

ΜΕΤΑΠΤΥΧΙΑΚΟ ΠΡΟΓΡΑΜΜΑ ΛΟΙΜΩΞΙΟΛΟΓΙΑ

Γρίπη-Πανδημική γρίπη-Γρίπη πουλερικών

Σωτήρης Τσιόδρας

Καθηγητής Παθολογίας-Λοιμώξεων

Ιατρική Σχολή ΕΚΠΑ

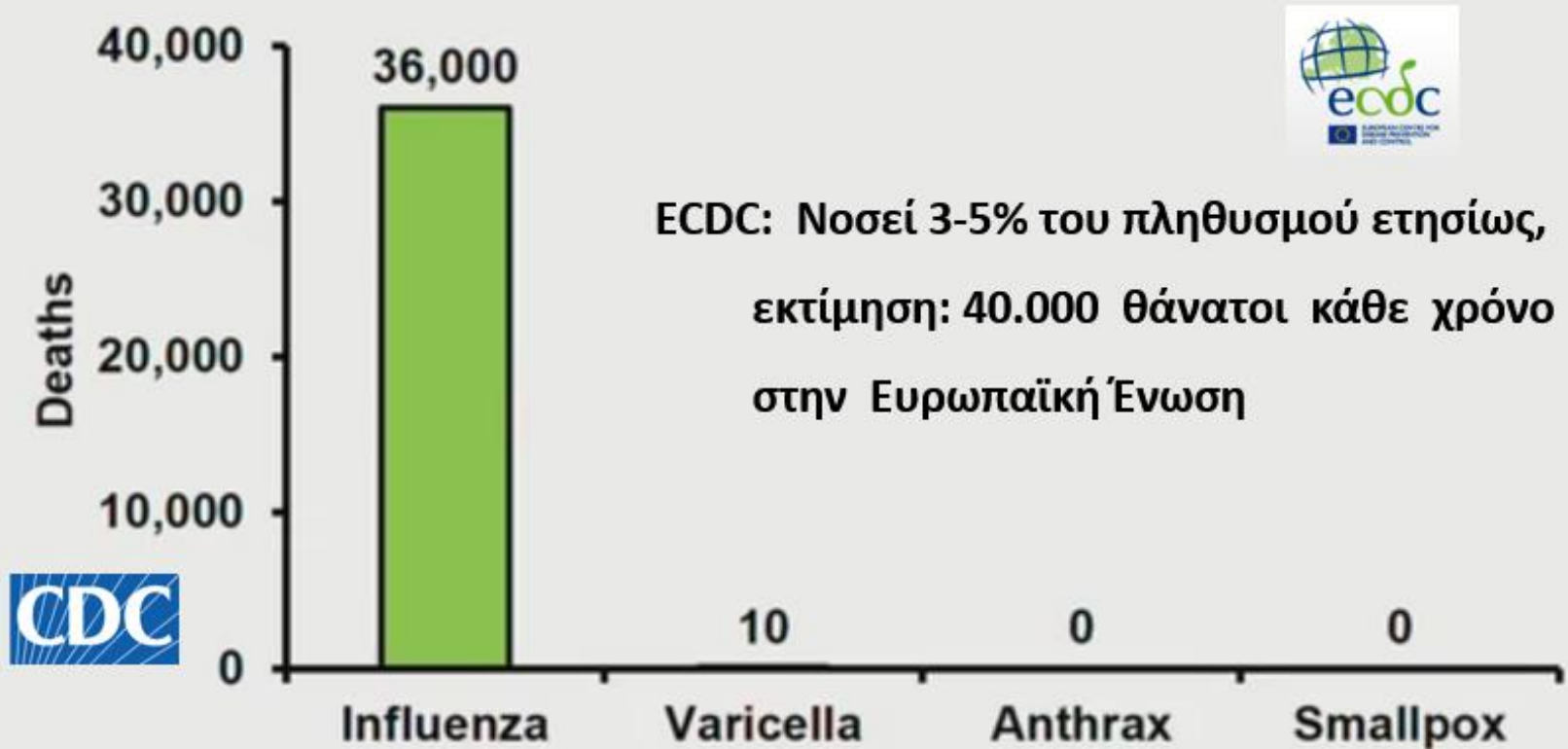
2/12/2019

Εποχική Γρίπη & συχνότητα

- **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

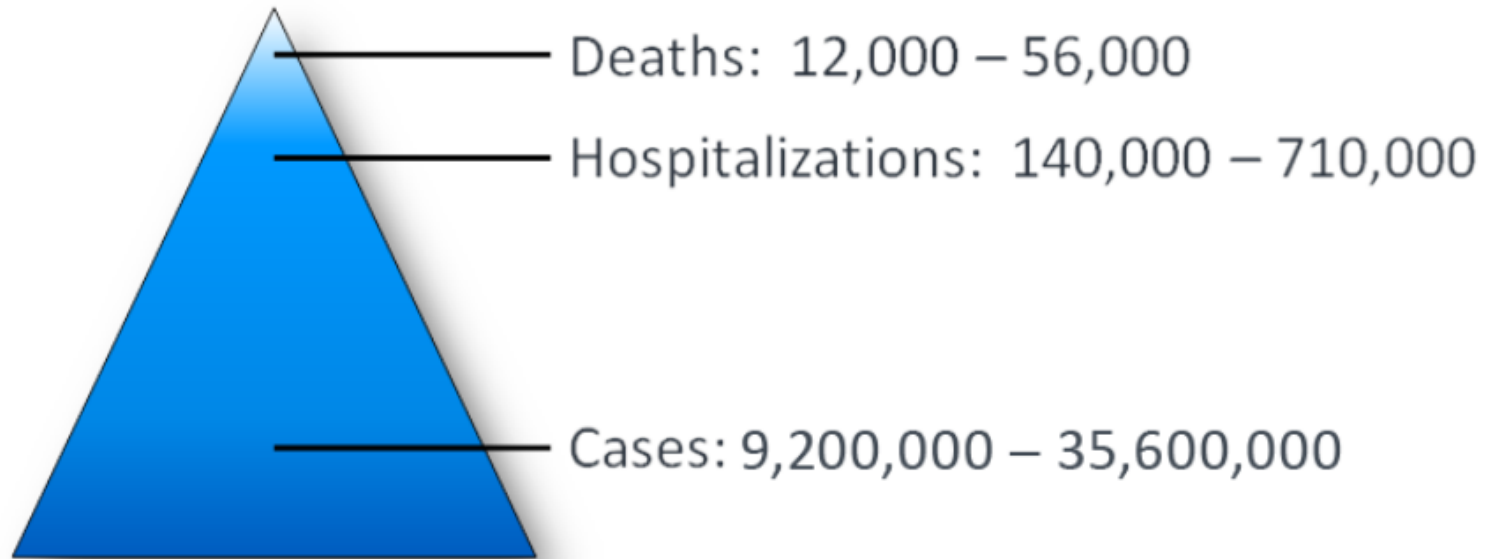


Εποχική Γρίπη & συχνότητα



USA 2010-18, estimates

Πιο συχνή νόσος που προλαμβάνεται με εμβολιασμό



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



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

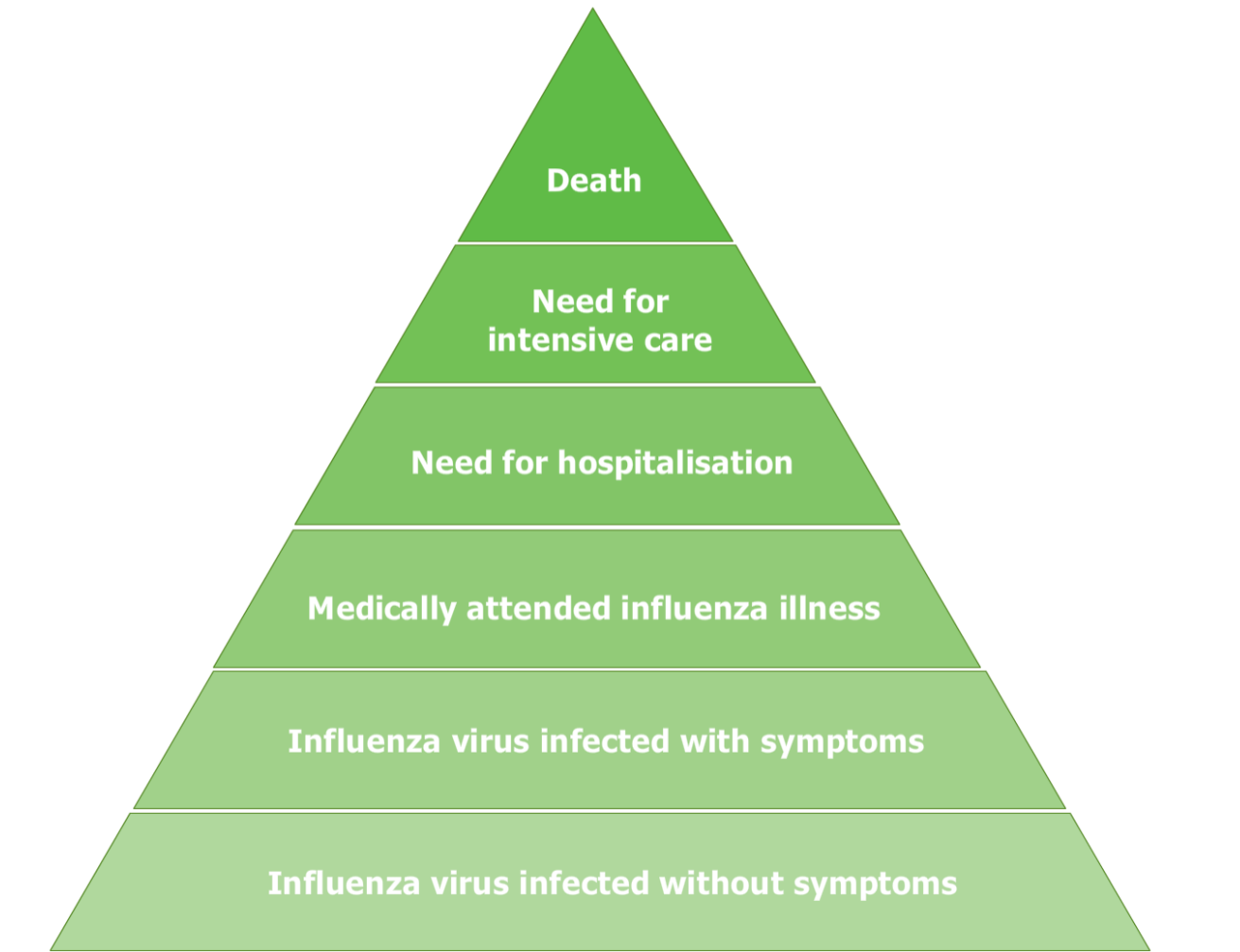


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14 December 2017 | News Release | GENEVA

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ΕΠΟΧΙΚΗ ΓΡΙΠΗ & ΕΠΙΠΛΟΚΕΣ



Influenza & οξύ έμφραγμα μυοκαρδίου

The New England Journal of Medicine

Myocardial Infarction after Influenza Infection

KEY POINTS FROM

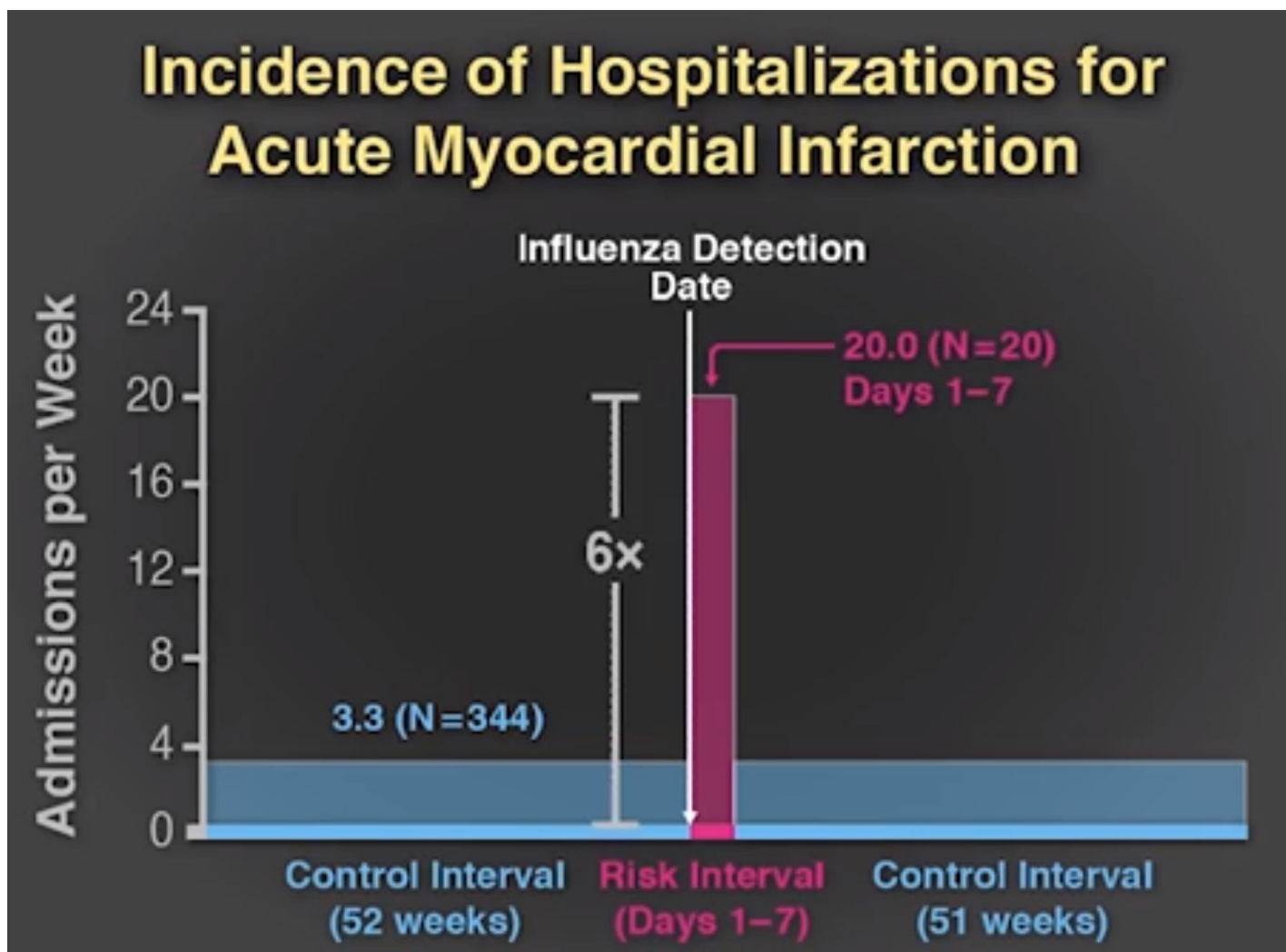
*Acute Myocardial Infarction after
Laboratory-Confirmed Influenza Infection*

by J.C. Kwong et al.

JANUARY 25, 2018



Influenza & οξύ έμφραγμα μυοκαρδίου, Kwong,et al, NEJM 2018



Flu-CDC estimates 2018-19

USA 2019

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**



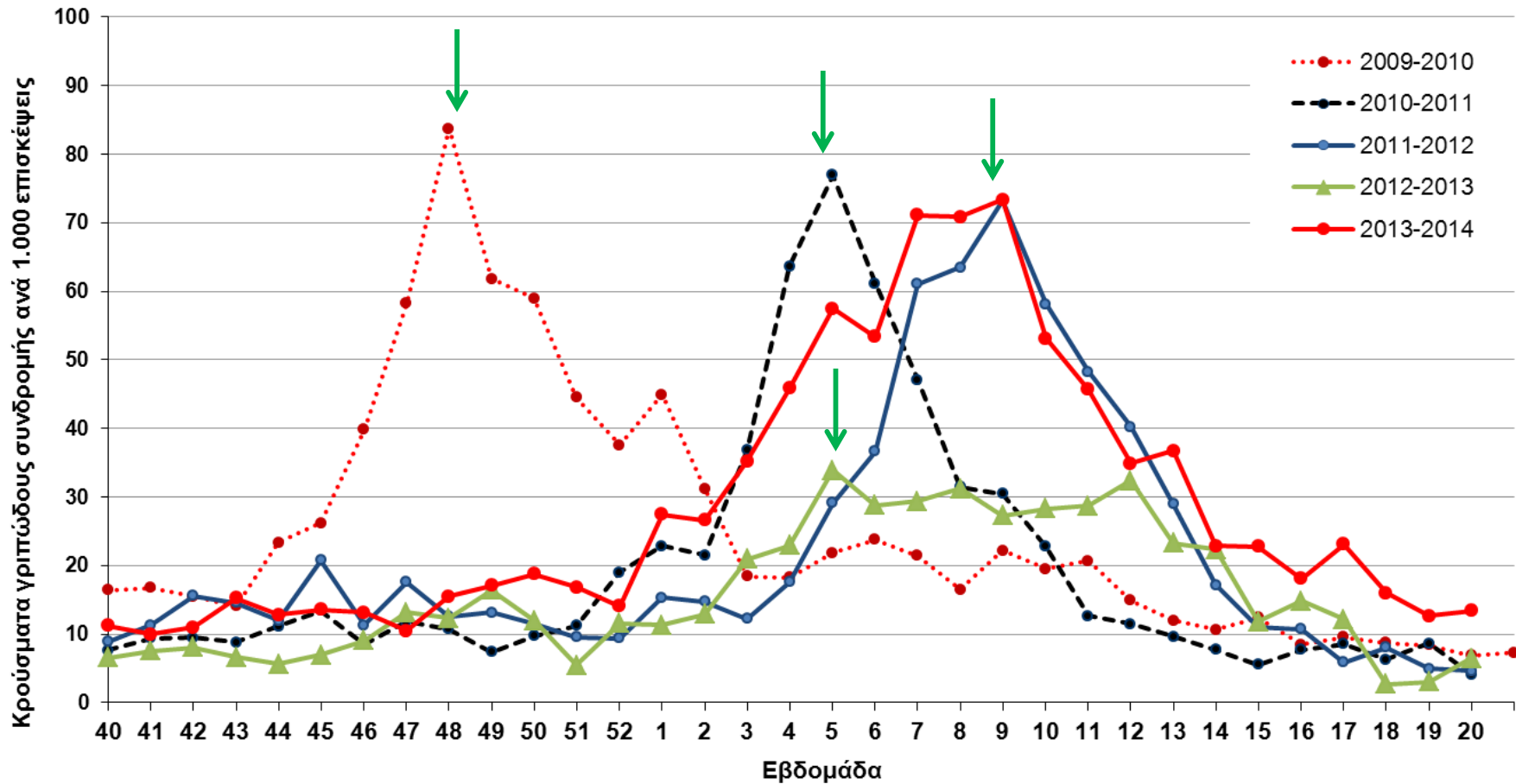
531,000 – 647,000
flu **hospitalizations**



