A global player for public health

An interview with Tikki Pang, Director of Research Policy and Cooperation at the World Health Organization

EMBO reports (ER): The SARS epidemic was brought under control with the help of the WHO [World Health Organization]. The disease came out of nowhere and spread rapidly. Could it happen again?

Tikki Pang (TP): I think this will most likely occur again in the future. Exactly where and how and involving what kind of agent, I don't know. But there is the potential for this to happen again, that's for sure. I personally think that population pressures and the entire process of globalization are contributing to the appearance of emerging pathogens. Deforestation, climate change, increased travel, speed of travel, crowding, proximity between animals and humans—they all contribute, too. So there is definitely a higher probability of something like SARS happening again in the future—from a microbiological perspective, that's a given.

ER: The WHO had a major role in tackling SARS, and pretty much scored on all points. Do you think that we got away lucky this time?

TP: No, I don't think that we were just lucky. We built on past experiences and, with the cooperation of the international scientific community and national governments, we were actually quite well prepared. There have been quite a few such situations in the recent past. I can cite the example of the Nipah virus outbreak in Malaysia in 1998, which was exactly the same situation: an unknown pathogen creating a severe disease with high mortality. There was another scare with avian flu in Hong Kong, and we had set up a global surveillance network that was immediately put into action. The striking thing is that the [SARS] pathogen was identified in two weeks and it was fully sequenced in a month, whereas with HIV/AIDS in the early 1980s it took two

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years to identify the virus. The identification of the SARS agent could not have been done without the support of the international scientific community and the national governments. That is the way the WHO works. We do not have laboratories with full-time staff doing cutting-edge research. We're basically an intergovernmental agency and our 'power' is in convening countries and scientists and institutions to work together, such as the CDC [Centers for Disease Control] in the USA and the labs in Hong Kong, Canada and Holland, for example, which all played a major role in the SARS epidemic. So, we were prepared and we reacted in the way that we always knew we would. One of our major early concerns was if SARS was causing so many deaths in Singapore, Beijing, Shanghai and Toronto, what would happen if this virus got into Africa or India, where the health care facilities are not as advanced? We would've had a major disaster. This was one of the reasons for our strong reaction. We were maybe a bit fortunate that the movement of people and air traffic between China and Singapore and Africa is not as high as it is within Southeast Asia. But in general, we were prepared for SARS.

ER: In response to SARS, the United Nations granted the WHO broader powers to deal with future epidemics. Do you think this could cause political friction, given how some countries, such as Canada, reacted to the WHO's travel warnings during the SARS crisis?

TP: It is important to have a certain amount of clout, but in terms of enforcement, it has been and will be done in close consultation with our 192 member states. Now, after the SARS epidemic, there is going to be a review of the international health regulations within the WHO. And I can imagine that this will be discussed extensively with the member states in the next year, to update regulations and determine how they can be enforced. In other words, it will not be a unilateral imposition on the member states, that is not how we work. Whatever we do in terms of actions is always endorsed by our member states. Yes, we do need some more clout, but that is something that the countries would want to see. Canada was of course affected. But other countries such as the USA were not affected as badly and would perhaps ascribe that to the fact that we did impose restrictions. The idea is to discuss these proposed 'extended powers' of the WHO openly and transparently with all the member countries, and come to a set of regulations in such a way that they are acceptable to everyone. Of course, you can't please everybody, and there will be political ramifications in terms of reduced autonomy of countries. But if you look at the ways some countries reacted, with some being less transparent than others about sharing information, the general feeling globally would be that it is a good thing to ensure that all countries share the information they have on any infections and outbreaks of disease. Given the political and economic implications, we do need to appeal to altruism, in that you don't just think of your own personal situation, but of the

people surrounding you, too. Perhaps the issue is not one of having more 'power', but more of the WHO being seen, and accepted by all, as the major international agency dealing with global health issues.

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ER: The WHO has also issued regulations regarding a ban on advertising, and stricter labelling of the health dangers of tobacco. Does that mean that the WHO is increasingly becoming a political and economic power?

