Trilateral Seminar on R&D Policies Related to Emerging and Re-emerging Infectious Diseases

E − Plenary Session IV: *Implementation of Effective Policies*

Invited Presentations

Panelist Presentations

Implementation of Effective Policies on Emerging Infectious Disease

Dukhyoung Lee, MD, PhD
Korea Center for Disease Control and Prevention

Background

After SARS that resulted in 8,098 cases and 774 deaths in 26 countries during a few months in 2003, and with the emergence of multiple cases of human infection of H5N1 avian influenza in Thailand and Viet Nam in early 2004, the World Health Organization (WHO) jointly with the Food and Agricultural Organization (FAO) and the World Organization for Animal Health (OIE) held a three-day consultation in May 2004 to identify the factors to allow diseases to jump from animals to humans as well as to improve surveillance systems for their monitoring and control. The meeting intended to identify the next candidate infectious disease that would affect global public health as seriously as SARS. The participants were known to agree that the next candidate must originate from animal infection and the most probable disease would be avian influenza.

Thanks to basic concerns shared by all the member states and with the guidance and initiative of WHO and its chairperson Ms. M. Whelan, Honorable Ambassador of Ireland to the Mission of Geneva, Revised International Health Regulations (IHR 2005) were finally agreed in the resumed second Inter Governmental Working Group meeting. It was adopted at the World Health Assembly in May and notified to Member States as of 15th June. This will be in effect in June 2007, two years after the official notification by the Director-General to the Member States, but basically the new IHR wants to be effective as early as possible. The theme of this revision is effectively and efficiently controlling the public health threat of international concern including the threat of emerging infectious diseases.

According to a 14th October WHO Press release, we are still in Phase 3. But it might be understood that human-to-human infection was implicated in Viet Nam cases in September 2004 and since then actually it has been moved to Phase 4 (human cases of avian influenza infection appear in a small cluster but the probability of pandemic is low). Anyway the pandemic is nearer – it is only a matter of timing and severity. I believe that all the participants here are well aware of the fact. Quotes from Richard Falkenrath who until recently served in the Bush administration as deputy Homeland Security adviser appear to summarize the American perception on the pandemic. "Flu pandemic is the most dangerous threat the United States faces today"; "It's a bigger threat than terrorism. In fact it's bigger than anything I dealt with when I was in government." And I can skip the details of the assessment or speculation surrounding the damage of coming pandemic.

Thanks to the pandemic influenza issue, now global cooperation and the preparedness at national levels on avian and pandemic influenza is being enhanced and this will provide a template for global cooperation to address all types of public health emergencies.

The International Partnership on Avian and Pandemic Influenza (IPAPI), advocated by the United Nations and the President of the United States in September 2005, is committed to protecting human and animal health as well as mitigating the global socioeconomic and security consequences of any influenza pandemic. The partnership seeks to work with all concerned states to limit the spread of H5N1 avian flu and any other highly pathogenic influenza strain by taking all necessary steps to prevent, prepare for, and respond to the growing threat. The IPAPI is expected to make further concrete actions in the APEC Summit in November in Busan.

Local Situation

The public health system in Korea in general is quite robust and efficient. But it appeared to have focused on water-borne disease like cholera until early 1990's. Since then, Korean health authority have tried to reshape its system so that it would deal with emerging and reemerging infectious diseases based on science and firm evidence.

During three and half months, from March to June 2003, in Korea, three suspected cases and 17 probable cases of SARS were reported. With the experiences managing SARS, the public health system has been reinforced markedly and the flexibility of the system has become improved.

Korea experienced highly pathogenic avian influenza I in late 2003 to early 2004. I believe the Ministry of Agriculture controlled the outbreaks effectively and successfully and we made intervention to prevent human infection from avian influenza. I believe that it was successful and no human infection was identified. And I believe that the most precious outcome in the control and response was establishment of intimate cooperation between animal health and human health authorities.

Short range measures

The legal basis of emerging infectious diseases in Korea is the Communicable Diseases Prevention Law. A scope of emerging infectious diseases was included into the disease category for notification in its 2000 revision. During the SARS response in 2003, another revision enabled the national or local health authority to provide compulsory quarantine for a suspected case of specific concern.

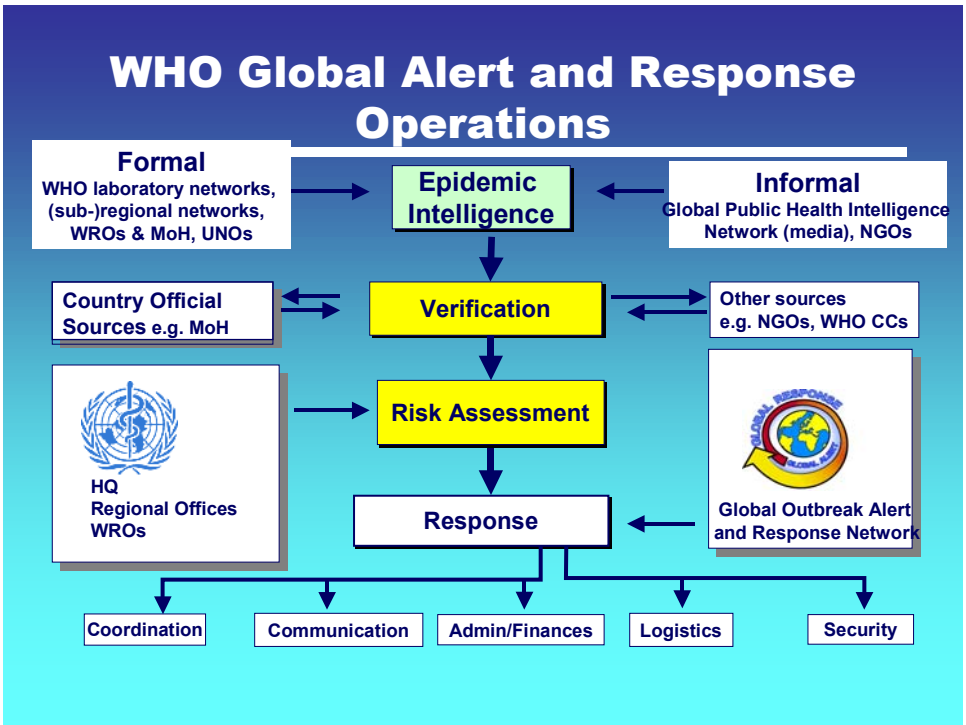
The organizational and functional scheme of the response to the public health threat of international concern was reshaped due to global SARS outbreak. Multiple related Ministries and the National Security Council became involved in case of global and

national public health threats. Thanks to SARS, the need for having technically advanced and leading national organizations was highlighted. Hence came the Korea Center for Diseases Control and Prevention (KCDC) in January 2004. In making its transition from the former Korea National Institute of Health (KNIH) to KCDC, quarantine management, bioterrorism preparedness, and bioprotection research activities were expanded by establishing new divisions. The KCDC made another organizational change on October 21, 2005. We consolidated surveillance and response functions within KCDC into one center known as the Infectious Diseases Response Center. The Center is comprised of five teams – planning and coordination, surveillance, epidemiological investigation, international health services, and bioterrorism preparedness. Provincial health authorities are expected to follow suit, but it will take time.

