

SOUTH AFRICA



Seipati Matshogo, research assistant, from Klerksdorp/Tshepong Hospital Complex (KTHC), conducting an interview.

OVERVIEW

CDC collaborates with the National Institute for Communicable Diseases (NICD)/National Health Laboratory Service (NHLS) to strengthen laboratory and epidemiologic capacity in South Africa.

SURVEILLANCE

The severe acute respiratory illness (SARI) and the influenza-like illness (ILI) programs continue at hospitals and outpatient clinics across the country. The SARI surveillance programme has been renamed pneumonia surveillance as the programme moves towards a national multi-pathogen programme that will include both acute and more chronic respiratory illness case definitions. The SARI programme tests for RSV, influenza A and B viruses, adenoviruses, human metapneumovirus, parainfluenza viruses 1, 2, 3, rhinoviruses and enteroviruses. The pneumonia surveillance programme will include testing for the following pathogens: *Pneumocystis jiroveci*, *Mycobacterium tuberculosis*, *Streptococcus pneumoniae*, *Bordetella pertussis*, *Haemophilus influenzae* type B,

HIGHLIGHTS

- Implemented national pneumonia surveillance protocol.
- Received core sustainable funding for surveillance through the National Department of Health.
- Published annual health care workers handbook on influenza.
- Published annual vaccine recommendations in South African Medical Journal.
- Established laboratory assays for influenza virus complete genome PCR and next-generation genome sequencing.

atypical bacterial causes of pneumonia (*Legionella species*, *Chlamydia pneumoniae* and *Mycoplasma pneumoniae*), coronaviruses (OC43, 229E and HKU1) and bocavirus.

Testing for these pathogens will allow for a full description of the causes of pneumonia in our setting. The ILI surveillance programme enrolls patients using a standard case definition of ILI and provides a platform for the influenza shedding study and an asymptomatic control cohort to enable better description of the risk factors for ILI and SARI in our high HIV prevalent setting.

SURVEILLANCE ACTIVITIES

- Reported to WHO on our annual influenza season to inform vaccine strain selection.
- Drafted the national influenza policy following two stakeholder meetings with the National Department of Health (NDoH).
- Supported NDoH on vaccine and clinical treatment guidelines for the 2013 and 2014 influenza season.
- Integrated the SARI surveillance system into a more comprehensive pneumonia surveillance and will move into the GERMS-SA programme to allow more national representation.
- Posted updates on novel coronavirus and other influenza-related international outbreaks weekly on NICD's webpage.



LABORATORY

The NIC processed a total of 6,537 samples in 2014. Influenza virus isolation was attempted on clinical samples and about 67% (50/75) were successful. The majority of influenza A virus isolates (n=35) were influenza A/H3N2 which dominated the season. Of the 50 influenza virus isolations obtained, 43 were from influenza A viruses and seven were from influenza B viruses. A total of 46 virus isolates could be characterized antigenically by hemagglutination inhibition assay (HAI) of which 70 % (32/46) were influenza A(H3N2). Of the influenza A(H3N2) viruses serotyped 69% (22/32) showed normal reactivity to the A/Texas/50/2012 vaccine strain reference antiserum. Almost 100 complete or near complete influenza A/B genomes were sequenced.

LABORATORY ACTIVITIES

- Performed inter-laboratory quality assurance testing with Seychelles and Zambia.
- Attended the 9th Annual Sequencing, Finishing, and Analysis in the Future meeting in Santa Fe, New Mexico (May 2014).
- Provided a report on the final results for sero and molecular surveillance for influenza A viruses in South African pigs surveyed nationally during 2013 to the Department of Agriculture, Forestry, and Fisheries (DAFF) and other stakeholders.

PREPAREDNESS

As part of our strategy to build partnerships for surveillance activities at the animal-human interface, we conducted HAI assays on pig serum samples as part of a collaboration with DAFF to ensure the ability to detect exposures to swine-origin influenza viruses and that necessary reagents are available in the laboratory. Several discussions with stakeholders in the ostrich industry took place regarding monitoring of staff with influenza-like symptoms.

PREPAREDNESS ACTIVITIES

- Designated staff to participate in the Good Emergency Management Practice Workshop: “Strengthening capacity to respond to animal diseases emergencies” presented by the Crisis Management Centre, Animal Health (CMC-AH) FAO; the Animal and Plant Health Inspection Services (APHIS), United States Department of Agriculture (USDA) and DAFF (25–29 August 2014).
- Attended meetings at WHO on “Influenza Severity Assessment” in April 2014 and November 2014.

TRAINING

The Centre for Respiratory Diseases and Meningitis (CRDM) continues to provide training support to southern African countries and to the staff working at the surveillance sites.

The following activities/trainings occurred:

- Trained visiting scientists from Rwanda and Mozambique on the multiplex real time RT-PCR assay (September 2013).
- Trained the virology laboratory at the University Teaching Hospital in Lusaka on influenza virus isolation techniques (November 2013).
- Helped screen pilgrims returning from Hajj in Saudi Arabia for the MERS-CoV virus and influenza A and B viruses.
- Assisted CDC South Africa with a site visit and influenza surveillance training in Maputo, Mozambique (September 2014).
- Appointed Dr. Cheryl Cohen as a member of the WHO Working Group on the Burden of Influenza Disease, 2014–2016.

INFLUENZA VACCINE ACTIVITIES

During this period, CRDM advised NDoH on the risk groups for influenza to assist with the national guidelines on influenza vaccination.

CRDM publishes the annual vaccine guidelines in the South African Medical Journal. In addition, NICD publishes a health care workers handbook on influenza which is circulated to stakeholders and published on NICD’s web page.

CRDM published a peer-review paper on the effectiveness of influenza vaccine for 2010 to 2013. A survey on knowledge, attitudes and practices related to influenza vaccine was also published in this period.

RESEARCH

CDC’s Influenza Division has collaborated with the National Institute for Communicable Diseases in South Africa to conduct severe acute respiratory illness surveillance at five hospitals and influenza-like illness at two sites. From this platform we have identified risk factors for influenza-associated hospitalization and death including HIV-infection, pulmonary tuberculosis infection, age <2 years and age ≥65 years. With data from health utilization surveys we have also estimated the burden of disease among children, adults and pregnant women. In

addition, newer studies have assessed the duration of viral shedding in HIV-infected and HIV-uninfected adults and children. Likewise, household transmission of influenza viruses has been studied to assess the role of HIV and TB infection in disease transmission. Research projects include studies to explore:

- Disease and economic burden of respiratory illness associated with influenza.
- Transmission of influenza viruses among HIV-infected and HIV-uninfected household members.
- Prospective cohort study of influenza viral shedding in HIV-infected and -uninfected adults.
- Attributable fraction and risk factors for influenza-associated severe acute respiratory illness hospitalization in a high HIV prevalence setting.
- Effectiveness of trivalent inactivated influenza maternal vaccination among pregnant women and their newborns.

