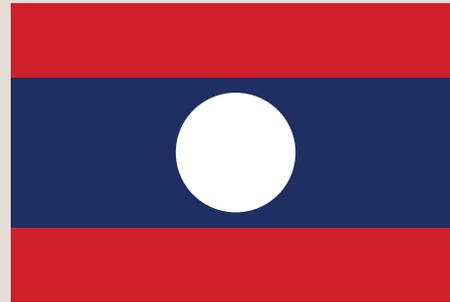


# Lao People's Democratic Republic (Lao PDR)



- **Capital:** Vientiane (Viangchan)
- **Area:** 236,800 sq km
- **Population:** 6,586,266 (July 2012 est.)
- **Age Structure:** 0-14 years: 36.7% (male 1,197,579/female 1,181,523); 15-64 years: 59.6% (male 1,908,176/female 1,950,544); 65 years and over: 3.7% (male 107,876/female 131,513) (2011 est.)
- **Life Expectancy at Birth:** Total population: 62.77 years; male: 60.85 years; female: 64.76 years (2012 est.)
- **Infant Mortality Rate:** Total: 57.77 deaths/1,000 live births; male: 63.68 deaths/1,000 live births; female: 51.62 deaths/1,000 live births (2012 est.)
- **Literacy Rate:** Total population: 73%; male: 83%; female: 63% (2005 Census)
- **GDP:** \$17.44 billion (2011 est.)
- **GDP per Capita:** \$2,700 (2011 est.)

## Highlights

- In August 2011, CDC's memorandum of understanding (MoU) was renewed with the human and animal health sectors legitimizing country operations in Lao PDR.
- Lao PDR hosted the NIC annual WHO Western Pacific and South-East Asia regional meeting following the designation of their National Center for Laboratory and Epidemiology (NCLE) as a World Health Organization (WHO) National Influenza Center (NIC).
- Lao PDR has translated the "One Health" principal into practice with the establishment of molecular diagnostic capacity in both human and animal health laboratories.
- Lao PDR has advanced molecular diagnostics with the establishment of full genomic sequencing capability, again, in both the human and animal health sectors.
- CDC supported Lao PDR's Field Epidemiology Training (FET) including field activities to establish the safety of and demand for pandemic influenza vaccination, to determine rubella susceptibility in pregnant women, and to establish the importance of Japanese encephalitis vaccine (JEV).
- Lao PDR's Ministry of Health (MOH) continues to demonstrate seasonality and identify circulating strains associated with human influenza.
- Lao PDR's NCLE has started building renovations in partnership with the World Bank and with the CDC-WHO collaboration providing technical expertise on design, structural integrity assessments, and direct support for biosafety enhancements of new BSL-2+ facilities. Assistance for this project has also been provided by CDC International Emerging Infections Program (IEIP), Bangkok.

## U.S. CDC Direct Country Support

The U.S. Centers for Disease Control and Prevention (CDC) developed an MoU with the Government of Lao PDR in May 2006, and formally renewed this memorandum for a further five years in August 2011. Uniquely, this agreement is with both the MOH and the Ministry of Agriculture and Forestry. This has enabled CDC, through its cooperation with WHO's WPR country office, to continue support for "One Health" practices including (i) shared human and animal health participation and representation in Lao PDR's FET; (ii) advanced laboratory genomic sequencing platforms; and (iii) outbreak response training with a focus on H5N1 and seasonal influenza. CDC-WHO also provides principal support to influenza laboratory capacity-building, to influenza-like illness (ILI) and severe acute respiratory infection (SARI) surveillance networks, and to outbreak response activities countrywide. CDC's Influenza Division, with WHO, provides technical and full financial assistance in the management of Lao PDR's FET, which now boasts 15 alumni. The CDC-WHO collaboration has worked (and funded) national infection control (IC) activities, that have seen newly developed guidelines implemented with the creation of the country's first infection control committees in all national and provincial hospitals, and the establishment of a model IC facility at a principal Vientiane hospital for the purpose of demonstrating "best practices" to newly identified IC committee staff.

### Surveillance

The importance of virological influenza surveillance was demonstrated when Lao PDR experienced the 2009 H1N1 pandemic. As such, the NCLE expanded ILI surveillance from six to eight hospitals throughout the country, and SARI surveillance from two to four hospital sites, moving away from what was a Vientiane, urban-centric system to a more countrywide surveillance system. CDC-WHO has also supported the transformation and expansion of Lao PDR's early warning (EWARN) system to all 144 districts nationwide, making real-time electronic relay of clinical data, including SARI data more meaningful through instant (programmed) interpretation.

Seasonal influenza circulated from October to December 2010, and again from August to September 2011, showing seasonality (as in previous years) during the August to December period. In 2010, the 2009 H1N1 pandemic strain continued to predominate but less so during the 2011 influenza season; in 2011, H3N2 resurged. Influenza B circulated throughout most of the 2011 non-influenza season, January to May.

