

Public Health Institutes of the World

IANPHI

IANPHI ANNUAL MEETING 2019

“Evidence informed global action for trans-boundary
public health challenges”



Pandemic preparedness and “World Flu Day” Initiative

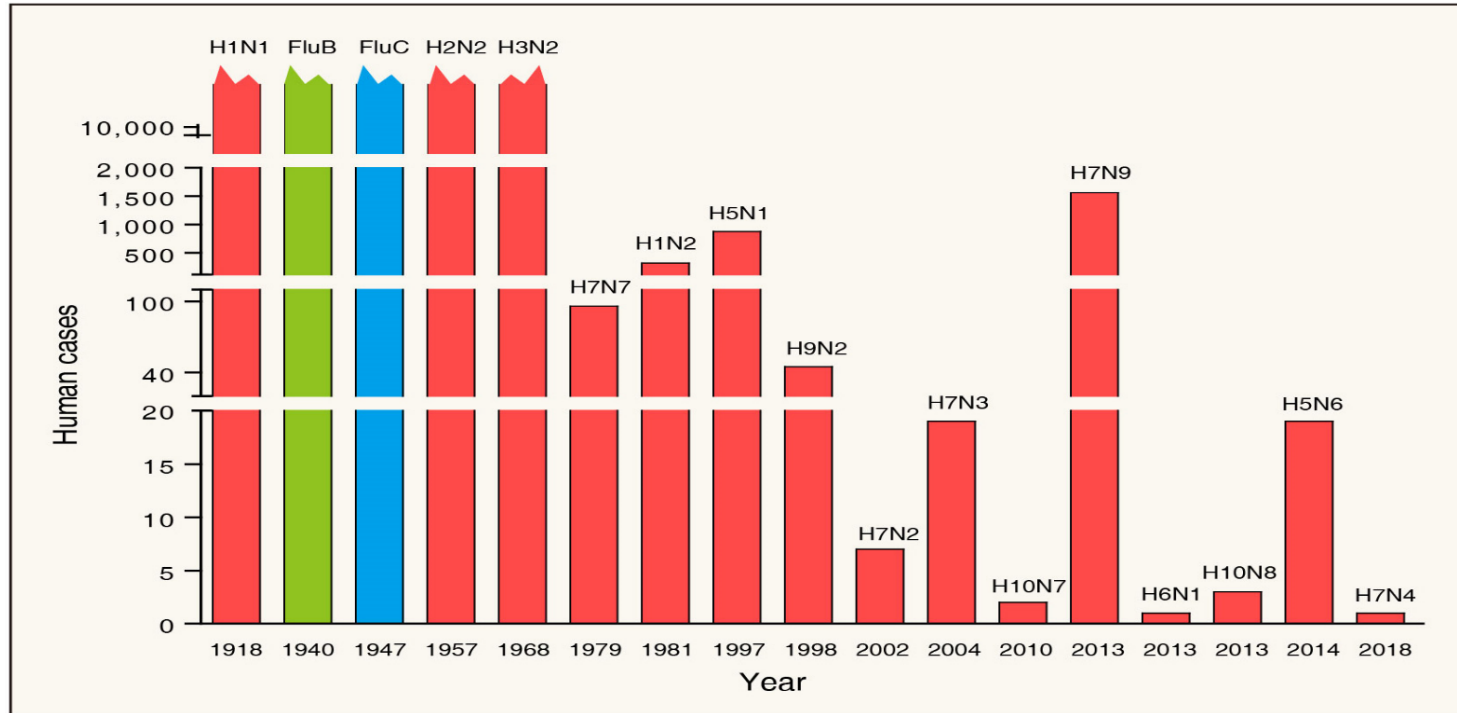
George F. Gao

Director-General, China CDC

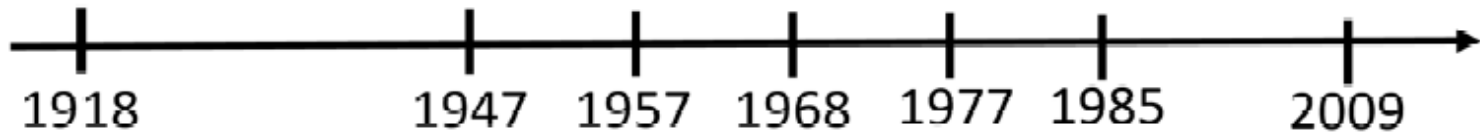
December 5th, 2019



The history of emerging influenza viruses : Continuous threats



Pandemics in the history

