Emerging Diseases & Global Health Policies in Southeast Asia

Ms Michelle Yap
Ministry of Home Affairs, Singapore
Office of the Chief Science & Technology Officer (OCSTO)

Vector-borne

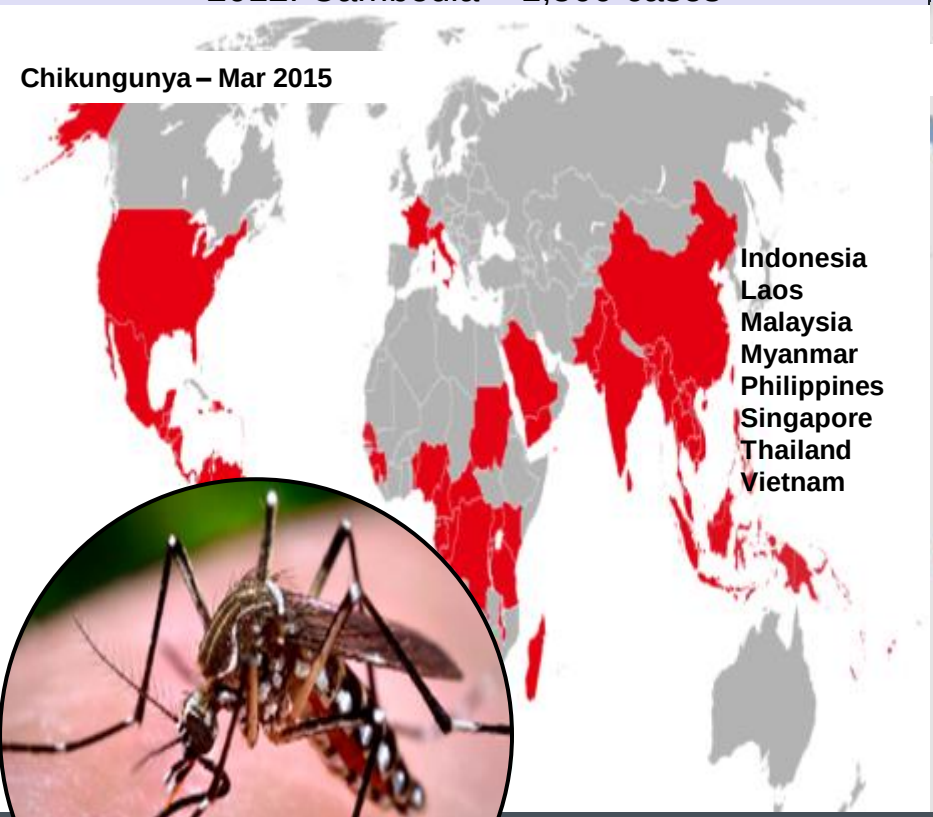
Zoonotic

H2H Respiratory

Southeast Asia's Encounters With EID

Chikungunya

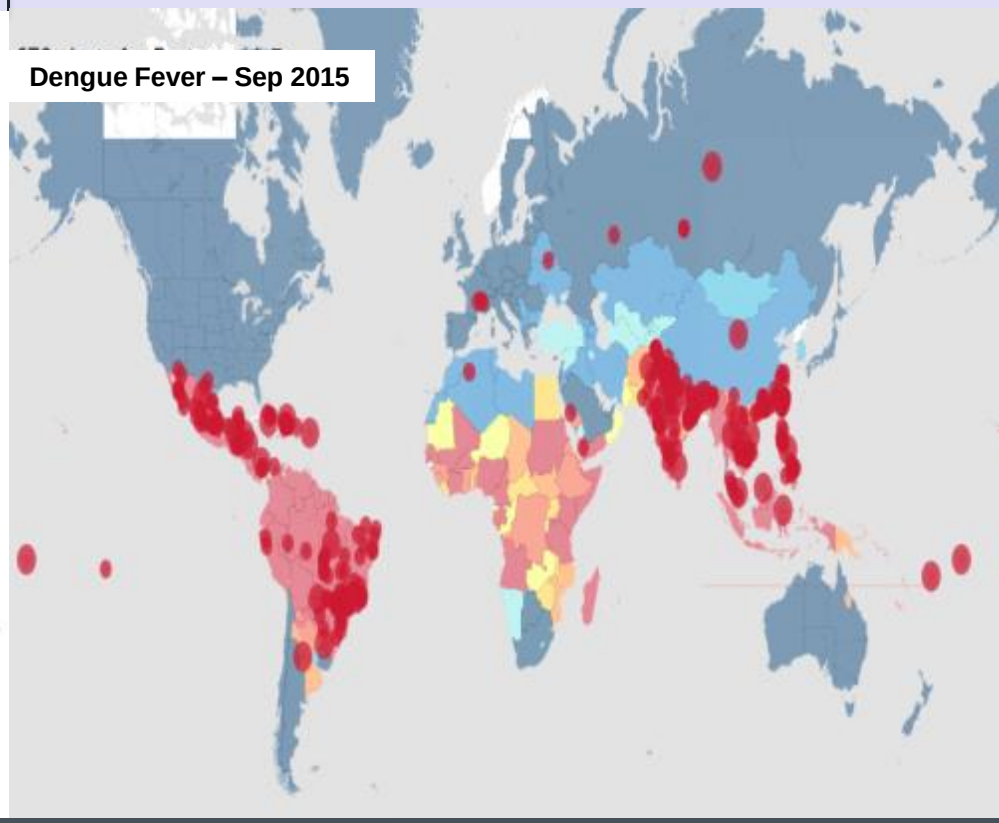
Endemic in SEA
2009: Thailand – 42,000 cases;
2012: Cambodia – 1,500 cases



