

Thailand



- **Capital:** Bangkok
- **Area:** 513,120 sq km
- **Population:** 67,091,089 (July 2012 est.)
- **Age Structure:** 0-14 years: 19.9% (male 6,779,723/female 6,466,625); 15-64 years: 70.9% (male 23,410,091/female 23,913,499); 65 years and over: 9.2% (male 2,778,012/female 3,372,203) (2011 est.)
- **Life Expectancy at Birth:** Total population: 73.83 years; male: 71.45 years; female: 76.33 years (2012 est.)
- **Infant Mortality Rate:** Total: 15.9 deaths/1,000 live births; male: 16.88 deaths/1,000 live births; female: 14.86 deaths/1,000 live births (2012 est.)
- **Literacy Rate:** Total population: 92.6%; male: 94.9%; female: 90.5% (2000 census)
- **GDP:** \$601.4 billion (2011 est.)
- **GDP per Capita:** \$9,700 (2011 est.)

Highlights

- Published a paper describing seven years of sentinel surveillance data for influenza in Thailand.
- Expanded phylogenetic and antiviral resistance testing.

U.S. CDC Direct Country Support

Fiscal Year 2011 was the second year of a sustainability cooperative agreement with the National Institute of Health (NIH) in Thailand. The agreement *Strengthening Thailand's Influenza Surveillance Network to Support Influenza Control Policy and Improve Pandemic Preparedness* is NIH's second, five-year cooperative agreement with the U.S. Centers for Disease Control and Prevention (CDC).

Surveillance

The Thai National Influenza Center (NIC) continues to operate 11 sentinel sites for influenza-like illness (ILI) surveillance in outpatients; three of these also conduct severe acute respiratory infection (SARI) surveillance in their hospitalized patients. The sites are geographically diverse and are located throughout northern, central and southern Thailand. In 2011, peak influenza activity occurred from mid-July through September. The most commonly identified influenza virus circulating in Thailand during this time period was influenza A (H3N2).

Surveillance Activities

- Weekly data are summarized and posted online and are publically available at <http://www.thainihnic.org/>.
- Working with the Bureau of Epidemiology, the NIH surveillance sites now collect the total number

of outpatient visits using International Classification of Diseases (ICD) 10 codes so that they can better understand the burden of ILI.

- A summary of seven years of influenza data from Thailand was published in a peer-reviewed journal.
- There were 94,407 (3.8%) ILI cases identified from a total 2,513,048 out-patient department (OPD) visits.

Laboratory

The Thai NIC, a World Health Organization (WHO)-designated Regional Influenza Reference Laboratory for Southeast Asia, continued to test an average of 80 respiratory samples each week for influenza viruses. In addition to testing for influenza viruses, laboratories were strengthened and tested for antiviral resistance using pyrosequencing and detection for other respiratory viruses [adenovirus, parainfluenza viruses (PIV), human metapneumovirus (hMPV) and respiratory syncytial virus (RSV)] using PCR.



Eggs used for manufacturing vaccine in one of Thailand's Government Pharmaceutical Organization (GPO) plants.

Laboratory Activities

- The NIH tested a total of 4,008 respiratory samples (3,682 from patients with ILI and 326 from patients with SARI).
- Among the 3,682 patients with ILI, 780 (21%) were positive for influenza viruses (382 were influenza A (H3N2) viruses, 152 were influenza A (H1N1)pdm09 viruses, and 246 were influenza B viruses). Among the 326 patients with SARI, 56 (17%) were positive for influenza (32 were influenza A (H3N2) viruses, seven were influenza A (H1N1)pdm09 viruses, and 17 were influenza B viruses).
- Of the 310 influenza viruses tested for antiviral resistance, only one influenza A (H1N1)pdm09 virus was found to be resistant to oseltamivir.
- Of the 326 respiratory samples from SARI patients, 114 (35%) were positive for other respiratory viruses (42 RSV, 28 hMPV, 26 adenovirus, one PIV1, four PIV2 and 13 PIV3).

Preparedness

With the support and policy of the Ministry of Public Health (MOPH), Thailand expects to increase the capacity and ability of nationwide influenza testing to improve preparedness and response time in the next pandemic or emerging infectious disease event. The 25 regional hospital laboratories were encouraged to become a part of the laboratory network. Recently, these laboratories have participated in training on diagnosis of influenza A(H1N1)pdm09 by RT-PCR. In 2011, seven regional hospital laboratories and three private laboratories in Bangkok were evaluated according to the standard requirements of MOPH for molecular diagnostics of influenza A (H1N1)pdm09 detection by RT-PCR.

Preparedness Activities

- The Department of Medical Sciences participated in the working group for development of the national strategic plan for emerging infectious diseases that includes strategic plans for prevention, control, and preparedness and resolution of avian influenza and pandemic influenza.
- The Thai NIC provided positive controls to support regional hospital laboratories, ensure the supplies needed to establish a laboratory that is accessible, and provided an External Quality Assessment to assess performance and proficiency.

- The Thai NIC continued sampling and conducting antiviral sensitivity testing on at least 20 isolates per month.
- The Thai NIC holds a refresher PCR training workshop once a year for regional medical science laboratory staff to update and review diagnostic protocols, the global influenza situation and the external quality assurance program.

Training

To enhance the capacity of the Thai NIC as a key coordinating unit, scientists participated in the following trainings, conferences, and meetings:

- Participated in the training course “Construction of reverse genetic of drug resistant virus and study of phylogenetic tree for prediction of novel or drug resistant in influenza virus” at the WHO Collaborating Center in Melbourne, Australia, February 28–March 11, 2011.
- Attended the training course “EQAS preparation for qualitative and quantitative nucleic acid testing” at the National Serology Reference Laboratory in Melbourne, Australia, March 21–April 1, 2011.
- Visited the Virology Division at the Centre for Health Protection (CHP) in Hong Kong Special Administrative Region (WHO Influenza External Quality Assessment Project), May 26–27, 2011.
- Attended the workshop “The Molecular Evolution of Influenza Viruses” at the National Institute of Virology in Pune, India, May 23–June 3, 2011.
- Attended the meeting “International Union Microbiological Societies 2011 Congress” in Sapporo, Japan, September 10–17, 2011.

Publications

- Chittaganpitch M, Supawat K, Olsen SJ, Waicharoen S, Patthamadilok S, Yingyong T, Brammer L, Epperson SP, Akrasewi P, Sawanpanyalert P. Influenza in Thailand: 7 years of sentinel surveillance data, 2004–2010. *Influenza and Other Respiratory Viruses*. 2012;6(4):276-83.
- Chittaganpitch M, Waicharoen S, De Silva JW, Supawat K, Pattamadilok S, Auwanit W, Olsen SJ, Akrasewi P, Sawanpanyalert P. A study of oseltamivir resistant influenza viruses in Thailand, 2008–2010. *Regional Health Forum WHO South-East Asia Region*. 2011;15(1):57-62.

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