

# ΜΕΤΑΠΤΥΧΙΑΚΟ ΠΡΟΓΡΑΜΜΑ ΛΟΙΜΩΞΙΟΛΟΓΙΑ

**Γρίπη-Πανδημική γρίπη-Γρίπη πουλερικών**

**Σωτήρης Τσιόδρας**

**Καθηγητής Παθολογίας-Λοιμώξεων**

Ιατρική Σχολή ΕΚΠΑ

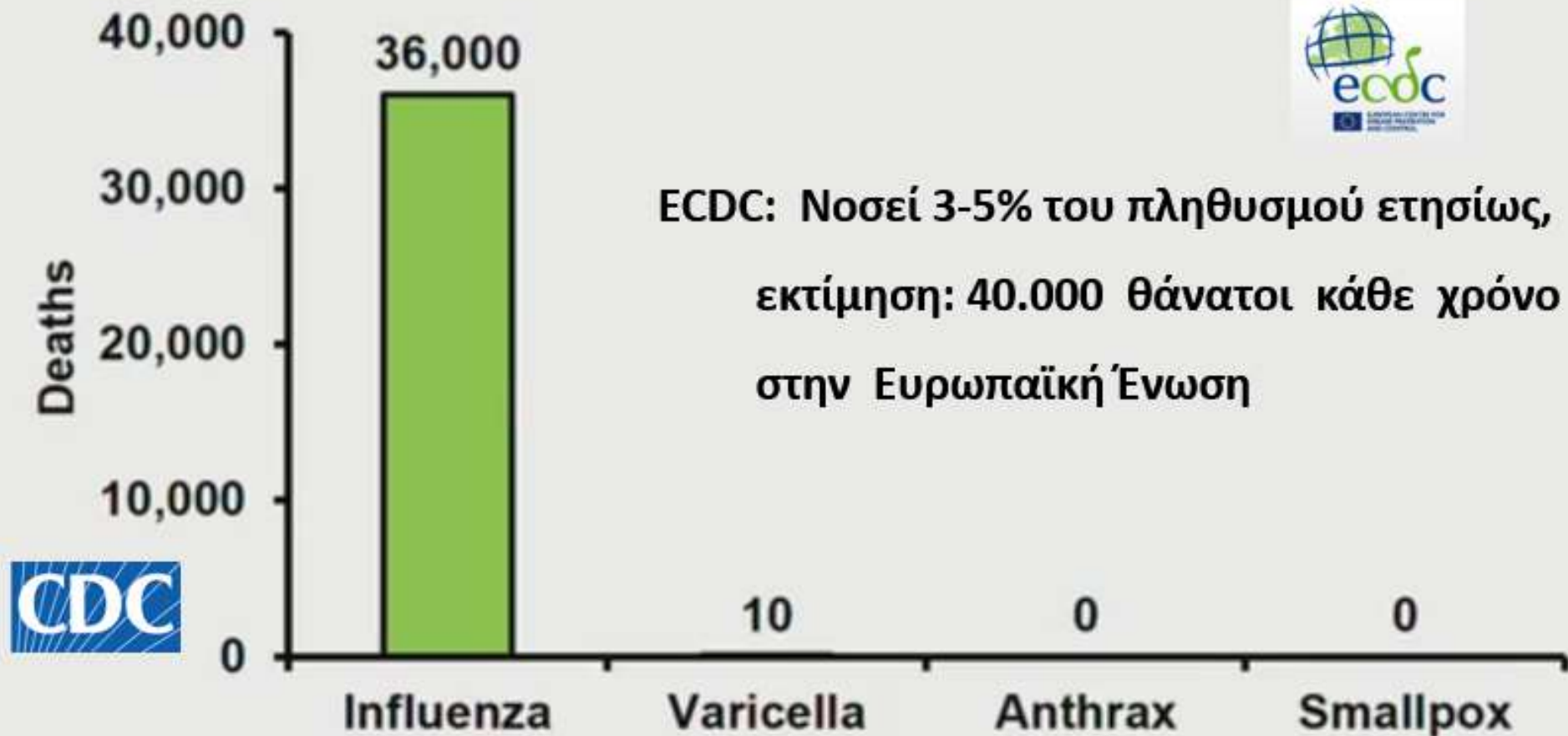
7/12/2021

# 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 προλαμβάνεται με εμβολιασμό
  - εκτίμηση: 250.000- 500.000 θάνατοι ετησίως

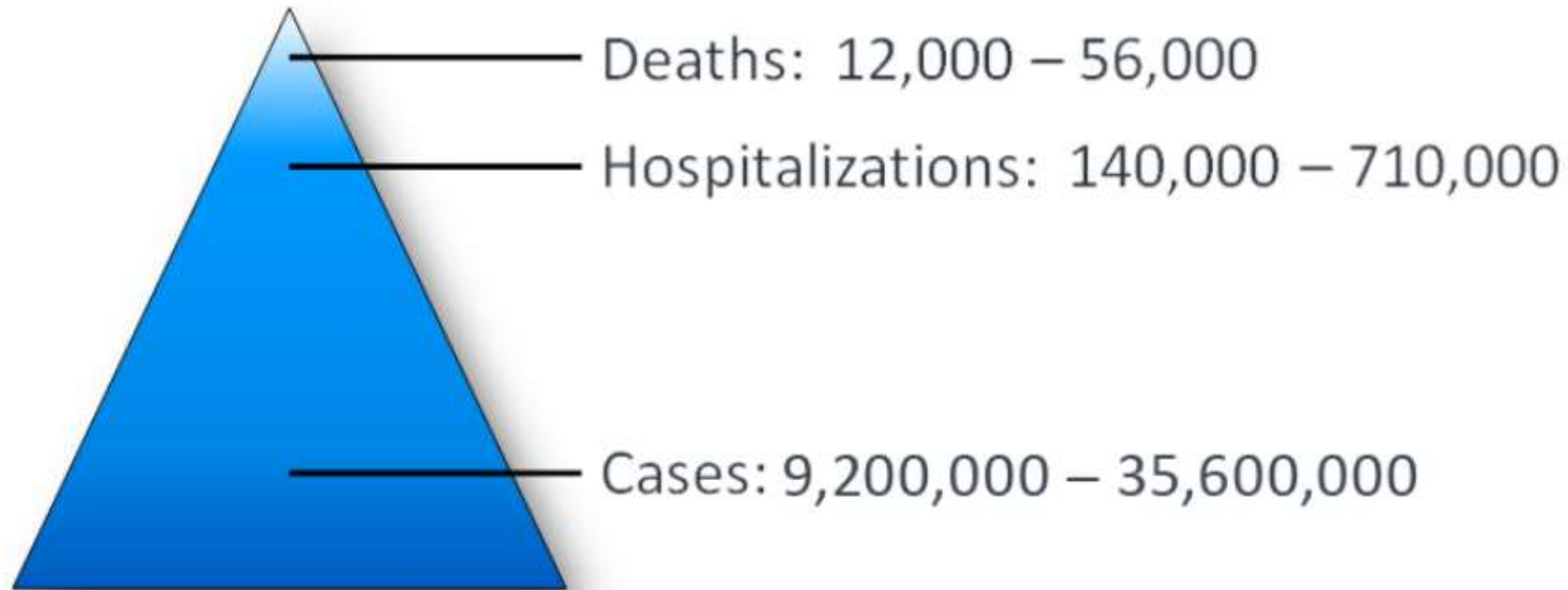


# Εποχική Γρίπη & συχνότητα



# 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



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



WHO / T. Pietrasik

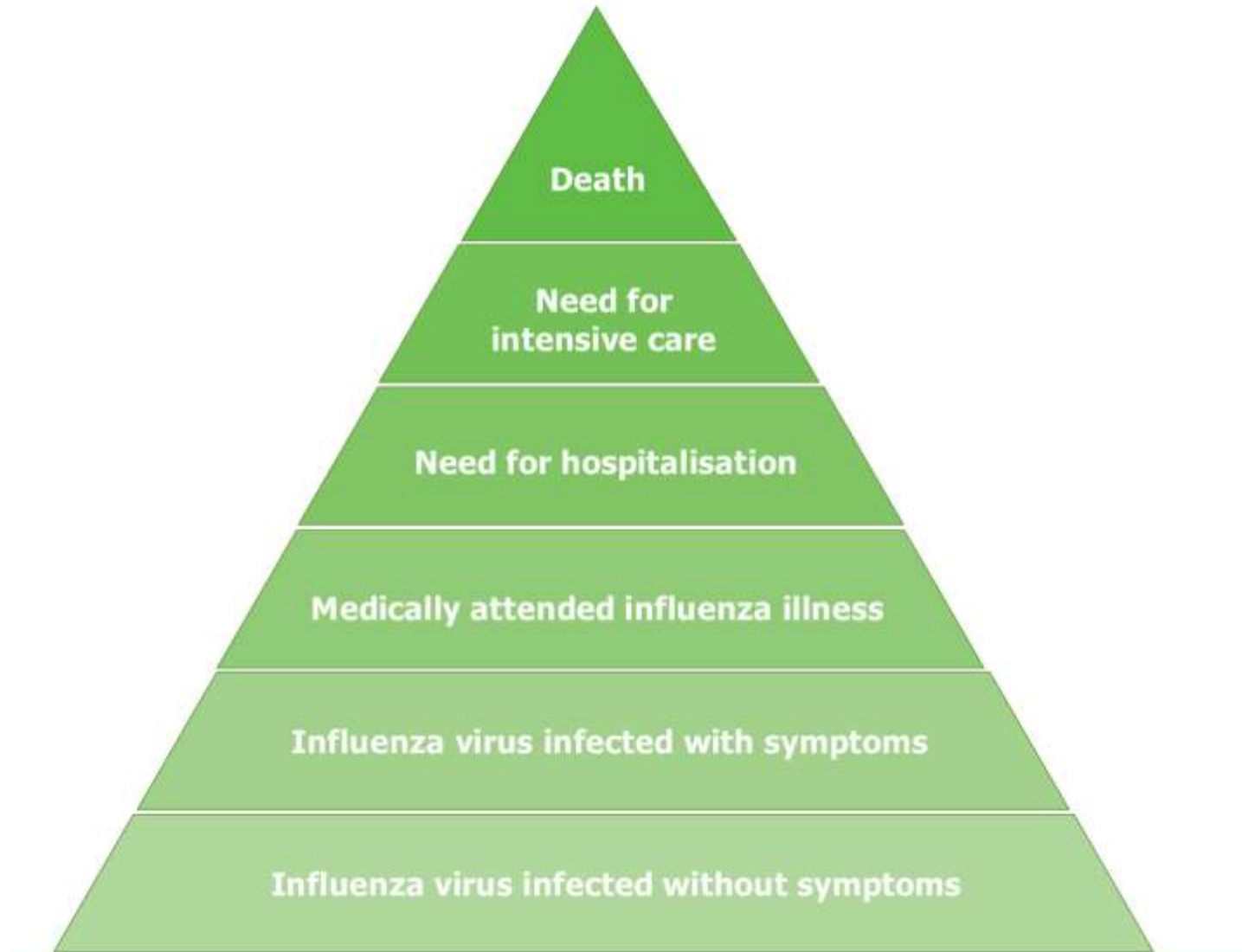


Up to 650 000 people die of respiratory diseases linked to seasonal flu each year



# Seasonal influenza & complications

More often in elderly



# Influenza & οξύ έμφραγμα μυοκαρδίου

The New England Journal of Medicine

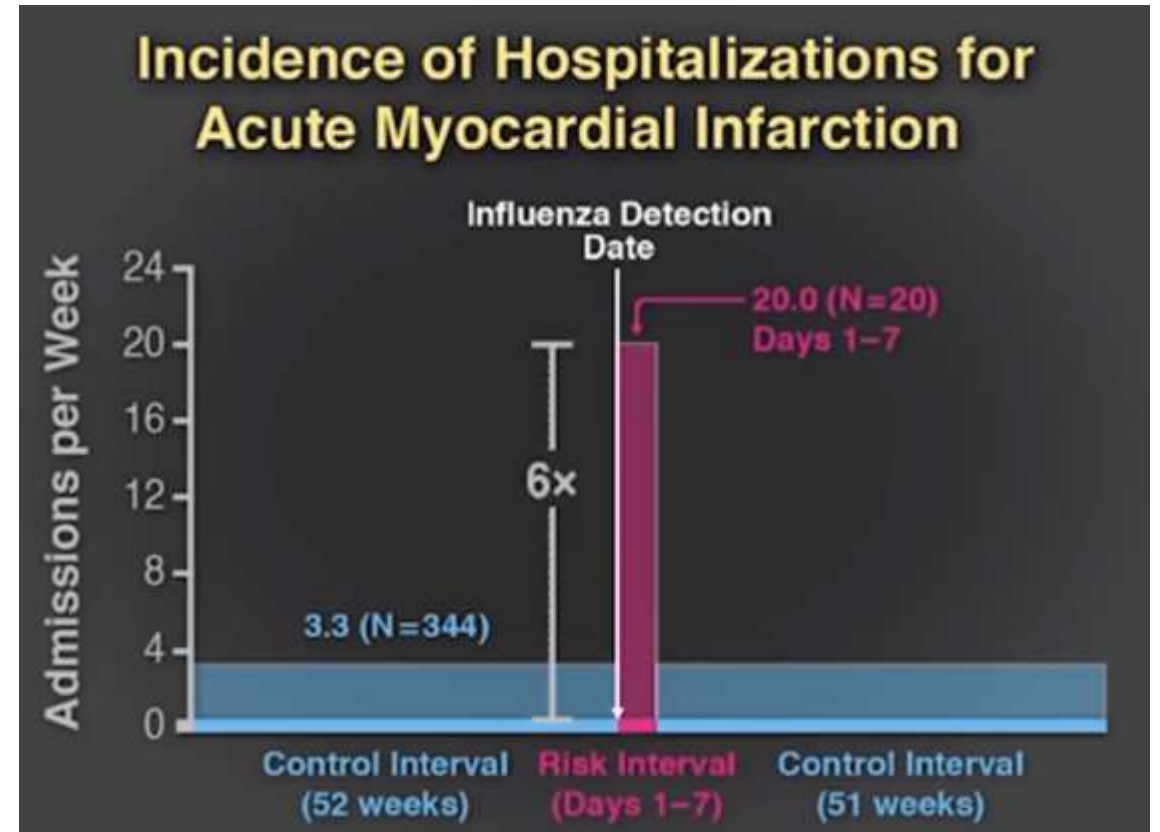
## Myocardial Infarction after Influenza Infection

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**

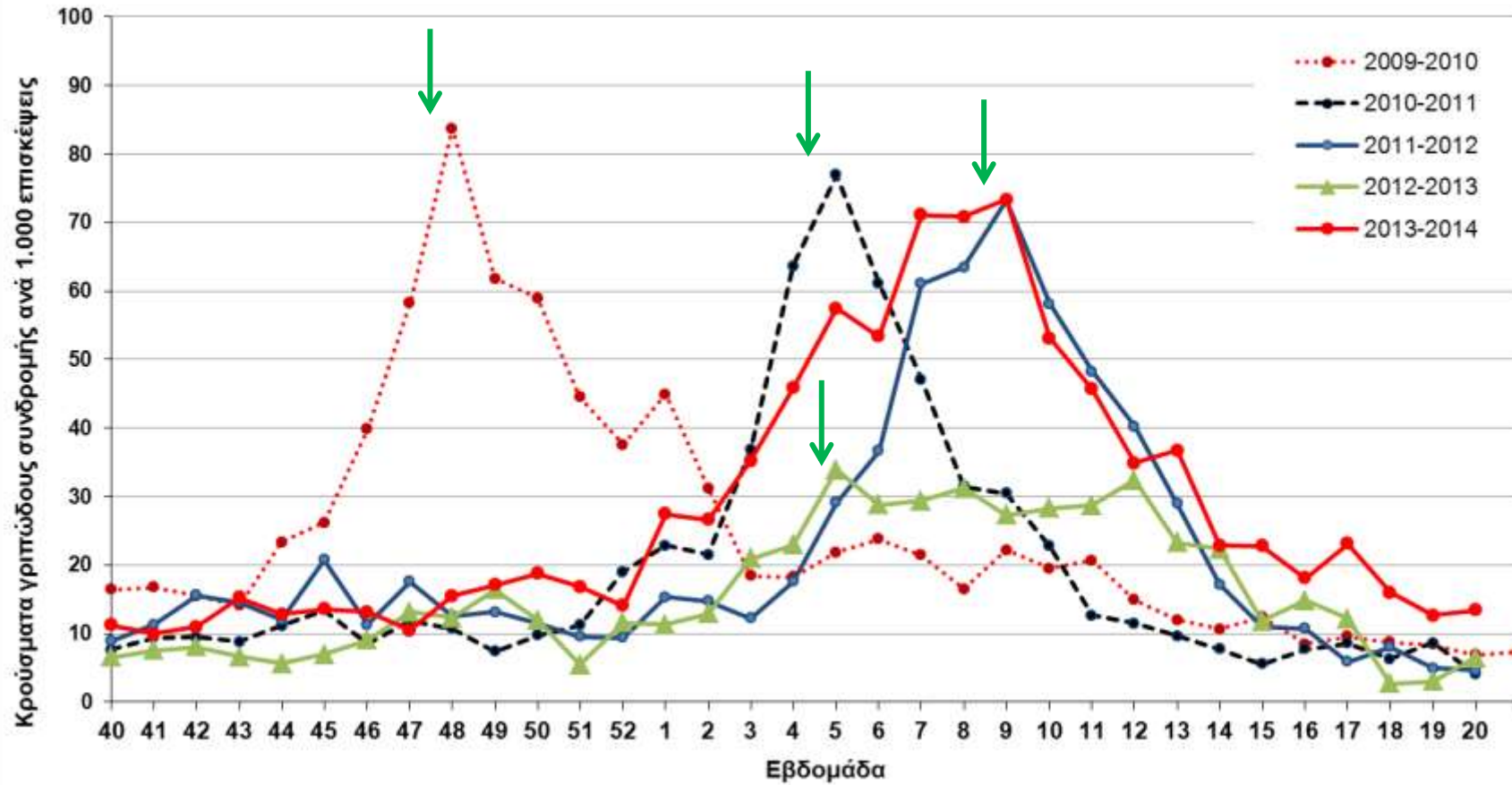


36,400 – 61,200  
flu **deaths**





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



# ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν (!)



SURVEILLANCE REPORT

## Seasonal influenza 2020–2021

Annual Epidemiological Report

# ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

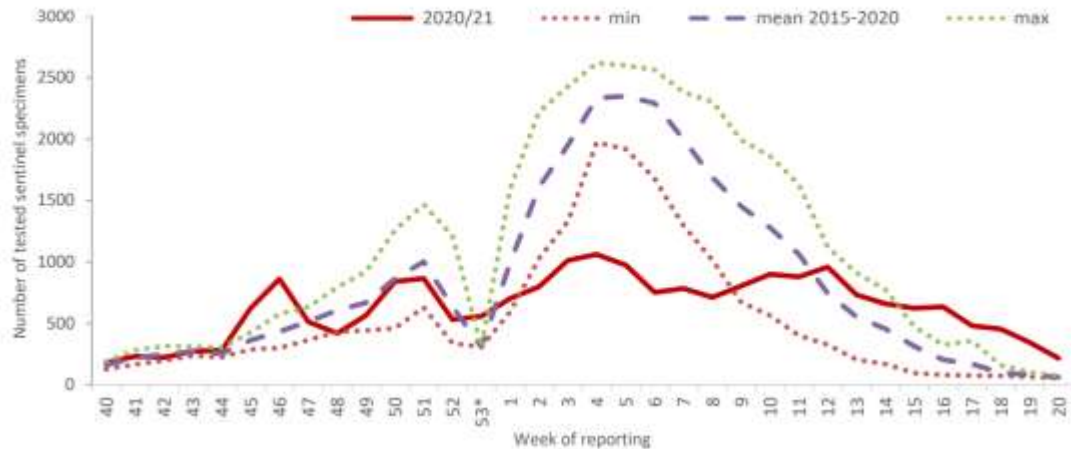
Μια πολύ περίεργη σεζόν για ΕU/ΕΕΑ (!)

- **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/ΕΕΑ (!)

**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



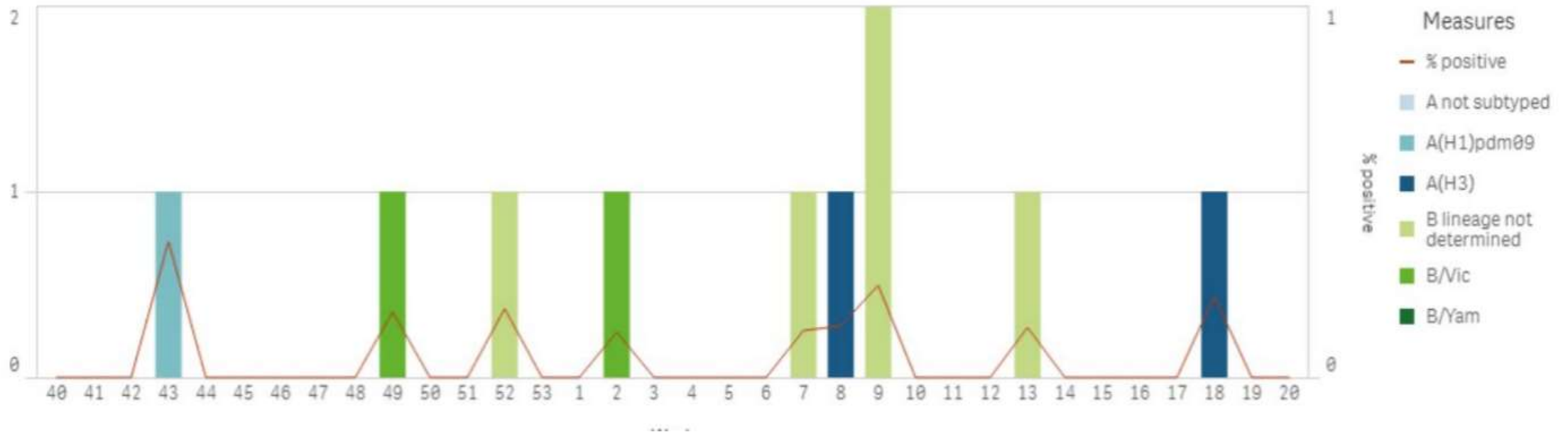
**Table 1.** Number of positive tested sentinel and non-sentinel specimens by type and subtype/lineage, EU/EEA countries, 2020-21

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	
<b>Total</b>	<b>10 (21 442)</b>		<b>158 (577 476)</b>	

# ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

Μια πολύ περίεργη σεζόν για ΕU/ΕΕΑ (!)

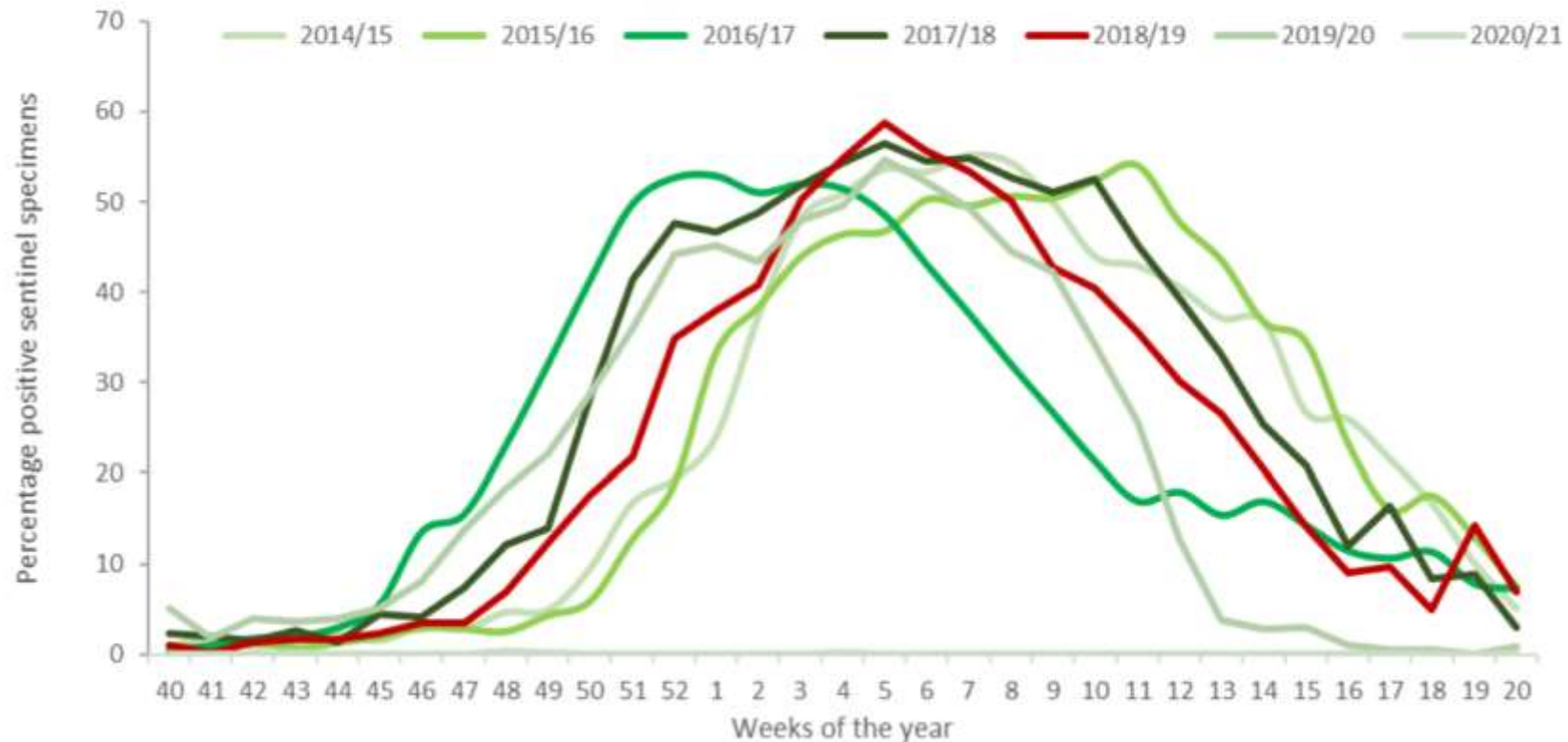
**Figure 2. Weekly proportion of sentinel specimens positive for influenza virus and number of detections by virus type, subtype/lineage and week of reporting, EU/EEA, 2020-21**



# 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/ΕΕΑ (!)

- 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/ΕΕΑ
- neither were there any fatalities from influenza reported

# ΕΠΟΧΙΚΗ ΓΡΙΠΗ 2020-21?

## Μια πολύ περίεργη σεζόν για EU/ΕΕΑ (!)

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

	Number of influenza viruses attributed to genetic groups 2020/2021
<b>Total</b>	<b>14</b>
<b>Influenza A</b>	<b>9</b>
<b>A(H1)pdm09</b>	<b>1</b>
A/Guangdong-Maonan/SWL1536/2019(H1N1)pdm09	1
<b>A(H3)</b>	<b>8</b>
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
<b>Influenza B</b>	<b>5</b>
<b>B/Vic</b>	<b>5</b>
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!



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### 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](#)

A close-up photograph of a person wearing a white lab coat and a white surgical mask. They are holding a small, clear plastic vial with a white cap. The vial has a white label with handwritten text that includes "16/234", "2-2/2018", and "5 kmr - k". The person's eyes are visible above the mask, looking towards the camera.