Vector-borne

Dengue

Endemic in SEA
Annual average of 2.9million episodes in SEA



Singapore's Efforts in Vector-Control Programmes

Wolbachia-carrying *Aedes aegypti* mosquitoes

Gravitraps

SINGAPORE

Local researchers may have found a new dengue vaccine option

T cells, a type of white blood cells, recognise and kill viruses in the body. And as scientists from the DUKE-NUS Graduate Medical School and the NUS Yong Loo Lin School of Medicine have discovered, they are also able to deal with dengue.

By Kenneth Lim
POSTED: 22 Aug 2015 14:07 UPDATED: 23 Apr 2015 23:27

World's first dengue vaccine could be available in 2015

08 January 2015 | By Denyse Yeo

French drugmaker Sanofi is ready to register its much-awaited dengue vaccine in affected countries in 2015.

If all goes according to plan, the world's first vaccine for the life-threatening illness could be available in the second half of 2015, subject to regulatory approvals, said a spokesman for Sanofi Pasteur, the pharmaceutical giant's vaccine unit.

This comes on the back of the successful completion of the vaccine's final phase III evaluations in Latin America, revealed in November 2014. The results of the Asian phase III study were announced in April 2014.

Serum Institute sets out for dengue fast track

September 24, 2015 | By Eric Sagonowsky

Serum CEO Adar Poonawalla

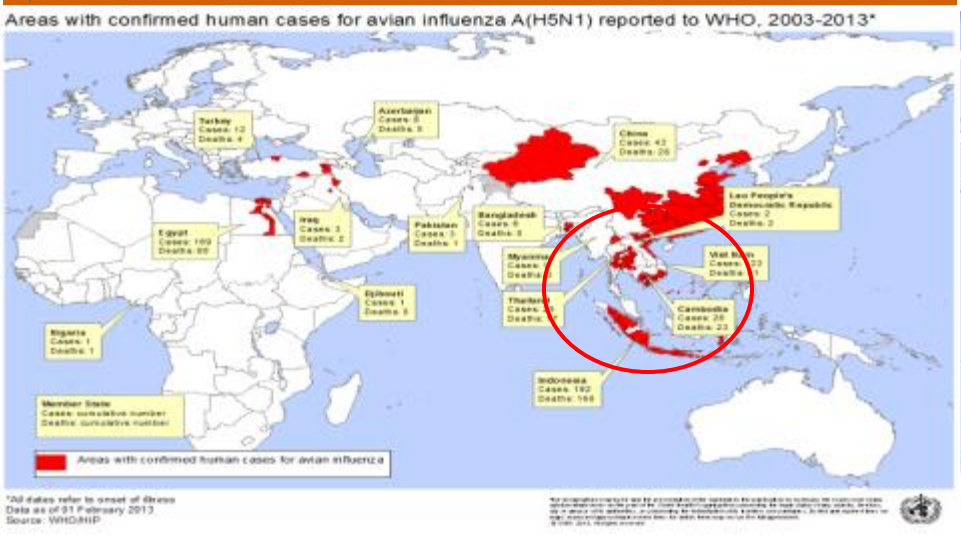
Asia's largest vaccinemaker just made a play that could affect the race for a vaccine protecting against dengue fever, a common affliction that has a big impact in the region.

The Serum Institute of India announced on Tuesday that it's seeking fast-track approval to launch a dengue treatment in India for which it purchased local rights from U.S. biotech Visterra earlier this month. If successful, the company could be the first globally to launch a drug for the mosquito-borne illness, *Reuters* reports--a development with potential implications in the ongoing dengue vaccine race between Sanofi, Takeda, and others.