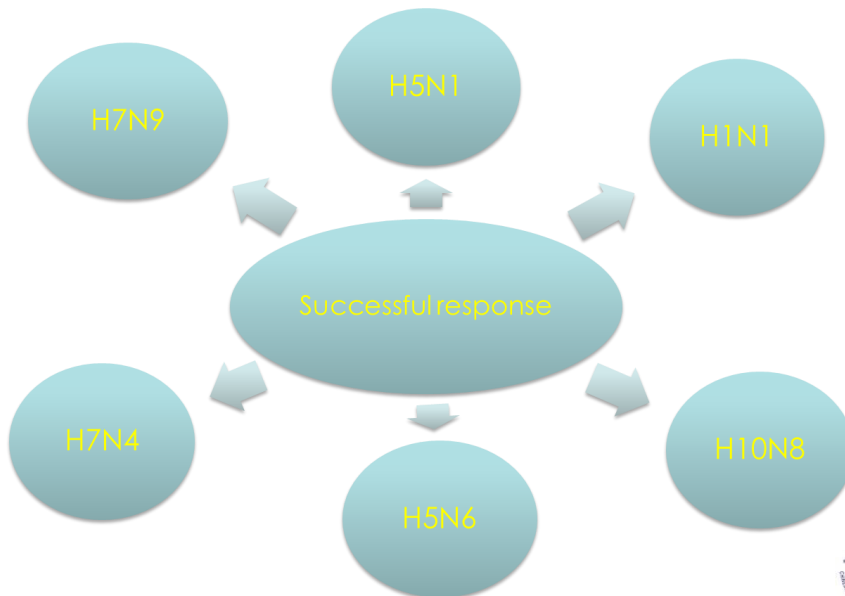
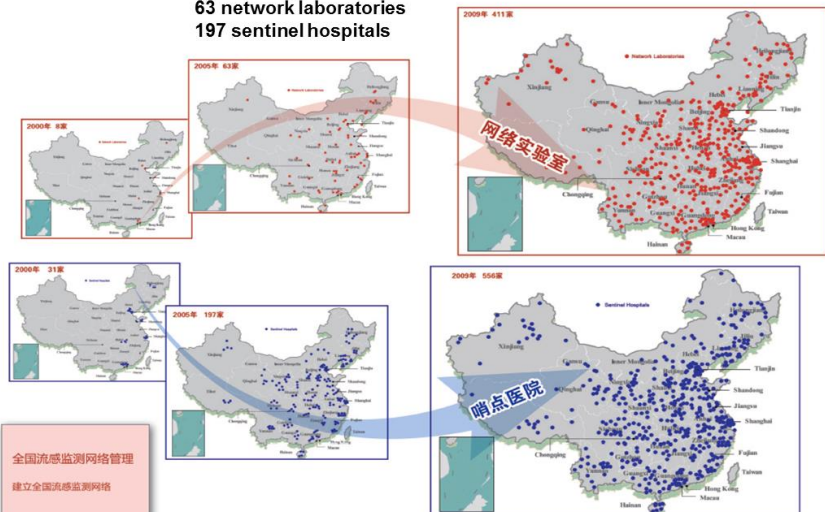


The largest national flu surveillance network

- Since 2009, Covering whole country, 408 labs, 554 hospitals
- Testing capacity: 99% labs can conduct flu virus Nucleic acid detection
87% labs can conduct flu virus isolation

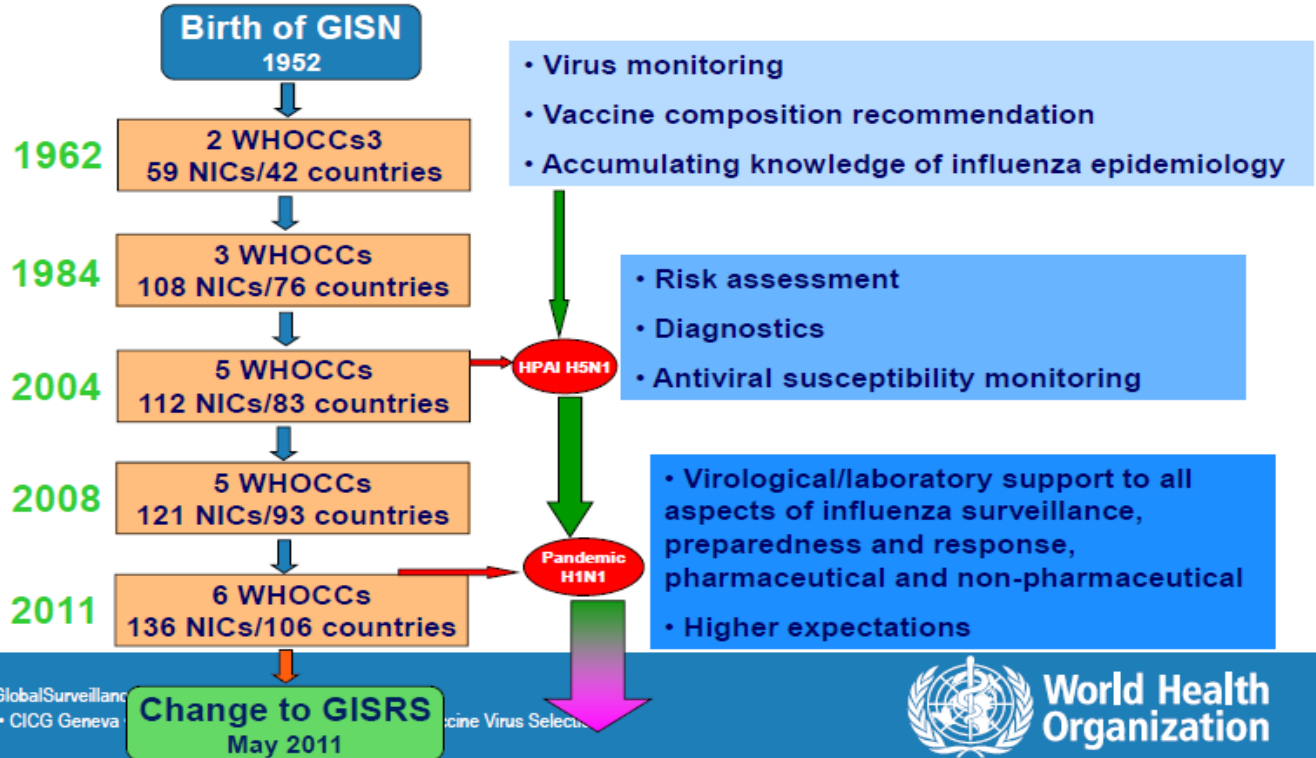
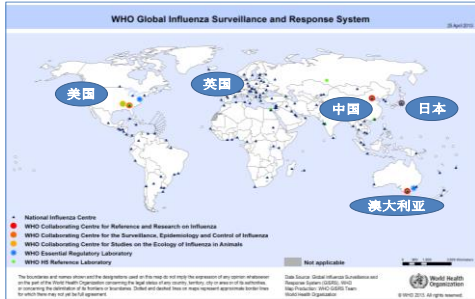
411 network laboratories (408)
556 sentinel hospitals (554)