# Annual composition of vaccine... for the other hemisphere



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## WHO Consultation on the Composition of Influenza Virus Vaccines for Use in the 2022 Southern Hemisphere Influenza Season

13 – 30 September 2021 | Geneva, Switzerland

It is recommended that **quadrivalent vaccines** for use in the 2022 southern hemisphere be composed of the 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

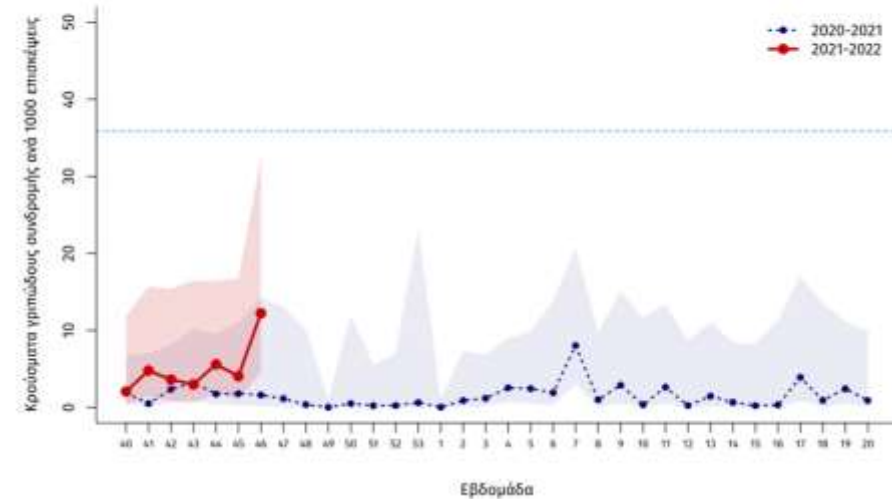


ΕΘΝΙΚΟΣ ΟΡΓΑΝΙΣΜΟΣ  
ΔΗΜΟΣΙΑΣ ΥΓΕΙΑΣ

25 Νοεμβρίου 2021

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

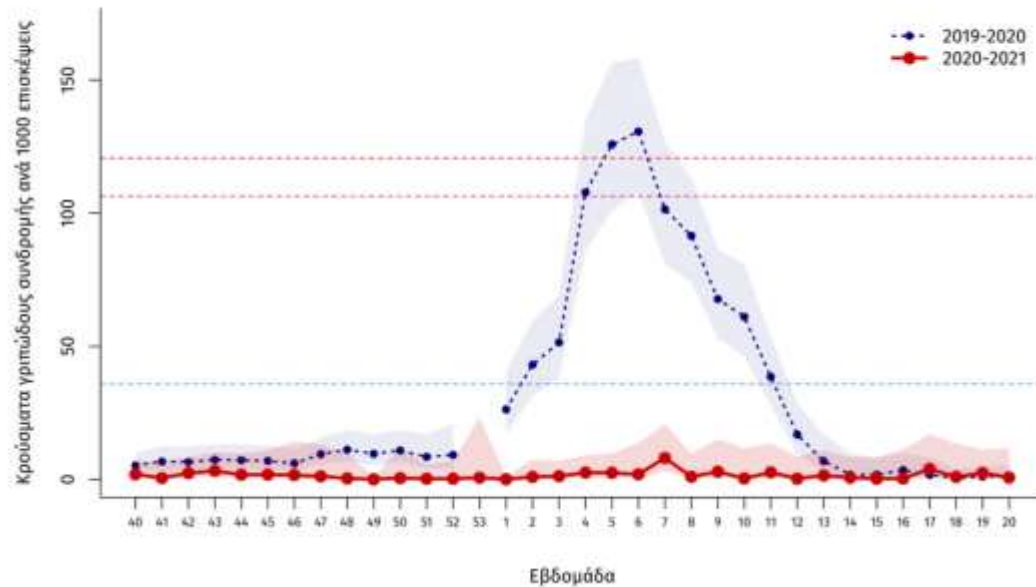
Διάγραμμα 1: Εκτίμηση αριθμού κρουσμάτων γριπώδους συνδρομής ανά 1.000 επισκέψεις, κατά εβδομάδα. Σύνολο χώρας, περίοδοι γρίπης: 2020-2021, 2021-2022.



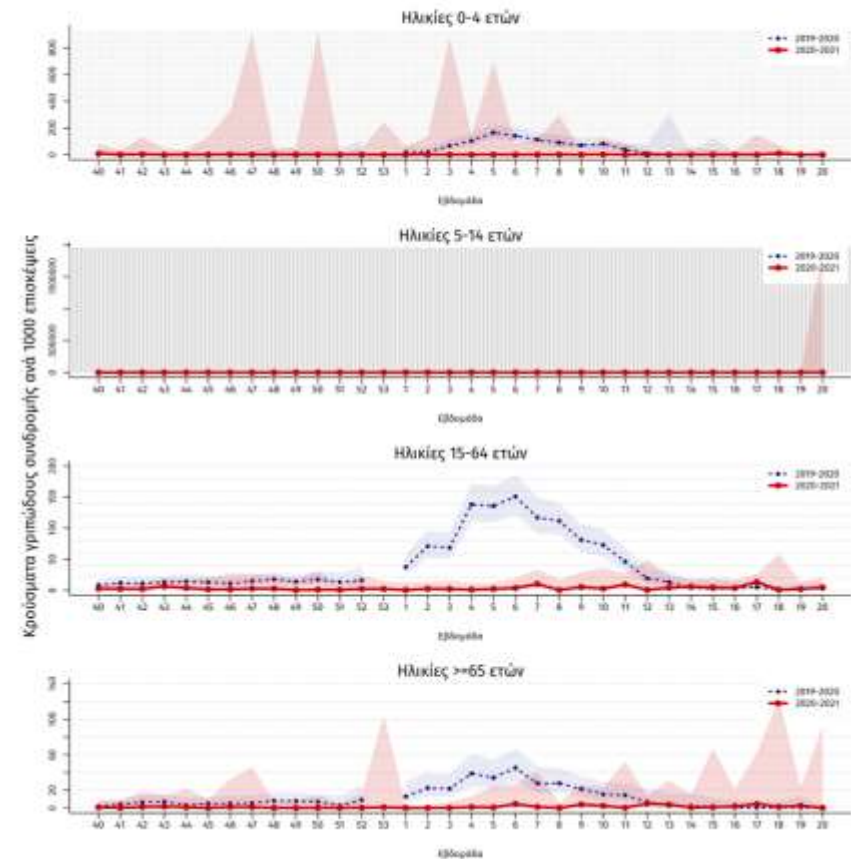
- Κατά την εβδομάδα 46/2021 (15–21 Νοεμβρίου 2021) οι επισκέψεις σε ιατρό για γριπώδη συνδρομή παραμένουν σε χαμηλά επίπεδα (Διάγραμμα 1 και 2).
- Κατά την εβδομάδα 46/2021 (15–21 Νοεμβρίου 2021) στα δύο Εθνικά Εργαστήρια Αναφοράς Γρίπης (Τμήμα Ιολογίας, Ελληνικό Ινστιτούτο Παστέρ, και Β' Εργαστήριο 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, περιοδοι γρίπης: 2019-2020, 2020-2021.

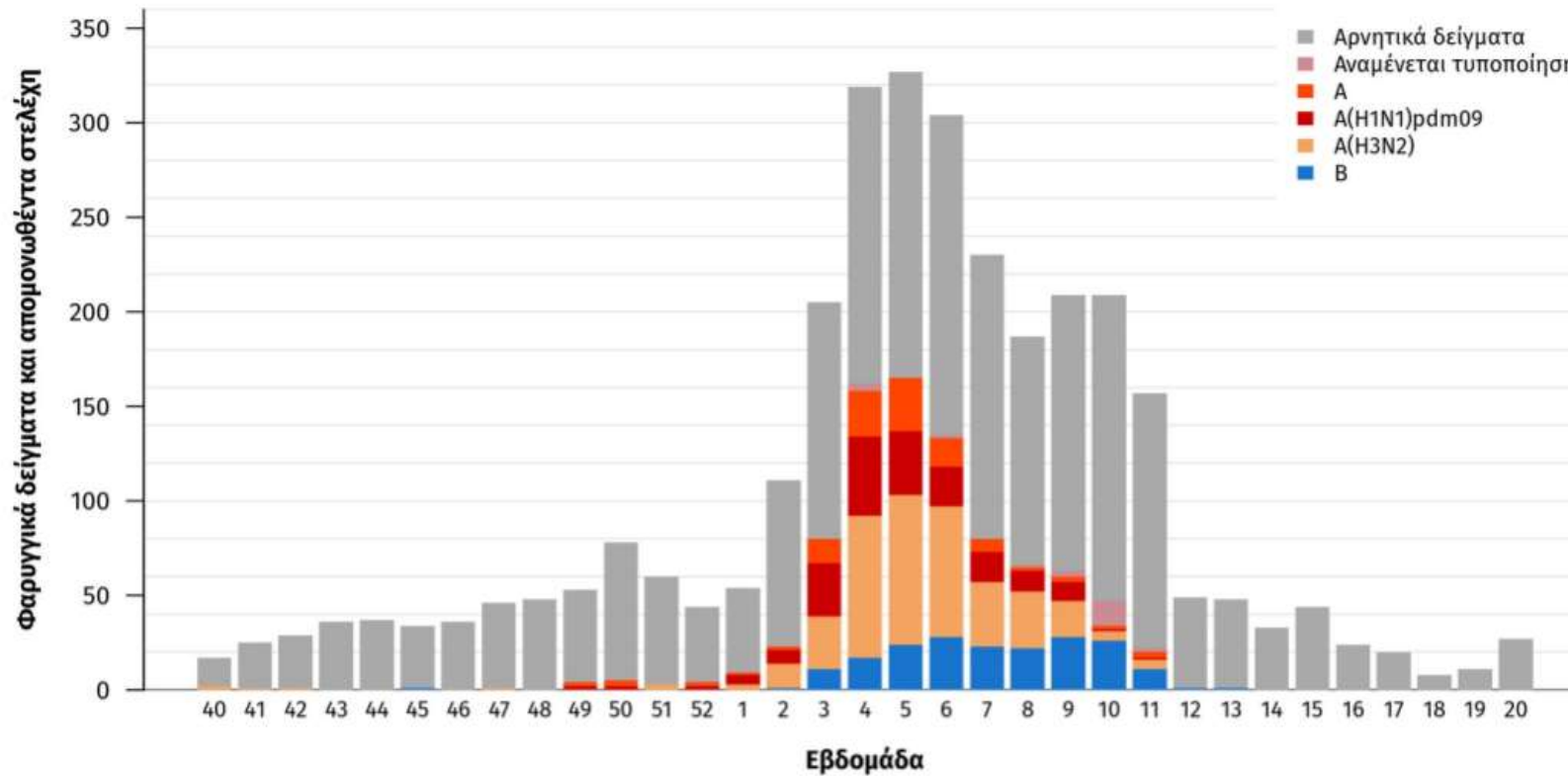


**Διάγραμμα 2:** Εκτίμηση αριθμού κρουσμάτων γριπώδους συνδρομής ανά 1.000 επισκέψεις, κατά εβδομάδα, ανά ηλικιακή ομάδα. Σύνολο χώρας, περιοδοι γρίπης: 2019-2020, 2020-2021.



# 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

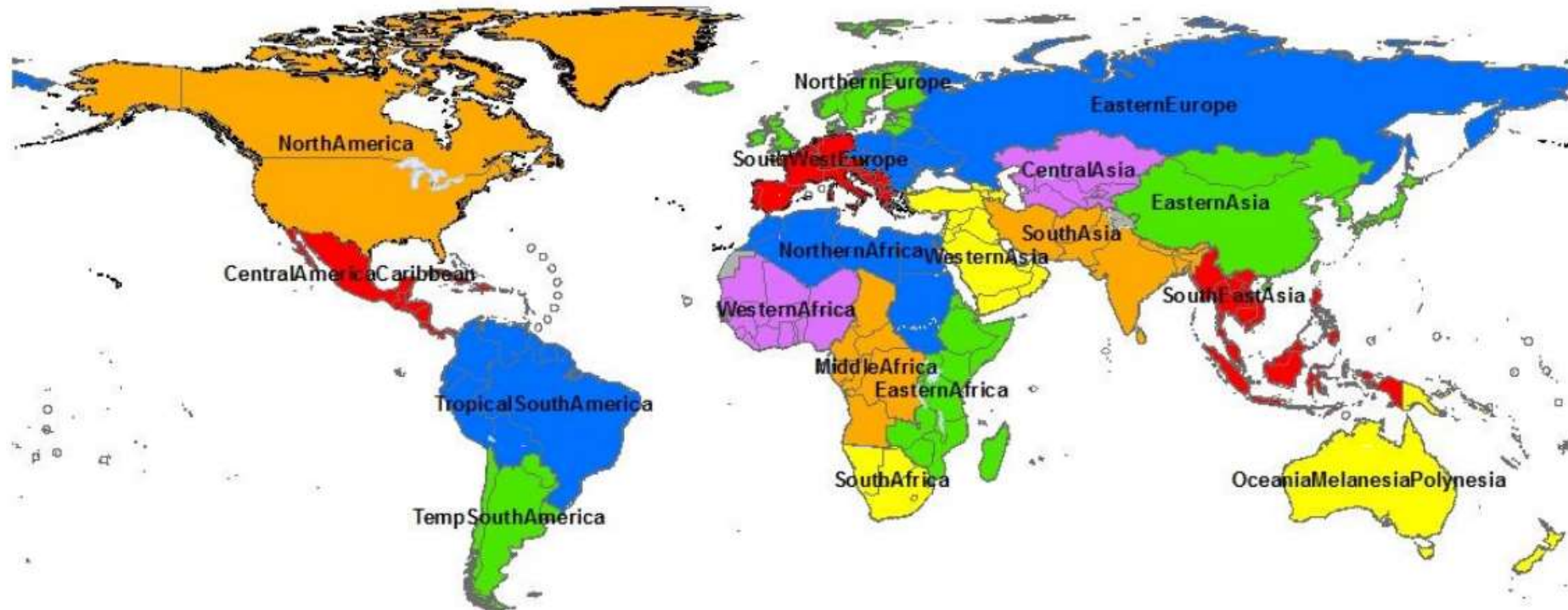
## δεν χαρακτηρίστηκαν στελέχη

- 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

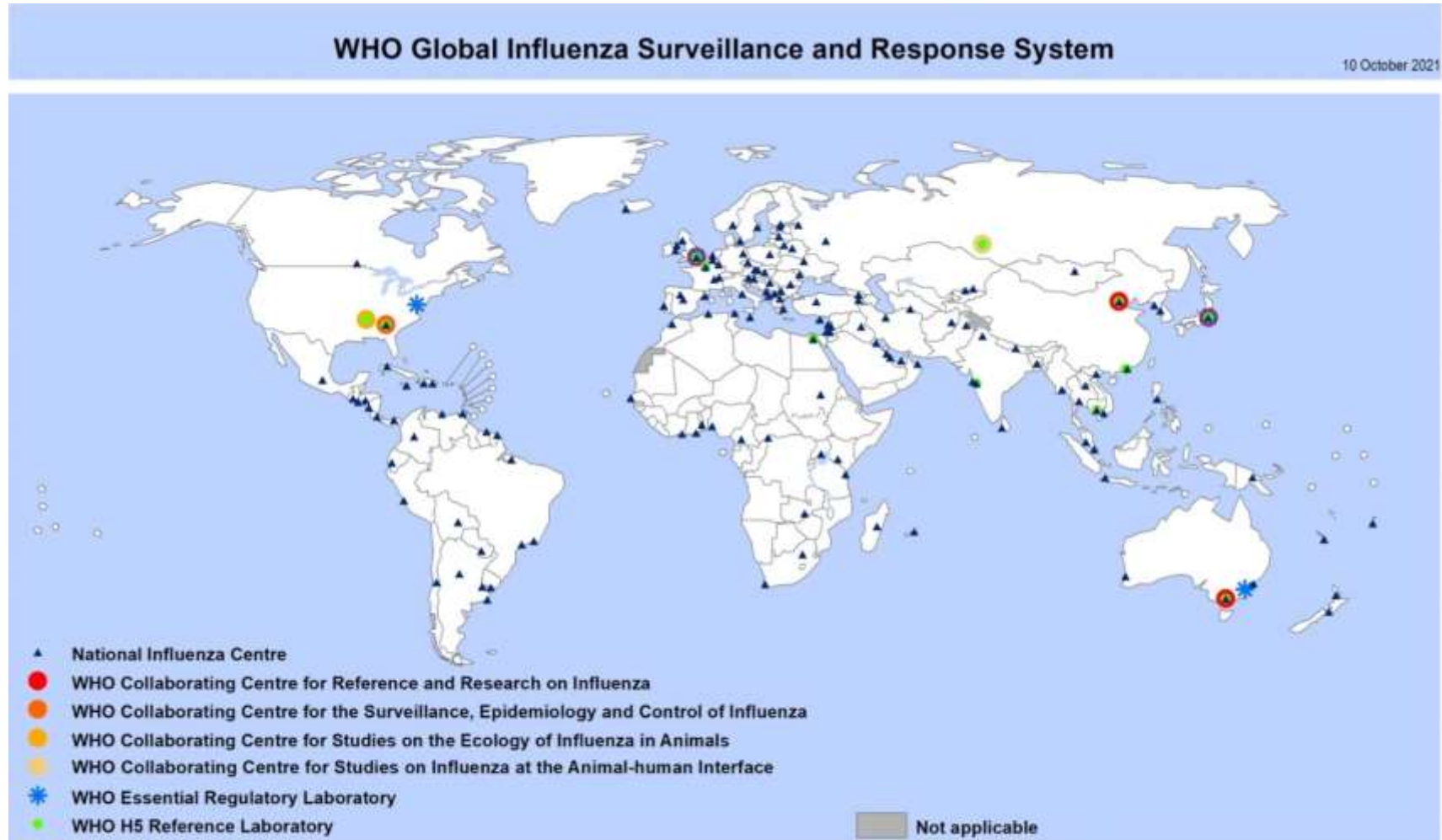
Influenza - COVID-19 Interface

(COVID-19) Pandemic

Coronavirus disease

Global Influenza Surveillance and Response System

GISRS



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: Global Influenza Surveillance and Response System (GISRS), WHO  
Map Production: Global Influenza Programme  
World Health Organization

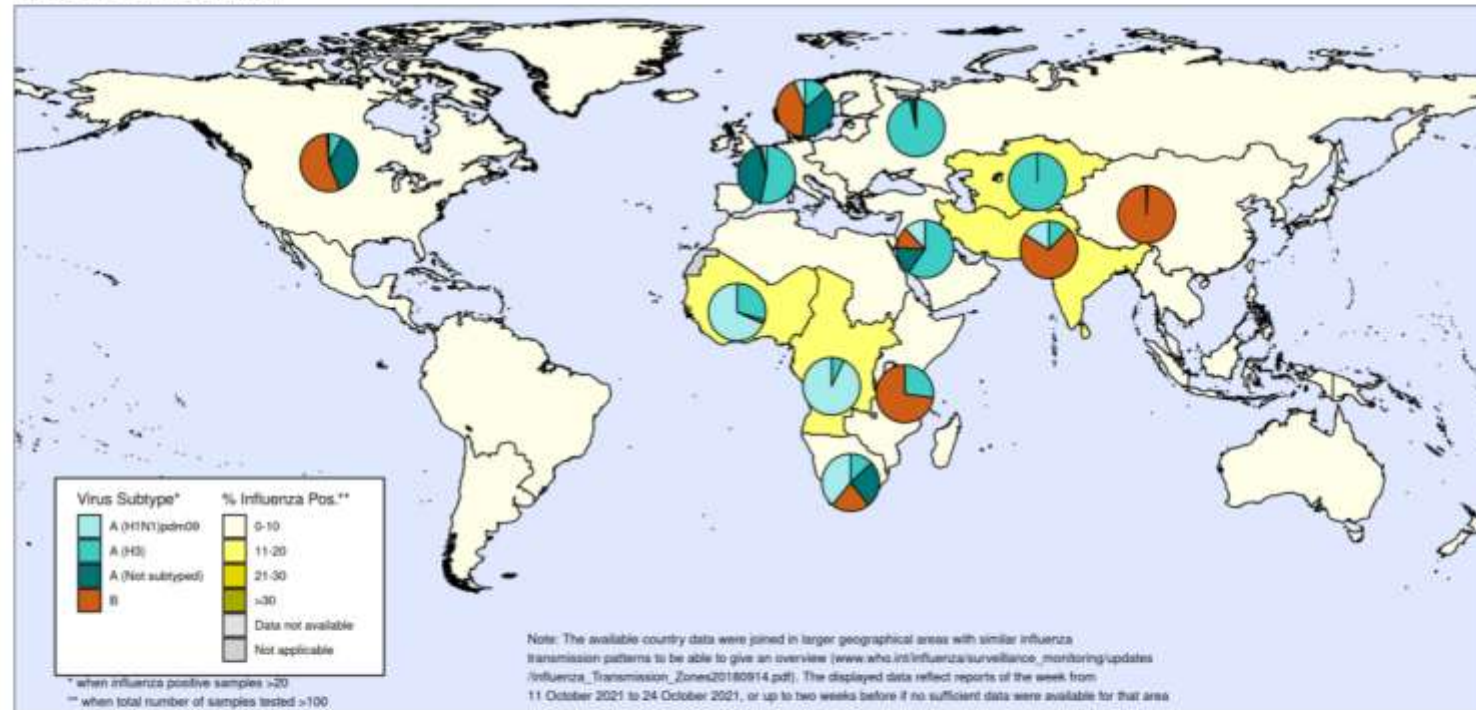


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# Influenza lab surveillance Nov 2021

Percentage of respiratory specimens that tested positive for influenza by influenza transmission zone<sup>1</sup>. Map generated on 5 November 2021.

Percentage of respiratory specimens that tested positive for influenza  
By influenza transmission zone  
Map generated on 05 November 2021

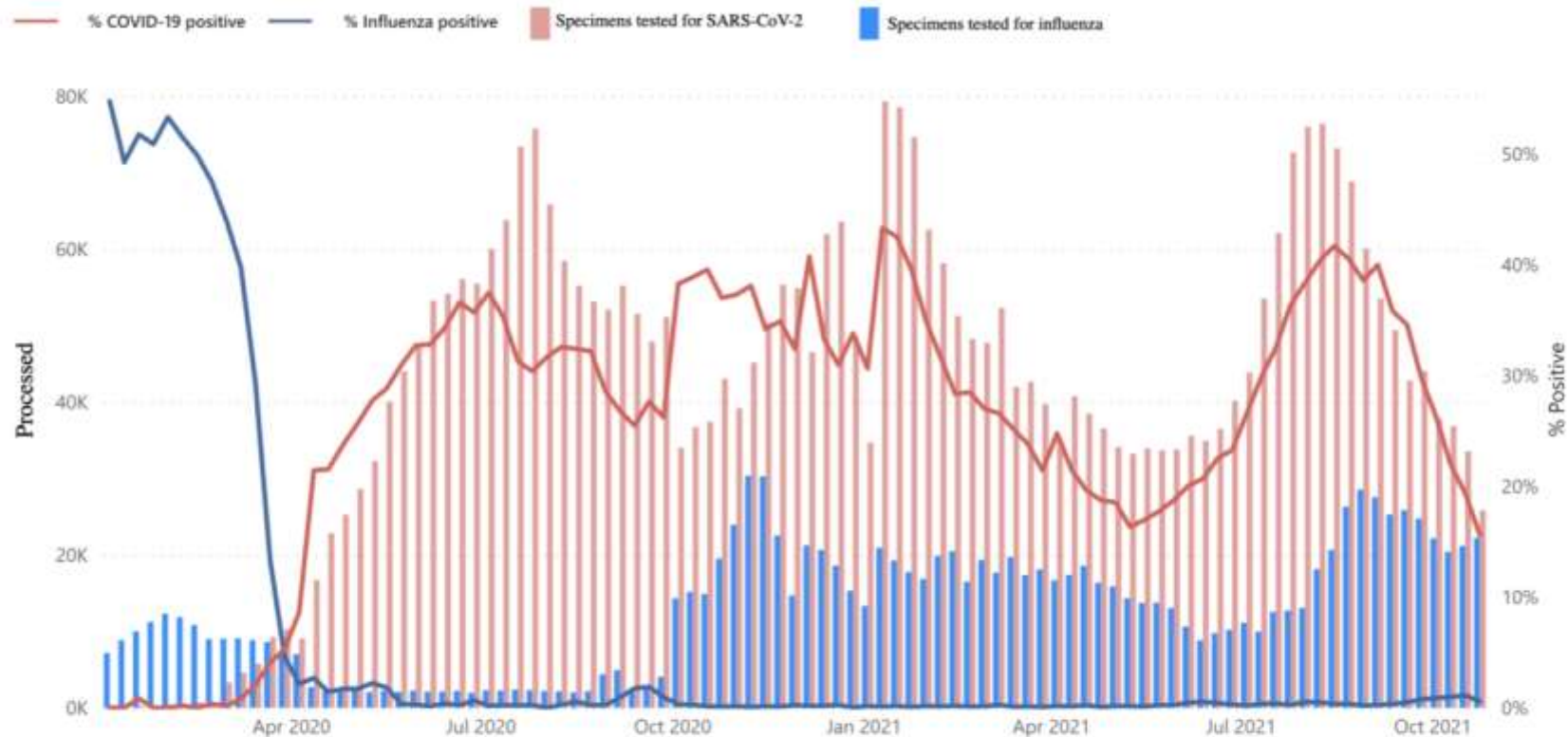


The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data source: Global Influenza Surveillance and Response System (GISRS), FluNet ([www.who.int/flu-net](http://www.who.int/flu-net))  
Copyright WHO 2021. All rights reserved.

