



BANGLADESH



Medical technologist getting ready to collect a blood sample from a pregnant woman study participant in Kishoreganj District, Bangladesh.

OVERVIEW

The Institute of Epidemiology, Disease Control, and Research (IEDCR) of the Ministry of Health and Family Welfare has been a recipient of the Centers for Disease Control and Prevention's (CDC) cooperative agreements since 2006. IEDCR is the national focal point for conducting disease surveillance and outbreak investigations. The CDC-funded influenza project concentrates on strengthening sustainable disease surveillance, enhancing laboratory capacity and responding rapidly to pandemic threats. IEDCR works closely with the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b), which also receives CDC funding to conduct influenza research and surveillance. The two institutions collaborate on surveillance, training and research. Bangladesh has made substantial progress in the field of respiratory illness since the start of the cooperative agreement.

SURVEILLANCE

CDC funding enabled IEDCR and icddr,b to establish Bangladesh's first sentinel surveillance for influenza. Together they have been conducting hospital-based influenza surveillance since 2007, in 12 tertiary hospitals across the country. In fiscal year 2013, the surveillance platform was enhanced by defining the catchment area of the participating hospitals and performing health utilization surveys in these areas. Also during 2014, surveillance activities were expanded to five additional sites: two sites through collaboration

HIGHLIGHTS

- Leveraged and enhanced the national influenza surveillance platforms to detect potential circulation of novel avian influenza A (H7N9) virus among poultry and suspected human cases or MERS-CoV.
- Enhanced the national hospital-based influenza surveillance platform.
- Participated in joint avian influenza outbreak investigations following a One Health approach with stakeholders.

between icddr,b and IEDCR and three sites by IEDCR to increase the chance of detecting avian influenza A (H7N9) virus and MERS-CoV.

The addition of these sites allows Bangladesh to better understand its influenza disease and estimate economic burden. The current national influenza surveillance system identifies cases of severe acute respiratory infection (SARI), influenza-like illness (ILI), and severe pneumonia in 24 sentinel sites. In addition, an event-based component of the surveillance system identifies clusters of severe disease, and all patients are screened for exposure to sick or dead poultry and tested for avian influenza A (H5N1) virus and for the novel avian influenza A (H7N9) virus as needed.



Two technicians collecting a post-mortem biopsy sample.

Bangladesh continues to experience outbreaks of highly pathogenic avian influenza A (H5N1) virus. In collaboration with IEDCR and the Department of Livestock Services (DLS), icddr,b currently conducts surveillance for avian influenza in domestic poultry and poultry workers in live bird markets within Bangladesh.

SURVEILLANCE ACTIVITIES

- Monitored and investigated suspected influenza outbreaks on a consistent basis.
- Continued to send detailed surveillance reports to CDC and the World Health Organization (WHO) FluNet on a weekly basis during the influenza season.
- Collected and tested specimens for influenza virus from 24 sentinel surveillance sites across the country.
- Tested nearly 30,000 specimens from surveillance activities (May 2007 to April 2015).

LABORATORY

Since 2007, CDC has provided diagnostic support, resources, training and technical support to laboratories at IEDCR and icddr,b, resulting in strengthened capacity and improved diagnosis of influenza and other respiratory viruses. Influenza viruses (100–200 per year) are routinely sent to CDC for further molecular and antigenic characterization and for use in vaccine strain selection.

In 2007, IEDCR was nominated as a National Influenza Center (NIC) by WHO and has routinely contributed specimens to GISRS. An upgrade of IEDCR's BSL-2 laboratory was completed in 2010.

State-of-the-art equipment was purchased and the new BSL-2 laboratory is performing real-time and conventional RT-PCR to identify seasonal, pandemic and avian influenza viruses (e.g., H1N1pdm09, H7N9, H9N2, and H5N1).

In fiscal year 2013, a sequencer was procured and training of NIC staff began. Plans are currently underway to increase the virus isolation and serologic testing capacity of the NIC.

Icddr,b houses a modern molecular virology BSL-2 laboratory, tissue culture capacity, animal virology laboratory as well as a certified BSL-3 laboratory where virus isolation and culture for highly pathogenic influenza strains can be performed.

LABORATORY ACTIVITIES

- Obtained and tested over 40,000 specimens, from both the human and zoonotic sector, through surveillance and research activities (May 2007 to April 2015).
- Integrated new sequencing capacity within several surveillance and research projects.
- Enhanced diagnostic capacity of partner laboratories for the detection of the novel avian influenza A (H7N9) virus.
- Participated in the field testing of novel rapid serological assays for influenza-specific antibodies (icddr,b laboratory).

