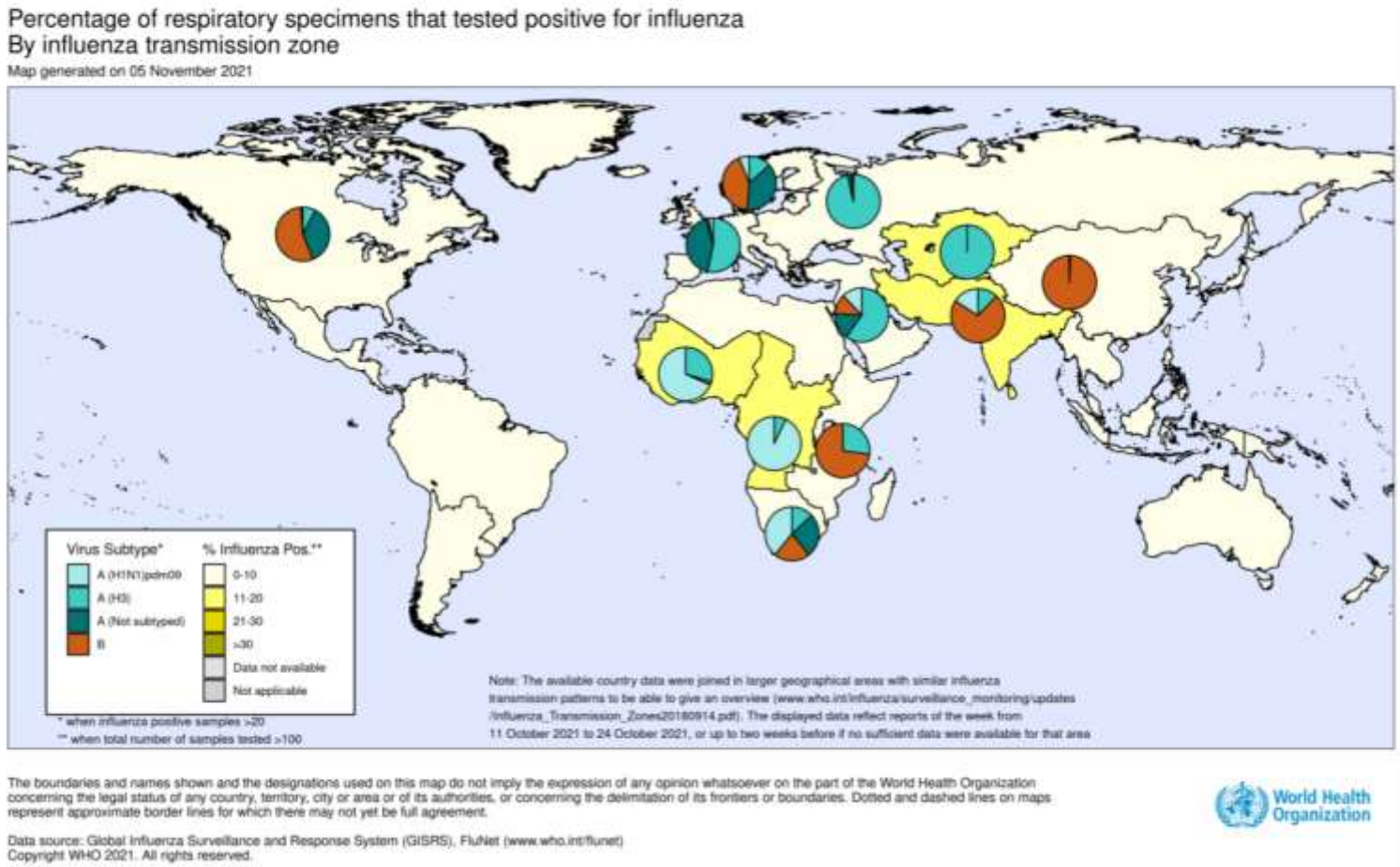
Global Influenza Surveillance and Response System
GISRS

GISRS
GLOBAL INFLUENZA SURVEILLANCE & RESPONSE SYSTEM



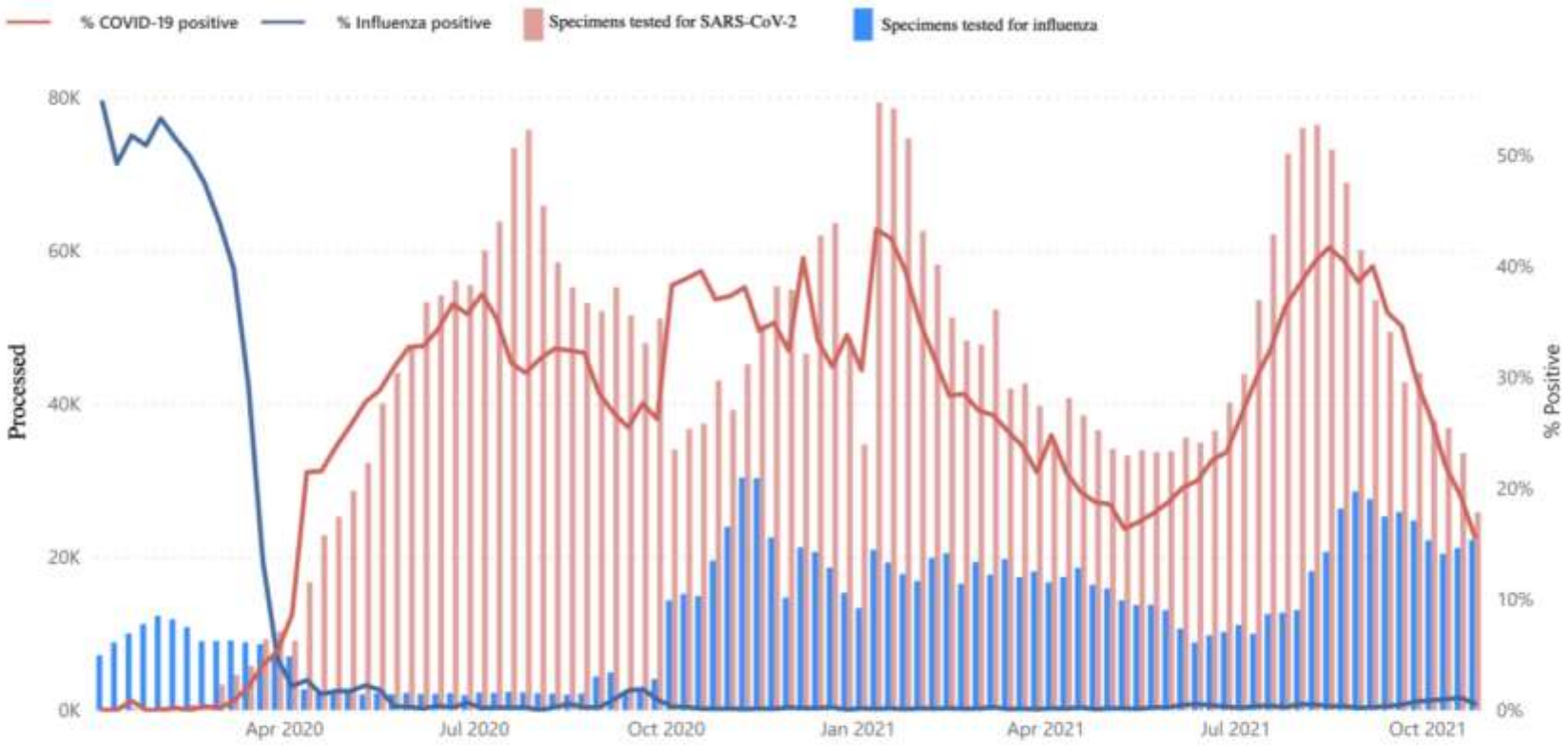
Influenza lab surveillance Nov 2021

Percentage of respiratory specimens that tested positive for influenza by influenza transmission zone[1]. Map generated on 5 November 2021.



Influenza surveillance, global data, Nov 2021

double surveillance both influenza & SARS-CoV-2



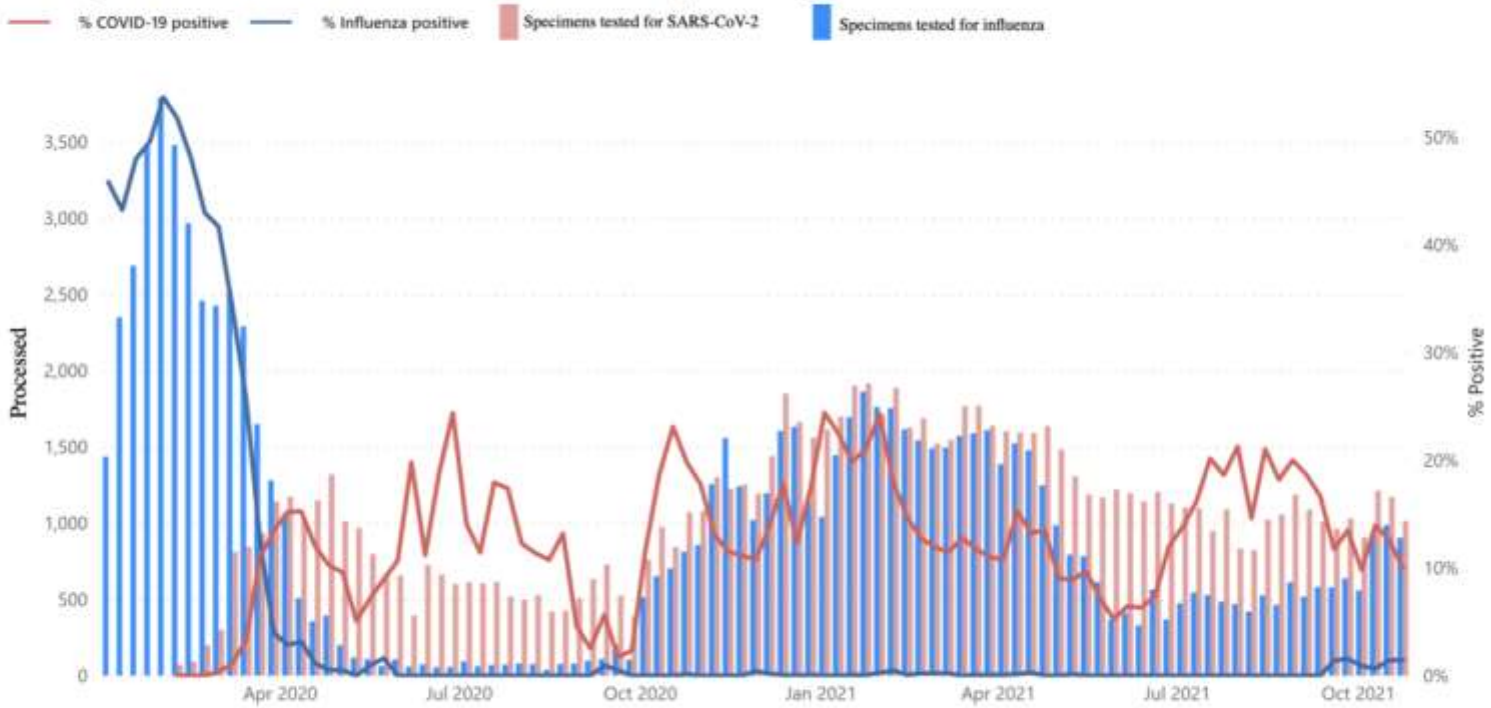
Data source: FluNet (www.who.int/toolkits/flunet). Global Influenza Surveillance and Response System (GISRS)
Data generated on 5/11/2021

World Health Organization

Influenza surveillance, European data, Nov 2021

double surveillance both influenza & SARS-CoV-2

Influenza and SARS-CoV-2 virus detections from sentinel surveillance reported to FluNet from countries, areas and territories in the WHO European Region



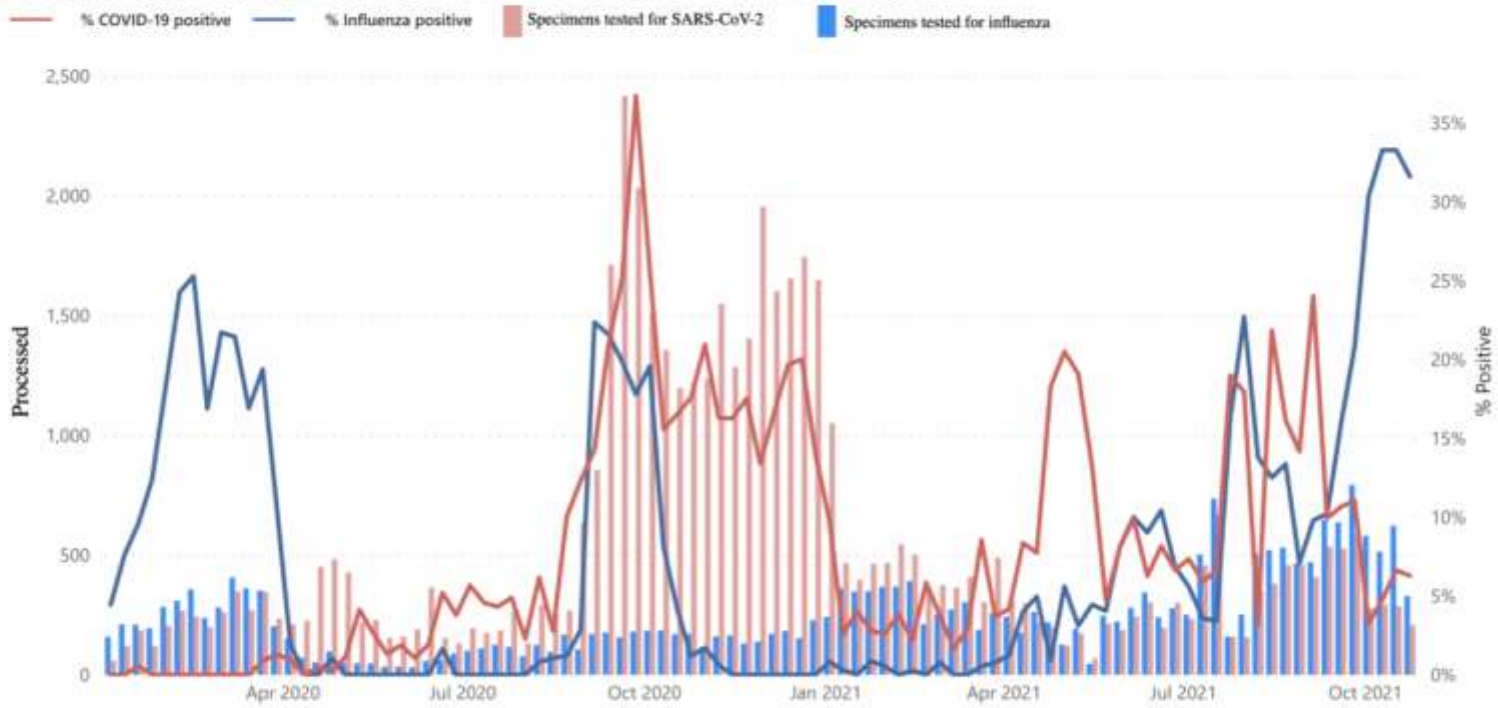
Data source: FluNet (www.who.int/toolkits/flunet). Global Influenza Surveillance and Response System (GISRS)
Data generated on 5/11/2021

World Health Organization

Influenza surveillance, SE Asia data, Nov 2021

double surveillance both influenza & SARS-CoV-2

Influenza and SARS-CoV-2 virus detections from sentinel surveillance reported to FluNet from countries, areas and territories in the WHO South-East Asia Region

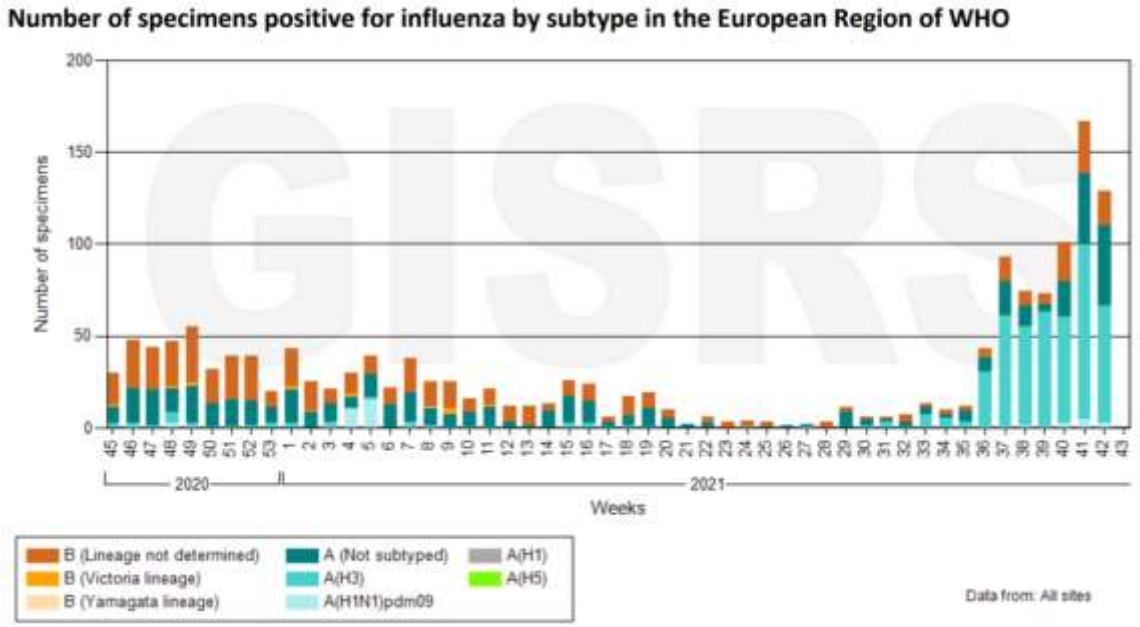


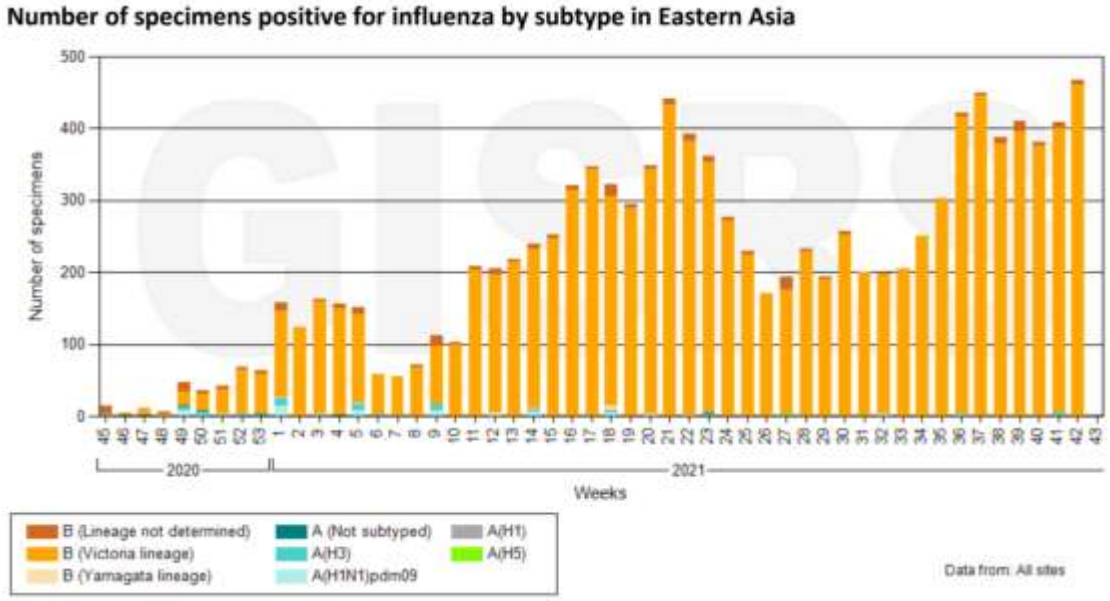
Data source: FluNet (www.who.int/toolkits/flunet). Global Influenza Surveillance and Response System (GISRS)
Data generated on 5/11/2021

World Health Organization

Influenza lab surveillance Nov 2021

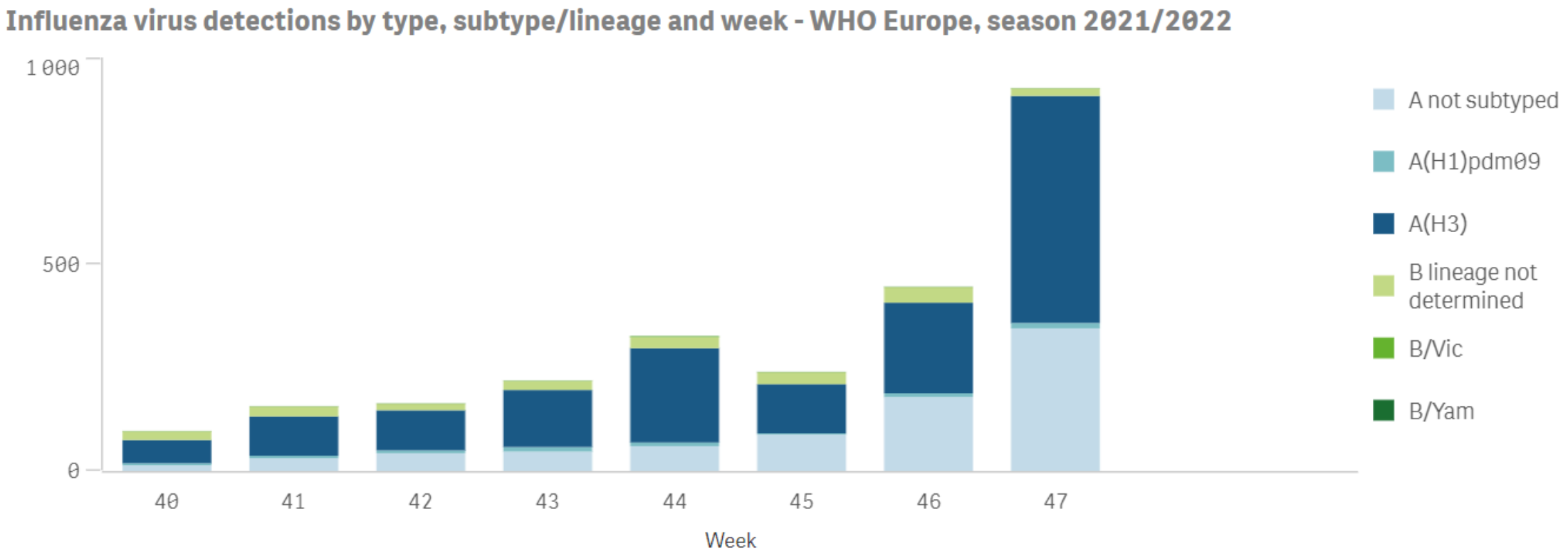
note difference between continents





Influenza 2021-22, EU/EEA, wk 47 2021

type A 98% (AH3N2: 61%, A(H1N1)pdm09: 1%, untyped: 38%), B 2%

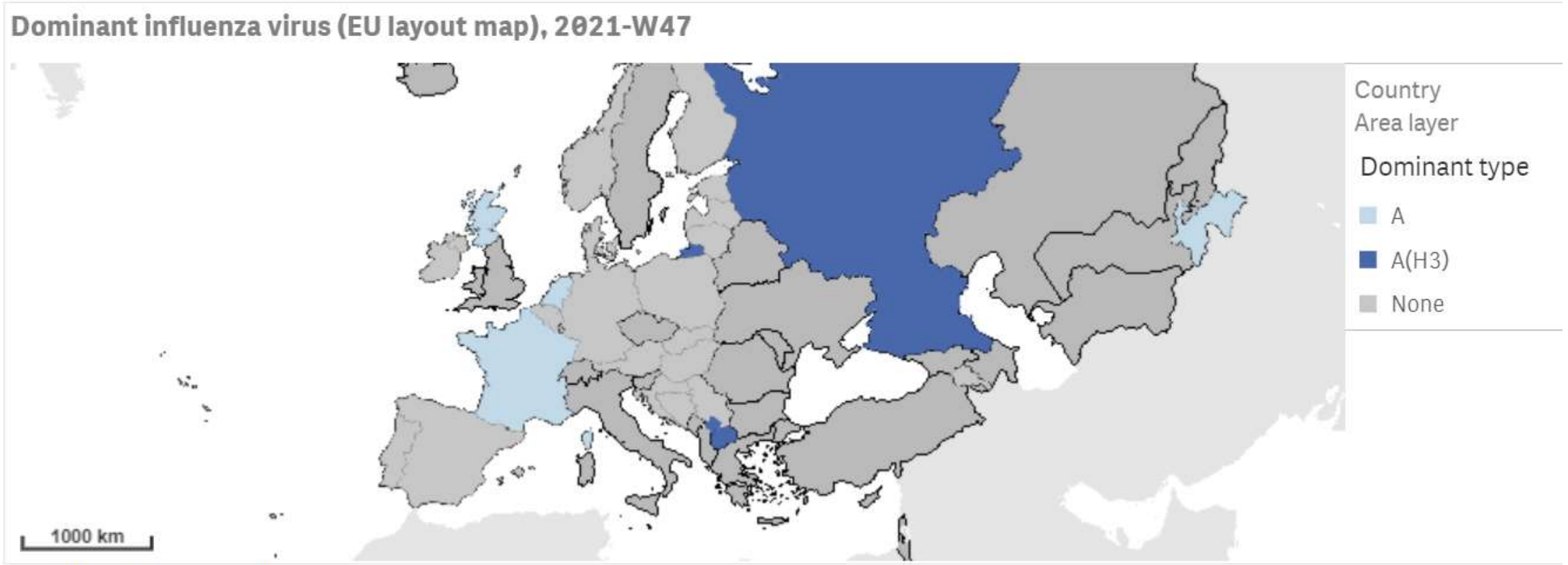


Sentinel data

Flu News Europe
Joint ECDC - WHO/Europe weekly influenza update

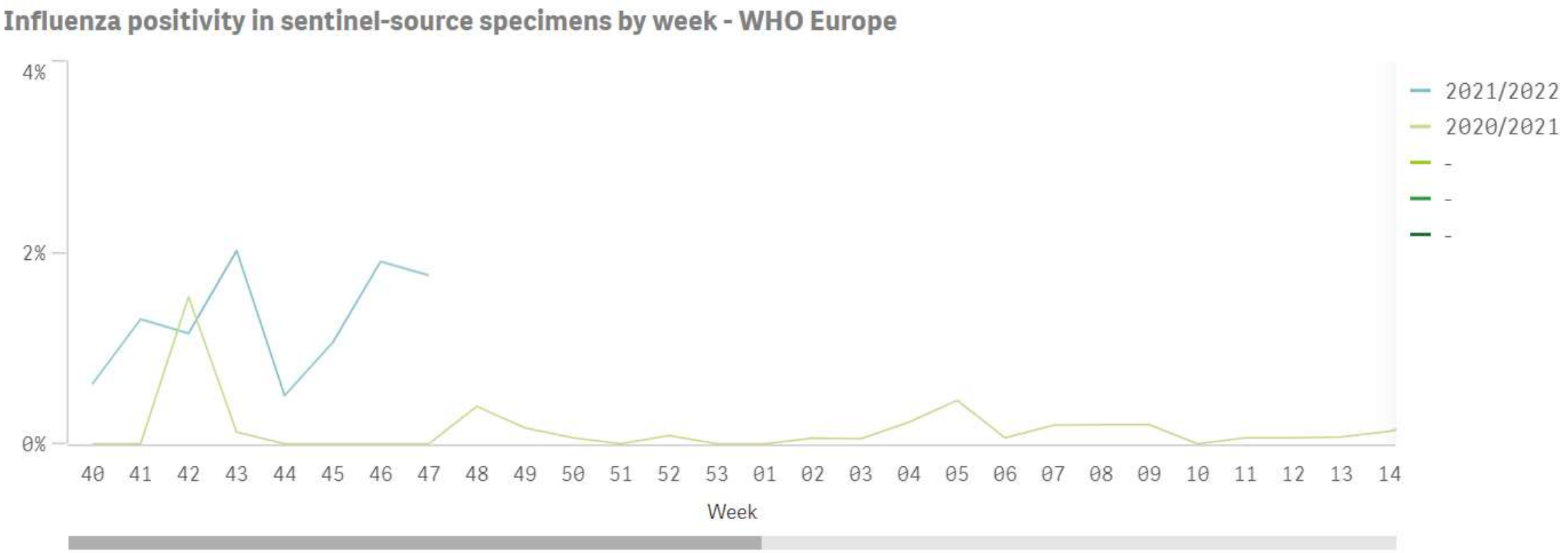
Influenza 2021-22, EU/EEA, wk 47 2021

dominant virus



Influenza 2021-22, EU/EEA, wk 47 2021

positivity rate < 10%, threshold for epidemic



Sentinel data

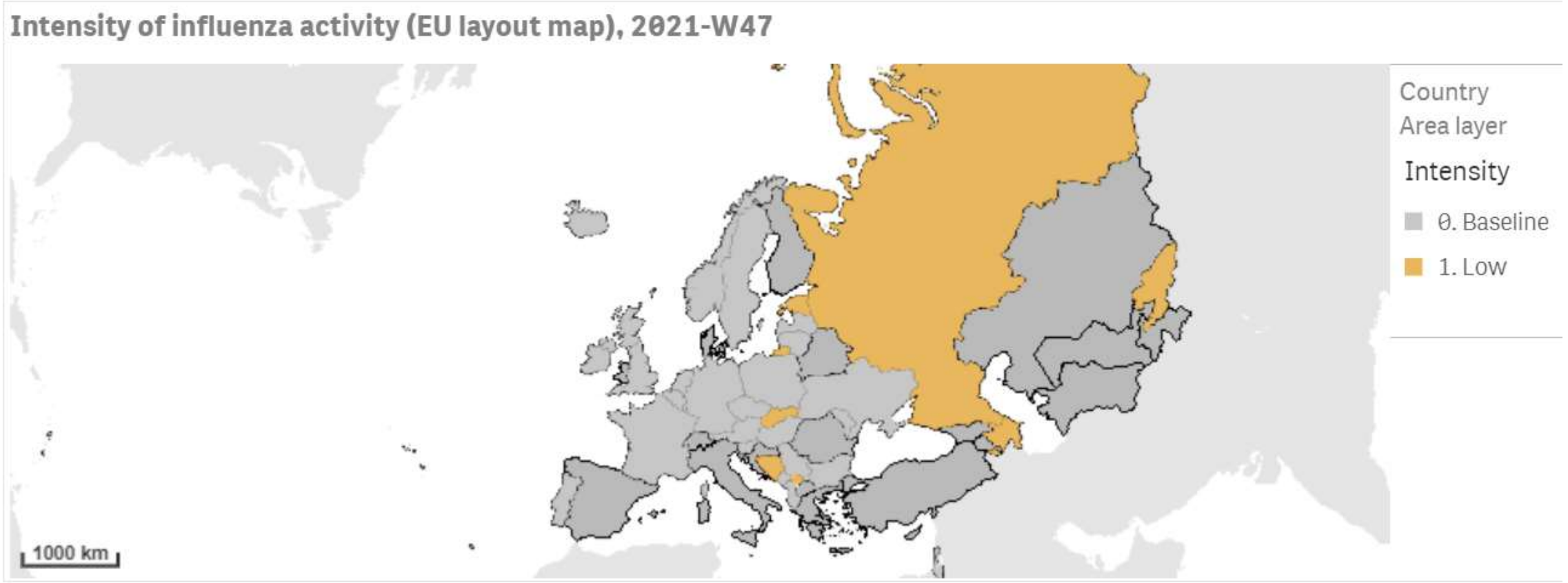
Flu News Europe
Joint ECDC - WHO/Europe weekly influenza update