36,400 – 61,200
flu **deaths**



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

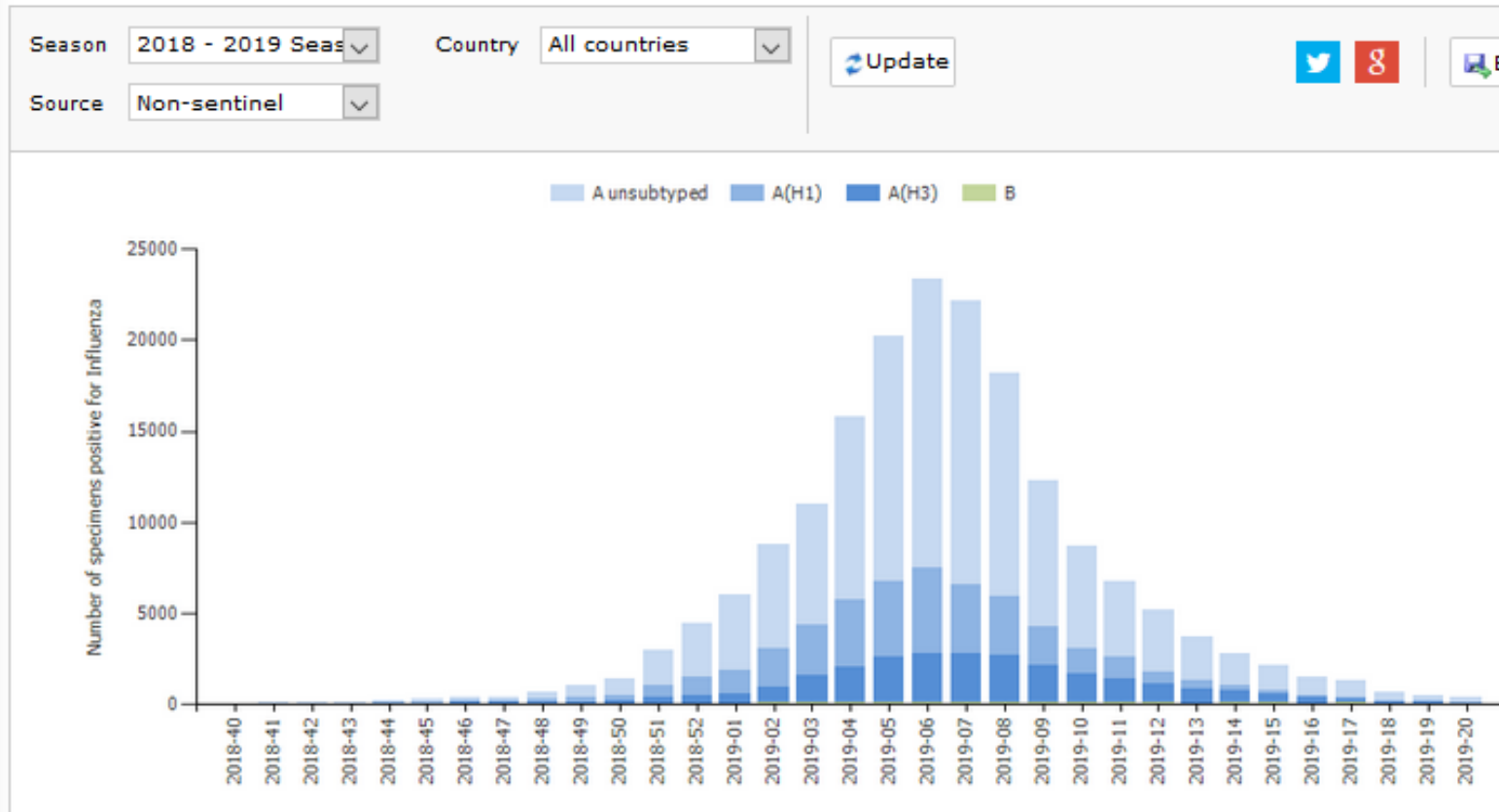


**Όποιο στέλεχος γρίπης κι αν
κυριαρχεί, οι επιδημίες γρίπης
συνδέονται με αυξημένη
νοσηρότητα!!!**

Influenza 2018-19, 2018-19, EU/EEA

type A 99%, (H1N1)pdm09: 55%, AH3N2: 45%

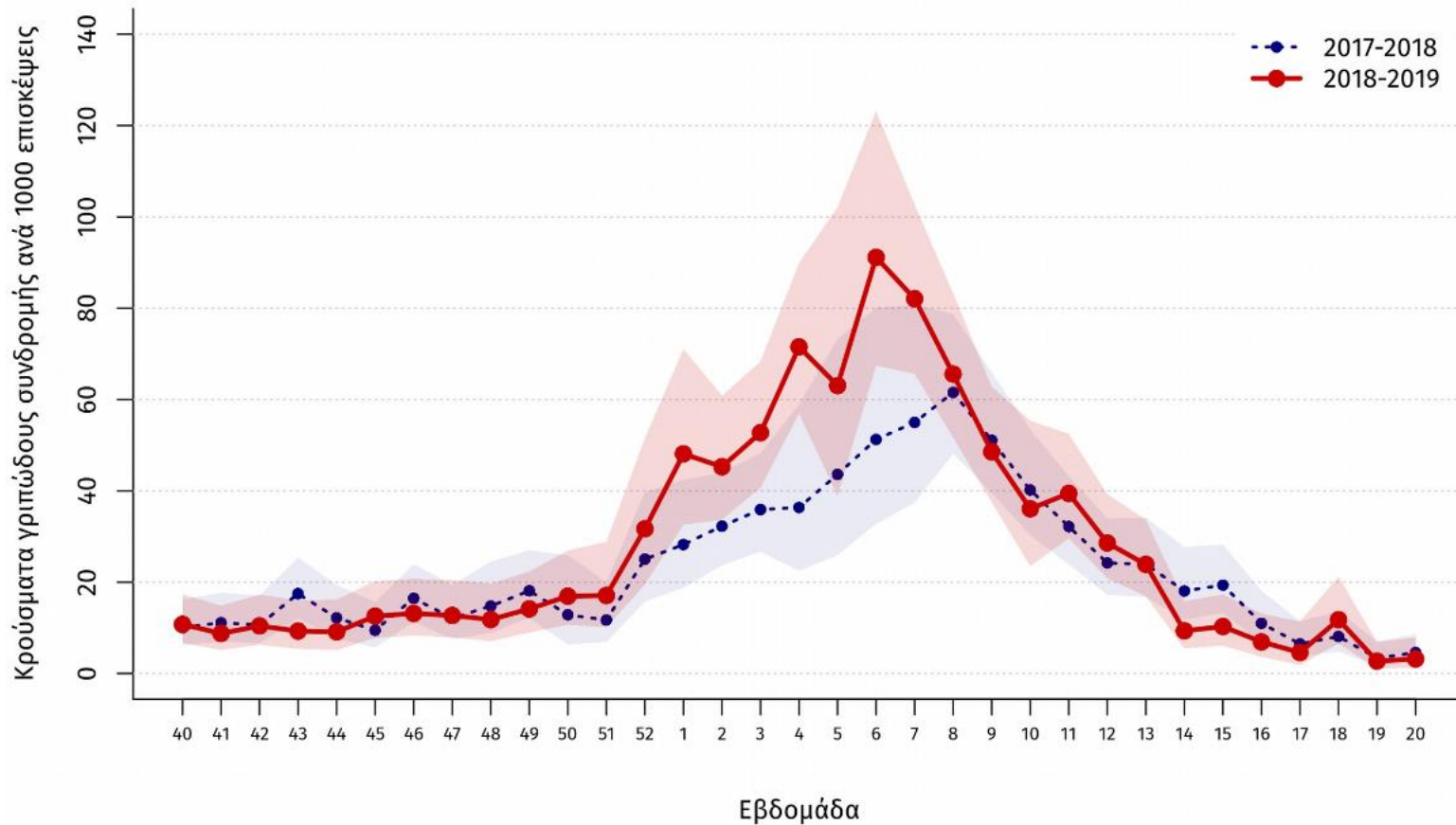
Virus detections by (sub)type



Sentinel data

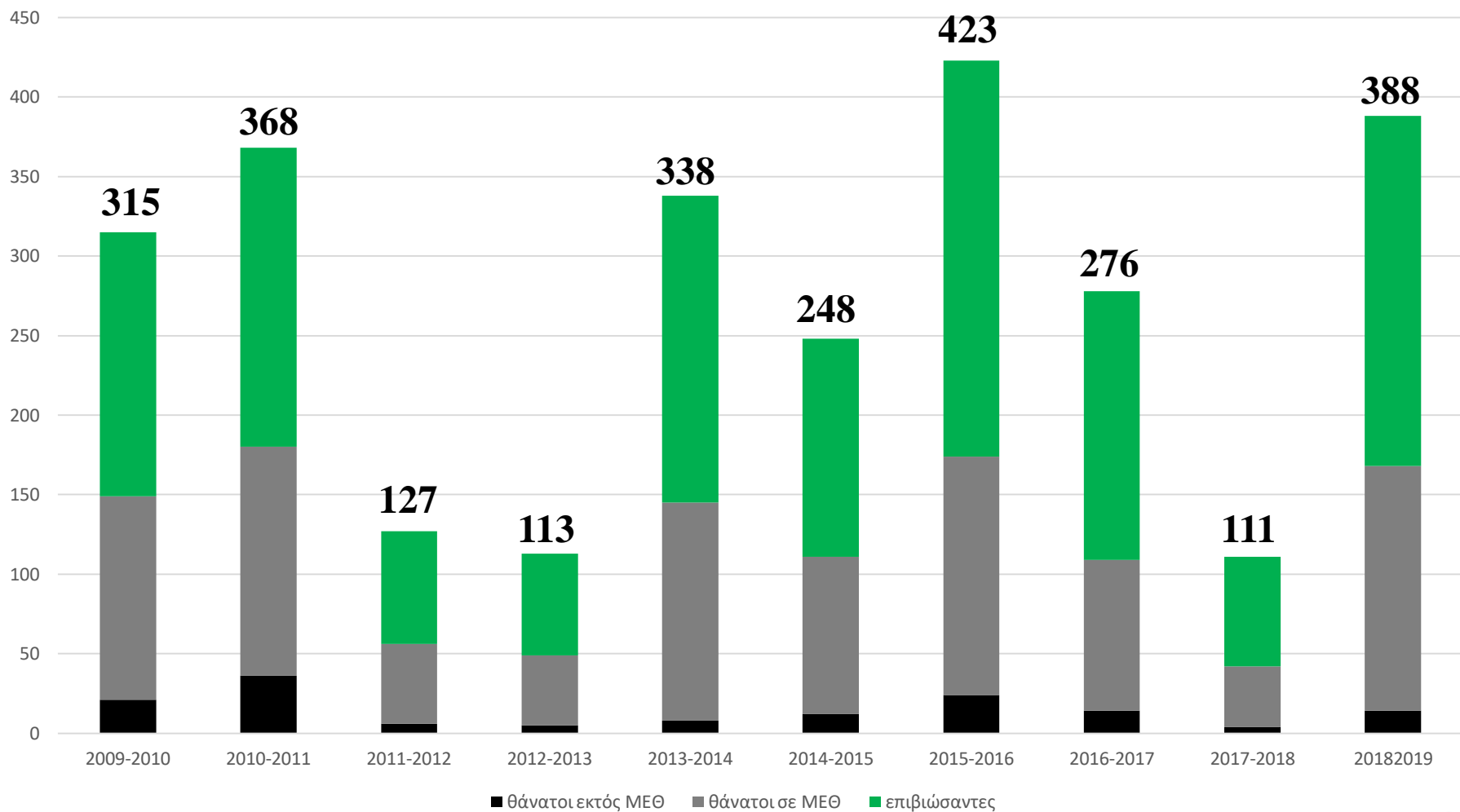
Γρίπη – Ελλάδα, 2018-19

Διάγραμμα 1: Εκτίμηση αριθμού κρουσμάτων γριπώδους συνδρομής ανά 1.000 επισκέψεις, κατά εβδομάδα. Σύνολο χώρας, περιοδοι γρίπης: 2017-2018, 2018-2019.



Ν σοβαρών Ελλάδα, 2009-2019

77% high risk, εμβολιασμένοι 15%!!!



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

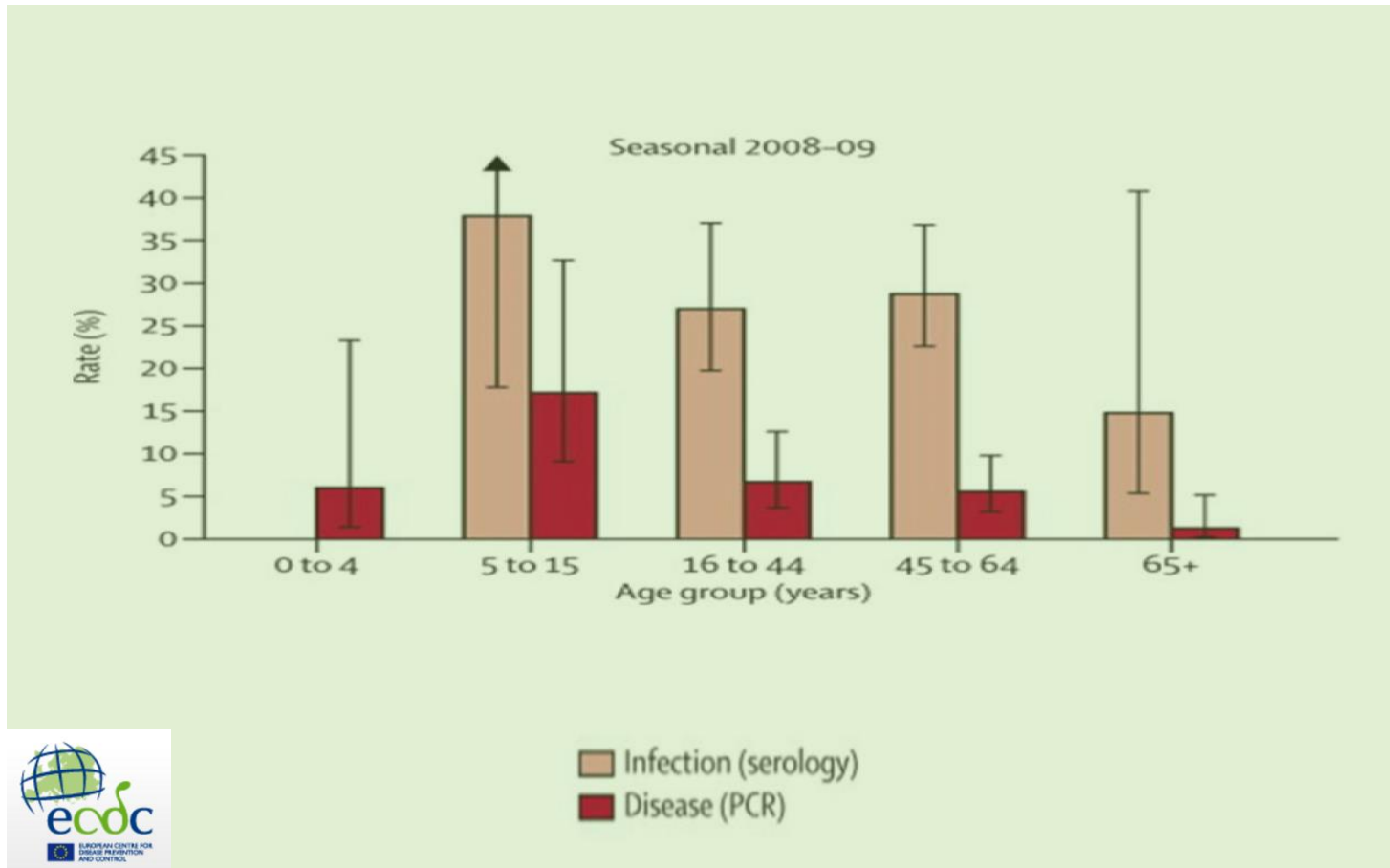
Πλειοψηφία=ήπια νόσος !!!

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



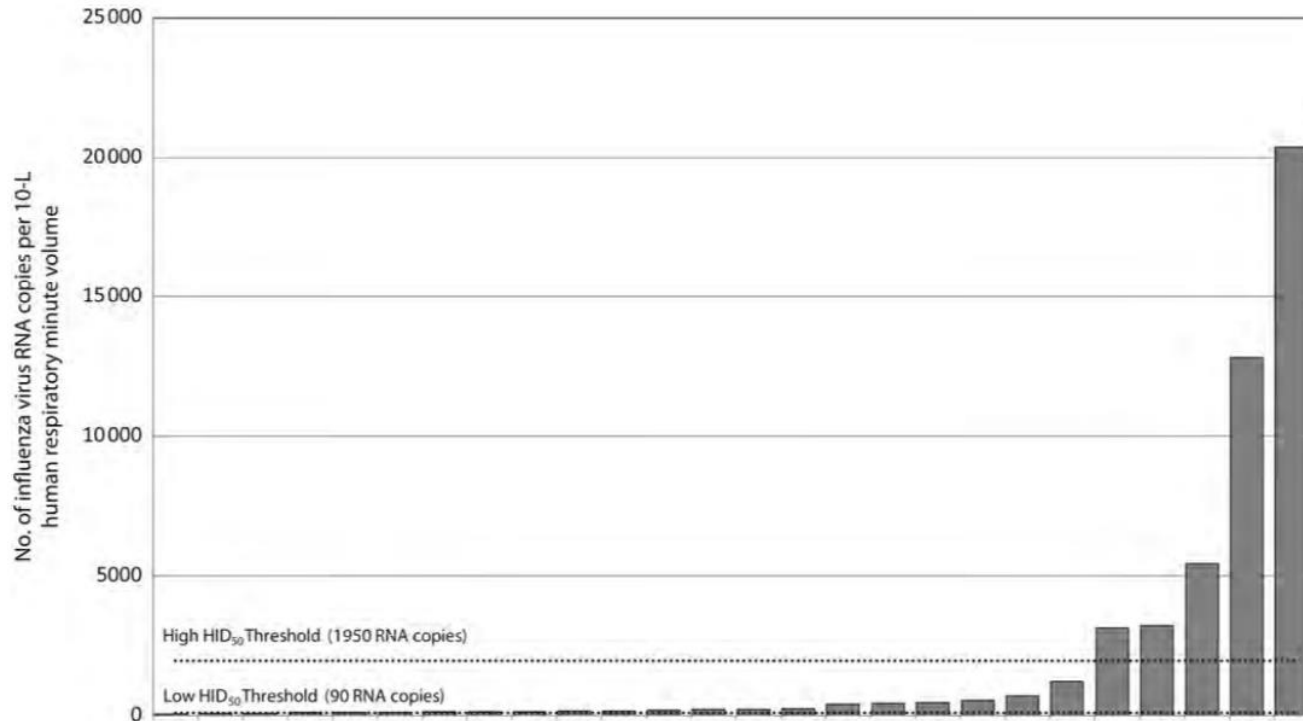
**Η ΓΡΙΠΗ ΕΙΝΑΙ ΥΠΟΥΛΗ ΝΟΣΟΣ &
ΜΠΟΡΕΙ ΝΑ ΜΕΤΑΔΟΘΕΙ & ΑΠΌ
ΑΣΥΜΠΤΩΜΑΤΙΚΟΥΣ**

ΑΛΗΘΕΙΑ !!!



