

Ebola Virus Disease and Support Provided by Japan

On September 18, 2014, the United Nations Security Council took an exceptional step of adopting a resolution for responding to the outbreak of an infectious disease. Japan was among the countries that co-sponsored the resolution, which stated that the Ebola outbreak constituted “a threat to international peace and security.” Based on that resolution, each government launched measures to help address the outbreak with an acute sense of the impending crisis.

The measures to be implemented in the regions affected by the Ebola outbreak required a broad range of items, including not only medicine, medical personnel, and experts in responding to infectious diseases, but also

large amounts of consumable medical supplies (personal protective equipment, etc.), intensive-care facilities where patients can be quarantined, and quarantines upon entering or departing from affected countries.

A big challenge for the affected countries was how to stop the further spread of the Ebola outbreak and bringing the number of cases to zero while responding to these needs. In order to resolve this issue, Japan provided not only financial assistance but also broad-ranging support that included the dispatch of experts and provision of relief goods. Below are two examples of support that leverage Japan’s advanced technologies and are characteristic of Japan.

■ (1) Ebola test kits

One of the obstacles that hindered the control of the Ebola outbreak was the difficulty of obtaining detailed information on the spread of the disease in areas outside urban districts. It is not easy for a feverish patient to take examinations at urban hospitals or Ebola treatment facilities in order to confirm whether the fever is caused by Ebola. Therefore, it is of vital importance to establish mechanisms that enable rapid and accurate confirmation of the infection locally without undergoing examinations at hospitals or treatment facilities.

The Ebola test kit is characterized by its swiftness, light weight, and accuracy. Conventional Ebola virus tests require approximately an hour and a half per test. Moreover, the necessary equipment is difficult to carry around and requires a stable supply of electricity, which is difficult to secure in the

majority of the areas affected by the outbreak.

This Ebola test kit developed by Nagasaki University and Toshiba Corporation, is faster and lighter than the existing testing methods, and is still as accurate. Furthermore, the new test kit does not require a stable supply of electricity, thus making it easy to use even in areas with insufficient basic infrastructure, such as rural areas.

In Guinea, which is one of the countries affected by the outbreak, the government issued a reinforced declaration of emergency measures, and an intensive eradication campaign was conducted from March through May 2015 in order to bring the outbreak to an end. The Government of Japan, responding to requests from the Government of Guinea, provided the Ebola test kits in April of the same year.



Ebola test device. (Photo: Toshiba Medical Systems Corporation)



Nagasaki University Professor Jiro Yasuda (right), and Assistant Professor Yohei Kurosaki (left edge) giving technical training on the utilization of the Ebola test devices.

As part of the assistance provided by Japan, Professor Jiro Yasuda and Assistant Professor Yohei Kurosaki at the Institute of Tropical Medicine, Nagasaki University, who developed a reagent for the Ebola test kits, visited Guinea and conducted technical training on utilizing the test kits to local government officials.

The two scientists also participated in the local campaign and cooperated in the provision of on-the-job training at the forefront of medical care. Thus, the Ebola test kits provided by Japan have greatly contributed to the early diagnosis of Ebola patients.



Nagasaki University Professor Yasuda (left) and Assistant Professor Kurosaki (right) inside a mobile laboratory. Behind them, a Guinean laboratory technician is using a rapid diagnostic test kit.

■ (2) Thermography cameras

Initially, the Ebola outbreak affected primarily the three West African countries of Guinea, Liberia and Sierra Leone, but soon spread to neighboring countries, with cases of Ebola infection being confirmed in Nigeria in July, Senegal in September, and Mali in October. Furthermore, secondary infections occurred among medical personnel from outside Africa (Spain, the United Kingdom, and the United States), who were previously engaged in the provision of medical care to Ebola patients.

Under these circumstances, there were growing concerns that the Ebola outbreak would cause significant economic damage to the entire African continent. These concerns resulted from the excessive reinforcement of immigration control by countries around the world as a quarantine measure to prevent



Thermography cameras measure the body surface temperature of multiple subjects simultaneously at the Felix Houphouët Boigny International Airport in Abidjan, Côte d'Ivoire. (Photo: Nippon Avionics Co., Ltd.)

the spread of Ebola, and the reduced movement of people, not just to and from the affected areas but also across the entire African region. In order to prevent the spread of the Ebola outbreak and the grave economic impact that would entail, it was important to establish reliable quarantine mechanisms, and to ensure the safe and secure movement of people.

The infrared thermography cameras produced by Nippon Avionics Co., Ltd., a subsidiary of NEC, are used at Narita International Airport in Japan. These cameras enable non-contact measurement of the body surface temperature of multiple subjects simultaneously, so their utilization is expected to prevent the spread of infection at quarantine, and to facilitate a safe and secure immigration control at busy airports.

As a measure to prevent the spread of infectious diseases, such as Ebola virus disease, Japan has provided these thermography cameras to seven African countries (as of August 2015), mainly in West Africa, such as Liberia. These cameras have been installed at places like international airports in each of the recipient countries, and effectively utilized in the quarantine operations during immigration control procedures.

As these examples demonstrate, Japan's advanced technologies contribute to human safety and security, and boost hopes that the free movement of people will be maintained and that the foundation for the further economic development of Africa will be strengthened.