ecdc

World Health Organization
Europe

Influenza 2021-22, EU/EEA, wk 47 2021

intensity -> low at the moment



Flu News Europe
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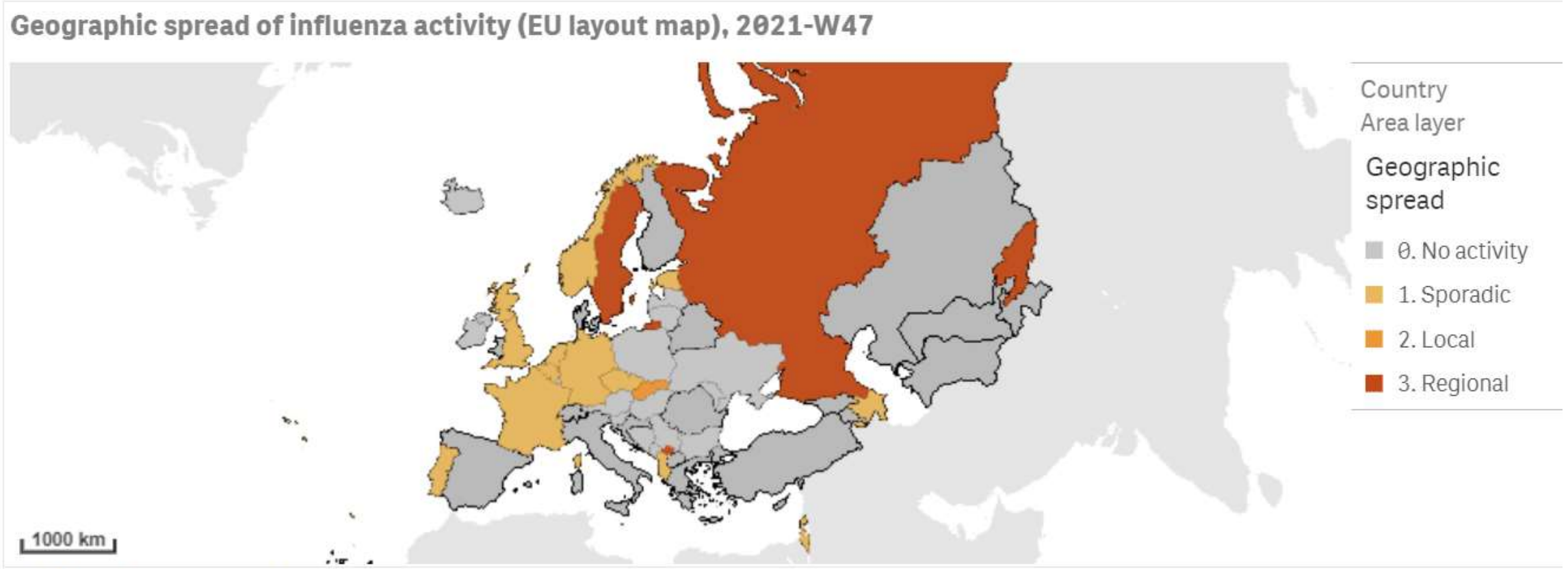
ecdc

World Health Organization Europe

Influenza 2021-22, EU/EEA, wk 47 2021

geographic spread

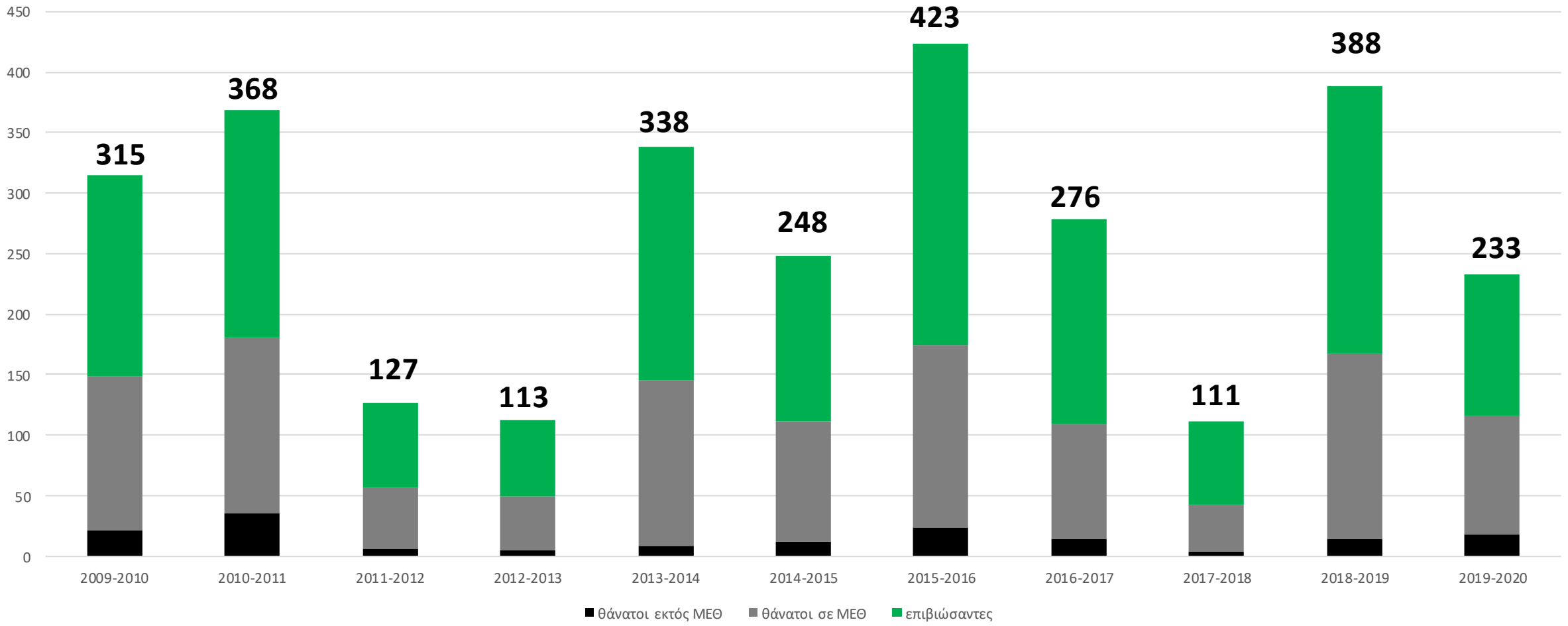


Όποιο στέλεχος γρίπης κι αν κυριαρχεί, οι επιδημίες γρίπης συνδέονται με αυξημένη νοσηρότητα!!!

Το στέλεχος A H1N1pdm09 & συσχέτιση με σοβαρή νόσο, μικρότερες ηλικίες & θανατηφόρα έκβαση!!!

Ν σοβαρών Ελλάδα, 2009-2020

77% high risk, εμβολιασμένοι 15% έως 2019 (37% 2019-2020)



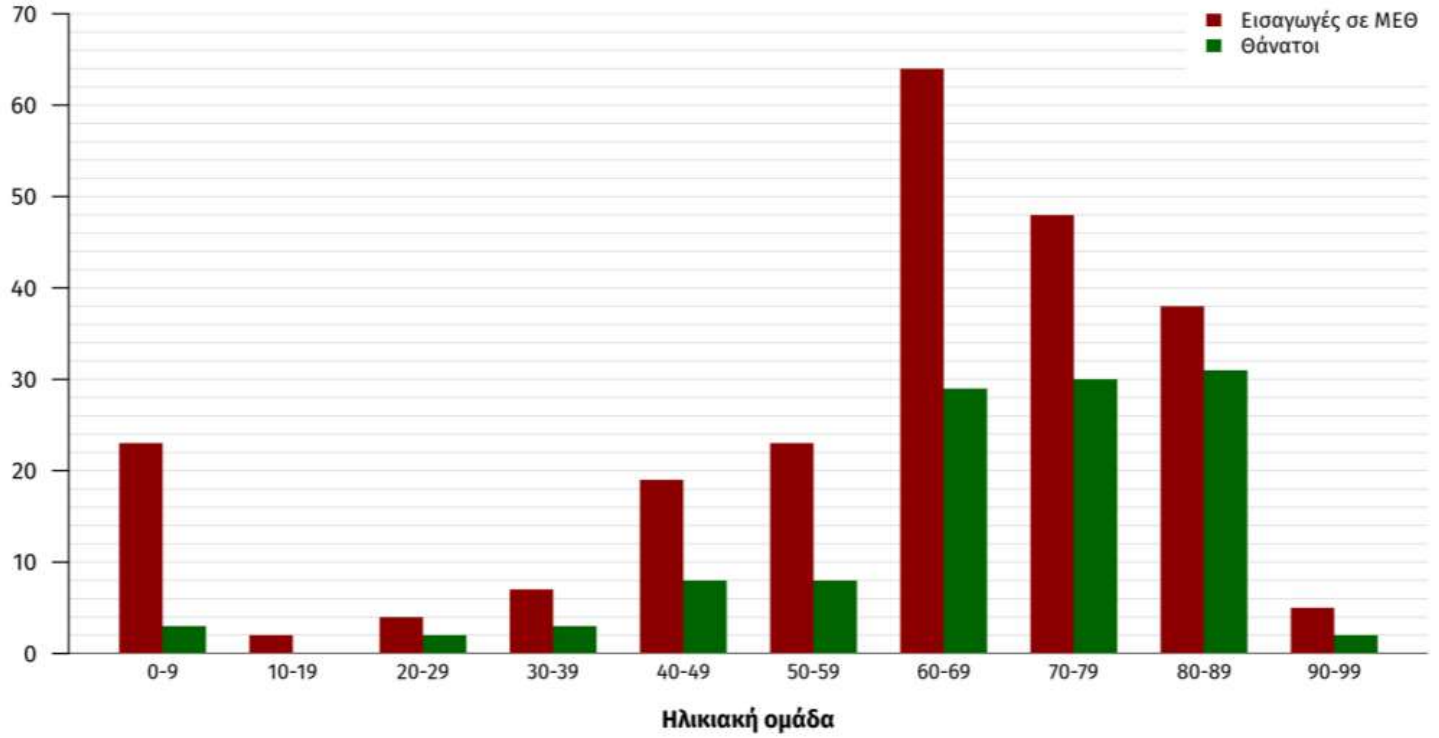
Πλειοψηφία=ήπια νόσος !!!

- **Η πλειοψηφία** όσων ασθενούν με γρίπη
  - **νοσούν για 3 έως 7 ημέρες** και
- **η υγεία τους αποκαθίσταται πλήρως**

Γρίπη – Ελλάδα, 2019-20

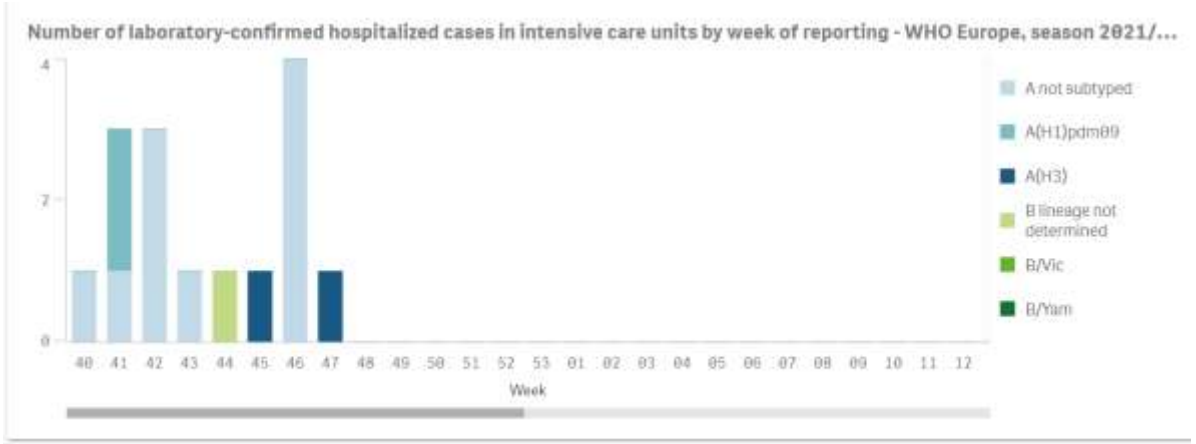
Influenza A dominant season, age effect

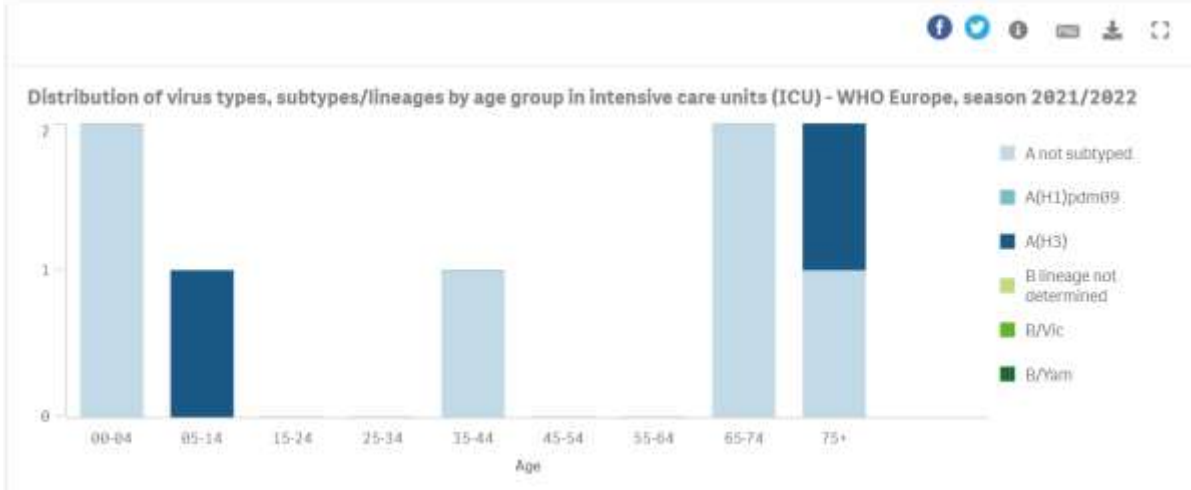
Διάγραμμα 6: Ηλικιακή κατανομή εισαχθέντων σε Μ.Ε.Θ. με εργαστηριακά επιβεβαιωμένη γρίπη και ασθενών που κατέληξαν σε Μ.Ε.Θ ή εκτός Μ.Ε.Θ. Σύνολο Ελλάδας, από εβδομάδα 40/2019 έως εβδομάδα 20/2020 (11–17 Μαϊου 2020).



Γρίπη – Ευρώπη, 2021-21

Influenza A dominant season, age effect





Flu News Europe
Joint ECDC - WHO/Europe weekly influenza update

ecdc

World Health Organization
Europe

ΑΤΟΜΑ ↑↑ ΚΙΝΔΥΝΟΥ
επιδείνωση χρονίων νόσων

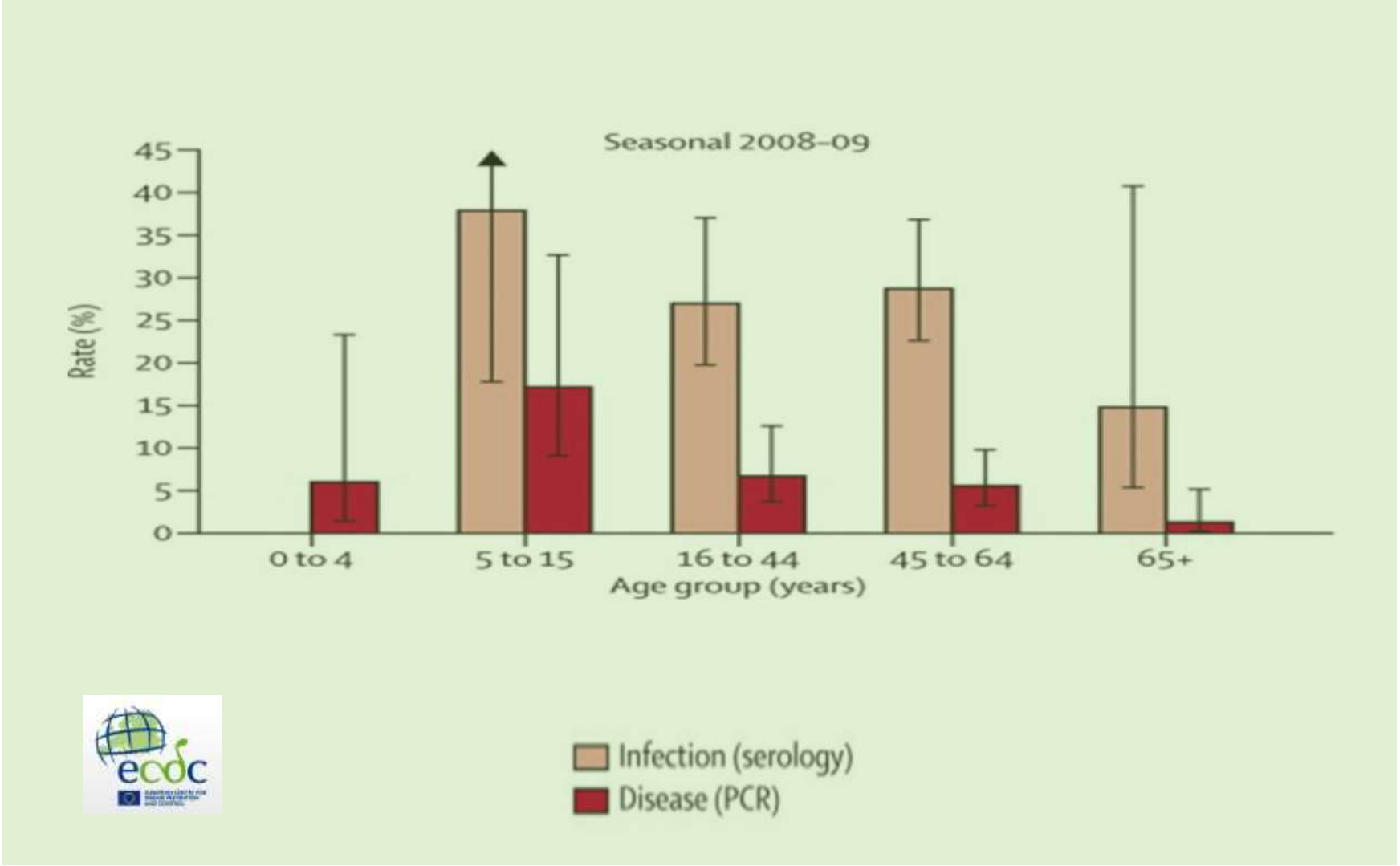
- **οι θάνατοι αφορούν κυρίως άτομα με υποκείμενα νοσήματα**
- **ΕΜΒΟΛΙΑΣΜΟΣ = SOS**
  - Άσθμα κι άλλες αναπνευστικές ασθένειες, καρδιαγγειακά νοσήματα
  - Διαβήτη, νοσήματα του ήπατος
  - Νεφροπάθειες, νευρολογικά νοσήματα
  - Καρκινοπαθείς και άλλοι ασθενείς σε ανοσοκαταστολή
  - **Έγκυες & παχύσαρκοι**

Η γρίπη ΕΙΝΑΙ ΥΠΟΥΛΗ ΝΟΣΟΣ & ΜΠΟΡΕΙ

ΝΑ ΜΕΤΑΔΟΘΕΙ & ΑΠΌ

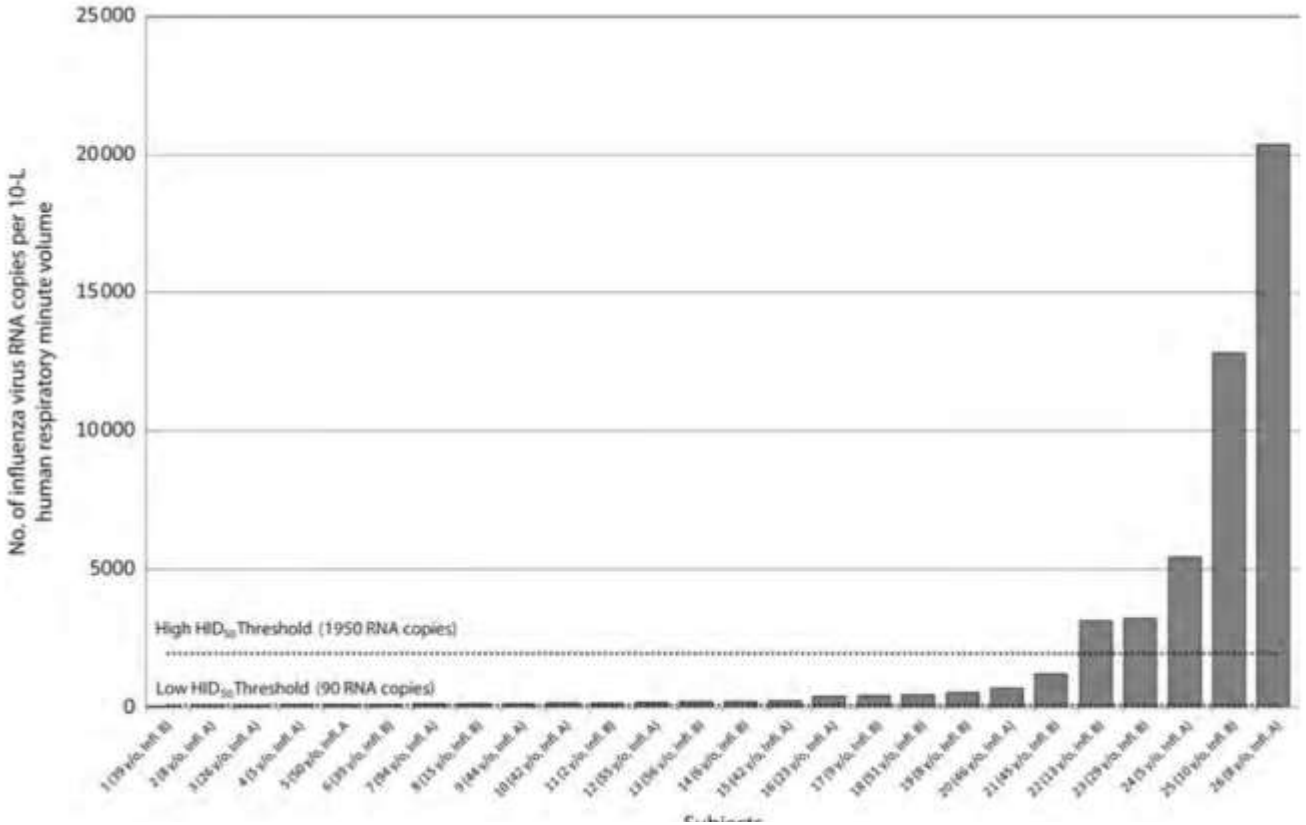
ΑΣΥΜΠΤΩΜΑΤΙΚΟΥΣ

ΑΛΗΘΕΙΑ !!!



Hayward et al Lancet Resp Dis 2014

Super emitters !!!



InfluenzaVirus: Here, There, Especially Air?

Caroline Breese Hall

Departments of Pediatrics and Medicine, University of Rochester School of Medicine and Dentistry, New York

ΔΙΑΓΝΩΣΗ

- **Στο peak – κλινικά**
  - **Πολύ δύσκολο πλέον με COVID-19**

- Εκτός peak
  - Rapid tests (Διπλός έλεγχος & για SARS-CoV-2)
  - **Molecular PCR tests**
  - **Multiplex tests**

- Gold standard = καλλιέργεια

Double tests, hit the news!

GlobeNewswire

COVID-19 NEWS SERVICES CONTACT US FRANÇAIS

Roche

Roche to launch SARS-CoV-2 & Flu A/B Rapid Antigen Test in countries accepting the CE Mark to enable rapid differentiation of viral respiratory infections

December 06, 2021 01:00 ET | Source: F. Hoffmann-La Roche Ltd

BD SARS-CoV-2/Flu for BD MAX™ System

An automated, multiplexed, real-time RT-PCR test intended for simultaneous qualitative detection and differentiation of nucleic acid from SARS-CoV-2, influenza A and/or influenza B in nasopharyngeal and anterior nasal swabs collected from individuals suspected of respiratory viral infection consistent with COVID-19 by their healthcare provider.