Hayward et al Lancet Resp Dis 2014

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

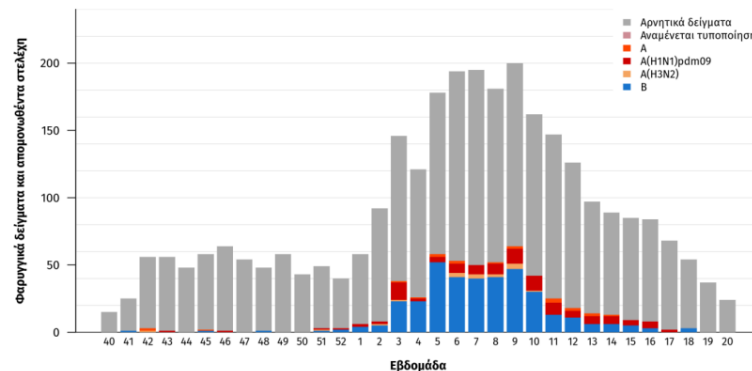
- Στο peak – κλινικά
- Εκτός peak
 - Rapid tests
 - Molecular PCR tests
 - Multiplex tests
- Gold standard = καλλιέργεια

Δίνουμε Αντιγριπικά & πότε;

- Πυρετός + βήχας σε περίοδο γρίπης = Rx

σαν γρίπη σε high risk groups

Διάγραμμα 3: Συνολικός αριθμός φαρυγγικών δειγμάτων και απομονωθέντων στελεχών ιού γρίπης στα Εργαστήρια Αναφοράς Γρίπης. Σύνολο χώρας, περίοδος γρίπης 2017 – 2018.



ΣΥΣΤΑΣΕΙΣ ΓΙΑ R_x

Ήπια γρίπη χωρίς επιπλοκές (ενήλικες και παιδιά)

R_x σε αυξημένου κινδύνου για την εμφάνιση επιπλοκών

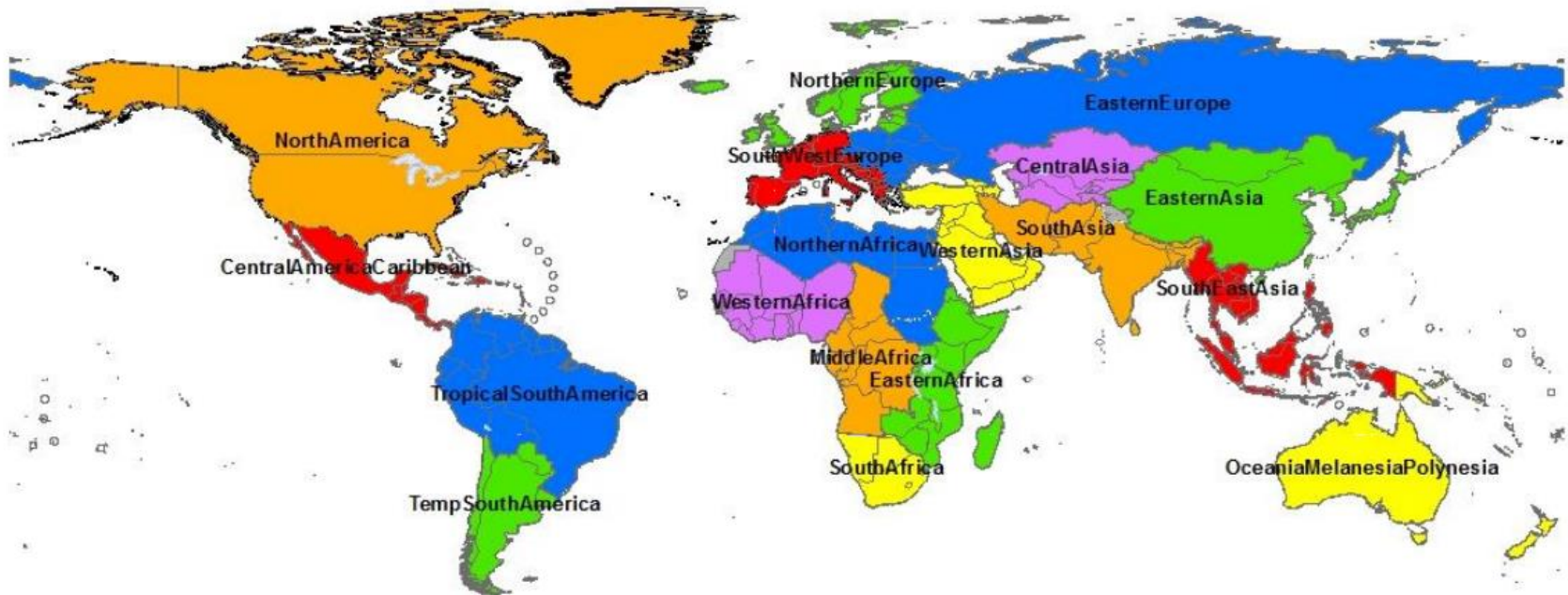
Γρίπη με επιπλοκές ή προοδευτική επιδείνωση

R_x σε όλους

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.



Influenza lab surveillance 2019



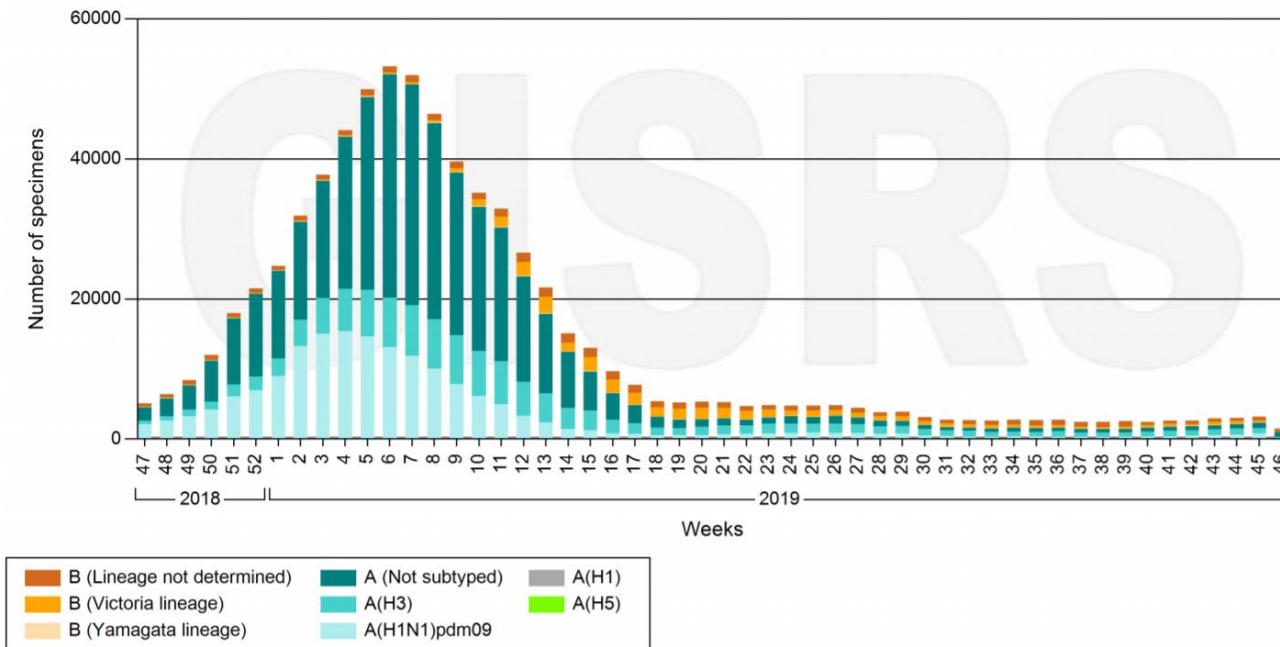
Influenza Laboratory Surveillance Information

by the Global Influenza Surveillance and Response System (GISRS)

generated on 22/11/2019 05:24:11 UTC

Global circulation of influenza viruses

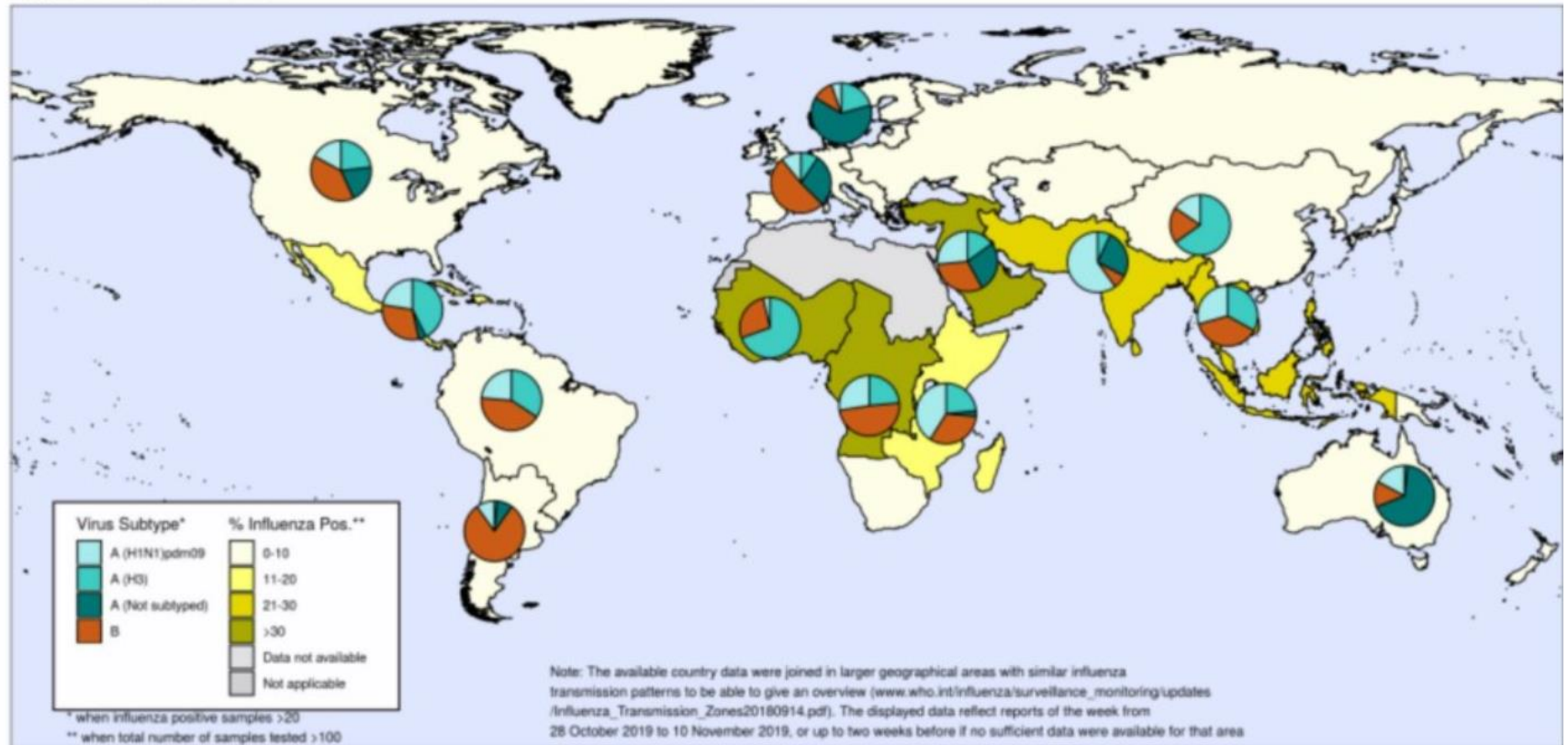
Number of specimens positive for influenza by subtype



Influenza lab surveillance 2019

Percentage of respiratory specimens that tested positive for influenza
By influenza transmission zone

Map generated on 22 November 2019



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



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/m²



Vaccination coverage EU -> insufficient!!!

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

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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](#) ▶



[Influenza vaccination coverage](#)

[Ebola outbreak in the DRC](#)

[Measles continues to spread](#)

[Zoonotic diseases: progress has stalled](#)

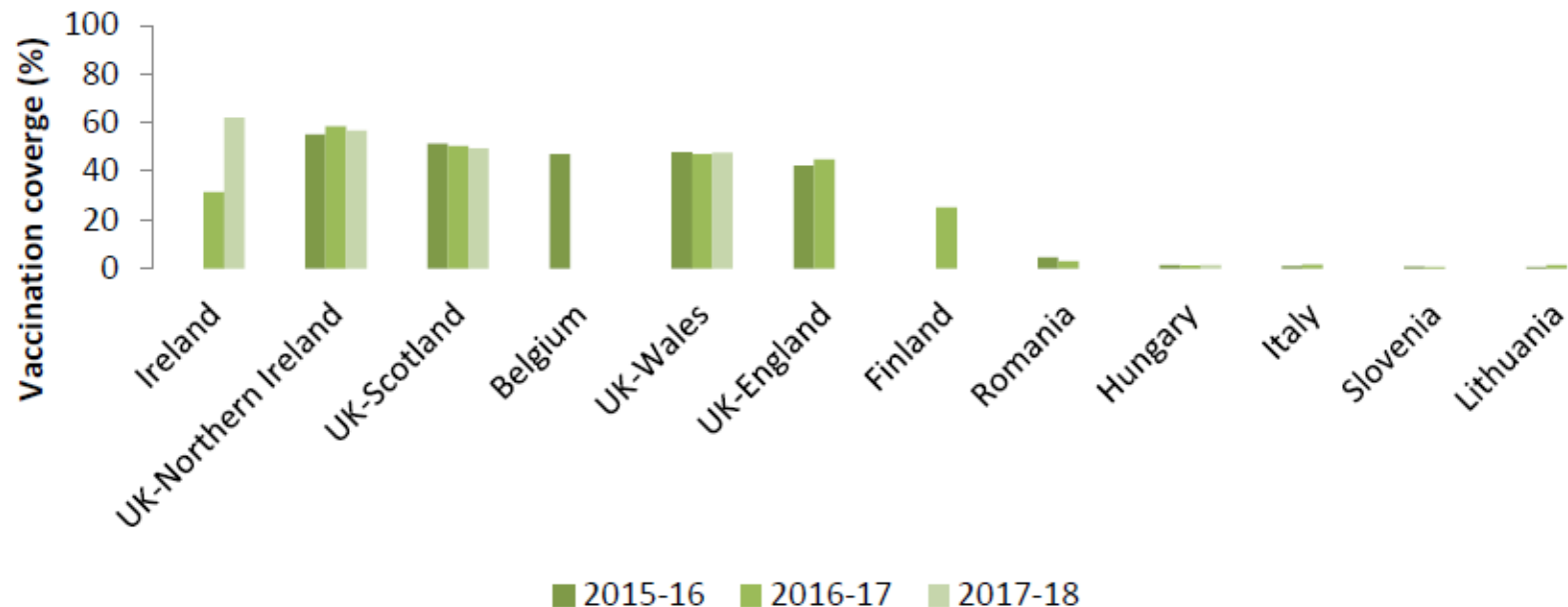
Η γρίπη είναι επικίνδυνη για εγκύους ;

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

Vaccination coverage EU -> insufficient!!!

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 ^(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

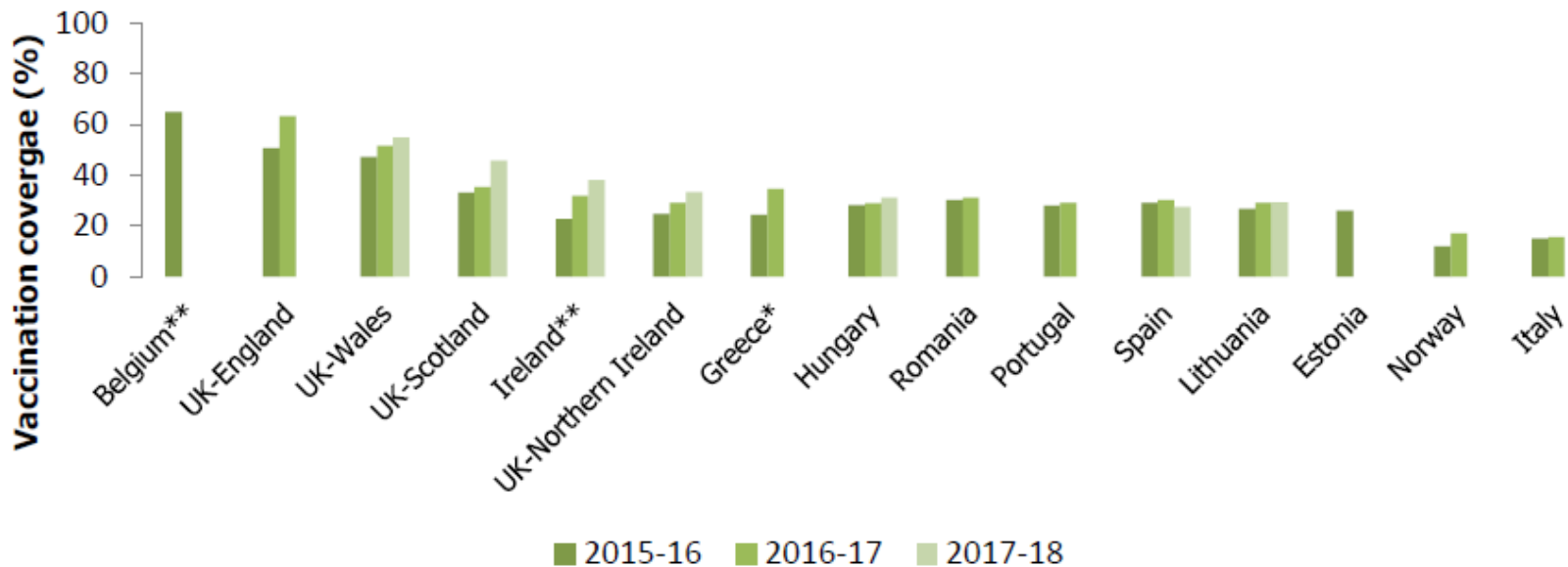
- 3,5 φορές υψηλότερος κίνδυνος λόγω επαγγέλματος
 - 30% με ασυμπτωματική λοίμωξη
 - παρ' όλα αυτά μεταδίδουν τον ιό
 - σε ασθενείς &
 - οικογενειακό περιβάλλον
 - 1-2 ημέρες προ έναρξης συμπτωμάτων



Vaccination coverage EU -> insufficient!!!

