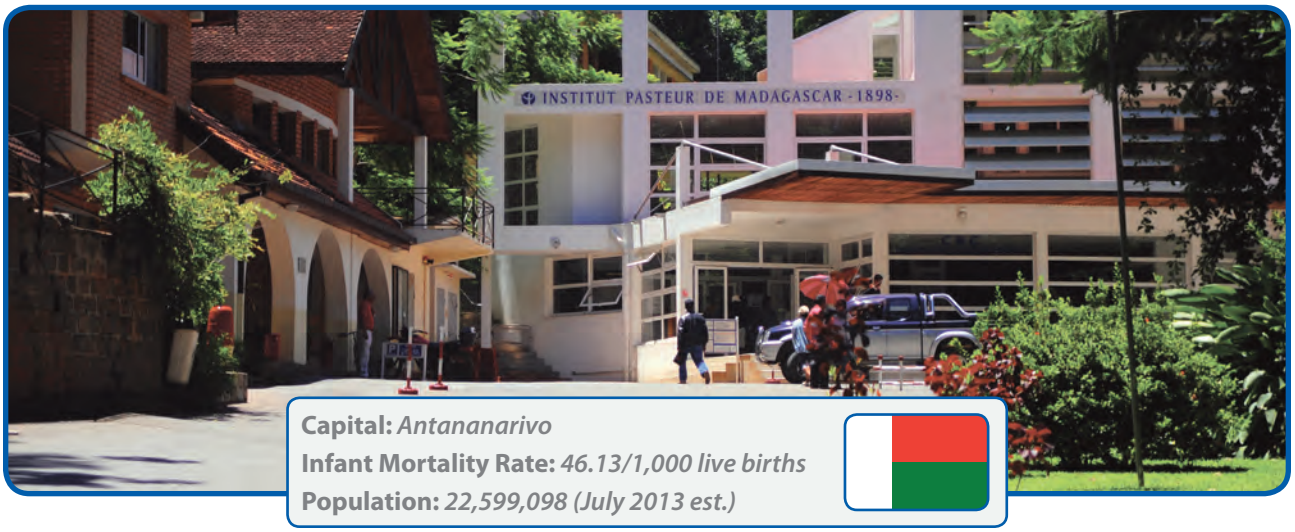
Madagascar



Capital: *Antananarivo*
Infant Mortality Rate: *46.13/1,000 live births*
Population: *22,599,098 (July 2013 est.)*

Overview

CDC provided support to substantially 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. The cooperative agreement (CoAg) also increases the capacity of the Central, Regional and District Health Authorities to provide a rapid public health intervention in response to a pandemic outbreak and to implement appropriate disease containment measures.

This CoAg is aimed at supporting the national efforts to address a possible second wave of pandemic A/H1N1 or of A/H5N1 from a disease prevention and control standpoint. In addition, the project intends to address preparedness for possible other emerging SARI so as to monitor the emergence of pandemic viruses; reduce morbidity and mortality due to possible emerging respiratory infectious diseases, both through rapid detection and containment; and consequently reduce economic effects and social upheaval/unrest due to a pandemic. Efforts to better understand the epidemiology of influenza in Madagascar and estimate incidence and burden of disease are also supported by the CoAg.

Highlights

- Conducted training based on techniques for the diagnosis of influenza with two technicians from the National Public Health Laboratory in Brazzaville (Congo) in April 2013.
- Opened two regional laboratories in Toamasina and Mahajanga.

Surveillance

To date, the ILI sentinel surveillance system encompasses 34 sites. All sites send daily epidemiological information regarding influenza to WHO's FluNet. On a weekly basis, twelve of them send respiratory specimens to the NIC for analysis.

A sentinel network for SARI surveillance is functional and encompasses 17 hospitals. Two hospitals (Antananarivo and Moramanga) recruit all SARI cases for virological surveillance of hospitalized cases. The two newly opened regional laboratories at Toamasina and Mahajanga have the capacity for influenza detection using CDC real-time RT-PCR kits and participate in ILI surveillance.

