WHO Documents Antibiotic Resistance, Polio, Ebola Outbreaks

World Health Organization (WHO) officials recently issued several reports with warnings on worldwide antibiotic resistance, a resurgence of polio, and a major outbreak of Ebola virus in West Africa:

- In April, WHO officials released a comprehensive report on antibiotic resistance, "Antimicrobial resistance: global report on surveillance," featuring data from 114 countries and providing a global overview as well as region-by-region analyses of drug resistance patterns. It calls drug resistance a "major threat to public health" and says that WHO is seeking "improved collaboration around the world to track drug resistance, measure its health and economic impacts, and design targeted solutions."
- In May, WHO warned that the recent spread of polio "constitutes an 'extraordinary event' and a public health risk . . . for which a coordinated international response is essential." The "over-riding priority . . . must be to interrupt wild poliovirus transmission . . . as rapidly as possible through . . . supplementary immunization campaigns with oral poliovirus vaccine, surveillance for poliovirus, and routine immunization."
- Through early June in West Africa, Guinea reported 351 cases of Ebola, including 226 deaths, while Liberia reported 11 deaths among 12 suspected cases of Ebola, and Sierra Leone reported 89 cases and 7 deaths, according to WHO officials. Meanwhile, this outbreak appears to be attributable to a new Ebola virus variant, according to Delphine Pannetier of INSERM and Sylvain Baize of Institut Pasteur in Lyon, France, and their collaborators. Details appeared 16 April 2014 in the New England Journal of Medicine (doi.org/10.1056/NEJM-Moa1404505).

Coping with Outbreaks

Jeffrey L. Fox

With their 10th anniversary looming, the International Health Regulations (IHR) of 2005 are gathering plenty of praise these days—a rarity for rules affecting practically every country on the planet. Thus, despite difficulties in implementing these rules and applying common standards to disparate countries, IHR 2005 is "widely accepted" among the nearly 200 countries that signed the document, according to Keiji Fukuda of the World Health Organization (WHO), which is charged with implementing the rules. He spoke during a two-day workshop, "Emerging Viral Diseases—the One Health Connection," convened by the Institute of Medicine (IOM) Forum on Microbial Threats and held in Washington, D.C., last March.

The IHR rules, which are meant "to prevent, protect against, control, and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade," require countries to "report certain disease outbreaks and public health events to WHO." The rules also require countries to "strengthen core surveillance and response capacities at the primary, intermediated, and national level. . . ."

The H1N1 influenza pandemic, whose initial outbreaks occurred early in 2009 first in Mexico and then in California, provided the first test of IHR 2005 and led to its first formal review the following year, according to IOM President Harvey Fineberg. He was one of 24 experts from as many countries who served on a World Health Assembly (WHAs) committee to conduct that review. One "special challenge" for the committee was to hold its meetings open to the public, heading off criticisms that "WHO was being secretive," he says.

The WHA committee came to several key conclusions about IHR 2005, according to Fineberg. First, the new rules "helped the world be better prepared" to cope with emerging diseases, even though many countries still fall short in terms of their core capacities for dealing with such emergencies, he says. Another issue is that, although IHR 2005 rules are binding, enforcement measures are lacking and, instead, depend on what can be negotiated with or cajoled from each country.

Barry E. DiGregorio is a freelance writer in Middleport, N.Y.

PUBLIC HEALTH

Rules from 2005 Ease Matters for Officials Coping with Outbreaks

Jeffrey L. Fox

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WHO takes great pains not to embarrass individual countries for how well or poorly they “measure up,” and this low-key approach ends up being a “core problem,” Fineberg says. Although the idea of WHO helping in efforts to assess a country’s capacity to deal with emerging infectious diseases “makes sense, national governments don’t like it,” Fukuda adds, noting that only about 20% of the countries have the appropriate capacity. “WHO is well-positioned to help with quality assessments, but we haven’t found the right way to achieve the necessary political balance.”

Another looming issue is how best to deal with the Convention on Biological Diversity (CBD), an international agreement from 1992 that was never intended to deal with public health issues. Nonetheless, some of its provisions bump into matters concerning IHR 2005, particularly when it comes to sharing of biological materials that, for example, might prove critical for the development of diagnostic tests and vaccines. “What can you do?” Fukuda asks. “This framework [the CBD] is seen as being ‘over there,’ having nothing to do with health, but we realize it does.”

Jeffrey L. Fox is the Microbe Current Topics and Features Editor.

NEW IN ASM JOURNALS

Freely Diffusing Topical Antifungal Agent Fixes Infected Toenails

David C. Holzman

The candidate antifungal drug efinaconazole is proving effective against toenail infections. The drug diffuses relatively freely through keratin-rich nails and binds less strongly to keratin than do other topicaly applied antifungal drugs, leaving it free to fight the fungus, according to Keita Sugiura of Kaken Pharmaceutical of Kyoto, Japan, and his collaborators. “This study suggests that . . . low keratin affinity is needed for favorable penetration and retention of antifungal activity within the nail matrix,” he says. Details appeared online 21 April 2014 and will be printed in the July 2014 Antimicrobial Agents and Chemotherapy.

Because topical antifungal drugs so often fail to cure this condition, physicians sometimes prescribe oral antifungal drugs such as terbinafine and itraconazole for some of their patients with stubborn cases of onychomycosis. However, Sugiura points out, this approach “is limited” because such drugs can damage the liver or may interact with other drugs that patients are taking. Although topically applied antifungal drugs such as ciclopirox and amorolfine have “a favorable safety profile,” he adds, “their cure rates are considerably lower.”

Sugiura and his collaborators tested human nails to find how well the drug diffuses through keratin-rich nails. Small 16 mm² squares from commercially available toenail material (who knew?) were mounted in Franz diffusion cells to measure how quickly several antifungal drugs pass through that material. Efinaconazole proved speediest, racing through the mounted nail squares within the first day, while ciclopirox took six days and amorolfine have “a favorable safety profile,” he adds, “their cure rates are considerably lower.”

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Of several drugs tested, only efinaconazole inhibited fungal growth under nails in vitro, according to Sugiura. He and his collaborators also tested the fungicidal activity of several topical antifungal products in a fluid keratin medium that is designed to “mimic the keratin-rich environment of the nail plate and nail bed.” Without a solid matrix to block the drugs, efinaconazole proved slightly more potent at killing...