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

Οι ηλικιωμένοι

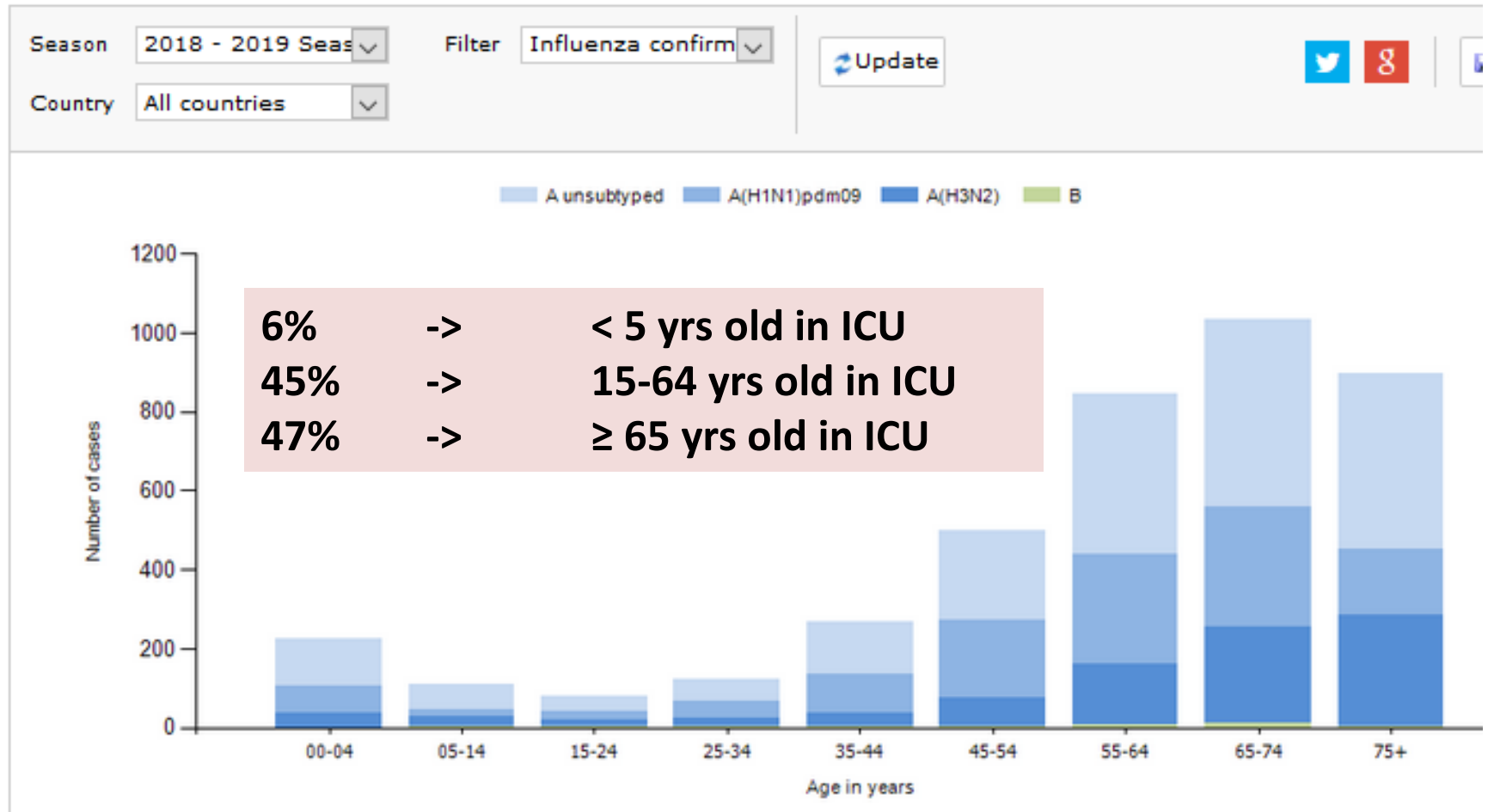
- Γνωστή χαμηλή αποτελεσματικότητα εμβολίου
- Υψηλά % νοσηλειών ΜΕΘ
 - Ιδιαίτερα για ΑΗ3Ν2
- Υψηλά % θνητότητας



Influenza 2018-19 season

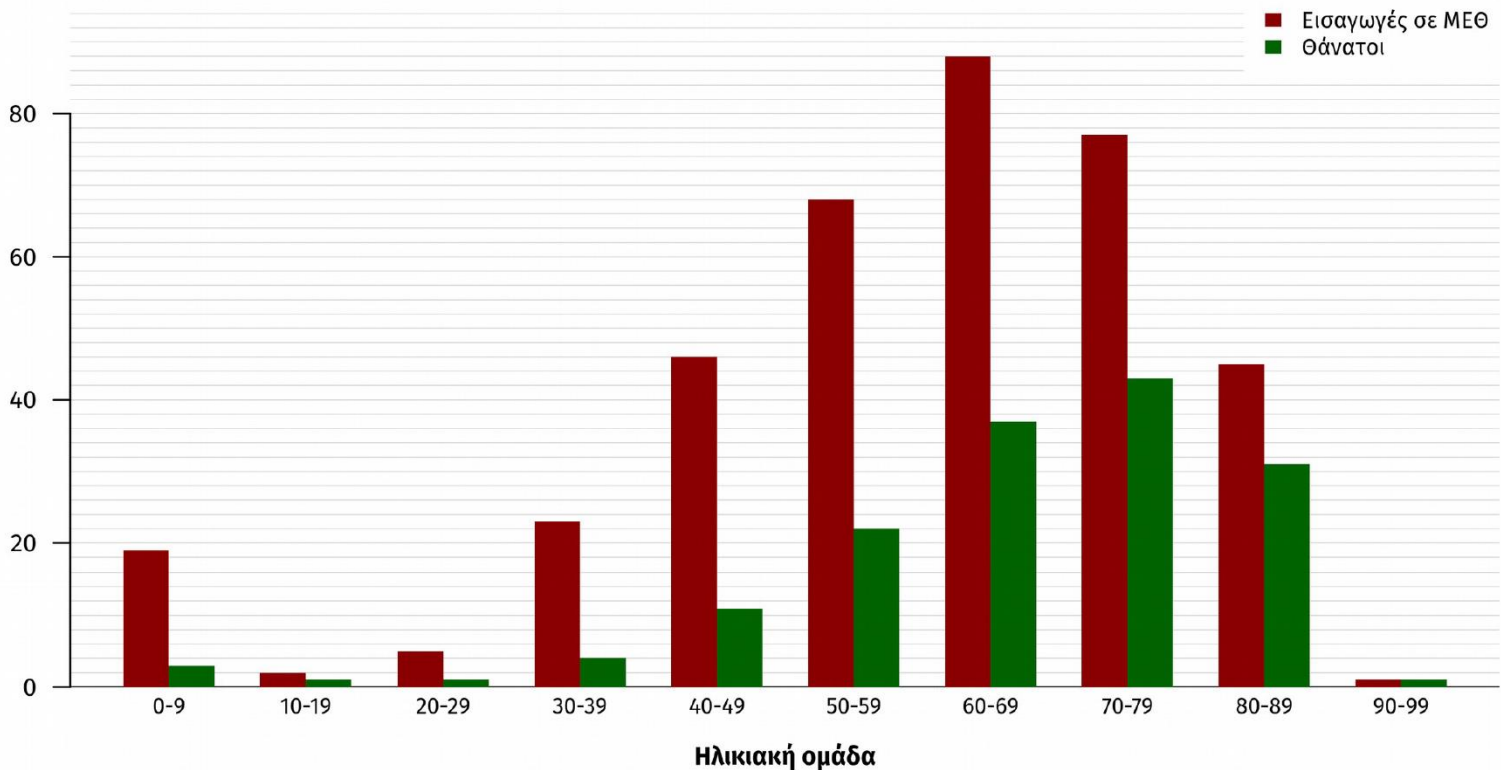
Hospitals 99% fluA (54% AH1N1), in ICUs 99% fluA (66% AH1N1)

Distribution of virus (sub)type by age group in hospitalised cases



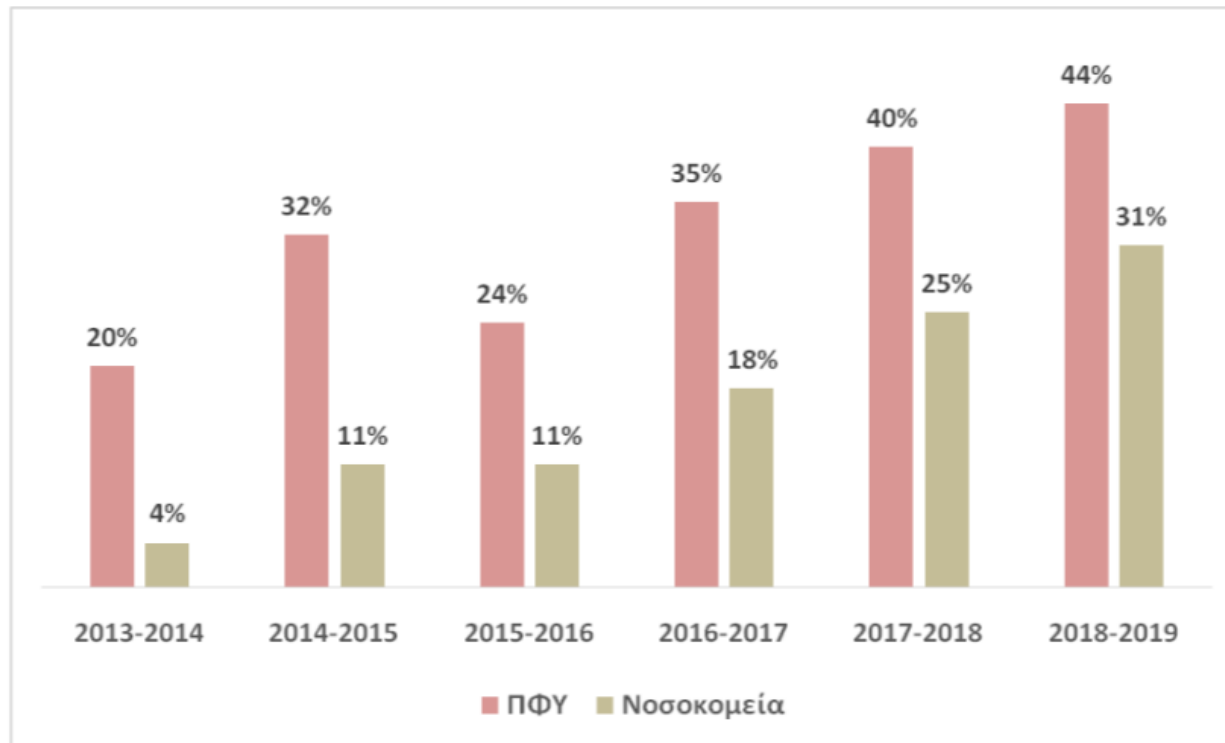
Influenza, severity, Ελλάδα 2018-19

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 40/2018 έως εβδομάδα 20/2019 (13-19 Μαΐου 2019).



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.



Vaccination of household contacts & HCW in contact!!!



Recommended vaccine composition

6 months before!



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Influenza

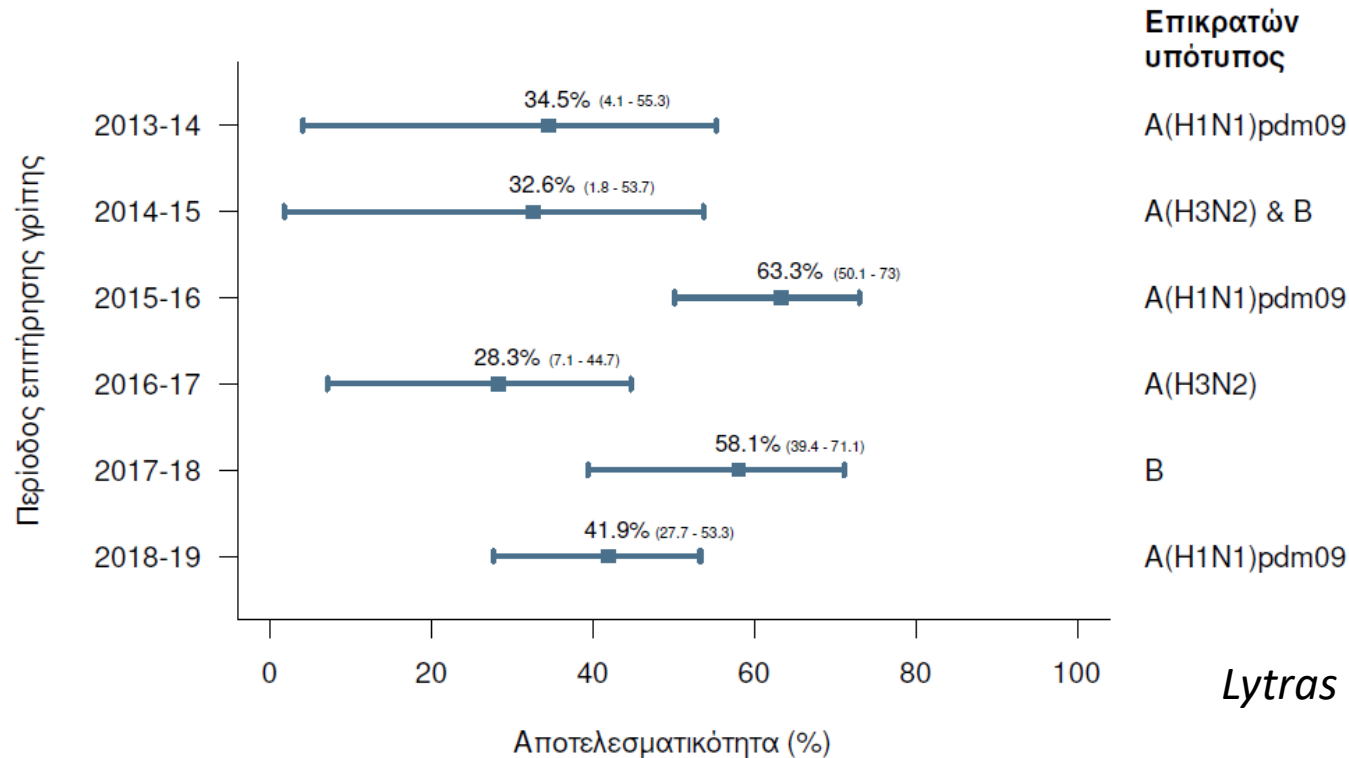
Recommended composition of influenza virus vaccines for use in the 2018-2019 northern hemisphere influenza season

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](#)



Ελλάδα 2013-19



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**

the benefits of flu vaccination 2017-2018

The estimated number of flu **illnesses prevented by vaccination** during the 2017-2018 season:

7 million

About the population of New York City



The estimated number of flu **hospitalizations prevented by vaccination** during the 2017-2018 season:

109,000

About the number of vehicles crossing the Golden Gate Bridge each day



The estimated number of flu **deaths prevented by vaccination** during the 2017-2018 season:

8,000

Twice the number of hospitals in the United States



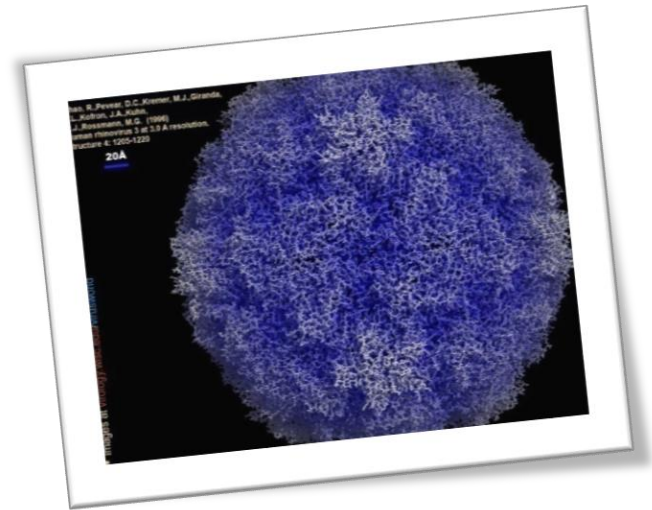
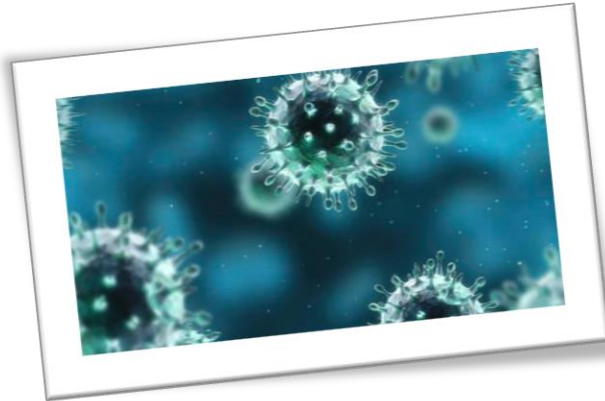
DATA: Journal Clinical Infectious Disease, Effects of Influenza Vaccination in the United States during the 2017-2018 Influenza Season, <https://doi.org/10.1093/cid/ciz075>



get vaccinated
www.cdc.gov/flu

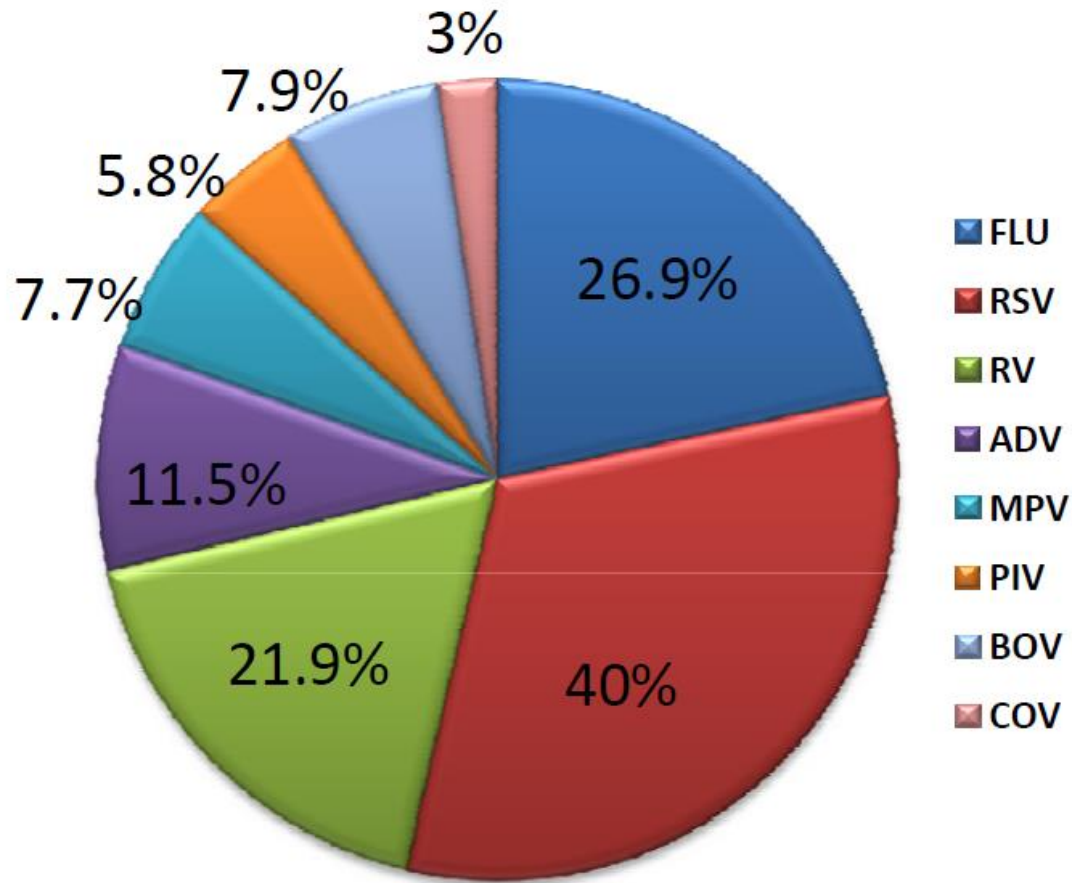


ΑΛΛΟΙ ΙΟΙ – ΚΟΙΝΟ ΚΡΥΟΛΟΓΗΜΑ



- Πληθώρα άλλων ιών κυκλοφορούν περίπου την ίδια χρονική περίοδο με τον ιό της γρίπης
 - ρινοϊοί, ο αναπνευστικός συγκυτιακός ιός (RSV), κοροναϊοί, αδενοϊοί
- Οι ιοί αυτοί προκαλούν το κοινό κρυολόγημα

Μελέτη Pasteur, Ελλάδα



Pogka et al, J Med Virol, 2011

ΑΛΛΕΣ ΓΡΙΠΕΣ!!!

