

# MADAGASCAR



Adventures on one of the dirtiest roads of Madagascar to reach one of the sentinel health care centers investigated during this project.

## OVERVIEW

Through a sustainability cooperative agreement, CDC provided support to sustain the capacity of the National Influenza Center (NIC) and Health Authorities for surveillance and diagnosis of influenza-like illness (ILI) and severe acute respiratory infection (SARI) [including Highly Pathogenic Avian Influenza (HPAI) in humans] in Madagascar. Efforts to better understand the epidemiology of influenza in Madagascar and estimate incidence and burden of disease are also supported by the cooperative agreement (CoAg).

## SURVEILLANCE

To date, the ILI sentinel surveillance system encompasses 34 health care centers that, on a daily basis, send epidemiological information for several diseases including ILI. Twelve send respiratory specimens for influenza diagnosis to the NIC on a weekly basis. The sentinel network for SARI surveillance is functional and encompasses 17 hospitals throughout the country. One hospital in Antananarivo (capital) recruits all hospitalized SARI cases for virological surveillance. The influenza specific project on SARI surveillance ended in October 2013, and was replaced with an enlarged SARI surveillance project in Antananarivo, focusing on four respiratory viruses of importance in Madagascar (influenza A and B viruses, rhinoviruses, and respiratory syncytial virus [RSV]).

## HIGHLIGHTS

- Published a paper on influenza seasonality in Madagascar, pointing out that there is a need for deeper studies to decipher factors and mechanisms that can explain influenza circulation and diffusion (in collaboration with the Fogarty International Center).
- Conducted the 4th Annual Sentinel Surveillance Network Meeting involving 61 participants from SARI surveillance sites.
- Conducted training on Risk Communication related to Public Health Emergency in Mauritius (December 2014).

## SURVEILLANCE ACTIVITIES

- Assembled a project focused on surveillance at three pig farms to explore the human-animal interface.
- Completed the influenza-specific SARI project in October 2013 and implemented a general SARI surveillance system.
- Managed ILI and SARI surveillance, including sampling and analysis.
- Organized the 4th Annual Meeting for SARI site managers in Antananarivo (July 2014). The discussion focused on coordination and standardization of data collection (clinical illness and mortality) of malaria and SARI throughout sentinel hospitals.

## LABORATORY

Madagascar's NIC enhanced its diagnosis and technical capacities by implementing rRT-PCR allelic discrimination analysis for detection of the substitution conferring influenza A(H1N1)pdm09 viruses resistant to oseltamivir. We also implemented the influenza virus microneutralization assay according to CDC's protocol. The NIC also worked closely with CDC Atlanta and South Africa in collaboration with the Association of Public Health Laboratories (APHL) to implement an international training on rRT-PCR for influenza diagnosis, gathering technicians and scientists from 18 African countries, including participants from Madagascar's NIC.

## LABORATORY ACTIVITIES

- Tested 2,583 specimens for influenza diagnosis between October 1, 2013 and April 19, 2015. Among all specimens, 311 were SARI cases that were tested at the NIC using an in-house panel system for the detection of respiratory viruses. Submitted 32 positive isolates and 34 positive swabs to the WHO Collaborating Center (CC) in London as part of the WHO Global Influenza Programme.
- Completed the WHO External Quality Assessment Project (EQAP) Panel 13.
- Investigated a bronchiolitis epidemic in Antananarivo in a children's hospital in early March; results highlighted RSV and human metapneumovirus infections in 67% of specimens collected.

## PREPAREDNESS

CDC support allowed the NIC to strengthen both ILI and SARI surveillance systems. All fever sentinel hospital sites participated in a meeting in July 2014 to coordinate and standardize data collection (clinical illness and mortality) of SARI data.

High-risk events vary widely in scope and nature but share one common characteristic: how well we manage these critical events relies heavily on how well we communicate before, during, and after these events. Training on Risk Communication, held in Mauritius in December 2014, helped us to understand the process of risk communication and provided tools for informed decision-making and communications.

### PREPAREDNESS ACTIVITIES

- Improved the SARI surveillance system by training 61 clinicians from 17 hospitals from July 15–18, 2014.
- Conducted training on Risk Communication in Mauritius with 20 participants from nine countries (December 2014).
- Supported the Ministry of Health of Madagascar in updating the national contingency plan for 2014–2016.
- Trained Ministry of Health staff on case definition and containment of suspected cases with regard to the Ebola outbreak in West Africa.



Students working on a laboratory exercise during the PCR Workshop.

## TRAINING

With CDC support, organized or directed participants to attend the following trainings/workshops through the NIC:

- International Grant Management Training Course for CDC Grantees in Antananarivo, Madagascar, 24–28 February 2014.
- Workshop on introduction to empirical population genetics, Institut Pasteur de Madagascar, Antananarivo, Madagascar, 19–23 May 2014.
- Burden of Influenza Disease Workshop, Cape Town, South Africa, 4 December 2014.
- International Workshop on Risk Communication Related to Public Health Emergency, Flic-en-Flac, Mauritius, 15–17 December 2014.
- CDC/APHL International Workshop on Influenza rRT-PCR Diagnosis, Institut Pasteur de Madagascar, Antananarivo, Madagascar, 27–30 January 2015.

## INFLUENZA VACCINE ACTIVITIES

Madagascar's NIC is working to provide new data in support of influenza immunization for high-risk groups. A study on pregnant women is currently ongoing in Moramanga to assess influenza incidence. In the coming months, data on influenza disease burden will also be reviewed.

Severity and impact of influenza will be studied through analysis of several indicators, such as mortality data, truancy, and medication use. Data on influenza strains identified in Madagascar will be analyzed regarding timing of isolation and WHO influenza vaccine recommendations for both Northern and Southern Hemispheres in order to guide public health policies.