

RECENT INTERNATIONAL, REGIONAL AND NON-GOVERNMENTAL DEVELOPMENTS RELEVANT TO DISEASE SURVEILLANCE, DETECTION, DIAGNOSIS AND CONTAINMENT

Submitted by the Implementation Support Unit

Summary

This paper summarizes recent key developments by international bodies and regional initiatives in the fields of disease surveillance, detection, diagnosis, and containment of infectious diseases. Particular focus has been placed on efforts to build capacity in these fields. It updates a similar paper prepared in 2004 on Mechanisms being implemented for Disease Surveillance by Intergovernmental Organizations and Significant Mechanisms being Implemented for Disease Surveillance by Non-Governmental Organizations (BWC/MSP/2004/MX/INF.1).

I. Drugs for Neglected Diseases Initiative (DNDi)¹

1. Formed in 2003, DNDi is a joint initiative of five public sector institutions (the Oswaldo Cruz Foundation from Brazil, the Indian Council for Medical Research, the Kenya Medical Research Institute, the Ministry of Health of Malaysia and France's Pasteur Institute); one humanitarian organisation (Médecins sans Frontières – MSF); and one international research organisation (the Special Programme for Research and Training in Tropical Diseases (TDR)). DNDi works with partners in industry, academia and NGOs in a "collaborative, patient's needs-driven, non-profit" manner to develop new treatments for malaria, visceral leishmaniasis, sleeping sickness and Chagas disease. DNDi attempts to balance the need for new medicines against stimulating research and development. Wherever possible, it makes use of and supports existing capacity in countries where target diseases are endemic and builds their capacity to deal with such diseases through relevant technology transfer. Physical upgrades of facilities directly related to clinical trials are taking place, including: building and renovating hospital wards, clinics, and health posts; renovating and re-equipping clinical laboratories; and training of health service personnel with particular emphasis on building expertise in clinical trial methodology, Good Clinical Practice and Ethics, patient treatment and evaluation, accurate diagnosis and follow-up by parasitology, and safety.

II. International Livestock Research Institute (IRLI)²

2. IRLI is dedicated to "bringing high-quality science and capacity building to bear on poverty reduction and sustainable development". It employs over 700 staff in about 80 countries and works in Africa, Asia and Latin America. Working through partnerships, IRLI attempts to build capacity in culture, process and technology "to support innovations at all levels, from individual livestock keepers to national and international decision-makers", including: providing information on livestock and poverty priorities and policies, impact evaluation, innovation processes and learning; identifying opportunities for the poor to benefit from increased consumer demand for livestock and livestock products; as well as dealing with diseases in livestock. The

¹ <http://www.dndi.org>

² <http://www.ilri.org>

ILRI works on combining "risk analysis from veterinary epidemiology and cost–benefit analysis to identify, test and adapt different options for animal disease control and food safety assurance that are more appropriate within context of developing countries". It is also developing products to support integrated disease control in production systems and improving animal genetic resources characterization.

III. Connecting Health Organizations for Regional Disease Surveillance (CHORDS)³

3. In 2007, at an international conference organized by the Global Health and Security Initiative (GHSI), health and disease surveillance specialists from Africa, the Americas, Asia, Europe and the Middle East identified three significant challenges to disease surveillance: the need to strengthen governance arrangements for disease surveillance networks; the necessity of efficient electronic knowledge management and sharing; and the a requirement to build relevant capacity. The outcome of this meeting became known as the Bellagio Call for Action⁴.

4. In response, the GHSI launched the CHORDS process to help "enhance the overall global capacity for infectious disease surveillance with a special focus on supporting nascent disease surveillance networks". It is designed to: form a community of practice for experts to share standards and distributing common knowledge; harness experience from disease surveillance experts in the animal, human, and agricultural sectors from around the world; drive connectivity and improve knowledge management using a hybrid system of advanced tools and technologies; assist participating countries to meet their legal obligations under the 2005 International Health Regulations; and make recommendations and generate support to sustain and develop regional disease surveillance networks. The current membership includes disease surveillance networks in East Africa, the Mekong Basin, the Middle East South-Eastern Europe and Southern Africa as well as international and regional health organizations, private sector research partners and specialists from around the world.