# Influenza surveillance, global data, Nov 2021

## double surveillance both influenza & SARS-CoV-2

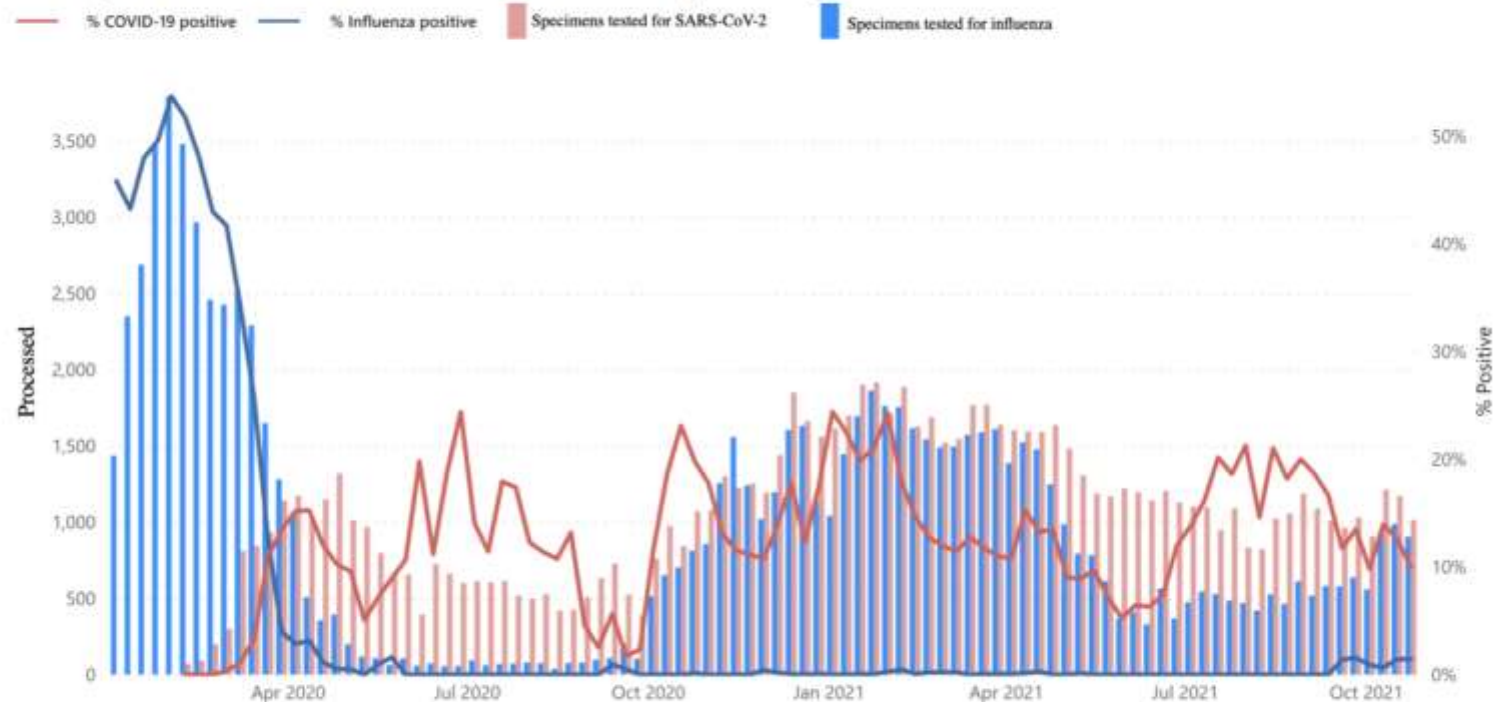


Data source: FluNet ([www.who.int/toolkits/flunet](http://www.who.int/toolkits/flunet)). Global Influenza Surveillance and Response System (GISRS)  
Data generated on 5/11/2021

# 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



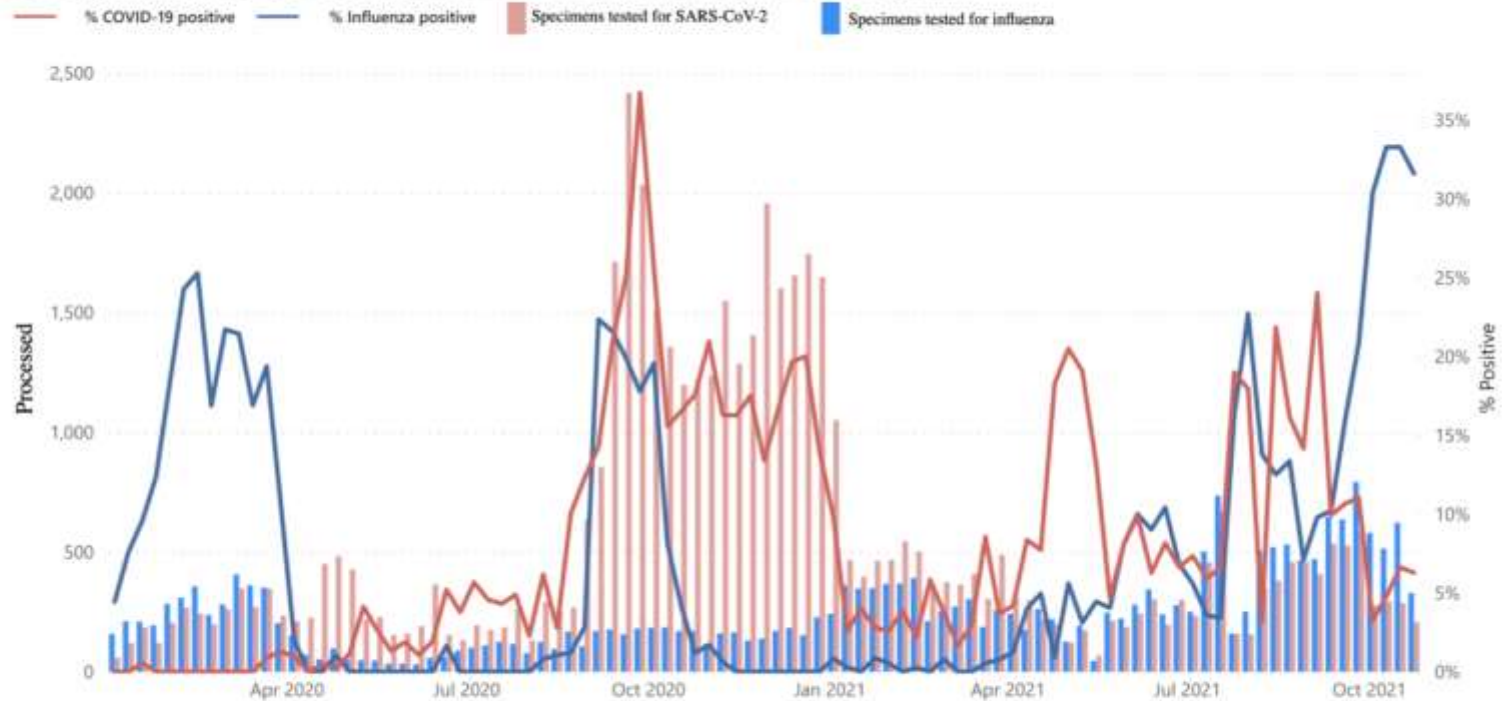
Data source: FluNet ([www.who.int/toolkits/flunet](http://www.who.int/toolkits/flunet)). Global Influenza Surveillance and Response System (GISRS)

Data generated on 5/11/2021

# 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



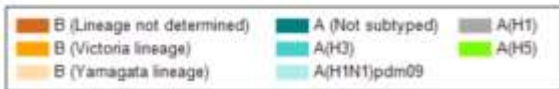
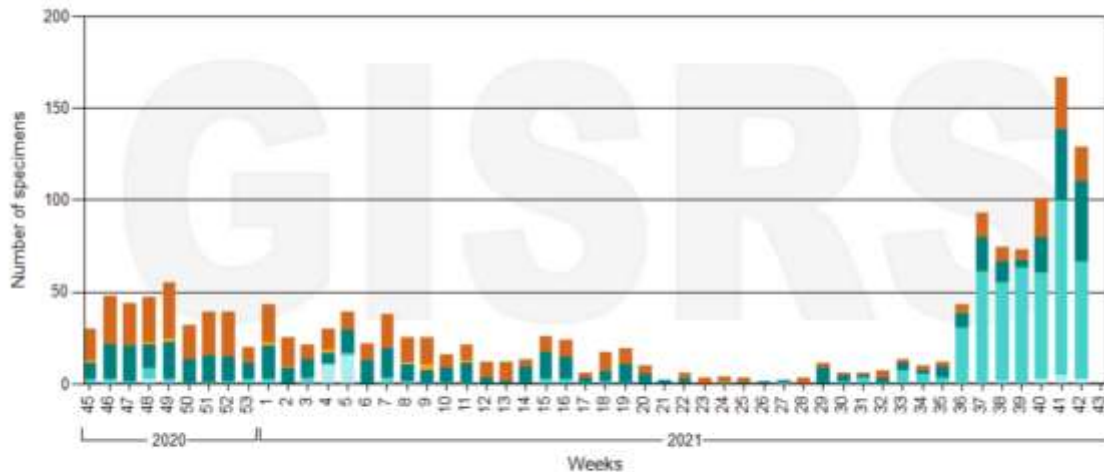
Data source: FluNet ([www.who.int/toolkits/flunet](http://www.who.int/toolkits/flunet)). Global Influenza Surveillance and Response System (GISRS)

Data generated on 5/11/2021

# Influenza lab surveillance Nov 2021

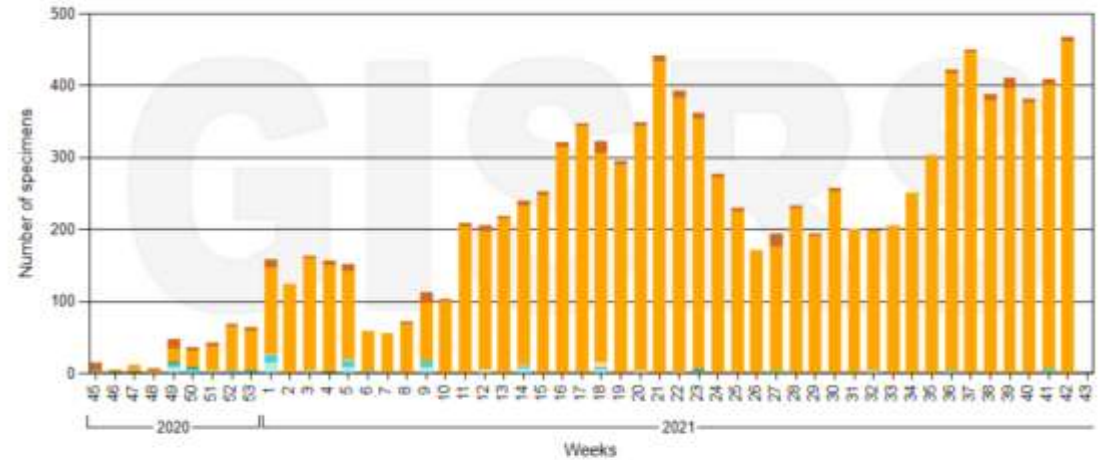
note difference between continents

Number of specimens positive for influenza by subtype in the European Region of WHO



Data from: All sites

Number of specimens positive for influenza by subtype in Eastern Asia

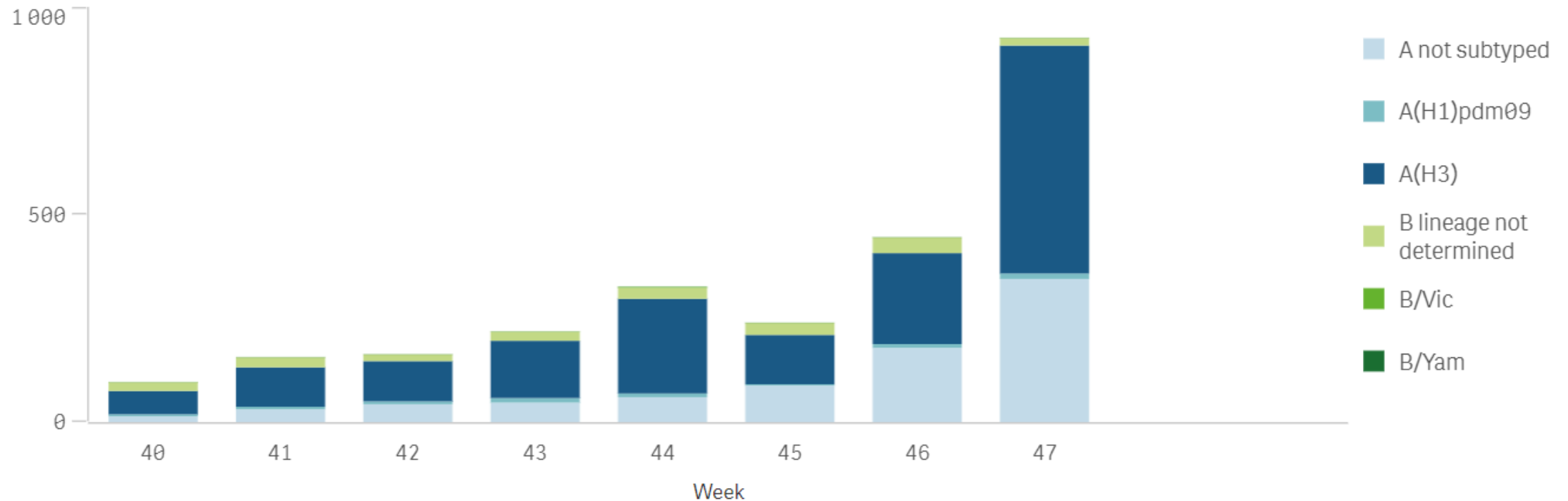


Data from: All sites

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

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

Influenza virus detections by type, subtype/lineage and week - WHO Europe, season 2021/2022



Sentinel data

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

## dominant virus

Dominant influenza virus (EU layout map), 2021-W47



© World Health Organization 2021

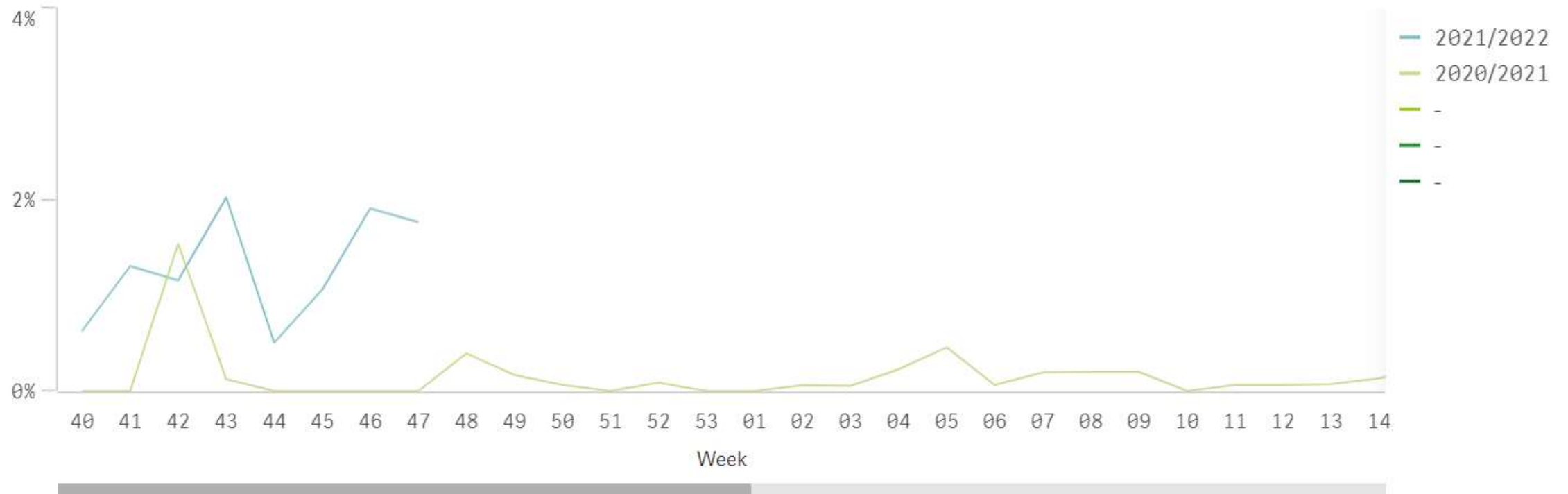
© European Centre for Disease Prevention and Control 2021



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

positivity rate < 10%, threshold for epidemic

Influenza positivity in sentinel-source specimens by week - WHO Europe



Sentinel data

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

intensity -> low at the moment

Intensity of influenza activity (EU layout map), 2021-W47



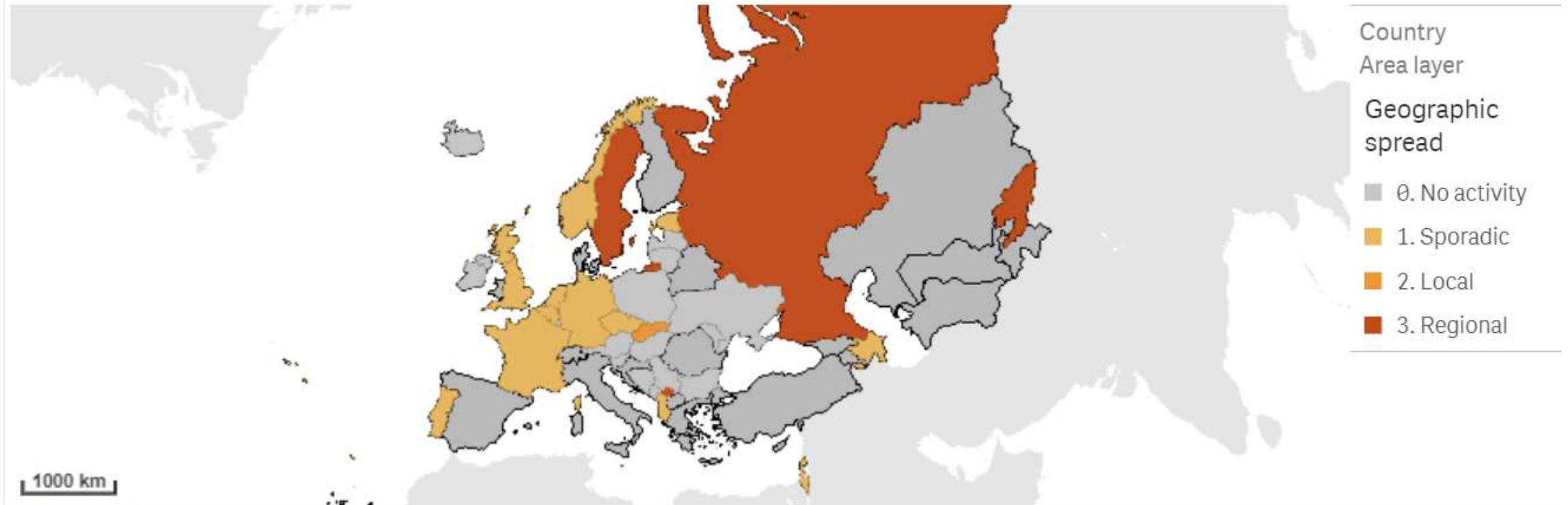
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# Influenza 2021-22, EU/EEA, wk 47 2021

## geographic spread

Geographic spread of influenza activity (EU layout map), 2021-W47



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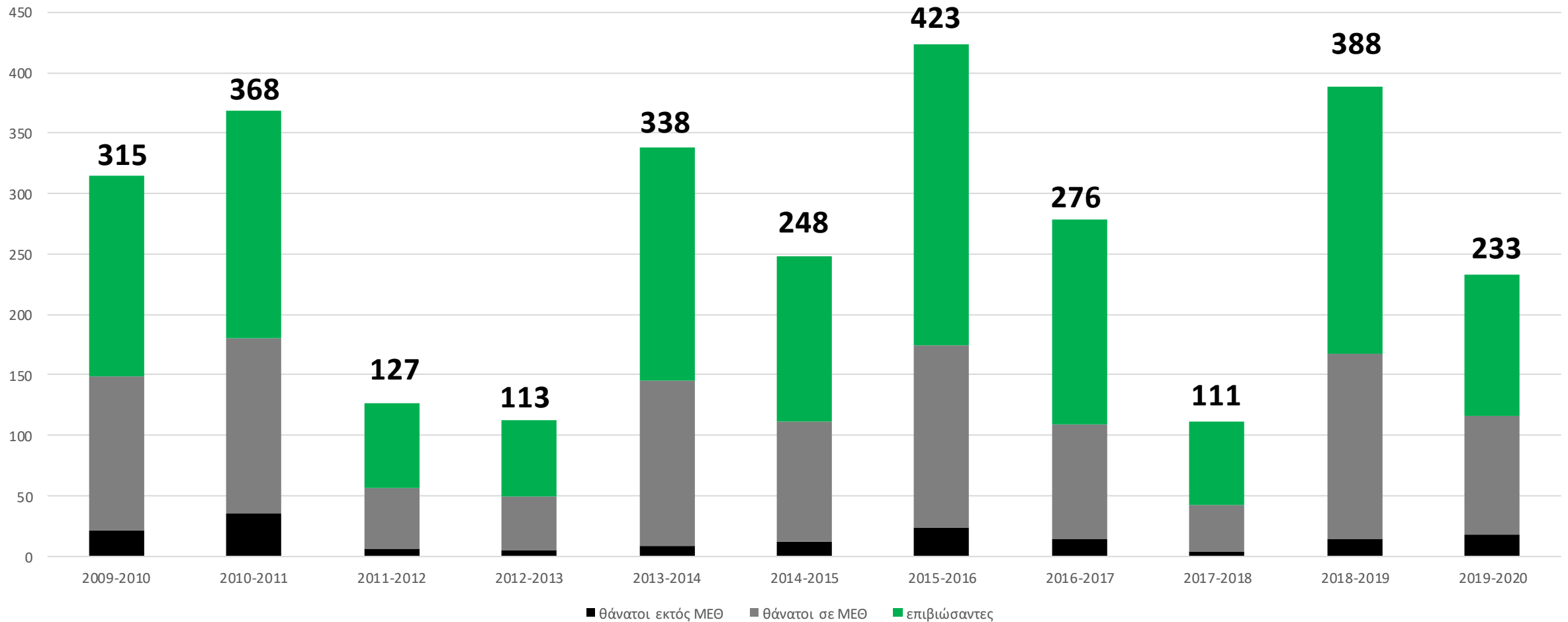
© European Centre for Disease Prevention and Control 2021

**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 !!!

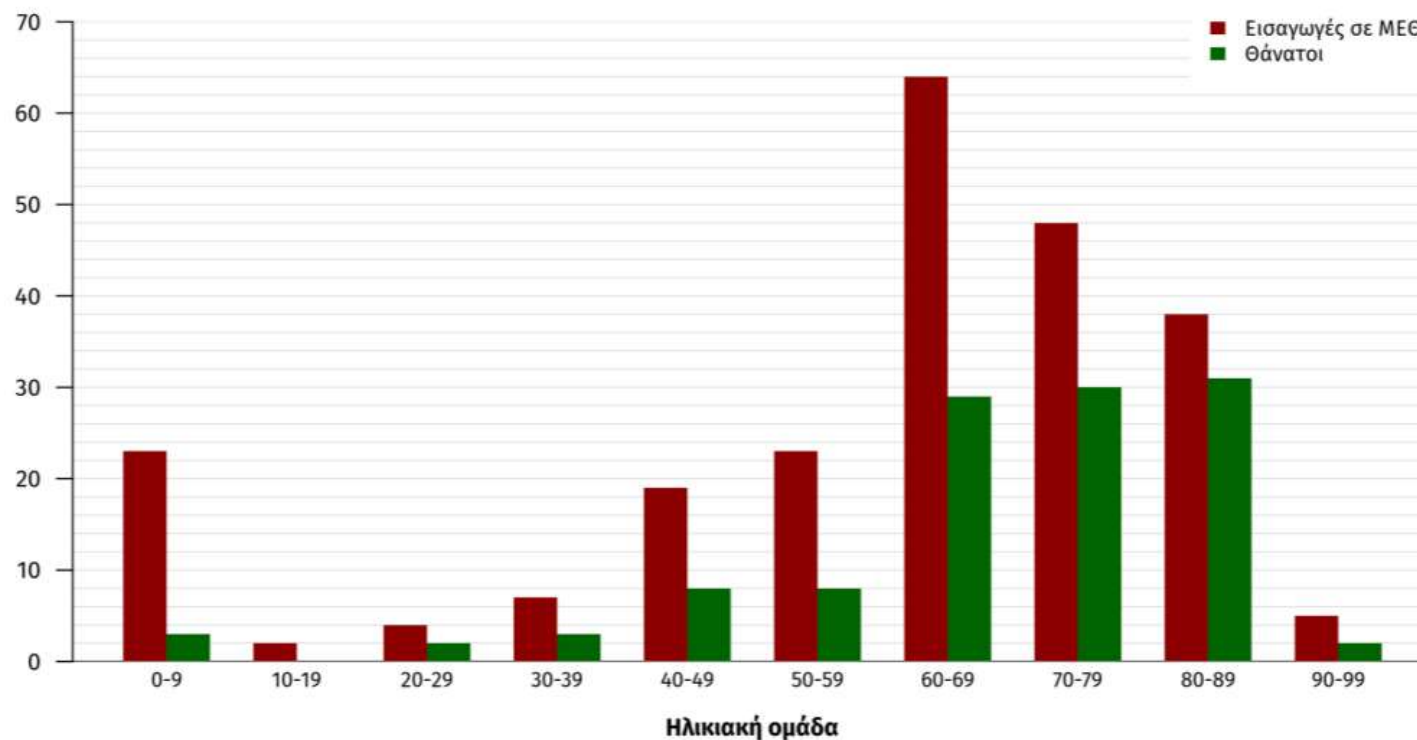
- Η πλειοψηφία όσων ασθενούν με γρίπη
  - νοσοούν για 3 έως 7 ημέρες και
- η υγεία τους αποκαθίσταται πλήρως



# Γρίπη – Ελλάδα, 2019-20

## Influenza A dominant season, age effect

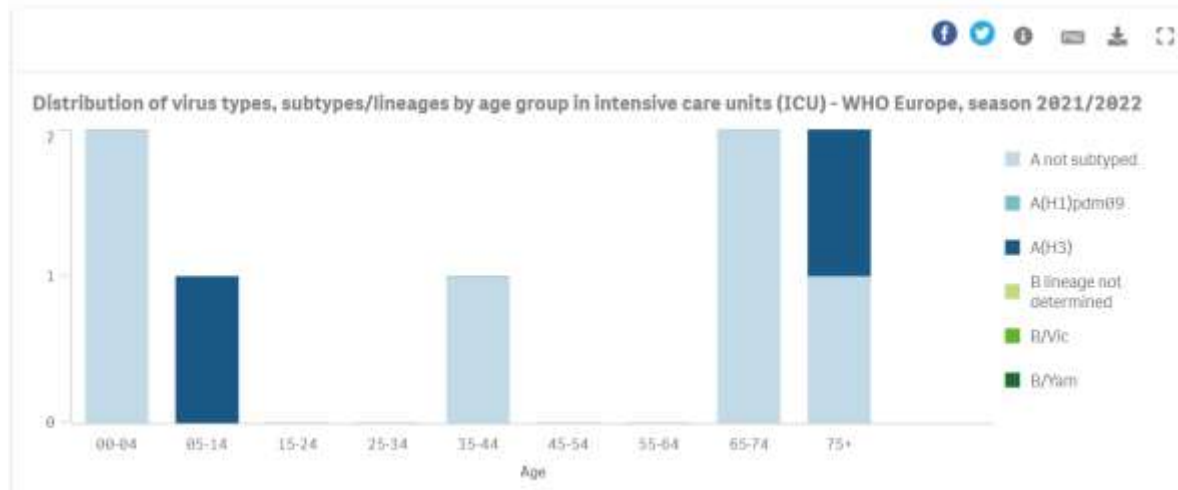
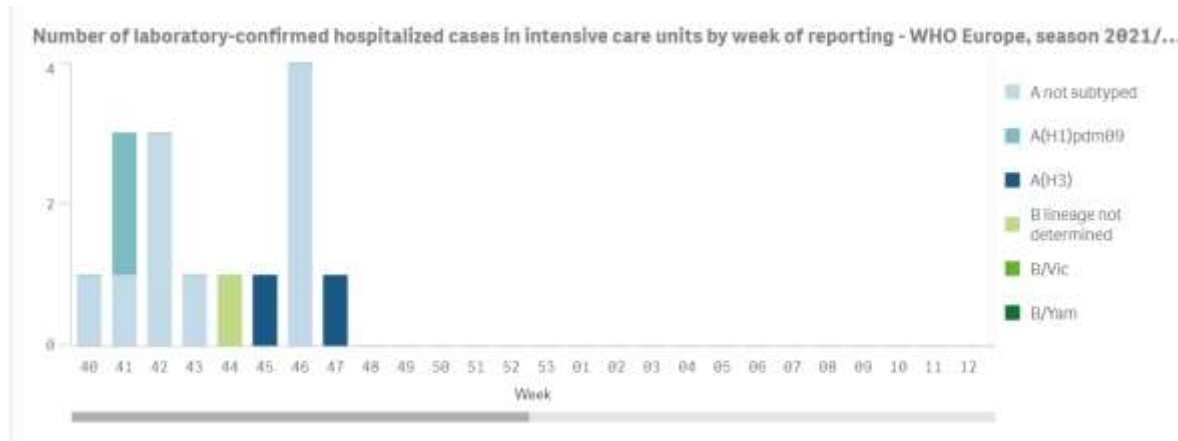
Διάγραμμα 6: Ηλικιακή κατανομή εισαχθέντων σε Μ.Ε.Θ. με εργαστηριακά επιβεβαιωμένη γρίπη και ασθενών που κατέληξαν σε Μ.Ε.Θ ή εκτός Μ.Ε.Θ. Σύνολο Ελλάδας, από εβδομάδα 40/2019 έως εβδομάδα 20/2020 (11-17 Μαΐου 2020).