- 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

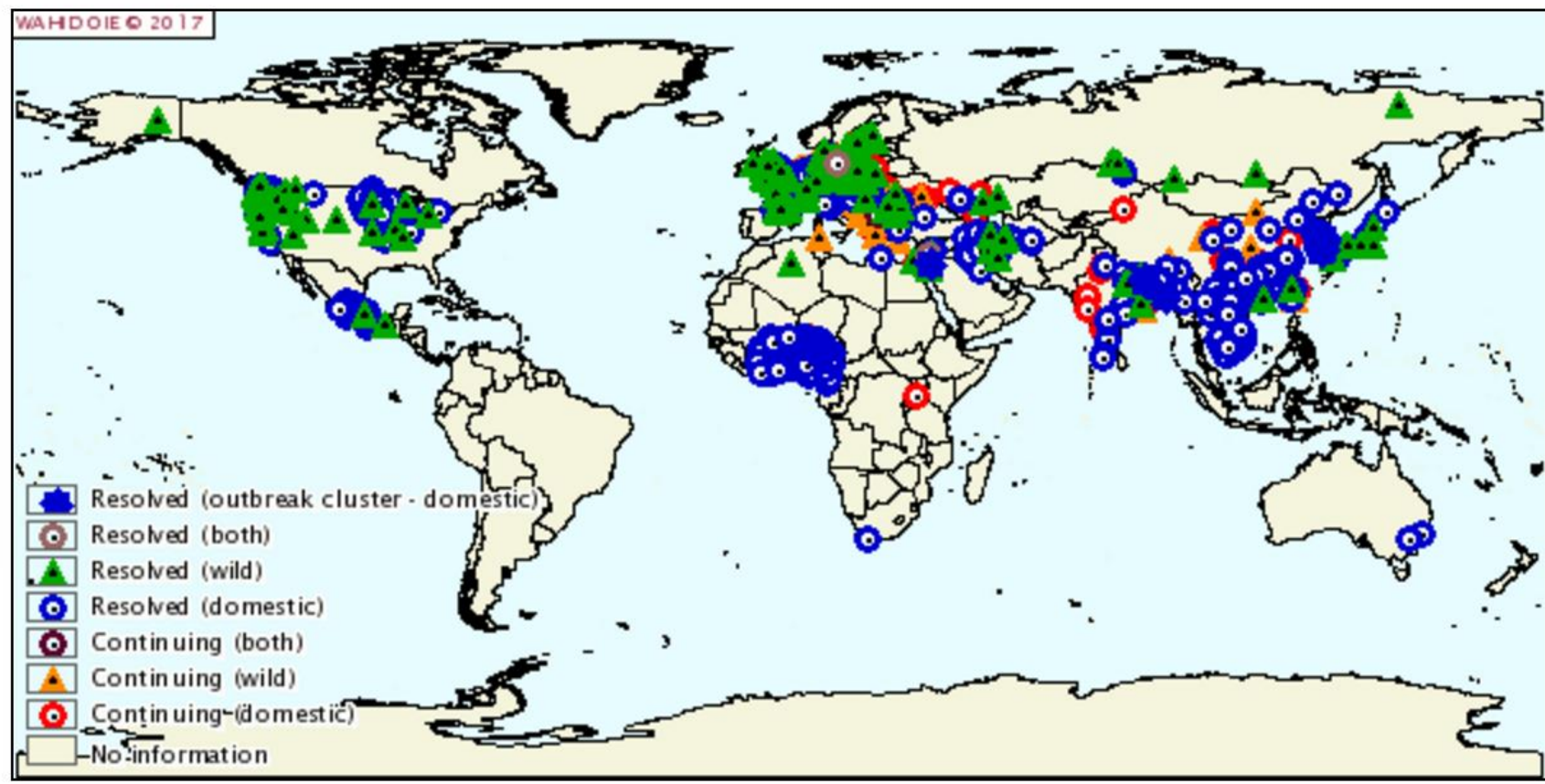
- ΠΟΥΛΕΡΙΚΑ

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

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

ΓΡΙΠΕΣ ΠΤΗΝΩΝ, ΗΡΑΙ 2013-17!!!



Avian influenza

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](#)

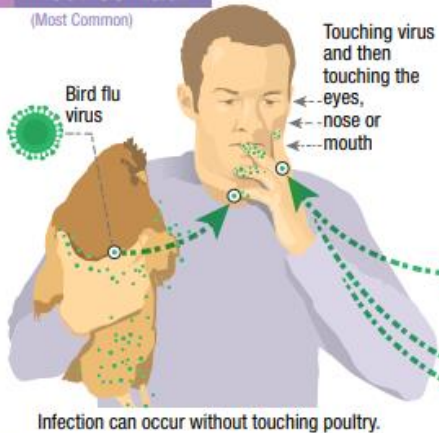
Avian influenza

How Infected Backyard Poultry Could Spread Bird Flu to People

Human Infections with Bird Flu Viruses Rare But Possible

1 Direct Contact

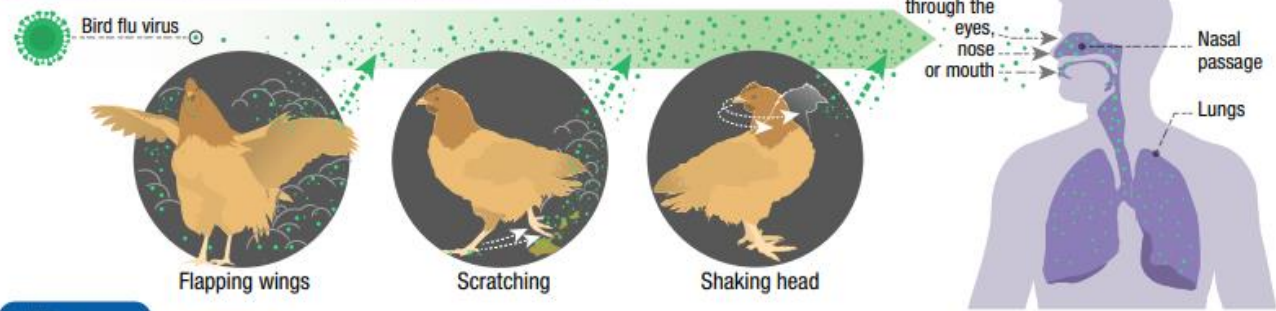
(Most Common)



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

Avian influenza



European Centre for Disease Prevention and Control

An agency of the European Union

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Avian influenza overview February – August 2019

Surveillance report

27 Sep 2019

Publication series: Avian influenza overview

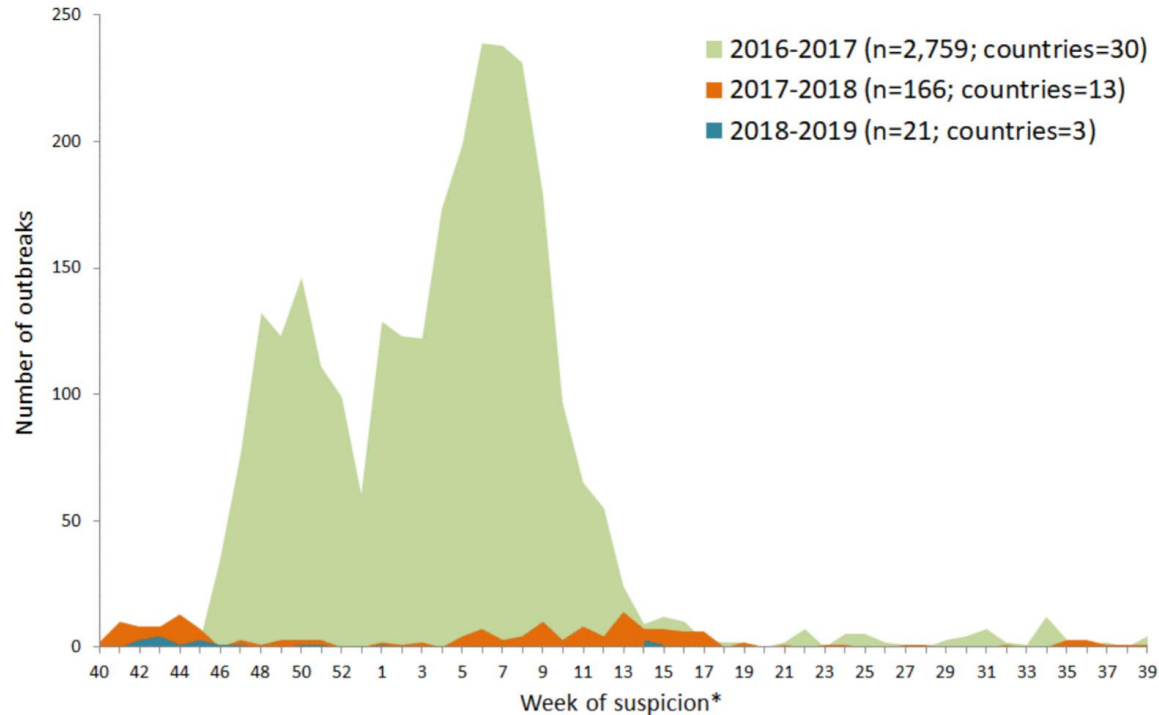
Time period covered: February – August 2019

Cite: 



Between 16 February and 15 August 2019, five HPAI A(H5N8) outbreaks at poultry establishments in Bulgaria, two low pathogenic avian influenza (LPAI) A(H5N1) outbreaks in poultry in Denmark and one in captive birds in Germany, one LPAI A(H7N3) outbreak in poultry in Italy and one LPAI A(H7N7) outbreak in poultry in Denmark were reported in Europe.

Avian influenza



* When the date of suspicion is not available then the date of confirmation is used to assign the week of suspicion.
Data source: ADNS, EFSA.

Figure 1: Distribution of total number of HPAI outbreaks detected in Europe in seasons 2016–2017 (green), 2017–2018 (orange), 2018–2019 (blue) and reported via ADNS by week of suspicion, 28 September 2015 – 15 August 2019 (n=2,946)

Avian influenza

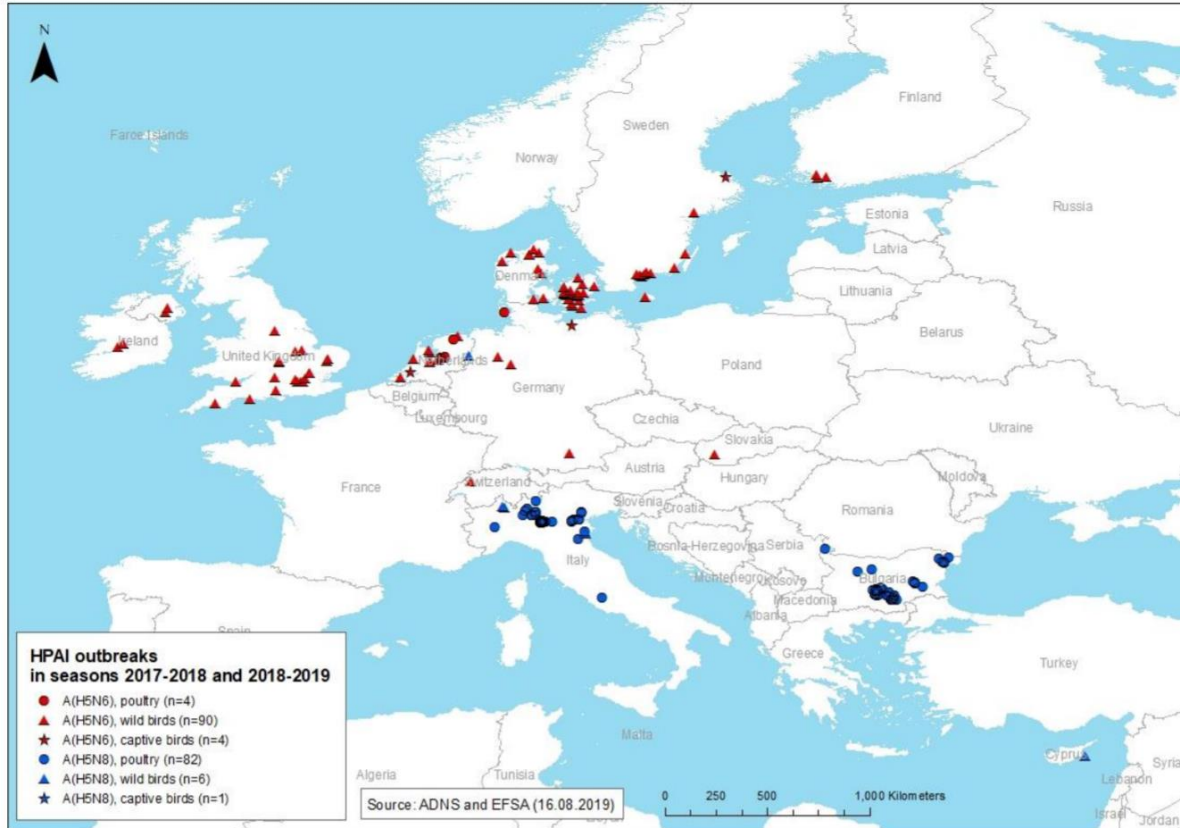
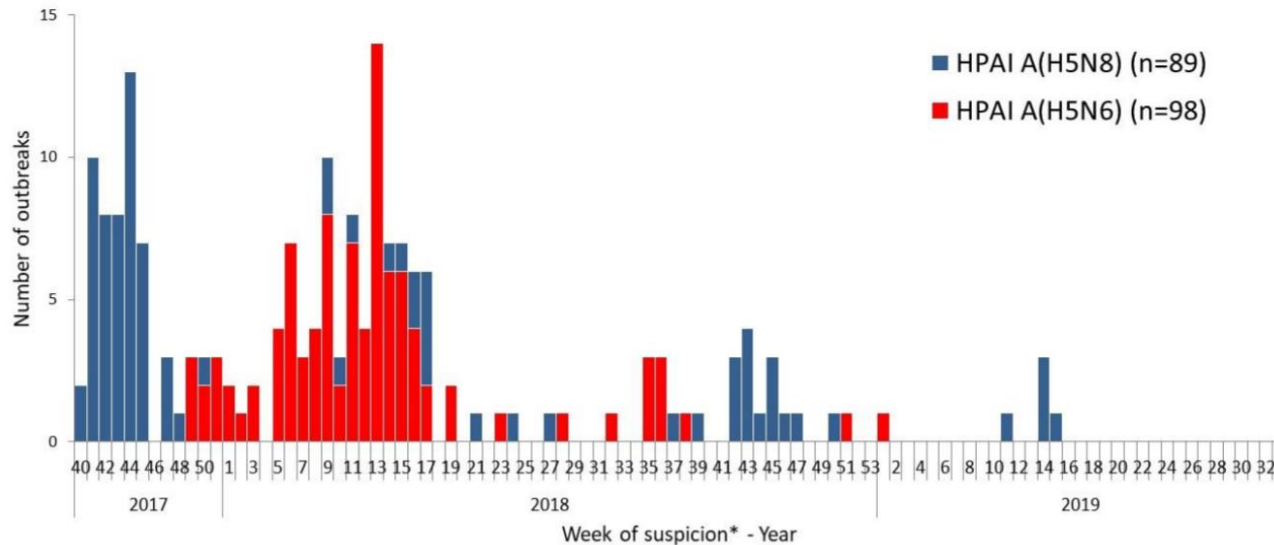


Figure 2: Geographical distribution, based on available geocoordinates, of HPAI outbreaks in Europe by A(H5N6) (red) and A(H5N8) (blue) virus in poultry (circles), wild birds (triangles) and captive birds (stars), in seasons 2017–2018 and 2018–2019 (2 October 2017 – 15 August 2019; n=187)

Avian influenza

Figure 2: Geographical distribution, based on available geocoordinates, of HPAI outbreaks in Europe by A(H5N6) (red) and A(H5N8) (blue) virus in poultry (circles), wild birds (triangles) and captive birds (stars), in seasons 2017–2018 and 2018–2019 (2 October 2017 – 15 August 2019; n=187)



* When the date of suspicion is not available then the date of confirmation is used to assign the week of suspicion.
Data source: ADNS, EFSA.

Figure 3: Distribution of total number of HPAI A(H5N6) (red) and A(H5N8) (blue) outbreaks in Europe by week of suspicion in seasons 2017–2018 and 2018–2019 (2 October 2017 – 15 August 2019; n=187)

Avian influenza 2018-19

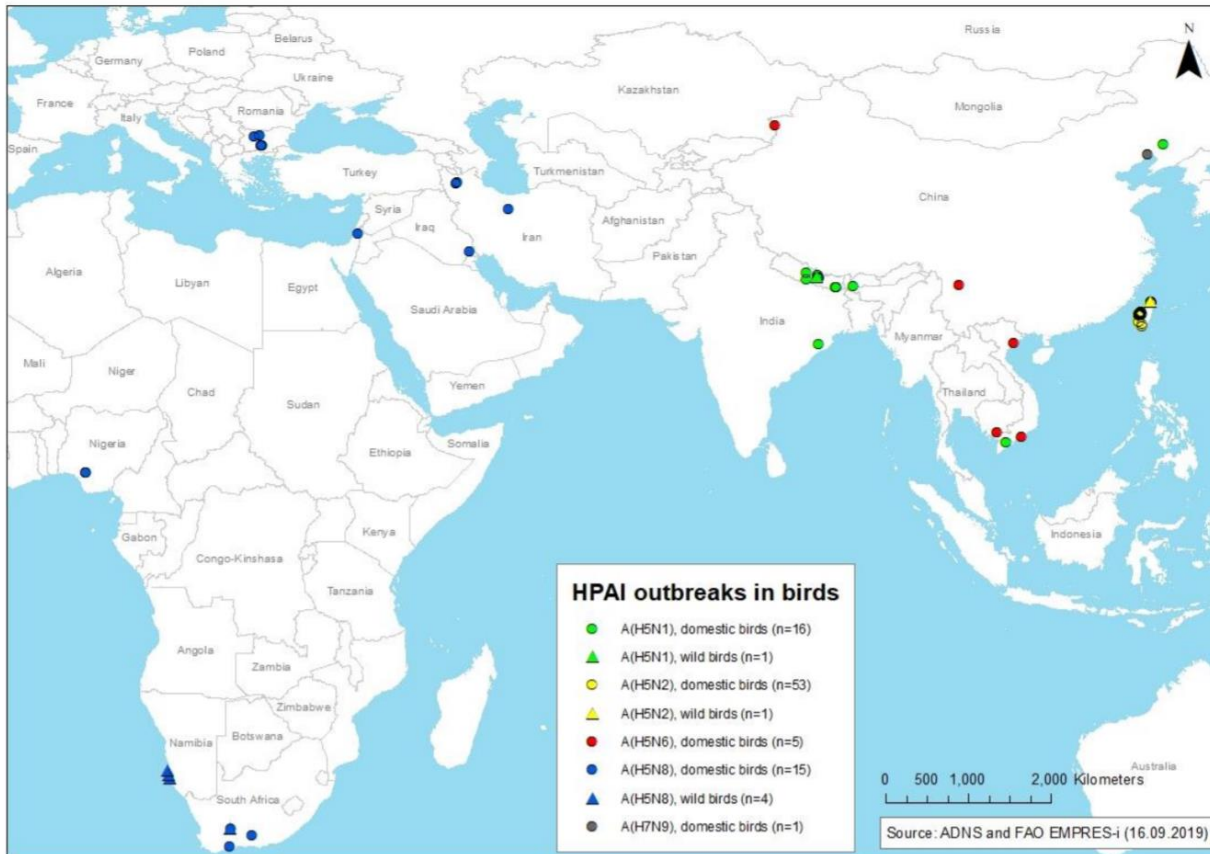
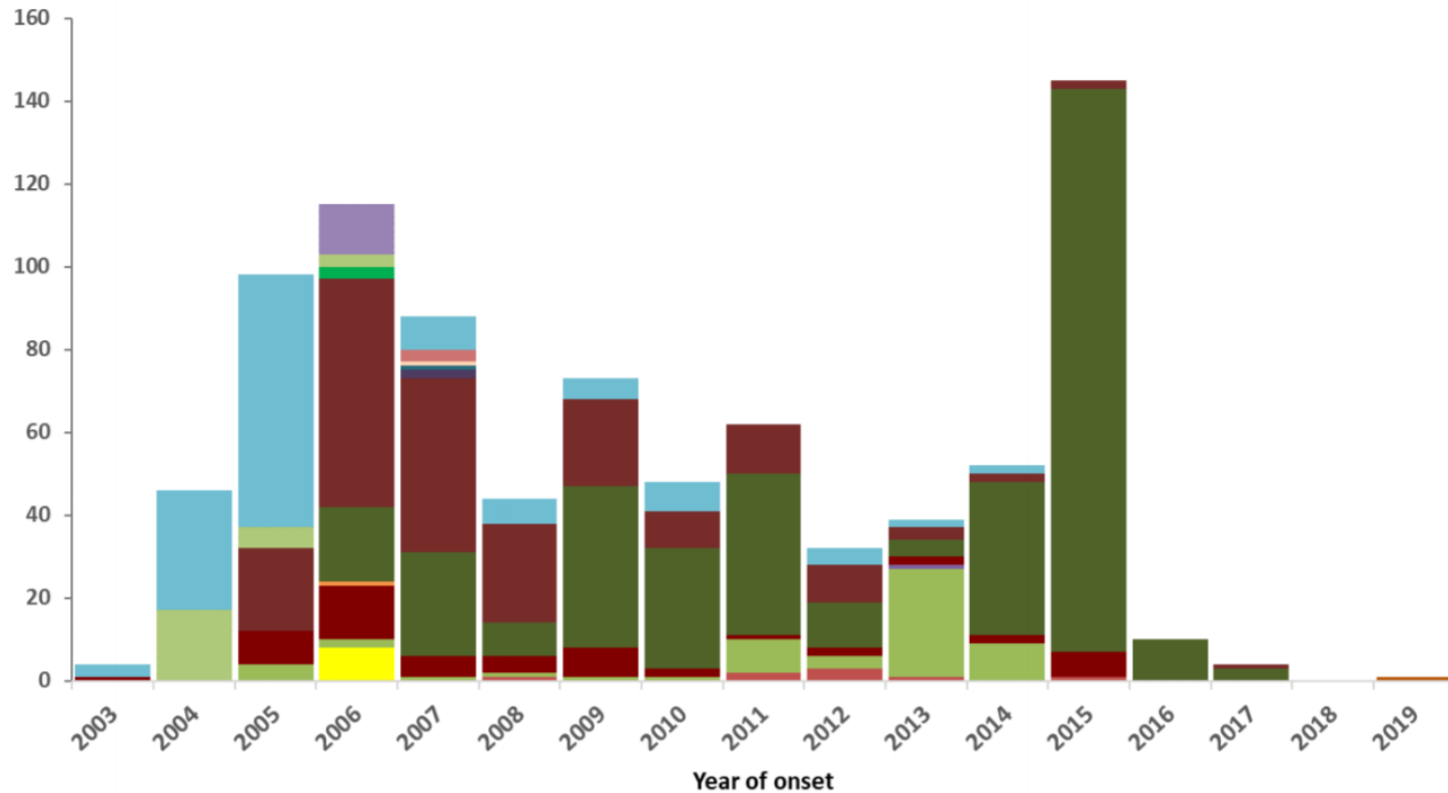