Surveillance Activities

- Continued ILI and SARI surveillance activities, including sampling and analysis.
- Supported all hospitalization costs including treatment in the context of SARI surveillance.
- Trained staff from the SARI sentinel site located in Fenoarivo on SARI surveillance and specimen collection.
- Shared weekly data with the Malagasy Ministry of Health (MoH), World Health Organization (WHO) and other partners.
- Developed a quarterly bulletin in collaboration with the NIC and the Epidemiological Department at the MoH. It is distributed electronically to partners and stakeholders.

Laboratory

Before the CoAg with CDC, the NIC in Madagascar already had the capacity for performing diagnostic tests, but there was room to improve diagnostic capacity and additional ways to prepare for a surge in testing during future pandemics. The CoAg supported laboratories in Madagascar, Mauritius and Seychelles, through the acquisition of new equipment and sampling material, allowing for an increase in the number of specimens that can be processed.

In order to implement diagnostic capacity, two regional laboratories for influenza detection were set up in 2012. The CoAg supported the creation of these laboratories.

Facing the threat of potential pandemics due to two new respiratory viruses infecting humans (influenza A/H7N9 and new coronavirus MERS-CoV), the Malagasy NIC implemented the assays for the detection of these new viruses and also implemented the techniques in both regional laboratories.

Laboratory Activities

- Tested 1,759 influenza specimens.
- Tested 596 SARI cases at the NIC using an in-house panel system for the detection of 14 respiratory viruses.
- Tested all SARI cases received since April 2013 (107) for influenza A/H7N9 and MERS-CoV viruses.
- Submitted a total of 65 positive isolates and 25 positive swabs to the WHO Collaborating Center in London as part of the WHO Global Influenza Program.
- Participated in the WHO External Quality Assessment Project (EQAP) and scored 100% for quality assurance.

Preparedness

CDC support has allowed the NIC to establish and strengthen both ILI and SARI surveillance systems. In the actual context of potential pandemics, the NIC implemented techniques of detection for influenza virus A/H7N9 and MERS coronavirus in both regional laboratories (Mahajanga and Toamasina) on July 2013.

Preparedness Activities

- Trained technicians from both regional laboratories in Mahajanga and Toamasina on techniques for detection of A/H7N9 and MERS-CoV viruses.
- Trained sentinel site leaders to strengthen and improve SARI surveillance systems in September 2013.

Research Projects

- Viral Etiology of SARI in Madagascar
- Seasonality of influenza in Antananarivo, Madagascar, from 2002 to 2012

**see Research Section for additional information*

Training

- Trained ILI sentinel site physicians on respiratory specimen sampling for influenza diagnosis (October 2012).
- Co-hosted a training in Mauritius with the purpose of establishing influenza surveillance in the Indian Ocean island countries (January 2013). Participants were from Mauritius, Madagascar, Reunion and Seychelles. It was funded jointly by CDC and the Association of Public Health Laboratories (APHL). The project has supported national efforts to implement laboratory capacities in Mauritius and Seychelles.
- Conducted a workshop for 14 participants at Institut Pasteur— Madagascar (IPM) focused on the revision of the national capabilities in preparedness and response to pandemic influenza (March 2013).
- Trained staff members from the reference hospital in Fenoarivo on influenza and virological surveillance (March 2013).
- Trained two technicians from the National Public Health Laboratory in Brazzaville (Congo) on techniques for diagnosis of influenza by NIC staff (April 2013).

Publications

Heraud JM, Njouom R, Rousset D, Kadjo H, Caro V, Ndiaye MN, Victoir K, Collard JM, Orelle A, Yekwa EL, Ekaza E, Razanajatovo NH, Adamou L, Biscornet L, Enouf V, van der Werf S, Diop OM. Spatiotemporal circulation of influenza viruses in 5 African countries during 2008–2009: a collaborative study of the Institut Pasteur International Network. J Infect Dis. 2012 Dec 15;206 Suppl 1:S5–13.

Orelle A, Razanajatovo NH, Rajatonirina S, Hoffmann J, Randrianasolo L, Razafitrimo GM, Naidoo D, Richard V, Heraud JM. Epidemiological and virological characterization of 2009 pandemic influenza A virus subtype H1N1 in Madagascar. J Infect Dis. 2012 Dec 15;206 Suppl 1:S140–7.

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