The main strategies of the preparedness for public health threat of emerging infectious diseases are: first, maintaining a basic public health scheme with capacity building, and second, establishing disease-specific supplement. With the emergence of the pandemic influenza threat, rather dramatic and active intervention has been proposed, sort of source containment. I understand that the main theme of the revised IHR shares the same direction with the above-mentioned strategies. For the purpose of national and regional and global public health security, the pertinent changes and activities must be encouraged even before it is legally effective and before each member states finish redesigning the related legal scheme. We are to do it quickly.

Surveillance systems for infectious diseases have been markedly improved in recent years with the help of information technology. Other than diseases notification we operate a sentinel surveillance system for some diseases including emerging infectious diseases. More than 2000 health facilities are involved in the sentinel surveillance system. The results of surveillance are posted on Communicable Diseases Weekly Report (CDWR) and Communicable Diseases Monthly Report (CDMR). And diagnostic services in relation with the notifiable infectious diseases are well functioning in the national reference laboratories, the provincial institutes of health, and major hospital laboratories. Infectious disease notification rates in general appear unsatisfactory for now but it will grow soon. Diagnostic capacity for emerging infectious diseases in particular will be improved with active international collaboration on specimen sharing and testing techniques. And we operate expert network and symptom surveillance on hospital emergency rooms in order to get clues on the new emerging diseases and bioterror events.

I think most of the participants here are quite familiar with the following figure showing the scheme of GOARN (global outbreak alert and response network). The approaches herein apply in the national surveillance system, too.



As to general medical system, accessibility is very high, and human and logistic resources are in a sufficient level. Usually the system takes care of infectious diseases quite effectively. But if we look into the system in dealing with infectious diseases of social concern (or panic) like some emerging diseases, or in time of disaster management, much should be improved. Our Hospital Association is trying to further elaborate hospital operation systems as a whole and at the intra-hospital level in times of national emergency.

When it comes to emergency, most people seem to be concerned for stockpiling first. Seeing is believing. "…blessed are they that have not seen, and yet have believed. (John 20.29)." As to Tamiflu, the government will seek consensus as to the optimum amount of stockpiling and will add the stockpile as approved by the national consensus consistent with its budget. And it will prepare utilization plans accordingly.

I thought the consensus would have been made by the time of my presentation. But a momentum developed in late October this year. The Roche Company gave the world the Pandemic Program by way of sub-licensing of Tamiflu production. About 20 pharmaceutical companies in Korea applied for the sub-license. And I think the progress of the sub-licensing will determine the mid-term and long-term national supply of the antiviral. And the availability of other effective antivirals in the international market and candidate antivirals also shall be considered. I see that procurement of the other stockpiling items like personal protective equipments is no problem.

In recent years seasonal influenza immunization has grown significantly. This year's supply of the vaccine amounts for about 17 million doses, covering one third of the population. Now Korea is number two country in influenza immunization rate followed by Canada. And the seasonal influenza immunization will grow as far as the supply is guaranteed.

In the plan of action on public health emergencies the following additional issues also should be dealt with thoroughly. Public communication scenario, measures to increase social distance, disinfection measures – hand washing, table top exercises, manpower mobilization to name a few. We are now making plans in details and will post our revised plan in an English version on the relevant website by early next year. I think that the plan basically adopts the guidelines of the WHO on pandemic influenza preparedness, and takes some consideration of local factors.

Now international and regional contribution and collaboration have become a prerequisite for every country. We should make sure to share transparency in reporting, immediate sharing of epidemiological data and samples, and to collaborate in capacity building in with in-country and international partners.

I think that the global strategy of the WHO alert and response efforts shown in the following figure applies the same way to national and regional circumstances. Actually the words 'alert or surveillance and response' are self-explanatory and summarize the basic public health measures in the simplest way. The ultimate goal is global health security. Containing known risks, responding to unexpected threats, and improving preparedness are three pillars supporting global health security. Effective policies dealing with emerging infectious diseases are targeted to containing known risks and improving preparedness. If both pillars are solidly established, we can respond to unexpected threats of any emerging infectious diseases quite successfully. Some short range measures to establish these pillars should be prepared and maintained. And part of them might be handed over to longer term measures. We are to try our best to minimize the handover.

Longer term measures

Resource allocations, dedication of domestic resources (human and financial), improvements in public awareness, and development of economic and trade contingency plans might be dealt with as longer term measures.

Core capacities in major international airports and ports as required by the new IHR should be established and maintained effectively.

The issue of pandemic vaccine has not been discussed sufficiently yet. We know that the U.S. Department of Health and Human Services ordered 15 million doses of investigational candidate pandemic influenza vaccine, Sanofi-Pasteur. When one of their executives visited Korea proposed KCDC to take a similar approach. If we are to do so, we have to deal with many prerequisites.

In September 2005, the Korea Green Cross Corporation and Chollanam-do made an MOU (actually a contract) on establishing influenza vaccine production facilities in Whasun-gun, Chollanam-do (a southwestern province of the country). The provisional plan is to start producing the seasonal vaccine with a maximum capacity of 20 million doses in a few years when the vaccine is to be approved by the Korea Food and Drug Administration (KFDA). In case of a pandemic emergency, if it comes after several years, this facility would be modified to produce pandemic influenza vaccine on a full scale, provided the vaccine strain are to be distributed by WHO and the pertinent

technology can be developed or procured on a prior agreement or contract. Needless to say, if the pandemic comes very soon, the pandemic vaccine supply would be limited as is the case of the global situation.

I was asked to say something about additional research and about education and career paths for the next generation scientists and policy specialists. I believe that with the emergence of emerging infectious diseases job opportunities and research needs in this area are markedly growing. I think these issues might be discussed better by Professor Choi and other panelists.

We Must Act: Addressing the Challenge of Microbial Threats to Health

Margaret A. Hamburg, M.D.
NTI Global Health and Security Initiative
Washington, DC

It is a great pleasure to be part of this trilateral seminar on R&D policies related to emerging and re-emerging infectious diseases. This is an extremely important and timely subject, and I am certain that we will all benefit from this opportunity to come together to share perspectives, experience and knowledge.

In this, the closing session, we have been asked to address the critical issue of implementation of effective policies. This is obviously a critical concern. I am sure we all recognize that it is usually easier to delineate the problems, than to design and execute the remedies necessary to address them. There are many challenges before us when it comes to addressing the biological threat, but perhaps the greatest challenge will be to ensure that we can actually translate knowledge into action, and that we can avoid the age-old trap of complacency that has repeatedly undermined efforts to prevent and contain infectious disease.

Just a few decades ago, there was enormous optimism that the threat of infectious diseases was receding. Scientific and technologic advances, including the development of antibiotics and vaccines, along with improved hygiene, sanitation and vector control enabled the prevention and control of many infectious diseases, particularly in the industrialized world. Some, including a Surgeon General of the United States in testimony to Congress, ventured to say that we could soon "close the book" on the era in which infectious diseases represented a serious threat to health. Back then, smallpox was on the verge of eradication, and health officials had targeted measles, malaria, polio and other diseases for elimination as powerful drugs and vaccines were readied to defeat microbial foes.

However, we know today that such optimism was premature. It did not take into account many critical factors such as:

- the extraordinary increases in international travel, immigration and trade;
- the movement of people into urban settings - many into mega cities, living in shantytowns - where opportunities for disease spread are amplified through crowding, along with poor sanitation and hygiene;
- changing agricultural practices and environmental manipulations that alter disease vectors as well as opportunities for exposure;

- the continuing difficulties of translating existing medical knowledge and tools into action for all who need it, whether because of inadequate resources, ignorance or complacency;
- and, of course, the extraordinary resilience and adaptability of the microbes themselves

As we enter the 21st century, infectious diseases continue to burden populations around the globe. The impact is greatest in the developing world, but there is no country that doesn't suffer the toll. Infectious diseases are responsible for one in every two deaths in developing countries and are the leading cause of death for children and young adults. AIDS, TB and malaria alone cause some half a billion illnesses each year and take the lives of at least six million. It has been estimated that every hour, 1,500 people die from an infectious disease - over half of them are children under 5 years of age.

