

Mexico



- **Capital:** Mexico City (Distrito Federal)
- **Area:** 1,964,375 sq km
- **Population:** 114,975,406 (July 2012 est.)
- **Age Structure:** 0-14 years: 28.2% (male 16,395,974/female 15,714,182); 15-64 years: 65.2% (male 35,842,495/female 38,309,528); 65 years and over: 6.6% (male 3,348,495/female 4,113,552) (2011 est.)
- **Life Expectancy at Birth:** Total population: 76.66 years; male: 73.84 years; female: 79.63 years (2012 est.)
- **Infant Mortality Rate:** Total: 16.77 deaths/1,000 live births; male: 18.58 deaths/1,000 live births; female: 14.86 deaths/1,000 live births (2012 est.)
- **Literacy Rate:** Total population: 86.1%; male: 86.9%; female: 85.3% (2005 Census)
- **GDP:** \$1.657 trillion (2011 est.)
- **GDP per Capita:** \$15,100 (2011 est.)

Highlights

- Mexico's National Influenza Center (NIC) is now part of the Laboratory Response Network of the U.S. Centers for Disease Control and Prevention (CDC), and it has received an international quality assurance certificate.
- The Mexican influenza surveillance system has detected and studied more than 700 samples for antiviral resistance with less than 1% of oseltamivir resistance mutation. The system is sensitive enough to observe small outbreaks and to perform sentinel surveillance to detect changes in the virus that could be potential pandemic viruses.
- The Mexican influenza information system is a web-based up to date system.
- Mexico has started sharing human-animal surveillance data on a more regular basis. The plan to merge animal and human influenza epidemic surveillance data in an effort to integrate their surveillance strategies into one system is still ongoing.

U.S. CDC Direct Country Support

Since September 2006, CDC has supported influenza surveillance in Mexico through a cooperative agreement. The agreement has helped to strengthen federal, regional and local influenza surveillance sites by funding training, equipment and coordination of activities of laboratories and epidemiology units. The Mexican National Laboratory Network consists of a NIC, the Institute for Epidemiologic Diagnosis and Reference (InDRE) that coordinates training, quality control and reporting for 31 state laboratories. The cooperative agreement has assisted Mexico's Secretariat of Health (SOH) by increasing influenza laboratory capacity in Mexican states and improving diagnostic protocols.

Mexico's outbreak response begins with local-state level investigations that are then assisted, if needed, by the Mexican Federal SOH. This response system was instrumental during the pandemic and remains the cornerstone of binational collaboration during the investigation of public health events of international concern.

Surveillance

Mexico's influenza surveillance system is based on local sentinel sites that are spread out in all 31 states. Over the course of the CDC cooperative agreement the surveillance network has grown; it started with less than 100 sites and now has grown to more than 700 units. Each year this sentinel network along with the influenza surveillance regulations, which are national and obligatory for all states, are revised by the National Epidemic Surveillance Committee.

The purpose of the units is to collect detailed information of all influenza-like illness (ILI) cases and take laboratory samples from hospitals and primary health care centers to monitor influenza strains. Epidemiologic and laboratory data are collected at the local level and sent to centralized databases that facilitate rapid analyses, interpretation, and response to influenza activity throughout the country.

Surveillance Activities

- The Directorate General of Epidemiology develops a weekly newsletter that is distributed to the national epidemiological network and shared with partners; several specific analyses can be done and shared, like the influenza activity on the U.S.–Mexico Border States.
- The Directorate General of Epidemiology developed and sustained a web-based clinical-epidemiological and laboratory reporting system that facilitates rapid identification of unusual activity and response to potential public health events of international concern.
- An updated national plan for influenza preparedness was developed to include interagency coordination activities with the Mexico SOH, Army, Navy, and the Ministries of Agriculture, Communication and Transportation.
- Based on lessons learned from the 2009 influenza A (H1N1) pandemic, the SOH has updated and improved the quality of data that is collected in the Mexican National Influenza Surveillance System.
- The *North American Plan for Avian and Pandemic Influenza* has been updated with input of Canada, Mexico and the United States and it is now the *North American Plan for Animal and Pandemic Influenza (NAPAPI)*, taking account of the lessons learned in influenza pandemic 2009; this plan considers important activities to share information along the three countries and to make joint risk assessments.

Laboratory

InDRE serves as a full-service national public health laboratory, performing surveillance and diagnostic-reference testing for a broad range of agents and diseases, including respiratory viruses, rabies and arboviruses. As Mexico's NIC, InDRE cultures influenza viruses, conducts real time qRT-PCR testing for respiratory samples and sequences viral isolates.

InDRE also provides oversight and proficiency testing for the national network of laboratories several times a year. It has also developed an ambitious program to grow capacity with a new building, built with international standards and increasing the laboratory's infrastructure with several BSL-3 laboratories.

Laboratory Activities

- InDRE has the capacity to do full antigenic and genetic characterization of influenza viruses, and has the capacity to isolate influenza viruses.
- All 31 labs in the National Public Health Laboratory Network perform influenza testing through real-time qRT-PCR.
- InDRE has detected four influenza cases with oseltamivir resistance mutation H275Y without epidemiological association and has reported them to the World Health Organization (WHO) according to International Health Regulations 2005 (IHR).
- SOH has developed an online platform to centralize data access and improve the communication system between the 31 state laboratories and InDRE.
- WHO's laboratory's performance assessment for InDRE has had perfect qualifications since 2010.
- InDRE has obtained international quality certification ISO-9001-2008.
- For the 2011–2012 influenza season, the virological niche was taken again by the influenza A (H1N1) 2009 virus.

Preparedness

The *National Influenza Preparedness Plan* was updated after the 2009 H1N1 pandemic. The National Laboratory Network was fully strengthened with diagnosis protocols based in real-time qRT-PCR and viral culturing. Mexico is part of the *North American Plan for Animal and Pandemic Influenza (NAPAPI)*, in partnership with Canada and the United States.

In 2011, Mexico hosted the “High Level Technical Meeting to Address Risks in the Animal-Human-Ecosystems” interphase with participation from Ministries of Health, Agriculture and Wildlife from 35 countries as well as organizations such as the Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE), and WHO.

Preparedness Activities

- The *National Preparedness Plan* has been updated to include the coordination of local and state plans and activities.
- Each state in Mexico has a rapid response team (RRT) that is equipped with medical doctors, epidemiologist, and laboratory staff.
- During the pandemic, there was successful distribution of antiviral medications to states and institutions.

Training

Mexico's SOH hosted the following training activities in 2011:

- Updated the National Public Health Laboratory Network leaders with regard to pandemic coordination.
- Several local epidemiologists are now studying for their Master's Degree in Public Health with the National Institute of Public Health.
- Level two of the Incident Command System Course for federal staff has been developed, in cooperation with the Public Health Agency of Canada.
- Influenza surveillance, preparedness and response are always an important part of the regional and national meetings with the National Epidemic Surveillance System [SiNaVE].

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