

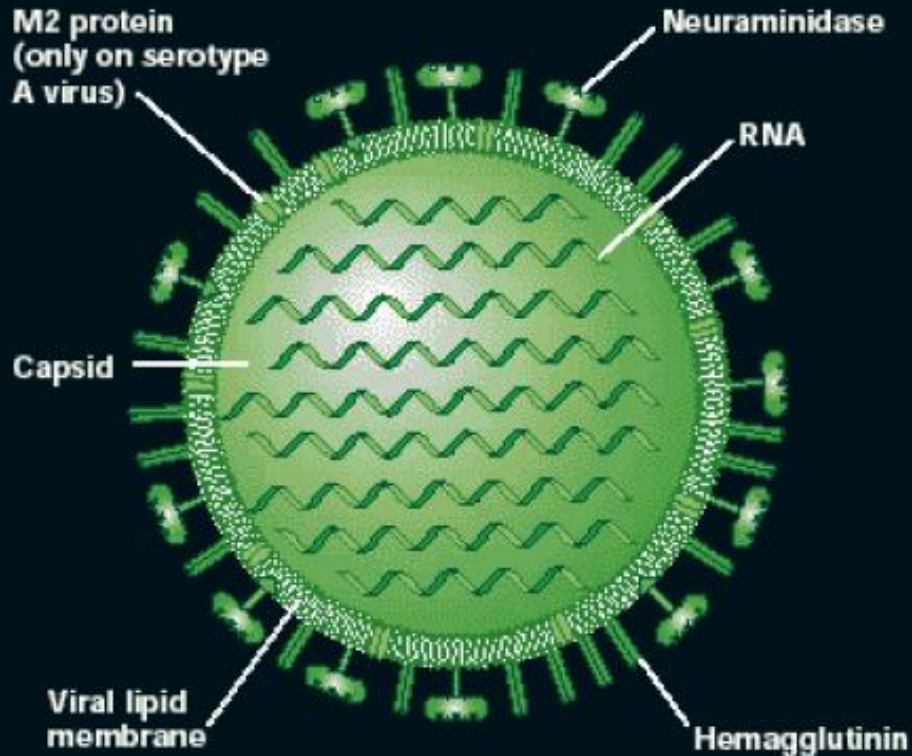


اپیدمیولوژی و پیشگیری از آنفلوانزای H1N1

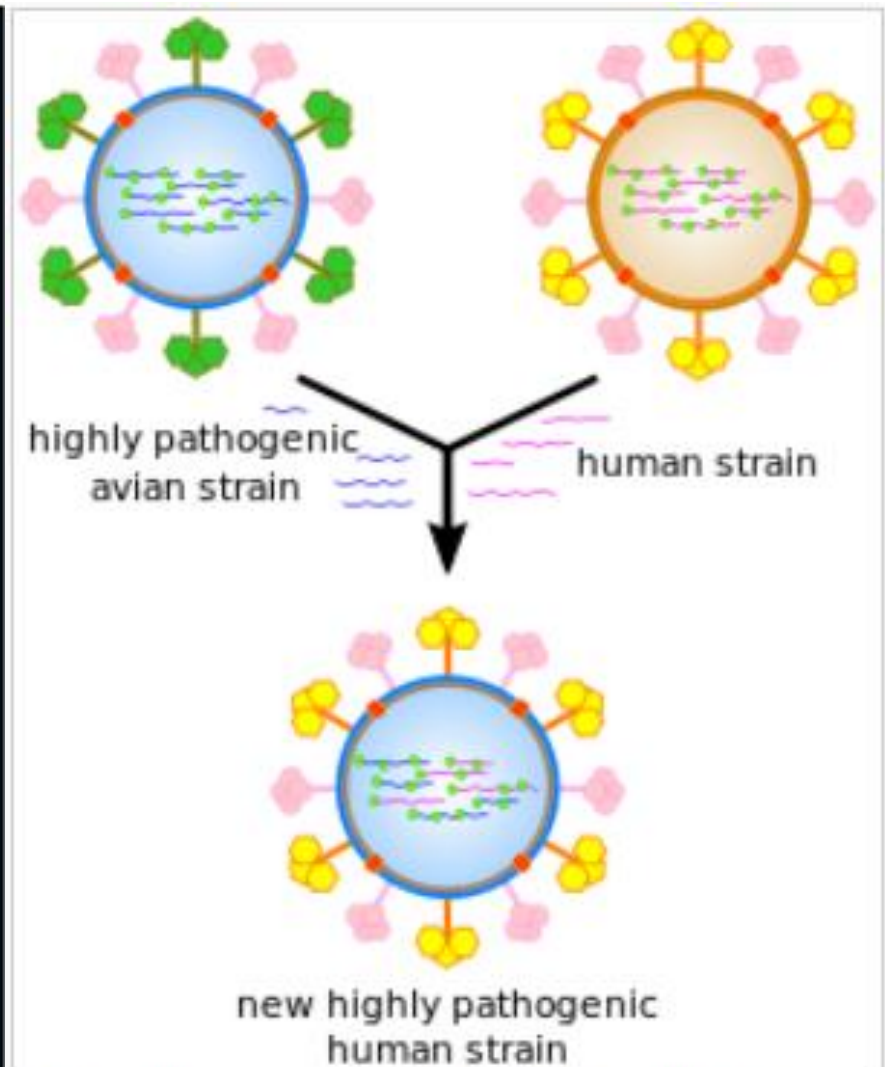
نوذر نخعی

آذر ۱۳۹۴

Antigenic Shift & Drift



Influenza A and B viruses have 2 surface glycoproteins: hemagglutinin, which is necessary for the virus to attach to host-cell membranes, and neuraminidase, an enzyme involved in viral penetration and release of virus from infected cells.



How antigenic shift, or reassortment, can

Antigenic Drift is responsible for new seasonal strains that makes necessary surveillance to detect these strains and to prepare new seasonal influenza vaccine (yearly basis)

Antigenic Shift may result in a new virus easily transmissible from man to man for which the population has no immunity : Results in Pandemics

چهار اپیدمی دنیا از ابتدای قرن بیستم

Causes Pandemics

- Spanish Flu [A (H1N1)] 1918-19;
- Asian Flu [A (H2N2)] 1957-59;
- Hongkong Flu [A (H3N2)] 1968-68;
- “Swine Flu” [A (H1N1)] 2009-10

What about past flu pandemics?