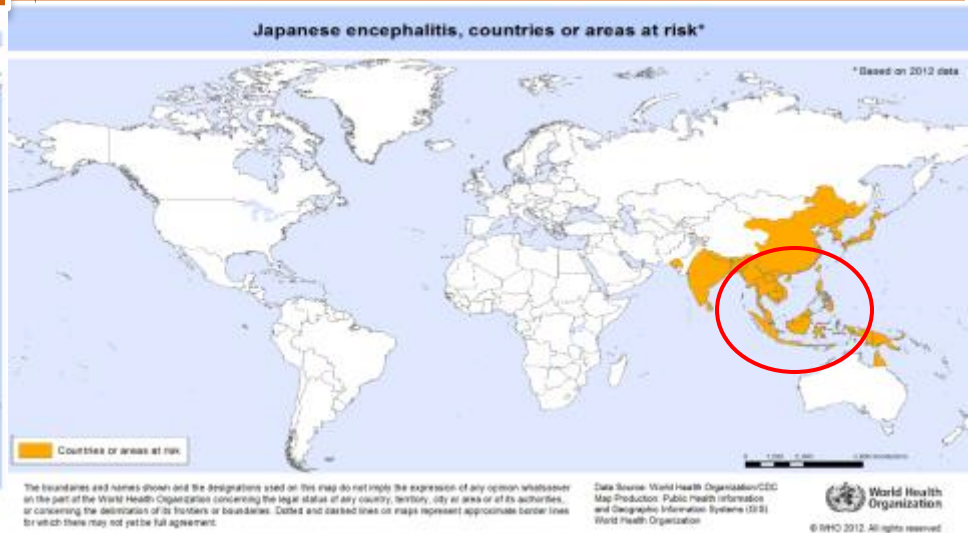
Serum CEO Adar Poonawalla told the news service his company will seek approval in a year to a year and a half versus the three to four years typically required for vaccines. However, Sanofi ($SNY), which has spent 20 years and $1.5 billion developing its vaccine, plans to launch yet this year in the region: Its vaccines head, Olivier Charmeil, said the company will have filed for approval in 20 countries--representing approximately half of the world's population at risk of dengue--by the end of this year.

Southeast Asia's Encounters With EID

Avian Influenza H5N1
2003-2015: 410 reported cases; 287 deaths in Indonesia, Vietnam, Thailand, Cambodia, Laos and Myanmar

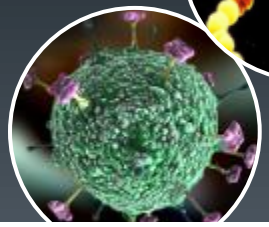


Japanese Encephalitis
2011: 10,246 cases with 95% from China and India.