Status™ COVID-19/Flu A&B

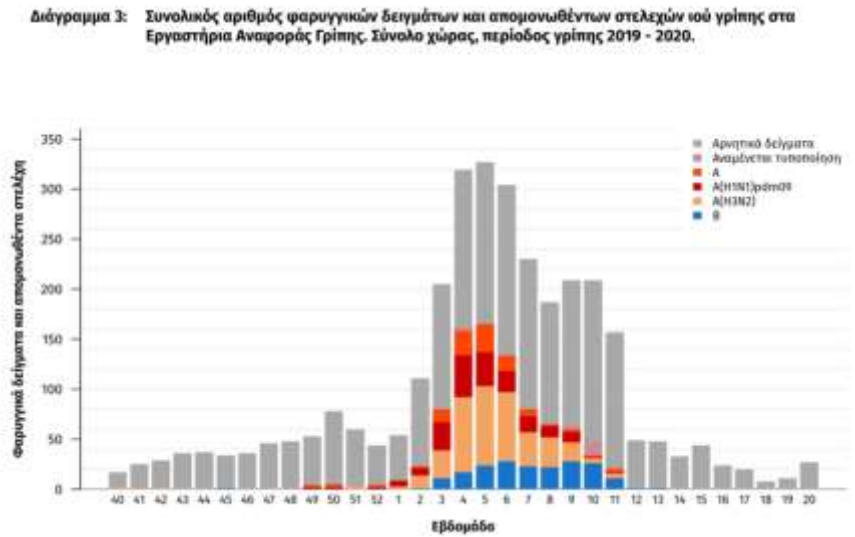
Rapid Immunoassay for Direct Detection and Differential Diagnosis of SARS-CoV-2, Influenza Type A, and Type B Antigens

For *In Vitro* Diagnostic Use Only

For Rx Use Only

Δίνουμε Αντιγριπικά & πότε;

- **Παλιά οδηγία -> Πυρετός + βήχας** σε περίοδο γρίπης = Rx σαν γρίπη σε **high risk groups – πλέον έλεγχος για SARS-CoV-2**



ΣΥΣΤΑΣΕΙΣ ΓΙΑ Rx

Ήπια γρίπη χωρίς επιπλοκές (ενήλικες και παιδιά)

Rx σε αυξημένου κινδύνου για την εμφάνιση επιπλοκών

Γρίπη με επιπλοκές ή προοδευτική επιδείνωση

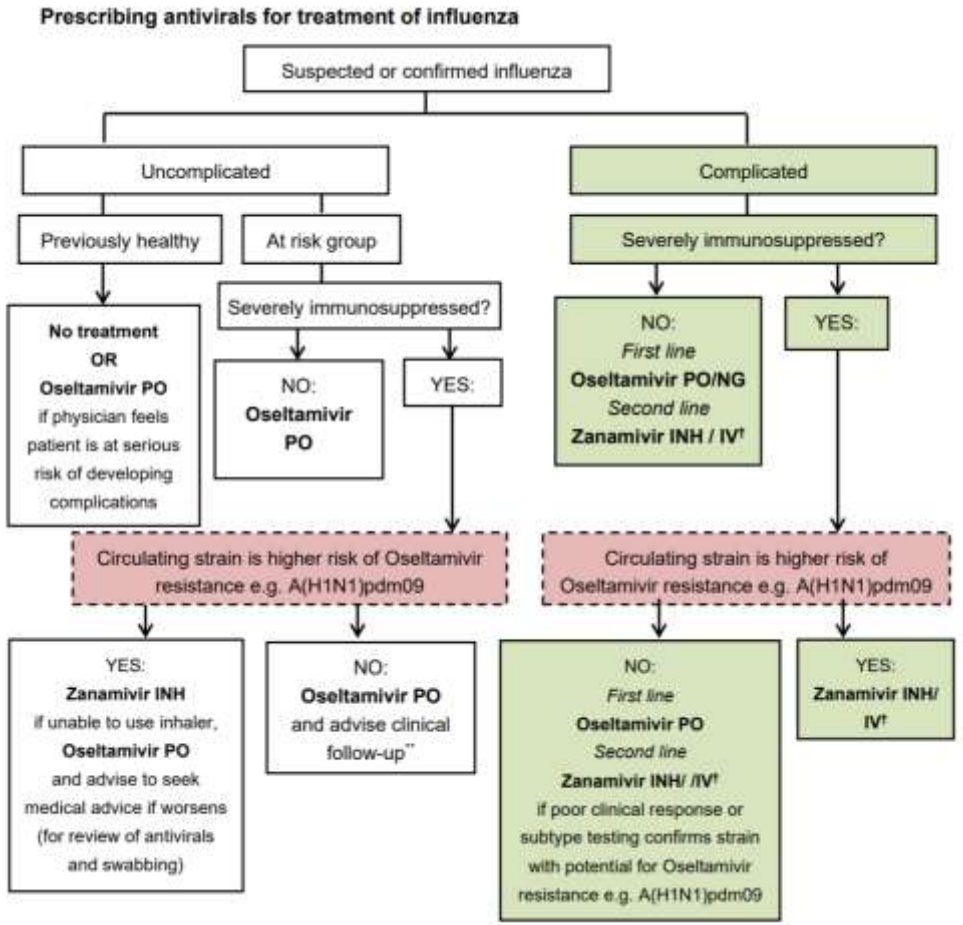
Rx σε όλους

Complicated Influenza

UK Health Security Agency

Guidance on use of antiviral agents for the treatment and prophylaxis of seasonal influenza

Version 11, November 2021



ΕΜΒΟΛΙΟ ΓΡΙΠΗΣ

προσοχή ευπαθείς ομάδες!!!

- **Πότε;** Κάθε χρόνο

- **Ποιοι;** Όλοι οι ενήλικες ασθενείς > 60 ετών

  Όλοι με υποκείμενες νόσους

Έγκυες, δείκτης μάζας σώματος > 40 kg/m^2

Εθνικό Πρόγραμμα Εμβολιασμών Ενηλίκων 2019

Εμβόλιο γρίπης & εμβόλιο COVID-18

ασφαλής & ανοσογονική η συγ-χορήγηση!!!

Flu News Europe
Joint ECDC–WHO/Europe weekly influenza update

ecdc EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

World Health Organization
REGIONAL OFFICE FOR Europe

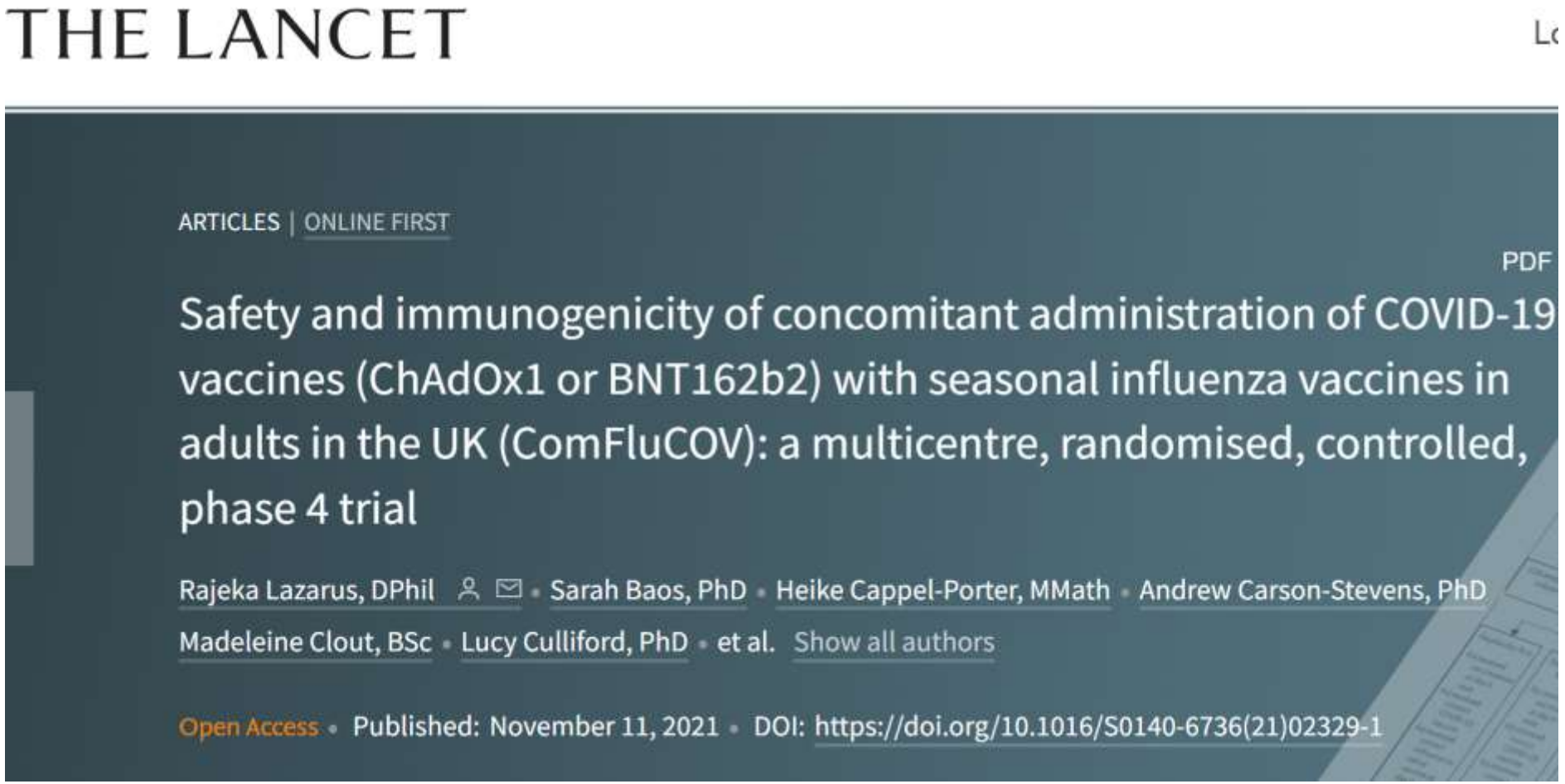
Weekly overview | Season overview | Primary care data | Hospital data | Virus characteristics | Vaccine | About us | Bulletin archives

Vaccine

Recently published results from a controlled, randomised trial in UK concluded that concomitant vaccination with one of two SARS-CoV-2 vaccines (ChAdOx1 or BNT162b2) plus an age-appropriate influenza vaccine raised no safety concerns and preserves antibody responses to both vaccines.

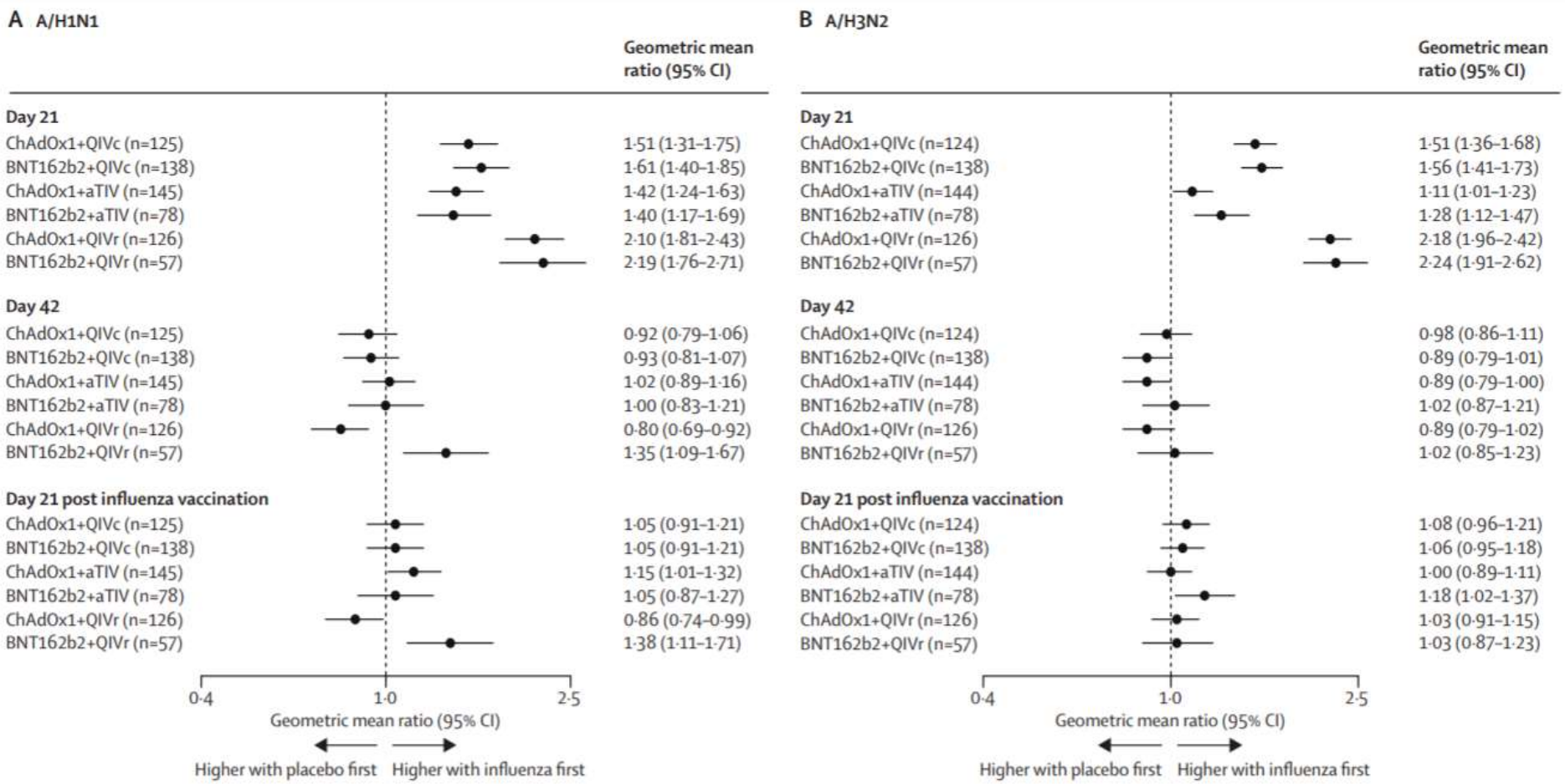
Εμβόλιο γρίπης & εμβόλιο COVID-18

ασφαλής & ανοσογονική η συγ-χορήγηση!!!



Εμβόλιο γρίπης & εμβόλιο COVID-18

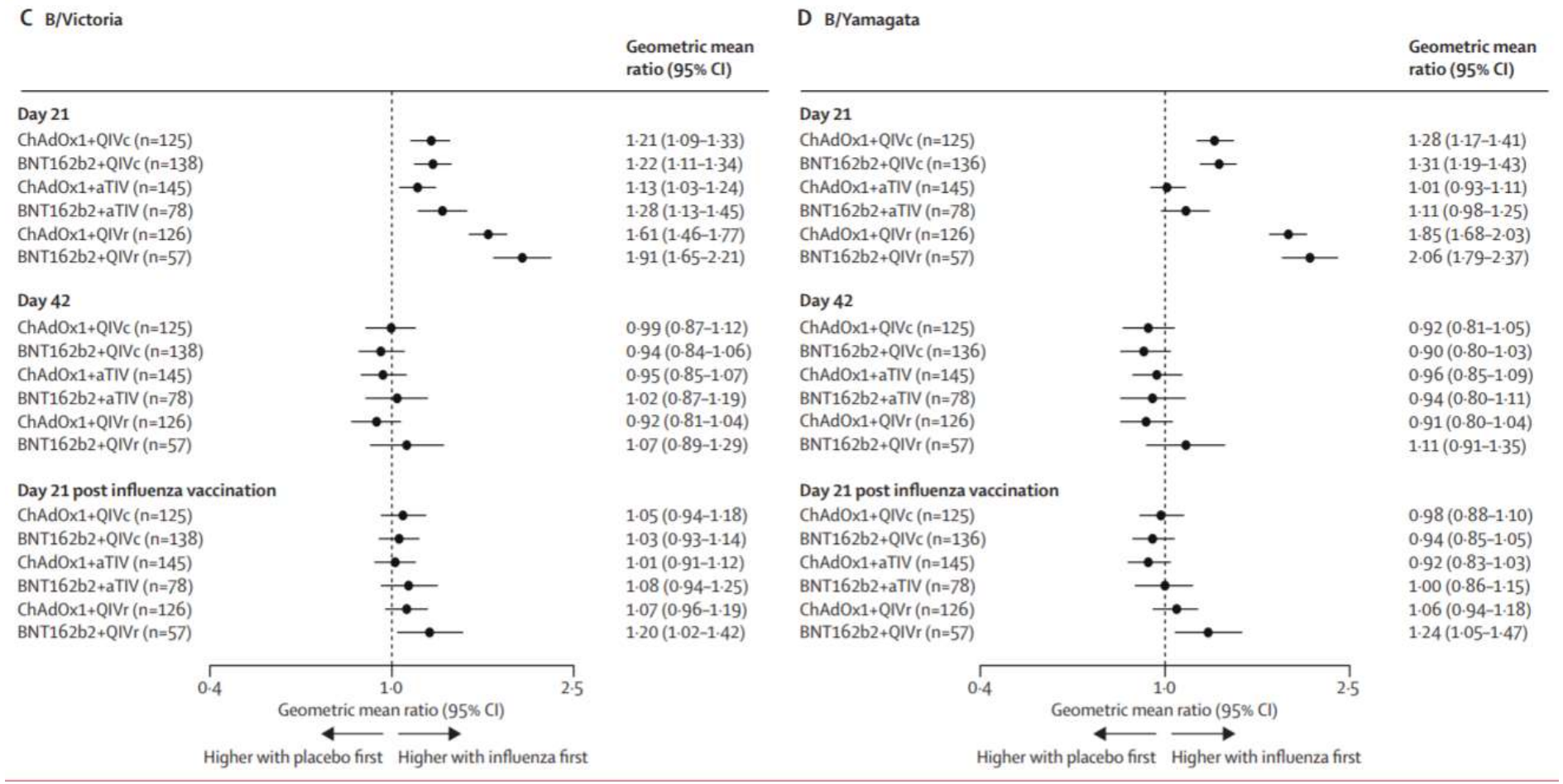
ασφαλής & ανοσογονική η συγ-χορήγηση!!!



Lazarus R et al. Lancet 2021

Εμβόλιο γρίπης & εμβόλιο COVID-18

ασφαλής & ανοσογονική η συγ-χορήγηση!!!



Lazarus R et al. Lancet 2021

Vaccination coverage EU -> insufficient pre-COVID

no country reached 75% in high risk groups!!!

Η γρίπη είναι επικίνδυνη για εγκύους ;

- **ΗΠΑ --> πιο σοβαρή νόσος σε έγκυες**
- **↑ επιπλοκών εγκυμοσύνης**
  - **Πρόωρος τοκετός**

Vaccination coverage EU -> insufficient pre-COVID

no country reached 75% in pregnancy!!!

Figure 6. Seasonal influenza vaccination coverage rates for pregnant women in nine EU/EEA Member States, influenza seasons (2015–2016; 2016–2017; 2017–2018)*

Source: National seasonal influenza vaccination survey, January 2018

**Data for UK is displayed by respective country (England, Northern Ireland, Scotland, Wales)*

Vaccination in HCWs!!!

We work when we are sick!!! 50% did in Canadian study

Healthcare Workers Often Work While Sick

Nicola M. Parry, DVM

June 21, 2019

Most healthcare workers (HCWs) with an acute respiratory illness (ARI) have worked while sick, putting their patients and coworkers at risk for infection, a recent study published online June 18 in *Infection Control & Hospital Epidemiology* has shown.

"[We] found that 50% of participants working in Canadian acute care hospitals reported 251 episodes of ARI during each influenza season, with 95% of those who reported an ARI working 1 or more days of their illness," write Lili Jiang, PhD, Sinai Health System, Toronto, Canada, and colleagues.

The investigators conducted a four-season prospective cohort study of influenza and other respiratory illnesses among HCWs across nine Canadian hospitals during the 2010–2011 to 2013–2014 influenza seasons.

Which healthcare workers work with acute respiratory illness? Evidence from Canadian acute-care hospitals during 4 influenza seasons: 2010–2011 to 2013–2014

Lili Jiang [a1], Allison McGeer [a1] [a2], Shelly McNeil [a3] [a4], Kevin Katz [a2] [a5]

DOI: https://doi.org/10.1017/ice.2019.141 Published online: 18 June 2019

Abstract

Background:
Healthcare workers (HCWs) are at risk of acquiring and transmitting respiratory viruses while working in healthcare settings.
Objectives:
To investigate the incidence of and factors associated with HCWs working during an acute respiratory illness (ARI).
Methods:
HCWs from 9 Canadian hospitals were prospectively enrolled in active surveillance for ARI during the 2010–2011 to 2013–2014 influenza seasons. Daily illness diaries during ARI episodes collected information on symptoms and work attendance.
Results:
At least 1 ARI episode was reported by 50.4% of participants each study season. Overall, 94.6% of ill individuals reported working at least 1 day while symptomatic, resulting in an estimated 1.9 days of working while symptomatic and 0.5 days of absence during an ARI per participant season. In multivariable analysis, the adjusted relative risk of working while symptomatic was higher for physicians and lower for nurses relative to other HCWs. Participants were more likely to work if symptoms were less severe and on the illness onset date compared to subsequent days. The most cited reason for working while symptomatic was that symptoms were mild and the HCW felt well enough to work (67%). Participants were more likely to state that they could not afford to stay home if they did not have paid sick leave and were younger.
Conclusions:
HCWs worked during most episodes of ARI, most often because their symptoms were mild. Further data are needed to understand how best to balance the costs and risks of absenteeism versus those associated with working while ill.

ΚΙΝΔΥΝΟΣ ΓΙΑ ΥΓΕΙΟΝΟΜΙΚΟΥΣ

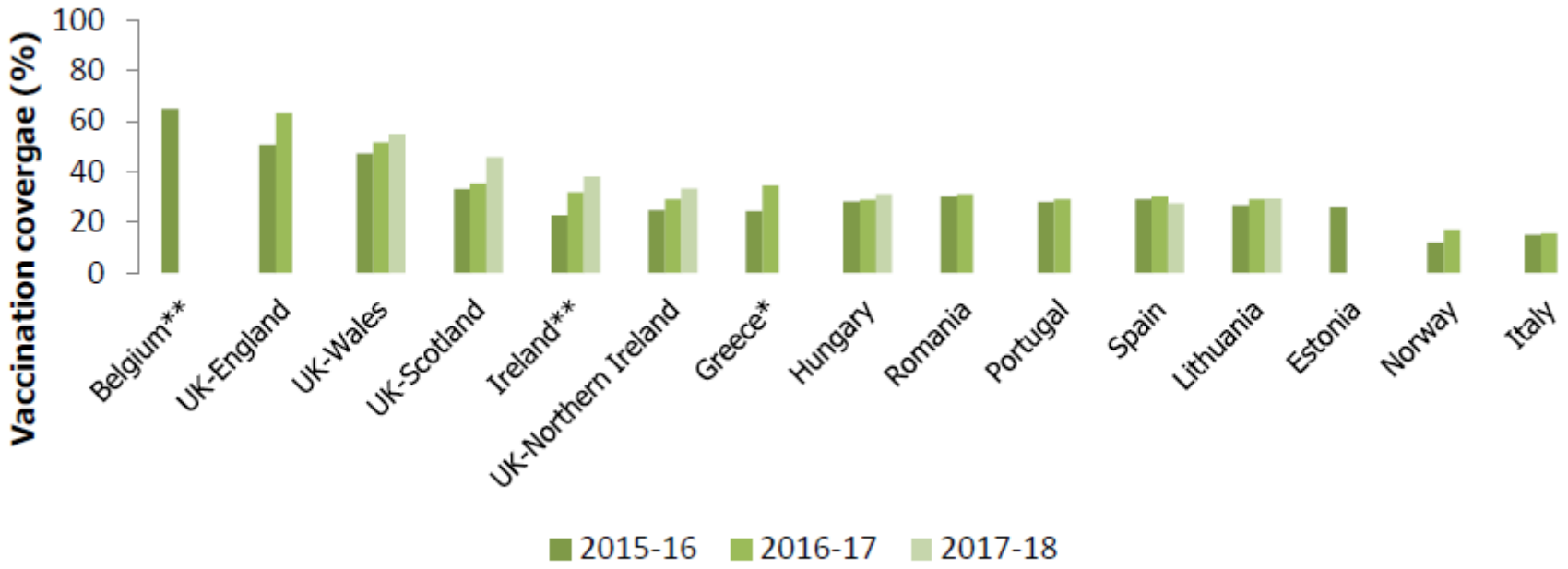
- **3,5 φορές υψηλότερος κίνδυνος** λόγω επαγγέλματος
  - **30% με ασυμπτωματική λοίμωξη**
  - παρ' όλα αυτά μεταδίδουν τον ιό
    - σε ασθενείς &
    - οικογενειακό περιβάλλον
    - 1-2 ημέρες προ έναρξης συμπτωμάτων

Kuster et al PLoS One 2011

Vaccination coverage EU -> insufficient pre-COVID-19

no country reached 75% in HCWs!!!

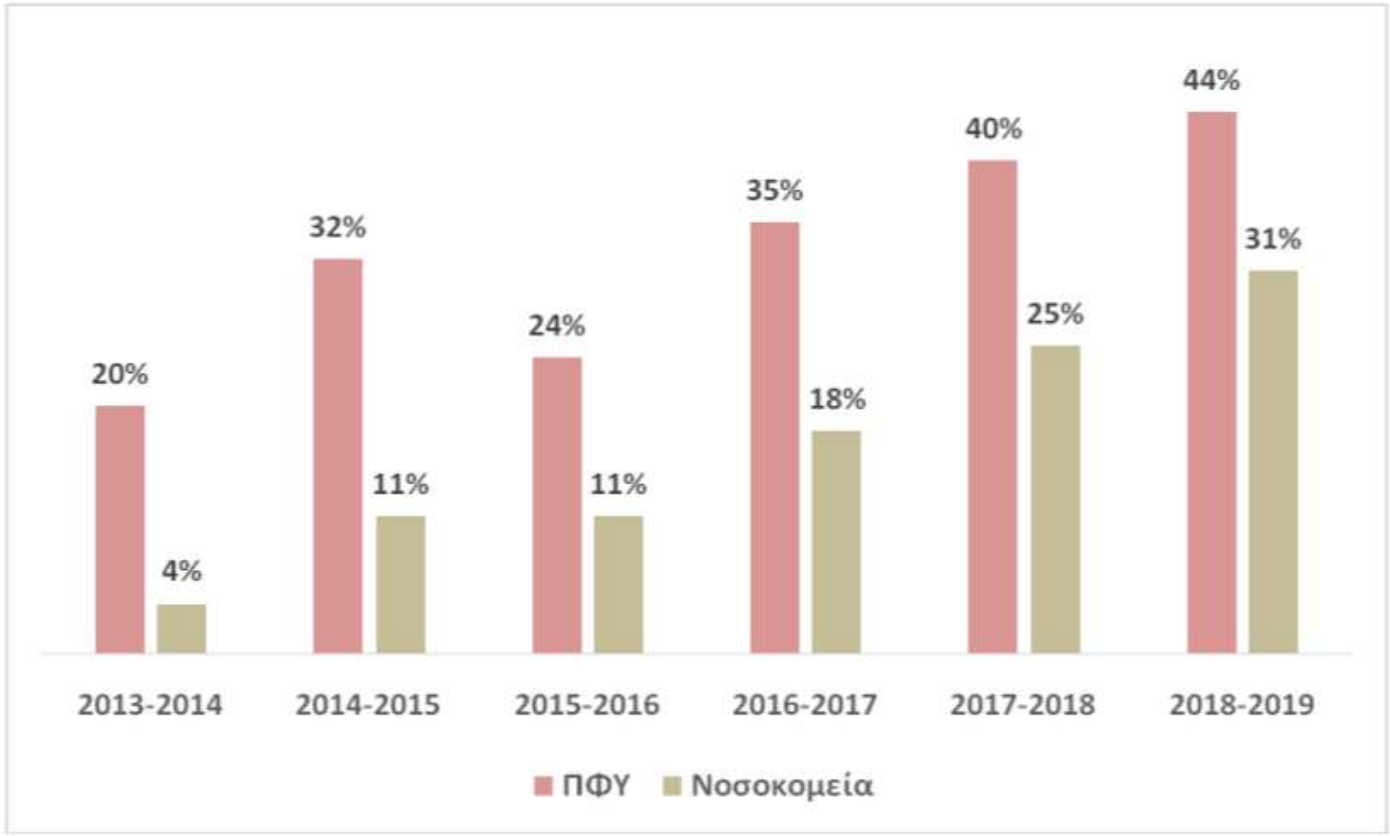
Figure 7. Seasonal influenza vaccination coverage rates among healthcare workers in 12 EU/EEA Member States, influenza seasons: 2015–2016; 2016–2017; 2017–2018



Source: National seasonal influenza vaccination survey, January 2018

Εμβολιασμός υγειονομικών Ελλάδα 2013-19, ΕΟΔΥ

Διάγραμμα 12: Ποσοστά αντιγριπικού εμβολιασμού των εργαζομένων σε χώρους παροχής υπηρεσιών υγείας (νοσοκομεία και Κέντρα Πρωτοβάθμιας Φροντίδας Υγείας), περίοδοι γρίπης 2013-2014 έως 2018-2019.



