

Openness is key in fight against disease outbreaks

New technology and real-time electronic media are vital to detecting outbreaks of infectious diseases globally, but more transparency is also needed. From June 2007 governments will commit themselves under the new International Health Regulations to report certain disease outbreaks and other potential global health threats.

When pneumonic plague struck Surat, Gujarat, India in 1994, thousands of people panicked and fled the city. “We were sitting in Ottawa watching CNN showing pictures of people fleeing,” said Dr Ron St John, Director-General of the Centre for Emergency Preparedness and Response at the Public Health Agency of Canada, recalling how news media were the first source of information on the outbreak for public health officials, including those at WHO.

The slow response to that outbreak and an Ebola outbreak in Kikwit in the Democratic Republic of the Congo the following year led to panic and unnecessary deaths. “We had no capacity to respond to outbreaks on our own, or even to deal with the information coming in. All we had was a fax machine. The switchboards at WHO were completely overwhelmed,” said Dr David Heymann, acting Assistant Director-General for Communicable Diseases and the WHO Director-General’s Representative for Pandemic Influenza.

New techniques were clearly needed to respond to disease threats, such as pandemic influenza, that could kill millions. In 1996, the then director-general, Dr Hiroshi Nakajima, asked Heymann to set up a new emerging infectious disease programme to deal with outbreaks.

In the age of real-time electronic media and television, journalists became a vital source of instant information that public health authorities could use to detect outbreaks, in addition to information from governments, nongovernmental organizations and health-care workers, said Dr Thomas Grein, Medical Officer, Alert and Response Operations at WHO.

The question was: how to search through the maze of thousands of reports filed by journalists every day? The answer came from Canada.

St John linked up with Dr Rudi Nowak from Health Canada, the Canadian health ministry, and they proposed the development of a computerized system that would collect raw news feeds from international news agencies such as Agence France Presse, Associated Press and Reuters, and scan these feeds automatically to find news of disease outbreaks.

Development work on the software began in 1997 funded by a Canadian government grant of 800 000 Canadian dollars (US\$ 500 000 at the time). The news filtering system St John and Nowak developed, known as the Global Public Health Intelligence Network (GPHIN, pronounced G-finn), went live in 1999 and scanned news feeds in English and French.

“We were astounded at how much information we could get,” said St John, adding that the system collects thousands of reports everyday. “But the information had to be verified, and incorrect information discarded.”

Nowak came to WHO in Geneva for two years to work with Heymann, Dr Guénaél Rodier, Special Adviser for Communicable Diseases to the Regional Director, WHO Regional Office for Europe, and Dr Mike Ryan, Director of the Department of Epidemic and Pandemic Alert and Response, in establishing

a team that would be responsible for verification.

Every weekday morning at 9am about 20 members of that team meet in the Strategic Health Operations



Morning meeting of outbreak review and risk assessment in the SHOC room.

WHO/C. Black

Centre, nicknamed “the SHOC room”, at WHO’s headquarters, to discuss outbreak reports that have come in and which ones need to be verified, by contacting WHO country offices, which, in turn, contact their host governments. The reports are also analysed by the relevant crisis centres set up at WHO’s regional offices.

Ryan and his team set up the Global Outbreak Alert and Response Network of 126 institutions across the globe. Its experts can be despatched to the field, where they work together with WHO staff from regional offices and headquarters to stem any outbreaks.

Before WHO and other subscribers receive the reports from GPHIN, these have been screened by a team of eight public health specialists in Canada.

The SHOC was opened in May 2004 with funding from the United States. After the death of WHO’s Director-General Dr LEE Jong-wook in May 2006, it was renamed the JW Lee Centre for Strategic Health Operations.

A new version, GPHIN II, which went live in 2002, scans newsfeeds in the four other official United Nations languages — Arabic, Chinese, Russian and Spanish — in addition to English and French, as well as in Farsi. A Portuguese service is in the pipeline. As well as WHO, other public health institutions and many governments subscribe to the GPHIN service.

“WHO cannot be both physician and police force. If we are perceived as the policeman, doors will be closed.”

Dr Guénaél Rodier, Special Adviser for Communicable Diseases to the Regional Director, WHO Regional Office for Europe.

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