63 network laboratories
197 sentinel hospitals



WHO | Global Influenza Surveillance and Response System (GISRS)

www.who.int/flunet

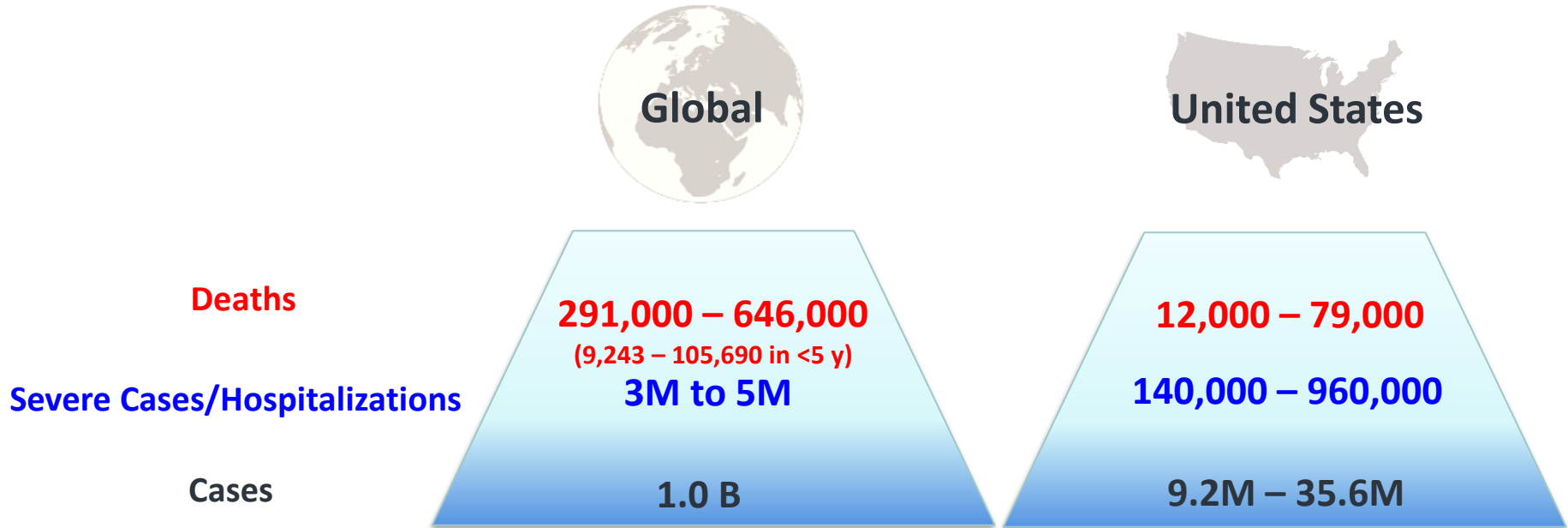


W • Global Surveillance
2011 • CIG Geneva

accine Virus Selecti



Annual Disease Burden of Influenza



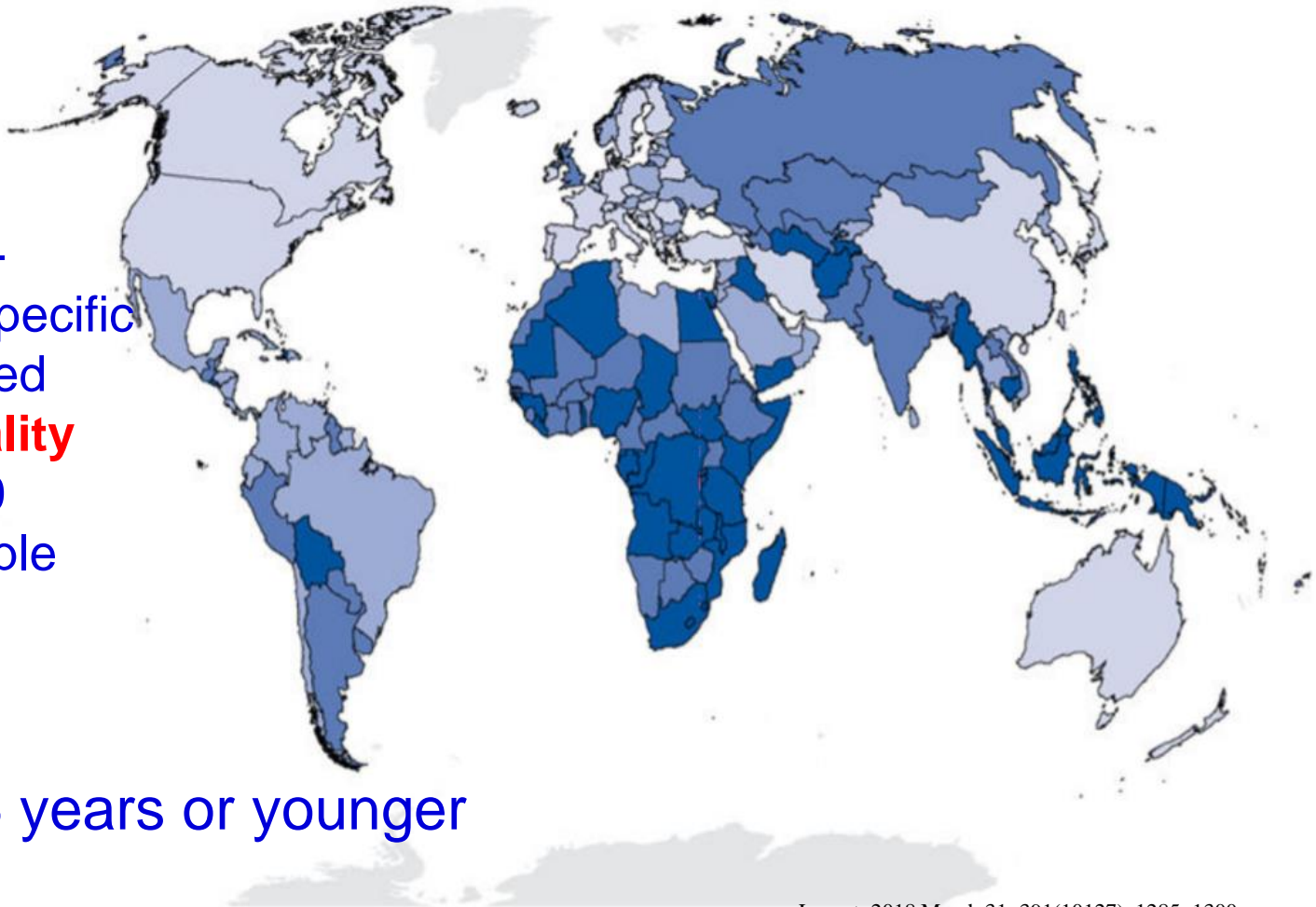
Total direct medical costs in US: \$10.4 B (\$4.1-\$22.2 B) per year
Total burden for all ages in US: \$87.1 B (\$47.2-\$149.5B) per year

Table Mean annual influenza-associated excess mortality rates (EMRs) per 100,000 population by age group for EMR-contributing countries

	Age <65 years	Age 65–74 years	Age ≥75 years
