

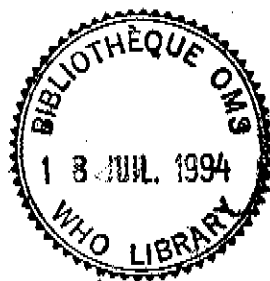


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**REPORT OF WHO MEETING ON
EMERGING INFECTIOUS DISEASES**

**Geneva, Switzerland
25-26 April 1994**



**Organized by: Programme on Viral, Bacterial Diseases and Immunology and
Veterinary Public Health Unit
Division of Communicable Diseases
World Health Organization, Geneva, Switzerland**



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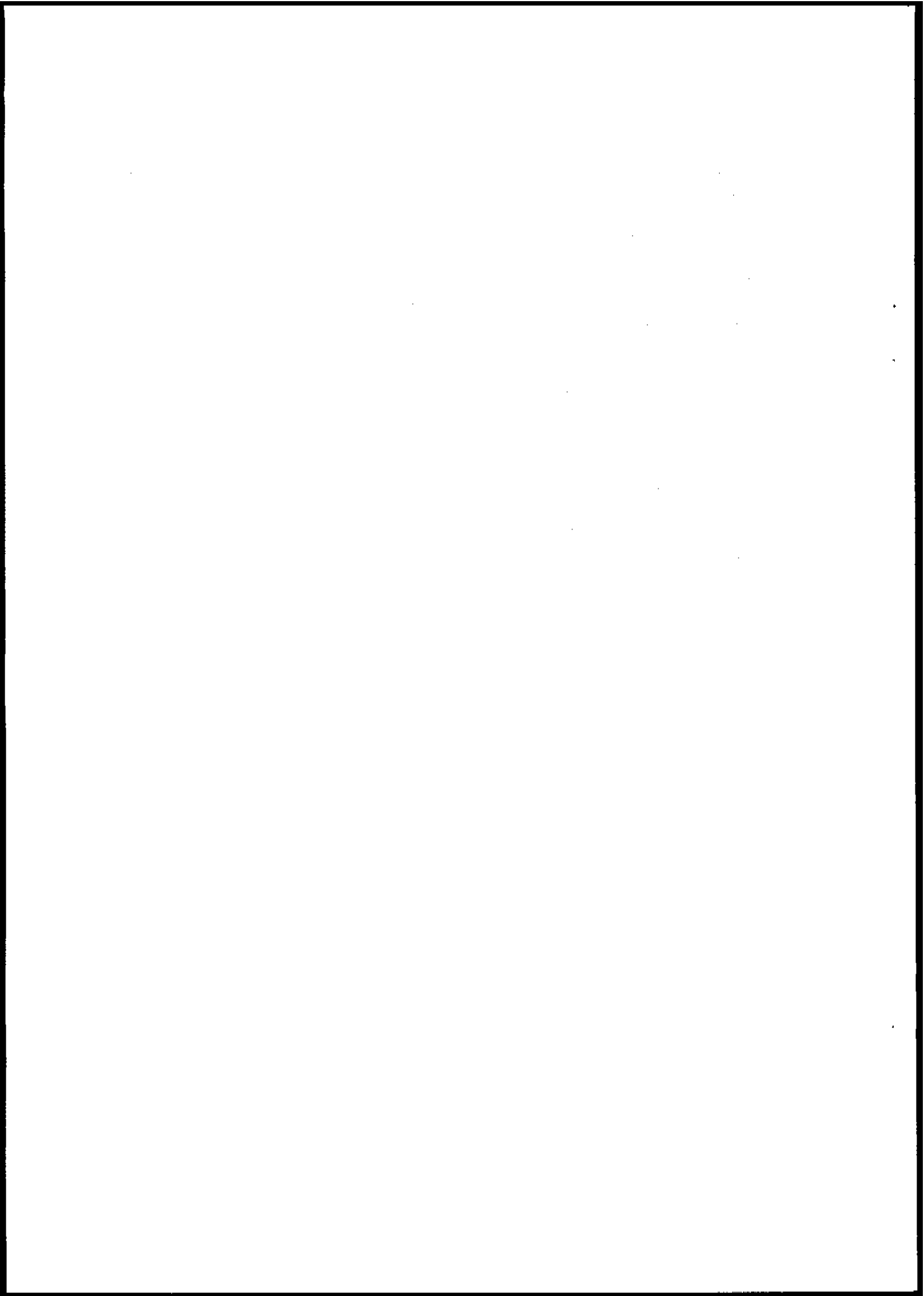
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1. INTRODUCTION

Considerable attention has recently been directed to the topic of emerging infections. This issue was brought to the fore of national and international discussions in the book, *Emerging Infections, microbial threats to health in the United States*, published in 1992 by the Institute of Medicine, U.S. National Academy of Science. Several factors have influenced the emergence and re-emergence of infectious diseases, including societal events, changes in health care practices, new food production processing and packaging procedures, environmental changes, and curtailment or reduction of public health preventive programmes, and numerous specific examples exist to document the importance of new or re-emerging microbes. Central to the topic is the realization that pathogens do not respect international borders, and that an infection acquired in one corner of the globe may lead to an epidemic in a distant country far removed from the original site of infection. Clearly a global approach is needed to address emerging infections, and this task falls squarely among the responsibilities of the World Health Organization. The meeting on emerging diseases was thus organized to begin formation of a plan of action to guide WHO in its attempts to meet this challenge.