One highly pathogenic avian influenza (HPAI) H5N1 poultry outbreak occurred in Luangprabang Province; however, no human H5N1 cases were identified.

### Surveillance Activities

- Re-training of 120 national and provincial hospital staff by NCLE laboratory and epidemiology teams was conducted with support from the CDC-WHO collaboration at ILI/SARI sentinel surveillance sites in Champassak, Savannakhet, Khammoune Vientiane Capital, Luangprabang, and Oudomxay, to increase both the number of specimens collected and influenza positivity yields.
- The MOH expanded SARI surveillance to hospital sites in Champassak and Oudomxay.
- Support and technical assistance was provided by the CDC-WHO collaboration for the annual national surveillance review conducted by NCLE (March 2011) with Health Authority



*Field Epidemiology Training (FET) –providing health education for local residents.*

representation from all 17 Lao Provinces, and development of a five year national surveillance strategic plan with MOH partners throughout 2011. Lao PDR's NCLE contributed data to the WHO's FluNet for the first time as a designated NIC.

- Lao's MOH contributed over 100 viral isolates through CDC to the WHO Global Influenza Surveillance and Response System (GISRS) between October 1, 2010 and September 30, 2011.
- Strain recognition throughout the reporting period has contributed to the MOH's policy decisions regarding the introduction of seasonal influenza vaccine in 2012.

## **Laboratory**

With funding and technical assistance provided through the CDC-WHO collaboration, NCLE was able to (i) adopt and adapt cell culture protocols from the Thai MOH to produce virus isolates; (ii) develop hemagglutination inhibition testing with assistance from CDC; (iii) work with CDC to develop full genomic sequencing capabilities; and (iv) mediate talks that led to an MoU between the human and animal health sectors to establish a single, advanced molecular diagnostic testing platform.

### **Laboratory Activities**

- Procured laboratory reagents for processing over 3,000 samples with assistance from CDC IEIP Bangkok and CDC Atlanta's Influenza Reagent Resource (IRR).
- Negotiated the procurement and maintenance arrangements of a new genomic sequencing machine for NCLE, and the repair of an existing machine at the National Center for Animal Health (NCAH). This new capacity will enable Lao PDR to describe the phylogenetic evolution of HPAI H5N1 from 2004, and contribute toward future recognition of avian, pandemic, and seasonal strain variability, regionally.
- Trained NCLE and NCAH laboratory staff in molecular sequencing capabilities for the first time, in Lao PDR.
- Maintained cell lines and produced reliable virus isolates for submission to the WHO GISRS.
- Conducted strain identification using HI testing for the first time.
- Established a roadmap for building sequencing capabilities; from sequencing of HPAI H5N1 samples from poultry outbreaks, to publishing the phylogenetic evolution of HPAI H5N1 in Lao PDR.
- Cross-trained NCLE staff to conduct real-time PCR, cell culture testing, and HI testing.

## **Preparedness**

Lao PDR's pandemic planning activities for FY 2011 were principally focused on lessons learned from the 2009 influenza pandemic experience. In the past, Lao PDR was able to quickly adapt to CDC-WHO supported pandemic plans in preparing for an H5N1 threat, and readily make changes at both national and provincial levels. Using the CDC-driven Automated Disaster and Emergency Planning Tool (ADEPT), Lao PDR proved responsive to the 2009 H1N1 pandemic through the mobilization of public and private resources.

Successful pandemic planning, including deployment of pandemic vaccine to more than one million susceptible people in 2010, elevated discussions in the MOH about introducing seasonal influenza vaccination as part of a long-term strategy for influenza pandemic threats.

### **Preparedness Activities**

- Lao PDR conducted review workshops in all 17 provinces to determine the effectiveness of pandemic plans, and how to better implement these in the future.

- CDC-Lao PDR technical advisory group (TAG) participated in the WHO sponsored pandemic planning meeting and workshops in Beijing, China (and included CDC's support for Lao PDR's participation).
- CDC-Lao PDR TAG participated in the WHO sponsored Asia-Pacific Strategy for Emerging Diseases (APSED) Meeting and workshops in Manila, the Philippines.
- CDC and WHO country teams contributed toward and reviewed a manuscript in which the Lao PDR example was used in illustrating the process and value of pandemic planning.

## Training

- ILI and SARI re-training activities took place through hospital-based workshops held in Vientiane Capital, Savannakhet, Khammoune, Luangprabang, Champassak and Oudomxay.
- Two training workshops in SARI surveillance were held in Champassak and Oudomxay provinces in order to expand SARI surveillance.
- The MOH supported an in-country APSED workshop to help develop Lao PDR's national five-year health strategy.
- Laboratory staff from NCLE and NAHC were trained in genomic sequencing at CDC Atlanta.
- Laboratory training for four NCLE and one NAHC staff for detection of influenza and other respiratory infections took place at CDC IEIP Bangkok, November 2010.

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