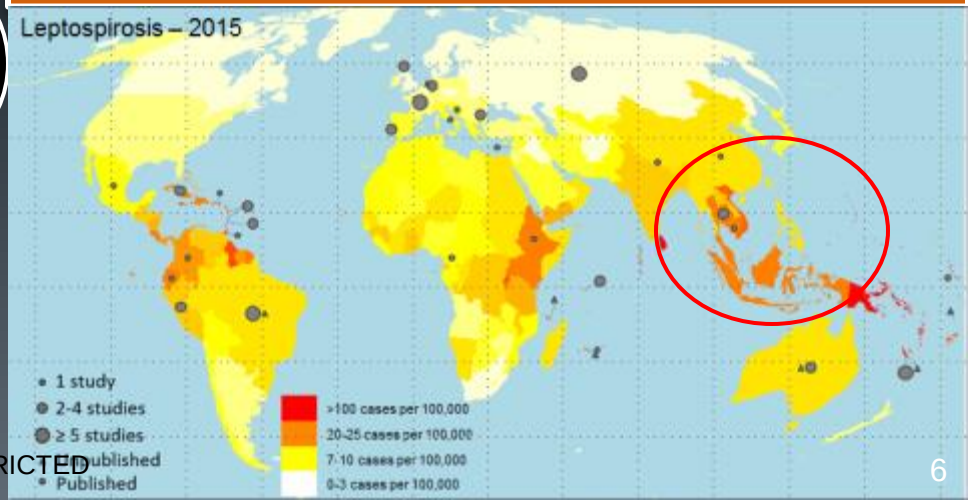
Zoonotic

Streptococcus suis
Case reports in Thailand and Vietnam



Nipah Virus
Outbreak of 276 cases and 106 deaths in Malaysia and Singapore

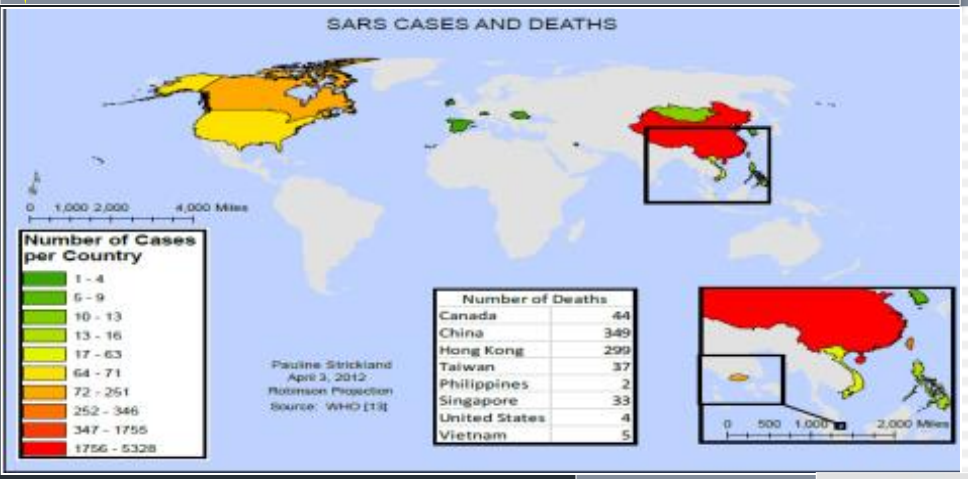
Leptospirosis
Annual estimates in SEA: 266,000 cases and 14,200 deaths

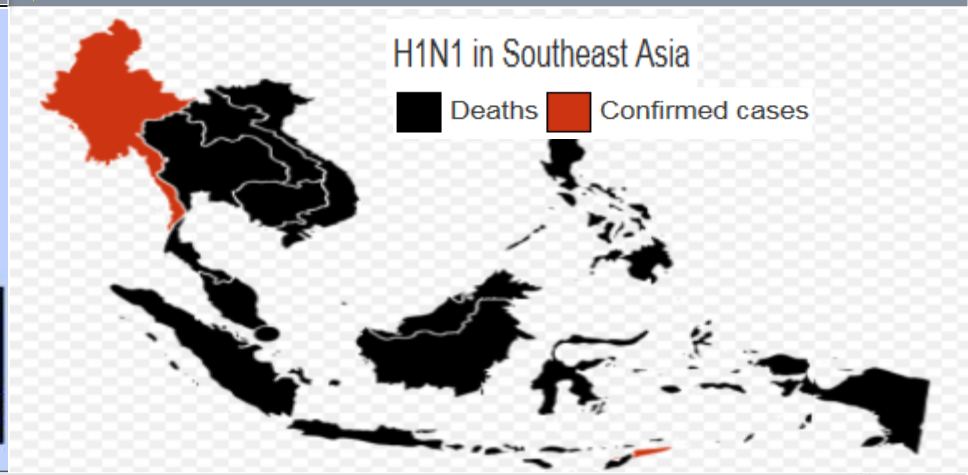


Southeast Asia's Encounters With EID

SARS
2003: 331 reported cases, 44 deaths in Singapore, Vietnam, Thailand, Malaysia, Philippines and Indonesia

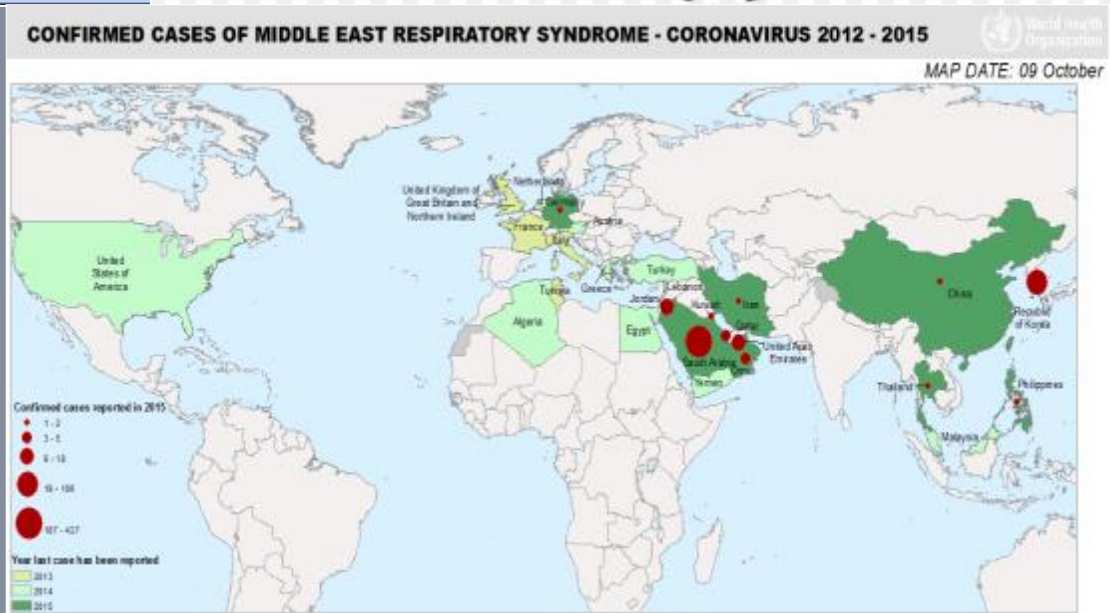
Pandemic Influenza H1N1 (Apr 2009 – Aug 2010)
Worldwide estimated range: 151,700 and 575,400 deaths … with SEA (and African) countries bearing the 51% of death burden … mostly unreported