Figure 9: Geographical distribution, based on available geocoordinates, of HPAI outbreaks in Europe, Asia and Africa in domestic birds (circles) and wild birds (triangles), by A(H5N1) (green), A(H5N2) (yellow), A(H5N6) (red), A(H5N8) (blue), A(H7N9) (grey), 16 November 2018 – 15 February 2019 (n=96)

Avian influenza H5N1 2013-19

n= 861, 455 deaths

Number of cases



- Azerbaijan
- Bangladesh
- Cambodia
- Canada
- China
- Djibouti
- Egypt
- Indonesia
- Iraq
- Laos
- Myanmar
- Nepal
- Nigeria
- Pakistan
- Thailand
- Turkey
- Vietnam

Γρίπη των πουλερικών H5N1 και άνθρωπος

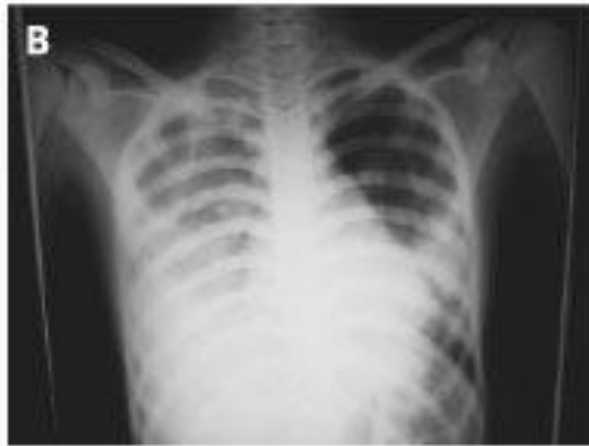


H5N1 - Άνθρωποι



- 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 & Άλλοι

ΜΥΘΟΣ

- Τα άγρια πουλιά μεταφέρουν τον ιό και συσσωρεύονται στα υδάτινα σώματα, όπου πεθαίνουν και μεταδίδουν τον ιό σε άλλα πουλιά.





ΜΕΤΑΔΟΣΗ ΣΕ ΑΝΘΡΩΠΟΥΣ = στενή επαφή



Live poultry market/
on-site slaughter

2004 1 21

Μετάδοση στον άνθρωπο = Στενή επαφή



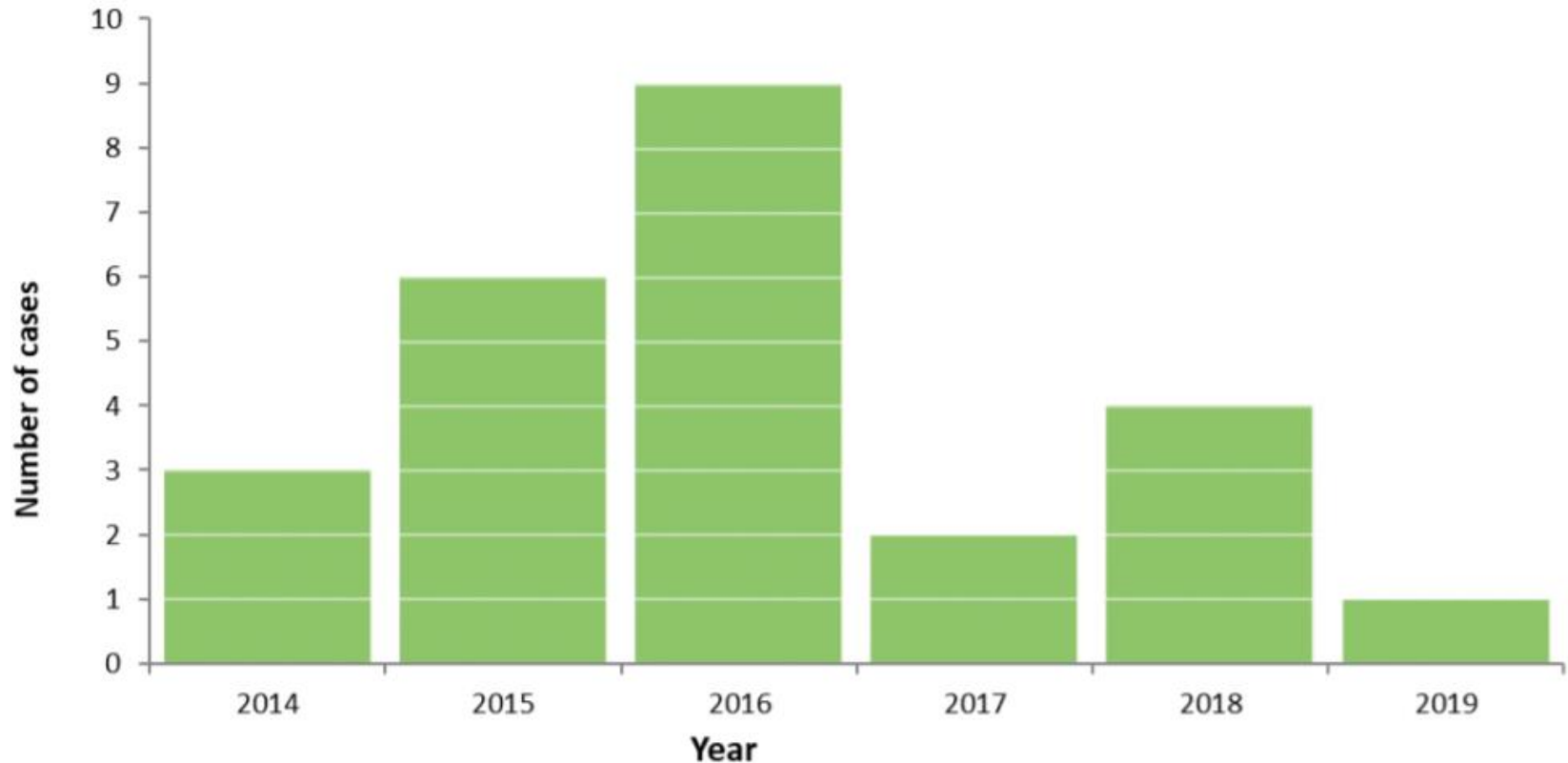


ΠΡΟΣΟΧΗ ΣΤΑ ΠΑΙΔΙΑ !!!



Avian influenza H5N6 2014-19

n= 25, 15 deaths



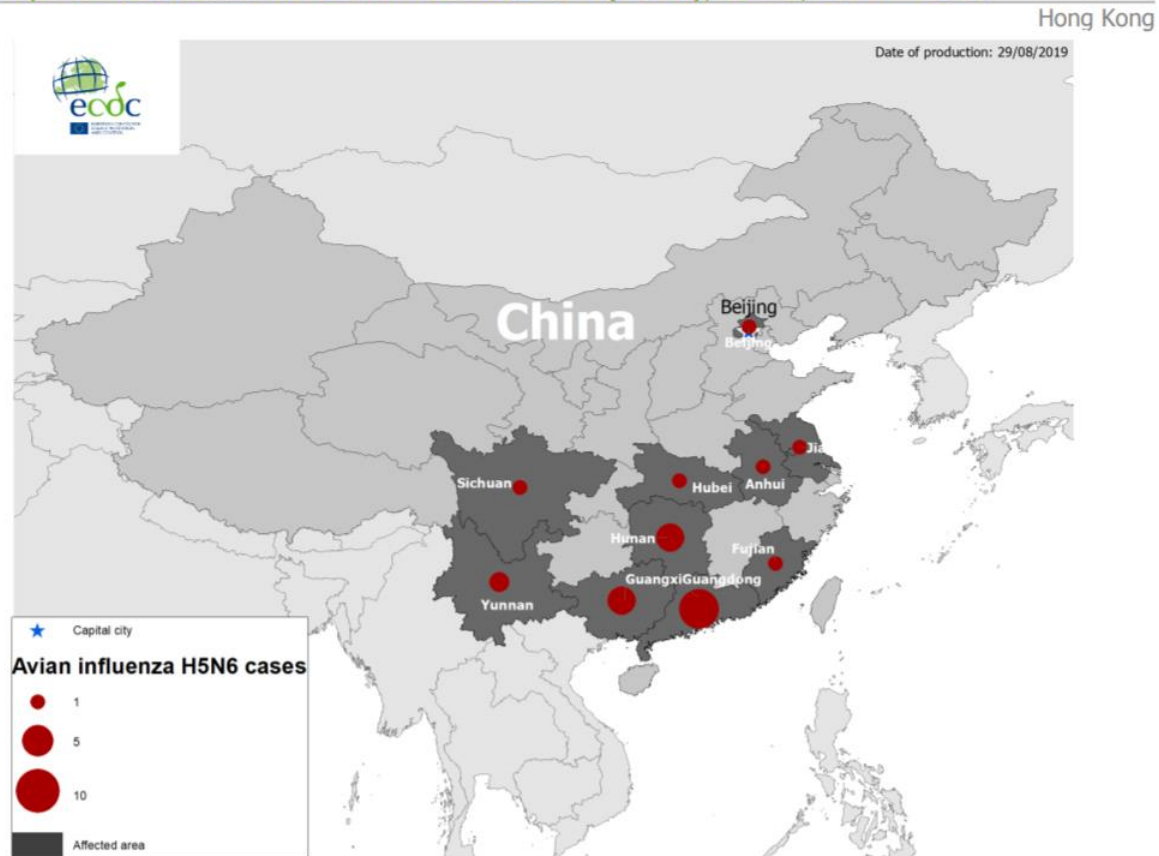
*If the date of onset is not available the date of reporting has been used