Credit: US National Museum of Health and
Medicine

1918: “Spanish Flu”
A(H1N1)

20-40 m deaths



1957: “Asian Flu”
A(H2N2)

1-4 m deaths



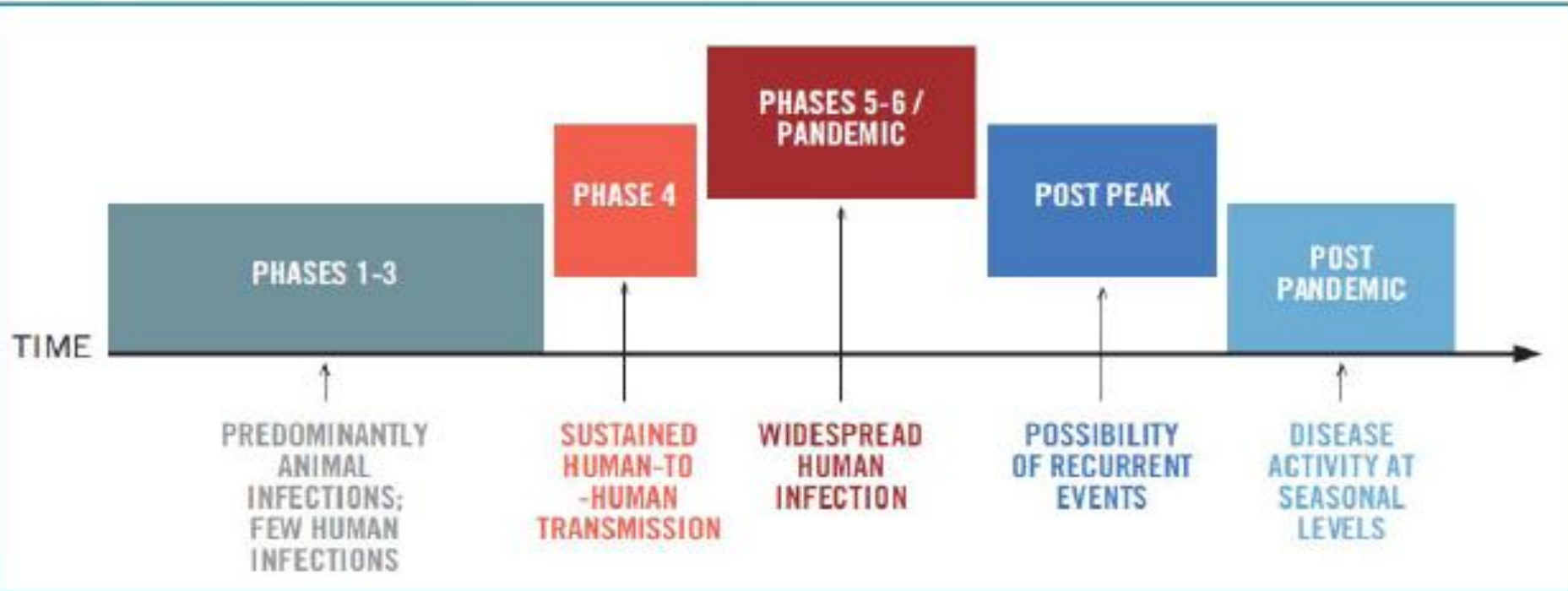
1968: “Hong Kong Flu”
A(H3N2)

1-4 m deaths

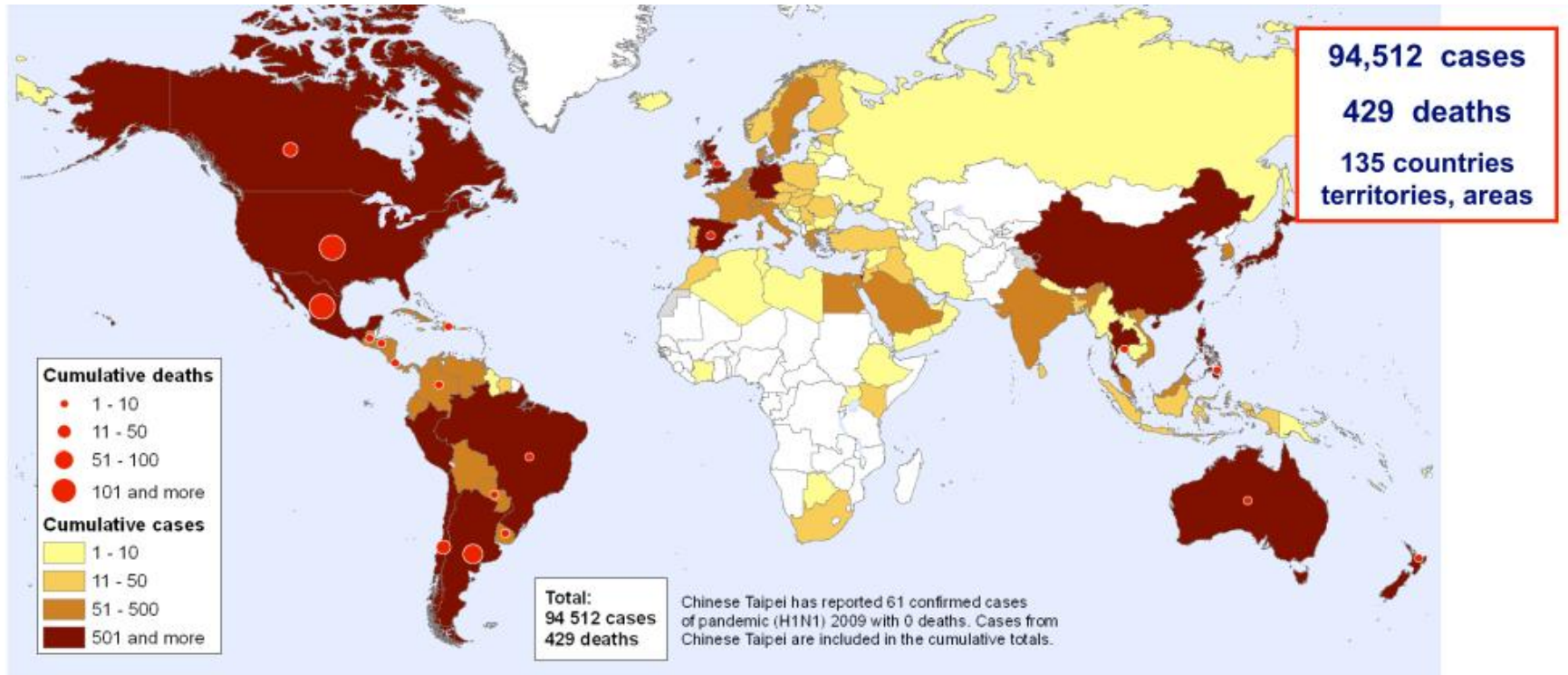
پاندمی چہارم

- آوریل ۲۰۰۹ میلادی یا فروردین ۱۳۸۸
- ۲۳ فروردین: مکزیک
- ۲۶ فروردین: کالیفرنیا
- در عرض ۹ هفته (خرداد ماه): کل دنیا

FIGURE 3
PANDEMIC INFLUENZA PHASES (2009)



۱۵ تیرماه ۱۳۸۸



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 lines on maps represent approximate border lines for which there may not yet be full agreement.

