

Technology plays vital role in detecting disease outbreaks

Under the revised International Health Regulations, governments have committed themselves to reporting outbreaks from the very outset and to confirming any reports of outbreaks in their country.

"An accurate diagnosis of the disease two months later doesn't help you to control the outbreak, particularly with avian influenza" said Dr Thomas Grein, Medical Officer, Alert and Response Operations.

Scientists can make diagnoses early and promptly thanks to technologies developed over the last twenty years in biological research. These tools can identify an infectious agent in as little as half an hour, and due to mass production, they have become more affordable for developing countries. For example, PCR (polymerase chain reaction), a technique that can be used to detect particular infectious agents. Technological improvements have allowed PCR machines to be made smaller and more robust.

"We can diagnose influenza and dengue fever using PCR. The tests are cheap, each one costs as little as US\$ 0.95," said Professor Leonard Peruski, Jr., from the US Centers for Disease Control and Prevention, based in Thailand.

But while the technology is good, Peruski said there is a shortage of skilled staff to do these tests in isolated and rural parts of developing countries, and re-training and quality control are often inadequate.

The toughest test for WHO's outbreak response was the emergence of a new disease, severe acute respiratory syndrome (SARS), in 2003. "WHO was able to mount an international response despite a very low budget and a small team," said Heymann.

Although WHO is widely credited with its role in coordinating global containment, Grein said the response was not easy as WHO was overstretched due to the global scale of the problem. At the time, email was the main means of communication between country offices and headquarters. "SARS was a nightmare," said Grein, recalling how thousands of emails flew around the world in an uncoordinated way.

Then, as now, WHO relies on Member States to confirm reports from GPHIN and other sources on disease outbreaks. But at the time of the SARS outbreak, Member States were only required to notify WHO of yellow fever, cholera and plague outbreaks under the International Health Regulations (IHR).

After SARS, it was clear to governments that the rules needed to be updated, something WHO Member States had already agreed to do in the mid-1990s. A revised version was developed and in May 2005 approved by the World Health Assembly.

The revised IHR (2005) require governments to report public health threats, in particular disease outbreaks and natural disasters, that could have an international dimension known as public health emergencies of international concern or PHEIC pronounced "phake". Health threats can also include chemical and nuclear accidents, laboratory accidents and bioterrorism.

Before IHR (2005), compliance was voluntary. Once the regulations come into force in June 2007, they will be legally binding. WHO's primary role is to support countries and maintain global health security through its global surveillance and response activities.

WHO is also charged with monitoring compliance of Member States. While there is no enforcement mechanism, there are strong incentives to comply.

"WHO cannot be both physician and police force. If we are perceived as the policeman, doors will be closed," said Rodier. "Countries will comply because of a sense of global solidarity in the face of a common threat, but also

they will comply because they prefer to maintain a good image and look responsible".

“We were astounded at how much information we could get ... But the information had to be verified, and incorrect information discarded.”

Dr Ron St John, Director-General of the Centre for Emergency Preparedness and Response at the Public Health Agency of Canada.



Two outbreak response workers from WHO gathering information in Angola in May 2005 about the Marburg outbreak.

WHO/G. Smyth

WHO is producing a new version of its global event management system to improve internal communications. This system would store the reports from GPHIN and other sources in a globally accessible database, and streamline internal WHO communications.

To tackle a major outbreak, such as an influenza pandemic, everyone at WHO headquarters, the regional and country offices will need to work together. "We are certainly not a military institution, but we need to learn from the military about operations, logistics and — to some extent — discipline. We must act as one," Rodier said. ■

William Burns, Geneva