IV. PulseNet International⁵

5. PulseNet International is a network of disease surveillance networks that track foodborne infections. It has six regional networks in Asia Pacific, Canada, Europe, Latin America and the Caribbean, the Middle East and the United States. The networks enhance surveillance, provide early warning of, and reduce global, social and economic losses due to, food and waterborne disease outbreaks, emerging pathogens and acts of bioterrorism. PulseNet also contributes to the epidemiological investigation of outbreaks, facilitates the early recognition of disease clusters and helps to identify common sources for events through molecular surveillance. PulseNet partners with reference laboratories around the world and builds capacity for molecular disease surveillance (DNA fingerprinting of pathogens). It collaborates on the development, validation and implementation of standards and performs collaborative studies on the geographic spread of different pathogens. PulseNet International has developed protocols for working with seven diseases⁶. It hosts disease information databases which help in disease surveillance, stimulates research and encourages networking of relevant individuals.

³ <http://www.ghsi.org/projects/chords.html>

⁴ http://www.ghsi.org/pressroom/Bellagio_Call_for_Action.pdf

⁵ <http://pulsenetinternational.org>

⁶ *Campylobacter jejuni*, *E.coli* 0157:H7, *Listeria monocytogenes*, *Salmonella*, *Shigella*, *Vibrio cholerae*, and *Yersinia pestis*.

6. PulseNet International has identified a series of steps to improve global surveillance of foodborne diseases, including to: improve collaboration during international outbreak investigations; increase the number of regional networks and the number of participants in each network; achieve real-time subtyping and real-time communication in all regional networks; increase the level of communication between laboratory staff and epidemiologists at the national and international levels; strengthen collaborations and establish partnerships with other stakeholders for food safety, such as academia and the food industry, as well as non-profit national and international organizations; and improve the subtyping methods and develop molecular surveillance tools for more organisms.

V. ProMED Mail⁷

7. Relevant core activities of ProMED Mail were described in the background papers prepared for the 2004 Meeting of Experts⁸. Since then, ProMED Mail has been continually upgrading its technology and infrastructure – most recently with the support of assistance from Google.org. It has expanded its coverage with regional networks in East Africa and a Francophone network in West Africa. It has also been working closely with HealthMap to web automated and human driven disease surveillance. It has also been involved in organizing meetings in 2007 and 2009 under the banner International Meeting on Emerging Diseases and Surveillance, each of which included over 600 participants from over 60 countries.

VI. HealthMap⁹

8. HealthMap provides a geographical interface for a broad variety of disease related data sources with a broad geographic distribution. It provides real time information on the current global state of infectious disease and their effect on human and animal health. HealthMap makes use of information drawn from validated official sources (such as the WHO), from curated professional accounts (such as those found on ProMED Mail) and from media sources (such as Google News). This data is aggregated by disease and location using an automated text processing system and displayed in a user-friendly interface. HealthMap operates in a number of languages including Chinese, English, French, Portuguese, Russian and Spanish. It displays three categories of events: those with international significance; new and ongoing outbreaks; and specific warnings.

VII. Bill and Melinda Gates Foundation Global Health Programme¹⁰

9. The Global Health Program of the Bill and Melinda Gates Foundations (BMGF) was established to target those diseases and health conditions that cause the greatest illness and death in developing countries, yet receive less attention and fewer resources. The Global Health Program attempts to improve health in developing countries through: discovering new insights to fight serious diseases and other health problems; developing effective and affordable vaccines, medicines and other health tools; and delivering proven health solutions to those who need them most. They also support advocacy efforts to build awareness of global health challenges, develop

⁷ <http://www.promedmail.org>

⁸ BWC/MSP/2004/MX/INF.1

⁹ <http://www.healthmap.org>

¹⁰ <http://www.gatesfoundation.org/global-health/>

new ways to finance health programs and improve health data. To date, the Global Health Program has made almost \$10 billion of grants to projects involved with combating: malaria; HIV and AIDs; tuberculosis; vaccine-preventable diseases; polio; pneumonia and influenza; diarrhea ;as well as other neglected diseases. The program has also invested in the discovery of new scientific and technological breakthroughs as well as policy work and advocacy.

VIII. Google.org Global Health Programme¹¹

10. Google.org's Global Health Programme is designed to confront the increased risk posed by emerging diseases due to climate change, deforestation, increased international travel and trade and the new ways in which humans are interacting with animals. It has a *Predict and Prevent* initiative to help prevent local outbreaks of diseases from becoming pandemics. There is also an *Inform and Empower* initiative to improve health related public services. The *Predict and Prevent* initiative aims to move from a reactive to a more proactive way of dealing with infectious disease. Too often, "emerging diseases are generally detected when once they are already entrenched in the human population, and response systems are often slow and uneven". Google.org's work on addressing this problem fall into three areas: supporting efforts to improve capabilities to know where to look; supporting efforts to find threats earlier; and working to improve capacity to respond quickly. The *Inform and Empower* initiative aims to provide meaningful, easily accessible information to citizens and communities, service providers, and policy makers to enable them to develop home-grown solutions for providing better public services.