Map produced: 06 July 2009 09:00 GMT

Data Source: World Health Organization
Map Production: Public Health Information
and Geographic Information Systems (GIS)
World Health Organization



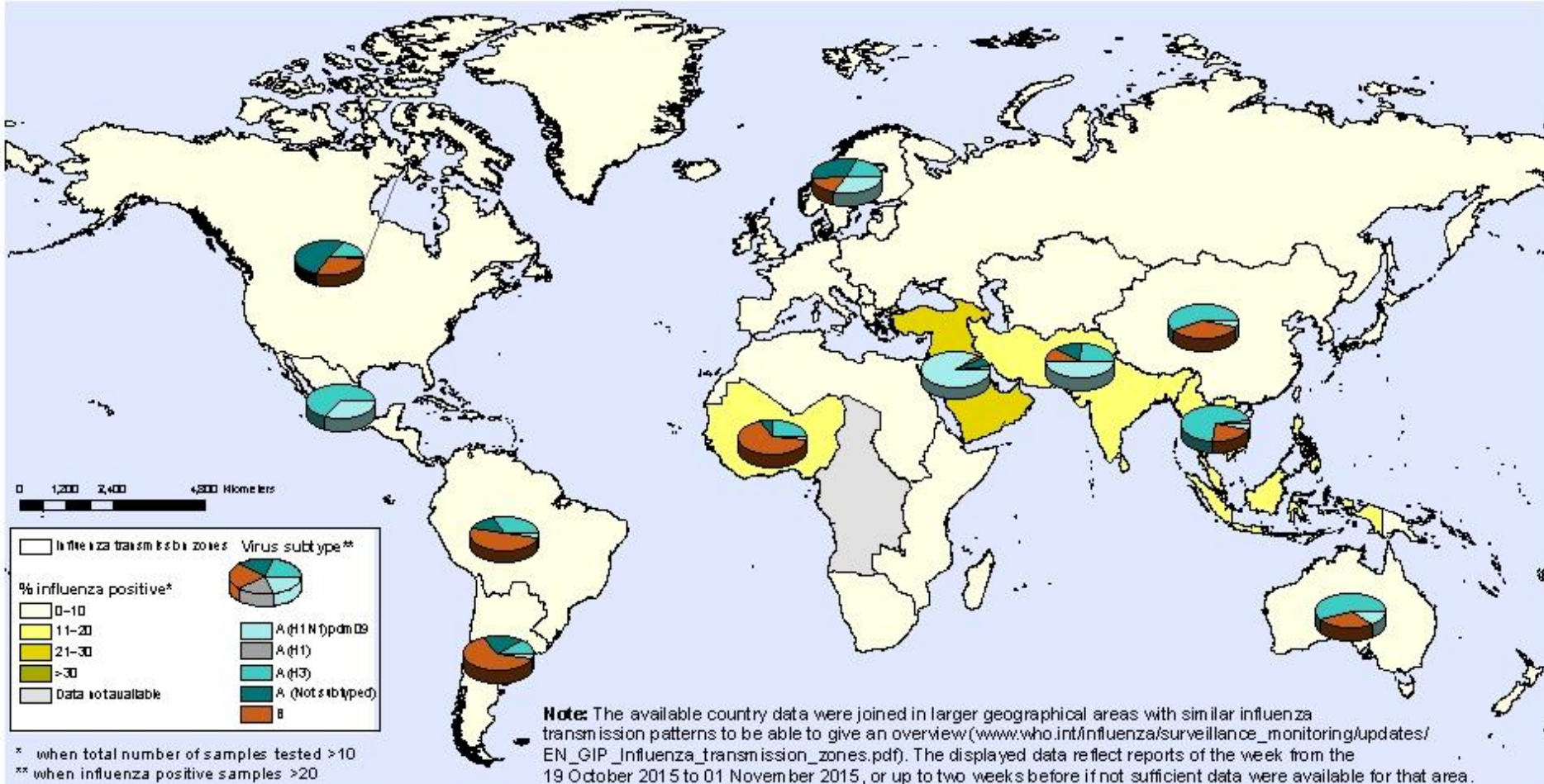
© WHO 2009. All rights reserved



وضعیت آنفلوآنزا تا آذر ۱۳۹۴

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

Status as of 12 November 2015



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).



©WHO 2015. All rights reserved.

Transmissibility

- Secondary attack rate estimates
 - School outbreaks: 22-33% (USA)
 - Households: 19% (USA) to 43% (Chile)
- Community transmission in multiple countries
 - NYC community-based telephone survey: 6.9% of the population developed an influenza-like illness between May 1 and May 20, 2009
- Explosive outbreaks / amplification in schools
- R_0 estimates
 - Pandemic (H1N1) 2009: 1.4 - 3.5
 - Seasonal influenza: 1.2 - 1.4