# Γρίπη – Ευρώπη, 2021-21

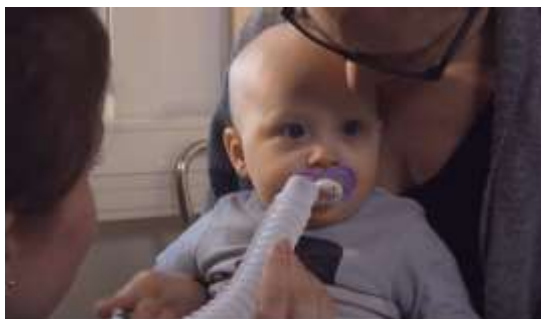
## Influenza A dominant season, age effect



# ΑΤΟΜΑ ↑↑ ΚΙΝΔΥΝΟΥ

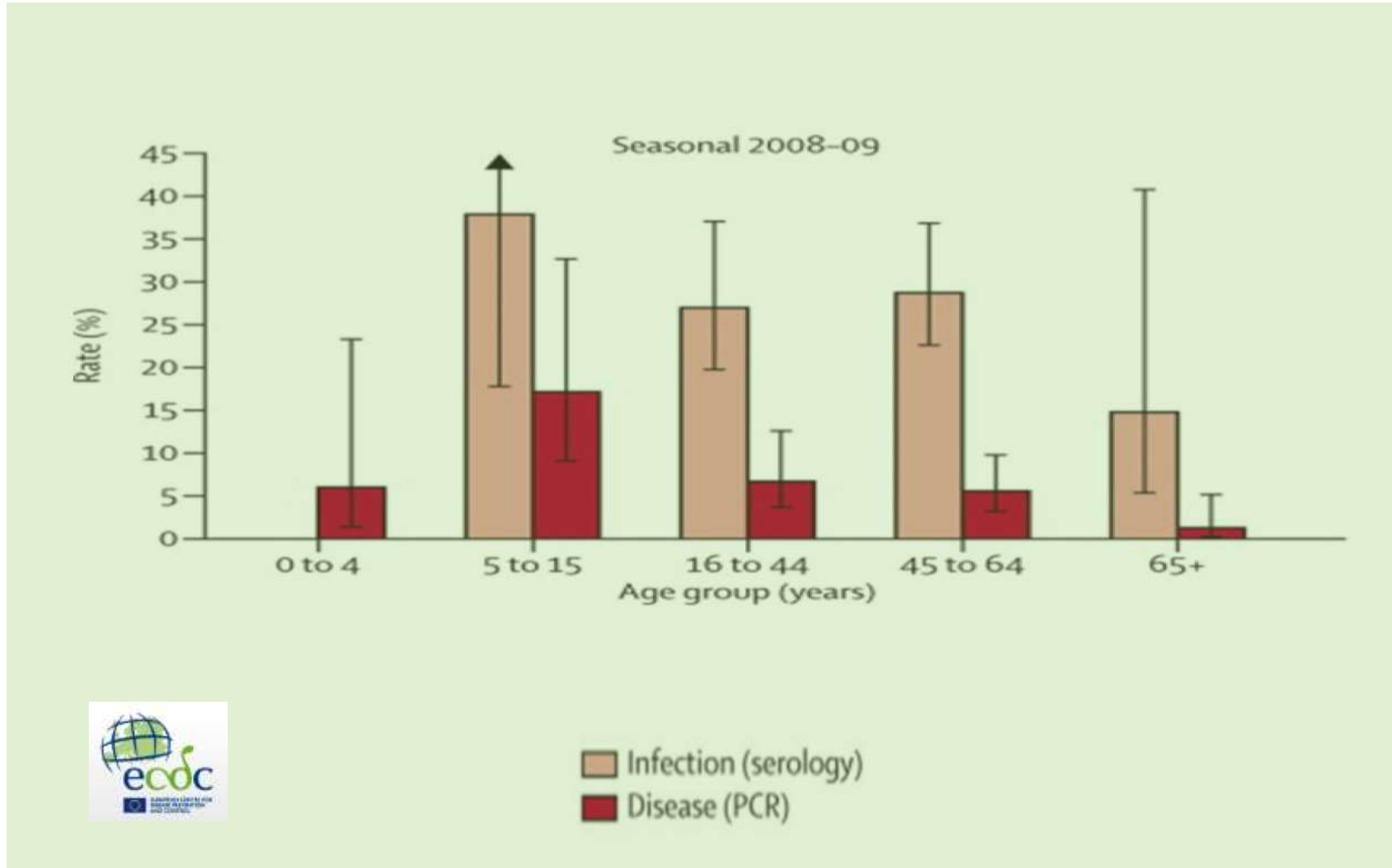
## επιδείνωση χρόνιων νόσων

- 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**

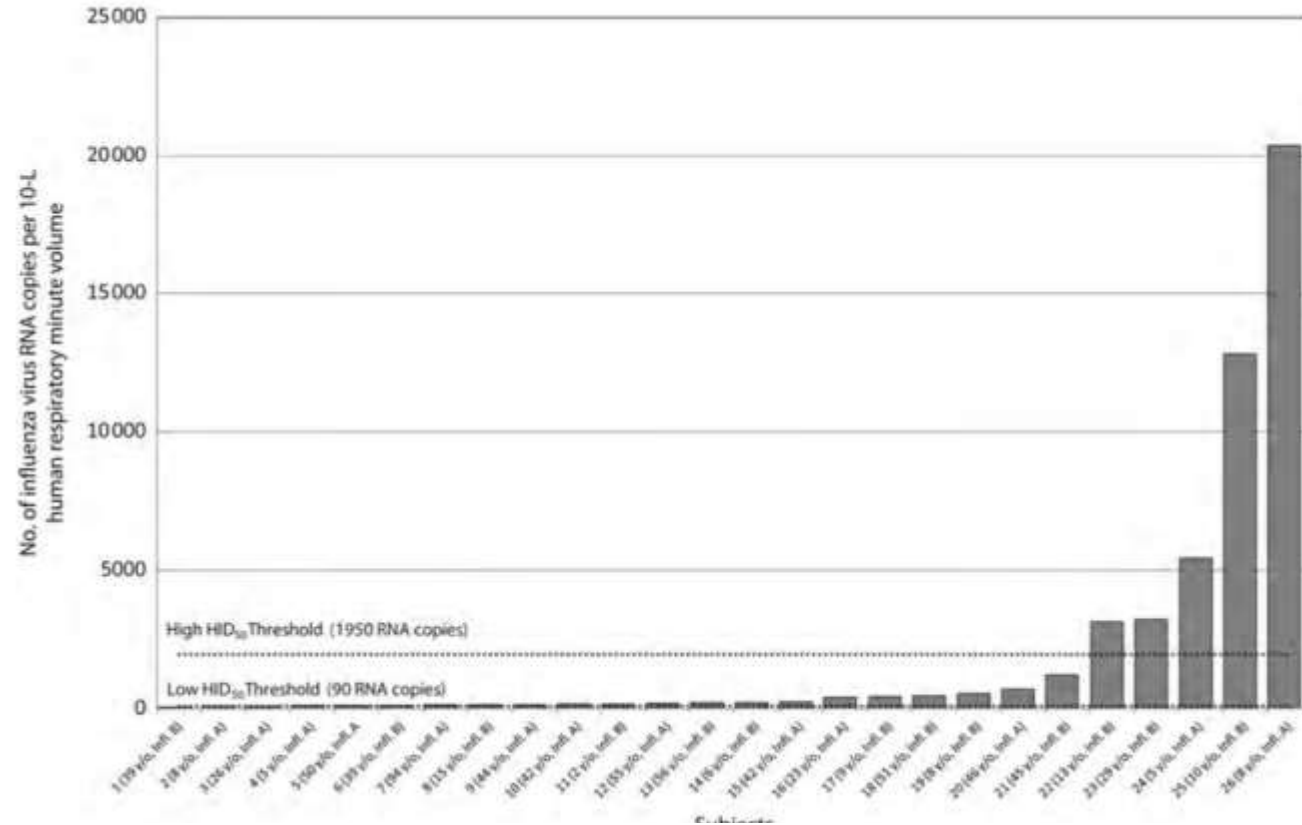


**Η γρίπη ΕΙΝΑΙ ΥΠΟΥΛΗ ΝΟΣΟΣ & ΜΠΟΡΕΙ  
ΝΑ ΜΕΤΑΔΟΘΕΙ & ΑΠΌ  
ΑΣΥΜΠΤΩΜΑΤΙΚΟΥΣ**

# ΑΛΗΘΕΙΑ !!!



# Super emitters !!!



## Influenza Virus: Here, There, Especially Air?



**Caroline Breese Hall**

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

# ΔΙΑΓΝΩΣΗ

- **Στο reack – κλινικά**
  - Πολύ δύσκολο πλέον με COVID-19
- **Εκτός reack**
  - Rapid tests (Διπλός έλεγχος & για SARS-CoV-2)
  - **Molecular PCR tests**
  - **Multiplex tests**
- **Gold standard = καλλιέργεια**

# Double tests, hit the news!



## 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

Rapid Test

SARS-CoV-2 + Flu A

## 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

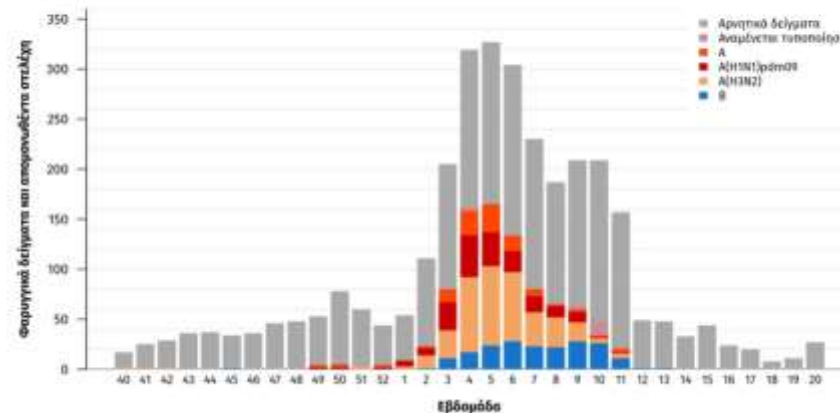
For *In Vitro* Diagnostic Use Only

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

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





# 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

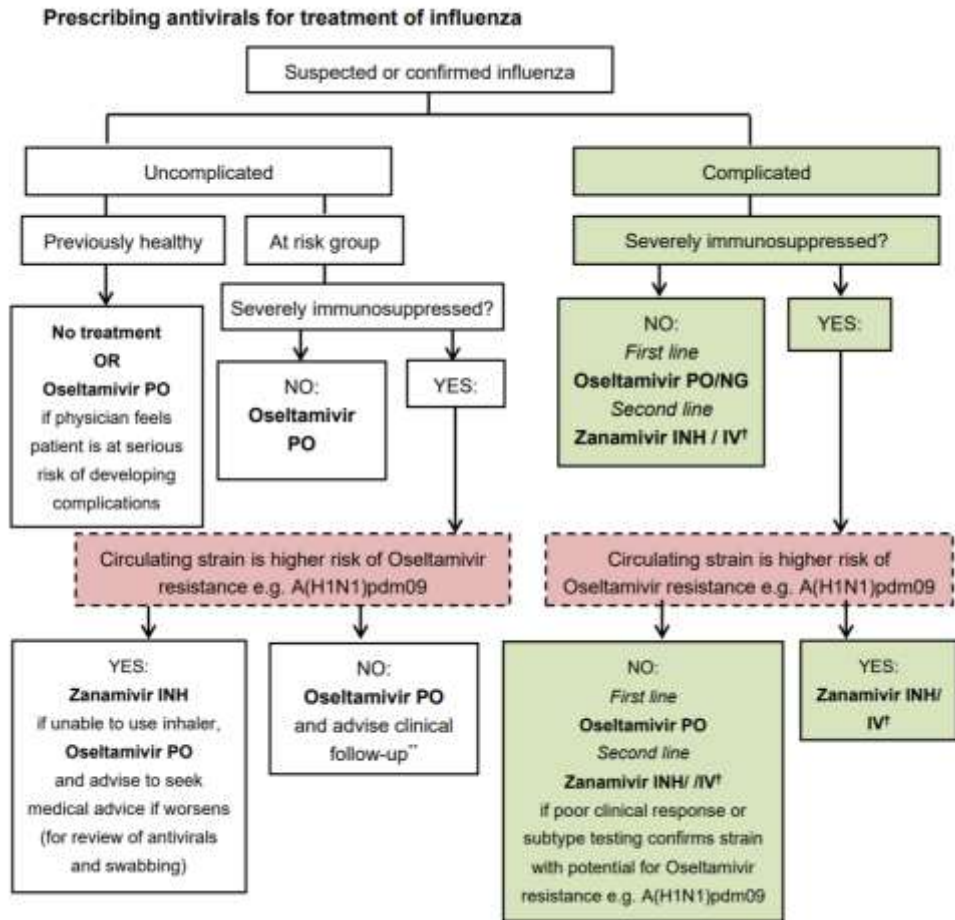
# Complicated Influenza



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<sup>2</sup>



# Εμβόλιο γρίπης & εμβόλιο COVID-18 ασφαλής & ανοσογονική η συγ-χορήγηση!!!

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



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!!!

THE LANCET

Lc

ARTICLES | [ONLINE FIRST](#)

PDF

Safety and immunogenicity of concomitant administration of COVID-19 vaccines (ChAdOx1 or BNT162b2) with seasonal influenza vaccines in adults in the UK (ComFluCOV): a multicentre, randomised, controlled, phase 4 trial

[Rajeka Lazarus, DPhil](#)   • [Sarah Baos, PhD](#) • [Heike Cappel-Porter, MMath](#) • [Andrew Carson-Stevens, PhD](#)

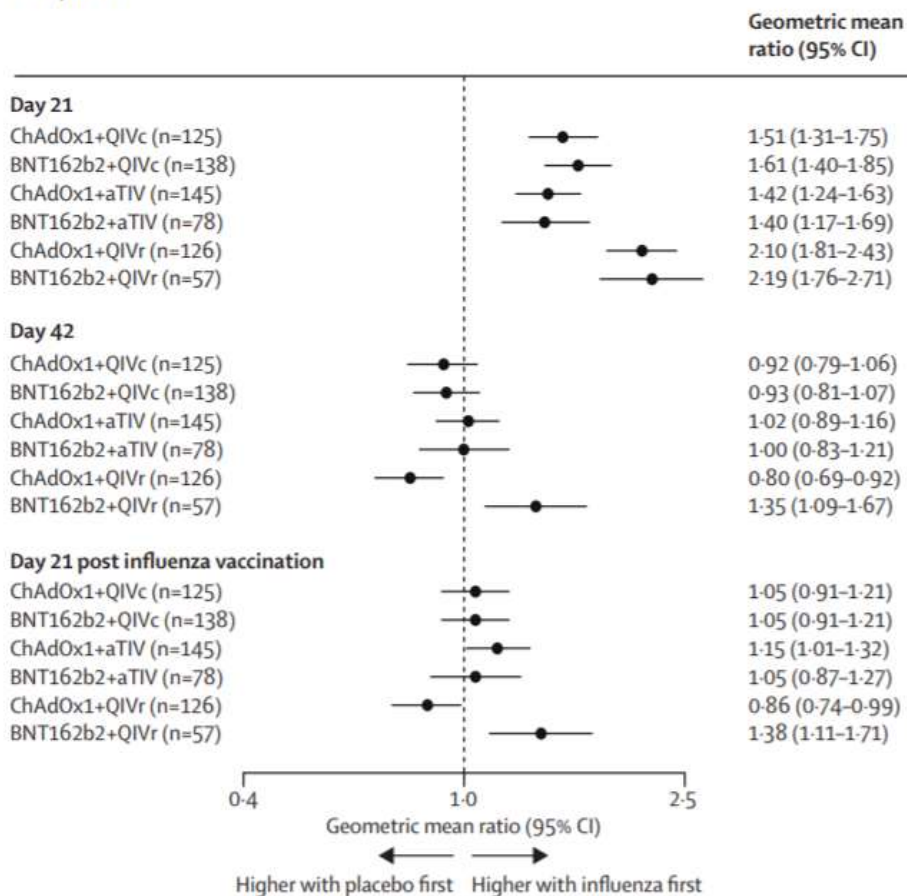
[Madeleine Clout, BSc](#) • [Lucy Culliford, PhD](#) • et al. [Show all authors](#)

[Open Access](#) • Published: November 11, 2021 • DOI: [https://doi.org/10.1016/S0140-6736\(21\)02329-1](https://doi.org/10.1016/S0140-6736(21)02329-1)

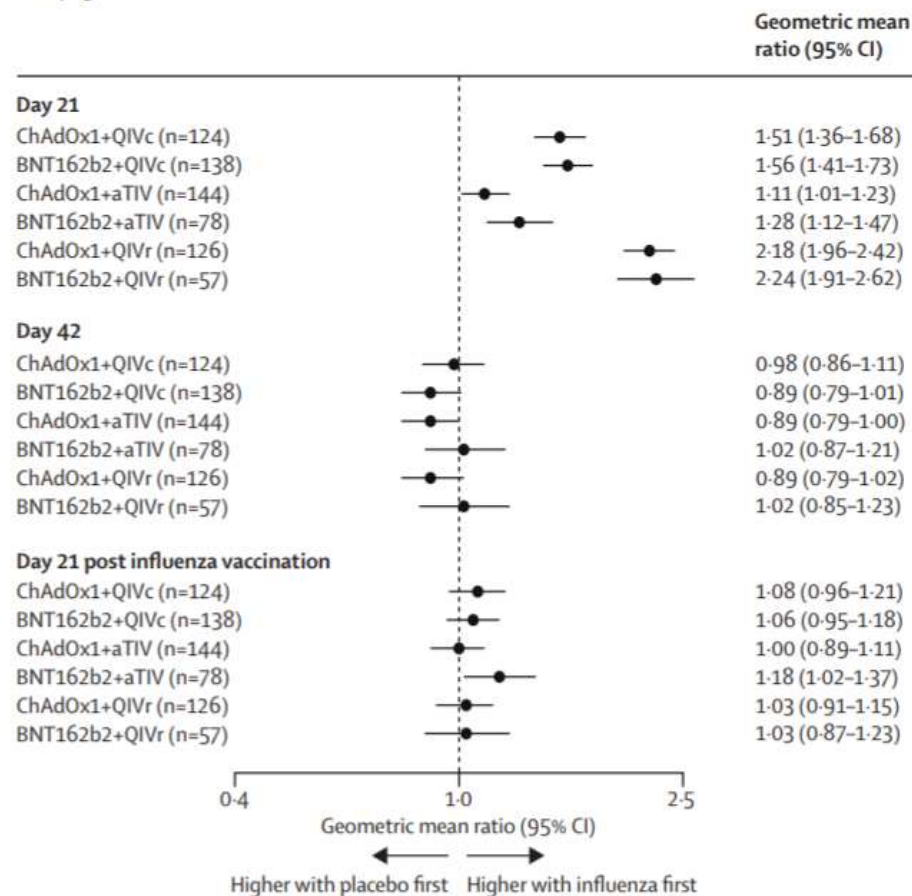
# Εμβόλιο γρίπης & εμβόλιο COVID-18

## ασφαλής & ανοσογονική η συγ-χορήγηση!!!

A A/H1N1



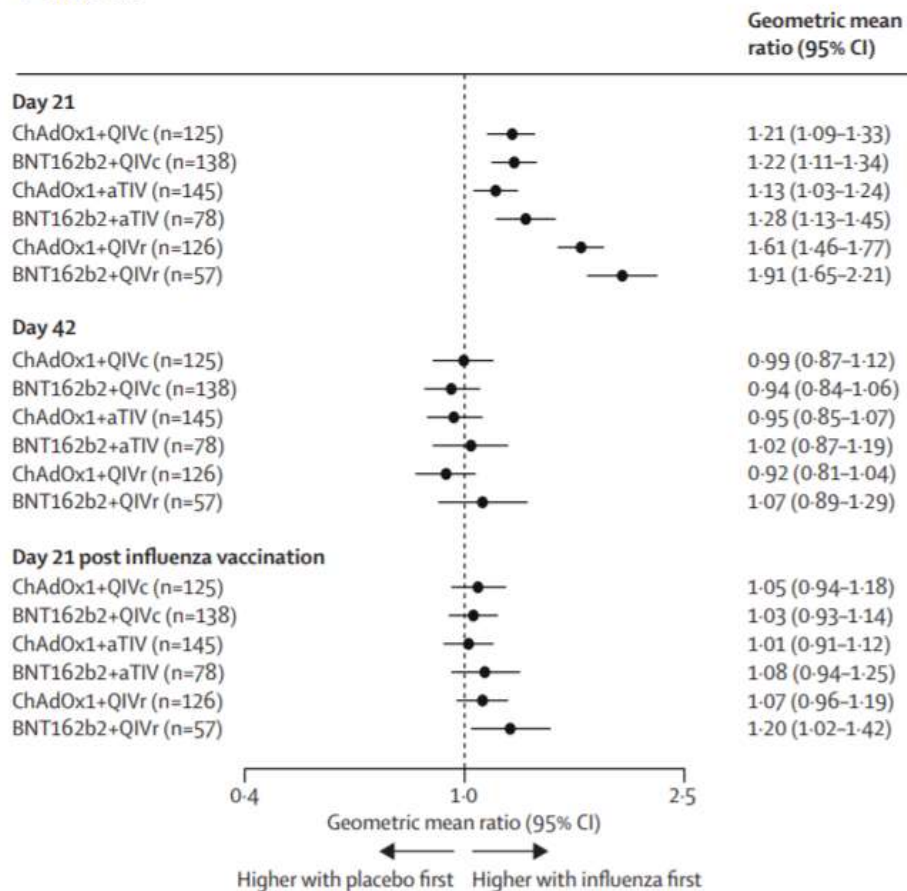
B A/H3N2



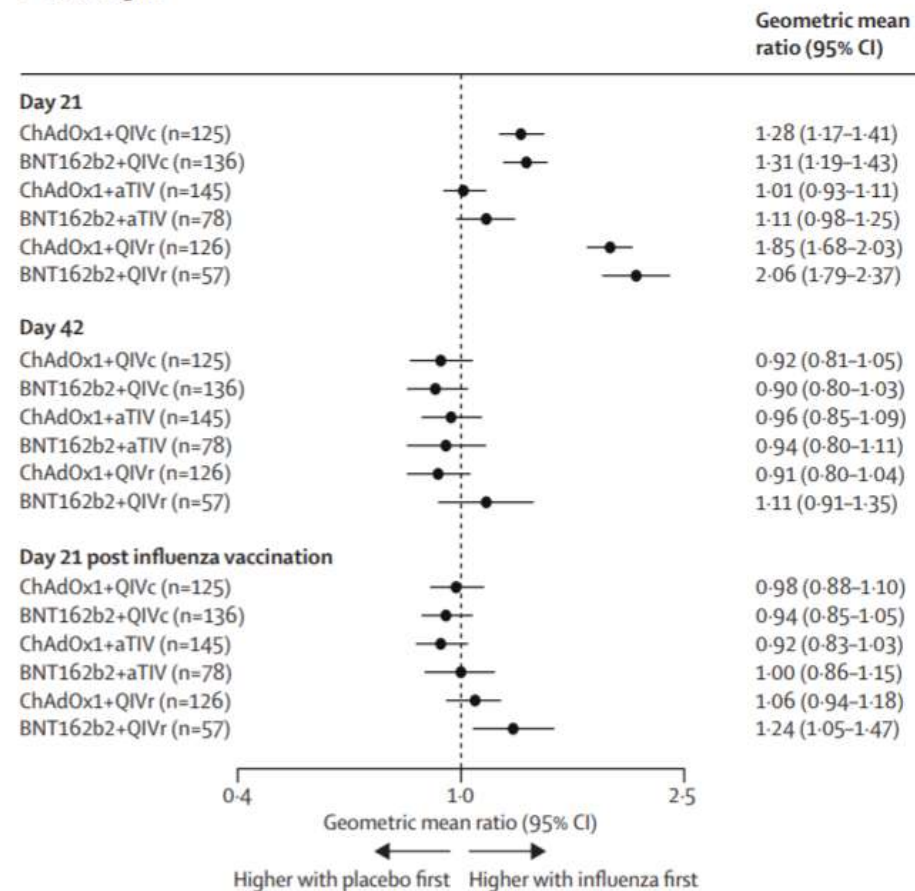
# Εμβόλιο γρίπης & εμβόλιο COVID-18

## ασφαλής & ανοσογονική η συγ-χορήγηση!!!

C B/Victoria



D B/Yamagata



# Vaccination coverage EU -> insufficient pre-COVID

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

Other sites: ECDC European Antibiotic Awareness Day ESCAIDE - Scientific conference Eurosurveillance journal



## European Centre for Disease Prevention and Control

An agency of the European Union

All topics: A to Z News & events Publications & data Tools About us Q

### Influenza vaccination coverage insufficient across EU Member States

None of the European Union (EU) Member States could demonstrate that they reach the EU target of 75% influenza vaccination coverage for vulnerable groups.

[Read more](#)



<a href="#">Influenza vaccination coverage</a>	<a href="#">Ebola outbreak in the DRC</a>	<a href="#">Measles continues to spread</a>	<a href="#">Zoonotic diseases: progress has stalled</a>
--	---	---	---



# 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



Read Comments



+ ADD TO EMAIL ALERTS

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 <sup>(a1)</sup>, Allison McGeer <sup>(a1) (a2)</sup>, Shelly McNeil <sup>(a3) (a4)</sup>, Kevin Katz <sup>(a2) (a5)</sup>   
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

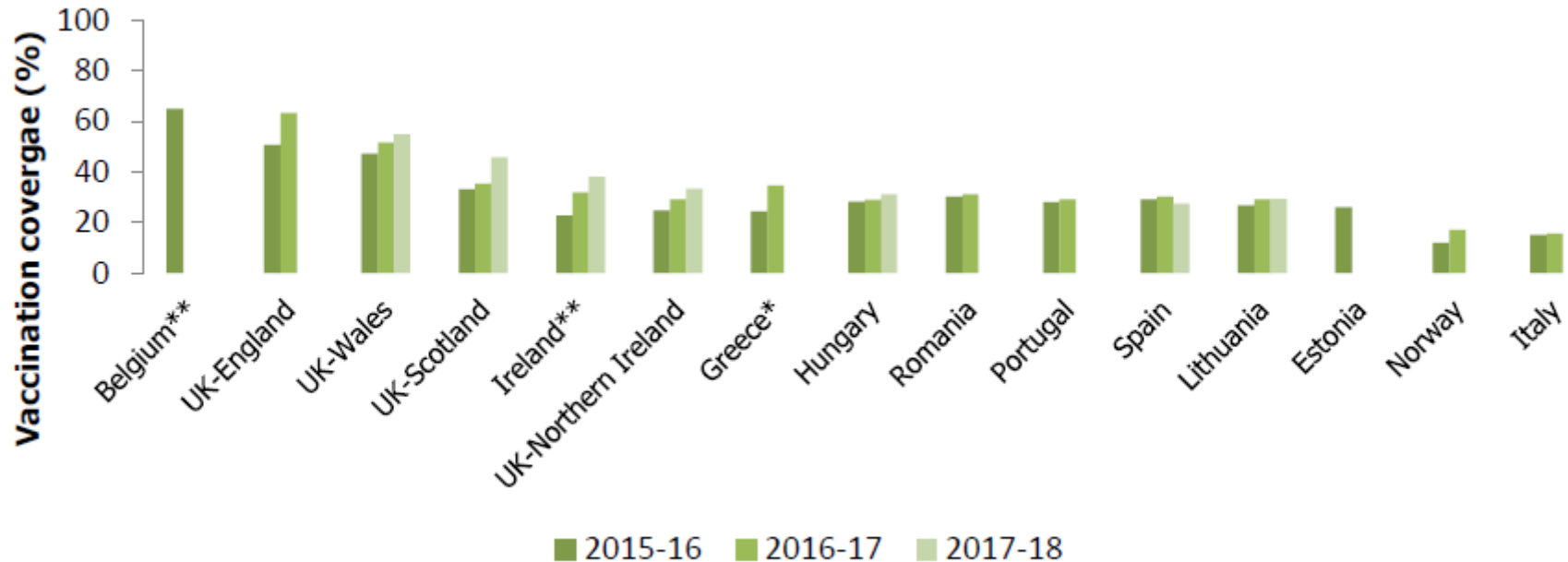
- **3,5 φορές υψηλότερος κίνδυνος λόγω επαγγέλματος**
  - 30% με ασυμπτωματική λοίμωξη
  - παρ' όλα αυτά μεταδίδουν τον ιό
    - σε ασθενείς &
    - οικογενειακό περιβάλλον
    - 1-2 ημέρες προ έναρξης συμπτωμάτων



# Vaccination coverage EU -> insufficient pre-COVID-19

no country reached 75% in HCWs!!!

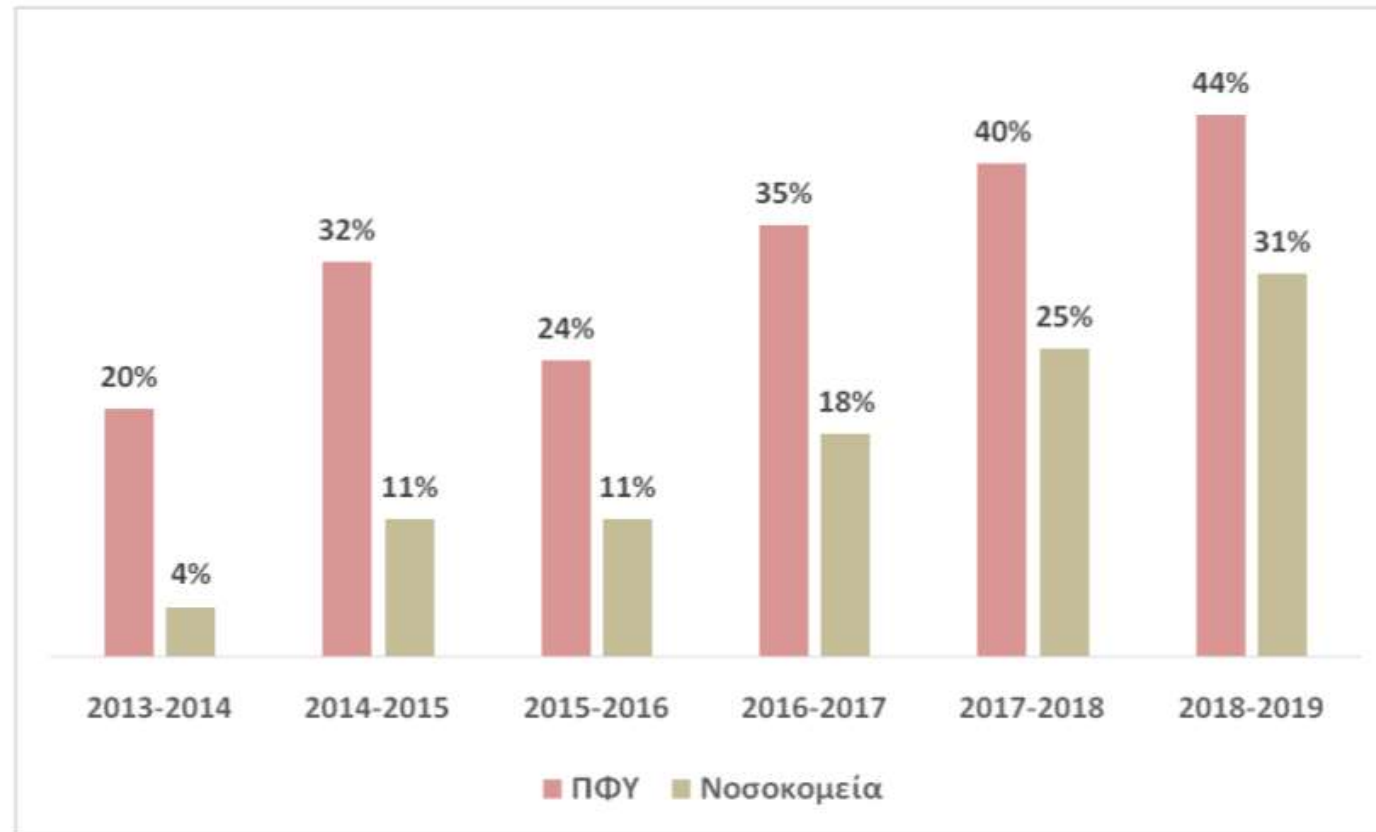
**Figure 7. Seasonal influenza vaccination coverage rates among healthcare workers in 12 EU/EEA Member States, influenza seasons: 2015–2016; 2016–2017; 2017–2018**



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), περιοδοί γρίπης 2013-2014 έως 2018-2019.