In recent years we have witnessed a series of new and serious infectious diseases that have emerged, SARS being one good example, but Legionnaire's, Ebola, Hantavirus Pulmonary Syndrome, and Lyme Disease also jump to mind. We have also watched old diseases like TB and malaria that have resurged, sometimes in epidemic proportion and often in new and more dangerous forms because of the development of drug-resistance which is an increasingly serious problem worldwide. Similarly, we have seen gains made against sexually transmitted diseases slow or reverse in certain populations. Also, we have seen old diseases that have emerged in new geographic regions, such as West Nile in the United States. In addition, many diseases once thought unrelated to infectious disease, are now known to be the result of chronic infections. Many such examples come from the realm of cancer, such as Human Papilloma Virus and Cervical Cancer, or Liver Cancer and Hepatitis B and C, but also certain condition like ulcers and some coronary heart disease. What is more, we live in an era when we must think seriously about the potential for deliberate use of biological agents as weapons to do harm, possibly even with genetically engineered organisms produced to enhance their lethality or infectivity.

Continuing Complacency. In recent times, the issue of emerging and re-emerging infections has stimulated flurries of interest and concern, but overall we, at least in the industrialized world, have been very complacent about the threat before us. It is, I suppose, a great tribute to the confidence of policymakers and the public in the ability of scientists to solve problems and keep us safe - but a clear underestimation of the power and capabilities of our adversaries, the microbes. In the competition between people and pathogens, eternal vigilance is the price of survival.

Diseases with epidemic potential are realities of the modern world - emerging and re-surging at an unprecedented pace as a consequence of the conditions of modern life. Many were stunned by the sudden appearance of SARS and how quickly it spread around the world, afflicting multiple countries in 2003. Today we watch nervously as the highly pathogenic Avian Flu (H5N1) makes its way progressively across countries, arising first

in Southeast Asia, and now has been found in poultry in Africa and parts of Europe. But we should not be that surprised. Virtually every year one or more newly recognized diseases add to the burden of known infectious threats. Conditions are ripe for this pattern to continue.

Today's high-speed international travel, expansive global commerce, environmental degradation and dramatic shifts in population into urban centers are just a few of the multiple factors that lead to the emergence of infectious disease. In the words of Dr. Joshua Lederberg, "One could hardly have created a better-calculated recipe for a tinderbox. We have never been more vulnerable. Infection knows no national boundaries, and we will pay dearly if we ignore the smouldering of infection anywhere."

Need for a Robust, Global Public Health System

The best defense against any infectious disease outbreak is a robust and global system for public health - both its science and its practice. Broad-based strategies to improve our ability to prevent, detect, and control emerging, as well as resurging microbial threats to health will, in the long run, are among the most effective approaches to improve our defense against biological events, whatever their origin. As current events once again underscore, several critical elements must be urgently addressed. First, we must dramatically improve capacity for global disease surveillance and reporting, linked to a rapid investigation and response capability, including adequate and appropriate diagnostic laboratory capacity. We must also strengthen institutional public health capacity, from the local to the global level, as well as integrated and functioning systems for health care delivery, whether in the context of routine or catastrophic events. Future preparedness will also depend on a well educated and trained clinical and public health workforce.

Furthermore, as I know you appreciate, a key to future disease prevention and health protection is a sound research agenda addressing near and longer term requirements for new insights into the nature of infectious disease threats, human host responses, and the opportunities to develop new diagnostics, drugs and vaccines. Current events also remind us of the need to examine the role and use of age-old public health measures such as travel restrictions, isolation, quarantine and even such basics as hand-washing and hygiene. Furthermore, a strong system for public health depends on partnerships. Importantly, we must find ways to more fully engage with the private sector around issues of mutual activity and concern. In particular, there is a pressing need to work more effectively with both the pharmaceutical industry and the health care system to develop new and innovative strategies for drug development and delivery, as well as in strategies for disease prevention, early recognition and care. And of course, the public must be partners in all we do, for they are critical players in a crisis, and valuable advocates to ensure that we do the right things before a crisis occurs.

Given our significant - and growing - vulnerabilities, markedly greater attention and resources must be devoted toward these problems. We must understand that pathogens - old and new - are endlessly resourceful in adapting to and breaching our defenses. We must also understand that factors relating to society, the environment, and our increasing global interconnectedness actually enhance the likelihood of disease emergence and spread, as well as the possibility of the intentional use of biological agents to do harm, human against human. The magnitude and urgency of the situation demand renewed commitment, and we must recognize that effective strategies will require greater coordination and cooperation with partners around the globe. Without question, we must work now to create systems that really work so that we can more effectively prevent or protect against the infectious disease threats before us - whether it is Mother Nature or an act of bioterrorism.

Certainly, this conference has given us a wonderful opportunity to explore in some detail many of these important issues with regard to surveillance, modeling and simulation, and products and technologies. In the time that remains, I do not want to review those ideas and insights so much as to talk some about the broader context in which that knowledge must be translated into action.

Bioterrorism

At this point, I think it also would be valuable to address several critical concerns that relate to the serious and growing threat of deliberate use of biological agents as weapons — and in particular bioterrorism. This threat has been mentioned, but not specifically addressed on our conference agenda. I just want to raise a few important and relevant issues for consideration and discussion by this group, as we think about how we, together, can act to make a real and enduring difference in addressing microbial threats to health. The bioweapons/bioterrorism threat is also important to discuss in some additional detail here, because it raises a set of research issues and concerns of particular sensitivity for R&D policies and the responsible stewardship of science.

Sadly, we live in a world today where terrorism is a fact of life. But until recently, few took the threat seriously enough, and especially not the possibility of biological agents being intentionally released to cause widespread panic, disruption, disease and death. Few are so complacent today. World events have forced the realization that neither technical barriers nor moral repugnance will protect us from their use. In the near term, "conventional" attacks such as bombs may remain the most likely mode of terrorism, yet there are many reasons to believe that biological agents may be an increasingly attractive approach.

Certainly, they can produce large numbers of casualties, potentially on a scale to devastate whole cities, regions and possibly the entire nation and beyond. Even without large numbers, attacks with biological agents - especially covert ones - can produce

enormous disruption, feelings of vulnerability and possibly panic and terror as people struggle to understand who is at risk and what can be done. Outbreaks with contagious diseases, that spread person to person, are especially frightening.

Truth is, probably no single terrorist attack - no matter how horrifying and catastrophic, could threaten the very stability of our society and institutions in the way that biological weapons could, except, perhaps, for a nuclear attack. Yet compared to nuclear weapons, biological weapons are relatively inexpensive and easy to produce, and significant damage can be done even in the absence of large quantities of material or an elaborate delivery mechanism. What is more, information about how to obtain and prepare bioweapons is increasingly available through the Internet, the open scientific literature and other sources. Also, opportunities for access to dangerous pathogens can be fairly routine; certain of these organisms are commonly found in nature, as well as legitimately studied in government, academic and industry labs. Furthermore, bioweapons facilities can be hidden within routine research laboratories or pharmaceutical manufacturing sites.