H2H Respiratory

MERS
Arrived in Asia. 1st MERS death in Malaysia in 2014.



Economic Impact of EID on Southeast Asia

Dengue

- SEA: US$950m *(Healthcare cost alone)*
- *Singapore: US$0.85b to US$1.15b (healthcare, community programmes, vector control and research)*

Nipah Virus

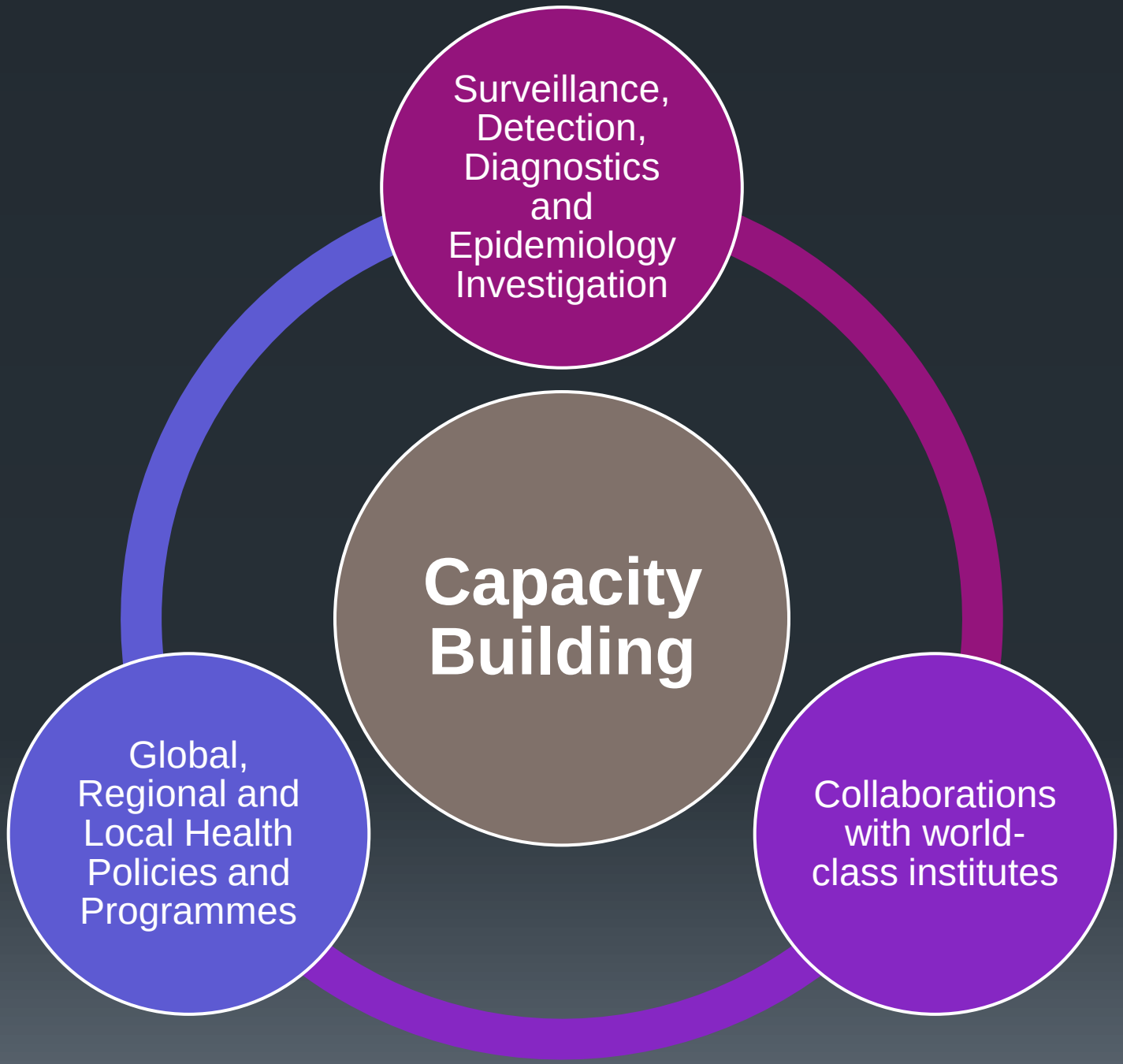
- Malaysia: Slaughtering of 1.1 million pigs in the 1998/99 outbreak … RM541m national economic damages