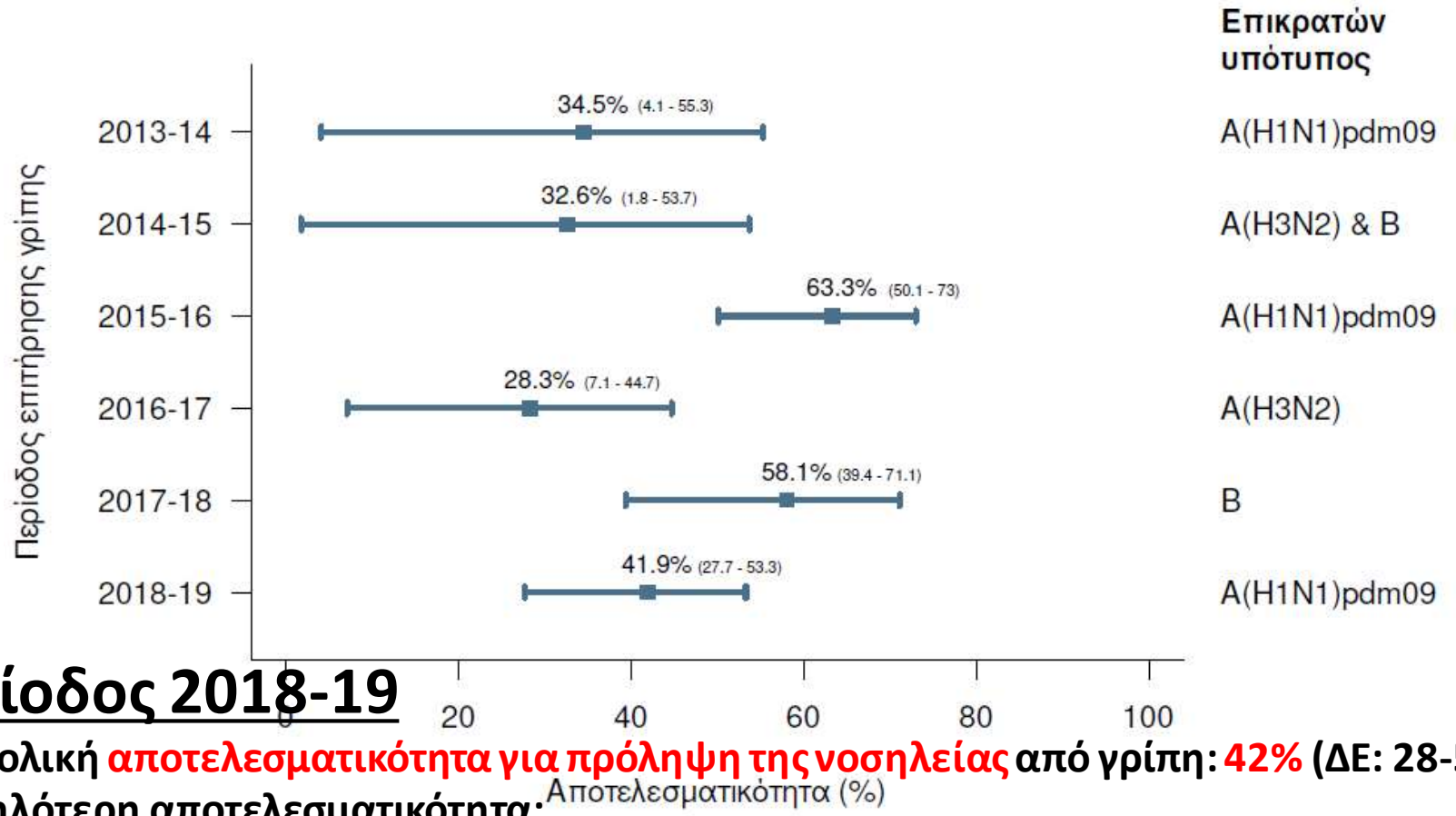
Οι ηλικιωμένοι & ανοσοκατεσταλμένοι

- **Γνωστή χαμηλή αποτελεσματικότητα εμβολίου**
- **Υψηλά % νοσηλειών ΜΕΘ**
  - **Ιδιαίτερα για AH3N2**
- **Υψηλά % θνητότητας**

Vaccination of household contacts & HCW in contact!!!

Ελλάδα 2013-19

αποτελεσματικότητα εμβολίου-εξαρτάται από τύπο γρίπης



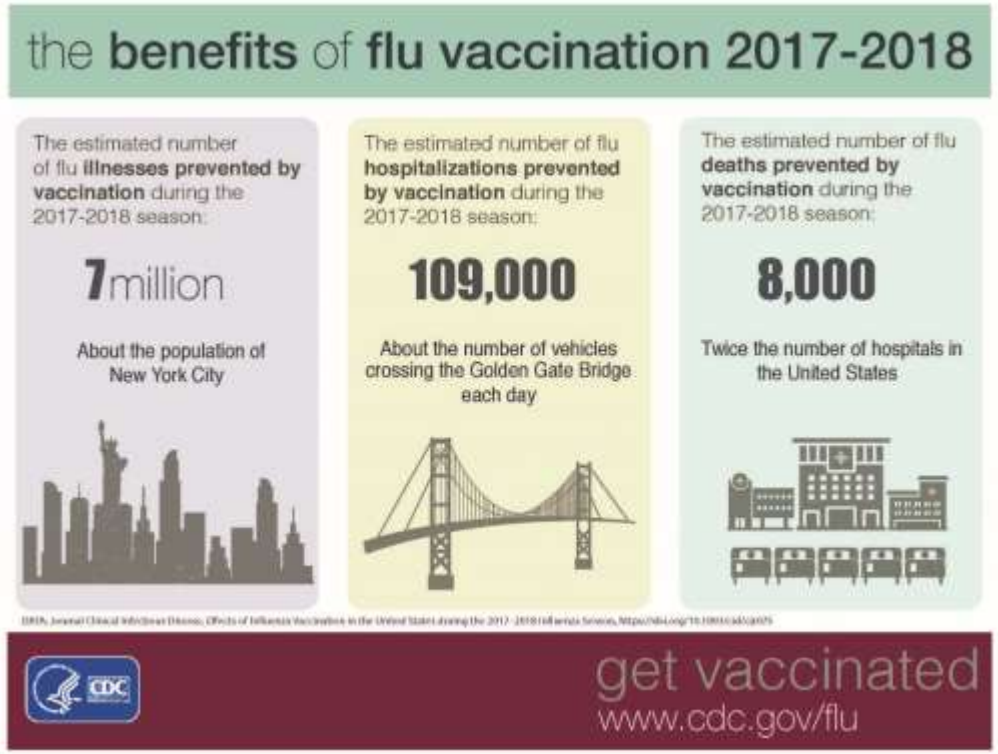
Lytras et al JMV 2016

Περίοδος 2018-19

- **Συνολική αποτελεσματικότητα για πρόληψη της νοσηλείας από γρίπη: 42% (ΔΕ: 28-53%)**
- **Υψηλότερη αποτελεσματικότητα:**
  - **Άτομα <65 ετών έναντι >65 ετών** — **55% ΔΕ: 36-68% vs 30% ΔΕ:6-48%**
  - **A(H1N1)pdm 09 έναντι υπότυπου A(H3N2)** — **45% ΔΕ: 28-57% vs 25% ΔΕ: 0-48%**

Influenza vaccine effectiveness, USA, 2017-2018

- **A(H3N2)** season, **VE 40%,** vaccine estimated to prevent
  - 7.1 million illnesses
  - 3.7 million medical visits
  - 109,000 hospitalizations
  - **8,000 deaths**



Influenza ?

Surveillance necessary together with vaccination- be ready

From Pandemic to Twindemic: What Will the 2021–2022 Flu Season Bring?

By GlobalData Healthcare | 11 Oct 2021 (Last Updated October 21st, 2021 16:00)

Across the globe, measures that aimed to curb the transmission of COVID-19, including travel restrictions, wearing masks, and other strategies have also helped to limit the spread of influenza and other infectious diseases.

Real-world data highlights flu vaccine efficacy

Flu vaccinations prevented 7.5 million illnesses and 6,300 deaths from influenza in 2019/20

HOME > INFECTIOUS DISEASES > FLU

University of Michigan Flu Outbreak Identified as Influenza A Virus—Here's What to Know

More than 500 people at the university's Ann Arbor campus have been diagnosed with the flu—and the majority did not receive the flu vaccine.

By Korin Miller November 18, 2021

November 19, 2021 | 2 min read

If you could eliminate influenza or coronaviruses, which would you choose?

Possibility of severe upcoming season for elderly

European Centre for Disease Prevention and Control
An agency of the European Union

All sections | Enter your keyword(s)

All topics: A to Z | Newsroom | Publications & data | Tools | About us

Home > Newsroom > Early influenza cases indicate the possibility of severe upcoming season for elderly

< Newsroom

Early influenza cases indicate the possibility of severe upcoming season for elderly

Press release
26 Oct 2021

Although the overall number of influenza detections in the majority of EU/EEA countries is still low, indications show that influenza circulation is above the seasonal threshold in Croatia, which is unusually early. The main reported subtype among the cases recorded in EU/EEA during the past month is A(H3N2), which disproportionally affects older people, and is associated with lower vaccine effectiveness. This is a sign that the upcoming influenza season could be severe for elderly people, and that influenza patterns may vary between countries in terms of timing.

ΑΛΛΕΣ ΓΡΙΠΕΣ!!!

κάποια παραδείγματα

- **ΠΟΥΛΕΡΙΚΑ**
  - Α H5N1 ΝΙΓΗΡΙΑ, ΓΑΛΙΑ 2016
  - Α H5N2, Α H5N3, Α H5N6, ΑH5N8, ΑH5N9
- **ΑΝΘΡΩΠΟΙ**
  - Α H5N1, ΑΙΓΥΠΤΟΣ 2015
  - Α H7N9, ΚΙΝΑ
  - Α H5N6, ΚΙΝΑ
  - Α H3N2v, ΗΠΑ 2015-16
  - Α H9N2, ΜΠΑΓΚΛΑΝΤΕΣ 2015
  - Α H7N3, Α H10N8, ΑH6N1

Zoonotic or variant influenza

- **influenza viruses that are routinely circulating in animals**
  - avian influenza virus subtypes A(H5N1) & A(H9N2)
  - swine influenza virus subtypes A(H1N1) & (H3N2)

- **Occasional human infection**
  - They get a “v” after the name

Avian influenza

LPAI & HPAI

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

SEARCH

CDC A-Z INDEX

Influenza (Flu)

Avian Influenza

- Bird Flu Basics +
- Current Situation
- Specific Avian Flu Viruses +
- Past Outbreaks +
- Health Care & Laboratorian Guidance +
- What CDC Does +
- Avian Influenza Related Links

Get Email Updates

To receive weekly email updates about Seasonal Flu, enter your email address:

Information on Avian Influenza

Avian influenza refers to the disease caused by infection with avian (bird) influenza (flu) Type A viruses. These viruses occur naturally among wild aquatic birds worldwide and can infect domestic poultry and other bird and animal species. Avian flu viruses do not normally infect humans. However, sporadic human infections with avian flu viruses have occurred. The links below offer more information about avian influenza.

Bird Flu Basics

- Avian Influenza Type A Viruses
- Bird Flu in Birds
- Bird Flu in People
- Prevention and Treatment

Bird Flu Updates

- Current Situation
- Specific Avian Flu Viruses
- Past Outbreaks

More >

Health Care & Laboratorian Guidance

- Case Definitions
- Testing, Reporting & Lab Information
- Infection Control

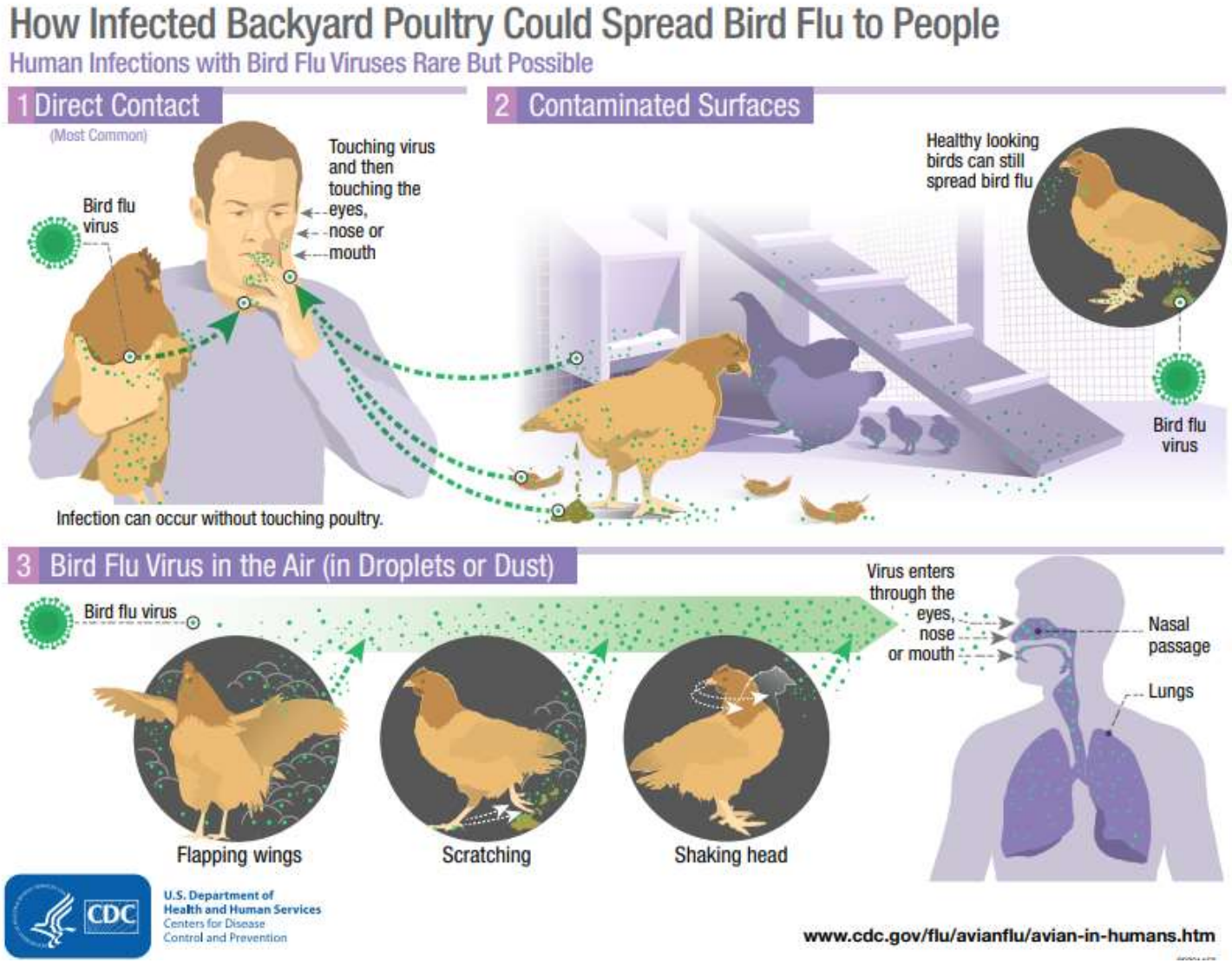
Avian influenza, 2021

Avian influenza is a notifiable disease listed by the OIE. As detailed by the OIE *Terrestrial Animal Health Code*, Members must report:

- all highly pathogenic avian influenza viruses, irrespective of their strain, detected in birds (domestic and wild)
- all low pathogenic viruses of subtypes H5 and H7 detected in poultry.

Unusual mortality among wild birds should also be reported to the OIE through its World Animal Health Information System (WAHIS).

Avian influenza



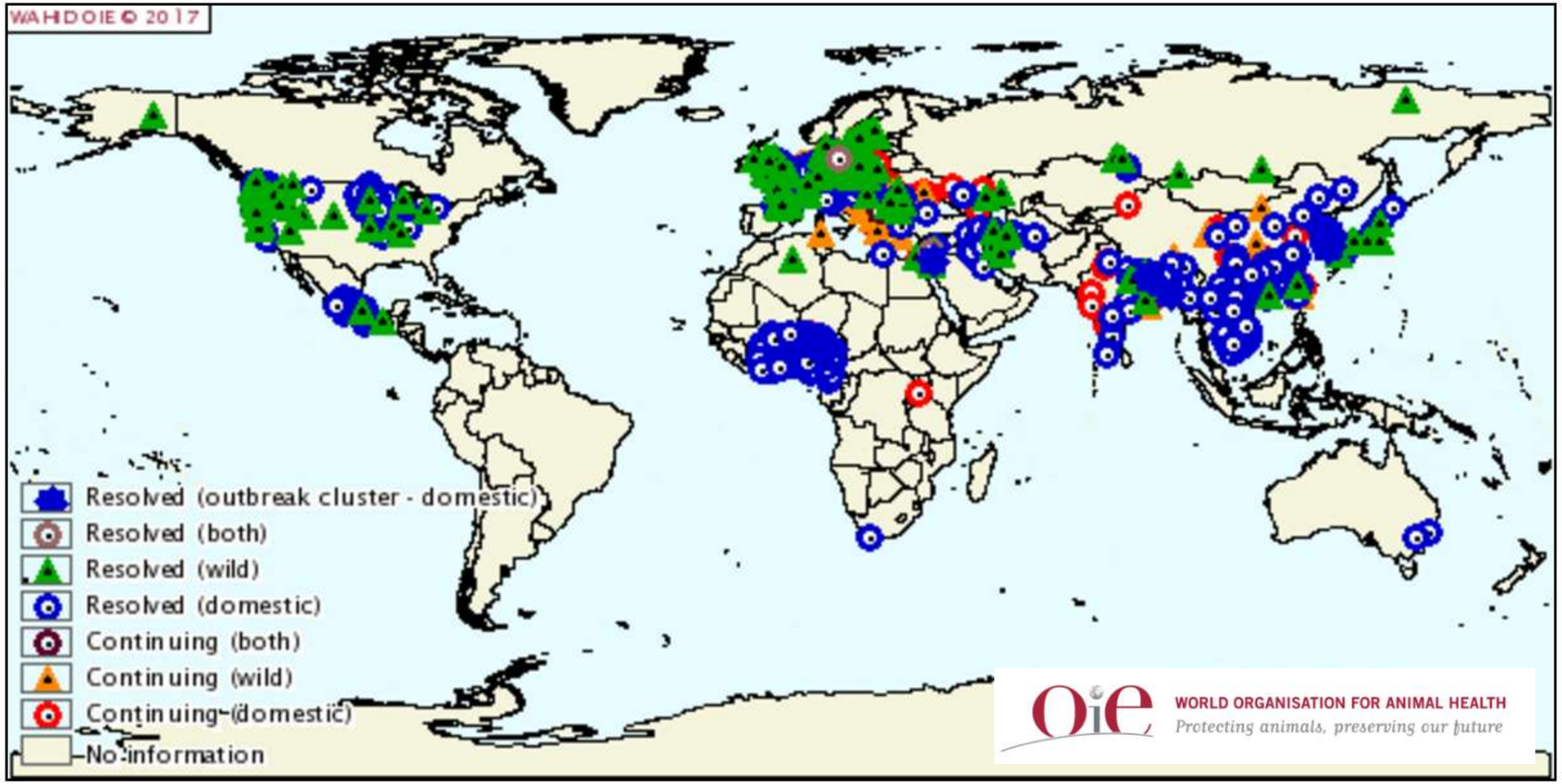
Avian influenza
birds & humans

High pathogenicity avian influenza (HPAI) is caused by influenza A viruses in the family Orthomyxoviridae. Since its identification in China (People's Rep. of) in 1996, there have been four waves of intercontinental transmission of the H5Nx Gs/GD lineage virus:

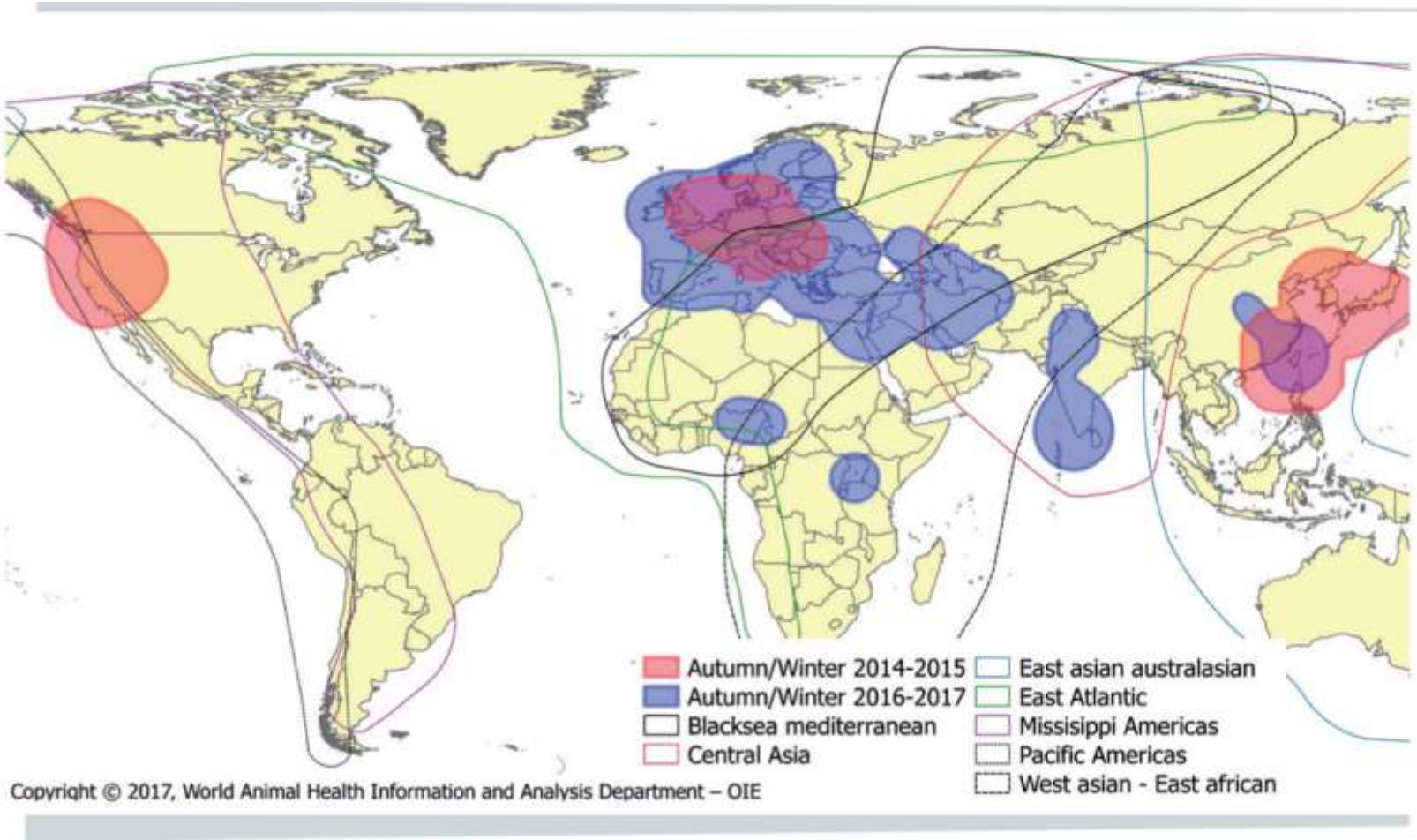
- 1) in 2005-2006, H5N1 clade 2.2 virus involving Africa, Asia and Europe;
- 2) in 2009-2010, clade 2.3.2.1c virus affecting Asia and Europe;
- 3) in 2014-2015, at the same time clade 2.3.4.4a H5N8 virus as well as clade 2.3.2.1c H5N1 virus involving Africa, Asia, and Europe ; and
- 4) in 2016-2017, 2.3.4.4b H5Nx clade also involving Africa, Asia, and Europe[1,2].

HPAI has resulted in the death and mass slaughter of more than 246 million poultry worldwide between 2005 and 2020, with peaks in 2006 and 2016. During these two particular years, about a quarter of the world's countries were affected with HPAI[3]. In addition, up to now, humans have occasionally been infected with subtypes H5N1 (around 850 cases reported, of which half died), H7N9 (around 1,500 cases reported), H5N6 (around 50 cases reported, of which half died) and sporadic cases have been reported with subtypes H7N7 and H9N2[4,5,6,7,8].

ΓΡΙΠΕΣ ΠΤΗΝΩΝ, HPAI 2013-17!!!



Spread of AH5N8 in 2014-17



Avian influenza, 2021

Seasonal trend

Using data reported to the OIE between 2005 and 2019 by 76 affected countries and territories for 18,620 outbreaks in poultry, we used a Seasonal and Trend decomposition using Loess (STL) analysis to determine the seasonal pattern of the disease (detailed methodology presented in Awada et al., 2018[3]). Based on the data reported to the OIE, spread is lowest in September, begins to rise in October, and peaks in February. Figure 1 shows the global seasonal pattern of HPAI in poultry and the red rectangle indicates where we currently are in the cycle based on the period covered in "recent updates" below.

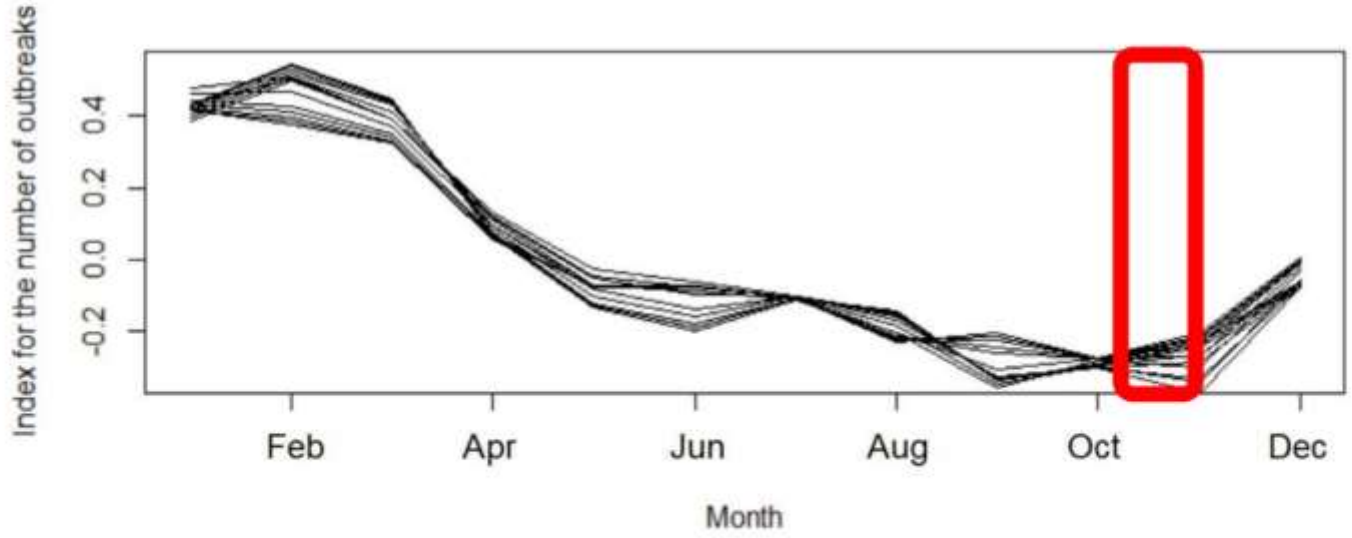


Figure 1. Seasonal trend in global HPAI incidence in poultry

Avian influenza, 2021

poultry

During the period covered by this report, a total of 8 new outbreaks in poultry were reported by 5 countries (Estonia, Germany, Israel, Italy, and Russia). Details are presented in Figures 2 and 3.