And we must recognize that while extraordinary advances in modern biology offer great hope to improve health and prevent disease, they also offer the tools - through malevolence, misapplication or sheer inadvertence - to create new and more dangerous organisms, as well as improved mechanisms for delivery. Overall, the reality is that access to the materials and know-how to produce potentially very serious biological threats becomes easier and more sophisticated every day. This has profound implications for both security and for science.

As we mobilize to respond to the threat of bioterrorism, it should be recognized that biological warfare is not new. Documented attacks date back centuries, including the catapulting of plague victims over the city walls during the Tatar siege of Kaffa, or the "gifts" of smallpox contaminated blankets to Native Americans during the French and Indian War. Modern history confirms that biological weapons were explored by many nations, although most programs were officially terminated with the Biological Weapons Convention (BWC) treaty, developed in 1972 and now ratified by more than 140 nations. The BWC prohibits the possession, stockpiling or use of biological weapons, although it contains no provisions for monitoring, inspection and enforcement.

Today, it is difficult to fully determine the risk of bioterrorism, but for a wide range of reasons - too many to fully discuss here - the threat is real and growing. Of great concern is the fact that we know with certainty that terrorist groups are working hard to get these weapons. In fact, Osama Bin Laden has said that acquiring weapons of mass destruction is a "religious duty." Disturbingly, a recent confidential report by a UN panel of experts said that the only thing holding back Al Qaeda from using biological weapons is its lack of technical know-how. The decision to use them in forthcoming attacks has already been taken and they have funding to continue developing their capabilities. In addition, several recent reports have warned that technology emanating from genomics and

modern life sciences research could produce "diseases worse than any known to man." Clearly these issues deserve our attention, concern and concerted action to address.

In theory, a wide range of infectious disease agents could be intentionally used to cause harm; however, most preparedness efforts have focused on a subset of organisms felt to pose the greatest threat to civilian populations. The so-called "A-list" of concern for bioterrorism includes: anthrax, smallpox, plague, tularemia, viral hemorrhagic fevers and botulism. This list reflects a set of criteria that combines intelligence information about credible threats with public health impact considerations, such as ability to cause significant illness and death, delivery potential of the biological agent and its ability to be produced in large quantities, potential for transmission, and special preparedness concerns such as stockpile requirements, enhanced surveillance or diagnostic needs.

But it is true that in the world today, the growth in biotechnology and explosion of knowledge about the fundamental building blocks of life - and how to manipulate them - gives new understandings of staggering and unpredictable power - and presents us with some difficult challenges.

There is a broad range of research that could be used toward biological weapons development and delivery, if that was your desire. When you think about the possibilities that could be achieved with the tools of modern biology, now and in the future, the prospects are frightening. Examples include: aerosol technology to deliver infectious agents more efficiently into the lungs for absorption by the body, gene therapy vectors that could cause permanent change in an infected person's genetic make-up, a "stealth" virus that could lie dormant inside the victim until triggered, or biological agents intentionally engineered to be resistant to available antibiotics or evade immune response.

An emerging capability is the creation of new forms of life *de novo* using the techniques of synthetic biology, or maybe new classes of pathogens, like chimeras that might combine the most frightening aspects of two organisms (such as smallpox and Ebola) or so-called binary biological weapons agents that only become effective when two components are combined. A disturbing example involves taking a mild pathogen that when combined with its antidote or treatment, would actually be activated to become highly virulent.

And while most bioterrorism, especially in the near future, will likely be infectious disease related, the future of the biological weapons threat does not necessarily have to involve infectious agents. Expanding insights into various regulatory and other systems within the human body offer new opportunities for the determined terrorist to develop tools that will disrupt critical functions for life or behavior. For example, we know that the Russians, in their former bioweapons program, were already experimenting with so called neuromodulators.

This is all very frightening. From a security perspective the natural reaction is to try to figure out how to limit the kinds of research that may be misused and distorted in these damaging ways. Certainly the response of many policymakers is initially to say: why not just shut the research down." Yet it is quickly apparent that while the potential for misapplication is resoundingly real, this same research holds great potential for good… and, in fact, may be essential to the development of the new medicines, vaccines, and technologies needed to counter bioterrorism, as well as to protect against naturally occurring disease.

As it turns out, it is very difficult - if not impossible - to define dangerous science, and it is certainly impossible to monitor all aspects of research that might have destructive applications. The tools of modern science that have potential to do harm are increasingly ubiquitous and embedded in the everyday work of science. So the challenge must be seen, not as how to stop the advance of dangerous science, but how to constrain the misapplication of scientific knowledge and capability without damaging the advancement of science.

Special Role for Scientific Community. This is a complex task with no easy or complete solutions. But there are ways to approach this problem. Strategies will not mirror traditional approaches to arms control. It will require new systems of governance, and it will require individual, community and government driven strategies. Science is at once the practice and product of individual scientists, and the outgrowth of scientist-to scientist collaborations. It is an inherently global enterprise. Important life sciences research today is as likely to occur in a private biotech company or in an academic lab, as in a government facility. An effective approach cannot reflect a model based solely on top down government regulations and legal requirements; nor can international treaties solve the problem. Meaningful solutions will require the full engagement of the scientific community, and will require a mix of strategies including legal regulations, professional standards and codes of conduct, international guidelines and agreements, and a fundamental shift in awareness and accountability about how science is done, the so-called ethos of science.

I have talked mainly about the dark side of modern science. But we are in a race. The magnitude of the bioterrorism threat, and the power of the science that surrounds it, compel us to better harness the extraordinary talents and capabilities of the bioscience world for good. We must get out in front for our protection and biodefense, and it is as true for naturally occurring diseases as it is for bioterrorism.

Investments in Research and Development. Today's investment in research and development will be the foundation of tomorrow's preparedness and response capabilities. To make sure that our nation can remain strategically poised, a comprehensive research agenda should be developed and pursued that extends across many important research domains. Our ability to detect and respond to a bioterrorist

attack or a natural disease epidemic depends considerably on the state of relevant medical science and technology. Without rapid techniques for accurate identification of pathogens and assessment of their antibiotic sensitivities, planning for the medical and public health response will be significantly compromised. Without efficacious prophylactic and treatment agents, even the best planned responses are likely to fail. The more we understand about the basic mechanisms of pathogenesis and the nature of the human immune response, the more likely we will be to discover future generations of treatments, protections and cures.

Other types of research are clearly needed to support our overall preparedness for a bioterrorist attack as well. For example, concerns such as defining the requirements for appropriate personal protective gear, strategies for making air-handling systems safer, and decontamination procedures under different circumstances. In many instances, that same knowledge is crucial to managing and controlling natural disease outbreaks. Also, we need more applied public health research that actually examines the effectiveness of various interventions, ranging from evaluating strategies for syndromic surveillance to modeling the use of quarantine in controlling communicable disease. I think that many of these issues have been talked about in the course of this meeting.

Restructuring Biomedical Research and Product Development. In addition, we must think about some fundamental ways to restructure (or reinvent) how we pursue biomedical research and product development. We must find new ways to dramatically reduce the time from discovery of a new pathogen to the availability of an effective therapy. It can now take eight or 10 years or longer to develop and license a new drug or vaccine, and we may not have the luxury of time. The threat of bioterrorism in the age of modern biology, demands that we find way to contract the time line from "bug to drug" - hopefully from years to weeks.