Clinical spectrum of infection

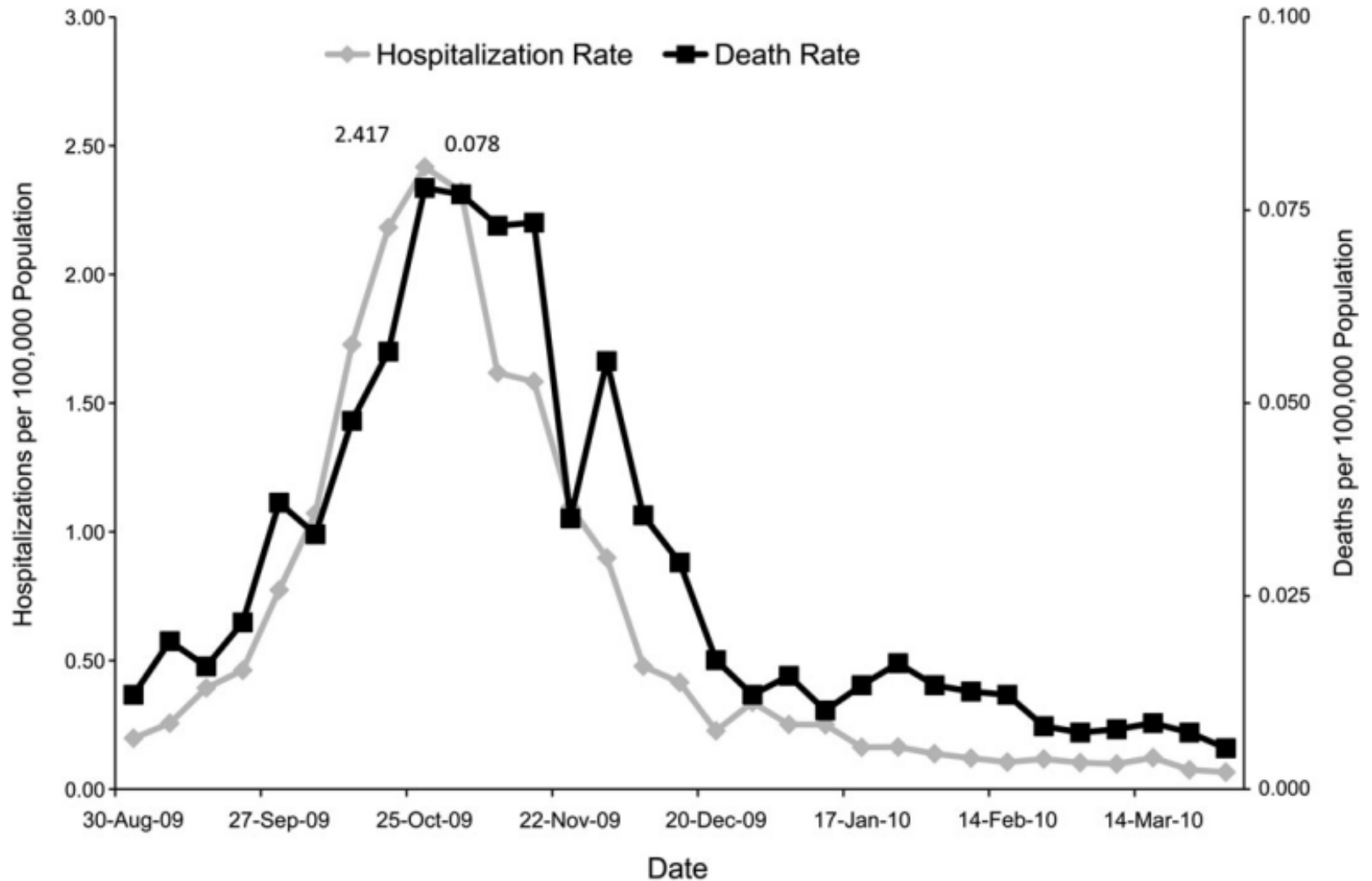
- Majority of cases have uncomplicated influenza illness that resolves without antiviral treatment
 - More GI complaints (emesis, diarrhea...) than for seasonal influenza
 - Non-febrile, mild, and asymptomatic (viral RNA+) cases
- Hospitalization: up to 10% of confirmed cases
 - 1-10% in US, 2-6% in Canada, 3.5% in Chile
- CFR: < 1% of confirmed cases
 - **Higher risk in adults (> 20 yrs old) and those with co-morbidities**
 - US < 0.4%; Mexico < 1.5%; Chile- 0.1%; Argentina < 1.5%



Examples of considerations for establishing priorities for use of pandemic vaccine

- As noted by Meltzer et al, "vaccination priorities depend on the objectives".
 - If the **objective** is maintaining the functioning of a country's critical infrastructure, then vaccinating the required personnel will be a priority.
 - E.g. Health care staff
 - If the **objective** is preventing the greatest number of deaths, then vaccinating groups at high risk of influenza-related mortality would be the first priority.
 - E.g. People with underlying conditions (but severe cases have been reported in healthy young adults)
 - If the **objective** is to reduce pandemic virus transmission within the community, then targeting children is a consideration.
 - E.g. School age children depending on local patterns

Epidemiology of 2009 Pandemic Influenza A (H1N1) in the United States

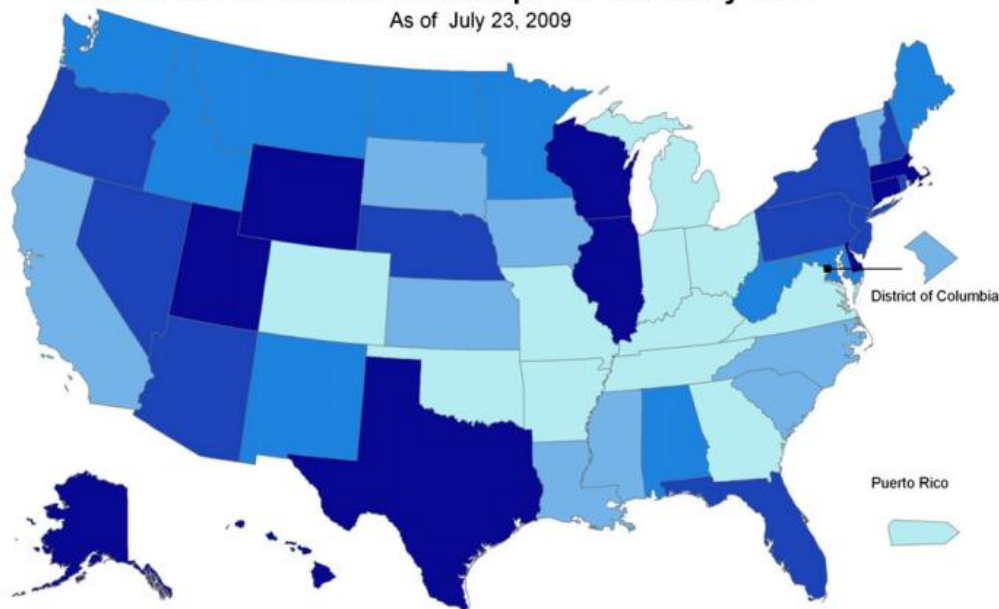


اپیدمیولوژی در آمریکا

b)