New events by world region (reported through immediate notifications)

Europe

Subtype H5

In Russia, a recurrence started in Rostov on 7 October 2021 and the first occurrence of HPAI started in Belgorod on 11 October 2021.

A recurrence started in Ukraine (Mykolayiv) on 11 October 2021.

Subtype H5N1

In Germany, a recurrence started in Niedersachsen on 13 October 2021, in Schleswig-Holstein on 14 October 2021, in Bayern on 20 October 2021 and in Mecklenburg-Vorpommern on 20 October 2021.

A recurrence started in Denmark (Syddanmark) on 13 October 2021.

Subtype H5N8

A recurrence started in Sweden (Östergötland) on 13 October 2021.

Africa, Americas, Asia, and Oceania

No new events reported

On-going events for which there were new reported outbreaks, by world region

Europe

Subtype H5

Russia

Subtype H5N1

Estonia, Finland, Russia

Subtype H5N8

Serbia

Africa, Asia, Americas, and Oceania

No new outbreaks reported in the on-going events, or no on-going events.

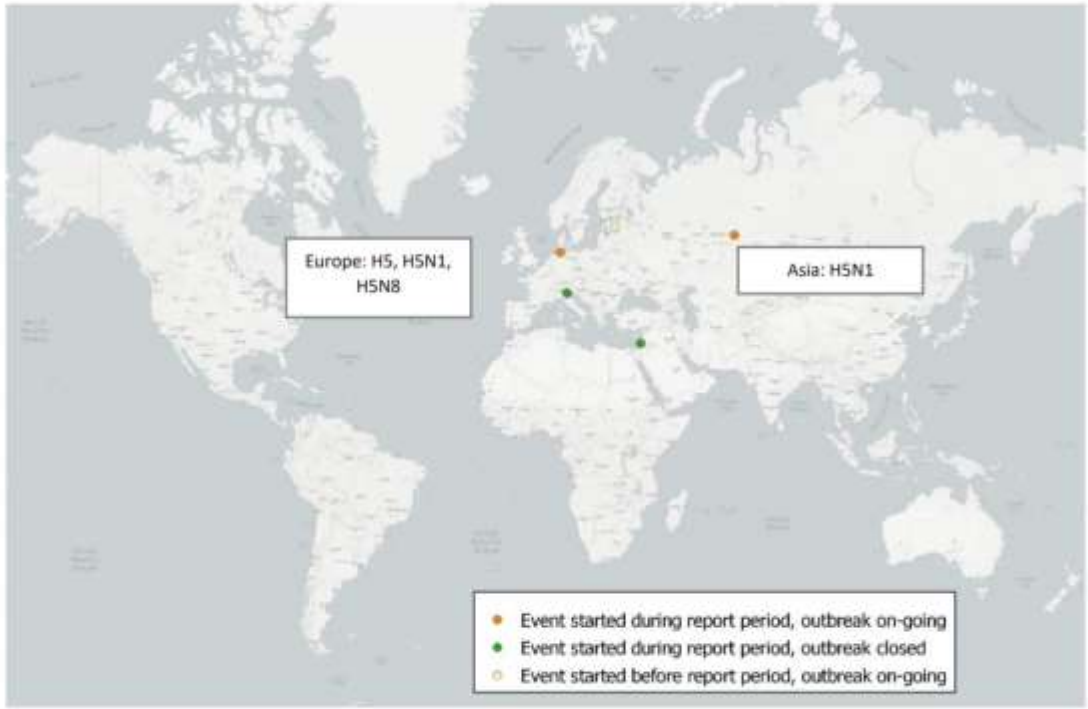


Figure 2. Distribution of HPAI new outbreaks in poultry, and corresponding subtypes

WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future

Avian influenza, 2021
poultry

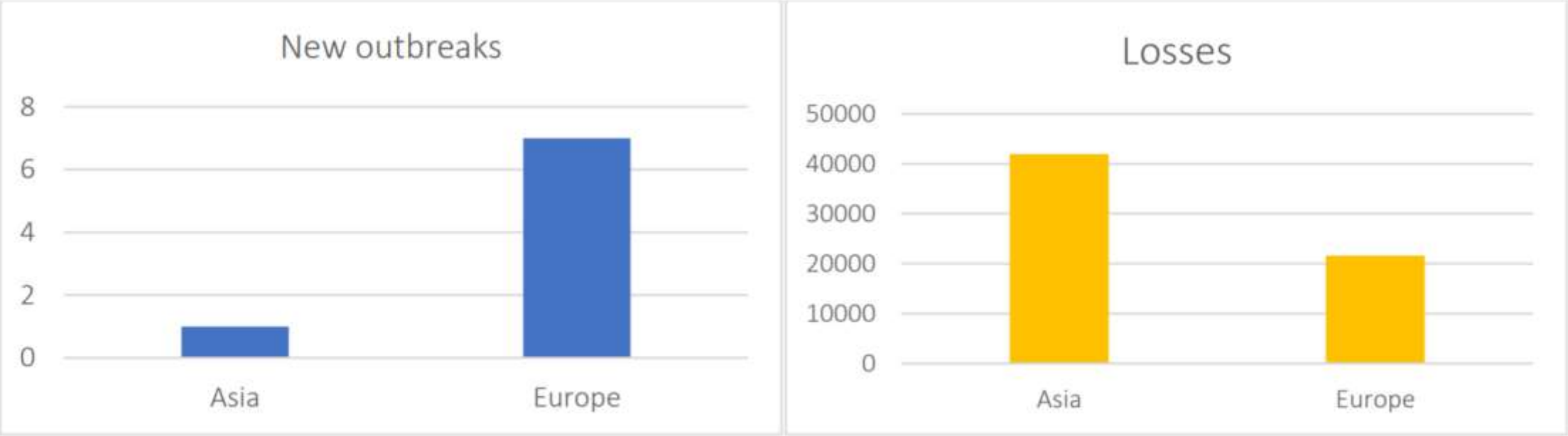


Figure 3. Number of new outbreaks and associated losses by geographical region (losses include animals dead and killed and disposed of)

Avian influenza, 2021
non-poultry

HPAI in poultry

New events by world region (reported through immediate notifications)

Asia
Subtype H5N1
A recurrence started in Israel (Hazafon) on 11 October 2021.
Europe
Subtype H5
A recurrence started in Russia (Tyumen') on 10 October 2021.
Subtype H5N1
A recurrence started in Italy (Veneto) on 18 October 2021.
A recurrence started in Germany (Schleswig-Holstein) on 22 October 2021.
Africa, Americas, and Oceania
No new events reported

On-going events for which there were new reported outbreaks, by world region

Europe
Subtype H5N8
Estonia
Africa, Americas, Asia and Oceania
No new outbreaks reported in the on-going events, or no on-going events

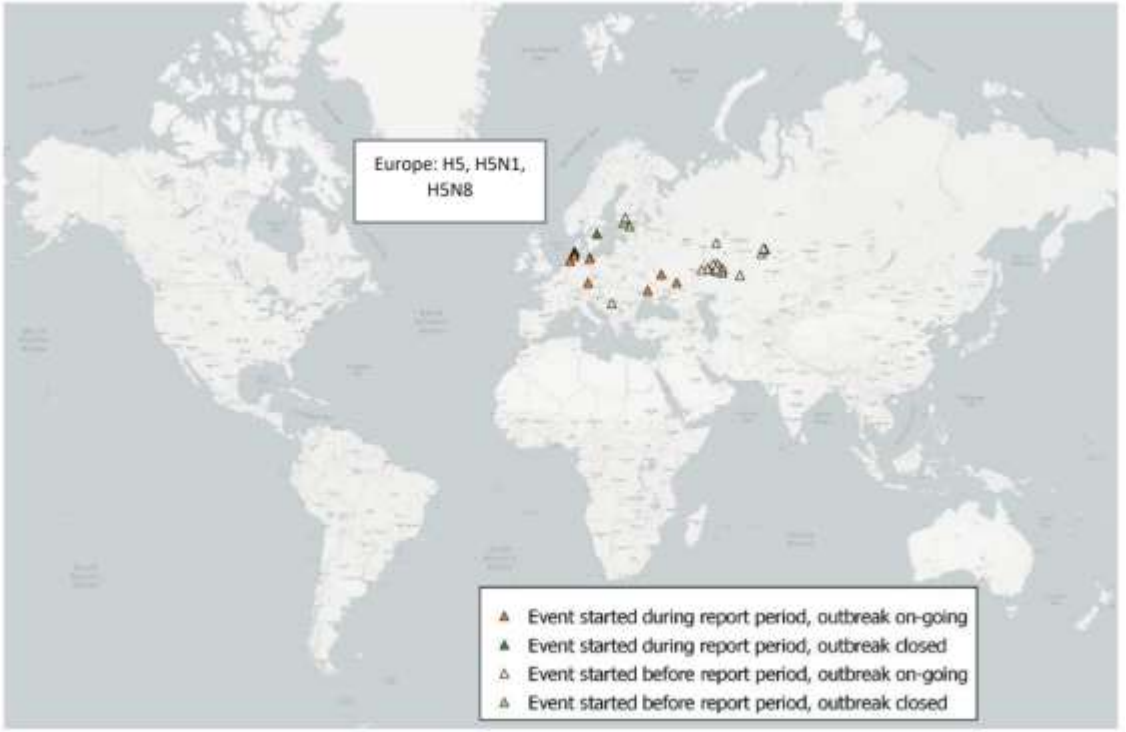


Figure 4. Distribution of HPAI new outbreaks in non-poultry birds, and corresponding subtypes.

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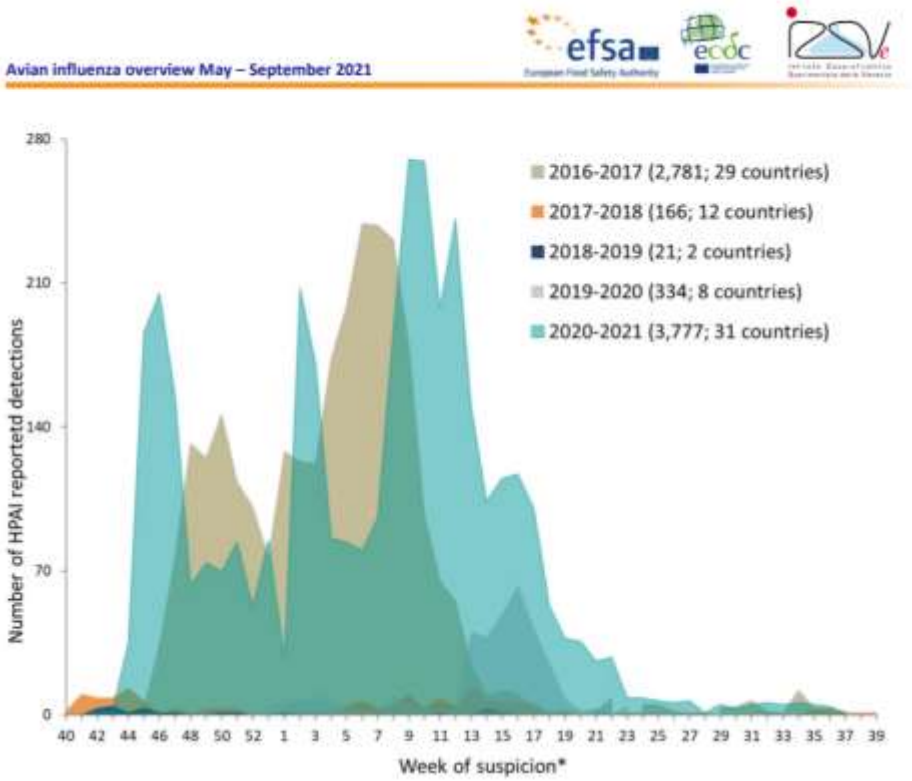
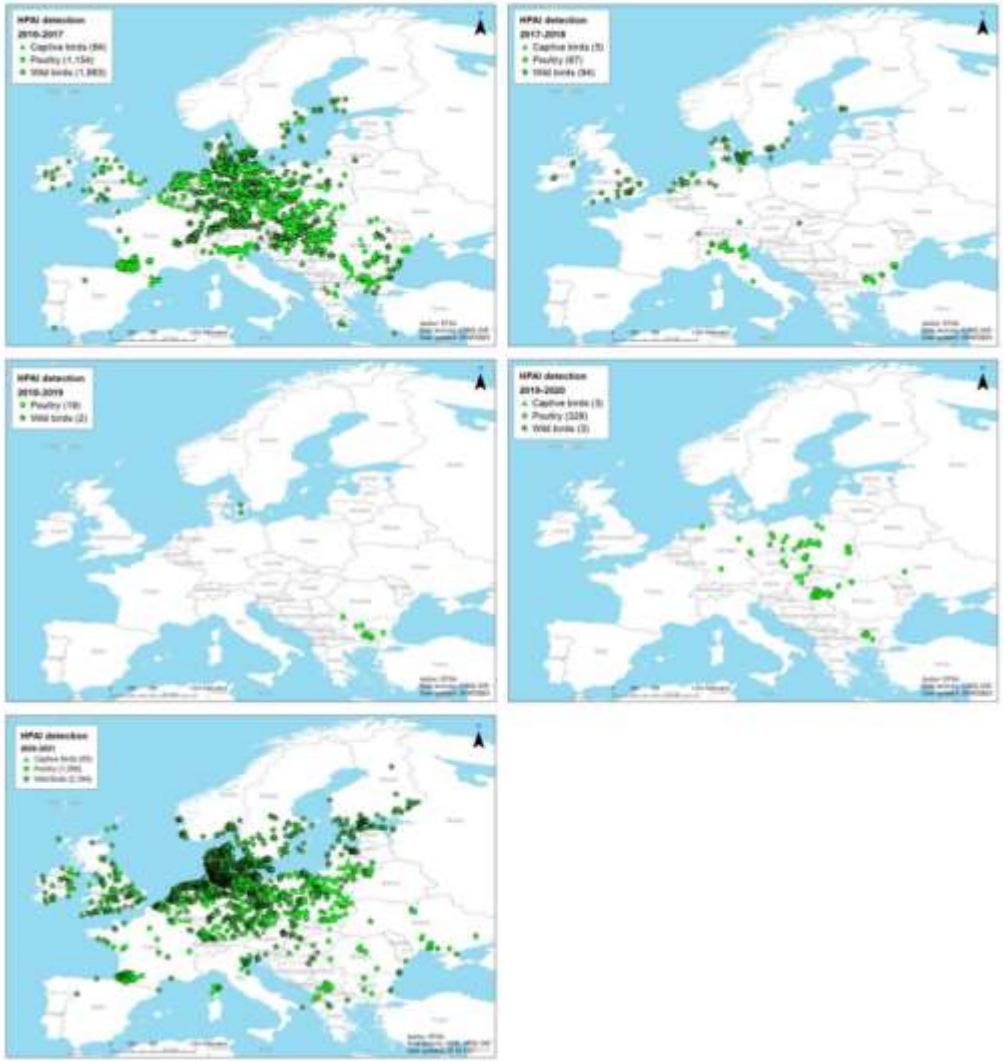
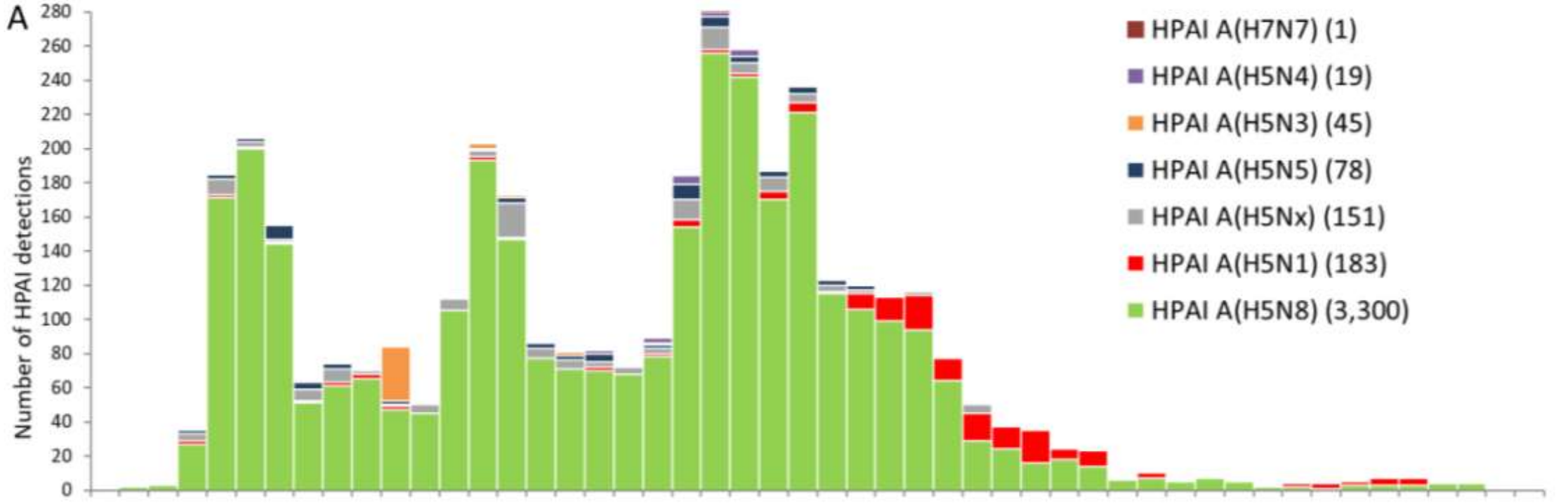
Avian influenza, Europe 2021

Avian influenza, Europe 2021

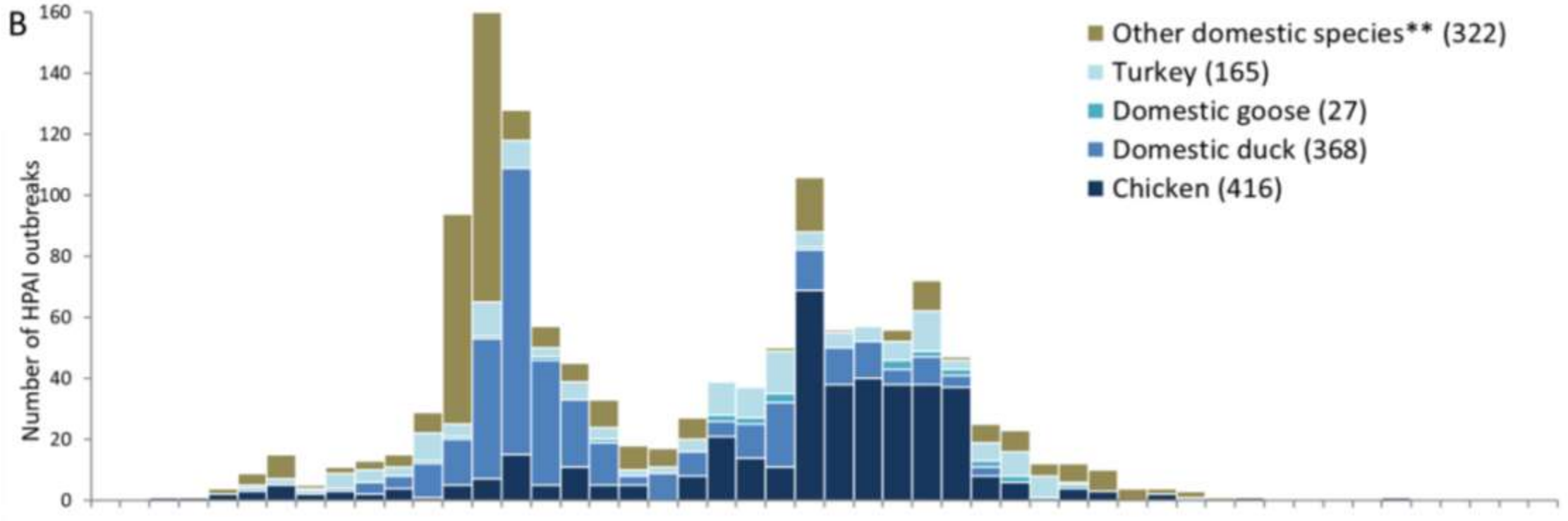




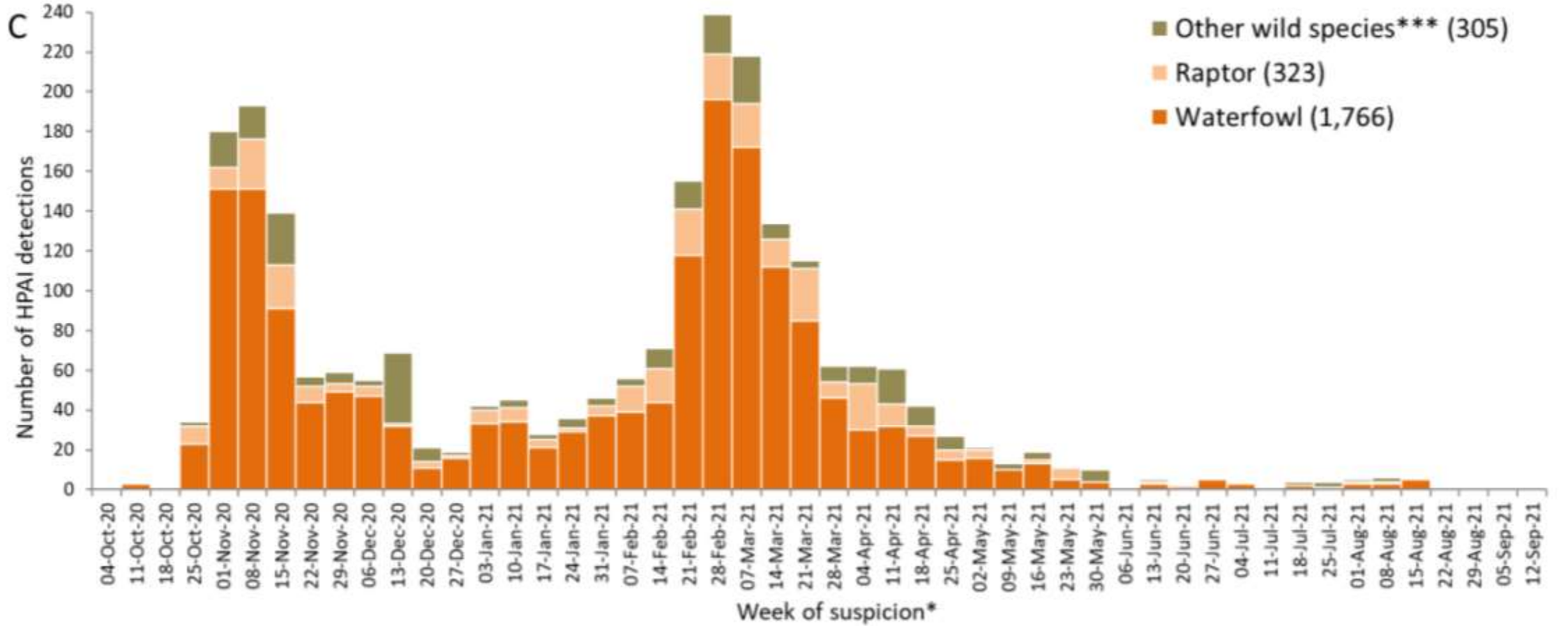
Avian influenza, Europe 2021
HPAI



Avian influenza, Europe 2021
HPAI domestic



Avian influenza, Europe 2021
HPAI, wild



Avian influenza, human cases within clade 2.3.4.4 A(H5Nx)

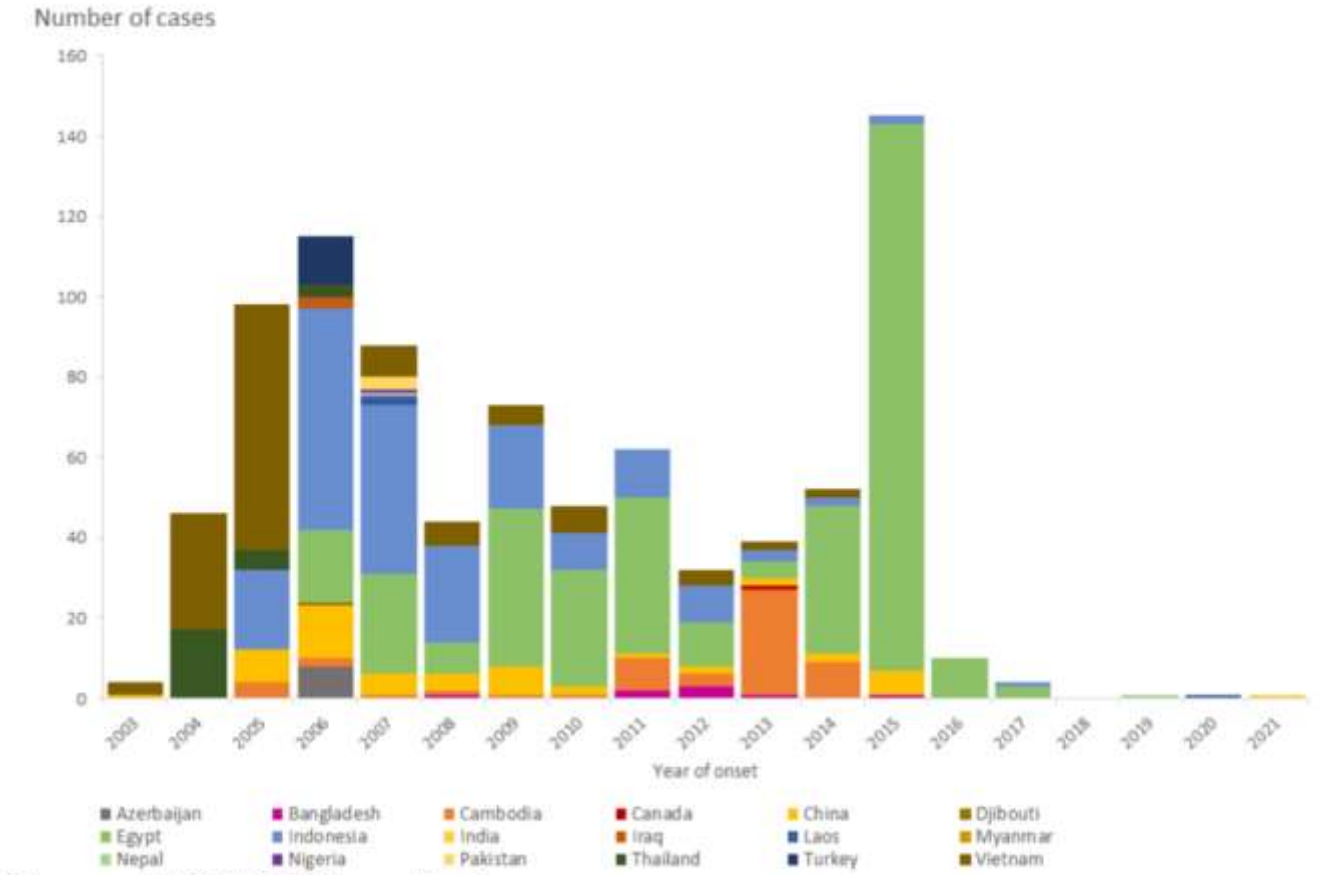
Table 2 Distribution of human cases infected by A(H5) viruses within clade.2.3.4.4 based on HA gene analysis

Clade	Year(s)	Number of human sequences	Country
2.3.4.4	2014-2015	6	China
2.3.4.4a	2014	1	China
2.3.4.4b	2017, 2020 and 2021	20	China, Nigeria, Russia
2.3.4.4d	2015, 2016	9	China
2.3.4.4e	2014, 2015	4	China
2.3.4.4g	2016	2	China
2.3.4.4h	2017, 2018, 2020, 2021	10	China

Source: (CCDC, 2021a; WHO, 2021c; GSAID, online)

Avian influenza, human cases

A(H5N1), n=863, 456 (52.8%) deaths, 18 countries, 2003-2021



Data source: WHO (WHO, 2021b, a, online-a).