We still must do more to leverage the enormous scientific talent and resources of our nations and the world to work on the challenge of biological threats. The scale of our efforts is still too modest and there is no long-term plan. And we all recognize that the problems are at least as acute with respect to naturally occurring infectious disease. As we totter on the brink of the next pandemic of influenza, we are painfully aware that we do not have the tools to effectively cope. We have inadequate supplies of vaccine and antiviral drugs, an antiquated vaccine methodology, huge gaps in national preparedness and planning in all our countries - and even bigger gaps when you look to preparedness efforts on a global scale. We must do more.

Multi-pronged Strategies to Address Infectious Disease. What Must We Do?

So let me turn now to what we must do. What are the actions that need to be taken to translate knowledge into meaningful action and measurable results, especially on the global stage? Looking at concrete needs, I want to highlight some of the key steps that

can and should be taken, now and in the future, as well as some of the barriers or constraints that may limit our effectiveness if we are not adequately mindful of them.

Many of the actions that need to be taken have been discussed during the course of this meeting. We have talked about the urgent requirement to improve and extend the global system for public health - both its science and its practice. I have just been talking about some of the research needs and priorities, and the enormous importance of adequate, appropriate and sustained investments in a realistic, well-coordinated and far-reaching research agenda addressing basic research, new diagnostics, drug and vaccine development, and applied public health and behavioral research.

Research is the foundation for preparedness and prevention. R&D policies have been the focus of this meeting, but the value of R&D comes only when its insights and resultant capabilities can be applied. Our global health depends also on the robustness of certain other important elements.

Strengthening Institutional Public Health Capacity. Experts agree that there is a pressing need to increase the core capacities of our public health and health care systems, but what does this really require in terms of real world actions? First and foremost, this must include strengthened institutional public health capacity. This means providing resources to improve and extend effective surveillance systems, and the ability to rapidly detect, investigate, track and respond to public health threats, including disease outbreaks and significant or unusual clusters of symptoms or disease. To do so, we must expand and strengthen on the ground epidemiologic capabilities and trained personnel. In conjunction, there needs to be sufficient laboratory capacity to rapidly analyze and identify biological agents. In addition, we need improved communication - including computer connectivity - to quickly collect, analyze and share information among public health and other officials at local, state and national levels, as well with others around the globe. We also must find better ways to work with and share information with other essential partners, whether, for example, those in veterinary health or animal husbandry, or other important partners such as the private sector and the media for example.

Strengthening Health Care Capacity. We must also strengthen the delivery of health care. In many parts of the world, both rich and poor, the infrastructure to support the delivery of critical public health interventions is inadequate to do the job. This is especially true when it comes to events that will place additional demands on the health care system such as a serious outbreak of infectious disease or a bioterrorist attack. We must find better and more innovative strategies to deliver both protective and treatment measures under routine circumstances as well as mass casualty and/or exposure conditions, especially when there may be an additional set of very difficult infection control requirements as well. We must strive for integrated and functioning systems for health care, effectively linking public health and health services - both routinely and in a crisis, including a well trained clinical and public health workforce.

How to deliver mass casualty care is a difficult challenge under any circumstances. It will require careful advance planning. Even in countries with advanced, well-established health care systems, most hospitals and related facilities are operating at or near capacity right now. As we watched SARS unfold in cities around the globe, we saw how easily health care systems could be overwhelmed by the burden of disease. Today, before the crisis strikes, we need to undertake a systematic examination of local capabilities and how they can be rapidly augmented by state, national and international assets. It is evident that we must find better ways to strategically support our health care institutions, both because of the implications of a catastrophic biological event and the existing demands on the system. In resource poor nations, the situation is dramatically more difficult.

New Partnerships and Improved Coordination. Effective public health preparedness demands new partnerships and improved coordination between government and the non-governmental health care providers, as well as other essential institutions and organizations, and sectors of society.

Historically, global health needs have been dramatically under-addressed and under-funded. We are beginning to wake-up to the importance of these issues. It is heartening that in the last few years we have developed new international initiatives to address such concerns as HIV/AIDS, TB and malaria. SARS increased awareness, and it is my guess that - at least temporarily - the threat of pandemic flu will stimulate new attention and resources to global health needs. We are witnessing increased engagement of governments, philanthropy, NGOs and private industry. As this occurs, we must attempt to ensure that new efforts will be well-designed and go toward developing or strengthening fundamental systems both for disease detection, investigation and response, and for the delivery of health care and implementation of critical public health interventions.

In my view, meaningful progress in this realm will require both new investments and real leadership. We must do more to define strategies that work; to define requirements and provide model guidelines and standards, tailored, of course, to local, regional and national circumstances and preferences. Planning efforts are essential. We need international leadership from organizations like the World Health Organization (WHO), as well as the real commitment of every nation.

Centrality of Local and Regional Planning. However, the final planning process must be undertaken on the local or regional level, engaging all the essential community partners and capabilities. By their nature, epidemics of disease can cross the globe, but their effects are excruciatingly local. The front line of response, even in a national or international crisis, is always local. Across all these various domains of activity, we must make sure that we have adequate capacity locally and regionally that can then be supplemented as needed.

An important example of this involves the issue of stockpiling. A large-scale outbreak or release of a biological weapon may require rapid access to quantities of antibiotics, vaccines or antidotes that would not be routinely available in the locations affected. Given that this may be an uncertain, unpredictable event in any given place, it would hardly be sensible or cost-effective for major stockpiling to occur at the local level. But when you need them, you want them to be available. Thus as we ramp up our public health and medical capacity to respond to biological threats, we should continue to strengthen stockpiles - real and virtual - so that vital drugs and equipment can be rapidly mobilized as needed. And we must address more effectively the broader mobilization of essential drugs, vaccines or other materials in the event of such a need anywhere in the world. While this may raise complex diplomatic issues, especially when the necessary pharmaceuticals are in short supply, addressing potential global need has vital disease control implications and must be a high priority for action.

In addition, as I am sure you recognize, beyond simply having the drugs and vaccines available, there must be plans in place for how those critical supplies will actually be distributed on the ground to those who need them. Unfortunately, we still need stronger leadership and support for regional and local contingency planning for how such distribution would occur, including health care institutions and health care providers.

Legal Issues. In planning for an effective response, an array of legal concerns still loom before us. Our nation's experience with anthrax raised many questions; SARS and now the threat of pandemic flu continue to underscore the need for further clarification and coordination of legal authorities. For example, there is still confusion about basic issues such as the declaration of an emergency. What are the existing authorities? Are they public health, or do they rest in other relevant domains? What are the criteria for such a declaration? What is the reach? What are the authorities that still need to be established? Of course these questions and their answers differ from state to state, and nation to nation. Other outstanding legal questions concern the ability to isolate, quarantine, or detain groups or individuals; the ability to mandate treatment or mandate restrictions on work, travel and trade; the authority to seize community or private property such as hospitals, utilities, medicines, or vehicles; and the ability to compel production of certain goods. Also, questions involving emergency use of pharmaceuticals or diagnostics that are not yet approved or labeled for certain uses need to be answered now. Related to this are the as yet, unresolved issues of liability and indemnification which have been especially troubling in the context of vaccine development and delivery, for both routine and possible biodefense needs. Certainly the issues of liability and compensation resulted in a major impediment to the success of the recent U.S. smallpox vaccination campaign.