Rate of Confirmed and Probable pH1N1 Cases by State

As of July 23, 2009



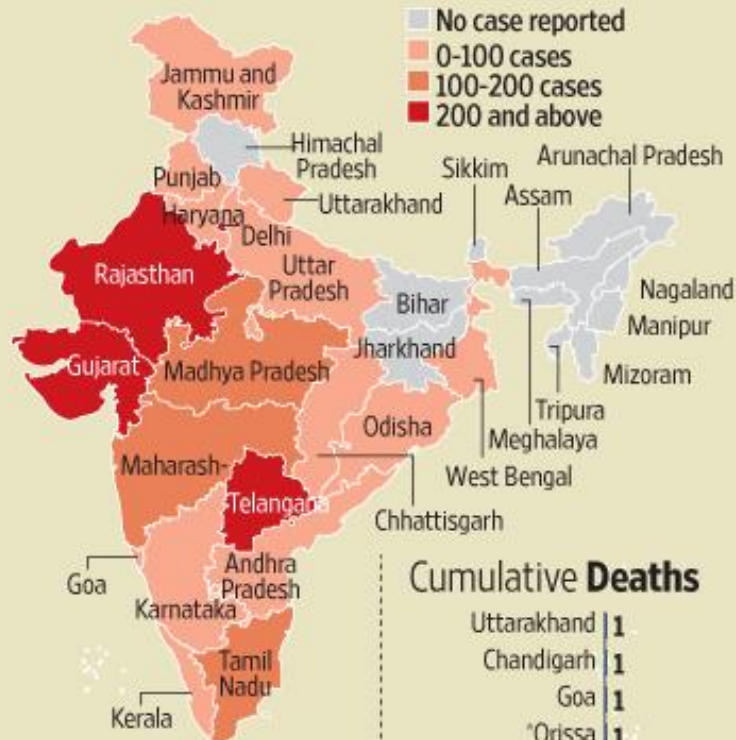
Cases per 100,000 Population

0.51 - 5.18 5.19 - 9.27 9.28 - 13.37 13.38 - 18.26 18.27 - 109.58

- In the United States between 5% and 20% of the population are infected with influenza every year, resulting in between 3,000 and 49,000 influenza-associated deaths

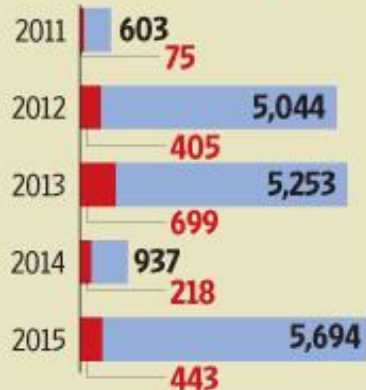
طغیان در هند 2015

Cumulative **Cases Reported** (since 1 January 2015)



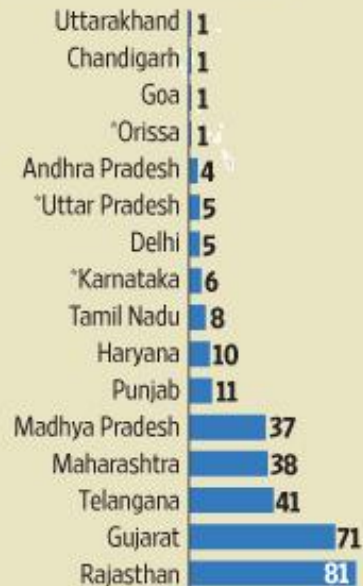
- The total number of laboratory confirmed cases crossed 33000 mark with death of more than 2000 people.
- The states of Gujarat and Rajasthan are the worst affected