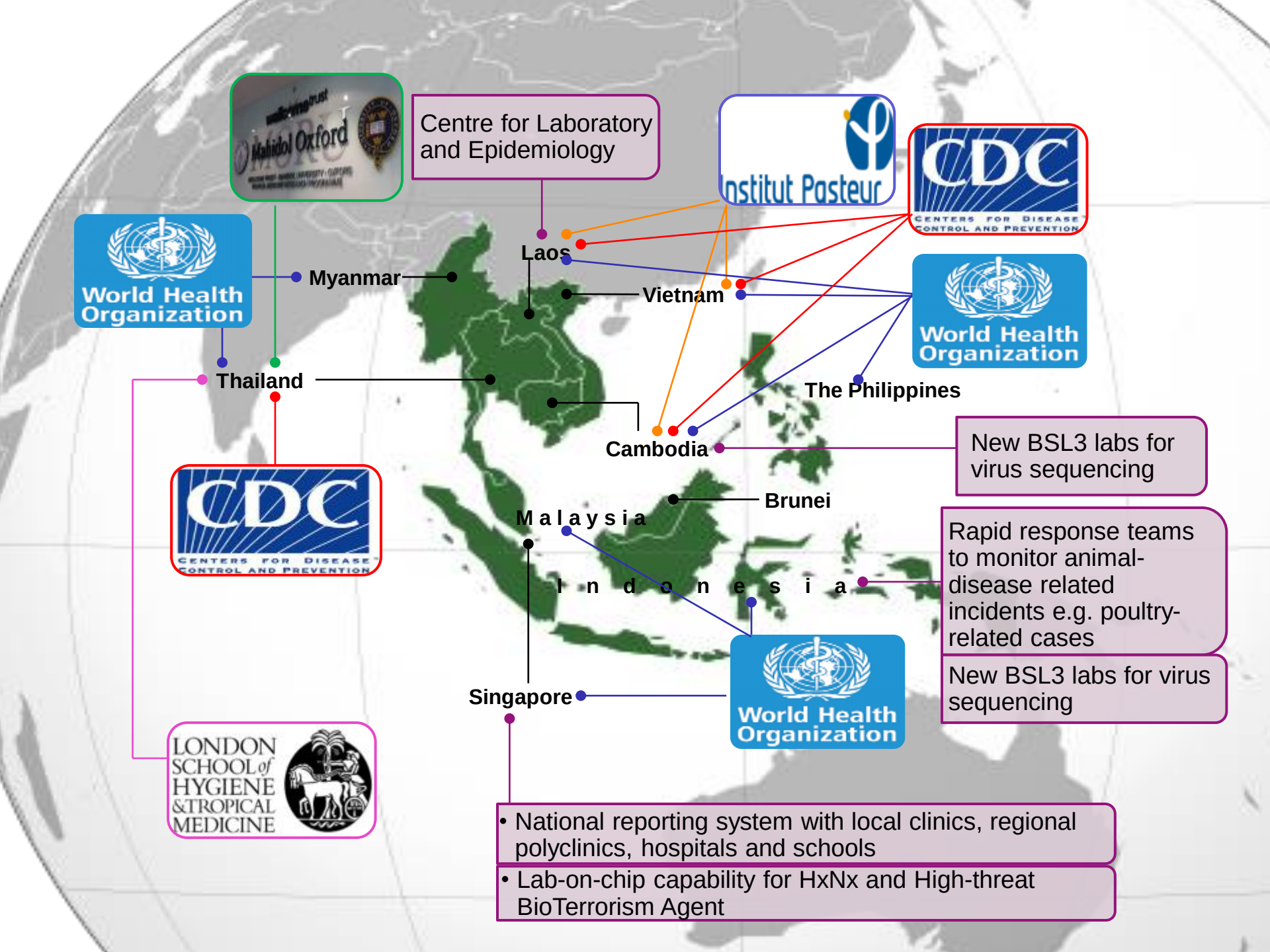
H5N1

- Vietnam: Culling of 45million birds ~ economic loss: US$118m
- Thailand: Poultry meat exports loss of US$554.1m