These questions involve many different nations, many different levels of government and sectors of society, many different laws and authorities, and involve many complex intertwined ethical, political and economic issues. In a systematic and coherent way, we

must address these pressing issues and concerns - not just what laws are in place or could be put in place, but also what policies and procedures would be necessary to actually implement them. SARS offered us some useful real-time experience with some of these issues, but we have a great deal more to think about and learn - hopefully before the next major crisis emerges.

Engaging the Public. Sadly, the many fears, anxieties and uncertainties that we currently see surrounding the threat of pandemic flu reinforce another major gap identified in current preparedness and planning efforts. This involves how to engage the public, and importantly, how to most effectively work with the public in the event of a crisis. Both our experience with the anthrax attacks in the U.S. in fall 2001 and SARS a couple years later - in somewhat different ways - gave new insights into how complex these issues may be. Certainly, the specter of a silent, invisible killer, such as an infectious agent, evokes a different level of fear and anxiety than many other disaster scenarios.

In any disaster, how the needs of the public are handled from the very beginning is critical to the overall response. For a biological event, this may be even more crucial. In fact, effective implementation of disease control measures may well depend on the constructive recruitment of the public to behave in certain ways, such as limiting congregate gatherings, following isolation orders, or taking vaccines. Managing the worried well may interfere with the ability to manage those truly sick or exposed. In the final analysis, clear communication and appropriate engagement of the public will be the key to preventing mass chaos and enabling disease control as well as critical infrastructure operations to move forward.

Correspondingly, the needs and concerns of response personnel, including health care workers, must also be addressed. Again, prior experience with serious infectious disease outbreaks tells us that when this does not occur, essential frontline responders and key workers are just as likely as the public to panic, if not flee. The mass exodus of health care workers following onset of the Ebola epidemic in Kikwit, Zaire, in the mid 1990s serves witness to this point. The response to SARS was considerably more promising, although real issues did emerge.

Roles of the Media. Especially in this era of 24 hour news, the media are key to efforts to communicate important information to protect health and control disease, as well as to reduce the potential for panic in a crisis. In recent times, it has been enlightening to see both the press and the public receive crash courses infectious disease - first anthrax, then SARS, and now pandemic flu. They have been fast learners. For the most part, I think, the media have done a credible and responsible job in communicating important information. In these instances, the very officials dealing with the crises also were learning as they went. But no matter what, successful leadership requires that there must be a clear plan for providing the news media with timely and accurate information.

Furthermore, the credible and consistent voices of well-informed health officials are critical to this effort.

It is also evident that the ability of the media to mobilize effectively in a crisis is greatly enhanced by a process of ongoing and continuing mutual communication and education in calmer times. We must strive for the development of a set of working relationships grounded in mutual trust - trust that they will be provided with factual information in a timely and appropriate manner, and in turn, that they will use that information in a responsible, professional way.

The Importance of Planning and Practice. Across many domains, prior planning and preparation is vital to preparedness and prevention, and can greatly mitigate the death and suffering that would result either from a serious disease outbreak or a bioweapons attack. Certainly our nation still needs comprehensive, integrated planning for how we will address these kinds of potentially catastrophic threats. As we learned painfully from our recent experience with Hurricane Katrina, we still need to define the relative roles and responsibilities of the different agencies involved, and identify the mechanisms by which the varying levels of government will interact and work together, and with the private sector.

Planning can make a huge difference, but we cannot begin to prepare in the midst of a crisis. Moreover, planning efforts must be backed by the necessary resources and authority to translate planning into action. And we must practice what we plan.

A Hazardous Future

Looking to the future, despite all the enormous scientific and other advances that have occurred, it is clear that both naturally occurring diseases and the possibility of bioterrorist attacks hold increasing potential to cause sickness, disability, and death. And the ability of infectious agents to destabilize populations, economies, and governments is fast becoming an unfortunate fact of life. The anthrax attacks and the SARS outbreak represent two very different but equally important examples that took many by surprise - not to mention the ongoing devastation of AIDS in sub-Saharan Africa, and - though less well publicized - in China, India and Russia. And I have just mentioned the impending threat of pandemic flu, a very real concern, with potential to cause death, disease and disruption on a scale we have not witnessed in our lifetimes. Moreover, because national borders offer little impediment to such threats, especially in today's highly interconnected and readily traversed “global village,” one nation's problem soon can become every nation's problem.

Thus the prevention and control of infectious diseases are fundamental to individual, national, and global security. Failure to recognize - and act on - this essential truth will surely lead to disaster. The magnitude and urgency of the problem demand renewed

concern and commitment. We simply must do more. As we take stock of our prospects with respect to microbial threats in the years ahead, we must recognize the need for a new level of attention, dedication, and sustained resources to ensure the health and safety of all our own nations - and of the world. Success will require political and public health leadership, new investments in people, facilities and programs, new partnerships across disciplines, sectors, levels of government and with the public, and importantly, sustained commitment and continual vigilance.

This will be a long term effort. We have a shared interest in addressing biological threats. Together, we must seek to mobilize the leadership necessary to sustain focus and effort. Together, we must support that leadership by finding ways to overcome bureaucracies that eat away at progress, by teasing out what are the right questions to ask and surfacing critical issues and concerns, and by addressing the right questions in a disciplined, systematic and scientific fashion. In this effort, we must better define mechanisms for action - and implement them - and develop better measures of effectiveness and accountability. We must also be flexible - learning from experience, integrating new knowledge and capabilities, and demonstrating an ability to adapt and manage as we go forward. Perhaps, most importantly, we need to work together.

A Great Opportunity to Address a Common Good

We have a great opportunity to together address a common and essential good. I suspect that most of us would agree that health is more than just the absence of disease. Health is a key building block to well being, prosperity, and productivity in any society. Health is a concern for all nations, and international collaborative health programs can serve as a valuable pathway to new hope and opportunity in communities impoverished of hope, as well as a bridge to new trust and partnership among communities or nations formerly at odds. We have witnessed the unifying power of health when conflicts have been stopped in order to allow vaccination campaigns to move forward – the so-called "days of tranquility." We have also seen the tensions and suspicions that arise between nations when unexpected serious outbreaks of disease occur, or, how the presence of health problems can both reflect and exacerbate serious issues of infrastructure breakdown, social instability and despair.

While health programs certainly represent an intrinsic good and demand our commitment and concern for that reason, I find it exciting to think about how they may also help foster broader foreign policy and diplomatic goals in important - and sometimes unique ways. They may help in:

- reducing regional tensions/conflict,
- strengthening cooperation at the community level,
- strengthening working relationships between national governments,
- promoting social stability and economic progress and,

- in the grandest terms, hopefully, foster cooperation and peace.

In fact, the WHO's report on macroeconomics and health contends that: "extending coverage of a relatively small number of crucial health services and specific interventions to the world's poor could save millions of lives each year, reduce poverty, spur economic development, and promote global security."

Whether or not you agree fully with this assertion, certainly a global partnership of developing and developed countries committed to improving health would make a huge difference, both to health, but also more broadly. Addressing the challenge of microbial threats is one area where we could make rapid progress with concerted effort for the benefit of all. We recognize that we have not done enough. In our complex global village, numerous forces converge to make us all more vulnerable to microbial threats to health, and the repercussions are many and far-reaching. But we also know that a great many opportunities stand before us to make a real and enduring difference.

I want to close my remarks with a quote from the philosopher Goethe which opens every report put out by Institute of Medicine of the National Academies: "Knowing is not enough, we must apply. Willing is not enough, we must do."

Thank you.

