

A conversation with Dr. David Heymann on February 17, 2014

Participants

- David L. Heymann, MD – Chair of the Health Protection Agency, UK; Head of the Centre on Global Health Security at Chatham House; former Assistant Director-General for Health Security and Environment, World Health Organization (WHO); Vice President, Mérieux Foundation
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Note: This set of notes was compiled by GiveWell and gives an overview of the major points made by Dr. David Heymann.

Summary

GiveWell spoke with Dr. David Heymann as part of its investigation of biosecurity. Conversation topics included: appropriate approaches to pandemic preparedness and public health capacity more broadly, the current state of preparedness, and how philanthropists might be able to help in this area.

General public health capacity versus targeted pandemic response

Improving public health systems around the world would help with both treating ongoing health concerns and reducing the likelihood of future crises, so philanthropists and international institutions should focus there, rather than specifically on pandemic preparedness. While there is considerable investment in epidemiology training, especially by the CDC, the task of strengthening laboratory capacity within individual countries does not receive adequate funding despite the benefits it offers. The CDC, through its global disease detection program, has strengthened selected public health laboratories in some developing countries and, through its recently announced effort to strengthen global health security, is planning laboratory strengthening in 30 or so additional countries.

Effective public health labs on the national level provide a country with the ability to rapidly identify and monitor the kinds of significant health risks that can give rise to pandemics before they become international emergencies. At the same time, the existence of these lab facilities allow for multi-center studies on a number of new and important interventions that could benefit from being tested in new settings.

Epidemiology as strategy

Proper training in epidemiology provides medical professionals with the expertise to:

- Maintain a proper alert system when patients first present with dangerous infections

- Know and collaborate with the proper authoritative testing centers to confirm diagnoses of high-risk diseases
- Coordinate a mass response to treat and contain outbreaks, including teaching other personnel what they need to do

The Centers for Disease Control and Prevention (CDC) offers highly effective training in epidemiology that provides comprehensive instruction in these areas in two years. By better equipping medical communities to respond to contagion and epidemics at early stages, this training allows national public health organizations to identify potential pandemics much earlier and respond more effectively at the point of outbreak rather than trying to limit the contagion after the fact.

Strengthening the capacity of public health laboratories

Many countries, especially poor and developing countries, lack public health laboratory facilities with the requisite capacity to serve the health issues of the local population, diagnose local problems, and monitor for serious community health risks. Improving the capacity of public health laboratories on a country-by-country basis is an ongoing concern for multiple groups and agencies.

The Mériex Foundation, where Dr. Heymann currently serves as Vice President, focuses on one country per year, finding partners locally and then providing expertise in setting up, provisioning and organizing public health laboratories, with ongoing support for five years. Rather than replacing hospital or clinic facilities, these labs can act as reference labs, providing supplementary testing services to the rest of the healthcare network. This project is continuously looking for partner organizations in new countries.

As described above, CDC has a similar laboratory strengthening program, and its expansion will contribute to stronger national public health. The CDC initiative is a response to the requirement, under the International Health Regulations, that all countries develop core capacities in public health.

Improving diagnostics

Improving diagnostics is very useful for both broad public health needs and pandemic preparedness. Point-of-care testing (POCT) for different health issues is a prime example of an intervention that could benefit from multi-center study. POCT also has the potential to reinforce effective public healthcare in both every-day and emergency conditions. Diagnostic procedures, even for high-risk health problems, can vary significantly. Simply verifying a diagnosis of polio might take 5-7 days at a remote clinic due to limited access to remote lab facilities. A facility with adequate POCT polio diagnostics could make the same determination in roughly twenty minutes.

Benefits and limits of focus on pandemic and endemic disease

Many public health facilities around the world benefit from international funding and support, but they often receive support on the condition that they focus on particular healthcare issues

While attention to emerging infections like severe acute respiratory syndrome (SARS) and new flu strains is important, many efforts to respond to them concentrate on the pathogens specifically, attending more closely to the changing genetic structure of a disease than to the epidemiological context of an outbreak. Large new outbreaks can bring much needed attention to public health, but the concern over the specific disease can translate into a narrow focus on only that disease without addressing underlying shortcomings in public health policies and resources.

The question of why individual outbreaks are so deadly is not always resolved by the study of a particular strain of the disease in the laboratory. Epidemiological characteristics of the disease must also be understood.. For example, circumstances in the affected human population can make a large difference in the spread and lethality of a disease. While recent pandemics, in particular flu pandemics, offer an important area of study, a comprehensive study requires examining more than just the flu virus – researchers should be accounting for epidemiological factors as well. The reason why the worldwide flu pandemic of 1918 was so deadly is still not completely understood. The role Southeast Asia has played in some of the more recent flu strain pandemics has brought more attention to the region's large populations of people and livestock living in close proximity to each other but, again, this is only one factor of many. Public health efforts must balance narrow focus on target issues with making national health infrastructures more robust.

Dual-use research as a security concern

As research progresses on especially dangerous infections, there has been increased concern about publishing new findings and/or continuing research that could arguably be used by rogue scientists to create or deploy a biological weapon. Dr. Heymann believes that this bias is misguided for several reasons:

- Hindering the free sharing of information within the field decreases the progress made toward understanding vital health issues and developing better responses.
- If rogue scientists are interested in obtaining this kind of existing information, they will almost certainly succeed regardless of restrictions on research and publication.
- Stringent rules against publication create a false sense of security because many countries simply cannot enforce such rules.

The preferable method for addressing the issue is to develop and maintain a robust ethical framework within the scientific community for how to treat sensitive research. The real mechanism of enforcement lies in scientists themselves insisting that their peers and institutions adhere to these standards.

Gaps in compliance with the International Health Regulations

Strong international standards, described in the International Health Regulations, lay out the skills and abilities needed for proper epidemiology and laboratory work. Methods for observing and verifying these standards exist, but require access and objectivity. Right now, assessment of compliance with standards is left almost entirely up to countries to self-assess, which may lead to overoptimistic or inaccurate assessments of country capacity. Political and budgetary considerations can easily pressure authorities in countries with low capacity to overestimate their facilities.

At present there is no robust third party to investigate and report objectively to bilateral donors or the public as a whole on the quality of laboratory capacity.

The WHO maintains strong standards and norms for the conduct and protocol of medical professionals and is respected for this around the world, but it lacks the human resources to act as an agent for monitoring and review of medical facilities around the world.

The US State Department has begun exploring the question of public health laboratory capacity in other countries, and some groups within the department believe that there needs to be an effective third party that can perform external reviews of laboratory capacity and provide the global health community with objective assessments. Dr. Heymann believes this may be an area where a philanthropist could help advance efforts, though the U.S. government or others may address the challenge before a philanthropist could intervene.

Funding opportunities

Both building lab capacity and assessing lab capacity independently are issue areas where there is still a significant gap. Well-organized private support with WHO collaboration could help significantly. Supporting CDC-like epidemiology training in other countries could also be very helpful.

Laboratory capacity needs would vary from country to country, mostly based on population. For example, while a small African country could likely address most of its public health needs with a single, properly equipped national public health laboratory, India may see significant health benefits from having one in each state. Private support could be especially effective in countries where direct involvement by USAID or other US government-backed agencies would be problematic for political reasons.

Other people to talk to about these issues

- Scott Dowell — Director of Division of Global Disease Detection & Emergency Response, CDC Center for Global Health

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