Last 4 Years Cases Deaths

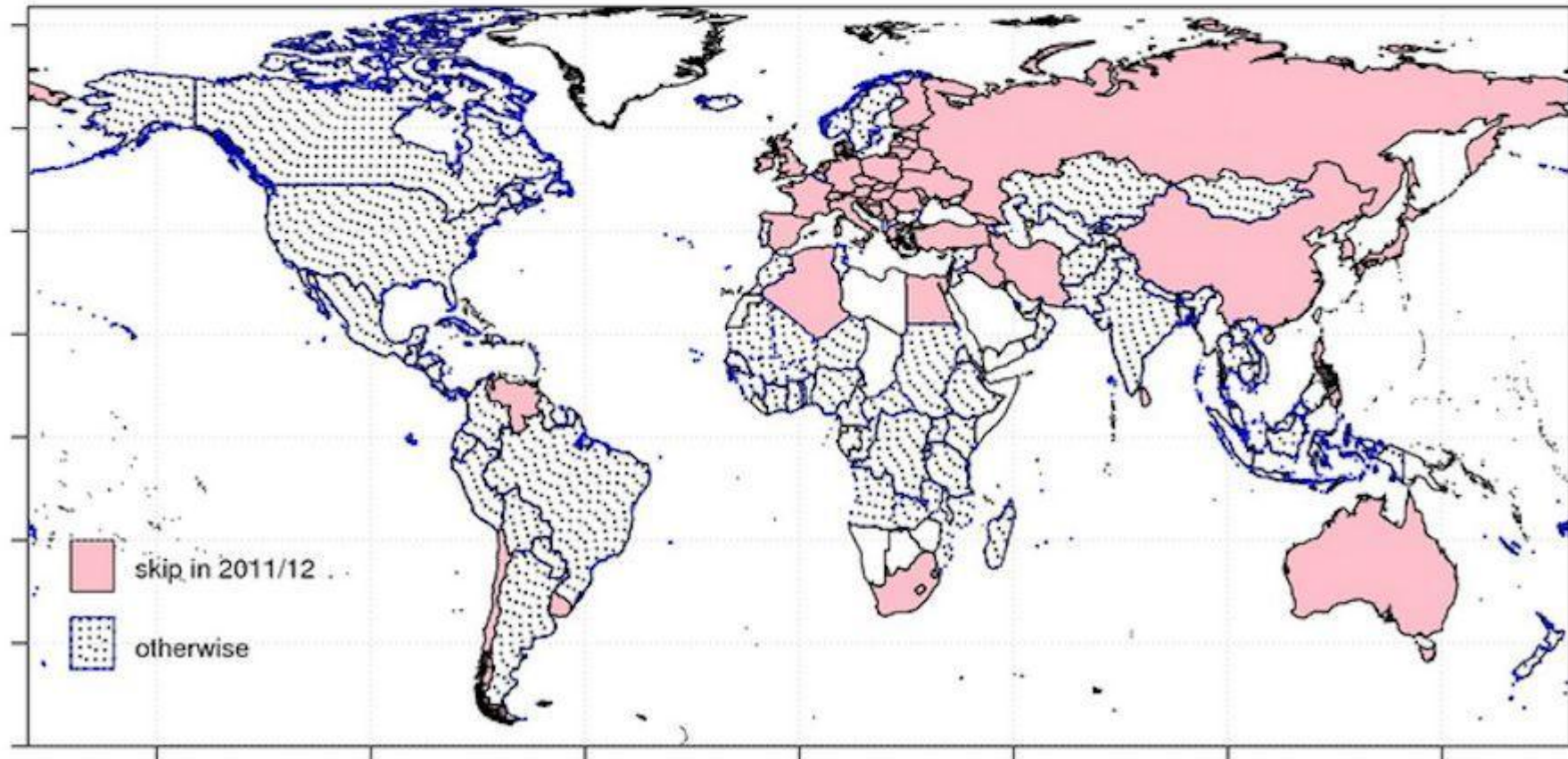
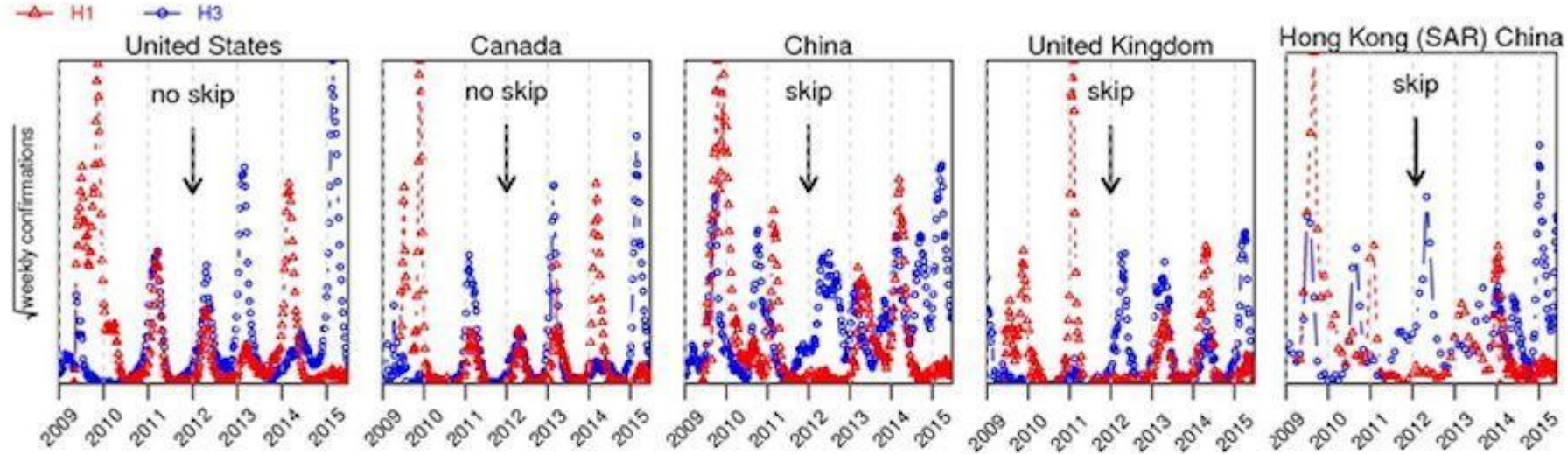


* As on 6 Feb 2015

Cumulative **Deaths**



Source: The Health Ministry



میزان حمله ثانویه و مرگ

- Influenza occurs globally with an annual attack rate estimated at 5%–10% in adults and 20%–30% in children. Illnesses can result in hospitalization and death mainly among high-risk groups (the very young, elderly or chronically ill). Worldwide, these annual epidemics are estimated to result in about 3 to 5 million cases of **severe illness**, and about 250 000 to 500 000 **deaths**.

Estimates of the reproduction number for seasonal, pandemic, and zoonotic influenza: a systematic review of the literature

• یک بیمار به طور متوسط چند نفر فرد غیر ایمن را بیمار میکند؟

- The median R value for 2009 was 1.46 (IQR: 1.30 – 1.70)

Disease	Transmission	R ₀
Measles	Airborne	12–18
Pertussis	Airborne droplet	12–17
Diphtheria	Saliva	6–7
Smallpox	Airborne droplet	5–7
Polio	Fecal-oral route	5–7
Rubella	Airborne droplet	5–7
Mumps	Airborne droplet	4–7
HIV/AIDS	Sexual contact	2–5
SARS	Airborne droplet	2–5 ^[2]
Influenza (1918 pandemic strain)	Airborne droplet	2–3 ^[3]
Ebola (2014 Ebola outbreak)	Bodily fluids	1.5-2.5 ^[4]