** the epicurve includes one case reported in the literature with year of onset in 2015

Avian influenza H5N6 2014-19

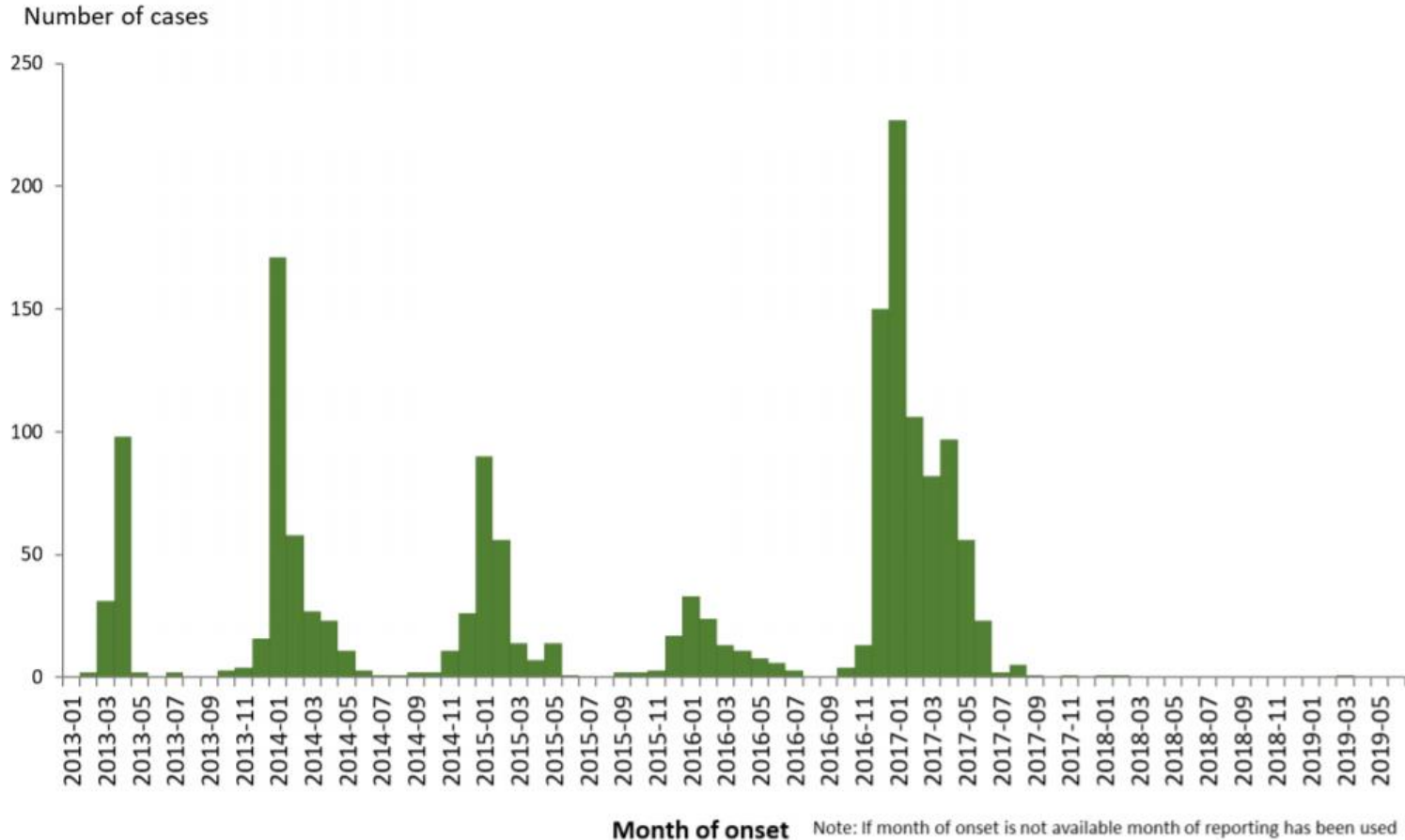
n= 25, 15 deaths

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



Avian influenza H7N9 2013-19

n= 1568, 615 deaths

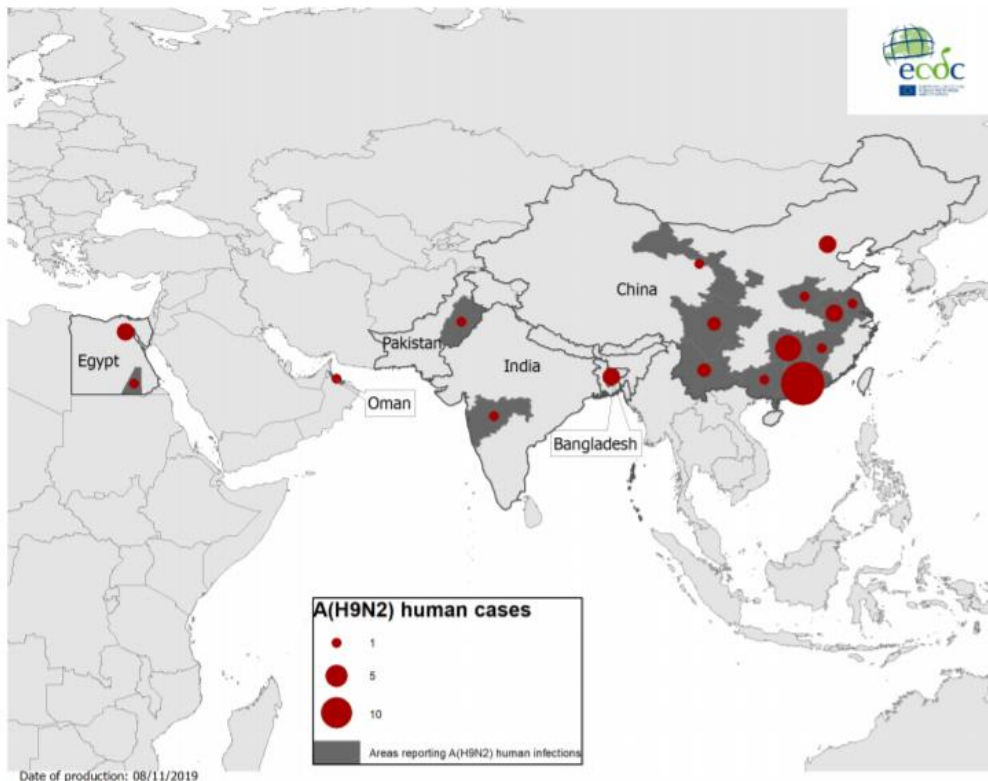


Avian influenza H9N2, 1998-19

n= 57, 1 deaths

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

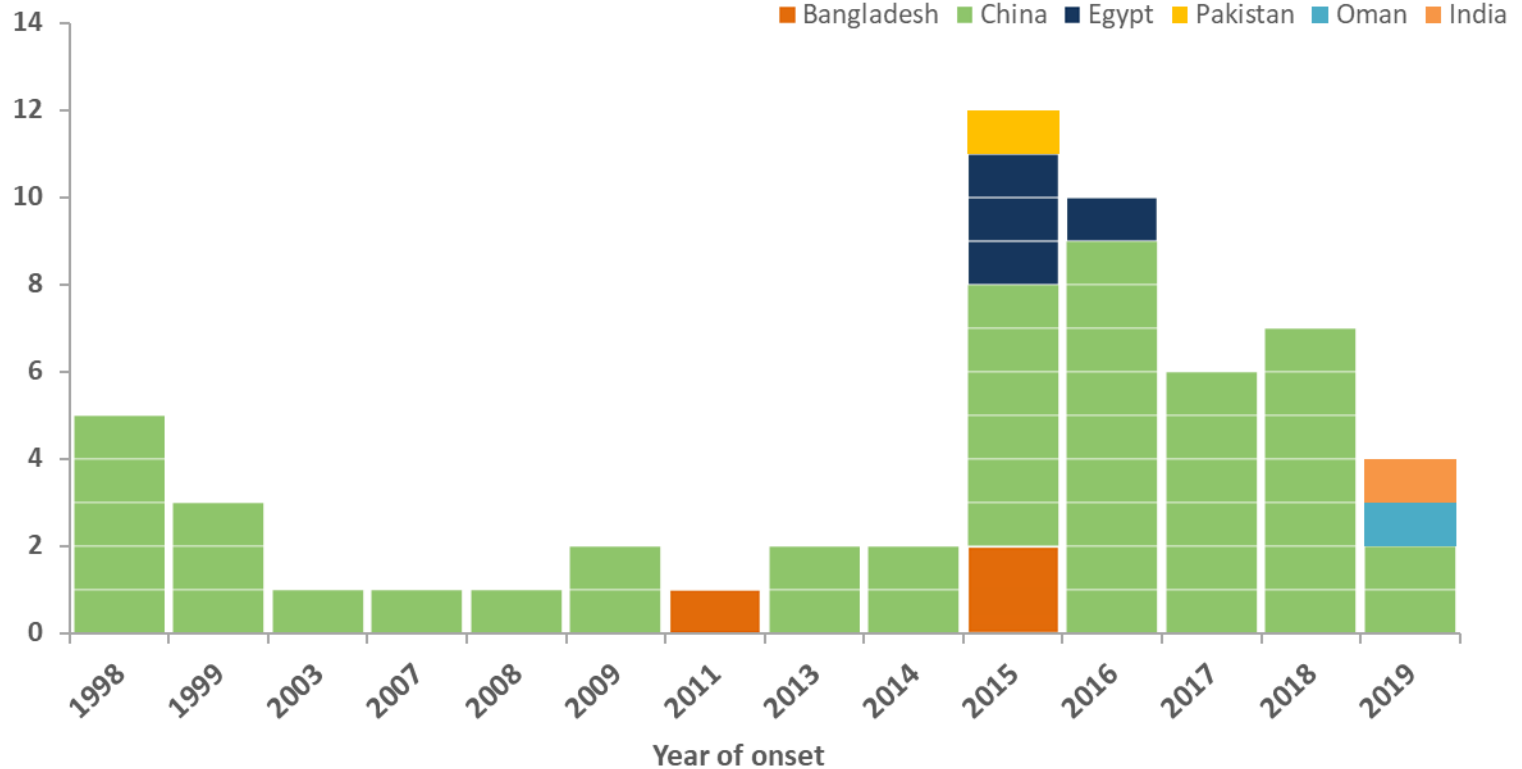
Source: ECDC



Avian influenza H9N2, 1998-19

n= 57, 1 deaths

Number of cases



Avian influenza 2019

ECDC assessment

- Risk of zoonotic Tx to general public
 - very low
- Risk of travel related importation from Asia
 - Very low
- Surveillance of AI is important

Travelers and China

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



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) ▾

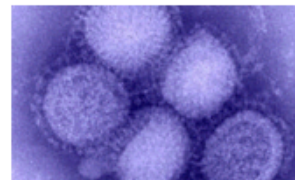
An influenza pandemic is a global outbreak of a new influenza A virus. Pandemics happen when new (novel) influenza A viruses emerge which are able to infect people easily and spread from person to person in an efficient and sustained way. The United States is NOT currently experiencing an influenza pandemic. [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](#)

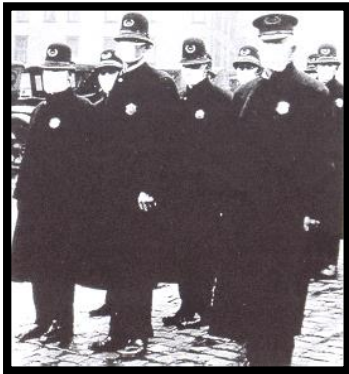
[Global Monitoring](#)

Πανδημίες γρίπης Μαθήματα από το παρελθόν

- 10 πανδημίες τα τελευταία 300 έτη

• **ΑΛΗΘΕΙΑ**

Pandemics 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

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

```
GCATTACCGATGCTGGGGCATT  
AAGUUECAJAJGSEGGGA  
TAAAGAGGAGGCAATGACCAAT  
AAGUUECAJAJGSEGGGA  
GATGCAATGACCAATGACCAAT  
AAGUUECAJAJGSEGGGA  
AAGUUECAJAJGSEGGGA
```

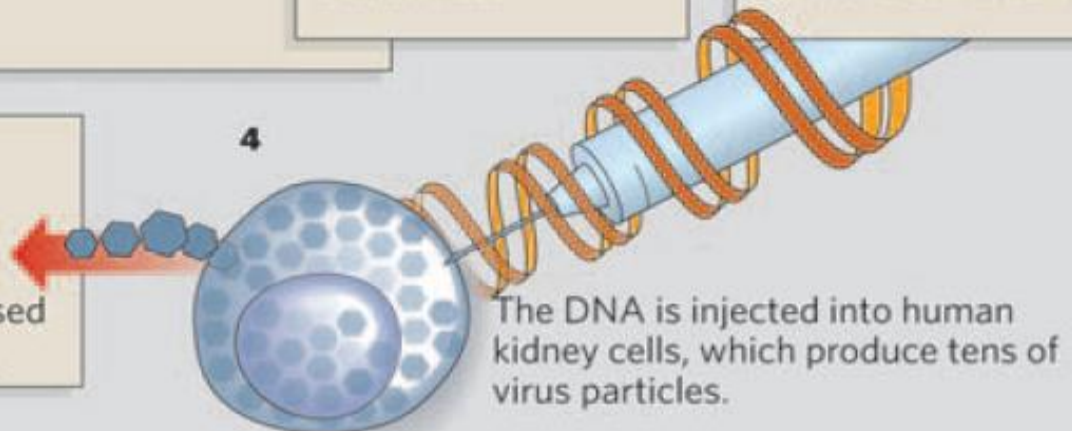
The overlapping sequences are pieced together to give the full genome sequence. A DNA version is synthesized in the lab.

5



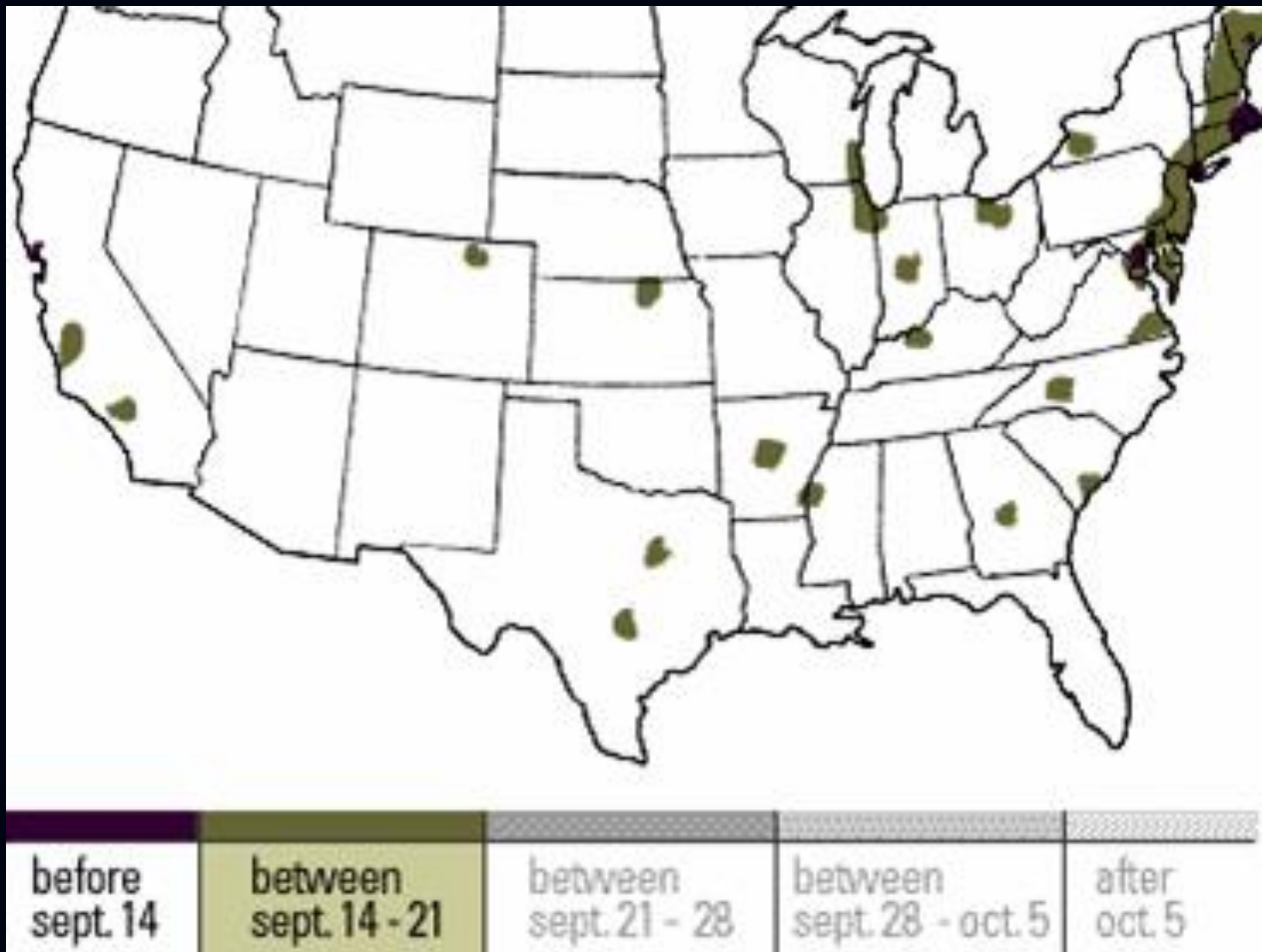
The virus is isolated from the cells and used to infect mice. They all die within 6 days.

4

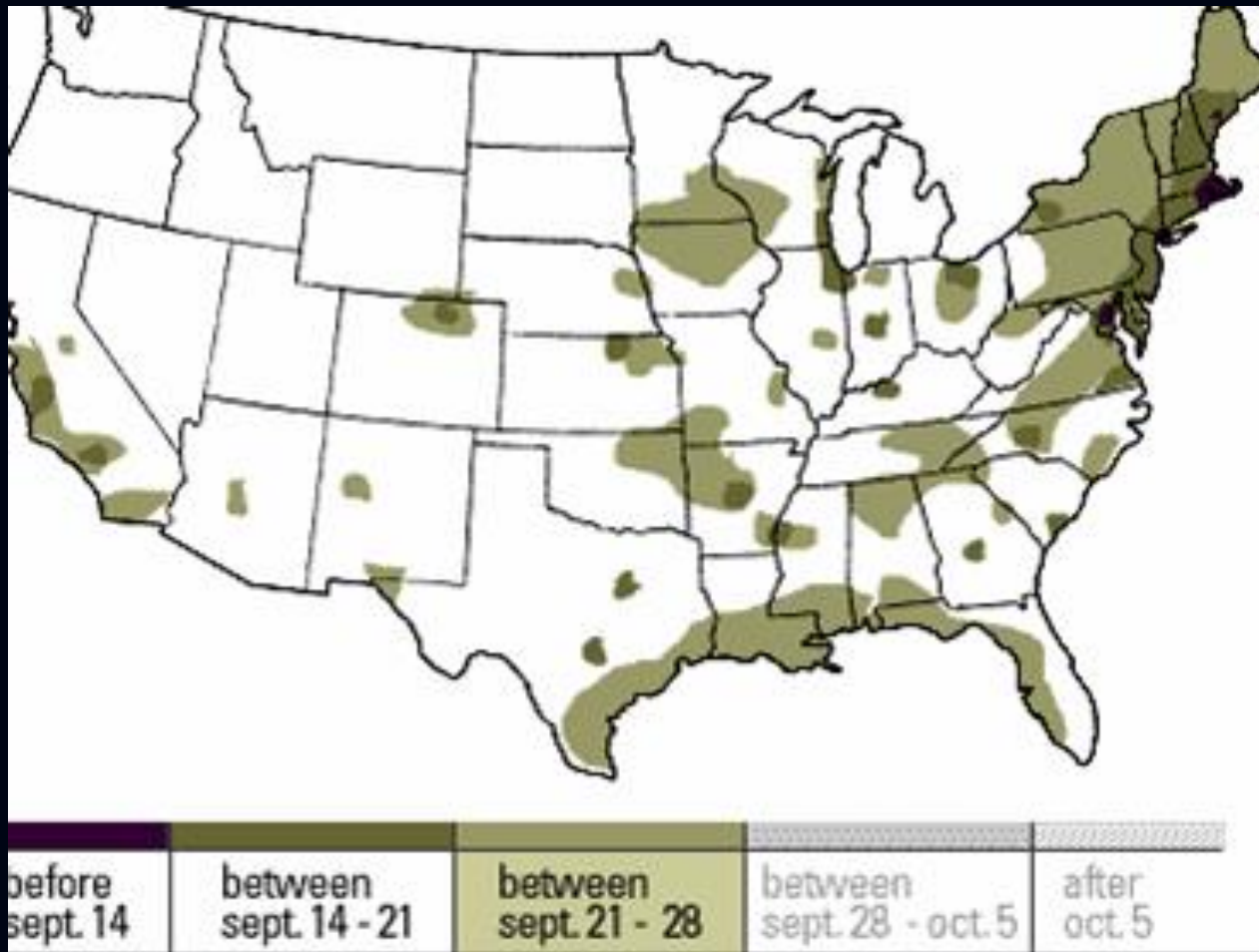


The DNA is injected into human kidney cells, which produce tens of virus particles.

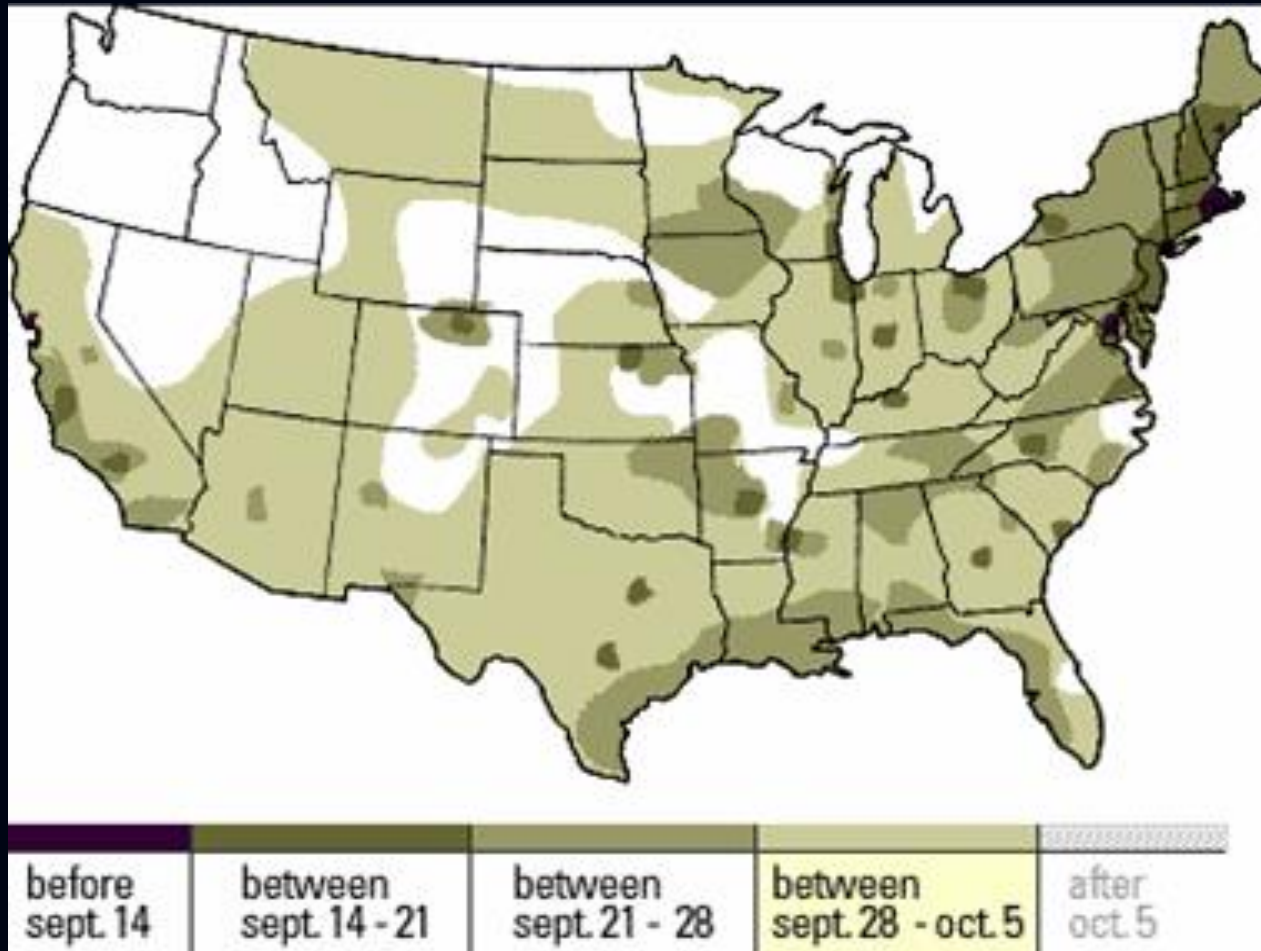
The 1918 Flu Pandemic in the U.S.