Implementation of Effective Policies for the control of emerging infectious diseases

Dr. Xian-Yi CHEN
Director General
Office of Health Emergency Response
Command Center for Public Health Emergency Response
Ministry of Health, People's Republic of China

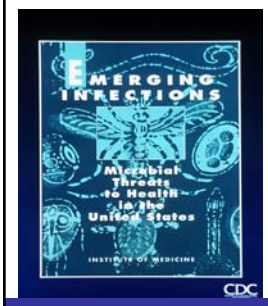
December 2005

I will discuss…

- What are EID's threats to human beings
- What are OHER's roles and responsibilities, and
- How to build capacity to implement EID prevention & control strategies.

What are EID's threats to human beings

Emerging Infectious Disease – Global Alert, Global Response"



Facing the challenges of EID, the World Health Organization, early in the year of 1996, sent an alarming signal to the world on the prevention of any emerging infectious disease. The theme of the World Health Day in 1997 was "Emerging Infectious Disease – Global Alert, Global Response".

SARS KISSING

What are OHER's roles and responsibilities

MOH emergency response offices duties and responsibilities(1)

- Organize/coordinate PH emergency management according to law
- Draft PH emergency related laws and regulations
- Draft PH emergency management related policies,guideline,and measures, and
- Set up and improve PH emergency surveillance and early warning system.

MOH emergency response offices duties and responsibilities(2)

- PH emergency planning and drills
- PH emergency preparedness training for PH and medical professionals, technical assistance for local PH emergency planning and management, including rescue and treatment
- Coordinate/organize PH part work in disaster, BT, toxic and radiological emergencies, and
- Organize emergency medical rescue and treatment in emergency involving deaths/casualties.

How to build capacity to implement EID prevention & control strategies

1.Government actions and legal system based control and prevention

- Re-check the viewpoint that "emphasis of diseases control should shift to non-ID"
- Enhance EID prevention & control education
- EID Control should be government's action
- Improve legal, policy and financial support, and
- Establish the EID emergency response mechanism.

2.Prevention first and well prepared

- Key to an effective response is prevention
- Develop a national EID prevention and control strategies & enhance the prevention and control of EID of public health importance
- High attention and improved decision making
- Formulate the preparedness plan and take a comprehensive prevention and control approach
- Strengthen the surveillance and early warning system, and
- Control the source of EID to reduce the risk.

3.Strengthen the infrastructure and improve the preparedness

- Conduct baseline survey of current EID epidemic situations
- Enhance EID emergency response technology and materials preparedness
- Enhance EID diagnostic technology and reagent preparedness, and
- Establish national EID pathogenic microbiology lab and pathogenic microbes database.

4. Strengthen surveillance and early warning system

- Enhance EID surveillance by setting up well equipped EID etiological diagnosis lab system
- Evaluate and improve the capacity of the surveillance system
- Enhance the lab emergency response capacity
- Develop new surveillance methods and systems to identify and verify EID
- Set up effective EID lab network system
- Strengthen international cooperation in EID surveillance, focus on early warming system for flu and avian flu, and
- Establish PH emergency forecasting and warming system, including EID.

5.Strengthen health education and mobilize the society to prevent/control EID

- Keep the harmonious relationship between human and nature
- Improve the entire nation's health level
- Strengthen health education and improve public awareness for prevention and control of EID, and
- Promote the healthy life style and healthy behaviors.

6.Enhance rapid response capacity

- Establish the rapid coordination and response system
- Strengthen the national border's quarantine capacity
- Improve multi-sector coordination mechanism
- Establish the national emergency response expert team, and
- Enhance the ability to rapidly mobilize multi-discipline resources.

7.Strengthen training, enhance R &D (1)

- Enhance training in
  - field epidemiology
  - lab testing
  - lab bio-safety, and
  - clinicians public health awareness and EID prevention and control knowledge.

7.Strengthen training, enhance R &D (2)

- Conduct research on
  - national EID prevention and control strategies
  - EID prevention and control theories, response mechanism, and strategies
  - EID surveillance technology, diagnosis and treatment methods
  - EID pathophisiology and the contributing factors
  - EID vaccines, and
  - Surveillance and control strategy,intervention techniques of EID of public health importance.

8.Strengthen international cooperation and global Action (1)

- Strengthen global cooperation and communication between nations and regions in:
  - Joint response to EID under the new IHR framework
  - Outbreak information exchange & technical support
  - EID surveillance and lab testing network
  - Research on EID of global importance
  - Best public health practice, and
  - Training.

8.Strengthen international cooperation and global Action (2)

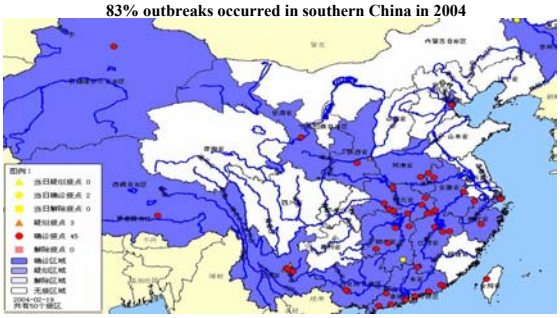
- Set up and improve the mechanisms for information & communication, technical cooperation, resource sharing, and joint prevention and control actions, and
- Strengthen national capacity, enhance regional joint prevention and control effort, and promote global actions.

Take Avian Flu as an example…

The experience and lessons learned from SARS also are contributing to the early detection, rapid response and preparedness for other emerging diseases, for example, the control of Avian Influenza.

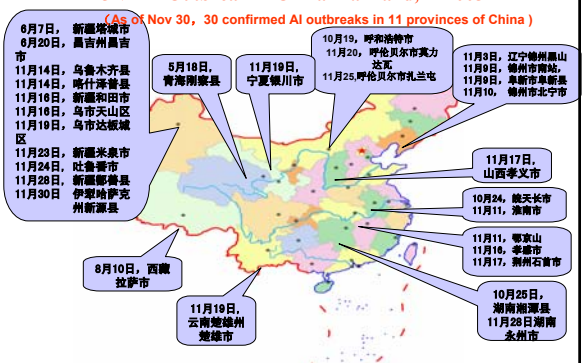
Relationship between Avian Flu epidemic points and distribution of water systems in China, 2004

A total of 50 outbreaks occurred in 16 provinces,
83% outbreaks occurred in southern China in 2004



H5N1 AI Outbreak in China Mainland, in 2005

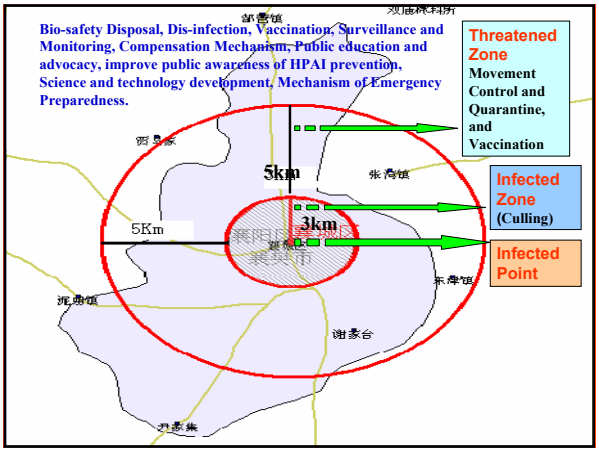
(As of Nov 30，30 confirmed AI outbreaks in 11 provinces of China)



Note: The time of each outbreak is the confirmation time (scattered, vaccinated and migrant birds)

Orderly and scientifically preventing and controlling highly pathogenic avian flu spreading to human being(1)

- Enhance inter-ministry level coordination, improve multiple-sector prevention and control mechanism. Health dept.and agriculture dept are required to arrive field,conduct investigation, and manage epidemic at the same time
- Strengthen epidemic surveillance, enhance disease reporting system, early diagnosis, early reporting, early isolation, and early treatment.