Figure 15: Distribution of confirmed human cases of A(H5N1) by year and country of reporting, 2003 to 14 September 2021 (n = 863)

Γρίπη των πουλερικών H5N1 και άνθρωπος

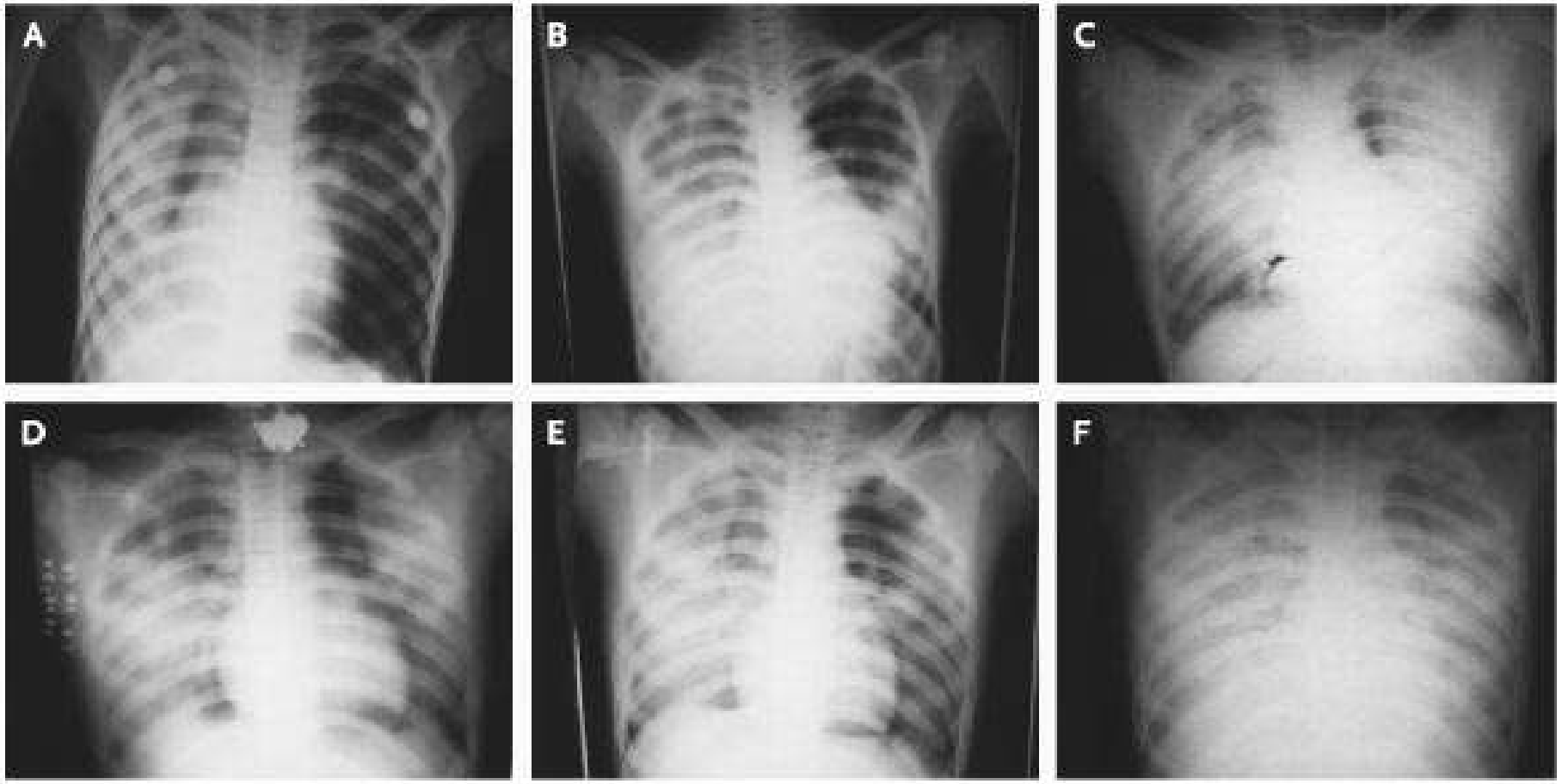
H5N1 - Άνθρωποι

- Καταιγίδα κυτταροκινών
- H5N1 patients had significantly higher levels of 6 out of 7 cytokines measured

  •**Nature Med 09/2006**

- Similar to 1918 H1N1 strain

Ακτινολογικές εικόνες H5N1



Avian influenza H5N1
Επιπλοκές

- 89 % θνητότητα σε παιδιά
  - < 15 ετών
    - 9-10 ημέρες νόσου
    - Αναπνευστική δυσχέρεια
  - Σε αντίθεση με το 1997

Γρίπη πτηνών H5N1 & ... οι

ΜΥΘΟΣ

- Τα άγρ... τοχή στις ... σε ...θρ... ς



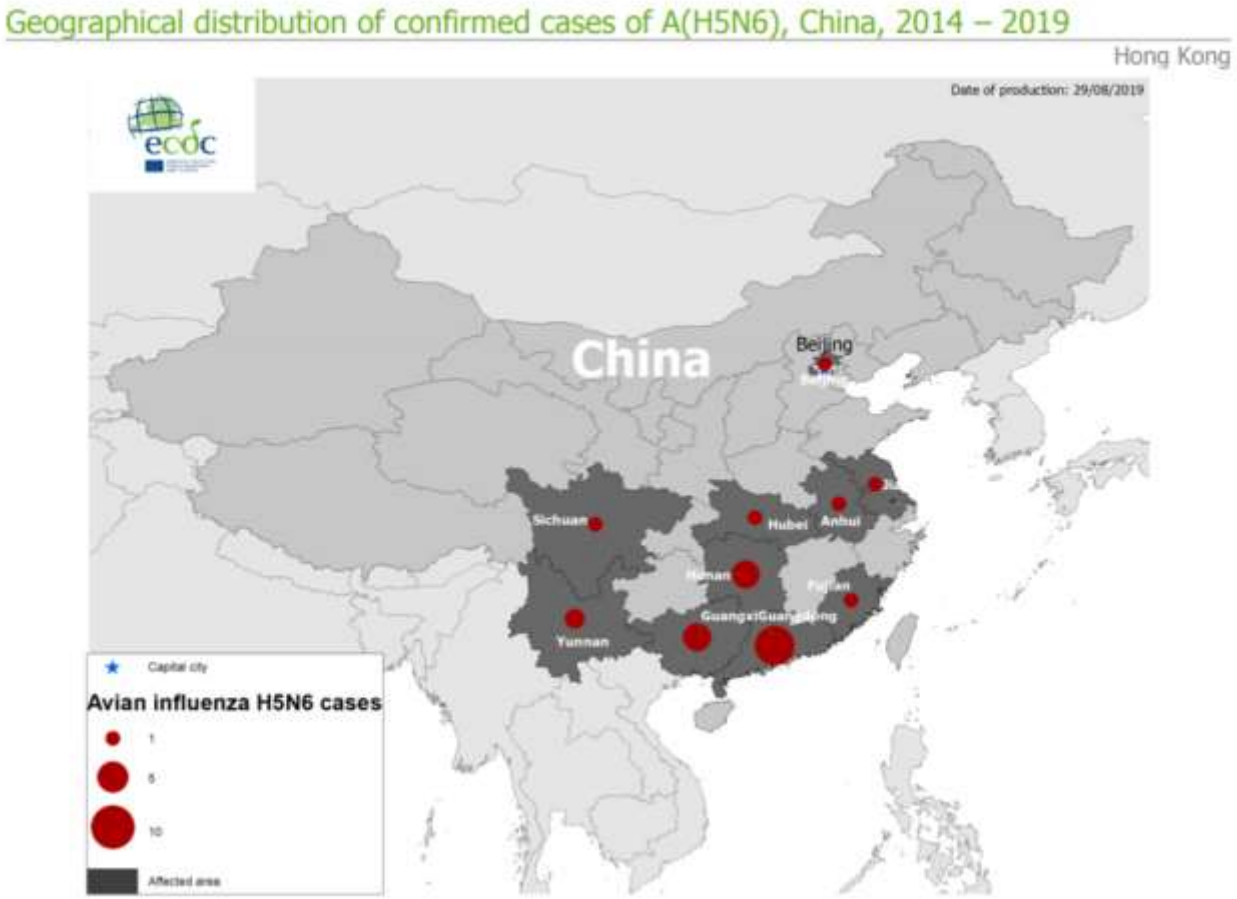
ΜΕΤΑΔΟΣΗ ΣΕ ΑΝΘΡΩΠΟΥΣ
= στενή επαφή

Μετάδοση στον άνθρωπο = Στενή επαφή

ΠΡΟΣΟΧΗ ΣΤΑ ΠΑΙΔΙΑ !!!

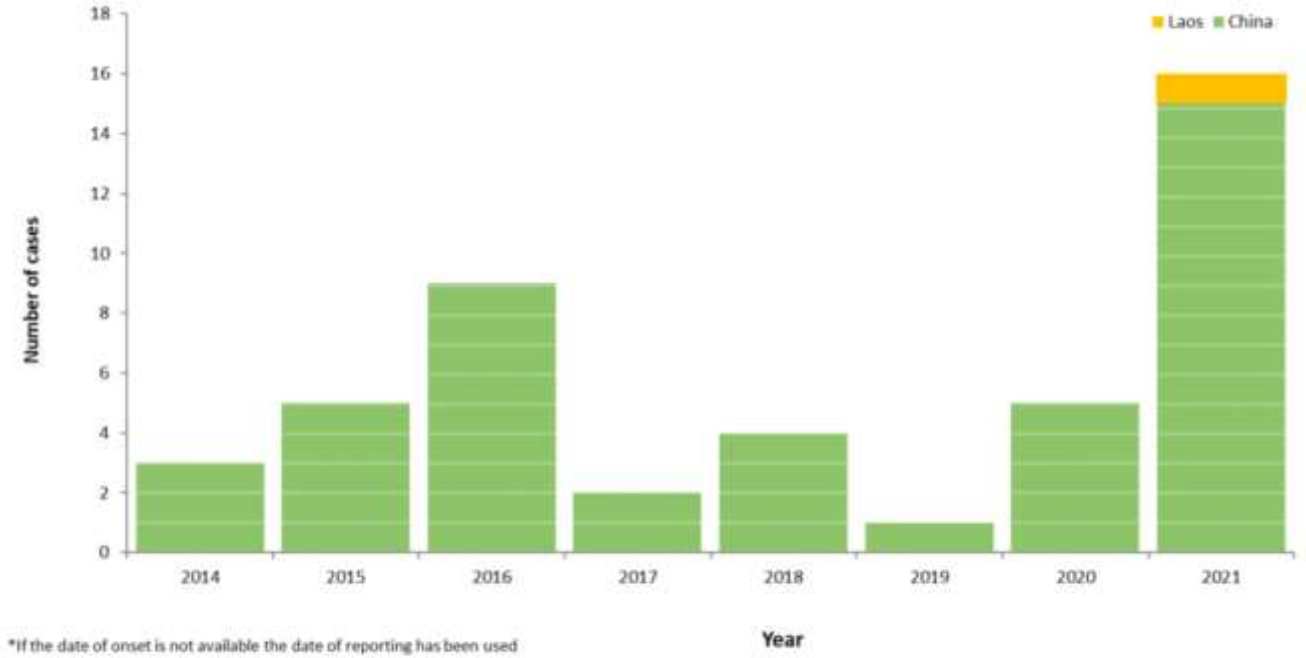
Avian influenza H5N6 2014-19

n= 25, 15 deaths



Avian influenza, human cases

A(H5N6), n=45, 21 (46.7%) deaths, China, Laos, 2014-2021



Source: ECDC line list (see Appendix B.2).

Figure 18: Number of human cases due to A(H5N6), clade 2.3.4.4, infection by year of onset, 2014 to 22 September 2021 (n = 45)

Avian influenza, human cases

A(H5N6), n=45, 21 (46.7%) deaths, China, Laos, 2014-2021

World Health Organization

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Home / Publications / Overview / Assessment of risk associated with influenza A(H5N6) virus

Assessment of risk associated with influenza A(H5N6) virus

19 November 2021

19 November 2021 | Emergency Situational Updates

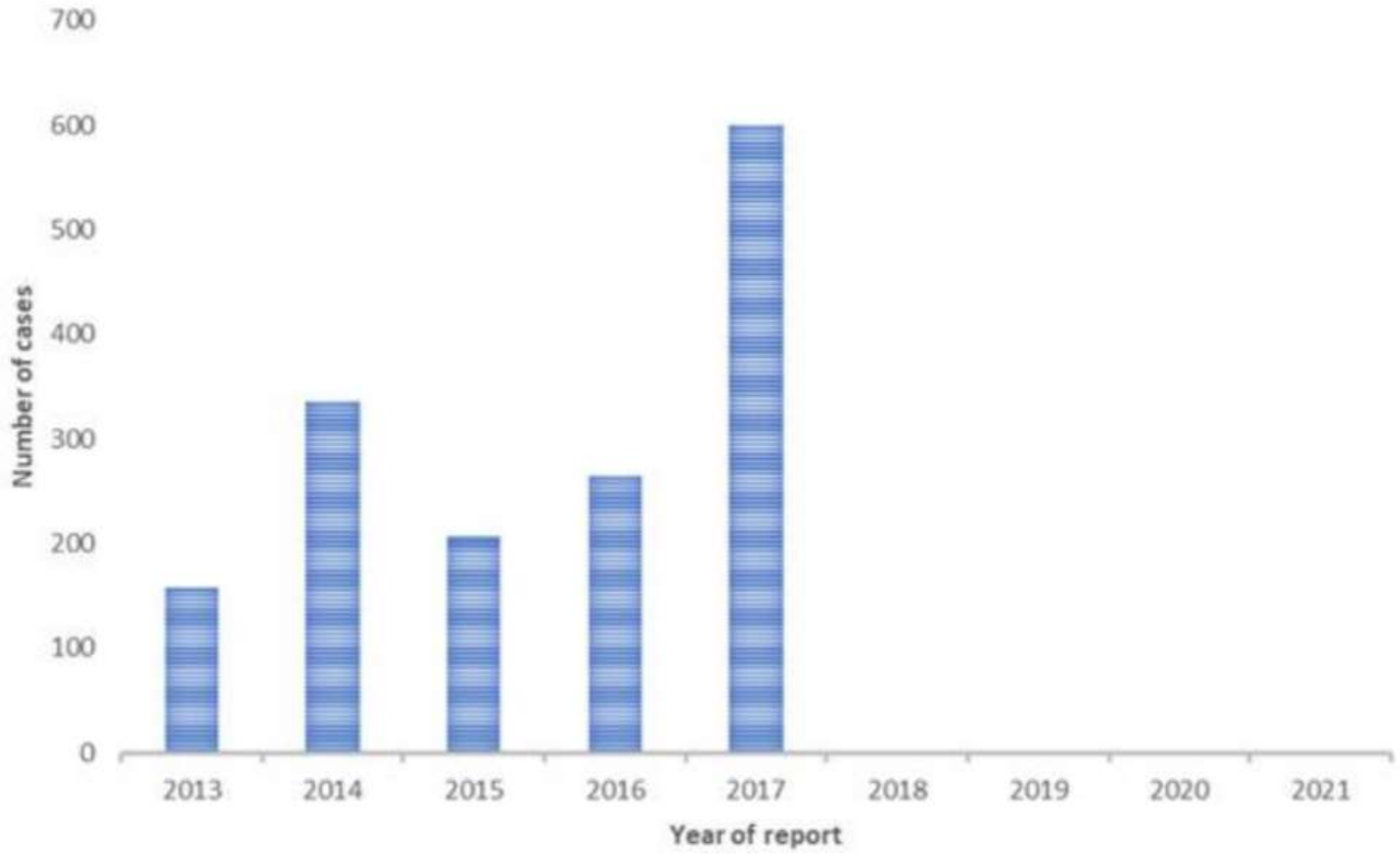
Download (214.9 kB)

Overview

Highly pathogenic avian influenza (HPAI) A(H5N6) viruses belonging to the 2.3.4.4b haemagglutinin (HA) genetic lineage have spread in birds in China and some neighboring countries. There have been 26 A(H5N6) human infections reported in 2021, of those 20 with illness onset dates after 21 June 2021. While the zoonotic threat remains elevated due to spread of the viruses in birds, based on evidence available so far, the overall pandemic risk is considered not significantly changed in comparison to previous years.

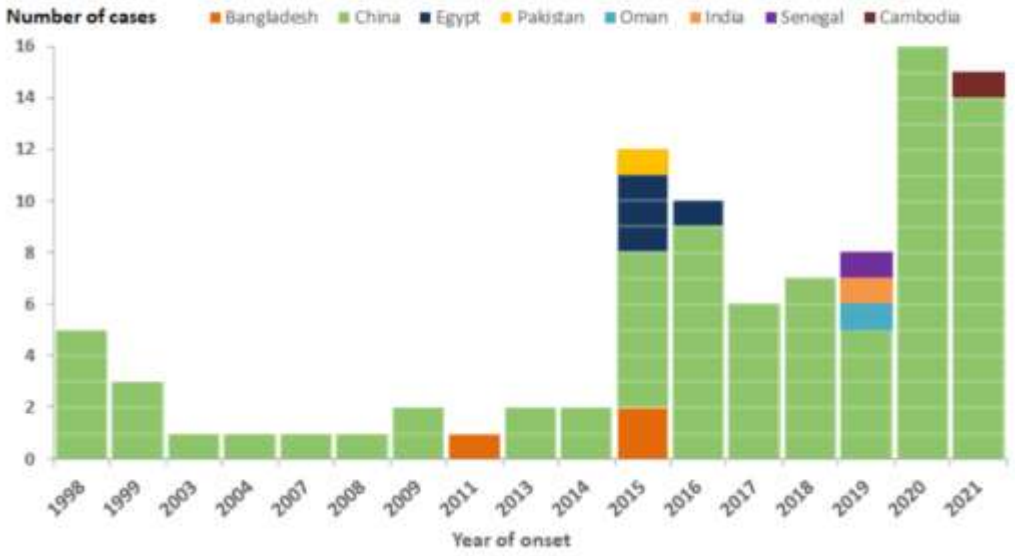
Avian influenza, human cases

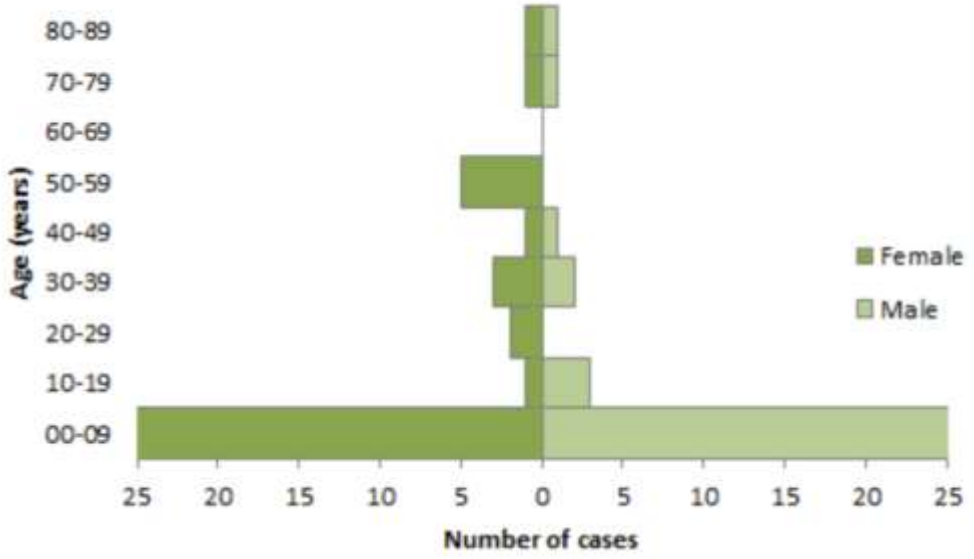
A(H7N9), n=1568, 615(39%) deaths, China, Laos, 2013-2021



Avian influenza, human cases

A(H9N2), n=93, 1(1%) deaths, 8 countries, 1998-2021, children <10 yrs



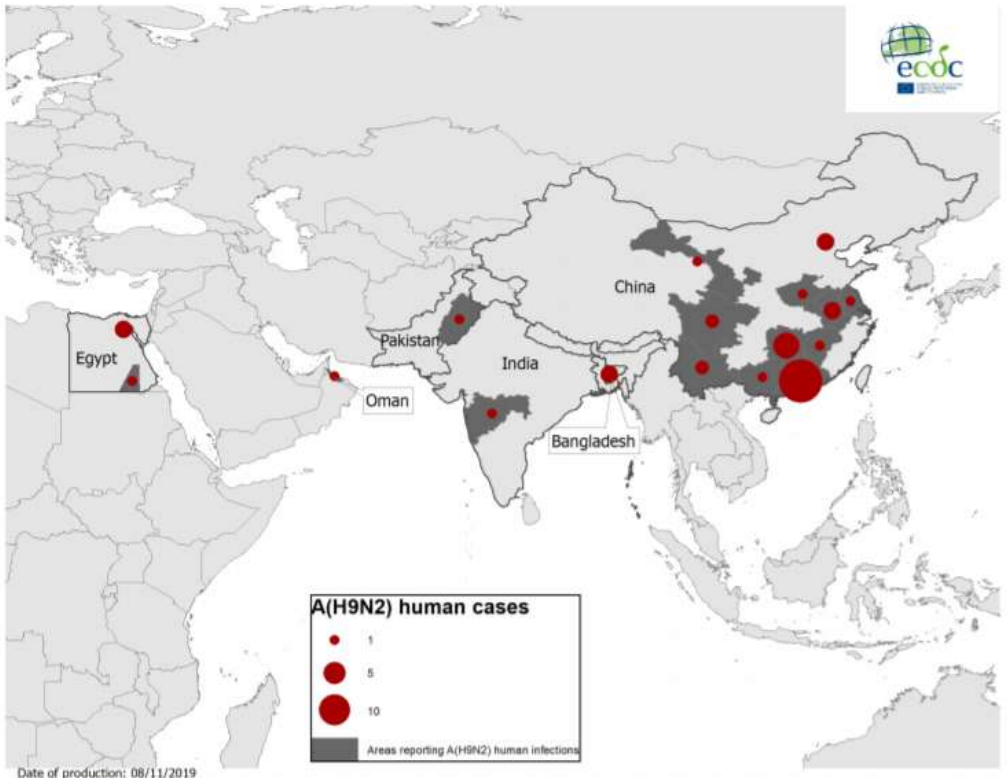


Avian influenza H9N2, 1998-19

n= 57, 1 deaths

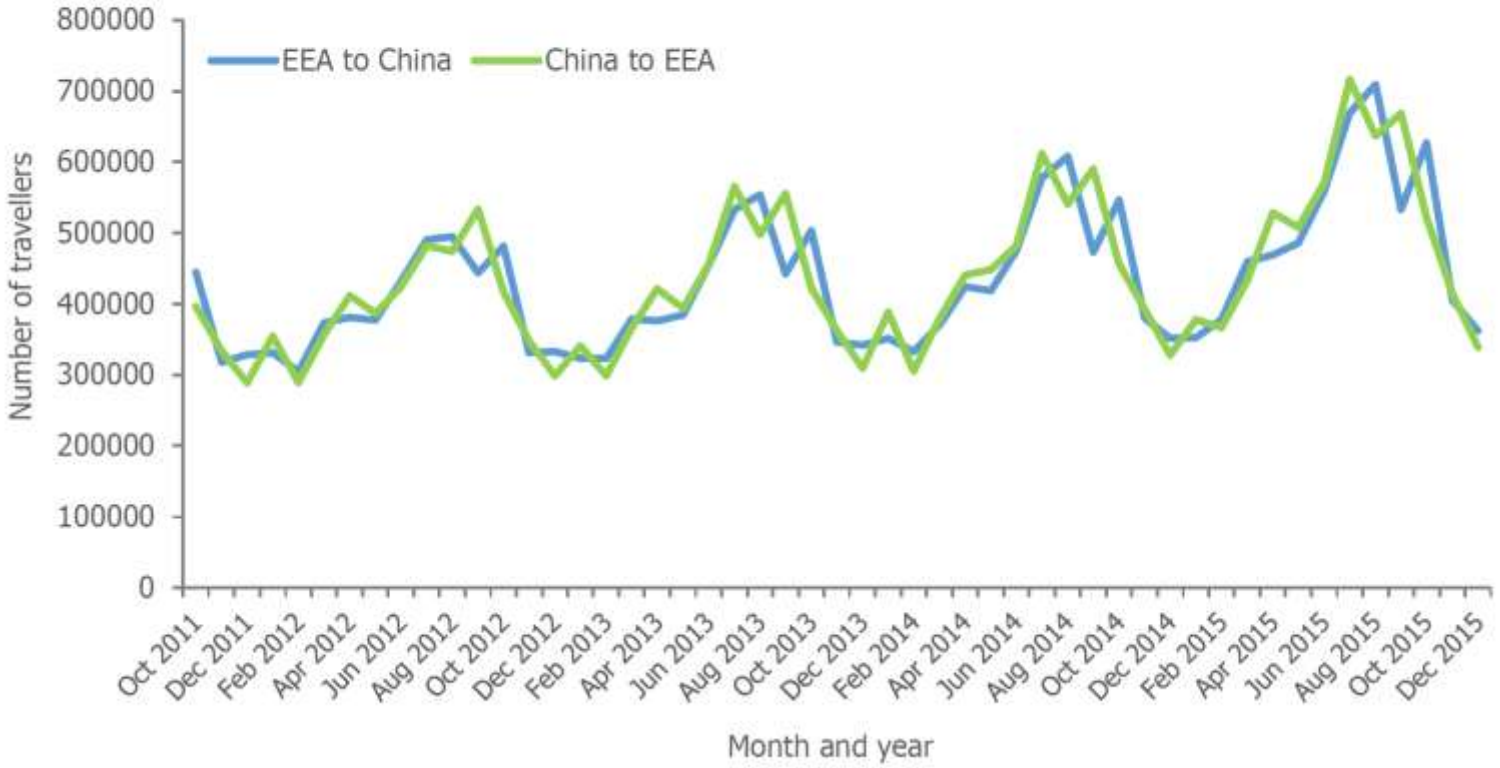
Geographical distribution of confirmed human cases of A(H9N2), 1998 - 8 November 2019

Source: ECDC



Travelers and China, pre-COVID

Table 3. Distribution of international air travellers from EU/EEA countries to and from China, by month, October 2011 to December 2015