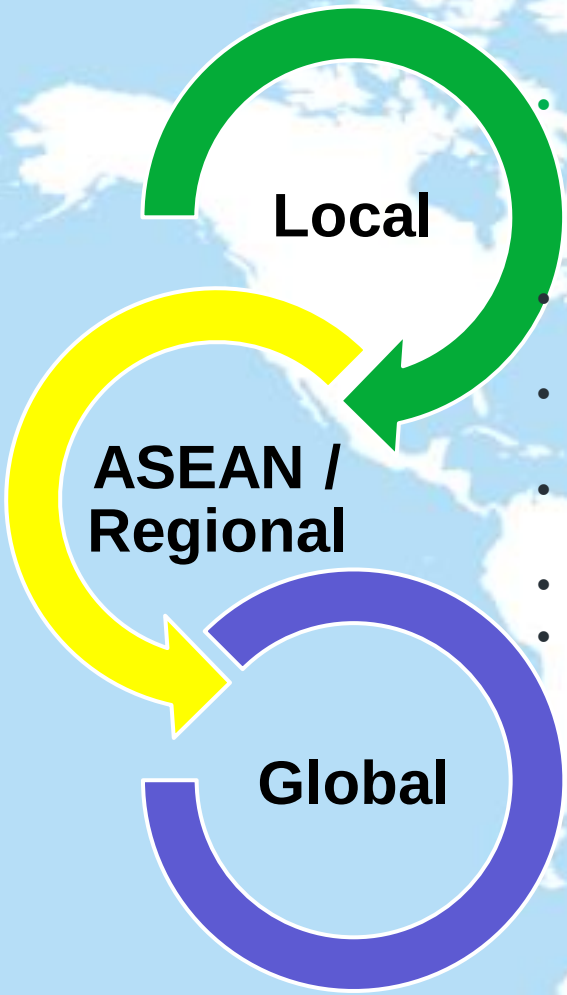
SARS

- Collapse of service industry which is highly reliant on the tourism industry of 35million tourists annually
- A shock to demand of US$283b for SEA


Surveillance, Detection, Diagnostics and Epidemiology Investigation
Capacity Building
Global, Regional and Local Health Policies and Programmes
Collaborations with world-class institutes


Mahidol Oxford
Centre for Laboratory and Epidemiology
Institut Pasteur
CDC
Centers for Disease Control and Prevention
World Health Organization
Laos
Myanmar
Vietnam
Thailand
The Philippines
Cambodia
New BSL3 labs for virus sequencing
Brunei
Malaysia
Indonesia
Rapid response teams to monitor animal-disease related incidents e.g. poultry-related cases
New BSL3 labs for virus sequencing
Singapore
LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE
• National reporting system with local clinics, regional polyclinics, hospitals and schools
• Lab-on-chip capability for HxNx and High-threat BioTerrorism Agent

Global, Regional & Local Health Policies and Programmes



- **National Coordination Committees on Communicable Diseases *(All)***

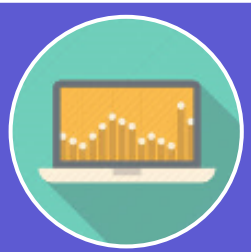
- **Regional Multi-Sectoral Pandemic Preparedness Strategic Framework**
- **South East Asia Infectious Disease Clinical Research Network**
- **ASEAN Highly Pathogenic Avian Influenza Task Force (2004 – 2010)**
- **Mekong Basin Disease Surveillance Network**
- **ASEAN+3 Expert Working Group on Communicable Diseases**

- **Implementation of Recommendations from WHO IHR 2005**
- **WHO's Asia-Pacific Strategy on Emerging Diseases (2010)**
- **Global Health Security Agenda *(GHSA) – 2014***

Closing the gaps … from the Public Health Domain

Prevent → **Detect** → **Inform** → **Respond**

R&D for early detection of EID



Upstream coordinated research with predictive analysis tools to study the emergence of EID with changes in socio-economic factors

Strengthening surveillance capacities for timely, coordinated responses and measures

Increase access to public health facilities as a conduit for surveillance

Increase regional coordination and timely information sharing

Strategic stockpiles of antivirals and vaccines.