# Οι ηλικιωμένοι & ανοσοκατεσταλμένοι

- Γνωστή χαμηλή αποτελεσματικότητα εμβολίου
- Υψηλά % νοσηλειών ΜΕΘ
  - Ιδιαίτερα για ΑΗ3Ν2
- Υψηλά % θνητότητας



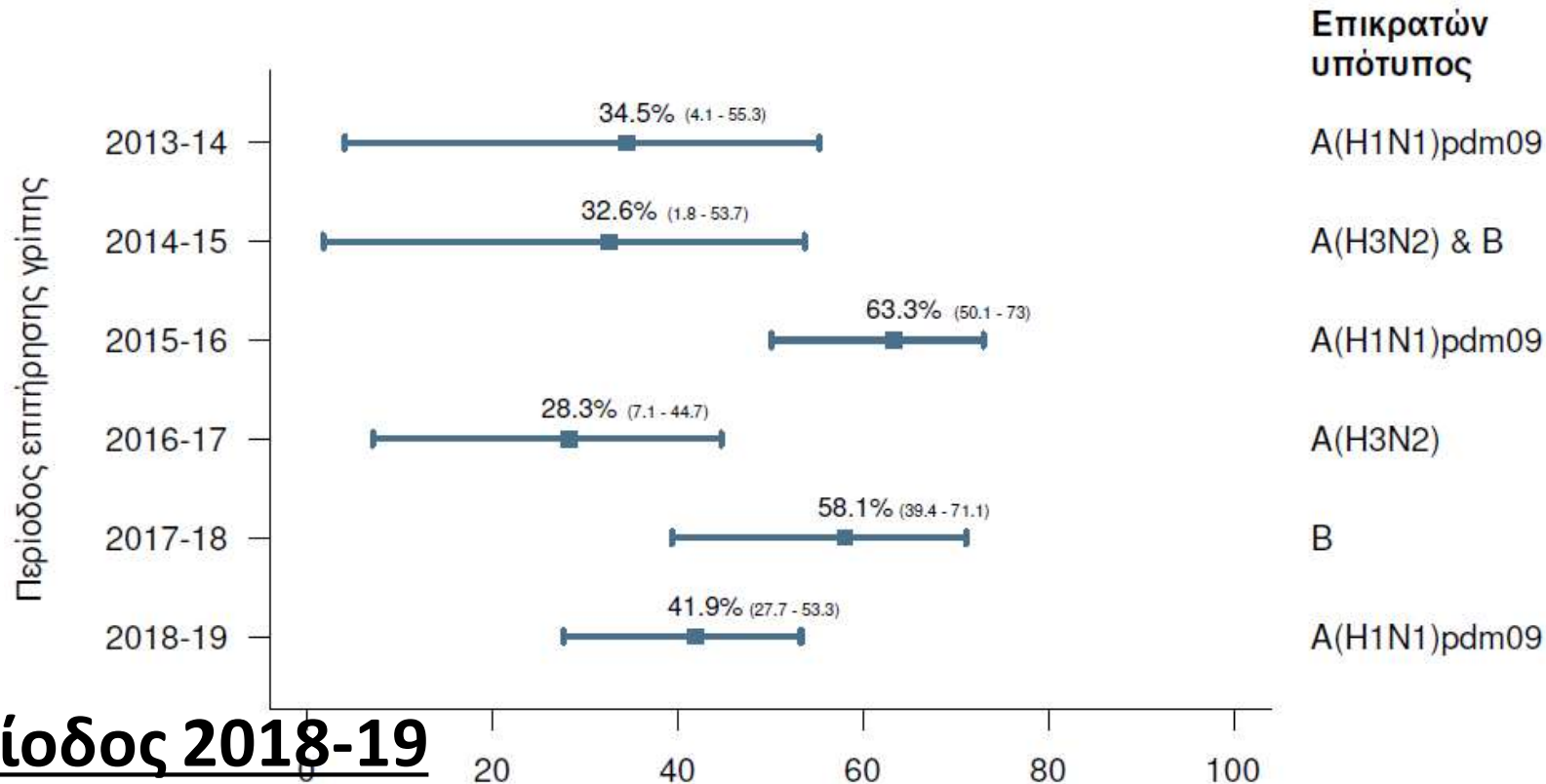
# Vaccination of household contacts & HCW in contact!!!





# Ελλάδα 2013-19

αποτελεσματικότητα εμβολίου-εξαρτάται από τύπο γρίπης



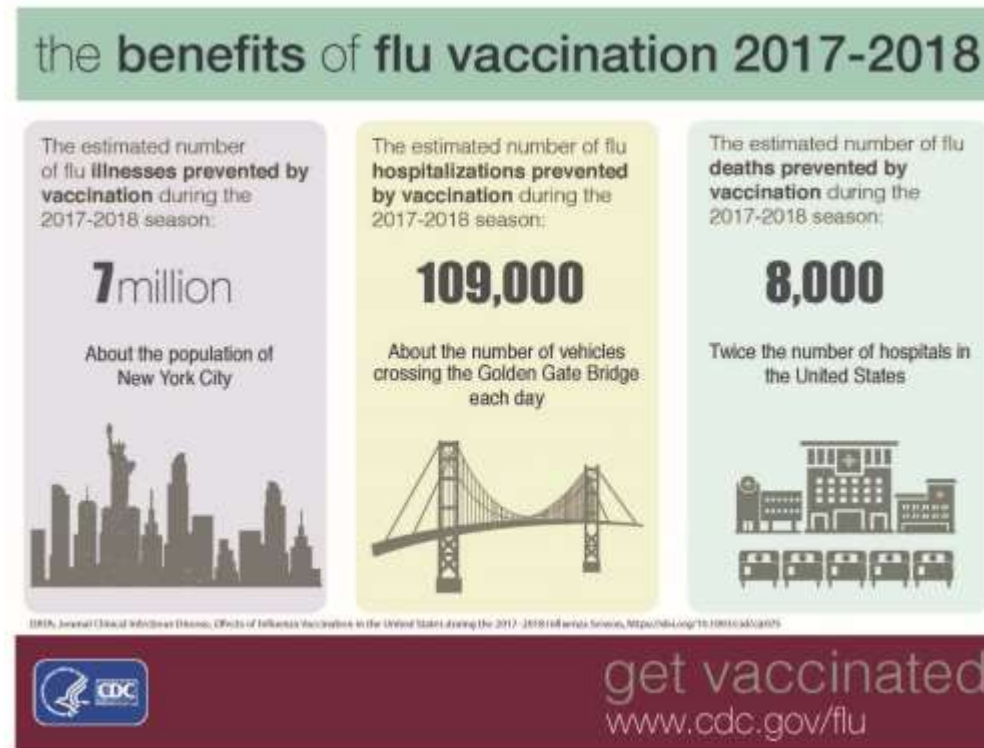
*Lytras et al JMV 2016*

## Περίοδος 2018-19

- Συνολική **αποτελεσματικότητα για πρόληψη της νοσηλείας** από γρίπη: **42%** (ΔΕ: 28-53%)
- Υψηλότερη αποτελεσματικότητα: 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 | 21 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.



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 19, 2021

### Real-world data highlights flu vaccine efficacy

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



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

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[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 Η5Ν1 ΝΙΓΗΡΙΑ, ΓΑΛΙΑ 2016
- Α Η5Ν2, Α Η5Ν3, Α Η5Ν6, ΑΗ5Ν8,  
ΑΗ5Ν9

- **ΑΝΘΡΩΠΟΙ**

- Α Η5Ν1, ΑΙΓΥΠΤΟΣ 2015
- Α Η7Ν9, ΚΙΝΑ
- Α Η5Ν6, ΚΙΝΑ
- Α Η3Ν2ν, ΗΠΑ 2015-16
- Α Η9Ν2, ΜΠΑΓΚΛΑΝΤΕΣ 2015
- Α Η7Ν3, Α Η10Ν8, ΑΗ6Ν1

# 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

### Influenza (Flu)

#### Avian Influenza

#### Information on 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:

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).



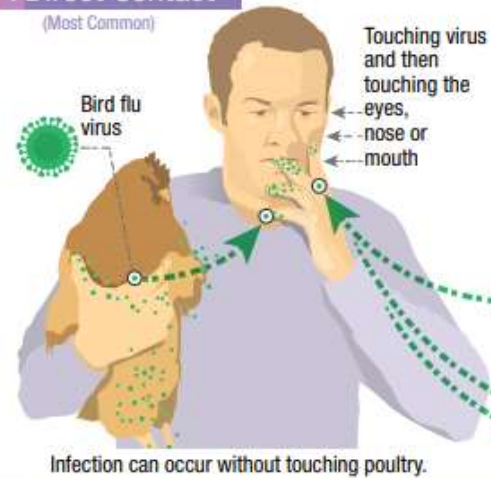
# Avian influenza

## How Infected Backyard Poultry Could Spread Bird Flu to People

Human Infections with Bird Flu Viruses Rare But Possible

### 1 Direct Contact

(Most Common)



### 2 Contaminated Surfaces



### 3 Bird Flu Virus in the Air (in Droplets or Dust)



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

[www.cdc.gov/flu/avianflu/avian-in-humans.htm](http://www.cdc.gov/flu/avianflu/avian-in-humans.htm)

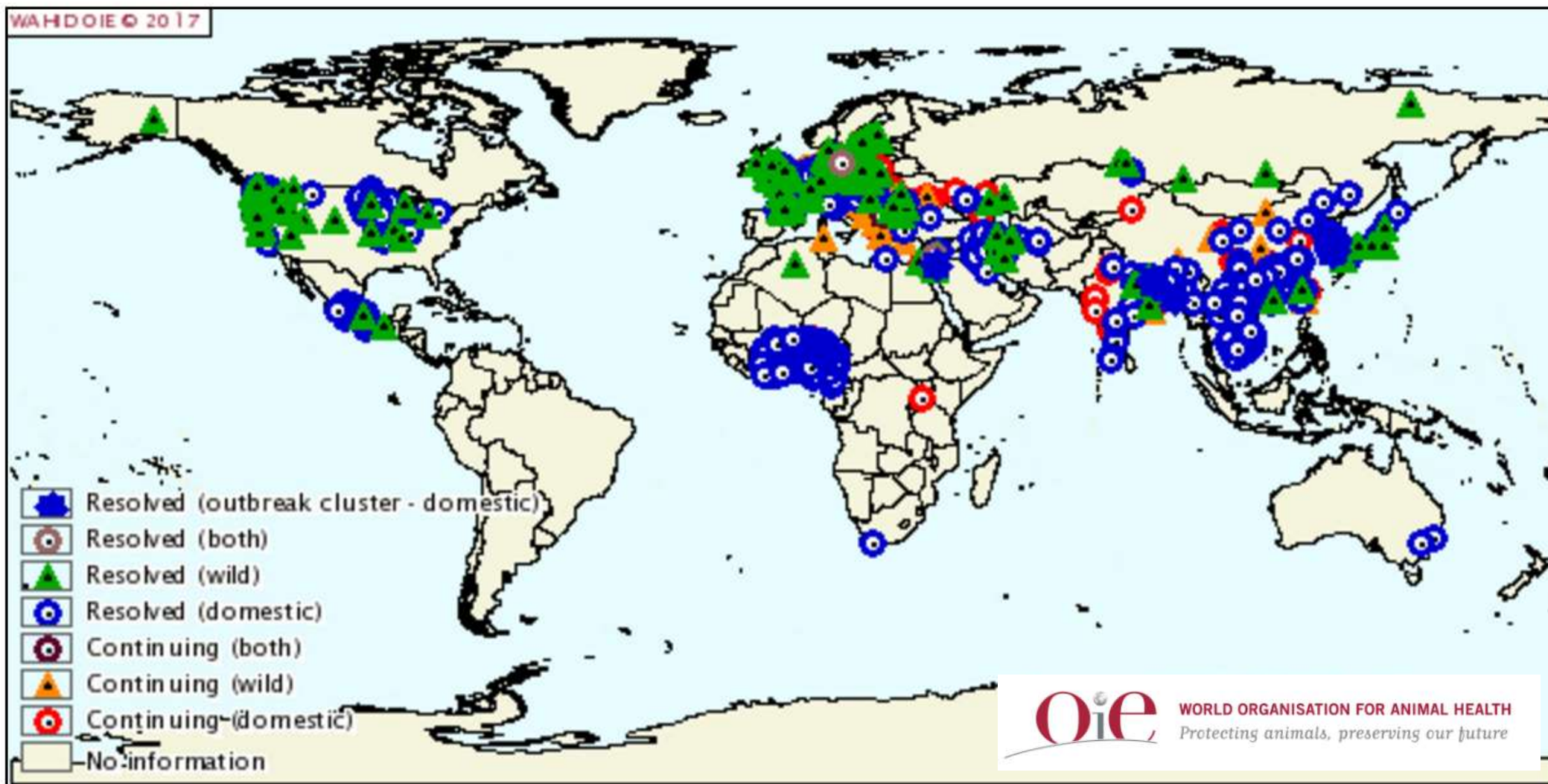
# Avian influenza birds & humans

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:

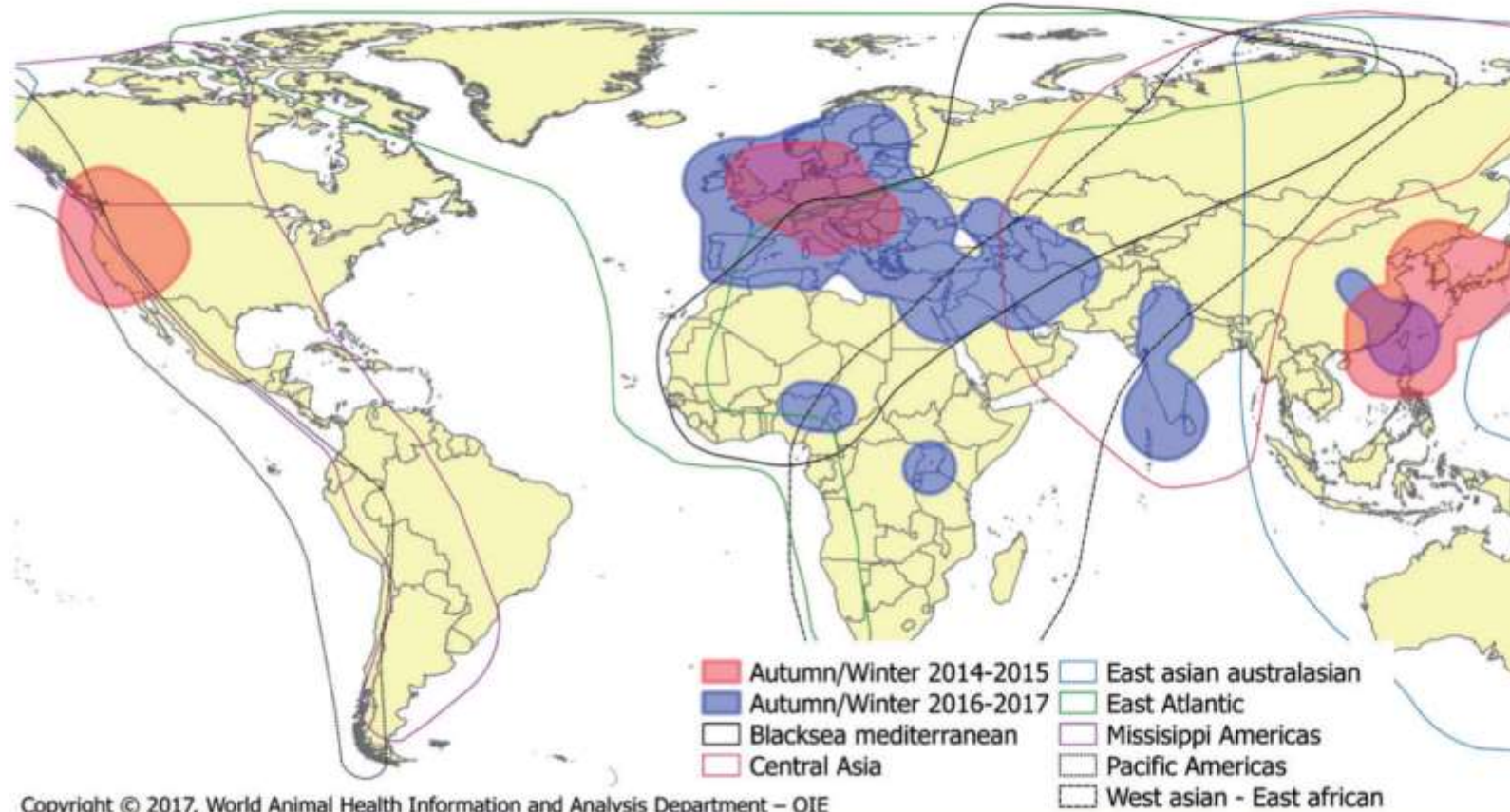
- 1) in 2005-2006, H5N1 clade 2.2 virus involving Africa, Asia and Europe;
- 2) in 2009-2010, clade 2.3.2.1c virus affecting Asia and Europe;
- 3) in 2014-2015, at the same time clade 2.3.4.4a H5N8 virus as well as clade 2.3.2.1c H5N1 virus involving Africa, Asia, and Europe ; and
- 4) in 2016-2017,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

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<sup>3</sup>. 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<sup>4,5,6,7,8</sup>.

# ΓΡΙΠΕΣ ΠΤΗΝΩΝ, ΗΡΑΙ 2013-17!!!



# Spread of AH5N8 in 2014-17



Copyright © 2017, World Animal Health Information and Analysis Department – OIE

# 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<sup>3</sup>). 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.

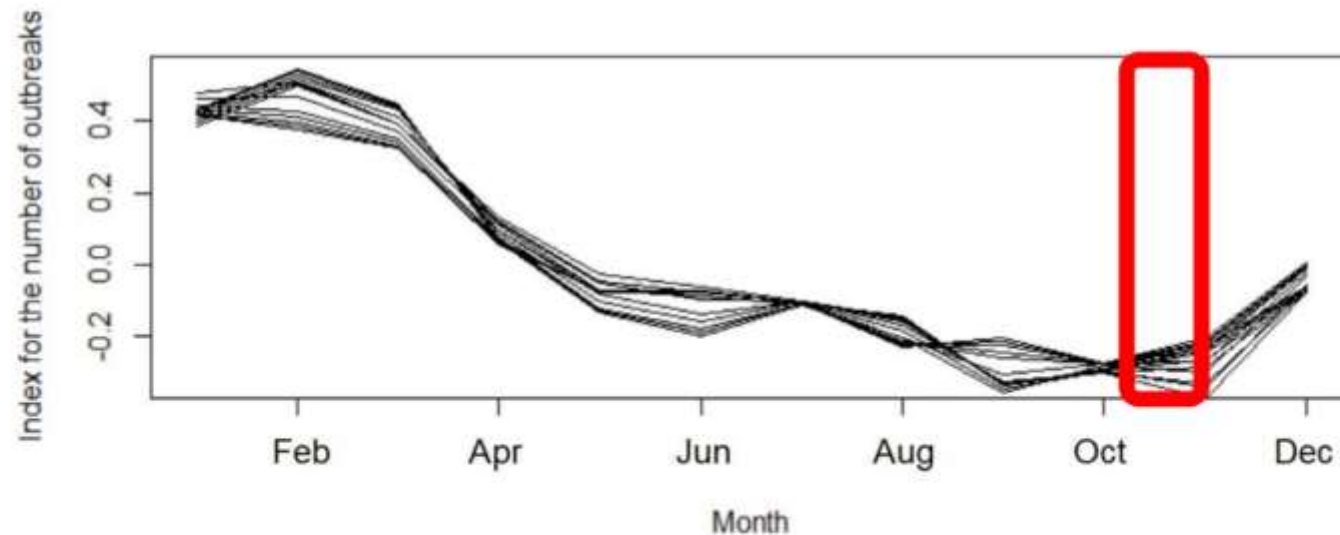


Figure 1. Seasonal trend in global HPAI incidence in poultry

# 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

# Avian influenza, 2021

## poultry

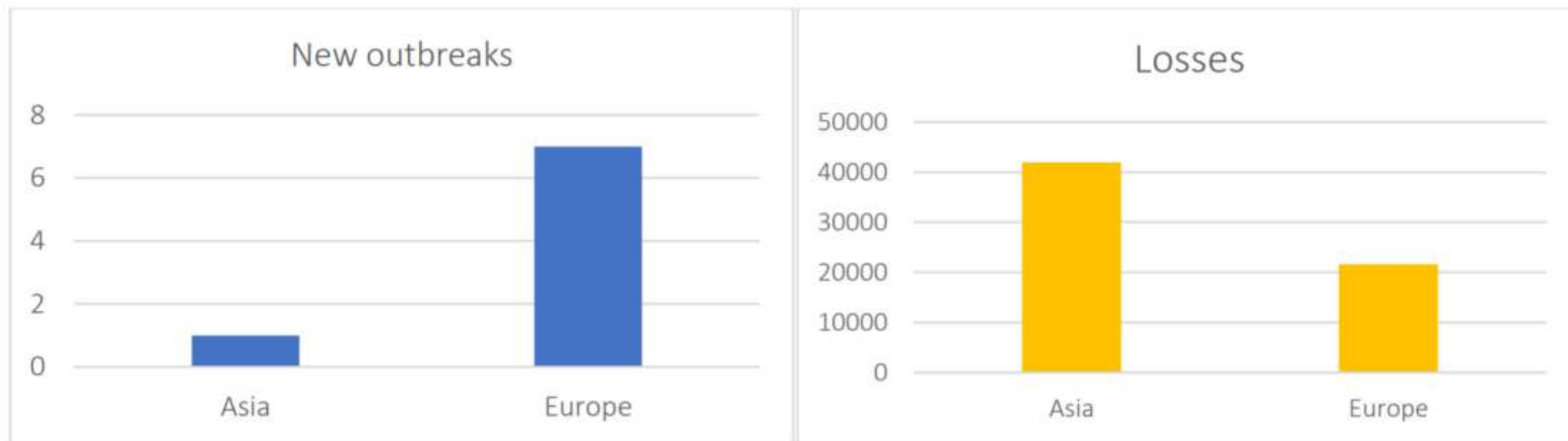


Figure 3. Number of new outbreaks and associated losses by geographical region (losses include animals dead and killed and disposed of)

# 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

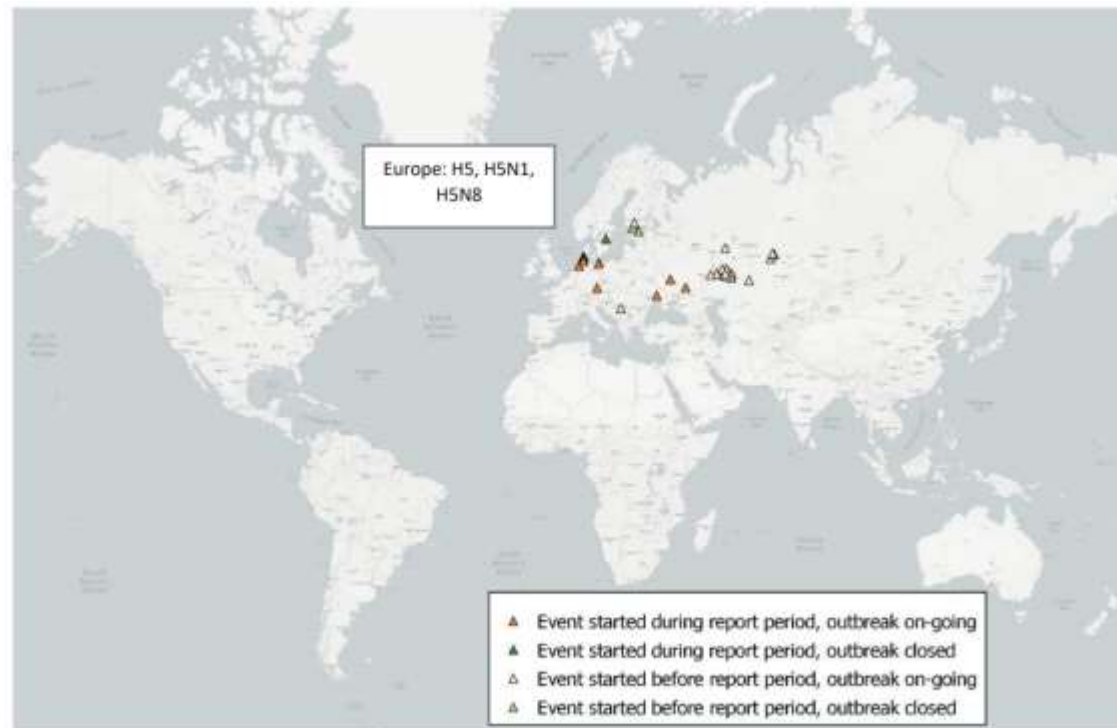


Figure 4. Distribution of HPAI new outbreaks in non-poultry birds, and corresponding subtypes.