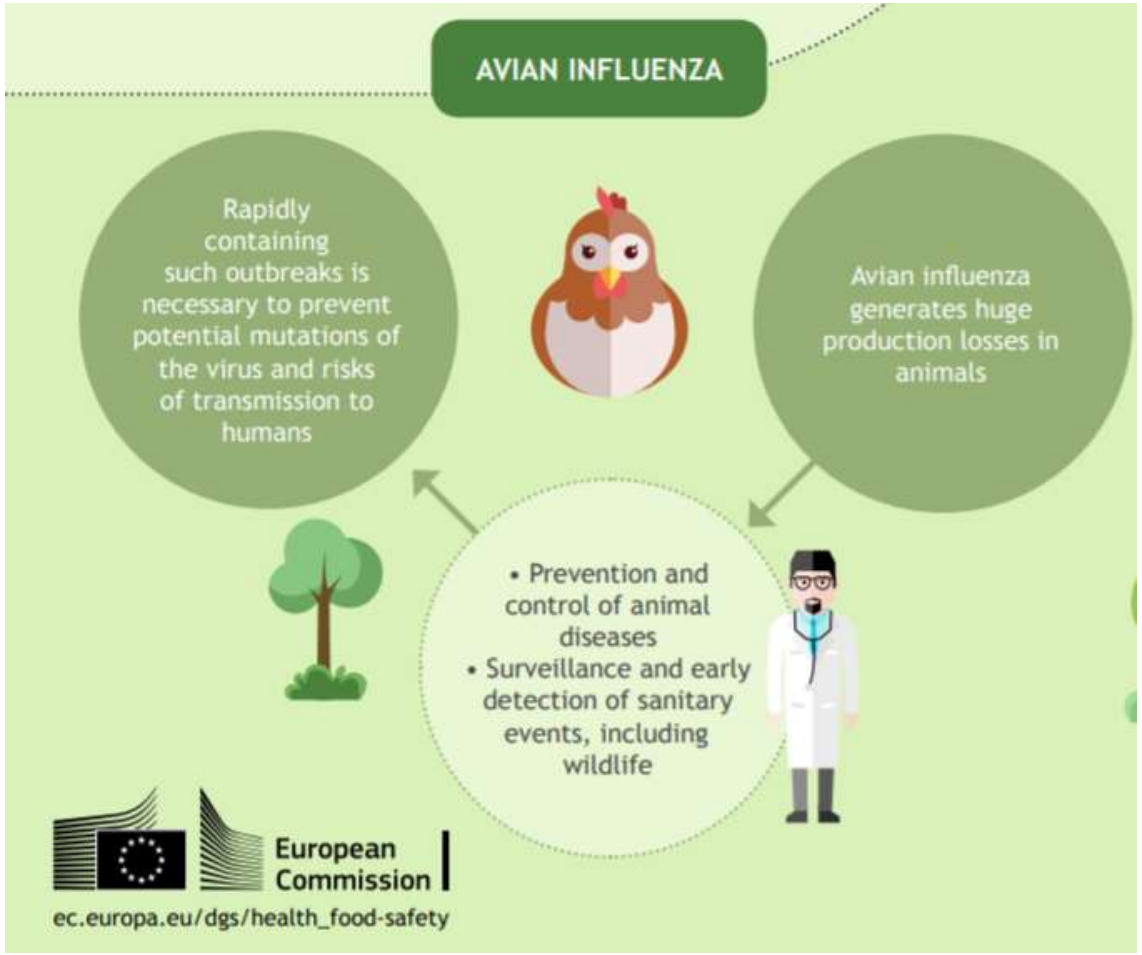
Prevention

Strict biosecurity, good hygiene

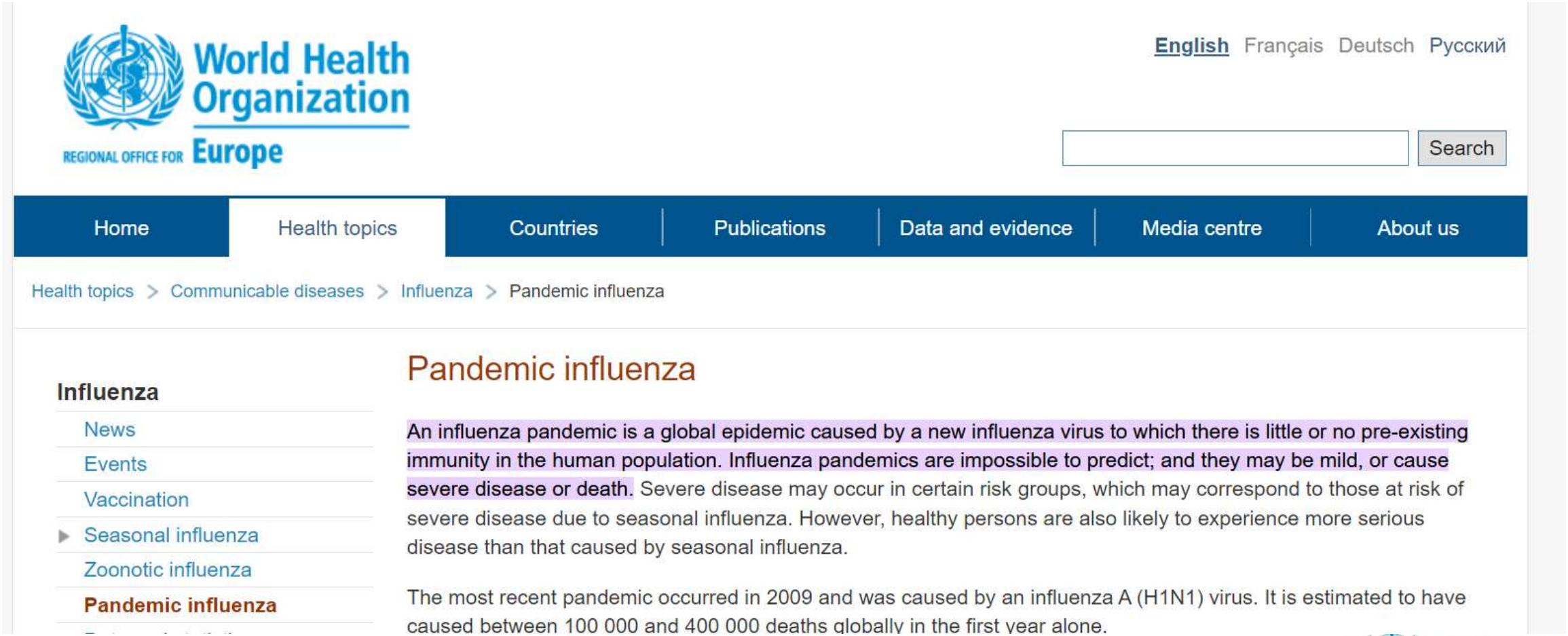
- keep poultry away from areas frequented by wild fowl
- do not keep on the premises elements that may attract wild birds, including poultry feed products placed outside the building
- maintain strict control over access to flocks by vehicles, people and equipment
- ensure the sanitation of property, poultry houses and equipment
- avoid the introduction of birds of unknown disease status into the flock
- report any bird illnesses and deaths to the Veterinary Services
- ensure appropriate disposal of manure, litter and dead poultry
- vaccinate animals where appropriate.

Prevention

Strict biosecurity, good hygiene



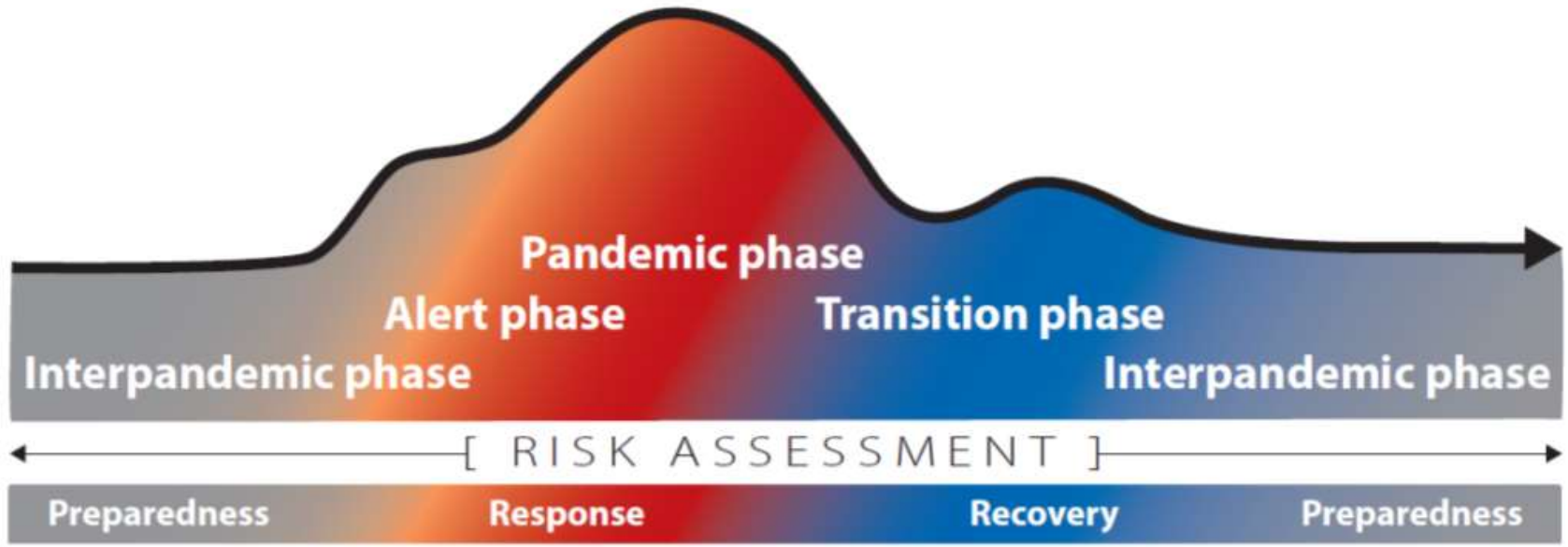
Pandemic influenza



World Health Organization

Pandemic & phases

Figure 2.1: The continuum of pandemic phases*

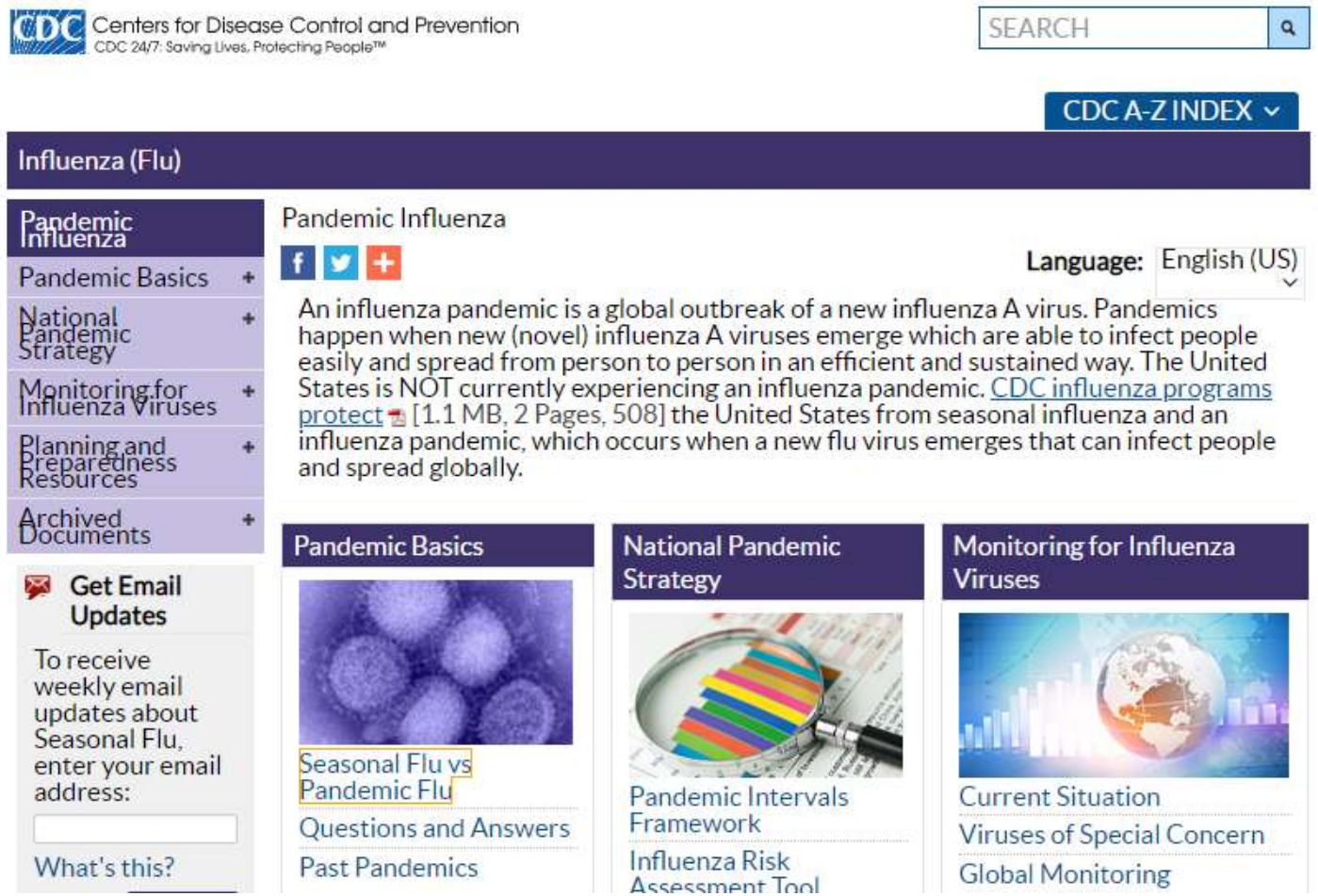


*This continuum is according to a "global average" of cases, over time, based on continued risk assessment and consistent with the broader emergency risk management continuum.

Interpandemic phase: This is the period between influenza pandemics.

World Health Organization

Pandemic influenza – 100 yrs after



Πανδημίες γρίπης
Μαθήματα από το παρελθόν

- 10 πανδημίες τα τελευταία 300 έτη

Pandemics 20th Century

1918: “Spanish”

50-100 mil. deaths

1957: “Asian”

1 mil. deaths

1968: “Hong Kong”

1 mil. deaths

H1N1

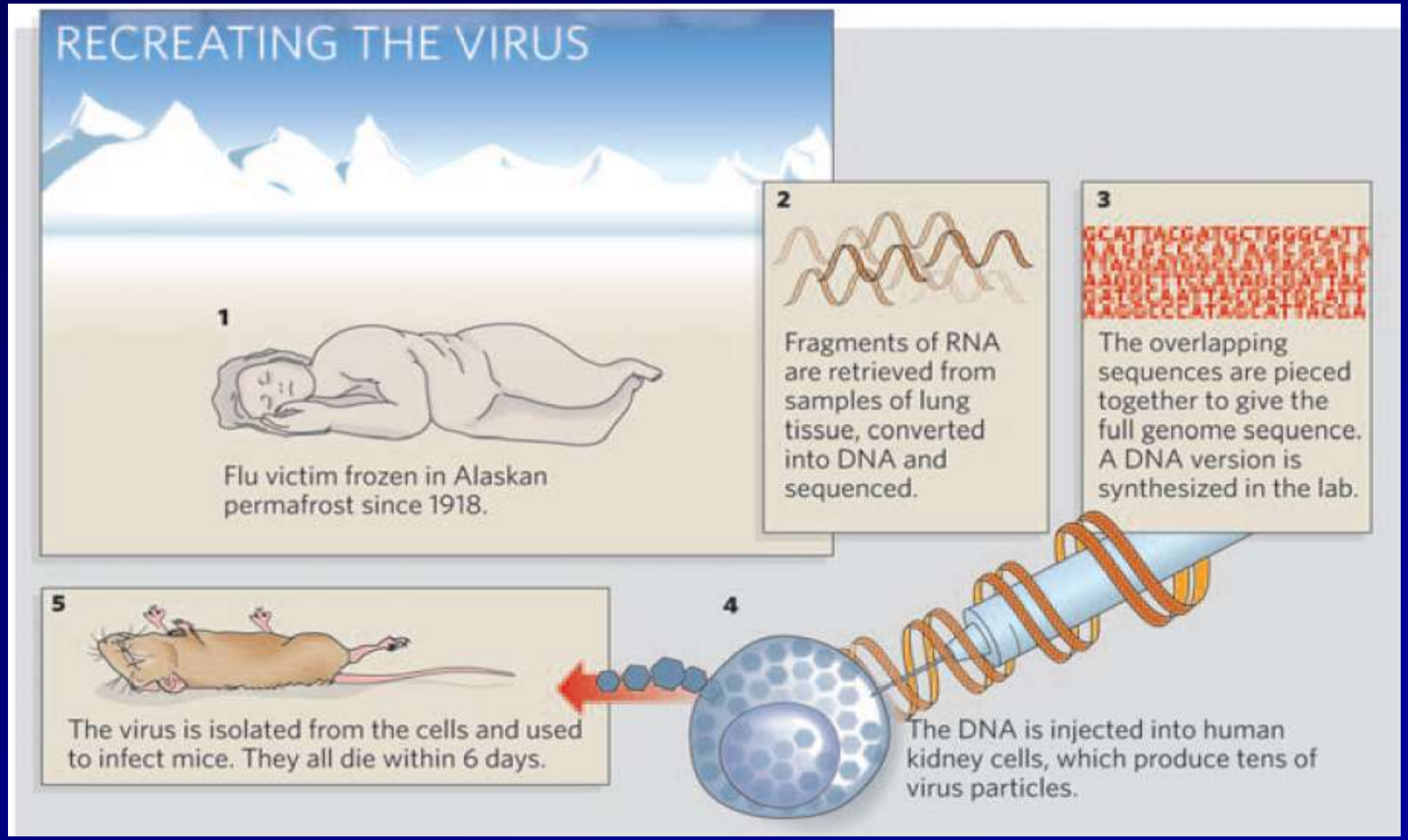
H2N2

H3N2

H1N1

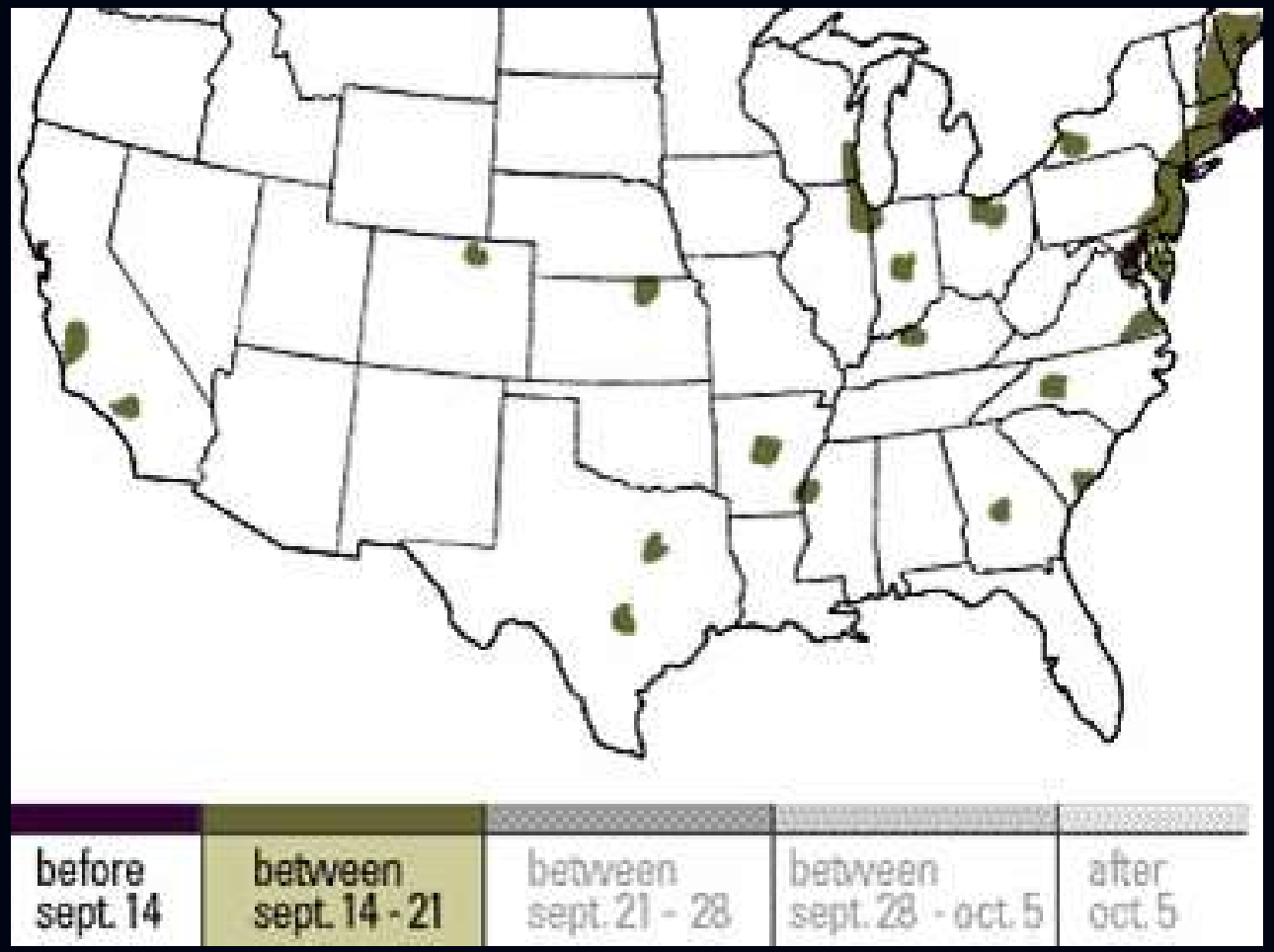
1920 1940 1960 1980 2000

1918 Influenza

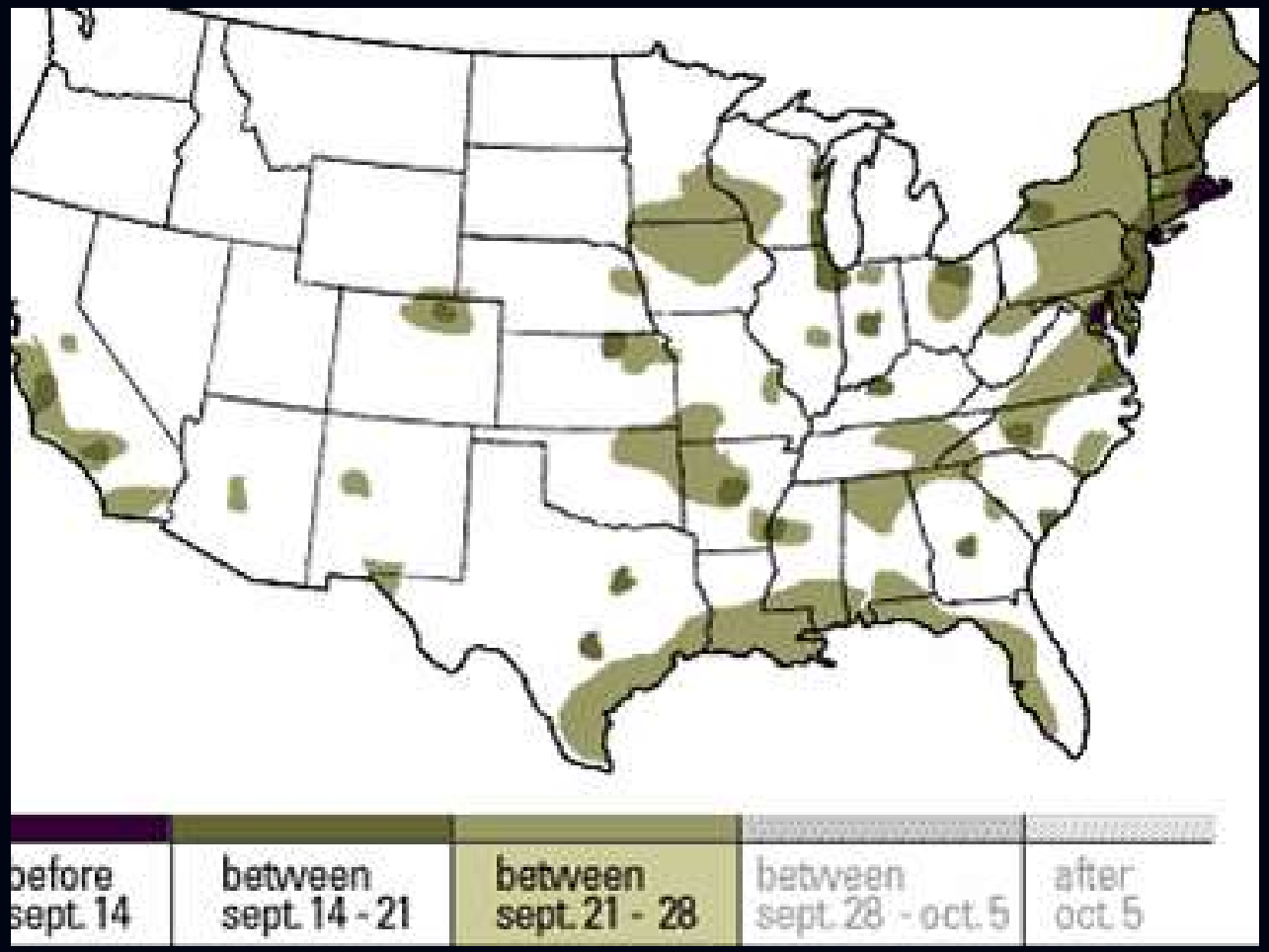


Taubenberger et al, Nature, 2005, Tumpey et al Science 2005

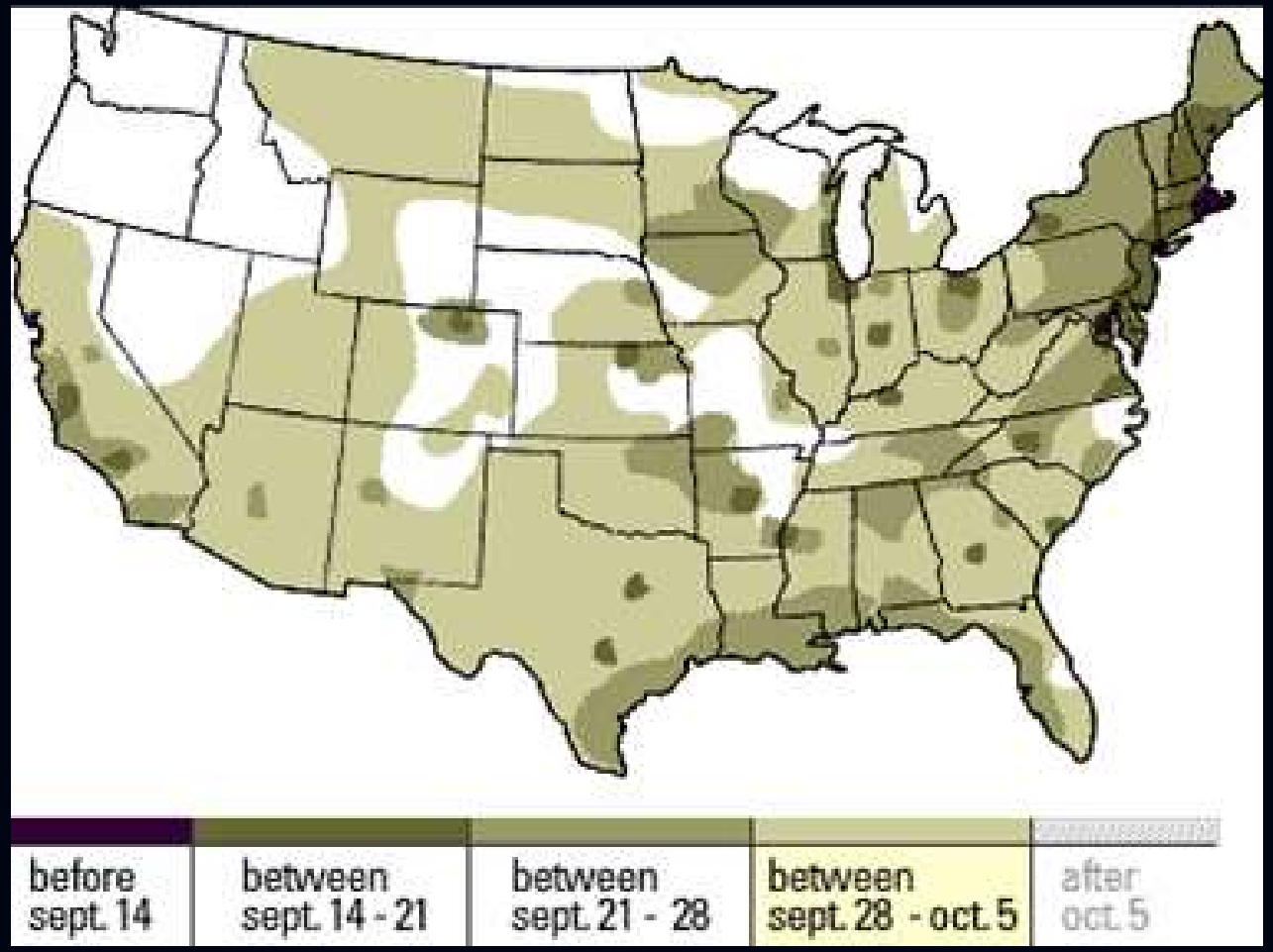
The 1918 Flu Pandemic in the U.S.