Quarantine facilities to house infected patients

Beyond Public Health …
Systems Approach Towards EID

Altered local ecosystems

Production of Livestock

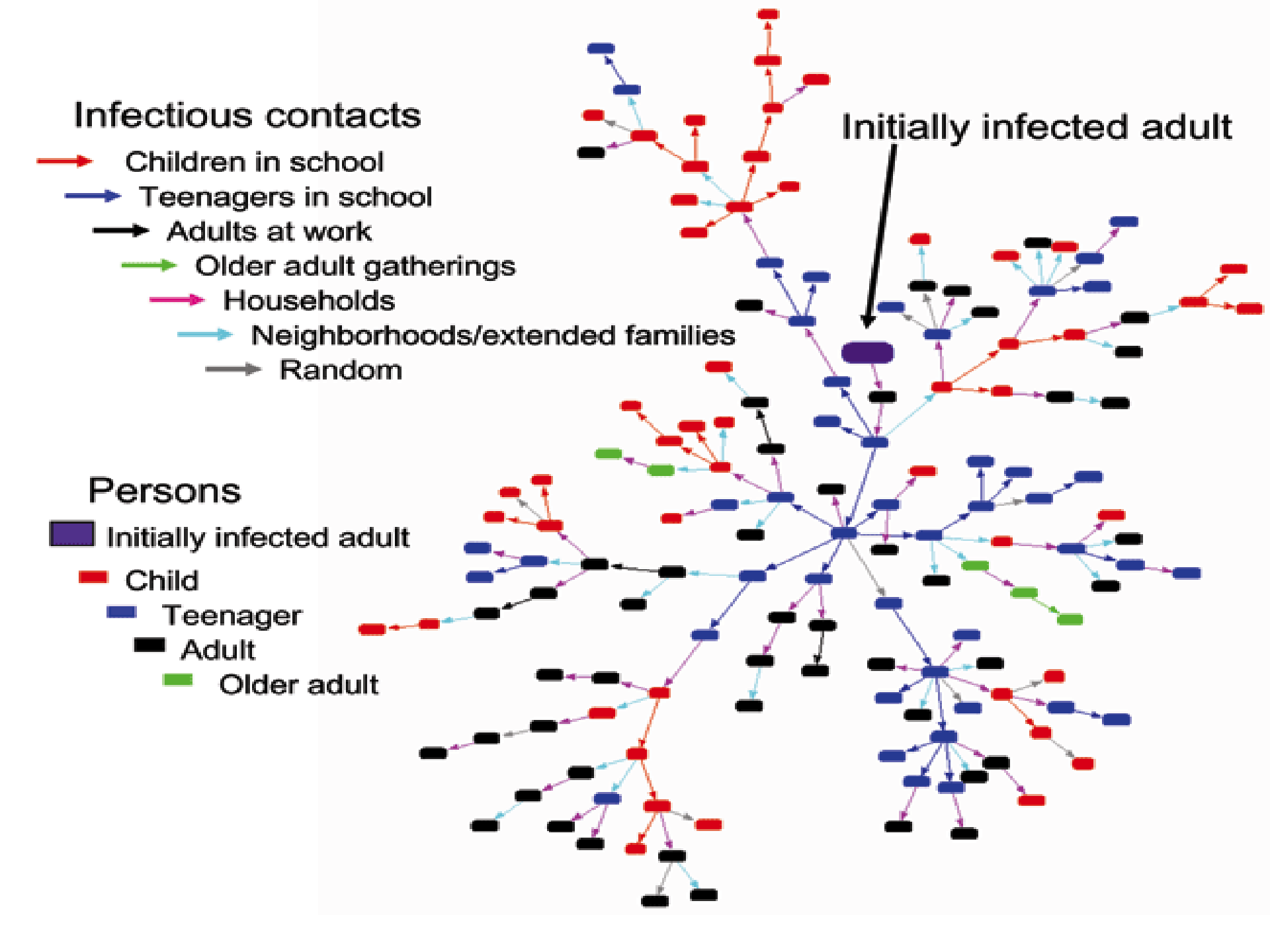
Biosecurity of farms and wildlife

Travel and Trade

Urbanization and Growing Population

Access to medical drugs

Bioterrorism with EDC (CBRN Agents)


Infectious contacts
Children in school
Teenagers in school
Adults at work
Older adult gatherings
Households
Neighborhoods/extended families
Random
Initially infected adult
Persons
Initially infected adult
Child
Teenager
Adult
Older adult

- Influenza B viru

Bio-Surveillance Programme

Bio-Surveillance on Poultry Livestock

Securing Point of Entry at Singapore's Border

Biosurveillance

Bio-Surveillance Programme

Bio-Surveillance on Poultry Livestock

Detect

Detects 5 Influenza virus subtypes:

- 2009 Pandemic Influenza A (H1N1)
- Seasonal H1N1
- H3N2
- H5N1
- Influenza B virus

Respond

MINISTRY OF HEALTH
SINGAPORE

AVA

Inform

Public Communications
…a critical tool in Singapore

PM Lee: Matter of time before Singapore sees first Mers case

Thank you.

Michelle YAP
Senior Assistant Director, S&T Assessment Taskforce
Office of the Chief Science and Technology Officer (OCSTO)
Ministry of Home Affairs, Singapore

Email: michelle_yap@mha.gov.sg