# Avian influenza, Europe 2021



**European Centre for Disease Prevention and Control**

An agency of the European Union

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[Publications & data](#)

## Avian influenza overview May – September 2021

Surveillance report

30 Sep 2021

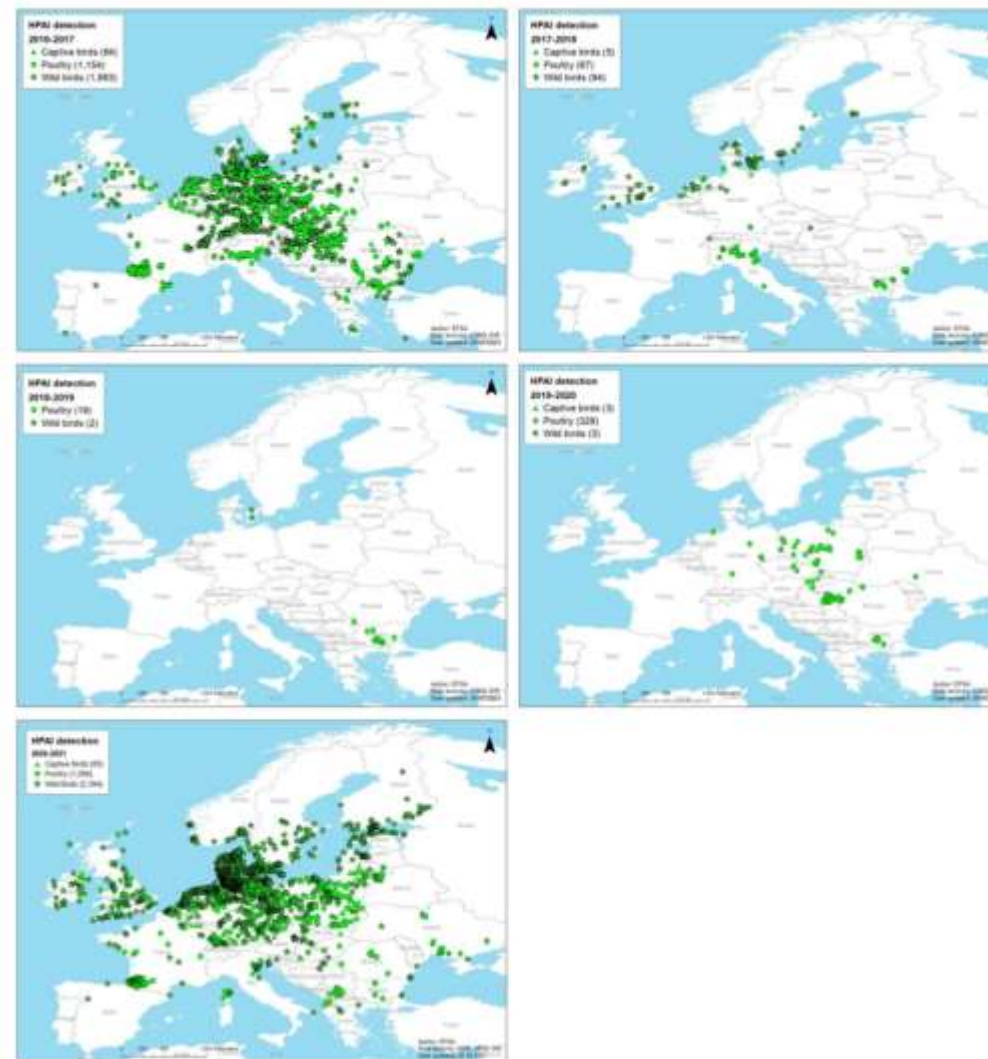
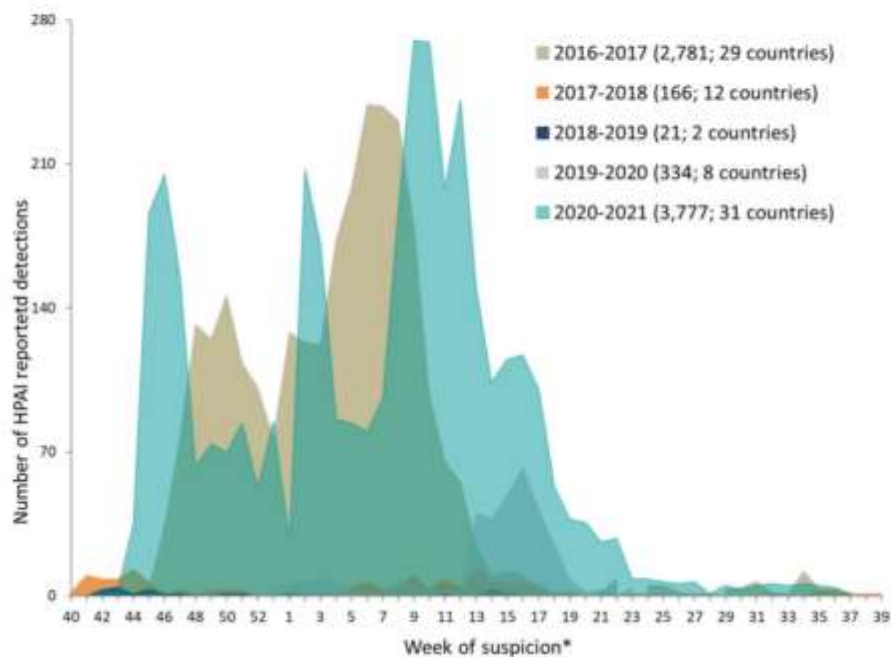
Publication series: [Avian influenza overview](#)



The 2020–2021 avian influenza epidemic with a total of 3,777 reported highly pathogenic avian influenza (HPAI) detections and approximately 22,900,000 affected poultry birds in 31 European Countries appears to be one of the largest HPAI epidemics that has ever occurred in Europe.

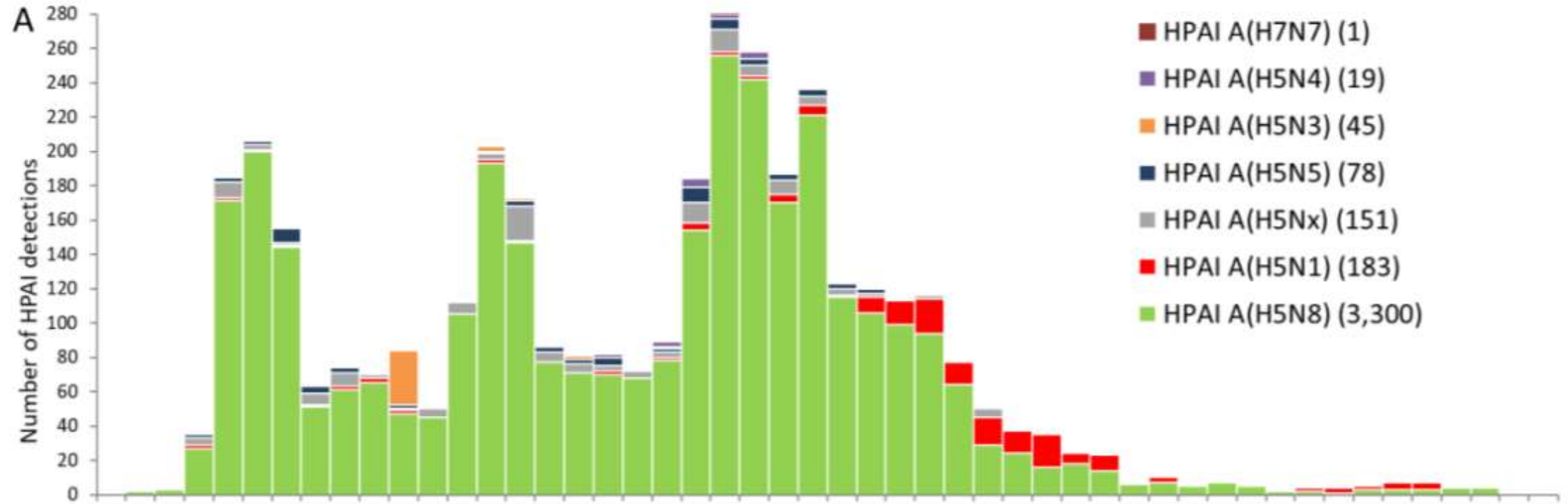
# Avian influenza, Europe 2021

Avian influenza overview May – September 2021



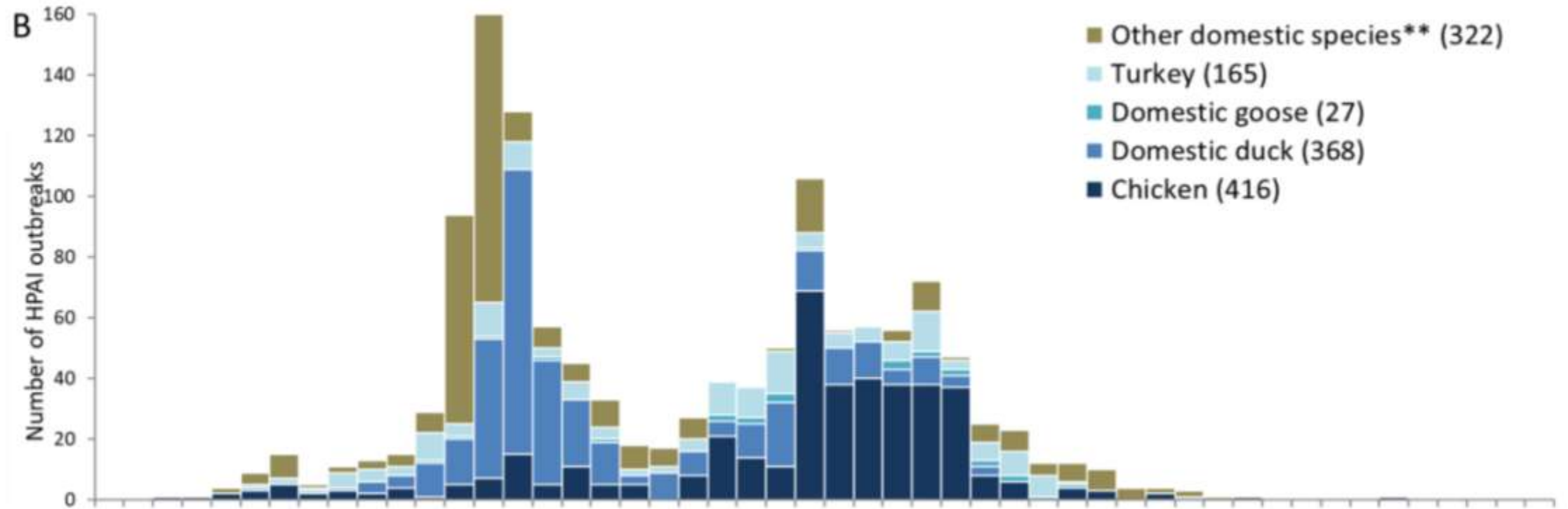
# Avian influenza, Europe 2021

## HPAI



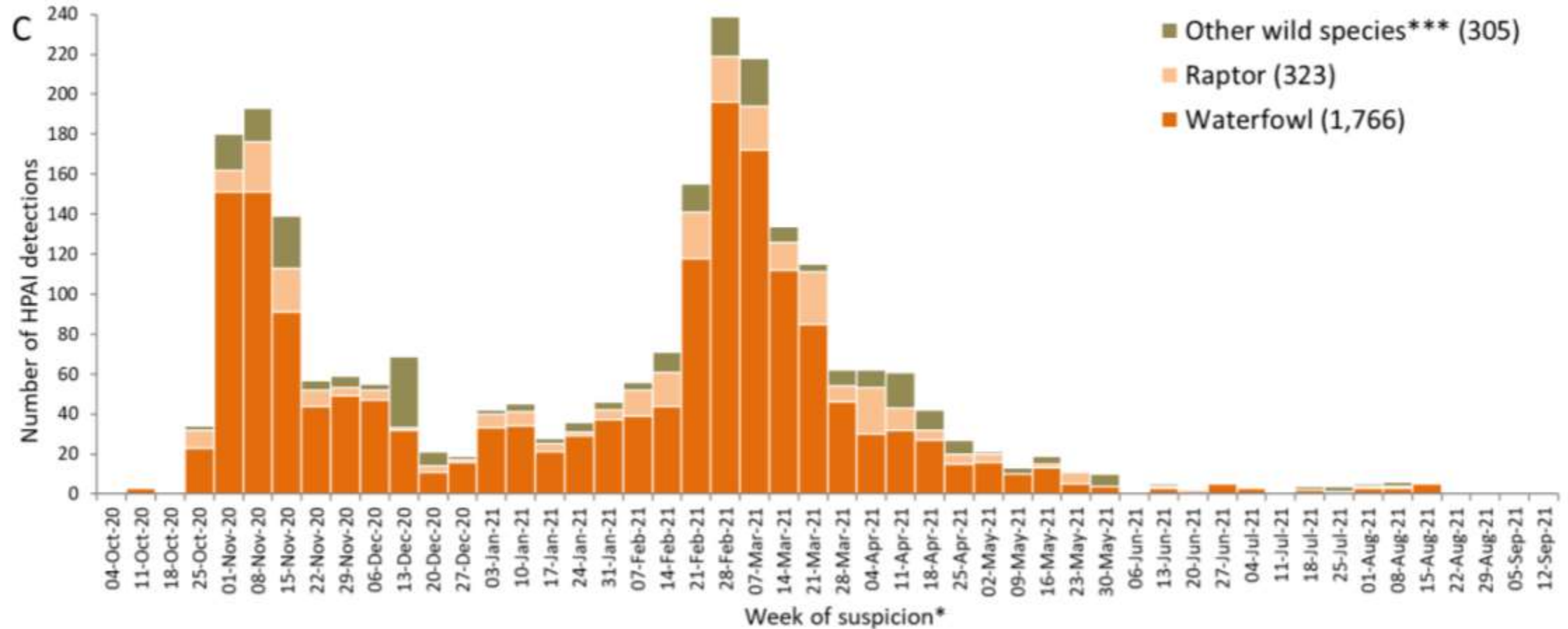
# Avian influenza, Europe 2021

## HPAI domestic



# Avian influenza, Europe 2021

## HPAI, wild



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

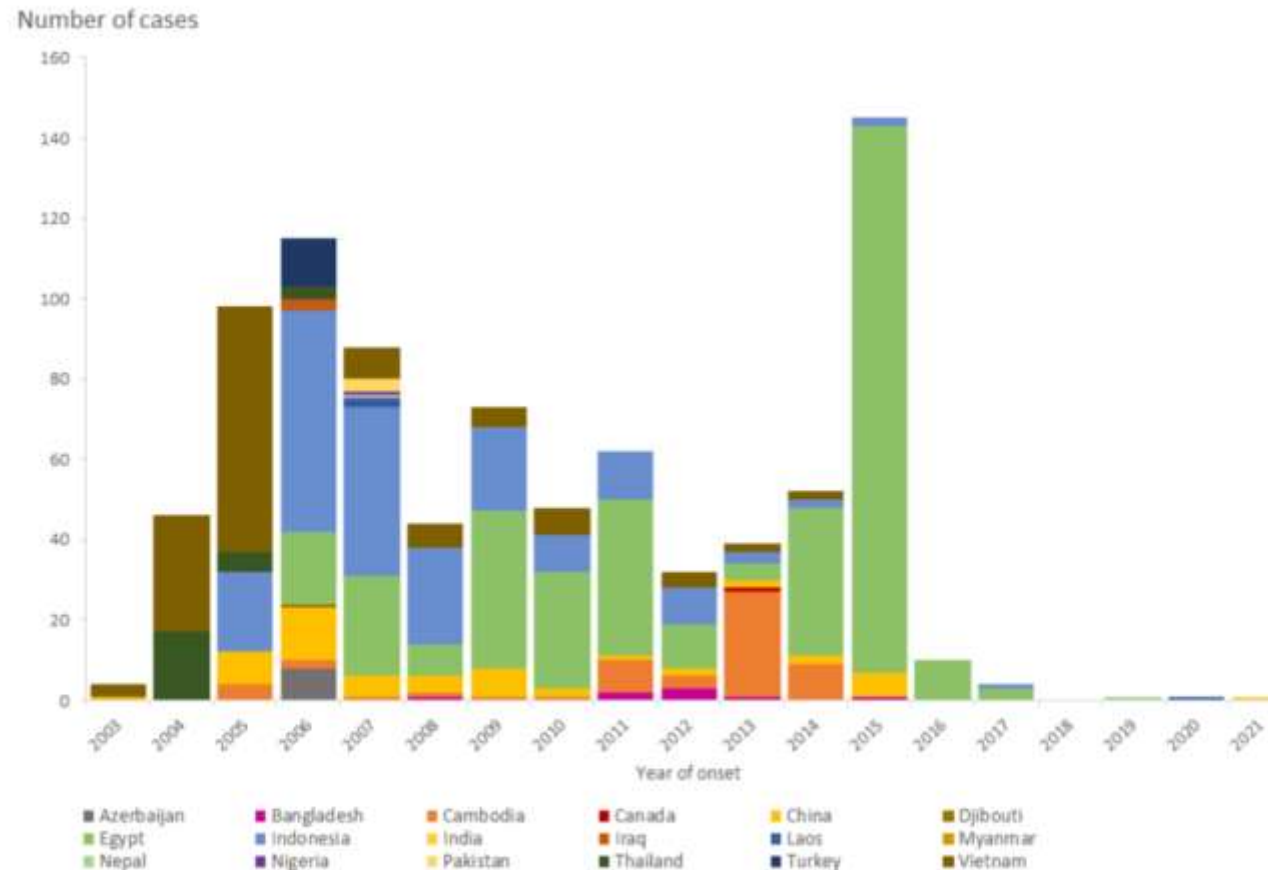
**Table 2** Distribution of human cases infected by A(H5) viruses within clade.2.3.4.4 based on HA gene analysis

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



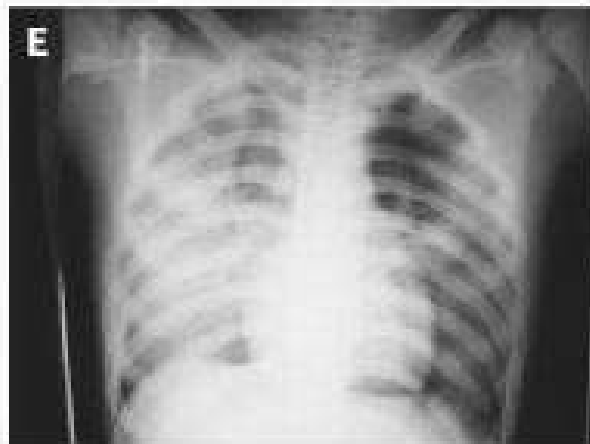
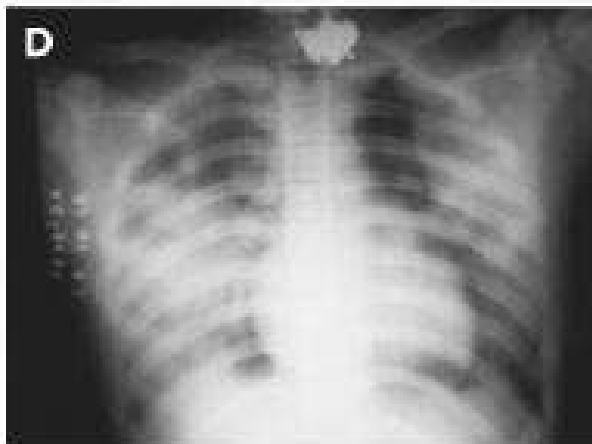


# H5N1 - Άνθρωποι



- 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 & Κορυμνοί

# ΜΥΘΟΣ

- Τα άγρια πουλιά μεταφέρουν τον κρυμνοί στο κοτόπουλο
- Στις ΗΠΑ η επιδημία κοτόπουλου οφείλεται σε μεταφορά από άγρια πουλιά





# ΜΕΤΑΔΟΣΗ ΣΕ ΑΝΘΡΩΠΟΥΣ = στενή επαφή



# Μετάδοση στον άνθρωπο = Στενή επαφή







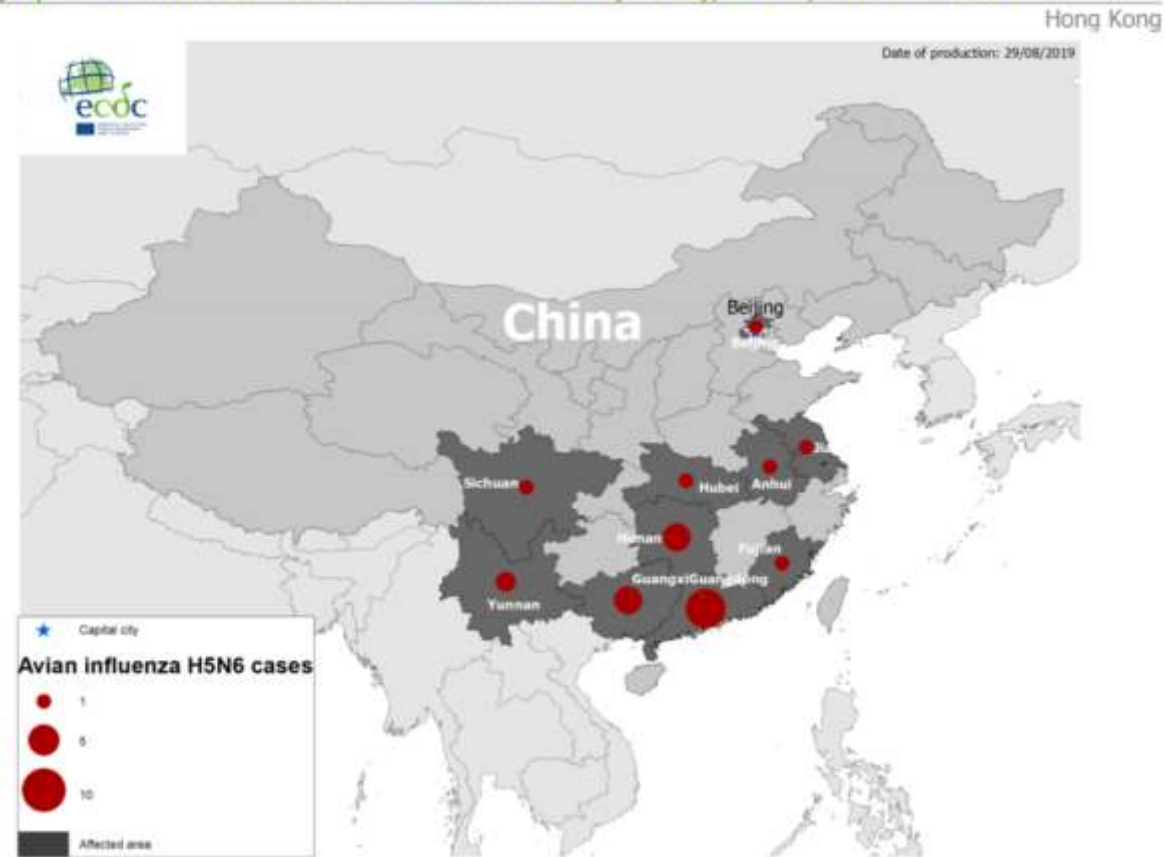
# ΠΡΟΣΟΧΗ ΣΤΑ ΠΑΙΔΙΑ !!!



# Avian influenza H5N6 2014-19

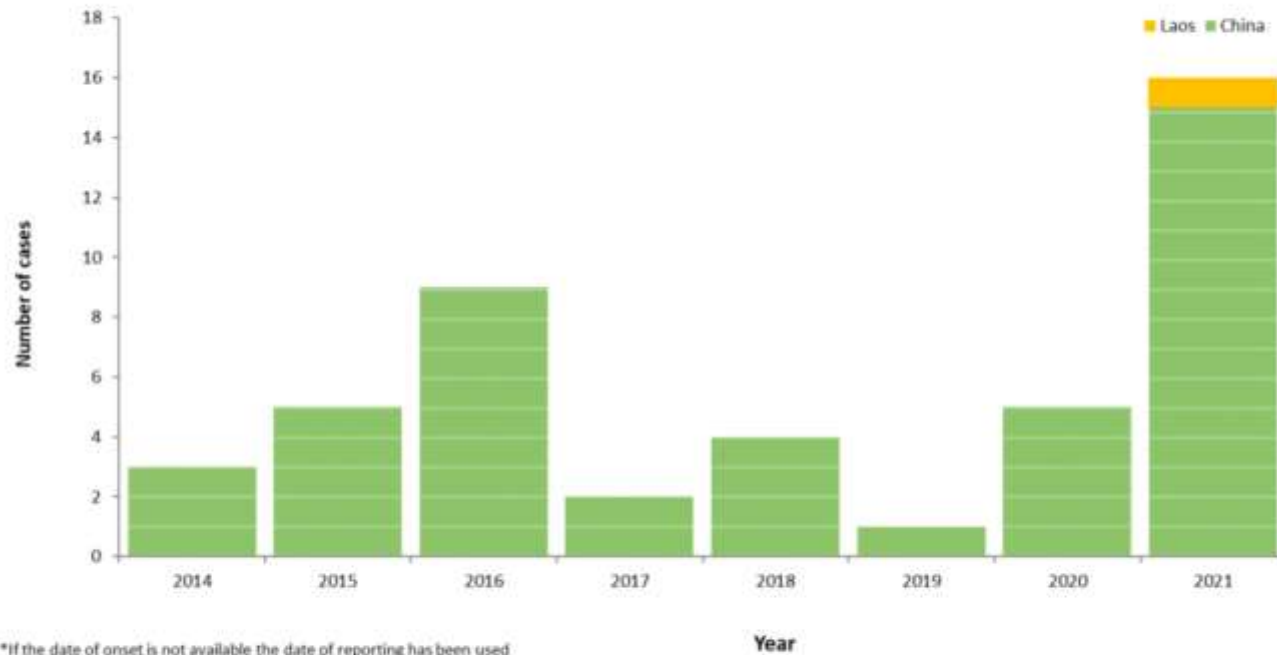
n= 25, 15 deaths

Geographical distribution of confirmed cases of A(H5N6), China, 2014 – 2019



# 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



Health Topics ▾

Countries ▾

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Emergencies ▾

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## Assessment of risk associated with influenza A(H5N6) virus

19 November 2021

19 November 2021 | Emergency Situational Updates



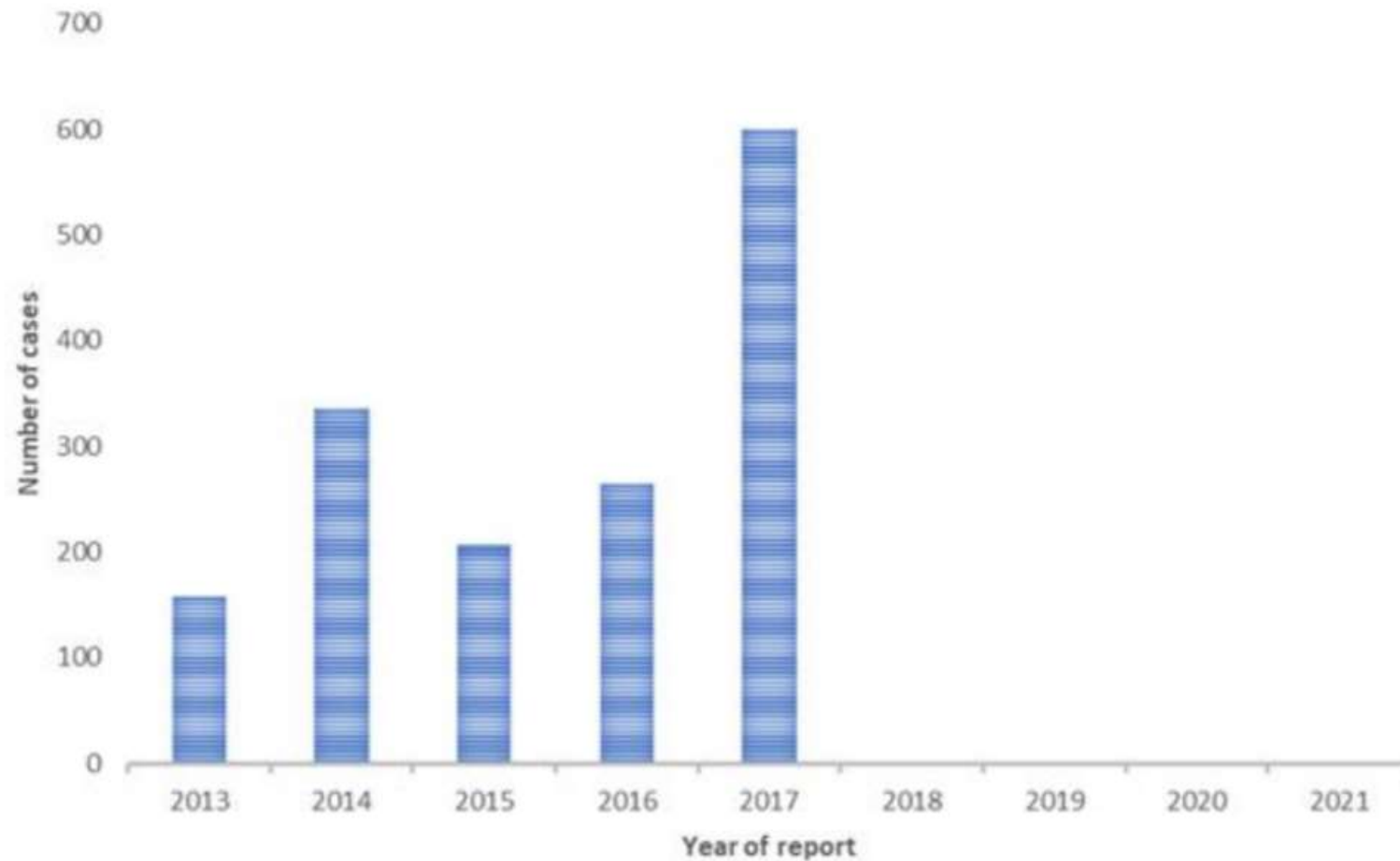
Download (214.9 kB)

