

**In the name of God**



Tehran University  
of Medical Sciences

*School of Public Health*

National Center of Excellence  
for Public Health Education



دانشگاه علوم پزشکی و  
خدمات بهداشتی درمانی تهران  
دانشکده بهداشت

قطب علمی آموزش  
علوم بهداشتی کشور

# Influenza Diagnosis Molecular Network & Its Challenges

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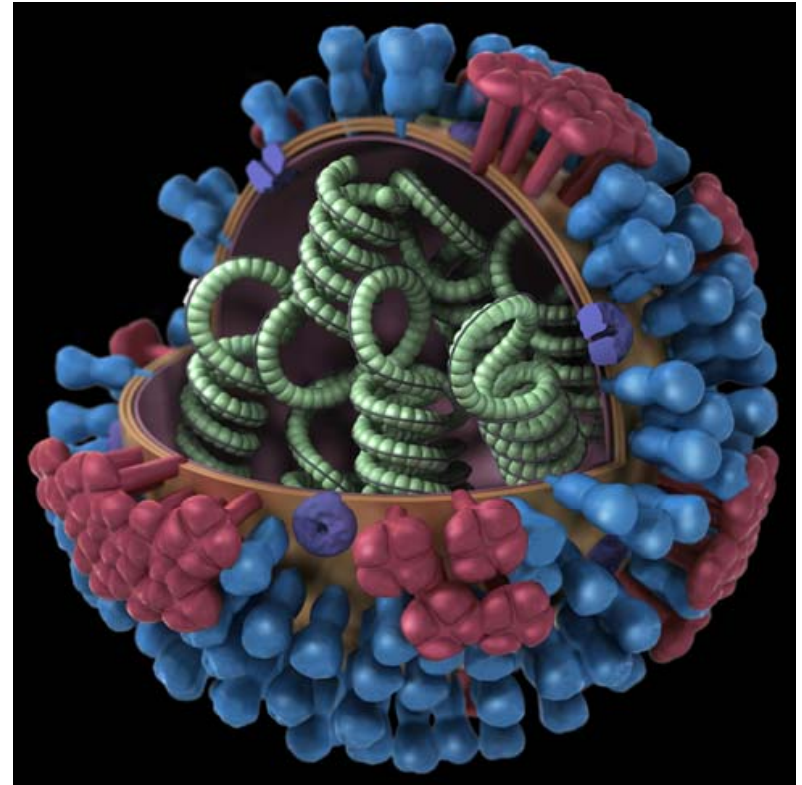
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# Influenza virus