Australia	0.5 (0.2)	3.5 (1.7)	20.8 (9.8)
Southern Brazil	1.0 (0.2)	19.8 (5.6)	111.1 (40.5)
Canada	0.4 (0.1)	6.1 (2.2)	44.5 (12.5)
China	0.7 (0.3)	19.1 (7.0)	112.7 (34.3)
Germany	0.4 (0.1)	2.9 (1.3)	21.0 (7.6)
India	2.2 (1.2)	35.5 (12.3)	88.1 (30.4)
Japan	0.2 (0.03)	3.5 (0.4)	27.5 (2.9)
Kenya	6.4 (2.5)
South Africa	5.2 (0.4)	37.4 (4.0)	123.3 (7.5)
South Korea	0.1 (0.03)	3.8 (1.0)	24.9 (6.6)
UK	2.4 (1.9)	17.3 (13.2)	66.6 (39.9)
USA	0.6 (0.1)	8.6 (1.0)	49.4 (6.2)

A Age <65 years

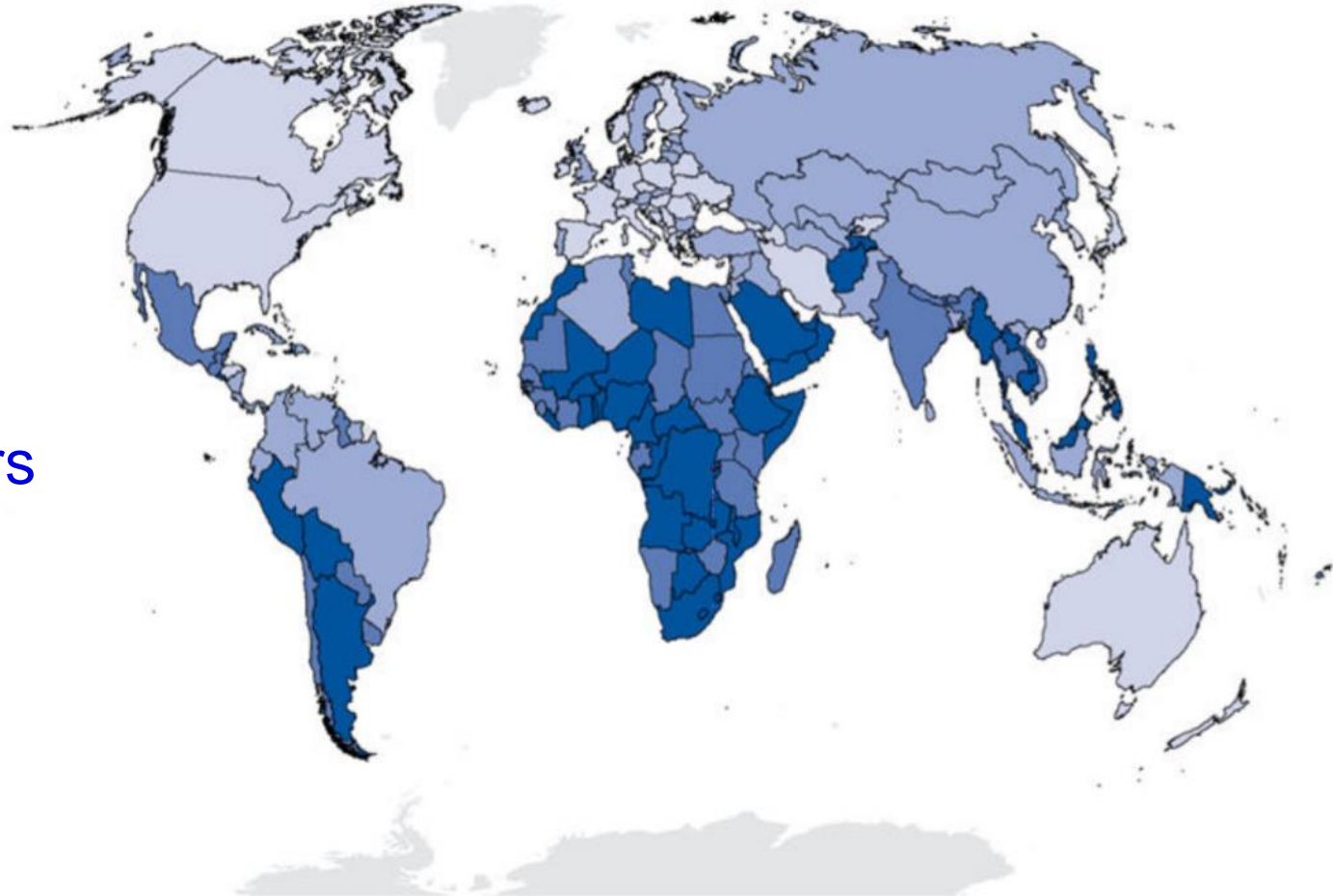
Estimated country-specific and age-specific influenza-associated **respiratory mortality rates** (per 100 000 individuals) in people



