

# Pakistan



**Capital:** Islamabad

**Infant Mortality Rate:** 59.35/1,000 live births

**Population:** 193,238,868 (July 2013 est.)



## Overview

Pakistan has had a cooperative agreement with CDC since 2006 which supports development of state-of-the-art laboratories at designated sentinel sites in Pakistan for rapid confirmation of human and novel influenza cases. The funds also support activities aimed at pandemic influenza preparedness through improved national influenza surveillance, as well as the development of a national vaccine policy. Significant progress has been made in light of continuing social and political challenges. A total of eight sentinel sites are located in outpatient departments of major provincial tertiary care hospitals, as well as one in the federal capital, Islamabad. Sites were selected on the basis of representative geographic distribution, high population density, and patient turnover rate.

## Highlights

- Pathologists, laboratorians, scientists and physicians attended a scientific seminar discussing global epidemiology of influenza, risk factors and management.
- Key surveillance staff of the Balochistan Health Department attended rapid response training.
- Hosted awareness seminars on epidemiology and prevention strategies at medical schools across the country in 2012 and 2013.
- Hosted Consultation on Enhanced SARI Surveillance for Avian Influenza H7N9 and MERS-CoV to obtain feedback on the induction of additional SARI sites.

## Surveillance

There was no sentinel site lab-based influenza surveillance prior to the cooperative agreement. Currently, eight sentinel sites are reporting influenza-like illness (ILI)/severe acute respiratory infection (SARI) cases to the National Influenza Center (NIC) at the National Institute of Health (NIH).

### Surveillance Activities

- Activated laboratory-based surveillance for ILI/SARI cases at three new sentinel sites at Multan, Muzaffarabad and Gilgit this year.
- Conducted sentinel site physician orientation and rapid response trainings in the three newly established sentinel sites.
- Trained and activated rapid response teams for timely response.
- Modified and periodically reviewed case definitions and standard operating procedures for sampling, storage and sample transportation based on emerging H7N9 and MERS-CoV situations.
- Dispatched viral transport media (VTM) to provincial health departments and high-risk districts on a regular basis to ensure safe transport of specimens.
- Procured and administered seasonal influenza vaccine to personnel engaged in influenza surveillance.
- Strengthened online submission of epidemiological data on ILI and SARI cases on FluID.

## Laboratory

The second cooperative agreement envisaged strengthening of the laboratory network for lab-based influenza surveillance using virus isolation and molecular diagnosis of influenza. The existing sentinel site laboratories routinely process specimens and send aliquots to NIH Pakistan for confirmation and virus isolation. Three additional influenza labs have been established in the new sentinel surveillance sites. Influenza surveillance has been strengthened through the network of the existing laboratories where PCR is done by trained lab personnel.

### Laboratory Activities

- Processed and reported 6,068 samples from eight sites in 2011–2013; 1,112 of those were positive.
- Provided logistic and technical support to all sentinel influenza laboratories.
- Shared virologic data regularly via WHO FluNet.
- Initiated indigenous sequencing of influenza viruses with technical support from CDC.
- Authorized NIH as the testing laboratory for Influenza A/H7N9 and MERS-CoV since it is the designated national laboratory for viral diagnostics.
- Influenza virus samples are regularly submitted through the Global Influenza Surveillance and Response System (GISRS) to CDC to be included for consideration in annual Northern Hemisphere vaccine recommendations.
- Developed a manual on influenza diagnostic protocols that will be distributed to all laboratories.

## Preparedness

Based upon the National Preparedness Plan for Prevention and Control of Avian and Pandemic Influenza, a national program was implemented in 2006 by the Ministry of Health. Provincial health departments in Pakistan are responsible for implementing major components including emergency response, provision of appropriate health services, procurement of antivirals/vaccine, disease containment and communication.

## Training

- Organized two short courses on epidemiology and biostatistics for the surveillance, epidemiology, and public health officers in June 2011 and July 2012.
- Hosted five, three-day courses on bio-safety and bio-security for laboratorians, pathologists, scientific officers, technologists and technicians during which over 100 laboratory-related personnel were trained.
- Conducted four, two-day rapid response trainings which were attended by 126 staff in Multan, Lahore, Karachi and Quetta.
- Provided sentinel site physician training to twenty doctors at Nishtar Medical College, Multan.
- Organized three awareness seminars for the medical students and faculty of the medical schools in Peshawar, Lahore and Rawalpindi.
- Conducted PCR training for 14 laboratory staff from the Quetta, Gilgit, and Muzaffarabad sentinel sites.
- Organized the first ever laboratory quality management training in collaboration with FELTP Pakistan. It was attended by laboratorians, pathologists, scientific officers, technologists and technicians; over 40 personnel were trained.
- Organized a laboratory quality management course for provincial sentinel site staff, laboratorians, Disease Early Warning System (DEWS) and FELTP officers in July 2013.

## Publications

Badar N, Bashir Aamir U, Mehmood MR et al. Influenza Virus Surveillance in Pakistan during 2008–2011. *PLoS One*. 2013 Nov 8;8(11):e79959. doi: 10.1371/journal.pone.0079959. eCollection 2013.

Bashir Aamir U, Badar N, Mehmood MR et al. Molecular Epidemiology of Influenza A(H1N1)pdm09 Viruses from Pakistan in 2009–2010. *PLoS One*. 2012;7(8):e41866. doi: 10.1371/journal.pone.0041866. Epub 2012 Aug 20.

Nisar N, Bashir Aamir U, Badar N et al. Prediction of clinical factors associated with pandemic Influenza A (H1N1) 2009 in Pakistan. (In Press).