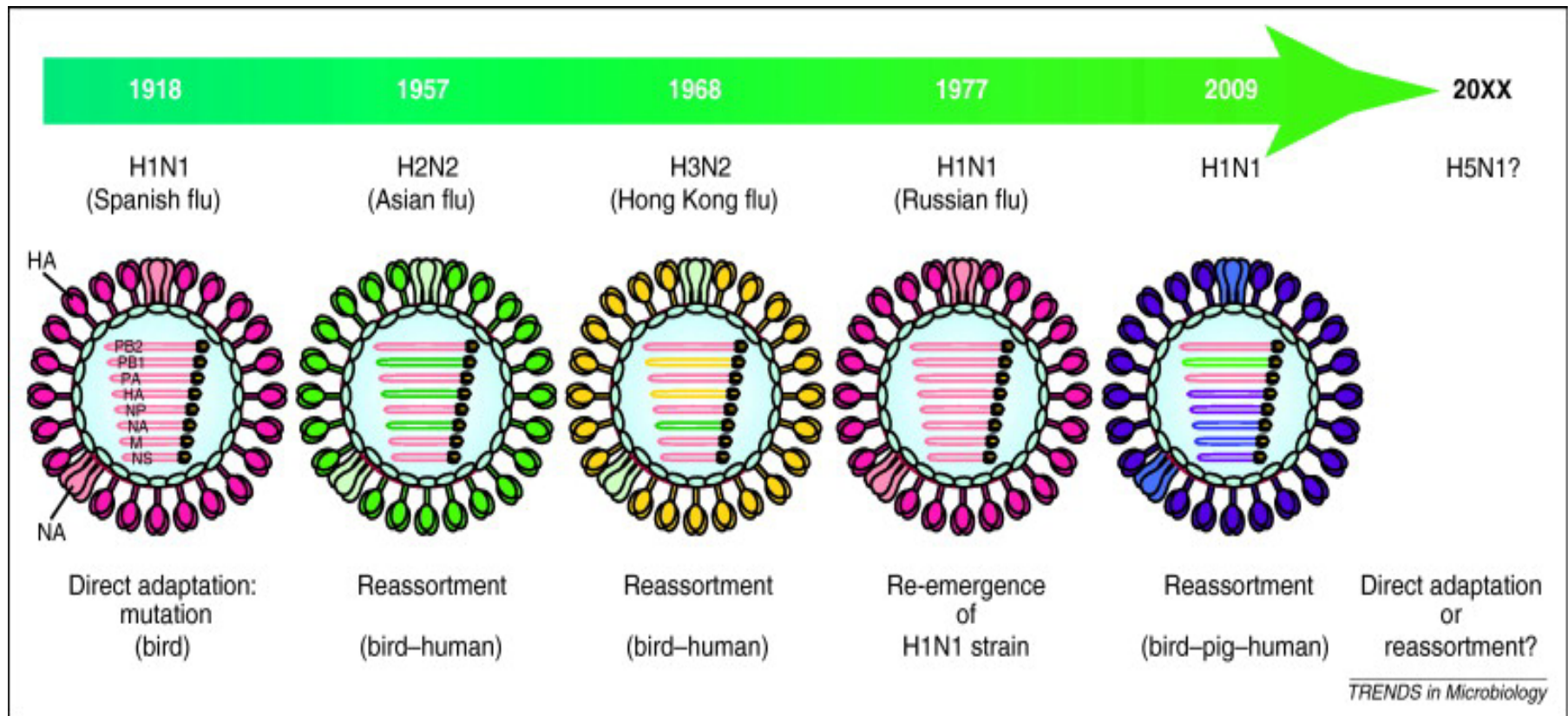


- \* Influenza virus consists of eight ssRNA gene segments.
- \* The specific structure of this virus allows genetic changes which can cause devastating epidemics and pandemics in humans & animals.



Google images

# Influenza Pandemics



# Influenza morbidity & mortality



Deaths: 250,000 - 500,000

Hospitalizations: 3 - 5 million

Affected cases

Google images

**Influenza is an important global public health concern.**

# Influenza surveillance...



- \* Influenza is a global challenge, and the prevention and control of influenza require a global response. The best way to detect, monitor, and control any pandemic is to build strong national and global surveillance, understand the epidemiology and risk factors for seasonal and pandemic influenza, and promote interventions, such as vaccine, antiviral drugs, and nonpharmaceutical interventions in different settings.

# Influenza surveillance...



- \* The WHO Global Influenza Surveillance Network was established in 1952. It comprises of WHO collaborating centers (WHOCCs) on influenza and 138 institutions, which are recognized by WHO as WHO National Influenza Centers (NICs).
- \* The Iran National Influenza Center (NIC) was established at School of Public Health, Tehran University of Medical Sciences, Tehran in **1976**.



# Influenza surveillance...



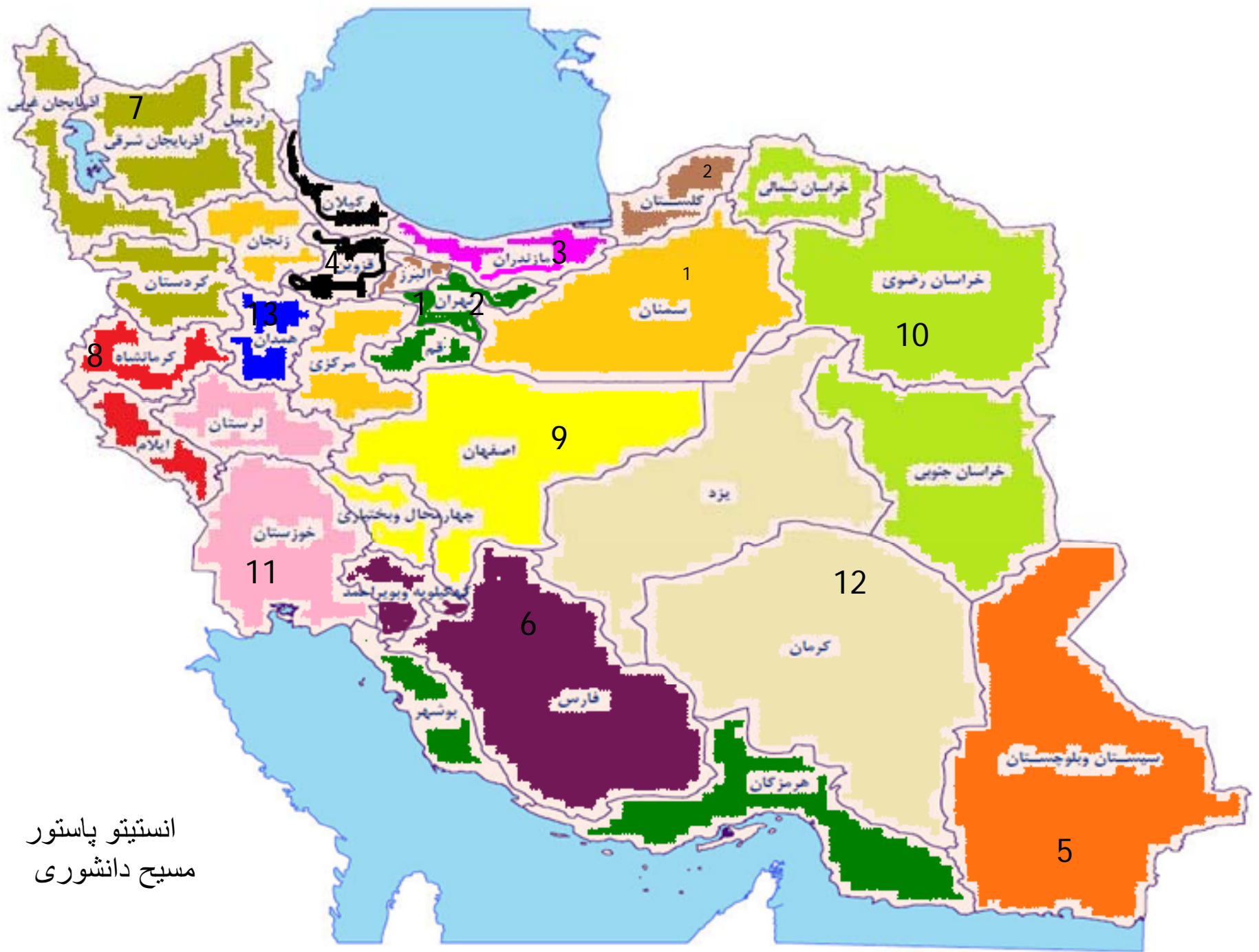
- \* According to the Communicable Disease Control Act of Iran, Ministry of Health, all suspected influenza complicated cases need to be reported and specimens must be collected and sent to NIC. Respiratory secretions from throat swabs, nasopharyngeal aspirates, or bronchoalveolar lavages were collected from patients who were suspected to have influenza infections.
- \* The diagnosis of influenza infection was confirmed by reverse transcriptase-polymerase chain reaction (RT-PCR).