(A) 65 years or younger

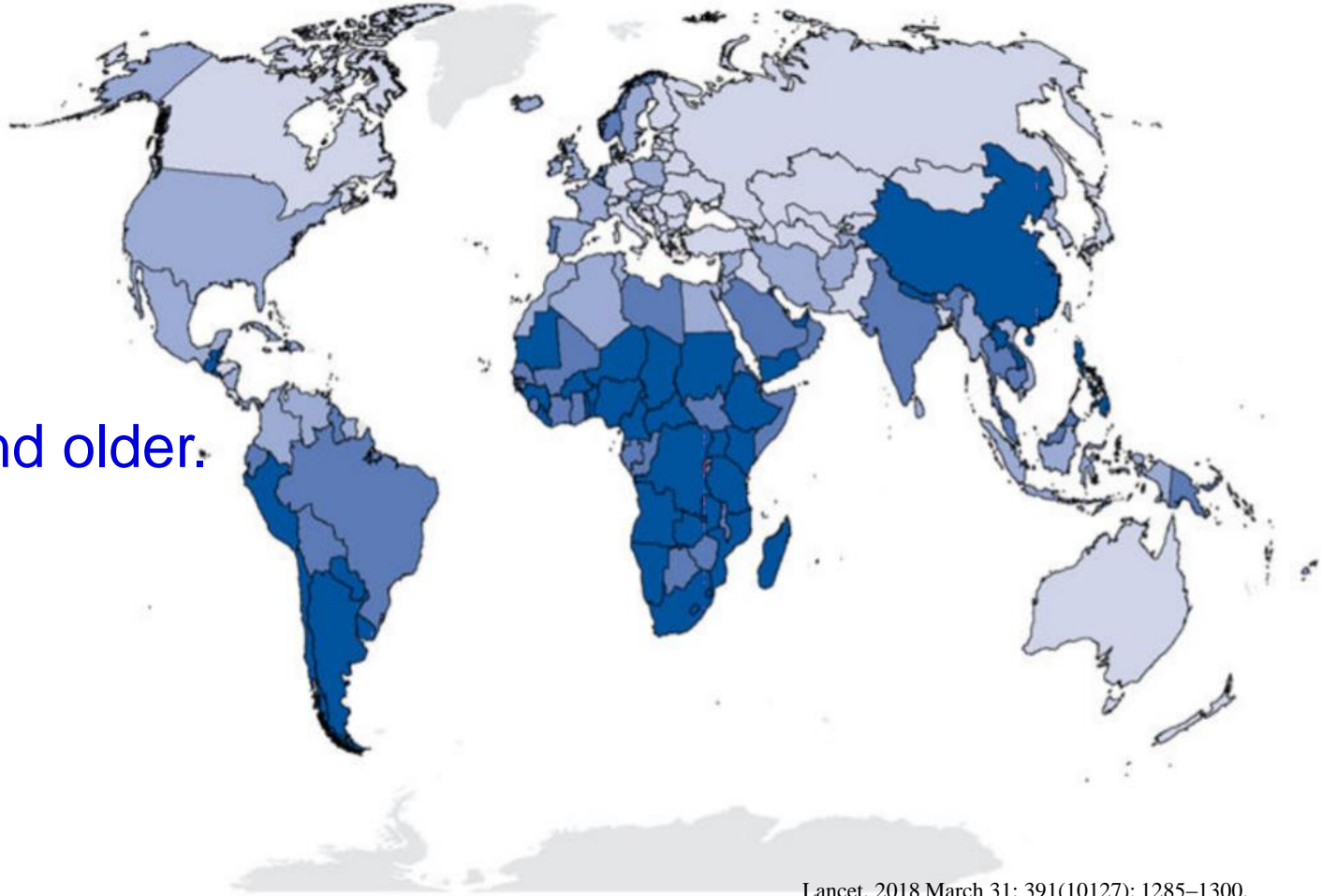
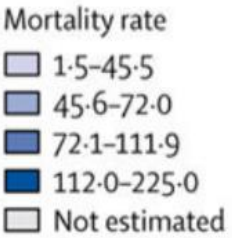
B Age 65-74 years