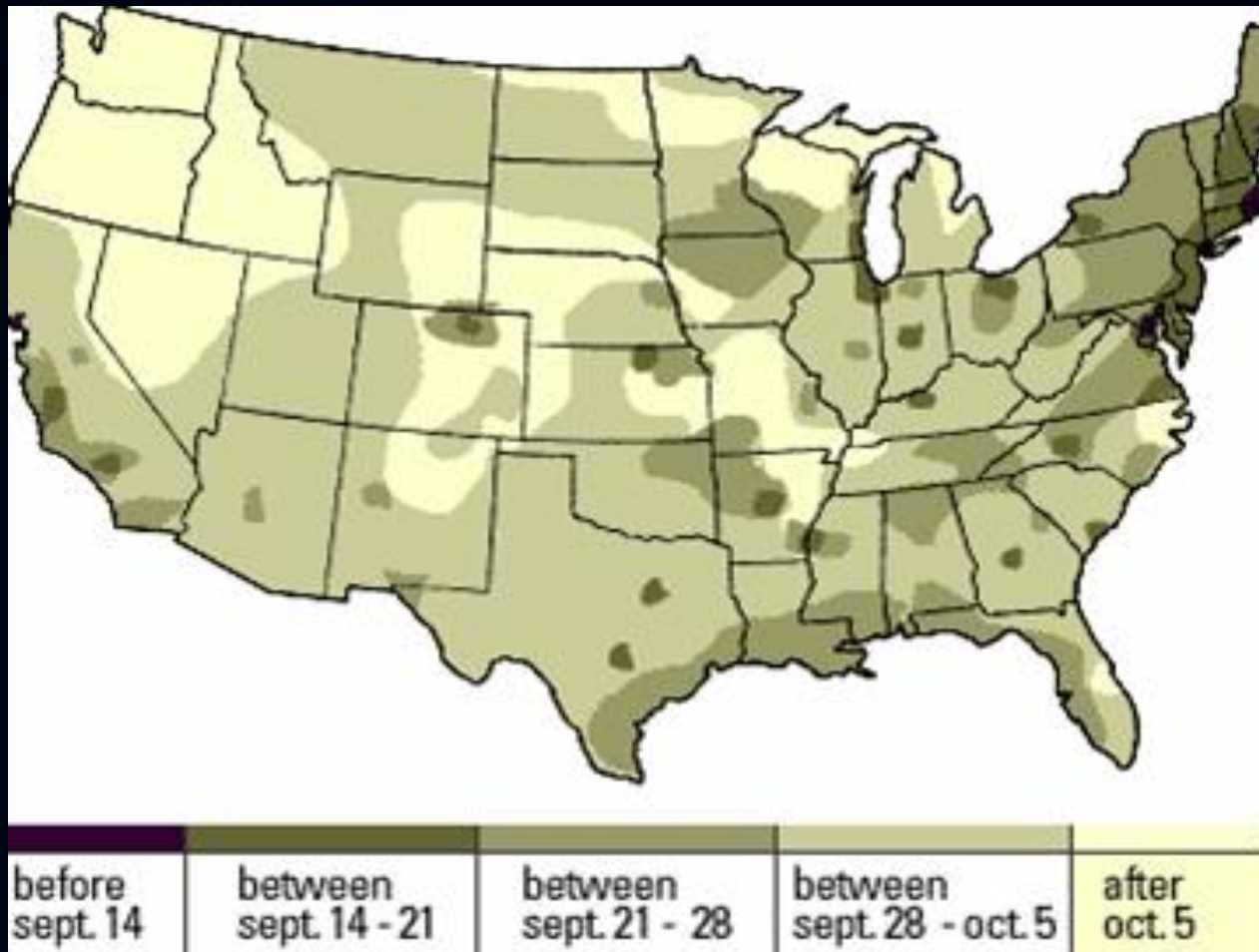
The 1918 Flu Pandemic in the U.S.



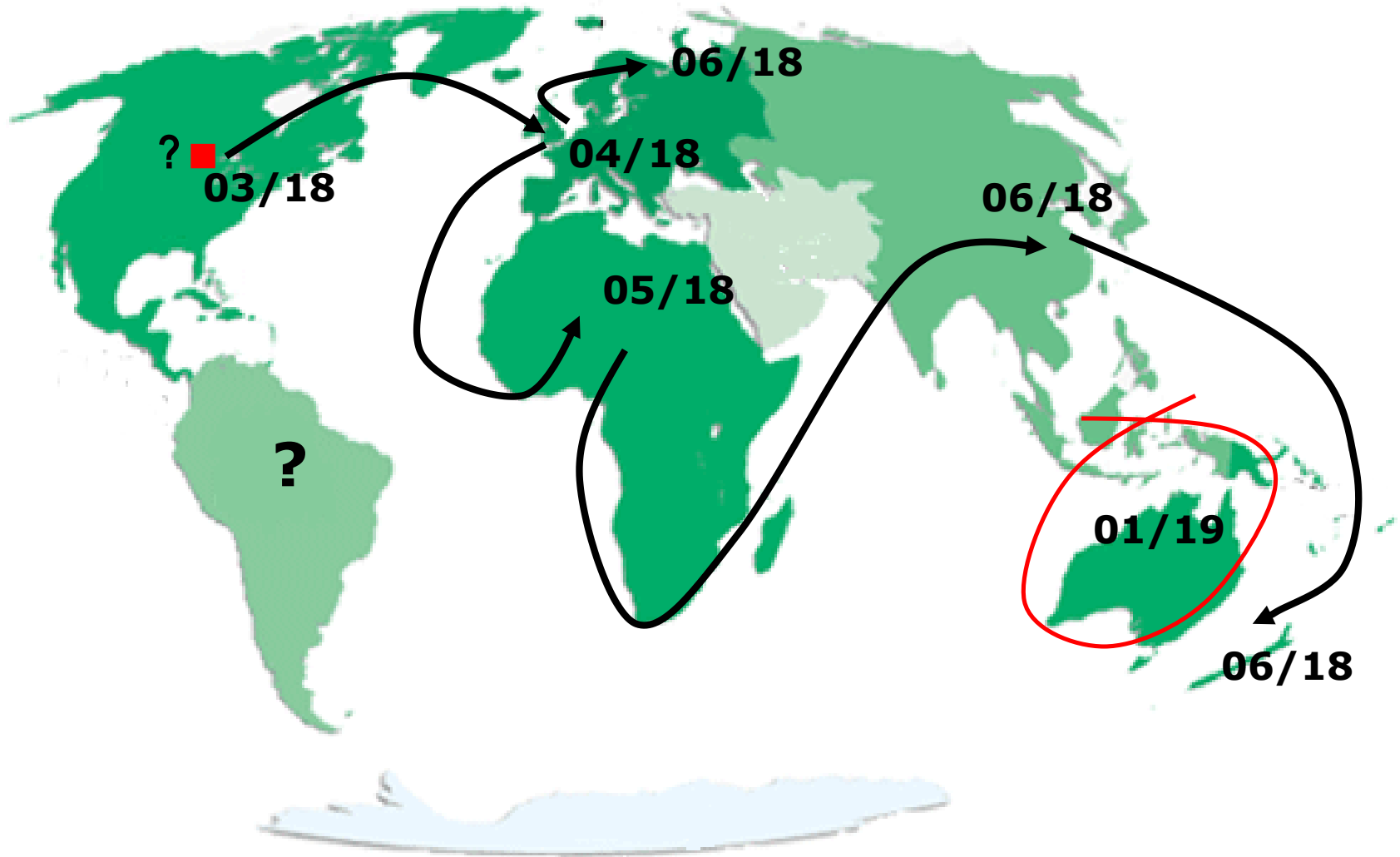
The 1918 Flu Pandemic in the U.S.

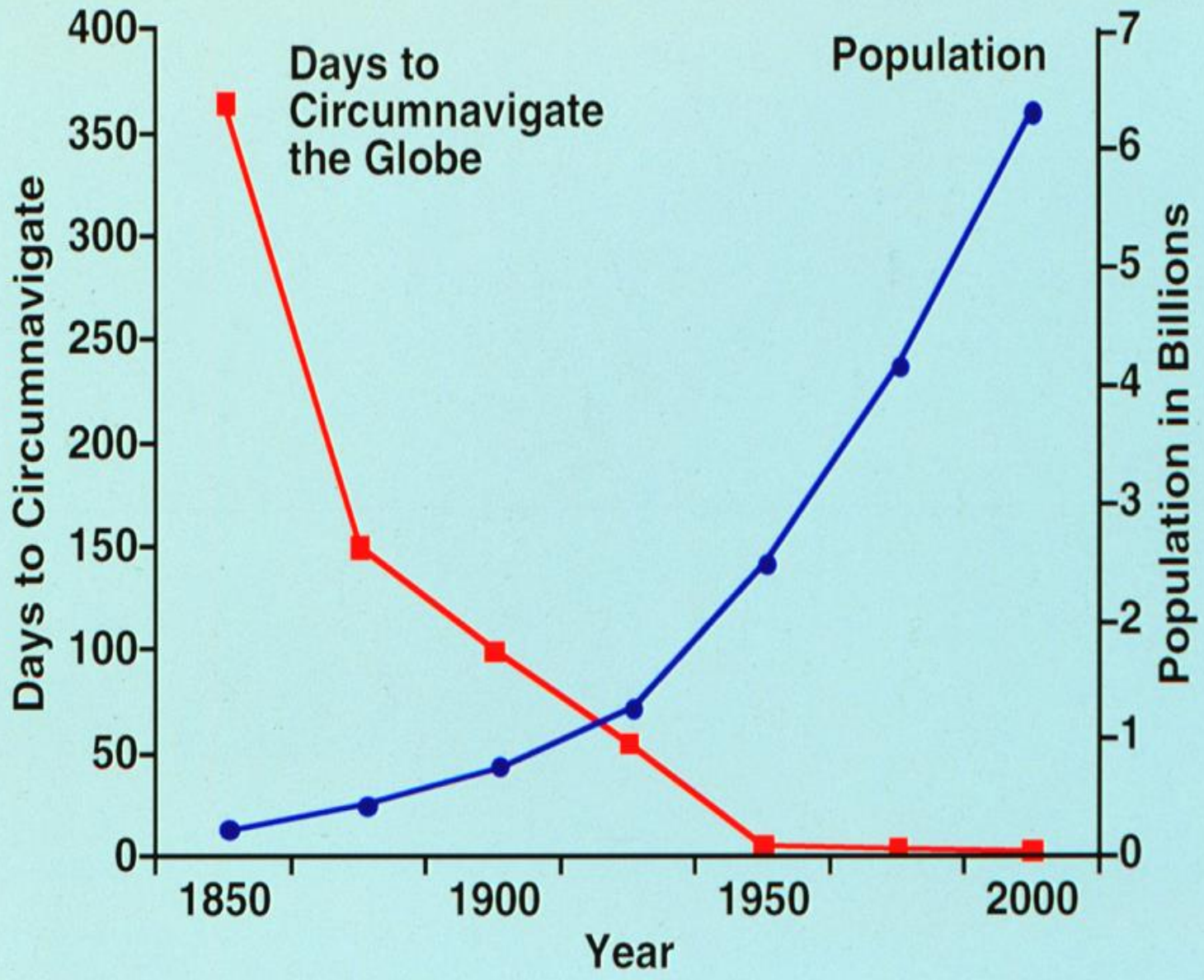


The 1918 Flu Pandemic in the U.S.



Geographic spread: 1918-19



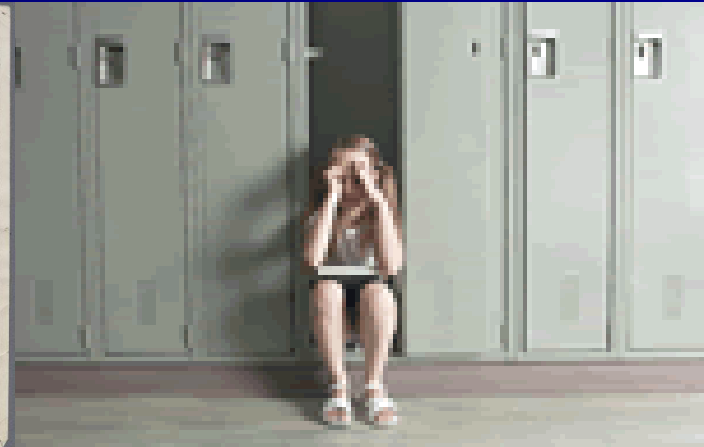
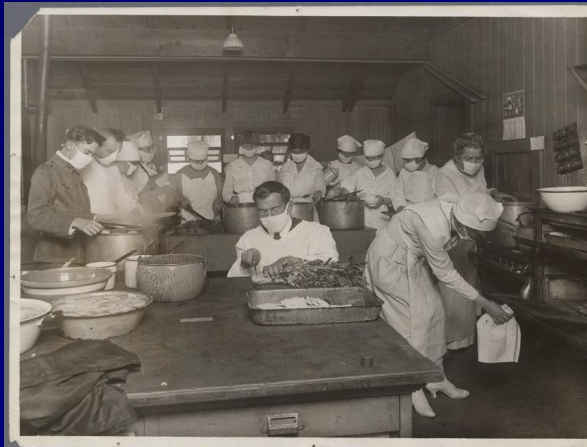




Believe it or not,
flu could hit you even harder

ΠΑΝΔΗΜΙΑ - ΕΠΙΠΤΩΣΕΙΣ

- Κοινωνικές
- Οικονομικές
- Πολιτικές



Pandemic influenza – 100 yrs after



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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

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?](#)

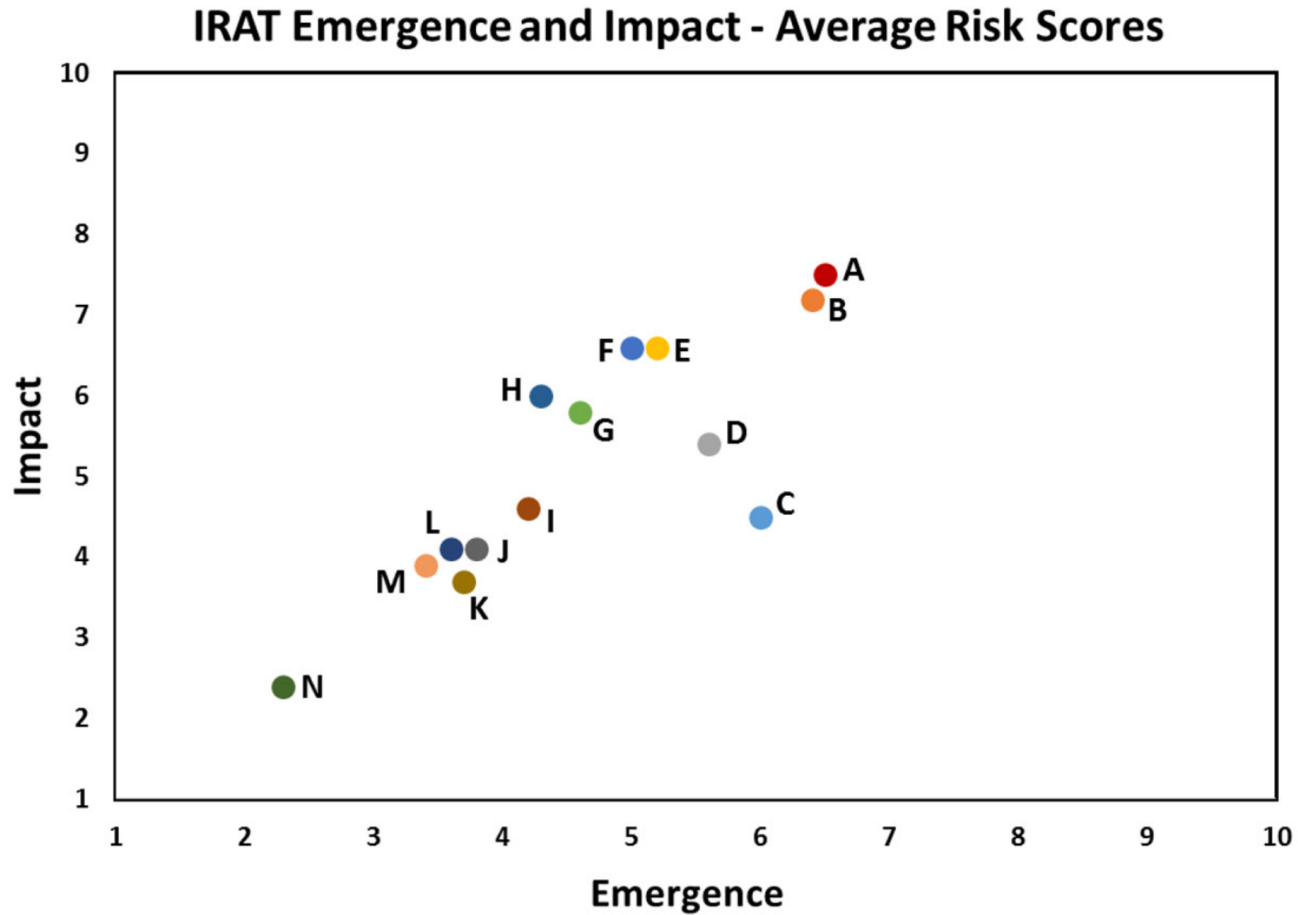
[Does the IRAT get updated?](#)

[What influenza viruses have been assessed using the IRAT?](#)

Pandemic influenza – IRAT

	Virus	Emergence Score	Impact Score
● A	H7N9 [A/Hong Kong/125/2017]	6.5	7.5
● B	H7N9 [A/Shanghai/02/2013]	6.4	7.2
● C	H3N2 variant [A/Indiana/08/2011]	6.0	4.5
● D	H9N2 G1 lineage [A/Bangladesh/0994/2011]	5.6	5.4
● E	H5N1 Clade 1 [A/Vietnam/1203/2004]	5.2	6.6
● F	H5N6 [A/Yunnan/14564/2015] – like	5.0	6.6
● G	H7N7 [A/Netherlands/2019/2003]	4.6	5.8
● H	H10N8 [A/Jiangxi-Donghu/346/2013]	4.3	6.0
● I	H5N8 [A/gyrfalcon/Washington/41088/2014]	4.2	4.6
● J	H5N2 [A/Northern pintail/Washington/40964/2014]	3.8	4.1
● K	H3N2 [A/canine/Illinois/12191/2015]	3.7	3.7
● L	H5N1 [A/American green-winged teal/Washington/1957050/2014]	3.6	4.1
● M	H7N8 [A/turkey/Indiana/1573-2/2016]	3.4	3.9
● N	H1N1 [A/duck/New York/1996]	2.3	2.4

Pandemic influenza – IRAT



Pandemic influenza – Preparedness

Influenza (Flu)

Pandemic Influenza > Planning and Preparedness Resources



🏠 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 +

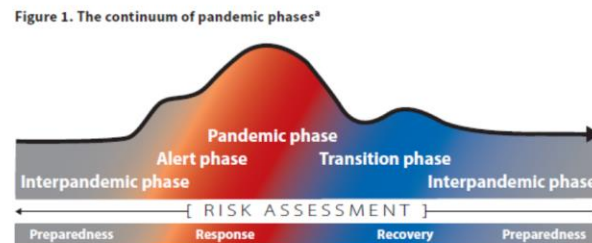
Archived Documents +

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).



Pandemic influenza – Preparedness




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Influenza

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

Public health preparedness




WHO/Elena Longarini

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" (PIRM), updates and replaces the "Pandemic Influenza Risk Management: WHO Interim Guidance" published in 2013.

[Pandemic Influenza Risk Management - A WHO guidance \(May 2017\)](#)


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 \(Jan 2018\)](#)

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 \(update October 2018\) pdf, 239kb](#)
- [Differences among seasonal, pandemic, and zoonotic or variant influenza](#)

Questions and Answers

- [Q&A: Seasonal influenza](#)
- [Recommended composition of influenza virus vaccines \(27 September 2019\) 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
EMERGENCIES
programme

ΕΜΒΟΛΙΟ
ΕΠΙΔΗΜΙΑΣ
ΓΡΙΠΗΣ

Είσαι 65+;

Πάσχεις από χρόνια νόσημα;

Είσαι έγκυος;

Είσαι εργαζόμενος στον τομέα της υγείας;

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κατά της γρίπης
είναι ο καλύτερος τρόπος
προφύλαξης από τη νόσο**

ΕΡΩΤΗΣΕΙΣ ;