# Influenza surveillance



- \* In 2009, after emerging the new variant of H1N1 subtype of influenza virus, the Ministry of Health helped NIC to be developed and also started to establish a laboratory network to minimize the impact of influenza pandemic. Currently, there are 13 sub national laboratories, geographically distributed in northern, central, southern, and eastern Iran and these laboratories 'network covered all provinces.



- 1 انسنتیو پاستور
- 2 مسیح دانشوری

# National Influenza Center...



- \* NIC serves as the **key point** of contact between the WHO and the country of origin in all questions relating to virological and epidemiological surveillance of influenza and provision of influenza virus isolates to the WHO Global Influenza Surveillance Network.

**Communication and Information-sharing**

**Virus Isolation and Shipment**

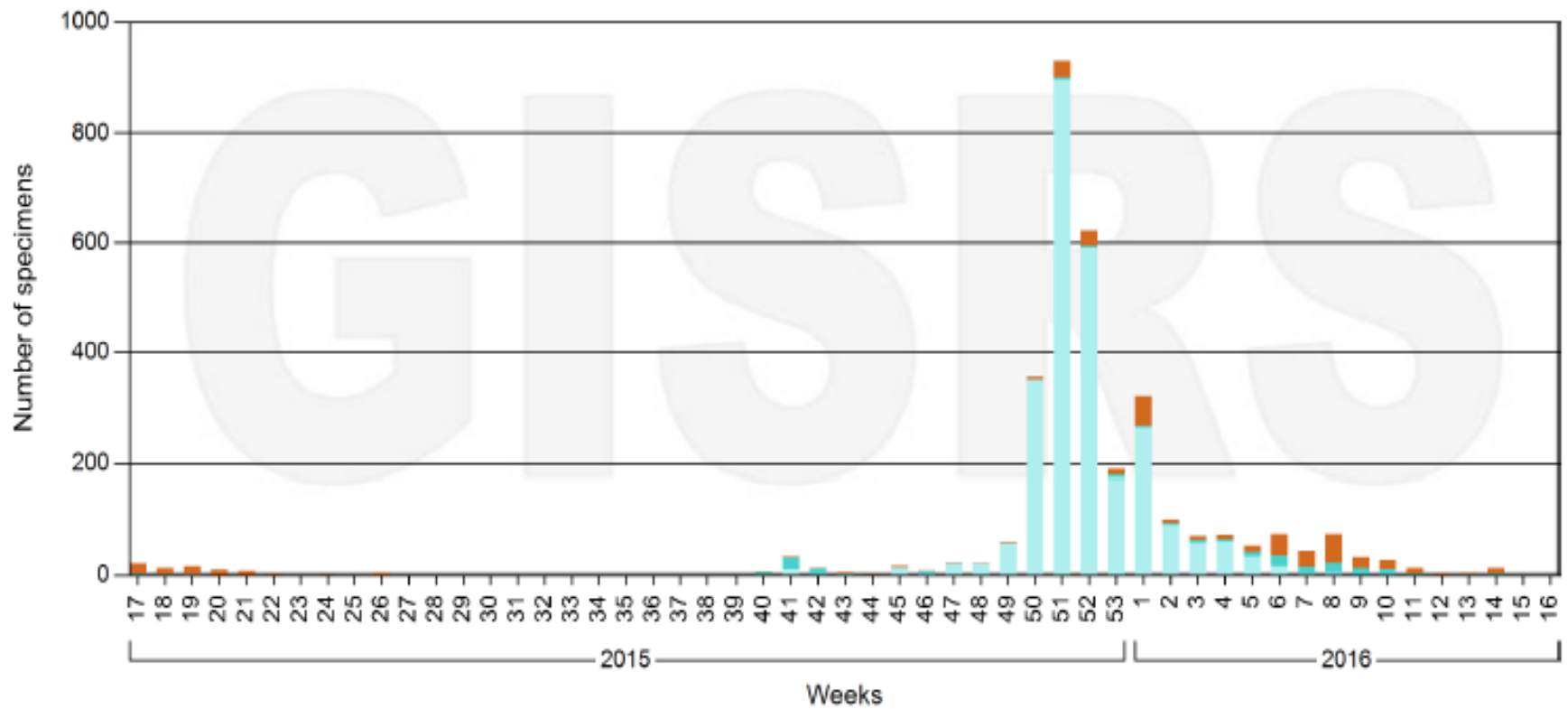
# National Influenza Center...