### 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.

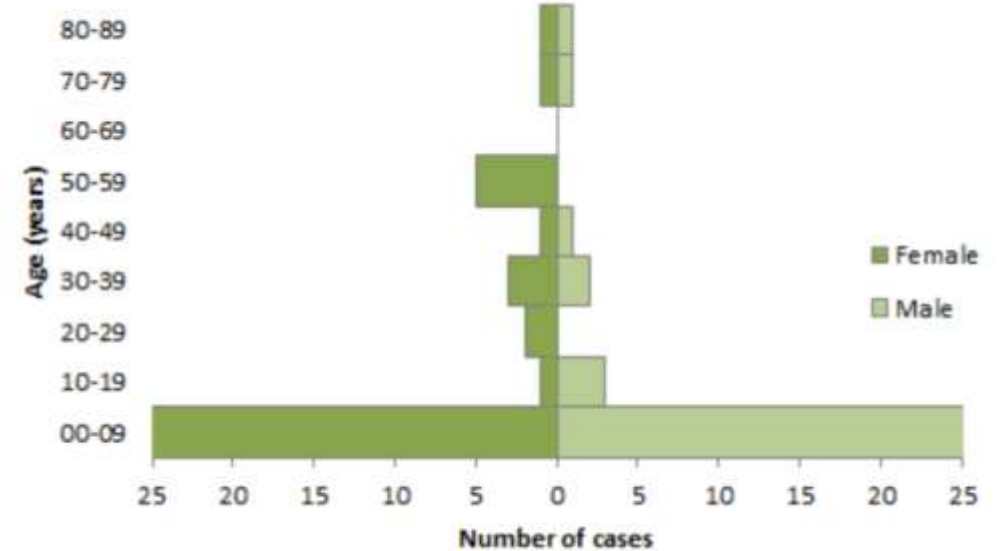
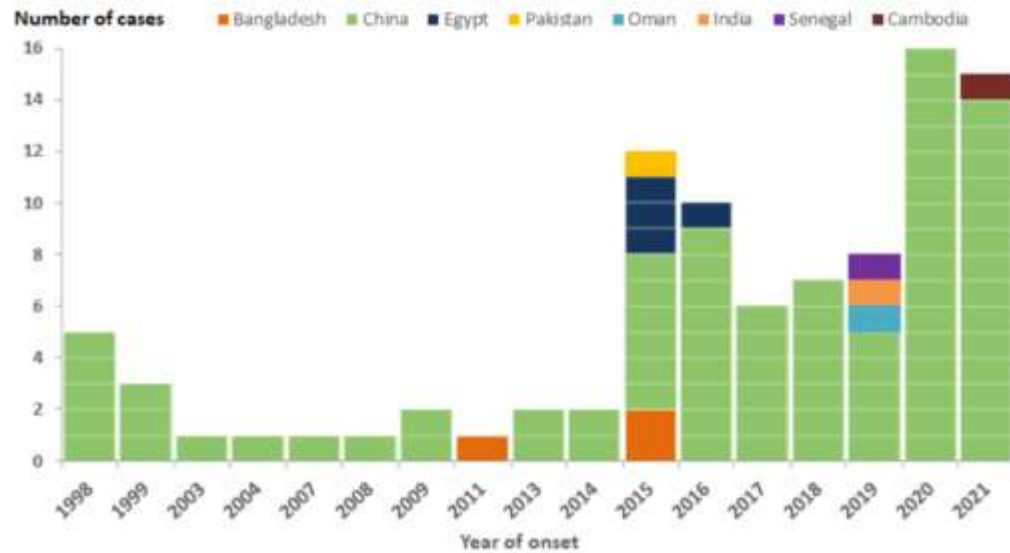
# Avian influenza, human cases

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

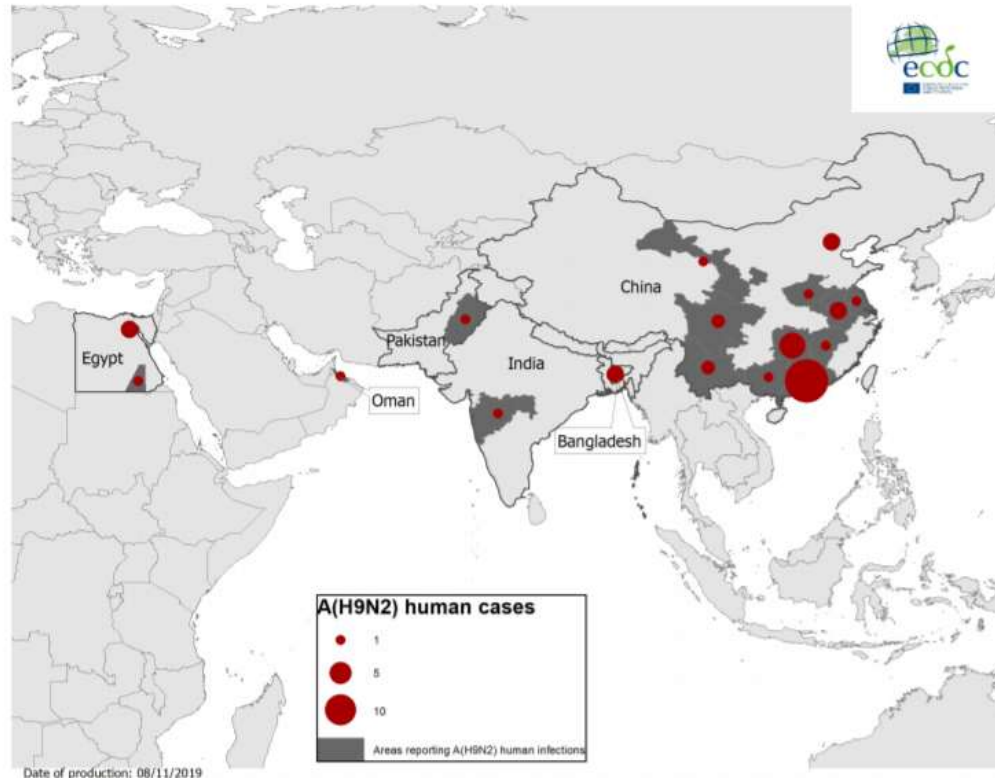


# Avian influenza H9N2, 1998-19

n= 57, 1 deaths

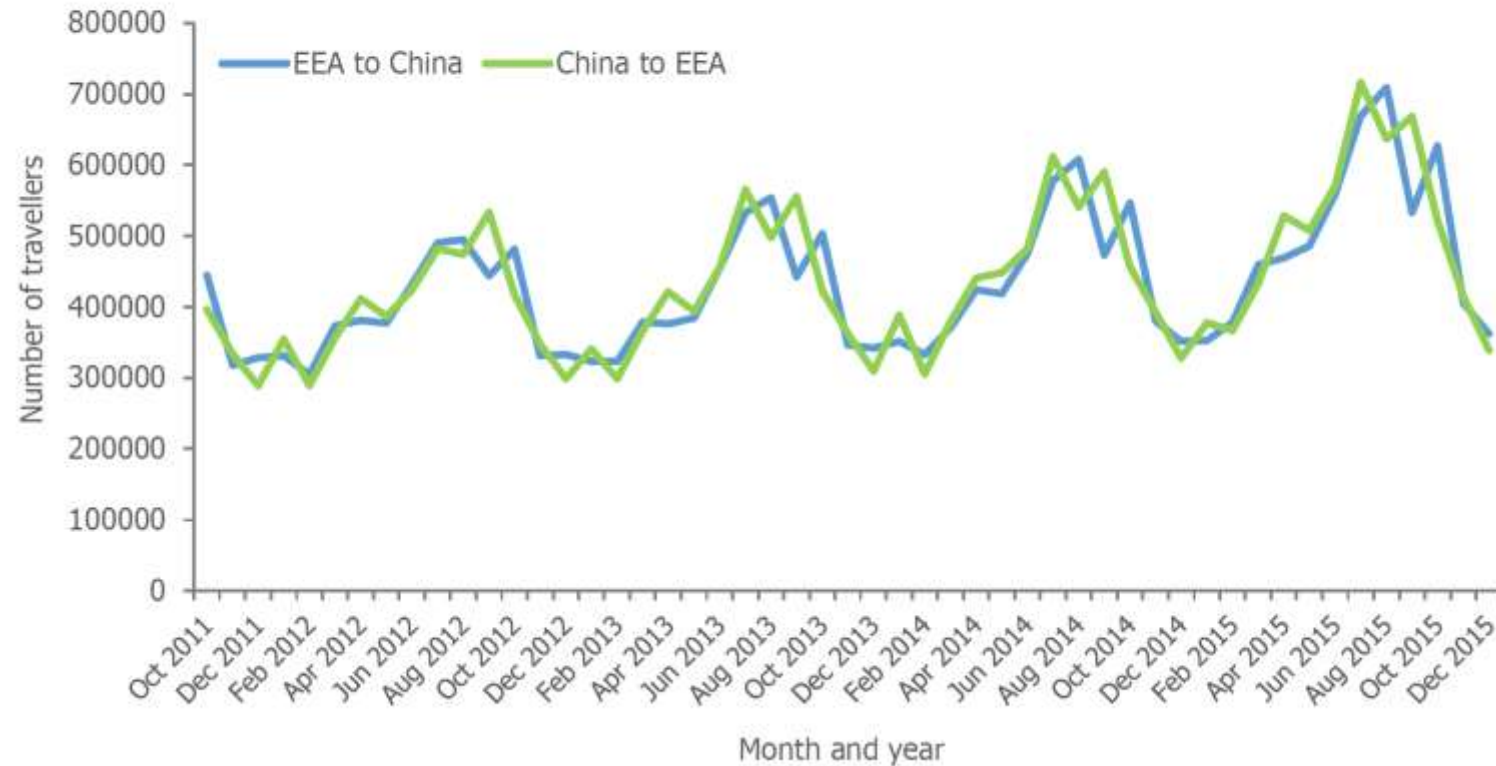
Geographical distribution of confirmed human cases of A(H9N2), 1998 - 8 November 2019

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**





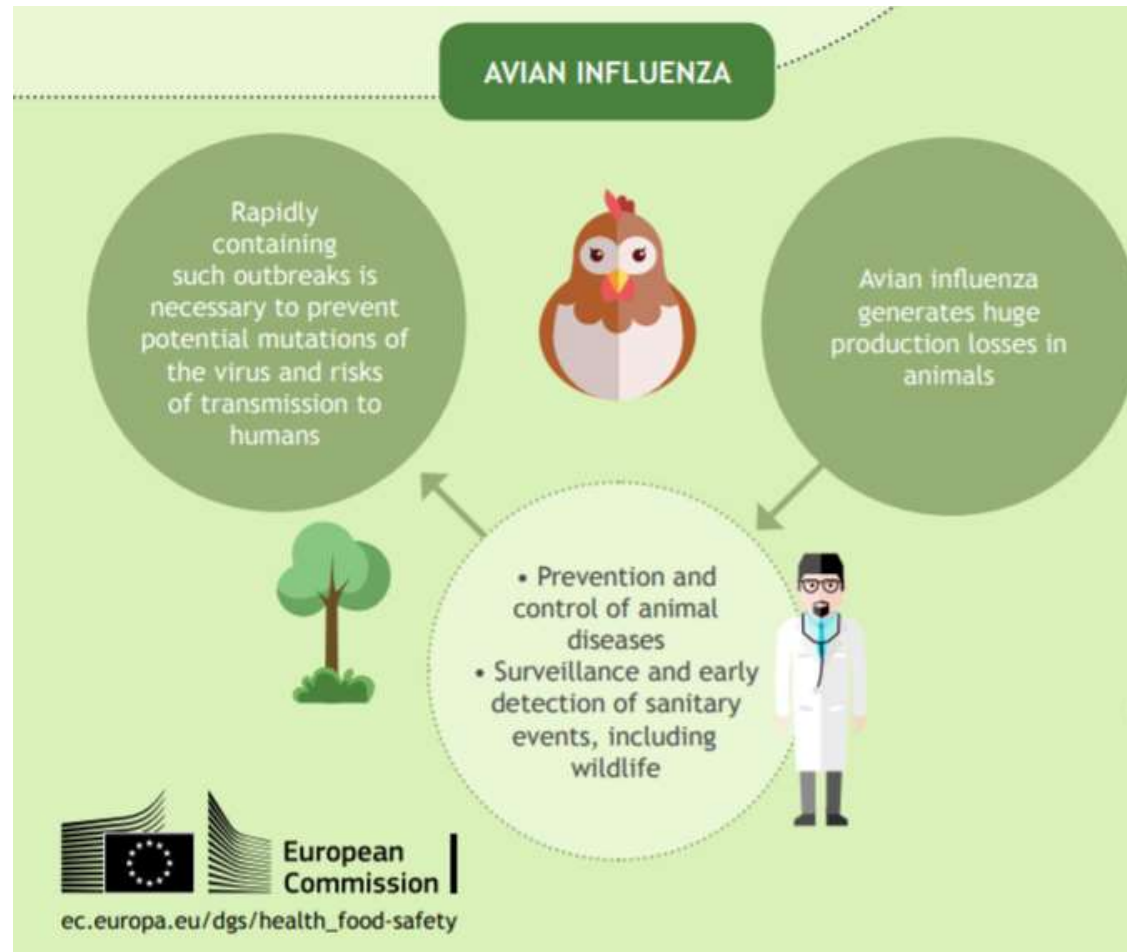
# Prevention

## 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

## Influenza

[News](#)[Events](#)[Vaccination](#)[▶ Seasonal influenza](#)[Zoonotic influenza](#)[Pandemic influenza](#)

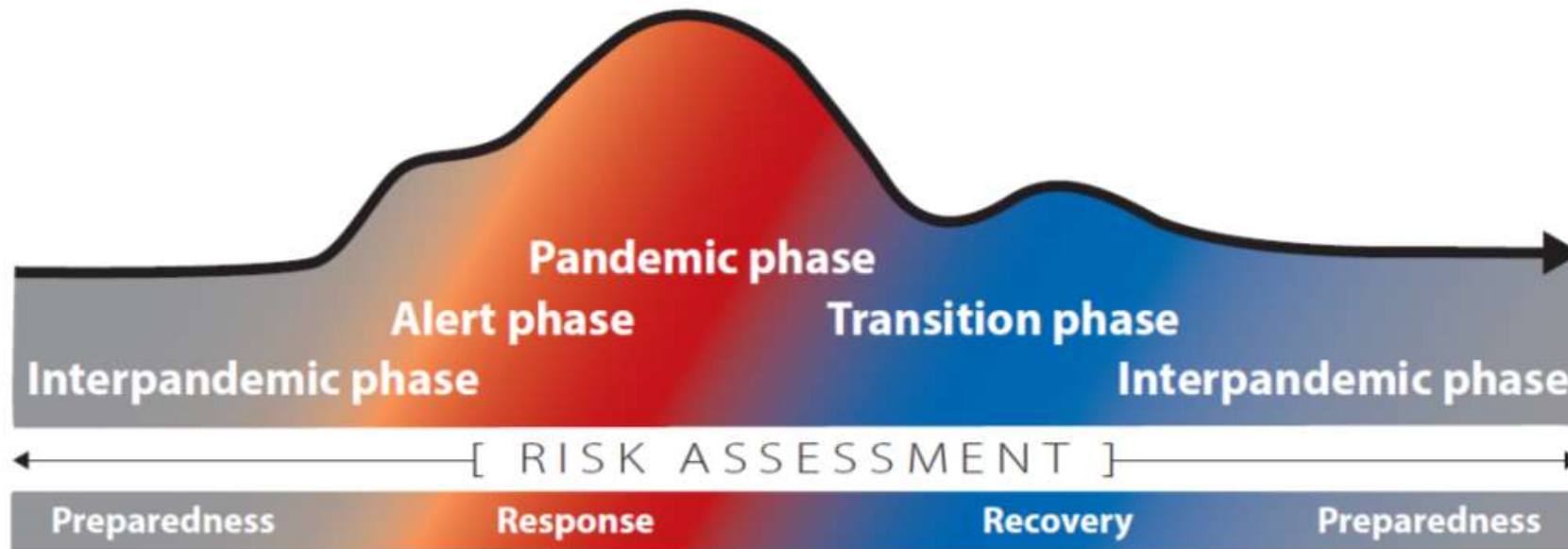
## Pandemic influenza

An influenza pandemic is a global epidemic caused by a new influenza virus to which there is little or no pre-existing immunity in the human population. Influenza pandemics are impossible to predict; and they may be mild, or cause severe disease or death. Severe disease may occur in certain risk groups, which may correspond to those at risk of severe disease due to seasonal influenza. However, healthy persons are also likely to experience more serious disease than that caused by seasonal influenza.

The most recent pandemic occurred in 2009 and was caused by an influenza A (H1N1) virus. It is estimated to have caused between 100 000 and 400 000 deaths globally in the first year alone.

# 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.

# Pandemic influenza – 100 yrs after

## Influenza (Flu)

### Pandemic Influenza

Pandemic Basics +

National Pandemic Strategy +


Monitoring for Influenza Viruses +

Planning and Preparedness Resources +

Archived Documents +

### Pandemic Influenza



Language: English (US) 

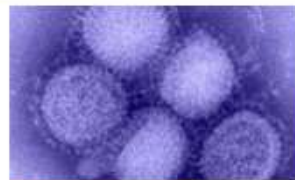
An influenza pandemic is a global outbreak of a new influenza A virus. Pandemics happen when new (novel) influenza A viruses emerge which are able to infect people easily and spread from person to person in an efficient and sustained way. The United States is NOT currently experiencing an influenza pandemic. [CDC influenza programs protect](#) [1.1 MB, 2 Pages, 508] the United States from seasonal influenza and an influenza pandemic, which occurs when a new flu virus emerges that can infect people and spread globally.

### Get Email Updates

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

[What's this?](#)

### Pandemic Basics



[Seasonal Flu vs Pandemic Flu](#)

[Questions and Answers](#)

[Past Pandemics](#)

### National Pandemic Strategy



[Pandemic Intervals Framework](#)

[Influenza Risk Assessment Tool](#)

### Monitoring for Influenza Viruses



[Current Situation](#)

[Viruses of Special Concern](#)

[Global Monitoring](#)

# Πανδημίες γρίπης Μαθήματα από το παρελθόν

- 10 πανδημίες τα τελευταία 300 έτη

• **ΑΛΗΘΕΙΑ**

# Pandemics 20<sup>th</sup> Century



**1918: "Spanish"**  
50-100 mil. deaths



H1N1



**1957: "Asian"**  
1 mil. deaths



H2N2



**1968: "Hong Kong"**  
1 mil. deaths



H3N2

H1N1

1920

1940

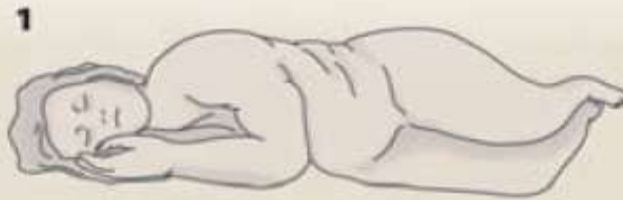
1960

1980

2000

# 1918 Influenza

## RECREATING THE VIRUS



1  
Flu victim frozen in Alaskan permafrost since 1918.



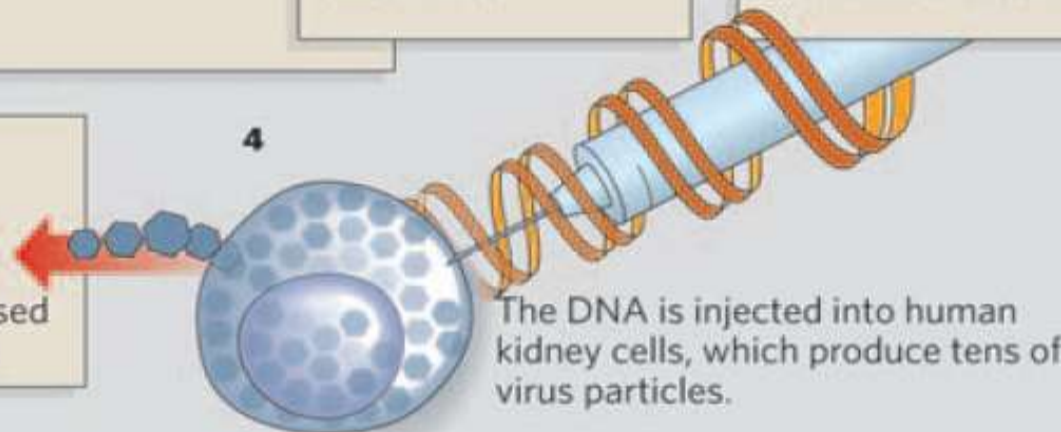
2  
Fragments of RNA are retrieved from samples of lung tissue, converted into DNA and sequenced.



3  
The overlapping sequences are pieced together to give the full genome sequence. A DNA version is synthesized in the lab.



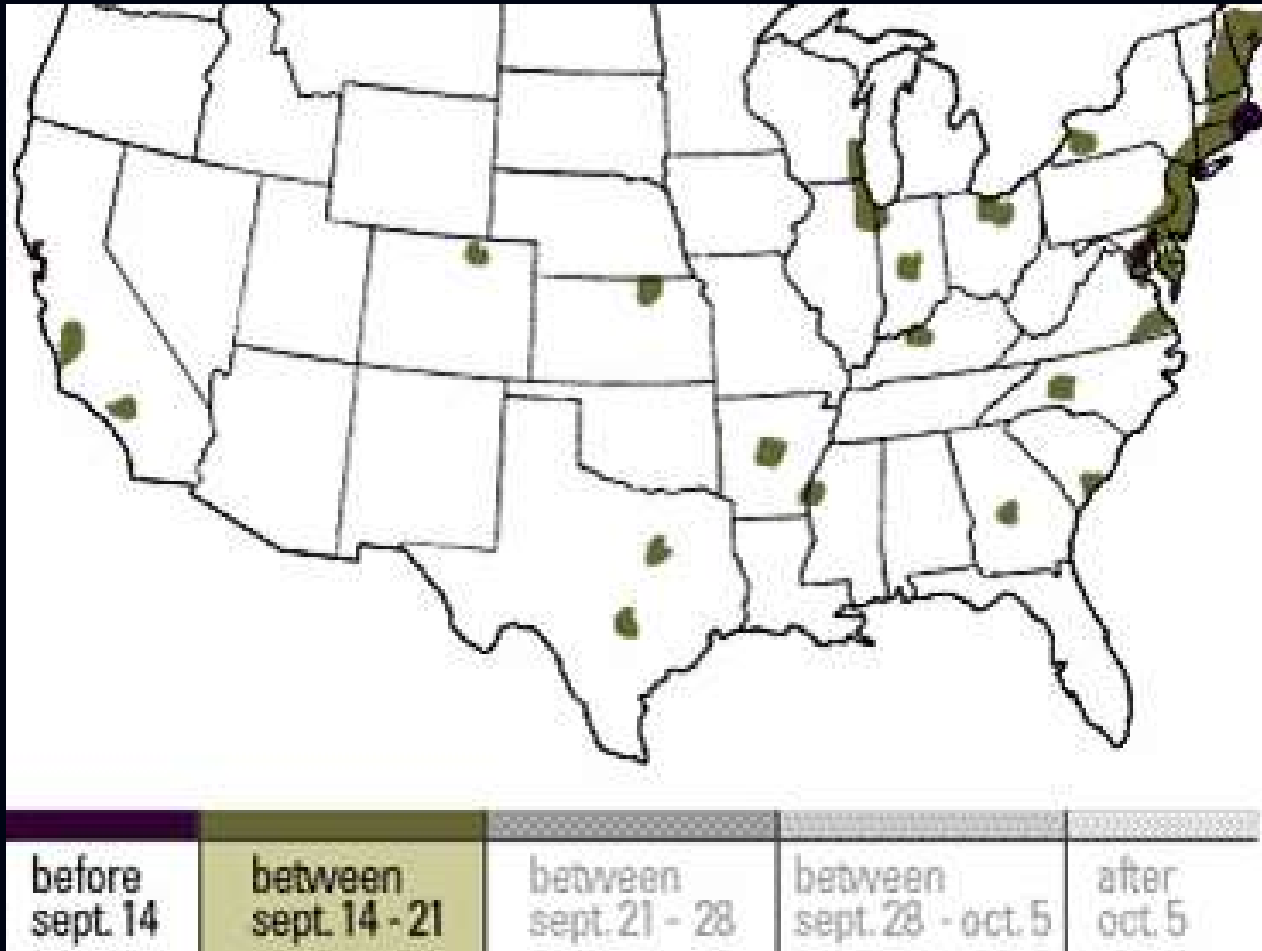
5  
The virus is isolated from the cells and used to infect mice. They all die within 6 days.



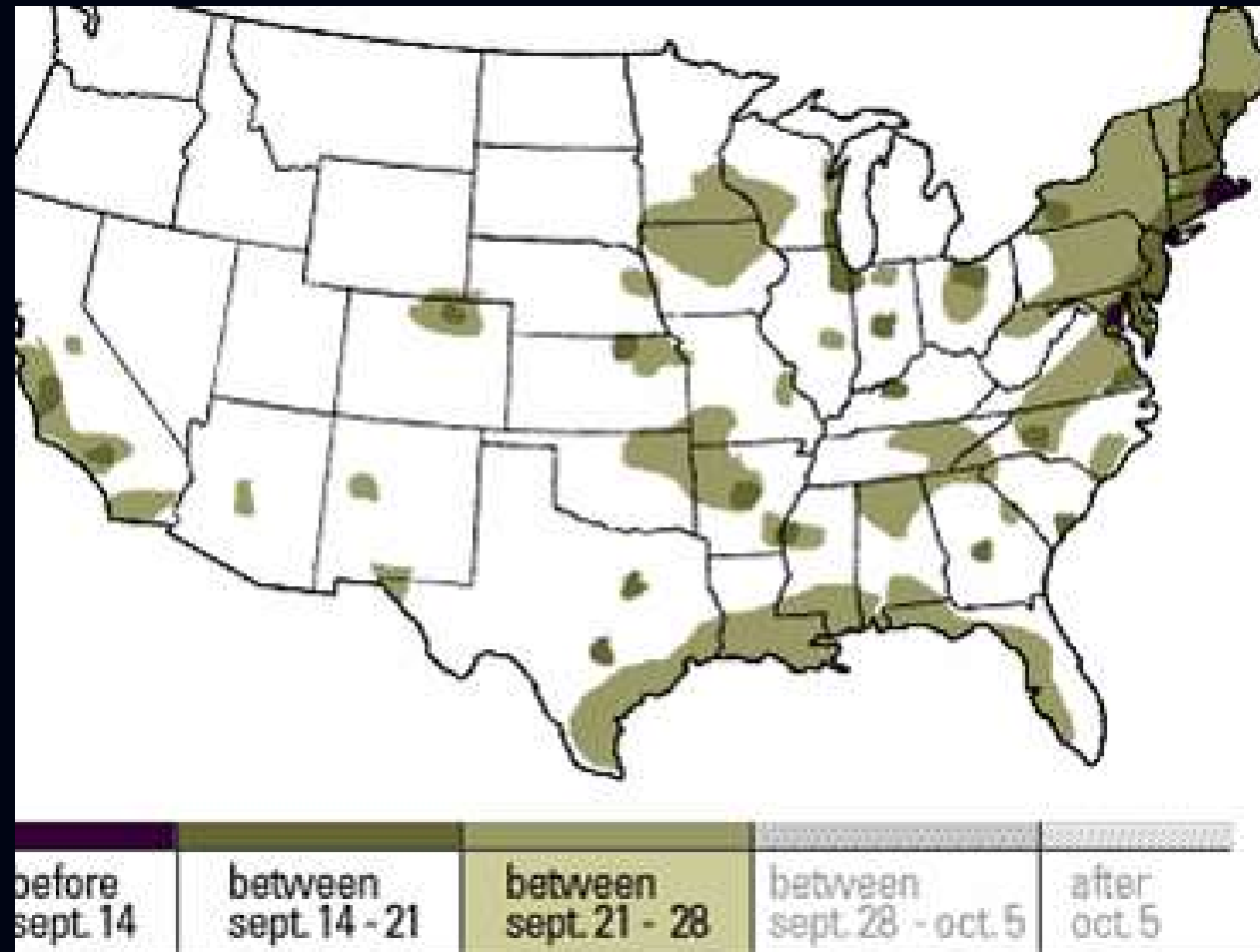
4  
The DNA is injected into human kidney cells, which produce tens of virus particles.