●

SHORT REPORT

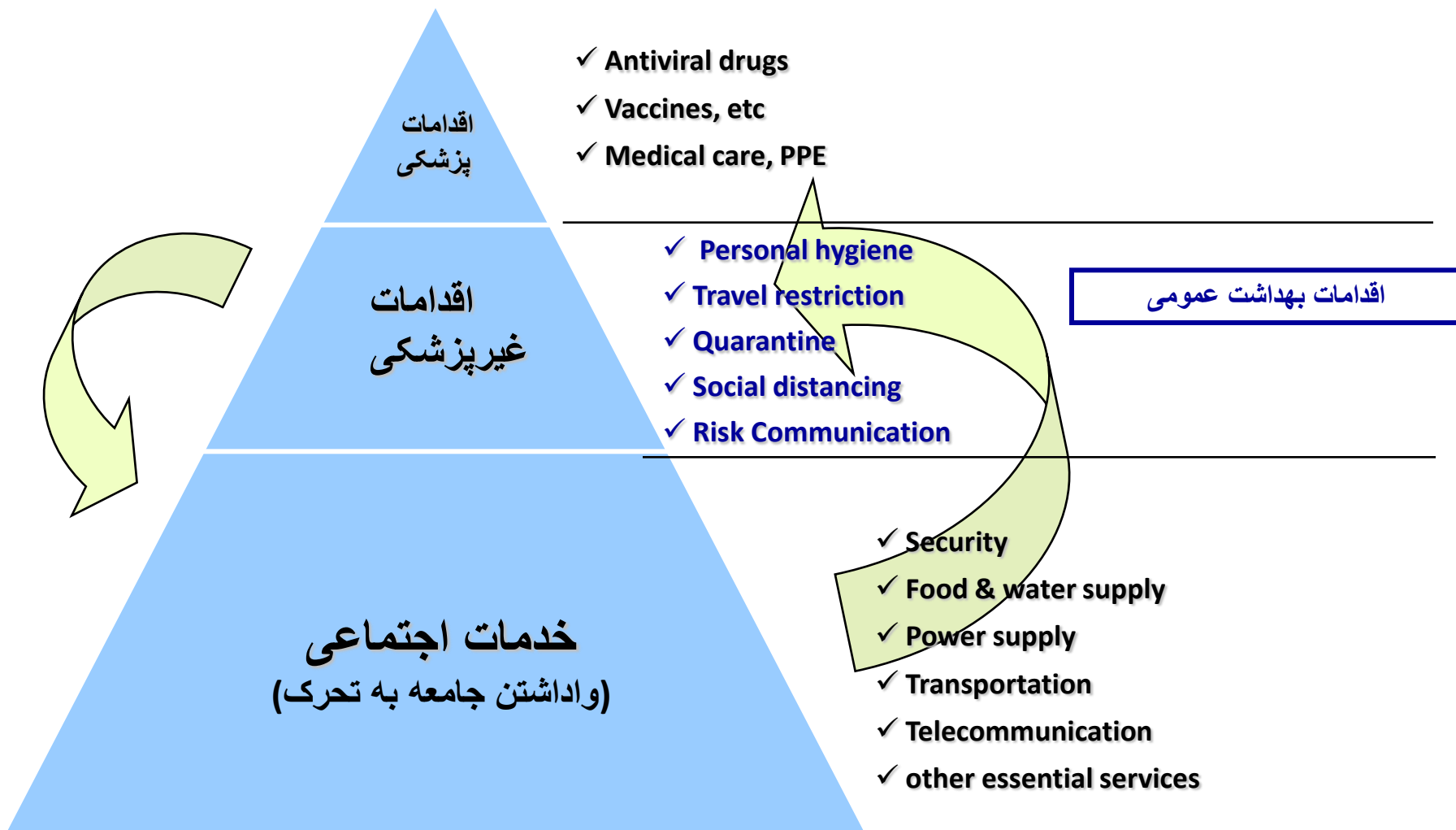
Open Access



An outbreak of influenza A(H1N1)pdm09 virus in a primary school in Vietnam

- The overall attack rate (AR) was 25 % , and was highest (41 %) in grade 4 pupils, where the outbreak started.

استراتژی های پاسخ به اپیدمی



دو راه اصلی انتقال

Infectious secretions



Infectious secretions are spread

- through the air; or
- by direct or indirect contact



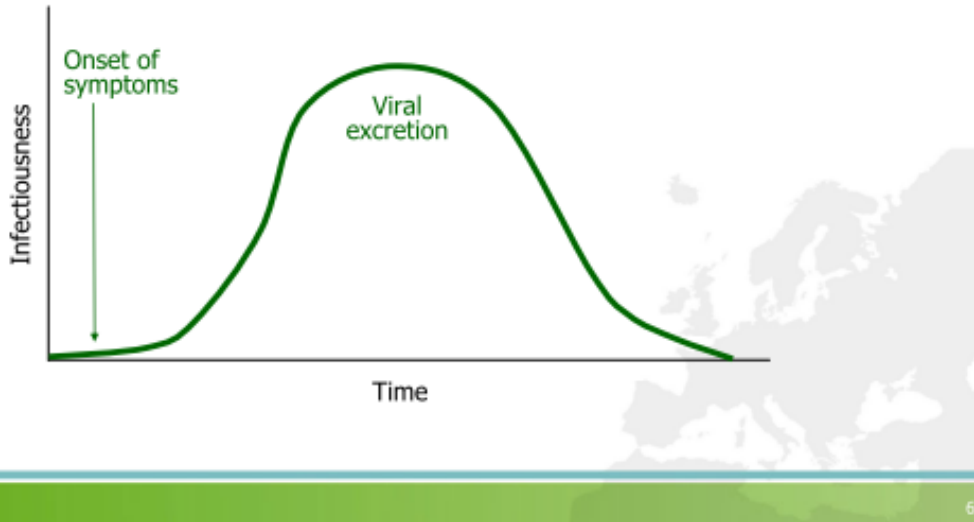
هاله یک متری

Airborne transmission through large droplets



بازه زمانی مسری بودن

Individual infectiousness is not uniform
— it changes over time



- 3-5 days from clinical onset in adults;
- Up to 7 days in young children
- Peak viral shedding occurs on day 1 of symptoms

بنابراین:

- پیشگیری کار پیچیده ای نیست!
- محور پیشگیری بر اقدامات بهداشتی و حفاظت فردی استوار است.
- و

چگونه از خود و دیگران محافظت کنیم؟



دستمال مصرف شده را
فوری پس از استفاده و
بطور مناسب دفع کنیم



هنگام سرفه یا عطسه،
بینی و دهان خود را با
دستمال کاغذی بپوشانیم



در صورت مشاهده
علائم شبه آنفولانزا، فوراً
به پزشک مراجعه کنیم

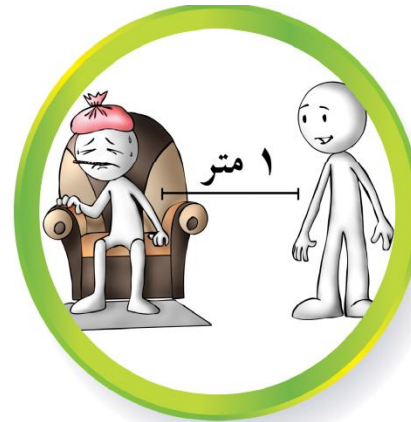


دست ها را بطور منظم
با آب و صابون بشوئیم

چگونه از خود و دیگران محافظت کنیم؟



اگر در خود علائم شبه
آنفولانزا دیدیم،
در منزل بمانیم



اگر آثار شبه آنفولانزا
مشاهده کردیم، از
افراد (حداقل یک متر)
فاصله بگیریم



از مالیدن و تماس دست
آلوده با چشمها و بینی و
دهان خودداری کنیم



هنگام احوالپرسی
از درآغوش گرفتن،
بوسیدن و دست دادن
خودداری کنیم

برای پیشگیری از: آنفلوآنزا و بیماری‌های حاد تنفسی

در صورت داشتن علائم بیماری:



روبوسه نکنید

خودداری از روبوسه، دست دادن و درآغوش گرفتن
افراد دارای علائم بیماری تنفسی

بپوشانید



پوشاندن دهان و بینی هنگام سرفه و عطسه
با دستمال (ترجیحاً) و یا قسمت بالای آستین



بشوید

شستشوی صحیح و مکرر
دست‌ها با آب و صابون

واکسن های موجود در دنیا

Table 2: Overview of available seasonal influenza vaccines in the EU/EEA (2014/15 Season)

Manufacturer	Name of product*	Vaccine type	Adjuvant	Administration route	Produced in	Age recommended
Novartis healthcare	Influvac Imuvac	Inactivated	None	im	Egg	From 6 months
Novartis healthcare	Fluenz (US trade name FluMist)	Live attenuated	None	intranasal	Egg	From 24 months to 17 years
Novartis healthcare	Trivalent: Fluarix** Alpharix Influsplit Quadrivalent: Fluarix Tetra Alpharix Tetra Influsplit Tetra	Inactivated/split	None	Trivalent im, sc Quadrivalent im	Egg	Trivalent: From 6 months Quadrivalent: From 3 years
Novartis healthcare	Agrippal Fluvirin Optaflu Fluad	Inactivated/subunit	None None None Squalene (MF59)	im	Egg Egg Cell Egg	From 6 months From 4 years From 18 years From 65 years
Novartis healthcare	Fluval AB	Inactivated	Aluminium phosphate gel	im	Cell	From 6 months
Novartis healthcare	Afluria*** Enzira	Inactivated Inactivated	None None	im im	Egg Egg	From 5 years, however increased fever reported in children 6 months to 5 years
Novartis healthcare	Vaxigrip** Intanza 9µg Intanza 15µg	Inactivated Inactivated Inactivated	None None None	im Intradermal Intradermal	Egg Egg Egg	From 6 months From 18-59 years From 60 yrs

واکسن



اولویت های واکسیناسیون

۱-۴- گروه های در معرض خطر برای عوارض

- خانم های حامله
- سن ۶۵ سال یا بالاتر، سن زیر ۵ سال و بویژه زیر ۲ سال
- هر یک از بیماریهای زمینه‌ای:
 - بیماری ریوی مزمن مثل آسم
 - بیماری مزمن قلبی عروقی (به جزء فشار خون)
 - اختلالات نورولوژیک مزمن مانند MS ، استروک ، CP ، دیس تروفی عضلانی
 - بیماران با نقص سیستم ایمنی، اختلالات خونی، بیماری مزمن کلیوی و کبدی، دیابت ، چاقی مرضی

اولویت نخست با خانم های باردار است.

واکسیناسیون در بارداری

- CDC recommends that pregnant women get a flu shot during any trimester of their pregnancy to protect themselves, their unborn babies, and their newborn babies from flu. The nasal spray vaccine is not recommended for use in pregnant women

اثر بخشی واکسن

Vaccine xxx (2015) xxx–xxx



Contents lists available at [ScienceDirect](#)

Vaccine

journal homepage: www.elsevier.com/locate/vaccine



Assessment of influenza vaccine effectiveness in a sentinel surveillance network 2010–13, United States

Across three winters, we estimated similar VE against medically attended laboratory-confirmed influenza in children and adults with point estimates ranging from 34% to 58% ([Table 2](#)). We

was higher against influenza A(H1N1) compared to A(H3N2) and B.

خصوصيات واکسن

- It usually takes 2 to 3 weeks for the protection against these viruses to be effective, and the protection lasts for 6 to 12 months

• شامل سه ویروس غیر فعال:

H1N1 •

H3N2 •

B •

نحوه تزریق و دوز

- [?] Adults and children over 35 months: A single injection (0.5mL)
- [?] Children 6 months to 35 months: A single injection (0.25mL), require a second injection a month later.

GBS

- **Attributable risk of 0.95 / 100,000 vaccinees**
- **Risk concentrated within first 6 weeks of vaccination (peak at week 2 – 3)**

منع مطلق:

Severe allergic reaction (e.g., anaphylaxis) after previous dose of any influenza vaccine; or to a vaccine component, including egg protein

انواع ماسک

Filters at least 95% of airborne particles

A. Cup style N-95 respirators

- Typical 3-ply surgical masks.



Dust Mask



استفاده از ماسک

- There is no evidence that wearing face masks (e.g. surgical-type) outside of healthcare settings during the influenza season or a pandemic offers effective protection or reduces transmission, and ECDC does not
- recommend their use.

Infection prevention and control in health care for confirmed or suspected cases of pandemic (H1N1) 2009 and influenza-like illnesses

1.1 When working in direct contact with patients, Standard and Droplet Precautions should always be applied.

As per Droplet Precautions:

- wear a medical mask, if working within or > 1 metre of the patient.
- emphasize hand hygiene before and after patient contact, and immediately after removal of mask.

**Infection prevention and control in health care for
confirmed or suspected cases of pandemic (H1N1) 2009
and influenza-like illnesses**

1.2 When performing aerosol-generating procedures (e.g. aspiration of respiratory tract, intubation, resuscitation, bronchoscopy, autopsy), health-care providers should be aware that these procedures have been associated with increased risk of infection transmission and IC precautions should include the following:

- wear a facial particulate respirator (e.g. EU FFP2, US NIOSH-certified N95), eye protection (i.e. goggles or a face shield); a clean, non-sterile, long-sleeved gown; and gloves (some of these procedures require sterile gloves);
- perform procedures in an adequately ventilated room (>12 air changes per hour);
- avoid permitting unnecessary individuals into the room; and
- perform hand hygiene before and after patient contact, and after PPE removal.

(1) Face masks should be placed carefully over mouth and nose and tied securely.

(a) Secure ties or elastic bands at middle of head and neck.



(b) Fit flexible band to nose bridge.



(c) Fit snug to face and below chin.

(2) While being worn, avoid touching the face mask with your hands.

(a) Any time a used face mask is touched, e.g., when removing a face mask, hands need to be cleaned by means of washing with soap and water or with an alcohol-based hand sanitiser.

نکات مهم

- ❑ Do not let the mask hanging from the neck.
- ❑ Change the mask after six hours or as soon as they become wet.
- ❑ Disposable masks are never to be reused and should be disposed off.
- ❑ While removing the mask great care must be taken not to touch the potentially
- infected outer surface of the mask

How to wash your hands properly



1 Wet your hands



2 Liquid soap



3 Lather and scrub - 20 sec



4 Rinse - 10 sec



5 Dry your hands



6 Turn off tap

DON'T FORGET TO WASH:

- between your fingers
- under your nails
- the tops of your hands

از توجه شما متشکرم