Orderly and scientifically preventing and controlling highly pathogenic avian flu spreading to human being(2)

- PH and medical institutes take sample timely for lab test if found flu or pneumonia patients who had close contact with dead poultry.
- Strengthen training,enhance emergency management capacity. Train health care providers infectious disease knowledge,master key skills to prevent and control Avian Flu, and
- Enhance supervision and check up to ensure the implementation of prevention and control measures and to correct mistakes that may occur

Orderly and scientifically preventing and controlling highly pathogenic avian flu spreading to human being(3)

- Enhance information exchange and public health education to raise population's self protection awareness and abilities. Timely inform public confirmed case information
- Continue vaccine and drug research, stockpile vaccine, drug and other emergency needed materials to prepare for emergency situation。
- Continue international cooperation, timely exchange epidemic information.

Thank you!

Office of Health Emergency Response, MOH,China

Panel Discussion
Plenary Session IV: Implementation of Effective Policies

Strengthening National Communicable Disease Control System in Korea for Local and Global Health

Bo Youl Choi M.D., Ph.D.

Department of Preventive Medicine,
Hanyang University College of Medicine

Previous Korean speakers talked about the status of many communicable diseases, and the preparedness and responses and their achievement in Korea.

I participated in drawing up the goal 6 part of MDG report of Korea in this year. The Millennium Goal 6 focused three diseases, HIV/AIDS, Malaria and tuberculosis.

These diseases are not-urgent, endemic diseases but their disease burdens are enormous.

So, I will review and discuss the achievement and future tasks to control these diseases.

HIV/AIDS – Status and Actions

- Status
  - The HIV prevalence rate is categorized as "very low".
  - However, the number of persons newly infected has been rapidly rising.
- Actions
  - AIDS Prevention Act in 1987
  - To support the medical treatment and care expenses for those infected with HIV/AIDS.
  - To operates a recuperation center for AIDS patients.

Korea Center for Diseases Control

HIV/AIDS – Goal and Future Tasks

- Goal; 'To halt and reverse the spread of HIV/AIDS before 2015.'
  - There will be many difficulties and barriers to accomplish this goal.
  - Comprehensive long term national plan on the prevention and control of HIV/AIDS should be established in 2006.
- Future tasks;
  1. To prevent discrimination against persons with HIV/AIDS,
  2. To provide wide-ranging services for AIDS prevention, such as programs for the distribution of free condoms, anonymous testing free of charge, and counseling,
  3. Voluntary counseling and testing service for the general public,
  4. Professional counseling services for people with HIV/AIDS,
  5. To establish welfare centers for people with HIV/AIDS,
  6. Service for foreign workers such as information service HIV/AIDS through the internet and counseling centers
  7. To support prevention awareness programs for high-risk groups as well as for the general population.

Malaria – Status and Actions

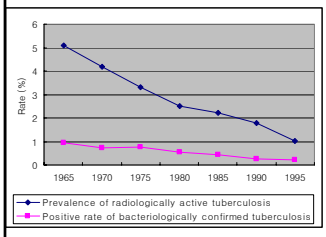
	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02
Civilian	-	2	7	46	361	1,148	1,541	1,580	1,113	911
Discharge from military services	-	1	12	25	207	1,127	996	1,273	754	471
Military Personnel	1	18	88	285	1,156	1,657	1,084	1,289	685	408
Total	1	21	107	356	1,724	3,932	3,621	4,142	2,552	1,790

- Focusing on the malaria risk areas, the Korean government is exerting efforts to detect patients at an early stage of infection and provide treatment.
- It is also enforcing prophylactic therapy as well as mosquito control in certain high-risk areas.
- Korea is also supporting the malaria control project in North Korea through the WHO, and it has been reported that the malaria situation in North Korea is improving.

Malaria – Goal and Future Task

- Goal ; to eliminate malaria in the near future.
- Future Tasks
  - Taking the incidence of malaria in North Korea into account, it is believed that the occurrences of malaria in South and North Korea are interdependent.
  - South Korea should do the malaria control program in more active collaboration with North Korea.
  - If this goal is accomplished, this program could be a model of the future collaborative diseases control projects for South and North Korea.

Tuberculosis – Status and Action



National tuberculosis survey (1965-1995)

Korea first implemented a national tuberculosis control program from 1960s.

By 1995, the prevalence of tuberculosis had fallen to one-fifth the level of 1965.

The current prevalence and death rate from tuberculosis is lower than the world average, but its prevalence is shown to be about 10 times higher than advanced nations.

Tuberculosis – Goal and Future Tasks

- Goal;

  'To reduce the incidence of tuberculosis to the level of developed countries by 2015'

- Future Tasks
  - Korea should strengthen the national tuberculosis control program.
  - Specific measures are as follows:
    ① early detection of patients;
    ② medical examination for those who have had contact with patients;
    ③ maximizing the treatment effect.;
    ④ reinforce laboratory testing for tuberculosis and;
    ⑤ increase the percentage of successful treatments; and
    ⑥ heightened cooperation with both private medical facilities and public health sectors.

Tuberculosis –Future Task (2)

- We have some informal informations about the high prevalence of tuberculosis in North Korea.
- We have the experience to reduce the tuberculosis during the past 30 years.
- So, we can share this experience of National Tuberculosis Control Program with North Korea.

- Health Promotion 2010 Korea -

Goals of communicable diseases control

- Established goals of communicable diseases control program as a part of Korean Health People 2010 until the end of this year.
- Many experts and professionals of KCDC, universities and institutes collaborated with KCDC were participated in 6 fields of communicable diseases control. Six fields are as follows;

  1) Food and water borne diseases,
  2) Vaccine preventable diseases,
  3) HIV/AIDS and STD
  4) Zoonosis and Vector-borne diseases
  5) Tuberculosis and Respiratory Infection
  6) Emerging infectious diseases

- Developed about 40 specific objectives and about 100 specific programs.

Future Research Subjects

- In the course of developing goals, further research subjects of each field were identified.
- These are consisted of basic, epidemiological and operational researches.
- We should also carry out evaluative research to assess the effectiveness of control program or services.
- Hereafter, the subjects should be classified according to priority and the road map for R&D studies should be planned.
- The outcomes from R&D studies will be contributed to strengthen the National Communicable Diseases Control System.

Epilog (1)

- Korea has made efforts to develop national communicable diseases control system since early 1990s.
- In the course of the system development, we have continuously monitored the global status of emerging and reemerging infectious diseases and inquired the goal and strategies of WHO and other countries.
- Dr. Park and Dr. Lee previously explained the efforts in detail. I believe that these efforts will contribute to the preparedness for and response to the global threat of emerging and re-emerging infectious diseases.

Epilog (2)

- I think that Korea have need to do the more sustained efforts to strengthen National Communicable Disease Control System.
- During the period, we expect to accumulate the scientific knowledge and technologies, many efficient programs, and many experiences.
- These will be the basis for actively participating in international programs to improve global all's health, in the near future.

Think Globally, Act Locally → Think Globally, Act Globally

Thank you very much !

We are all responsible for all. - Dostoevsky -