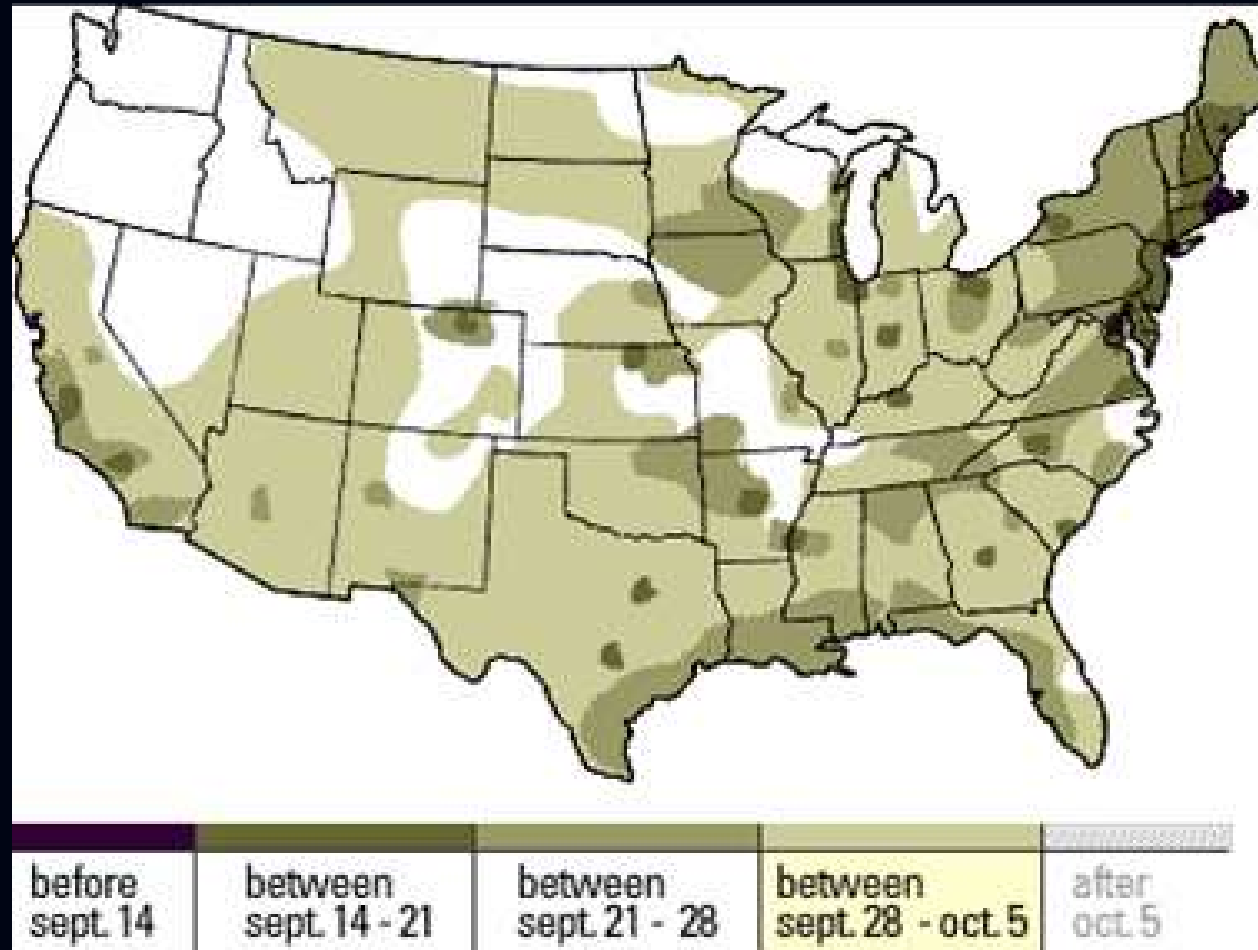
# The 1918 Flu Pandemic in the U.S.



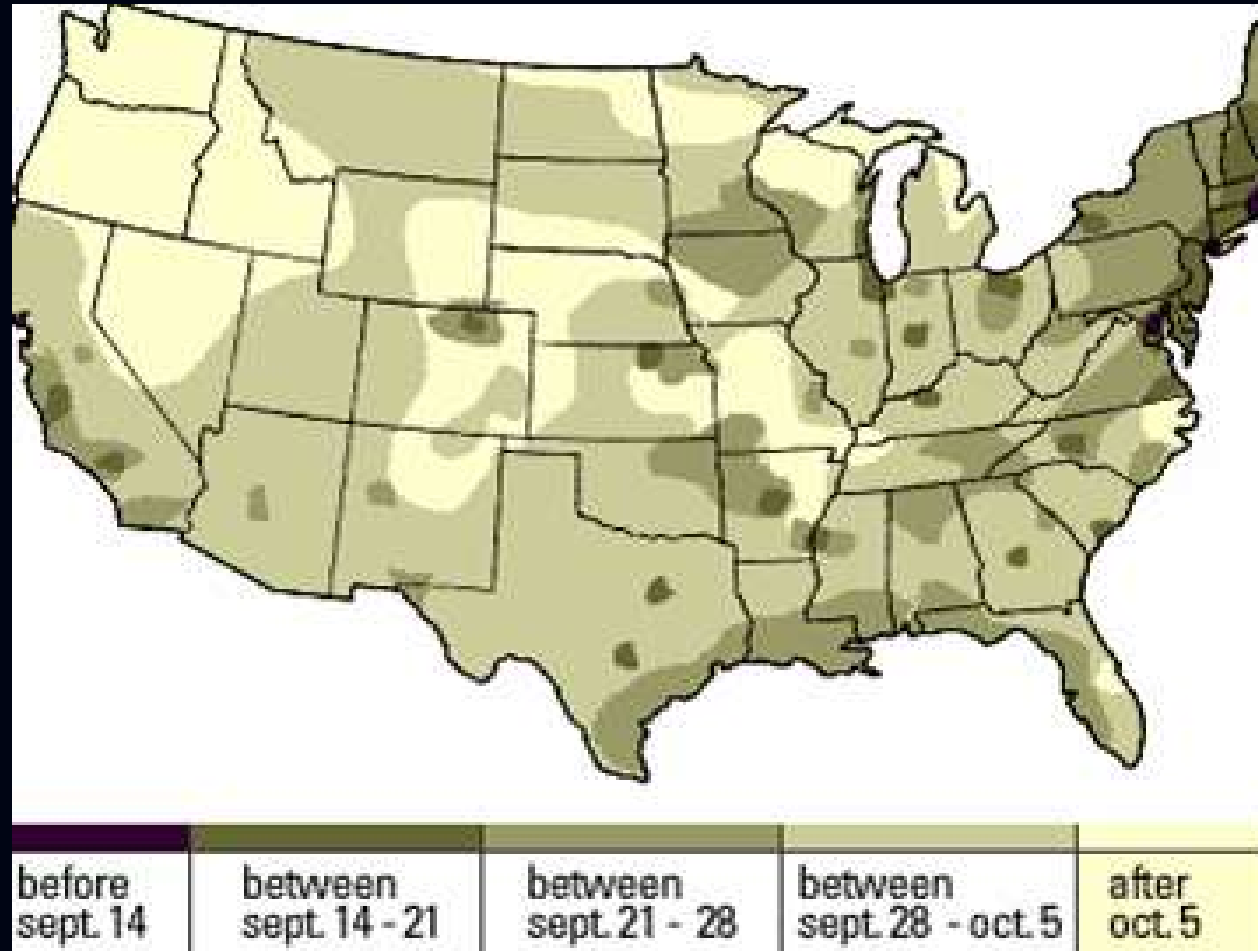
# The 1918 Flu Pandemic in the U.S.



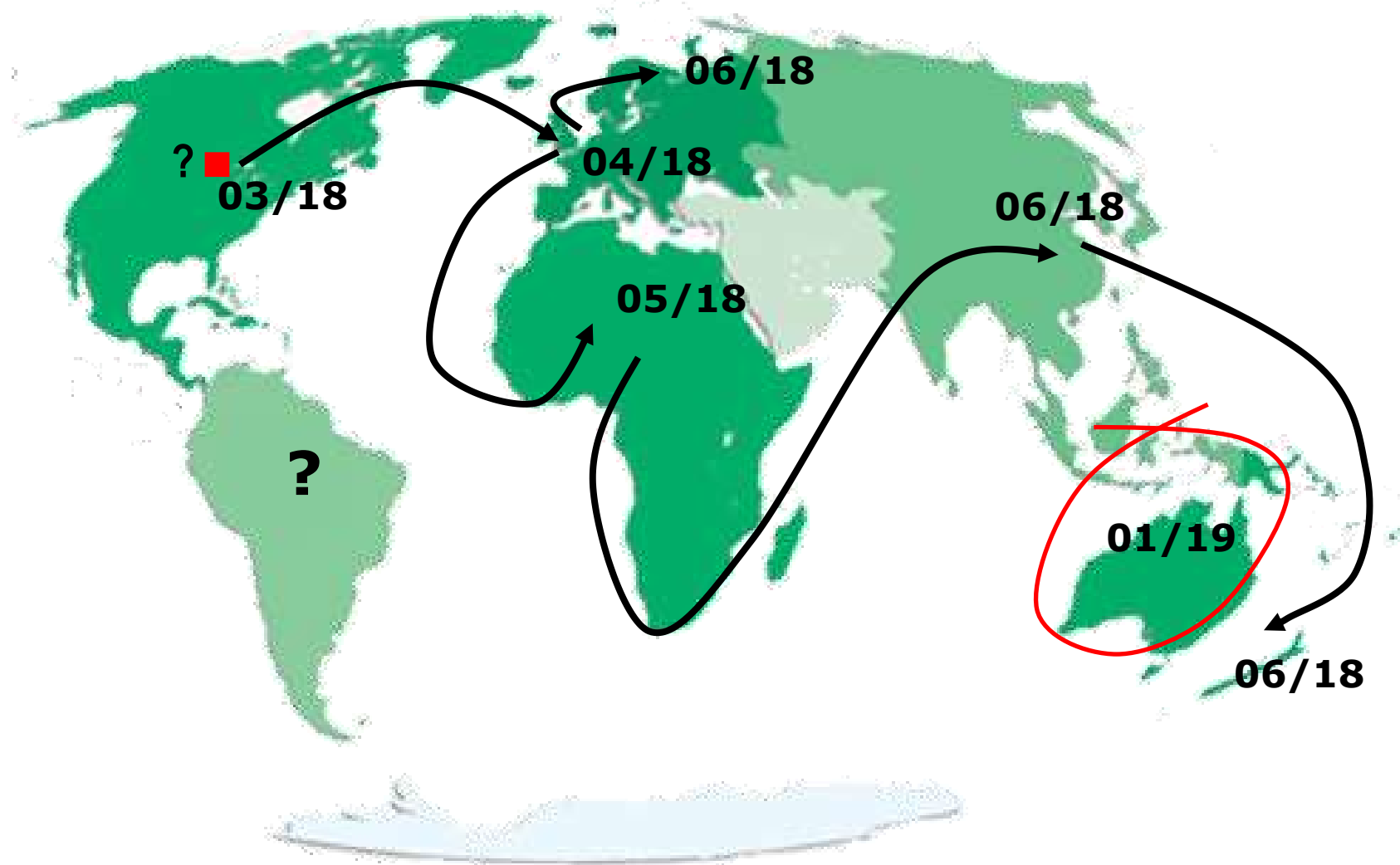
# The 1918 Flu Pandemic in the U.S.

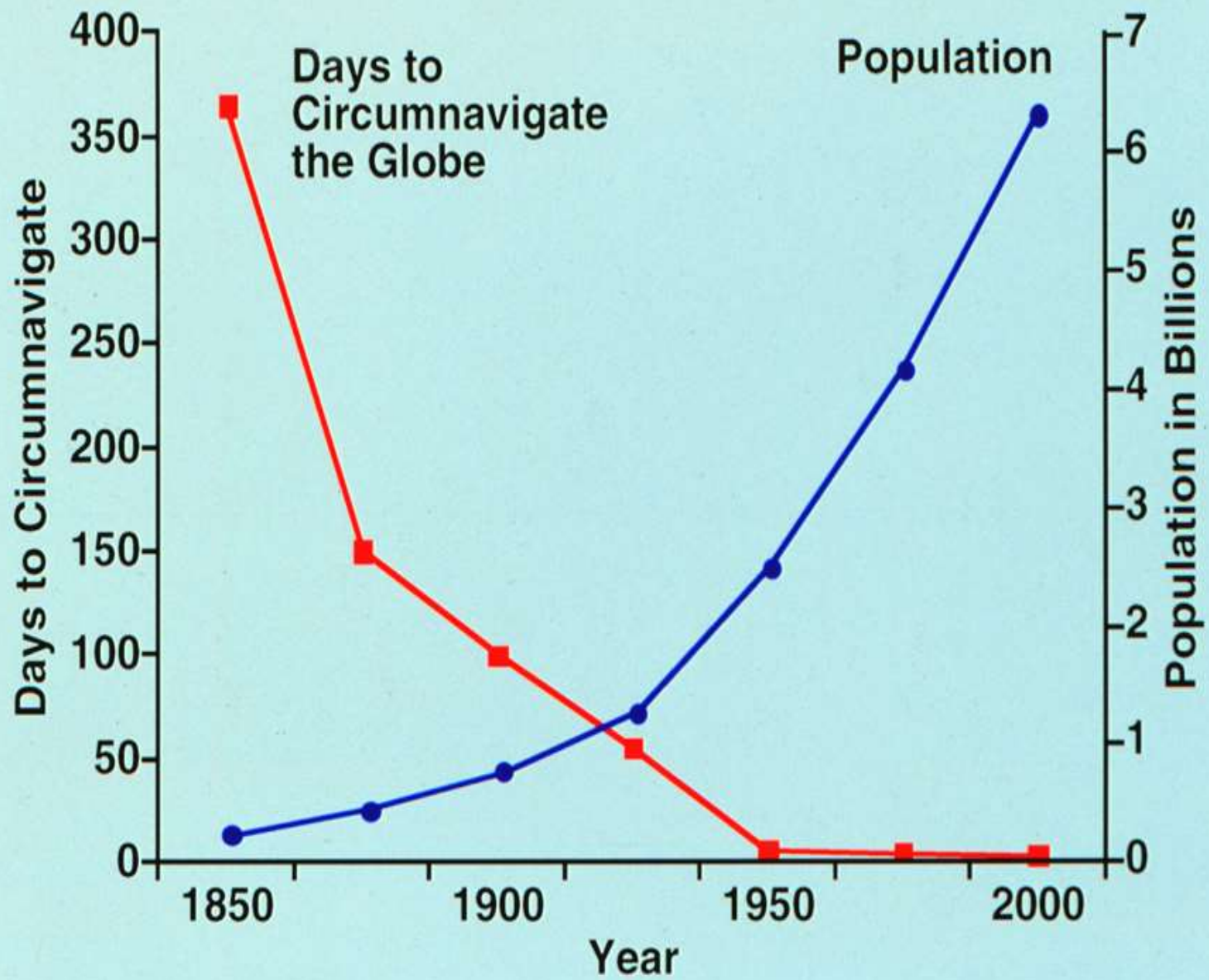


# The 1918 Flu Pandemic in the U.S.



# Geographic spread: 1918-19







Believe it or not,  
flu could hit you even harder

# ΠΑΝΔΗΜΙΑ - ΕΠΙΠΤΩΣΕΙΣ

- Κοινωνικές
- Οικονομικές
- Πολιτικές





# Pandemic influenza – 100 yrs after



Health Topics ▾

Countries ▾

News ▾

Emergencies ▾

About Us ▾

## 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

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

[A-Z Index](#)

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## Influenza (Flu)

Pandemic Influenza > National Pandemic Strategy

- Pandemic Influenza
  - Pandemic Basics +
  - Past Pandemics +
  - National Pandemic Strategy -**
    - Pandemic Intervals Framework
    - Influenza Risk Assessment Tool**
    - Pandemic Severity Assessment Framework
    - Allocating & Targeting Pandemic Influenza Vaccine +
  - Monitoring for Influenza Viruses +
  - Planning and Preparedness Resources +
  - What CDC Does +
  - Archived Documents +

### Influenza Risk Assessment Tool (IRAT)

#### Questions & Answers

[Español](#)

Please see this [summary of Influenza Risk Assessment Tool \(IRAT\) results](#) for more information.

### What is the Influenza Risk Assessment Tool (IRAT)?

The Influenza Risk Assessment Tool (IRAT) is an evaluation tool developed by CDC and external influenza experts that assesses the potential pandemic risk posed by influenza A viruses that currently circulate in animals but not in humans. The IRAT assesses potential pandemic risk based on two different scenarios: “emergence” and “public health impact.”

“Emergence” refers to the risk of a novel (i.e., new in humans) influenza virus acquiring the ability to spread easily and efficiently in people. “Public health impact” refers to the potential severity of human disease caused by the virus (e.g., deaths and hospitalizations) as well as the burden on society (e.g., missed workdays, strain on hospital capacity and resources, and interruption of basic public services) if a novel influenza virus were to begin spreading efficiently and sustainably among people.

#### On This Page

- What is the Influenza Risk Assessment Tool (IRAT)?
- Can the IRAT predict a future pandemic?
- What is the purpose of the IRAT?
- Does the IRAT have any limitations?
- What are the evaluation criteria used by the IRAT?
- How are the IRAT’s 10 evaluation criteria ranked and weighted?
- Does the IRAT get updated?
- What influenza viruses have been

# 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

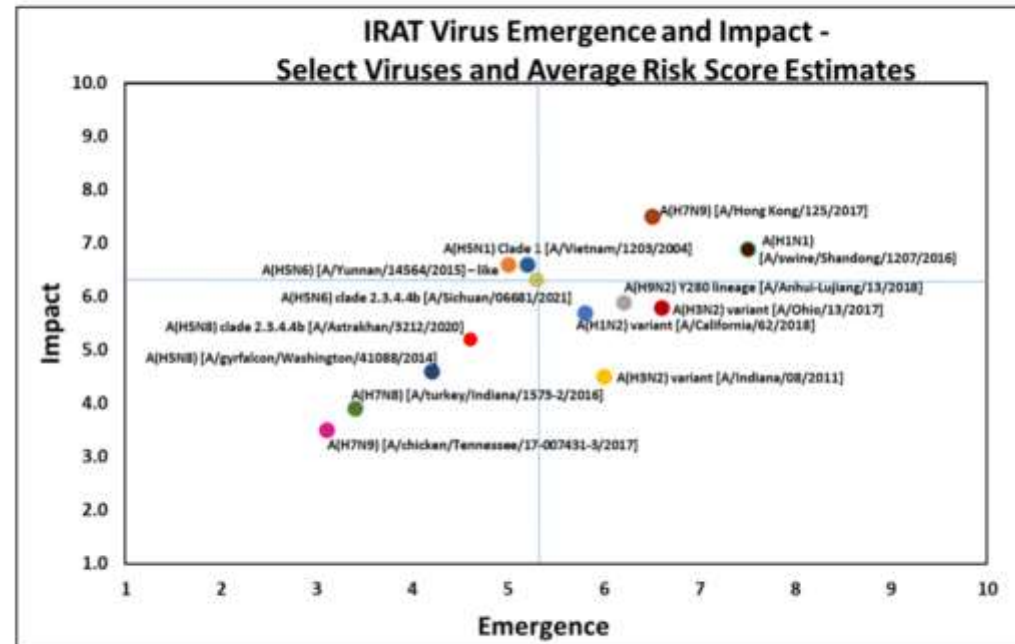


Figure: Potential pandemic risk for clade 2.3.4.4b A(H5N6) virus plotted by emergence and impact average weighted risk score estimates (highlighted with blue crossbars). Additional select viruses scored using IRAT are displayed for comparison.

# Pandemic influenza – Preparedness

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

[A-Z Index](#)

Search

## Influenza (Flu)

Pandemic Influenza > Planning and Preparedness Resources



- Home Pandemic Influenza
  - Pandemic Basics +
  - Past Pandemics +
  - National Pandemic Strategy +
  - Monitoring for Influenza Viruses +
  - Planning and Preparedness Resources**
    - Global Planning**
    - Federal Resources for Planning +
    - CDC Pandemic Tools +
    - State and Local Government Planning
  - What CDC Does +
  - Archived Documents +

### Global Planning

[Español](#)

Advance planning and preparedness are critical to help reduce the impact of a pandemic. The World Health Organization (WHO) guidance document "[Pandemic Influenza Risk Management](#)" outlines an "all-hazards" emergency risk management approach to pandemic influenza risk management. The guidance takes into account the [lessons learned from the influenza A\(H1N1\) 2009 pandemic](#) in order to create a pandemic influenza planning framework that would allow public health response efforts to be adapted for a more moderate event. WHO will use the global phases of a pandemic – Interpandemic, Alert, Pandemic, and Transition – to describe the spread of a novel influenza A virus. Different countries will face different pandemic phases at different times. The WHO guidance introduces a risk-based approach that would allow public health officials to develop flexible plans based on a national risk assessment while taking into consideration the WHO global risk assessment. To see how the WHO phases map to the CDC phases, see the table in the MMWR article "[Updated Preparedness and Response Framework for Influenza Pandemics](#)."

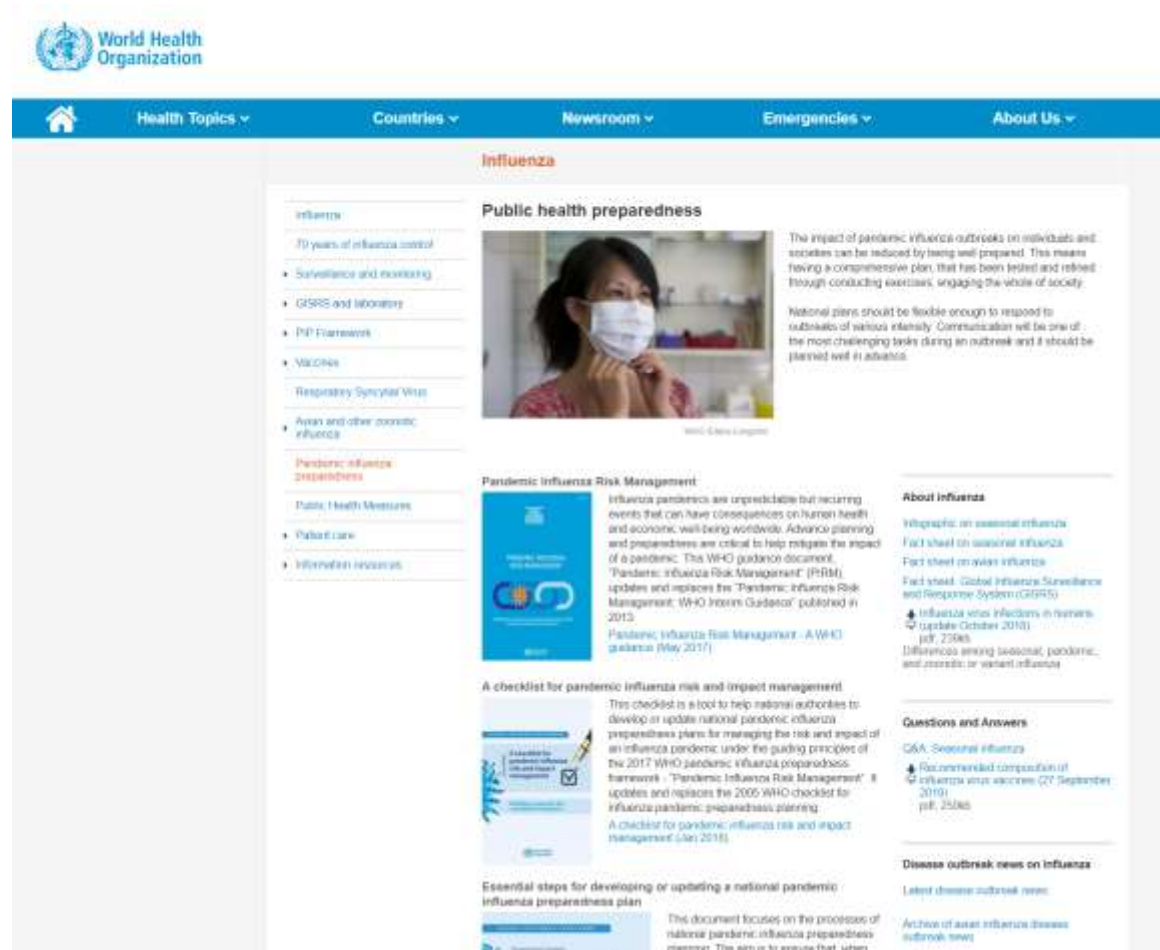
Figure 1 describes the overlap risk assessments and the continuum of the global pandemic phases. ([508 Version](#)).

**Figure 1. The continuum of pandemic phases\***



The figure illustrates the continuum of pandemic phases. It features a bell-shaped curve representing the spread of a novel influenza A virus. The curve is divided into four phases: Interpandemic phase (grey), Alert phase (red), Pandemic phase (red), and Transition phase (blue). Below the curve, a horizontal axis shows the progression of risk assessment and response: Preparedness (grey), Response (red), Recovery (blue), and Preparedness (grey). A bracket labeled 'RISK ASSESSMENT' spans the Alert and Pandemic phases.

# Pandemic influenza – Preparedness



The image shows a screenshot of the World Health Organization's website page for Influenza. The page is titled "Influenza" and features a navigation bar with "Health Topics", "Countries", "Newsroom", "Emergencies", and "About Us". The main content area is titled "Public health preparedness" and includes a photograph of a woman wearing a face mask. The page is organized into several sections: "Public health preparedness", "Pandemic Influenza Risk Management", "A checklist for pandemic influenza risk and impact management", "Essential steps for developing or updating a national pandemic influenza preparedness plan", "About influenza", "Questions and Answers", and "Disease outbreak news on influenza".

**World Health Organization**

Health Topics Countries Newsroom Emergencies About Us

## Influenza

- Influenza
- 70 years of influenza control
- Surveillance and monitoring
- GISRS and laboratories
- PIP Framework
- VACCINES
- Respiratory Syncytial Virus
- Arya and other zoonotic influenza
- Pandemic influenza preparedness**
- Public Health Measures
- Patient care
- Information resources

### Public health preparedness

The impact of pandemic influenza outbreaks on individuals and societies can be reduced by being well prepared. This means having a comprehensive plan that has been tested and refined through conducting exercises, engaging the whole of society.

National plans should be flexible enough to respond to outbreaks of various intensity. Communication will be one of the most challenging tasks during an outbreak and it should be planned well in advance.

**Pandemic Influenza Risk Management**

Influenza pandemics are unpredictable but recurring events that can have consequences on human health and economic well-being worldwide. Advance planning and preparedness are critical to help mitigate the impact of a pandemic. This WHO guidance document, "Pandemic Influenza Risk Management" (PRM), updates and replaces the "Pandemic Influenza Risk Management: WHO Interim Guidance" published in 2012.

Pandemic Influenza Risk Management - A WHO guideline (May 2017)

### A checklist for pandemic influenza risk and impact management

This checklist is a tool to help national authorities to develop or update national pandemic influenza preparedness plans for managing the risk and impact of an influenza pandemic, under the guiding principles of the 2017 WHO pandemic influenza preparedness framework - "Pandemic Influenza Risk Management". It updates and replaces the 2005 WHO checklist for influenza pandemic preparedness planning.

A checklist for pandemic influenza risk and impact management (Jan 2016)

### Essential steps for developing or updating a national pandemic influenza preparedness plan

This document focuses on the processes of national pandemic influenza preparedness planning. The aim is to ensure that, when

### About influenza

- Infographic on seasonal influenza
- Fact sheet on seasonal influenza
- Fact sheet on avian influenza
- Fact sheet: Global Influenza Surveillance and Response System (GISRS)
- Influenza virus infections in humans (October 2010) (pdf, 250kb)
- Differences among seasonal, pandemic, and avian or variant influenza

### Questions and Answers

- Q&A: Seasonal influenza
- Recommended composition of influenza virus vaccine (27 September 2010) (pdf, 250kb)

### Disease outbreak news on influenza

- Latest disease outbreak news
- Archive of avian influenza disease outbreak news

# Pandemic influenza

## Predictably unpredictable



WHO/SEARO/J.Perugia

**Predictably unpredictable**

# Influenza

Συνεχώς αναδυόμενη νόσος  
που «ρολάρει»



# Seasonal & Pandemic influenza preparedness is similar

## What to know about seasonal influenza

Influenza or "the flu", is an illness caused by seasonal influenza viruses. These viruses are spread from one person to another.

### How to recognize the flu?



Sudden high fever



Headache



Cough or  
sore throat



Muscle pain

### What to do when you have the flu?



Cover your cough  
or sneeze with  
your arm/elbow  
or tissue



Wash your hands  
frequently



Get plenty of rest



Drink plenty  
of water and  
eat nutritious food



Seek medical advice  
if you are not getting  
better or if you are in  
a high risk group

## How to prevent the flu?

Getting a flu vaccine  
each year is the best way  
to prevent the flu.



Vaccination is especially important  
for those at high risk of influenza  
complications:

- pregnant women
- people above 65 years of age
- children between 6 months and 5 years of age
- people with chronic medical conditions

and people who live with or care for  
those at high risk



World Health  
Organization

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

**ΕΡΩΤΗΣΕΙΣ ;**