(B) 65-74 years

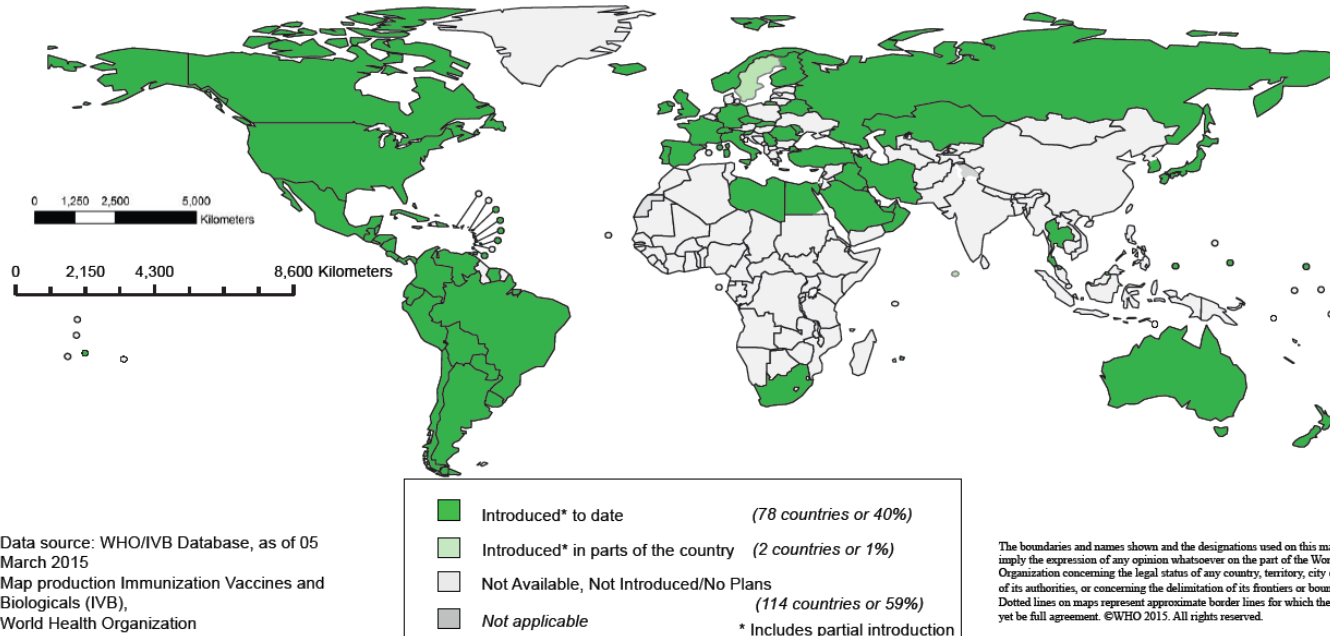


C Age ≥75 years

(C) 75 years and older.



Influenza vaccination in NIP



- **>40% of countries listing influenza vaccination in NIP as 2015**
- **Brazil: children aged 6m - 5 years, pregnant women, 60+, health professionals, indigenous population, and people with chronic diseases since 1999**
- **Thailand: for older adults since 2008**

Influenza vaccine coverage

Figure 4. Seasonal influenza vaccination coverage rates in older age groups, 19 EU/EEA Member States, influenza seasons 2015–2016; 2016–2017 and, if available, 2017–2018*

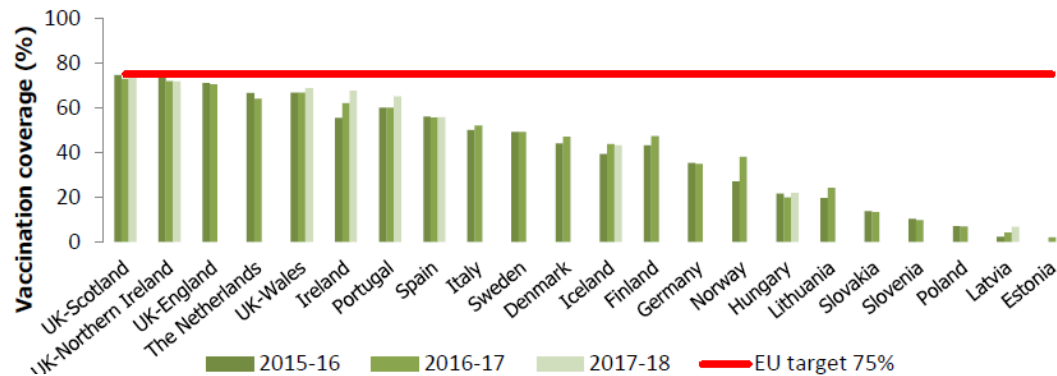
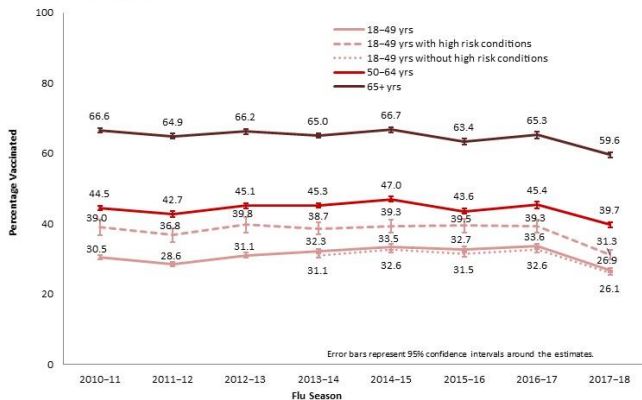