IX. African Field Epidemiology Network (AFENET)¹²

11. AFENET works to ensure "effective prevention and control of epidemics and other priority public health problems in sub-Saharan Africa". It works with ministries of health, non-government organizations, international agencies, private sector, and other public health agencies to help African nations enhance or develop their own applied epidemiology capacity. AFENET is involved with: strengthening field epidemiology capacity; enhancing public health laboratory capacity; strengthening surveillance systems for priority communicable and non-communicable diseases; and advancing the sharing of regional expertise in field epidemiology and laboratory activities. AFENET conducts needs assessments for epidemiological training; organizes residential training courses and in field training; facilitates research on new immunization strategies; develops tools and kits for use in the field; provides resources to support personnel; and can offer financial support.

X. Asia Pacific Economic Cooperation Emerging Infections Network (APEC EINet)¹³

12. APEC EINet is "dedicated to providing timely information via the internet on issues of emerging and re-emerging infectious diseases to promote better collaboration and communication between policy makers, health officials and commerce officials throughout the Pacific Rim". APEC EINet has six objectives: to improve public health emergency preparedness in APEC economies; to reduce economic risk in these economies through enhanced collaboration across sectors in preparing for epidemic diseases; to use advanced high-quality

¹¹ <http://www.google.org/predict.html>

¹² <http://www.afenet.net>

¹³ <http://depts.washington.edu/einet/>

network technologies and applications for secure communication, collaboration and visualization; to provide timely, reliable and accurate disease alerts and updated distance learning materials; and to strengthen working relationships among sectors within and across economies. In order to realize these aims, APEC EINet disseminates the latest news, journal articles, and notifications for emerging infections; fosters online information-sharing and collaboration through e-mail; organizes events to increase communication and collaboration; provides online learning tools; and explores the use of advanced networking technologies to improve communication and collaboration.

XI. Information Centre on Emerging Infectious Diseases in the ASEAN plus Three Countries¹⁴

13. The information centre aims to provide policy makers, researchers, programme managers, the media and civil society with the necessary information to improve health interventions and raise awareness of health-related concerns. The Centre operates primarily through its website, which has both restricted and public sections. The restricted section of the site is accessible to national focal points of member states and partners in the region. The public part of the website provides information on each of the major areas of focus for the center: disease surveillance data, including data for compulsory reporting; information resources, such as documentation that could assist efforts to prepare for or respond to disease events; good practices based upon regional or national experiences; and a directory of experts.

XII. European Centre for Disease Prevention and Control (ECDC)¹⁵

14. The ECDC was created to strengthen Europe's defences against infectious diseases and is charged with identifying, assessing and communicating the current and emerging threats they pose to human health. The ECDC works with national health protection bodies to strengthen and develop continent-wide disease surveillance and early warning systems. It also pools health-related expertise to develop scientific opinions about specific risks. The ECDC searches for, collects, collates, evaluates and disseminates relevant scientific and technical data; provides scientific opinions and scientific and technical assistance including training; provides information to the EU Commission, member states, community agencies and relevant international organizations; exchanges information, expertise and best practices and facilitates the development and implementation of joint actions; as well as coordinating the EU bodies involved in all these tasks.

XIII. European Medical Intelligence System (MedISys)¹⁶

15. MedISys is a real-time news alert system for medical and health related topics. It is designed to reinforce disease surveillance networks and enable the early detection of an attack with a biological weapon. It uses online information to "rapidly detect, track and assess threats so advance warning can be given". It processes over 20,000 articles a day from around 4,000 sources including 1600 new sources in 45 languages. It uses a dynamic statistical modeling technique to refine results, and categorizes articles into pre-defined medical topics in 25 languages. It also has several ways that information can be provided automatically to the user,

¹⁴ <http://www.aseanplus3-eid.info>

¹⁵ <http://ecdc.europa.eu>

¹⁶ <http://medusa.jrc.it>

including email alerts of low, medium and high severity events in real time as well as a daily summary report. MedISys compiles data on: airborne diseases; bloodborne diseases; food and waterborne diseases; hemorrhagic diseases; parasitic diseases; sexually transmitted diseases; vaccine preventable diseases; vectorborne diseases; zoonoses; animal diseases; and certain symptoms, including colic, coma, constipation, cough, diarrhea, fever, gastroenteritis, hemorrhage, pain and sneezing.