- \* Report regularly during the influenza season preferably weekly by electronic means on the extent of national influenza activity and ensure timely distribution of this information at relevant national and international levels through for example WHO **FluNet**. FluNet data are a key element in developing the yearly WHO recommendations on the composition of seasonal influenza vaccines.
- \* Provide to the WHO Global Influenza Program an annual national summary on influenza activity, virological surveillance and other relevant information on the influenza epidemiological situation.

Iran (Islamic Republic of)

Number of specimens positive for influenza by subtype



# National Influenza Center...



- \* Early detection is critical to containment and reduction of morbidity and mortality during a pandemic.
- \* Collect appropriate clinical specimens from patients throughout each year and especially during the influenza season and outbreaks for the isolation of influenza virus.
- \* Undertake initial identification of virus type and subtype.
- \* Act as a collection point for virus isolates where available from laboratories within the country.

# National Influenza Center...



- \* Forward representative virus isolates to a WHO Collaborating Centre.
- \* Alert the WHO Global Influenza Program on any influenza isolate that cannot be readily identified and immediately forward the isolate to a WHO Collaborating Centre.
- \* Alert WHO immediately on the emergence of unusual outbreaks of influenza or influenza-like illness.



# More in Iran NIC



- \* Monitor the circulation of the resistant viruses.
- \* Genetic characterization of viruses.

**Antivirals may be the only option available not only for treatment but also for prevention of influenza after emergence of a novel strain. The early detection of emerging antiviral resistance is an essential element in the developing and updating of national policies on the use of antivirals as part of both seasonal and pandemic influenza preparedness and response activities.**

# Sub national laboratories



- \* All the laboratories have to pass the proficiency tests of viral diagnosis (organized by IRAN NIC) every year.
- \* They should attend in workshops in NIC every year to update their knowledge.
- \* They should report all the results to NIC. Efforts should also be made to ensure that the forwarding of influenza-positive specimens to the NIC is adequate, timely and efficient.
- \* They must send any untypable viruses to NIC.

# Long term Challenges...



- \* Sustainable funding (equipments, materials...)
- \* Effective coordination...at all levels and the importance of sustained national support to NICs from Ministry of Health.
- \* Human resource....trained physicians and lab workers.....
- \* Public Private Partnership.....major private hospitals must be taken on board for data sharing.
- \* Enhance nationwide reporting of suspected cases/deaths.
- \* Enhance the detection and surveillance of other respiratory viruses.

# Long term Challenges...



## \* **Persons at High Risk for Influenza Complications:**

- Children <5 years, but especially children <2 years
- Adults >65 years
- Pregnant and postpartum women (up to 2 weeks after delivery)
- Persons with immunosuppression and underlying chronic disease

**Then**

**Motivation...at all levels**

# Long term Challenges



- \* As more than 30% of adults aged 50–64 have one or more chronic medical conditions that put them at increased risk



Thanks



## Influenza - the need to stay ahead of the virus