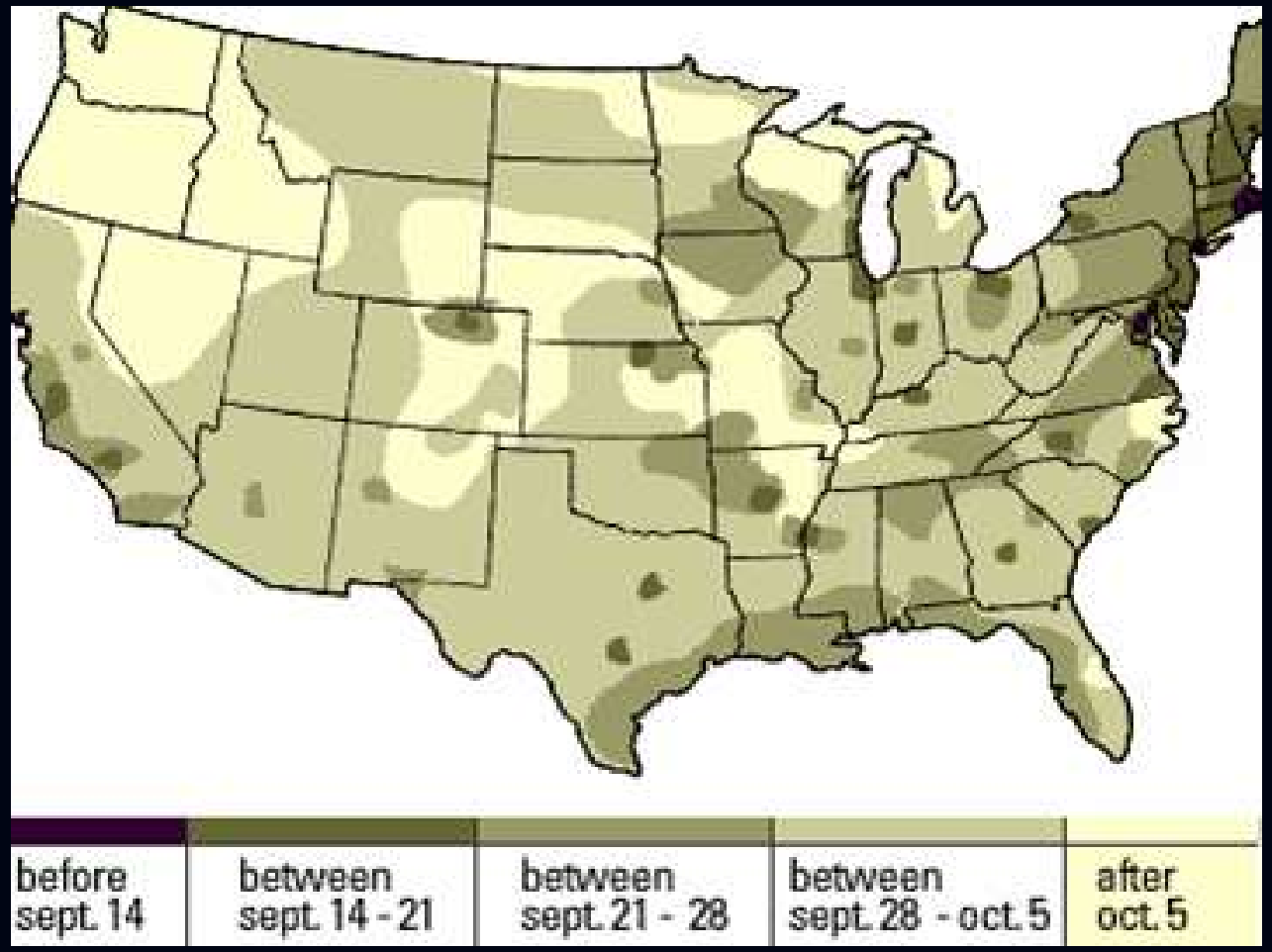
The 1918 Flu Pandemic in the U.S.



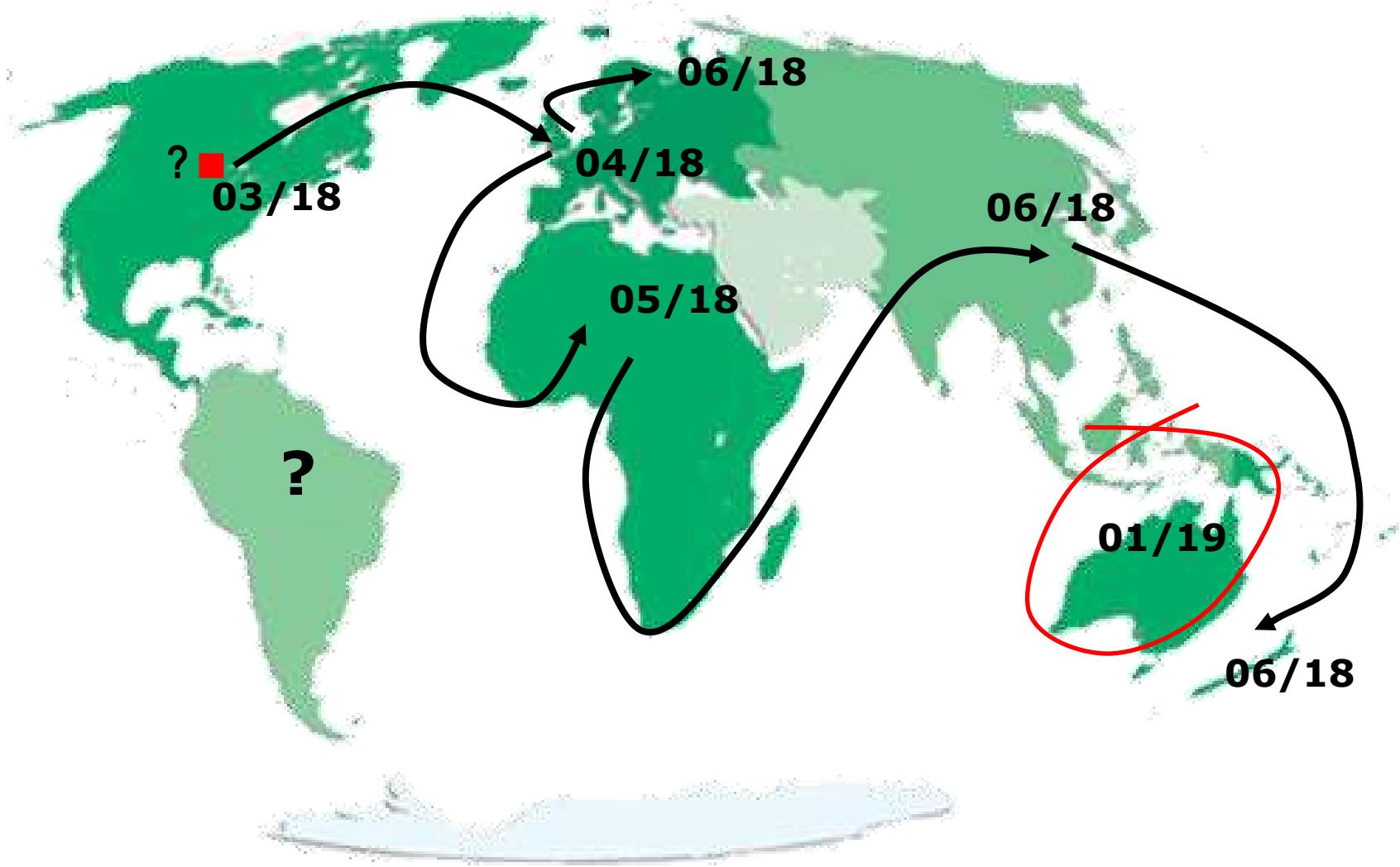
The 1918 Flu Pandemic in the U.S.



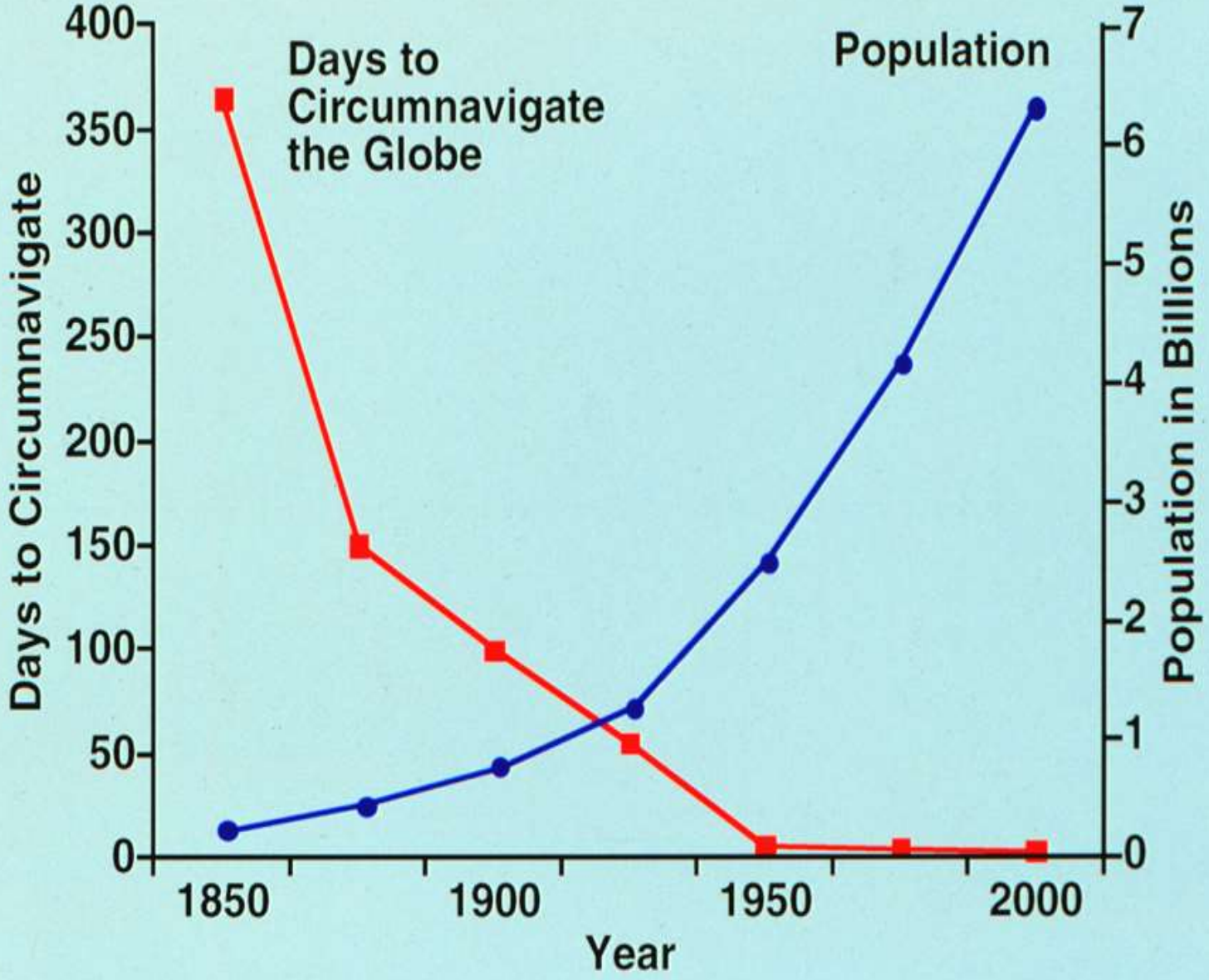
The 1918 Flu Pandemic in the U.S.



Geographic spread: 1918-19



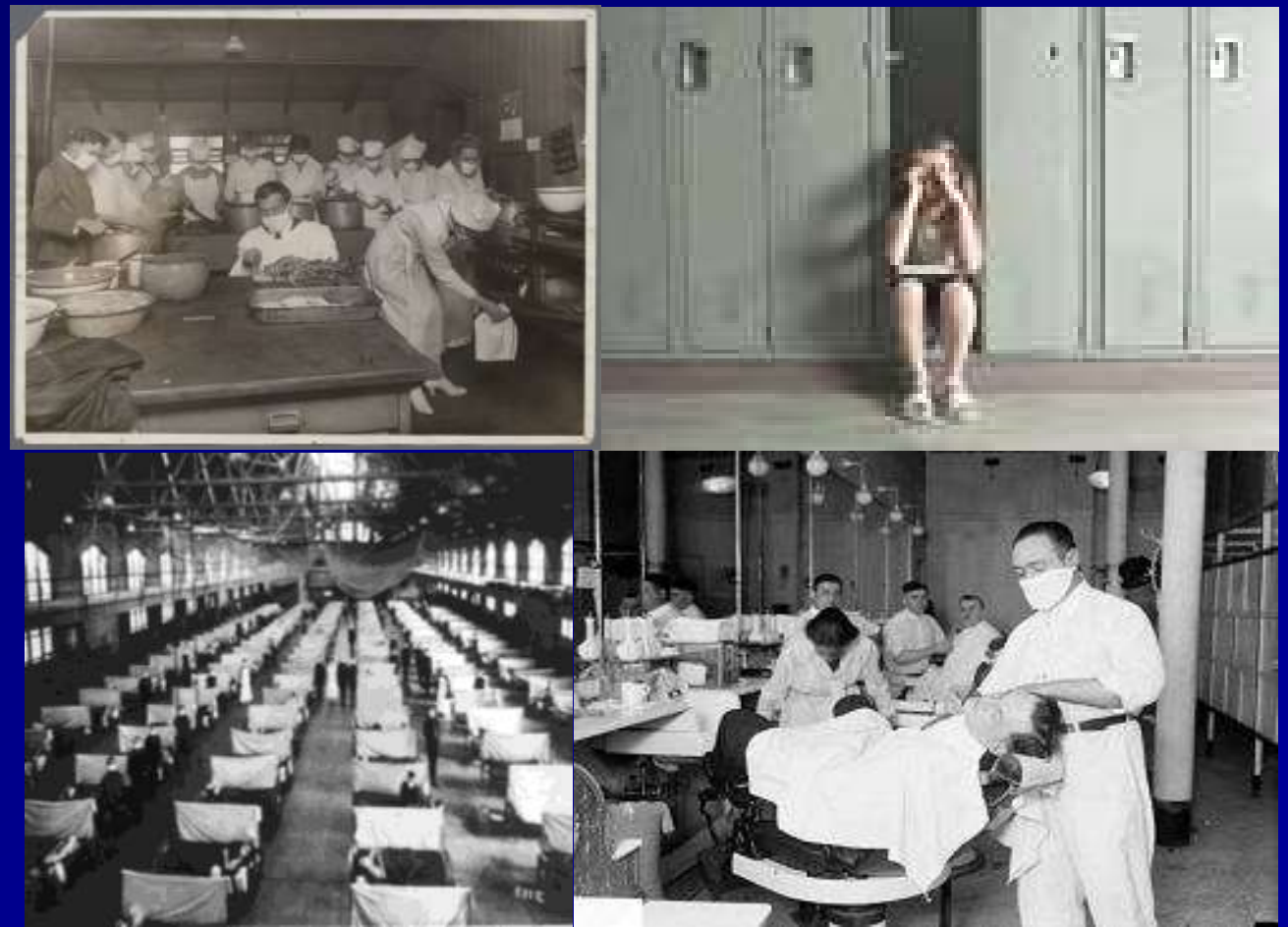
C.W. Potter, Textbook of Influenza, 1998


Days to Circumnavigate the Globe
Population
Days to Circumnavigate
Population in Billions
Year
400
350
300
250
200
150
100
50
0
7
6
5
4
3
2
1
0
1850
1900
1950
2000

Believe it or not,
flu could hit you even harder

ΠΑΝΔΗΜΙΑ - ΕΠΙΠΤΩΣΕΙΣ

- Κοινωνικές
- Οικονομικές
- Πολιτικές



Pandemic influenza – 100 yrs after

World Health Organization

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Influenza

Pandemic Influenza: an Evolving Challenge

2018 marks the 100th anniversary of one of the largest public health crises in modern history, the 1918 influenza pandemic known colloquially as "Spanish flu." The intensity and speed with which it struck were almost unimaginable – infecting one-third of the earth's population, which at the time was about 500 million people. By the time it subsided in 1920, tens of millions people are thought to have died.

Although influenza has been with humankind for millenia, the global spread and impact is in many respects a function accelerated in modern times. Urbanization, mass migration, global transport and trade accelerate the spread of pandemics.

Pandemic influenza – IRAT

Pandemic influenza – IRAT, CDC/DHHS 2021

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention (CDC)
Atlanta, GA 30329-4027

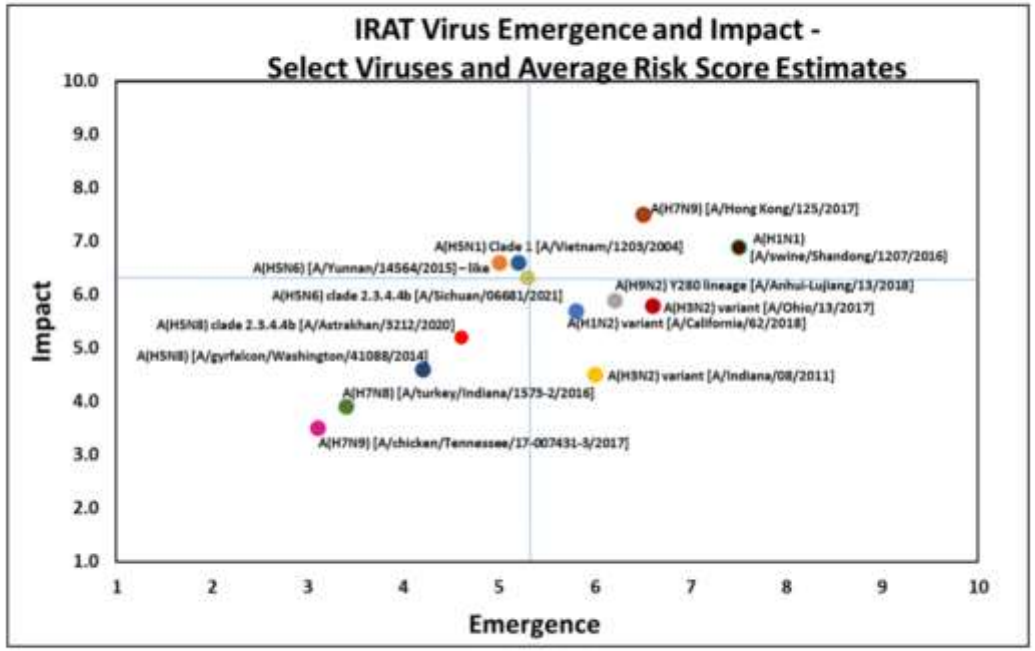
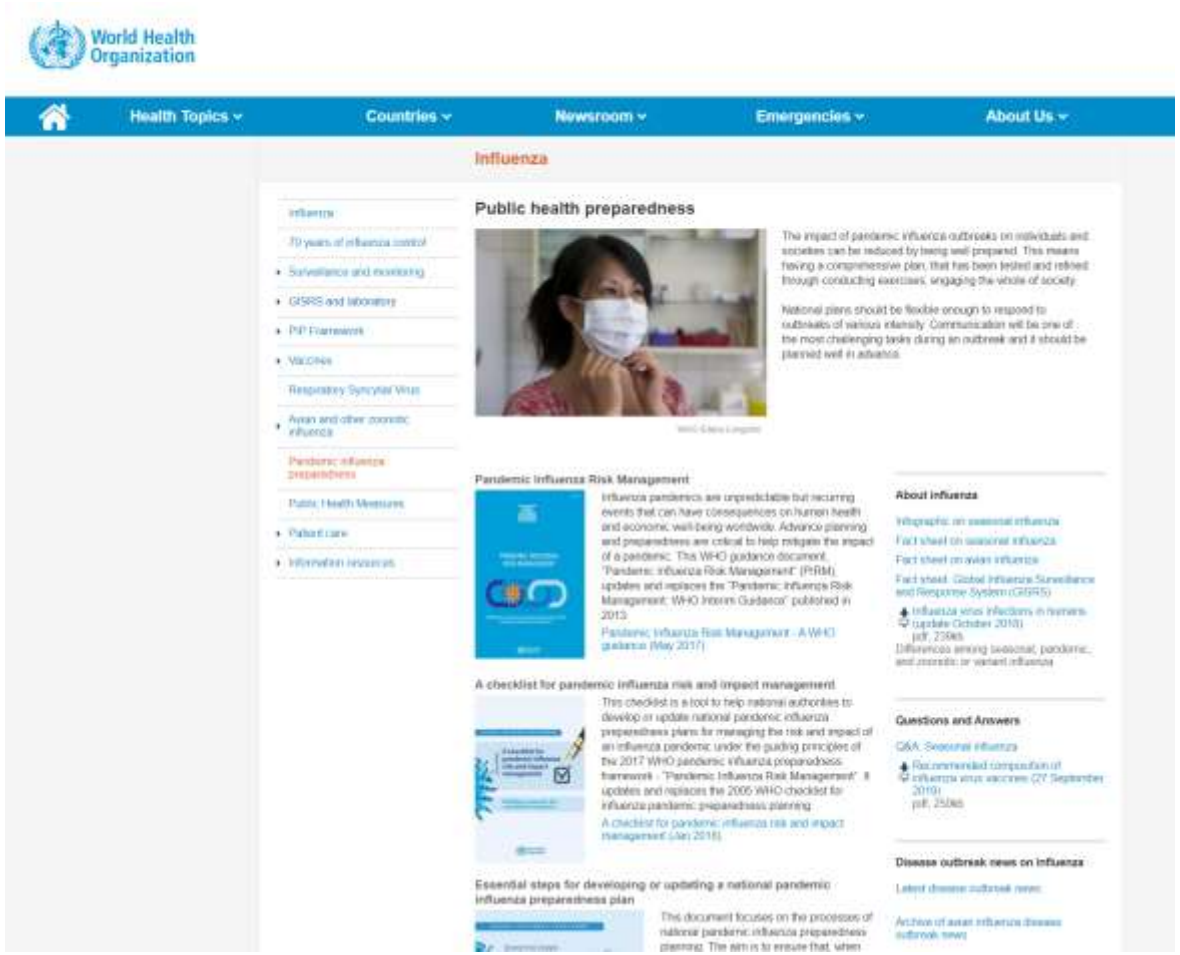


Figure: Potential pandemic risk for clade 2.3.4.4b A(H5N6) virus plotted by emergence and impact average weighted risk score estimates (highlighted with blue crossbars). Additional select viruses scored using IRAT are displayed for comparison.

Pandemic influenza – Preparedness

Pandemic influenza – Preparedness



Pandemic influenza

Predictably unpredictable

WHO/SEARO/J.Perugia

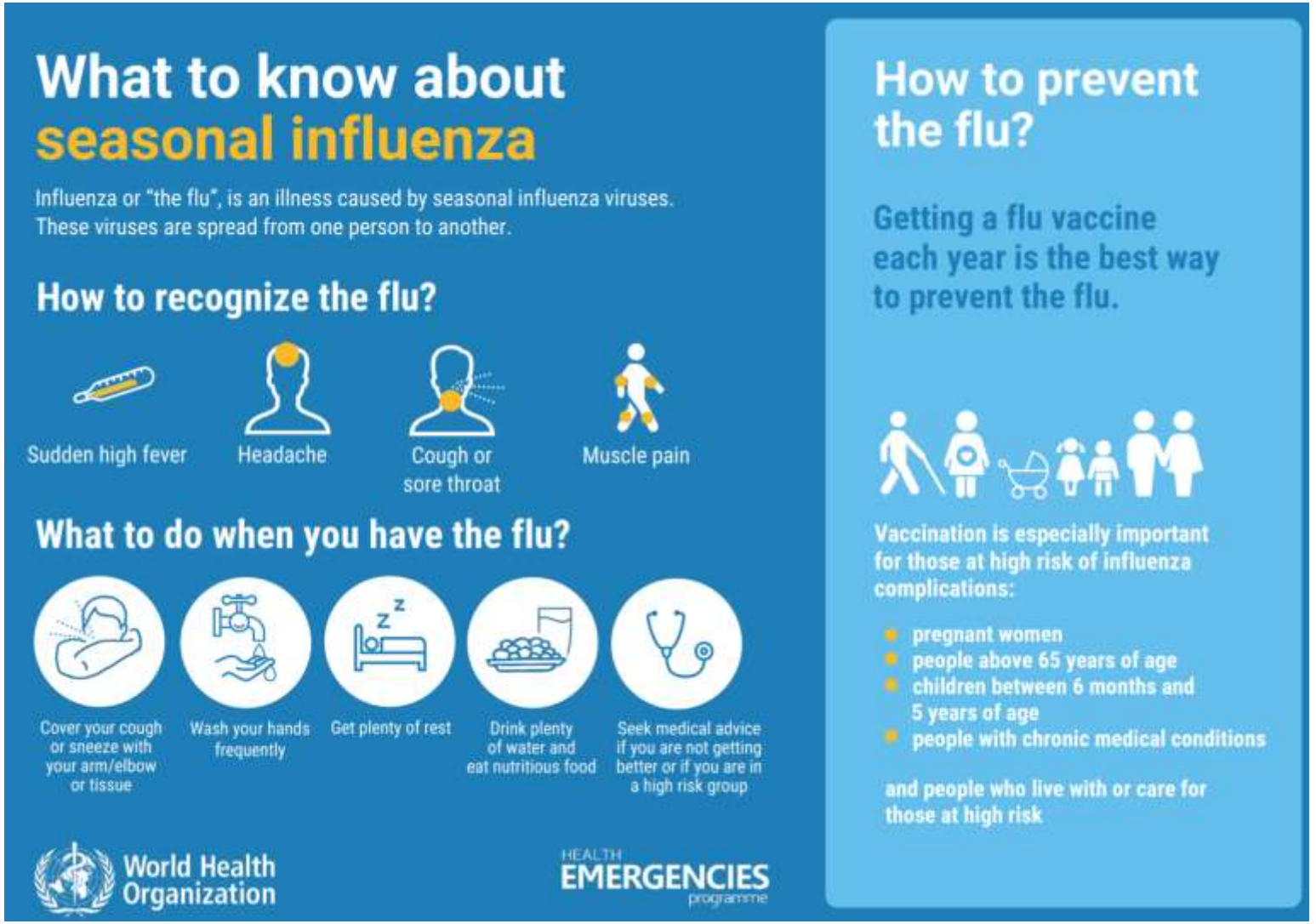
Predictably unpredictable

Influenza

Συνεχώς αναδυόμενη νόσος
που «ρολάρει»

Seasonal & Pandemic influenza

preparedness is similar



Ο ετήσιος εμβολιασμός κατά της γρίπης είναι ο καλύτερος τρόπος προφύλαξης από τη νόσο

ΕΡΩΤΗΣΕΙΣ ;