Figure 2. Flu Vaccination Coverage Among Adults, by Age Group and Season, United States, 2010–2018



Latin America and the Caribbean adults, 2013-2017

	2013	2014	2015	2016	2017
Bolivia	84.00	89.00	71.00	100.00	63.00
Colombia	71.00	100.00		50.00	
Ecuador	75.00	39.00	88.00	93.00	90.00
Peru	42.00	89.00		53.00	
Venezuela	9.00	9.60	14.00	13.00	
Brazil	88.00	86.00	89.00	96.00	88.00

http://www.who.int/immunization/sage/meetings/2015/april/Hombach_SAGE_13April2015.pdf



Influenza vaccine: Low coverage in China: 1%-3%

The influenza vaccine coverage in China is much lower than that of Europe and US, and some developing countries in Asia and South America.



图1 2007年至2018年我国流感疫苗批签发量

Population 人群	China 中国	US 美国 (14/15) ¹
Pregnant women 孕妇	contraindication	50.3%
Young children 低龄儿童	Multi-cities 26% (6m-5y; 11/12) ² Xining 12%-13% (2-7y; 14-16) ³	70.4% (6-59m)
Older adults 老年人	Multi-cities 4.3% (≥60y; 11/12) ⁴	66.7% (≥65y)
Health workers 医务人员	Qingdao 4.8% (13/14)⁵	77.3%

Data sources:

1. <http://www.cdc.gov/mmwr/index2015.html>
2. Bu L, et al. (2015). Chinese Journal of Public Health 31(6).
3. Xu L et al. PLoS ONE 2017
4. Zhou L, Su Q, Xu Z, et al. (2013). PLoS ONE 8(9): e73724
- 5 Song Y et al. Vaccine (2017)



Flu and Wild/Domestic Birds (Science, 2005; Science, 2014)

One Health strategy to control Flu



George F. Gao is director

EDITORIAL

Influenza and the Live Poultry Trade

LIVE POULTRY TRADE AT LOCAL MARKETS HAS LONG BEEN A PART OF CHINA'S NATIONAL IDENTITY. From small villages to big cities, the gathering and selling of different birds in this vibrant atmosphere is at the heart

of the country's cuisine culture. Unfortunately, the backdrop to Last year, the H7N9 virus, a new strain of influenza A, jumped from birds to humans, causing 144 cases of human infection and 47 deaths in China. Now coursing through the country, with 258 confirmed cases and 99 deaths, scientific evidence points to a connection between the conditions of live poultry markets and the spread of flu, suggesting that until other means are found to prevent or effectively treat the illness, China must shut down live poultry markets. The spread of the virus and a possible global pandemic.

The Center for Disease Control and Prevention and several prominent scientists quickly identified H7N9 as the causative agent of the emerging virus. The virus was immediately traced to live poultry markets. With a call to close these markets in major cities, including Beijing, the government quickly controlled the spread of the virus. The market deemed long-term closure to be economically infeasible and reopened soon after the summer.

During the flu season in October, the virus bounced back in the River delta region. This year, it has spread to Guangdong province) in China, which is alarmingly common there. The people infected with H7N9 had close contact with or exposure to a contaminated environment, where the virus can spread quickly between provinces is probably not its spread across China. Although it is H7N9 has not developed human-to-human



BREVIA

Highly Pathogenic H5N1 Influenza Virus Infection in Migratory Birds

J. Liu,^{1*} H. Xiao,^{2,4*} F. Lei,^{3*} Q. Zhu,⁵ K. Qin,¹ X.-w. Zhang,⁶ X.-l. Zhang,¹ D. Zhao,¹ G. Wang,^{2,4} Y. Feng,^{2,4} J. Ma,² W. Liu,² J. Wang,⁶ G. F. Gao^{2,†}

All eight infected chickens died within 20 hours, and seven of eight infected mice died within 72 hours; the last died 96 hours post-infection. Earlier isolates taken from ducks in China were less virulent in mice and chickens (6). Hence we speculate that viruses might be emerging from reassortants that originate in birds overwintering in southeast Asia (7).

The occurrence of highly pathogenic H5N1 AIV infection in migrant waterfowl indicates that this virus has the potential to be a global threat: Lake Qinghaihu is a breeding center for migrant birds that congregate from southeast Asia, Siberia, Australia, and New Zealand.

References and Notes

1. R. J. Webby, R. G. Webster, *Science* **302**, 1519 (2003).
2. K. Subbarao et al., *Science* **279**, 393 (1998).
3. K. S. Li et al., *Nature* **430**, 209 (2004).
4. Materials and methods available as supporting material on Science Online.