TP: The way we see it, and always will, is primarily from the health perspective. The political and economic implications are secondary to health. It just so happens that some of these actions involve major consumer items and multibillion-dollar industries. There are well-documented attempts by the tobacco industry to actually sabotage what we are doing and try to discredit the WHO. Another example is the recent report on sugar levels in the diet. The Food and Agriculture Organization and the WHO produced a report that recommended that refined sugar should not be more than 10% of your diet. That was immediately challenged by the sugar lobby in a leading developed country, which cited another report that said it should be 25%. I don't think you need a PhD to work out that 25% sugar in your diet is absurd, but once again there was political pressure to withdraw the report. But full credit to our Director General [Gro Harlem Brundtland], she held the line. Basically, we are a global advocate of actions for better health, based on strong scientific evidence. And if we need to ruffle a few feathers, that's part of the process. But first and foremost, our mission is to improve the health of people all over the world, especially poor people. So if it means taking on the food industry in the case of sugar, or the tobacco industry in the case of the Framework Convention [on Tobacco Control], this is nothing we will shy away from.

ER: As an advocate for the health of poor people, the WHO is very active in addressing 'neglected diseases'. Do you see an

increasing role for researchers in the developing world in this area?

TP: Absolutely. I see a lot of emphasis on neglected diseases, especially malaria, tuberculosis [TB] and HIV/AIDS, especially in the context of the Millennium Development Goals. The Global Fund to Fight AIDS, TB and Malaria is also pouring lots of money into developing countries, and for the first time they will have a research component into some of these activities. We put a lot of emphasis on research in the three neglected diseases that I mentioned, but tropical diseases in general are still an issue: leishmaniasis, Chagas disease and dengue fever are all priorities with the WHO. From a personal perspective, typhoid is another problem in developing countries.

ER: It's still a very expensive process to develop a drug and test it. The developing world can't manage that on its own.

TP: You're right, and that's why people have looked at other models of developing drugs that the major pharmaceutical companies are not interested in because of limited profitability. Good examples are the public-private partnerships in malaria and TB that the WHO has had a major hand in putting together. The MMV [Medicines for Malaria Venture] and the Global Alliance for TB drug development have both taken the approach of public-private partnership, rather than trying to convince big pharma to get involved. The idea is to develop an alternative model by bringing private sources of funding, like venture capital, together with the public sector that's doing the research, and trying to accelerate the development process. Another good example is IAVI, the International Alliance for AIDS Vaccine, that has succeeded in bringing a candidate AIDS vaccine from basic research to clinical trials in less than two years, and for much lower costs than traditional drug development. So there are models that are being currently tested for overcoming the reluctance of the big pharmaceutical companies to take on these issues.

The other aspect is improving the capacity of developing countries to actually do some of these things themselves. In the long term, that may even be the better way to go, particularly with advances in genomics, especially pathogen genomics. In maybe two or three years, 95% of all the known human pathogens will be completely sequenced. Now, with much of the genomic pathogen

data available in the public domain, you could develop capacity in bioinformatics and data mining in developing countries. And some countries already have a viable pharmaceutical industry—for example, India, China, Indonesia, Brazil, Cuba and Vietnam have these capacities. If they can form a consortium and use the power of genomics, indigenous bioinformatics capacity and indigenous pharmaceutical industry, they could make a tremendous difference in making some of these drugs available. These are countries that have a vested interest in developing these products. Personally, I think that is the way we should be focusing our attention, in addition to the public-private partnerships.

ER: Given that the knowledge and expertise is still based in the First World, is there the danger that these partnerships are imposing First World solutions on Third World problems?

TP: Yes, I agree that there is a risk of this happening. But, as I said, if the developing countries themselves can apply their perspective on the problem, use their own experience with those diseases, and couple that with the capacity to utilize the genomic data, they will be able to evaluate solutions based on their own experience, rather than, as you said, having solutions being imposed upon them by people who have no idea of the realities of the disease. In the initial stages, you do need linkages with First World centres of excellence to ensure that advanced technologies such as bioinformatics, data mining and microarrays help you identify which pathogen genes are being expressed in a patient. That would clearly need some capacity building and transfer of technology, but once that initial hurdle is taken, my vision is that, in the future, researchers in developing countries will be able to contribute in their own right to a better understanding of these diseases. They will not be second-rate players who are just receiving and utilizing technologies developed in the West. By virtue of their own insights and knowledge of the disease conditions in the real world, they will be able to contribute on an equal footing.

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ER: I could see this working in South America and Southeast Asia, but do you think this approach could work in sub-Saharan Africa?

TP: In this area, Africa's capacity unfortunately is still behind Asia and Latin America. What is true though is that all the attention on diseases that affect mainly sub-Saharan Africa is going to have an impact on national governments, in terms of building capacity in their own countries. I see some fairly encouraging

developments in African countries getting together to overcome this lack of capacity. For example, 20 or 30 African countries formed an African health research forum in Arusha [Tanzania] last year that aims to address some of these problems and improve health research capacity. At the higher political level, the development of NEPAD, New Partnerships for African Development, is another potentially powerful regional networking activity to give more political support. It's

really a matter of building capacity at all levels, not just in research, but also in health systems, in the delivery of health care. It's a major challenge.