PREPAREDNESS

IEDCR, together with key partners, has periodically updated their pandemic response and avian influenza plan with lessons learned from the 2009 influenza pandemic. IEDCR has led several recent trainings for public health officials and health professionals on pandemic preparedness.

An emergency operations center (EOC) was built and equipped to help centralize a government response during major outbreaks and pandemics.

PREPAREDNESS ACTIVITIES

- Responded to outbreaks and unusual health events or diseases reported directly or indirectly to the Director.
- Updated the national pandemic preparedness plan in collaboration with stakeholders which will now include all emerging infectious diseases.

TRAINING

IEDCR continuously conducts trainings on emerging and re-emerging diseases to strengthen Bangladesh's capacity to detect, survey, prevent, and control influenza, including novel pandemic threats (Ebola virus disease (EVD) and MERS-CoV):

- Trained the National rapid response team (RRT), District RRT, Upazilla RRT, clinicians, and health personnel at ports of entry on EVD (Fall 2014).
- Conducted training on web-based disease surveillance (July 2013–current).
- Conducted training on development of standard operating procedures (SOP) on laboratory biosafety and infection control of emerging infectious diseases (Fall 2013).

- Conducted hands-on training on SOPs for diagnosis of emerging infectious diseases (Fall 2013).
- Conducted a workshop on establishing laboratory network among public health laboratories with policy makers (Fall 2013).
- Conducted training for preparedness, capacity building, surveillance, laboratory support and response for zoonotic Diseases (July 2013–current).
- Conducted disease surveillance training for Upazilla health officers and medical officers (March 2013–current).
- Conducted workshop on National Influenza Surveillance, Bangladesh (June 2013).

INFLUENZA VACCINE ACTIVITIES

DGHS/MOH is planning to introduce seasonal influenza vaccines among high-risk groups. The government already identified high-risk groups. An estimated 15.87 million or 10% of total population are at high risk. Ministry of Health organized several consultations to explore the funding and to develop a vaccine development plan. Currently, the expanded program on immunization (EPI) is working on providing influenza vaccination among pregnant women.

RESEARCH

Influenza Division works closely with icddr,b, IEDCR, and DLS to explore the risk of avian influenza among persons who work closely with poultry, potential interventions to interrupt zoonotic influenza transmission, seasonal influenza disease and economic burden among SAGE target groups, and the potential value of vaccination programs to avert medically attended illness and its associated cost.

Ongoing research activities include studies to explore:

- Avian influenza in domestic waterfowl in live bird markets in Bangladesh, 2007–2012.
- Risk factors for highly pathogenic avian influenza A (H5N1) virus outbreaks in backyard poultry flocks, Bangladesh, 2009–2012.
- Understanding the failure of an intensive behavior change intervention to reduce the risk of avian influenza transmission from flocks to backyard poultry raisers in rural Bangladesh.
- Developing and piloting safe home slaughtering practices in a Bangladeshi rural community to reduce human exposure to avian influenza viruses.



A family working in one of the poultry markets in the city.

- Where backyard poultry raisers seek care for sick poultry: implications for avian influenza prevention in Bangladesh.
- Risk of avian influenza transmission among poultry in Dhaka live bird markets and possible impact of routine disinfection.
- Mild respiratory illness in young children caused by highly pathogenic avian influenza A (H5N1) virus infection in Dhaka, Bangladesh, 2011.
- Household-level risk factors for secondary influenza-like illness in a rural area of Bangladesh.
- Factors driving customers' health care seeking behaviors for acute respiratory illness at pharmacies, drug sellers' treatment recommendations and outcomes, in Dhaka City, Bangladesh, in 2012.
- Etiology and incidence rates of hospital-acquired viral respiratory illness in tertiary care hospitals in Bangladesh, 2008–2011.
- Viral etiology of pneumonia and outcomes in severely malnourished children in an urban hospital.
- Incidence of viral respiratory infections among hospitalized children aged <5 years, 2010–2013.
- Assessing laboratory-confirmed influenza virus infection among family caregivers in district hospitals in Bangladesh.
- Piloting hand-hygiene interventions in hospital wards to improve hand hygiene behavior in resource-poor health care facilities in Bangladesh.
- Incidence of influenza-associated mortality in Bangladesh, 2010–2012.