Avian influenza virus (AIV) involving at least three subtypes, H5, H7, and H9, has emerged as an important pathogen in the poultry industry and is of major current global health concern (1). The first case report of chicken-to-human transmission was in Hong Kong in 1997 (2); since 2003, H5N1, a highly pathogenic AIV, has emerged in 10 Asian countries, including Thailand, Vietnam,

Several H5N1 viruses were isolated from the viscera, brain, and swabs of the oropharynx and cloaca of sick and dead birds. Four of the isolates from different bird species were com-





ASIAN-PACIFIC CENTENARY SPANISH 1918-FLU SYMPOSIUM

NOVEMBER 1-2, 2018 SHENZHEN, CHINA

A SYMPOSIUM ON 100-YEARS OF THE SPANISH 1918-FLU

AND THE SEVENTH CHINA-JAPAN BILATERAL
SYMPOSIUM ON ALL INFLUENZA VIRUSES

AND THE SECOND INTERNATIONAL CONFERENCE ON
PRECISION MEDICINE AND INFECTIOUS DISEASES



Aspirations

- To commemorate the 100th anniversary of the Spanish 1918-Flu pandemic;
- To summarize the achievements and experiences gained over the past century on influenza virus;
- To establish an international platform for the exchange of new technology and theory to promote influenza prevention and control

Event organizers:

- Chinese National Influenza Center (CNIC), National Institute for Viral Disease Control and Prevention, Chinese Center for Disease Control and Prevention
- Shenzhen Third People's Hospital
- CAS Key Laboratory of Pathogenic Microbiology and Immunology, Institute of Microbiology, Chinese Academy of Sciences
- CAS Center for Influenza Research and Early-Warning (CASCIRE), Chinese Academy of Sciences

Co-chairs:



George F. Gao,
Chinese Center for Disease
Control and Prevention, China



Yoshihiro Kawaoka,
University of
Wisconsin-Madison, USA



Mark von Itzstein,
Griffith University,
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Lei Liu,
Shenzhen Third People's
Hospital, China



Kwok-Yung Yuen,
University of Hong Kong,
China

1st World Flu Day 2018, Shenzhen China

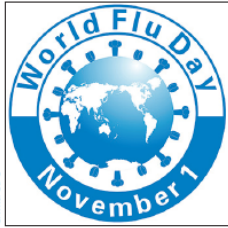


[Film]





World Flu Day: momentum from China for influenza control



China CDC

Nov 1 marks the first World Flu Day and was formally launched at the Asian-Pacific Centenary Spanish 1918-flu symposium in Shenzhen, China. The campaign was developed by George F Gao, director of the China Center for Disease Control and Prevention (CDC), in collaboration with other leading influenza specialists, including Yoshihiro Kawaoka from University of Wisconsin, WI, USA, Mark von Itzstein from Griffith University, QLD, Australia, and Kwok-Yung Yuen from Hong Kong University, Hong Kong. Gao told *The Lancet* that World Flu Day had

four major purposes: to commemorate the centenary of the 1918–19 influenza pandemic; to raise public awareness of influenza; to accelerate scientific innovation and basic research efforts toward remaining challenges of influenza, particularly the development of a universal flu vaccine; and to push for stronger global political will in continuing the support of influenza prevention and control.

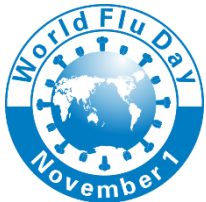
Unlike official global health campaigns such as World Health Day and World Tuberculosis Day, marked and sponsored by WHO, the proposal and implementation of World Flu Day are mainly driven by scientists who work

on unsolved questions in influenza research. Furthermore, the major organising institution in the influenza campaign this year is China CDC. 2018 also marks the 15-year commemoration of the severe acute respiratory syndrome outbreak, after which strengthening the CDC became the top priority in China's public policy agenda. As a result, China boosted investment in the public health system, strengthening national and local surveillance systems for all infectious diseases more efficiently and effectively, and improving research capacity, especially for emerging infectious diseases.

In the changing landscape of global health, China has increased its global health engagement and influence through health aid, health security, health governance, and knowledge exchange. Historical lessons from influenza should remain at the core of global efforts for pandemic preparedness. Launching the first World Flu Day in China is not just a timely call for raising global awareness about this common and easily ignored disease, but also an important opportunity for China to strengthen global collaboration in influenza research and control. ■ *The Lancet*

For *The Lancet's* Pandemic Influenza: 100 years see https://info.thelancet.com/pandemic-flu-100?utm_campaign=pandemicflu100&utm_source=boombbox%C3%82

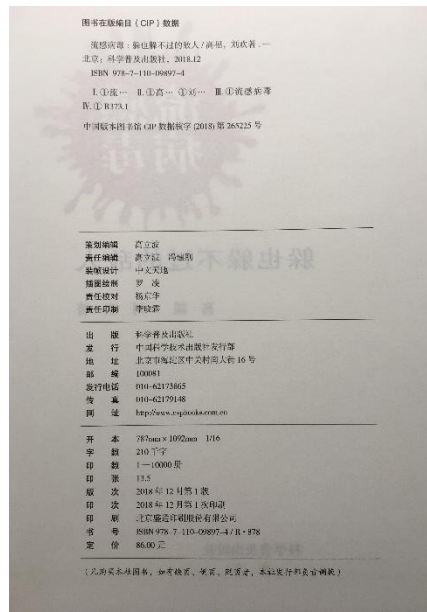




2nd "World Flu Day" 2019, Beijing



Know Flu, Prevent Flu and Beat Flu



Popularization of the knowledge on Influenza



China CDC Weekly (CCDC Weekly)

- Launch Issue: Vol. 1 No.1 Nov. 29, 2019.
- Publishes authoritative professional information on national population health, disease and risk factor monitoring, investigation data and important public health event investigation reports.
- Will follow a path initially set forth by the US CDC *Morbidity and Mortality Weekly Report* (MMWR).

Foreword

**Foreword from Editor-in-Chief George F. Gao
— China's Outreach to the World: Public Health Goes Global**



Scan to submit



Thank you!



Flu virus sculpture
—CAS Campus



ZIKV and Ab sculpture
—Shenzhen 3rd People's Hospital