ER: The advances in computer and information technology have led to a growing technology gap between the developing and the developed countries. Are you confident that this will not happen with the genomics industry?

TP: No, I think that the information technology revolution will actually help developing countries to become more equal players in taking advantage of genomics data. Having said that, I'm well aware of the fact that 95% of internet connectivity is in the developed world. And, for example, 95% of internet connectivity in Africa is in South Africa. So there are clearly parts of the world that do not have access to the World Wide Web. We're working with other organizations to develop alternative methods of access, using satellites and handheld radios to provide access to information that is not web-based. But as far as maximizing the potential of genomics, I think the information technology has been beneficial.

ER: Do you see intellectual property protection as a potential hurdle in neglected disease research, given that an increasing number of genes are being patented by biotech companies in the First World.

TP: The whole issue of innovation and intellectual property rights is a major topic, and it was actually one of the agenda items in the World Health Assembly just a few weeks ago. We've come up quite clearly on the patenting of genes, but there are also other areas that could affect drug development. Once again, this is where we really need to tread very carefully because of the potential implications for a whole range of players, and we need to work with other United Nations organizations that have more technical experience in these areas. That includes WIPO, the World Intellectual Property Organization, the WTO [World Trade Organization] and maybe even UNESCO [the United Nations Educational, Scientific and Cultural Organization] in terms of scientific research in general.

The position we took in the last World Health Assembly was that it really requires a lot more dialogue as to what the implications are of genes being patented. Of course, the pharmaceutical industry needs to be involved in this dialogue. There are some alternative models to patents, for example. Other possibilities are the pharmaceutical industry relaxing patents for certain diseases. The issue of tiered pricing is another idea that we

discussed, and it's actually been applied in the area of vaccines.

ER: With genomics playing an increasingly important role in research in developing countries, should you also tackle the ethical problems, such as informed consent or patient participation in research, as early as possible?

TP: Absolutely. Developing countries need to be aware of these ethical issues, otherwise they won't be aware of the implications and risks. And this is why we recommend in our report [Genomics and World Health] that governments of developing countries first build their own capacity in the ethics of genomics and of biotechnology in general, such as ethical review committees. Second, it means education of society in general and most importantly of the medical professionals. These concepts are new for many practising physicians in both developed and developing countries, and they need to understand not only the ethical issues but also the scientific advances and their implications. We're investing quite a bit on capacity building in ethical review in developing countries. We actually created a separate unit last year called Ethics in Health that is involved in those areas.

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ER: You said that physicians in developing countries should be educated about scientific advances. What about the scientists in basic research—should they also be more aware of the applications of their work?

TP: Yes, and it is actually working both ways. You clearly need scientific research at the highest levels. But educating scientists to give some thought about how their research is going to be used, that would be even better. In terms of output that research institutions produce, which is

measured mainly by publications in high-impact journals, that is quite different from what we measure, which are health indicators such as reduction in infant or maternal mortality or the incidence of specific diseases. It's a matter of how do you make one influence the other in such a way that it's complementary.

ER: So you're saying that research institutions and health care organizations should cooperate more closely in the future?

TP: Yes. The people who deliver health care understand where the gaps are and then inform the researchers. Of course, most of the time we're talking about basic biological research, but there are other areas of research that people tend to forget. Often, it's not a problem that you don't have a good drug, but you don't have the knowledge about how to deliver it in the most optimal way. We're talking here about operational research, about people's behaviour, about cost-effectiveness of various delivery modes. Many people have this misconception that research is all about biomedical or clinical research, and yet if you want to ensure that it is used, there are other areas which to me are just as important, but sometimes short-changed. Economists, sociologists, psychologists, health services and health delivery researchers, they don't get published in *Science* or *Nature* or *Cell*, and in fact sometimes they don't get published at all. Ultimately, you can produce the best research in the world, but if somebody in the Ministry of Health does not decide that it will be implemented, you'll never see the benefits. And then the question is, how do these policy makers actually make their decisions? They are not scientists, they don't read *Science*, they don't read *Nature*. In the end, synergy always means that the two together have a bigger impact than the two separately. And I think there is a potentially powerful synergy between research institutes and an organization such as the WHO that applies the knowledge for improving the health of people, especially in the developing world.

ER: Dr Pang, thank you for the interview.

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