2. BACKGROUND

Prior to the 1970's, the World Health Organization's efforts focused primarily on communicable diseases, with a number of action oriented programmes that lead to remarkable successes in disease control, culminating with the global eradication of smallpox. Since that time, however, interest in communicable diseases has waned, partly due to changes in health care priorities, diminished resources, and the need to focus limited manpower and fiscal resources on non-traditional communicable diseases such as HIV/AIDS. The net result of these changes has been an overall diminution of programmes in communicable diseases, the deterioration of surveillance efforts, and a loss of technical expertise in traditional infectious diseases. This erosion of the infrastructure surrounding communicable diseases has directly affected the global capacity to recognize and respond to new, emerging, and re-emerging diseases. As an example, a recent survey of WHO Collaborating Centres for Arboviruses and Haemorrhagic Fevers found that while most had sufficient reagents to identify local virus diseases, few had the reagents needed to recognize common diseases not traditionally endemic in their area. Thus, if these key reference resources are not prepared to identify "common" pathogens, it will be all the more difficult for them to recognize truly "new" diseases. This deterioration of laboratory capacity has been accompanied by an equally dramatic loss of surveillance efforts, such that both developed and developing countries' capacity to maintain surveillance activities for communicable diseases, and respond to outbreak situations, has crumbled. Finally, the cohort of experts trained in communicable diseases prior to the 1970's has aged, often reaching retirement, and these skilled personnel resources have frequently not been replaced, or their positions have been transferred to support other programmes. The net result in terms of recognition and response to new, emerging, and re-emerging diseases is that the necessary infrastructure needed to accomplish this task is in disarray, leading to the conclusion that we must concentrate first on rebuilding our foundations in communicable diseases, if we are to have the capability to address new challenges of emerging and re-emerging infections.

3. OBJECTIVES OF MEETING

The meeting on emerging diseases was convened to gather international experts currently dealing with the concept of emerging diseases, so that they could present and discuss with a knowledgeable and interested group, the fruits of their efforts and accomplishments achieved to date. In response to the Institute of Medicine report, *Emerging Infections*, the governments of the United States and Canada have begun development of specific programmes to address emerging diseases, and both these initiatives contain specific mention of the global nature of the threat of emerging diseases, and the need for active participation of the World Health Organization in addressing this challenge. The meeting thus offered a venue for these needs to be articulated and discussed, and consensus reached as to the best means by which WHO can contribute to attaining these goals.

The following specific objectives were formulated for this meeting:

- 3.1 To offer prominent international experts an opportunity to meet and exchange information regarding recent activities and initiatives that deal with emerging diseases, and the related topics of the ability of international, regional and national institutions to address all communicable diseases, including newly emerging and re-emerging infections, as well as existing, well-defined infectious disease problems.
- 3.2 To discuss specific ways that WHO may assist member nations in their efforts to recognize and respond to emerging diseases and other communicable disease threats.
- 3.3 To elicit the support of these experts in establishing a coordinated international effort to address emerging and re-emerging diseases.
- 3.4 To provide a venue to describe to these experts the activities that WHO has already initiated to address this problem, to offer proposals for future interventions, and to elicit their suggestions and support for these efforts.
- 3.5 To actively solicit the input of representatives of the Regional Offices, both in terms of problem definition and in guidance for implementation of proposed activities.

4. SUMMARY OF PRESENTATIONS

- 4.1 **Welcoming address:** Dr R.H. Henderson, ADG, opened the meeting on behalf of the Director-General, Dr H. Nakajima, welcoming the participants to Geneva and WHO, and specifically acknowledging a debt of gratitude to Dr Joshua Lederberg for agreeing to serve as the meeting Chairman. Dr Henderson summarized some past accomplishments by WHO in addressing emerging diseases, such as the ongoing global surveillance of influenza, which leads to the annual recommendations for composition of the influenza vaccine, and stressed the importance of continued leadership by WHO in this area. He noted that WHO was already the focal point for surveillance of yellow fever, plague and cholera under the International Health Regulations, and commented on the prompt dissemination of reported cases through publication in the Weekly Epidemiological Record. He spoke of the value of the

existing networks of WHO Collaborating Centres, indicating that they represented a tremendous resource which could be effectively used in addressing emerging diseases. He acknowledged that several technical skills will be needed to fully address emerging diseases, but recognized that most diseases which will fall into this category will be communicable diseases. Consequently, he announced that the focus for emerging diseases activities will be in the Division of Communicable Diseases, stating that while all of the work will not be carried out within this Division, it will exercise programmatic leadership and serve to coordinate activities throughout the Organization, as well as pursue its own specific initiatives in the field. The complete text of Dr Henderson's remarks is included in the Appendix.

- 4.2 **Problem definition:** Dr Joshua Lederberg, The Rockefeller University, New York, presented introductory remarks, referring often to the seminal publication, *Emerging Infections*, which he co-authored. He noted that while the book was targeted to the United States, there was at least a 70 to 80% overlap in topics and issues on a global level. He contrasted the public perception between risks such as asbestos or radiation, with that of infectious diseases, and noted that infectious disease threats had clearly not received comparable public attention, even though the health consequences are equally great, or indeed larger. He commented on the growing scientific basis of emerging diseases as an important component of infectious diseases, and indicated that we are just beginning to understand the issues surrounding emergence of new diseases.
- 4.3 **Report from the United States of America:** Dr Ruth Berkelman, Deputy Director, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, spoke on the recently released document, *Addressing Emerging Infectious Disease Threats*. She opened by noting that today, HIV and AIDS is the number one killer of men aged 25 to 44 years old in the United States, while only a decade ago, this disease was unknown to medicine. This clearly documented the potential and very real threat that emerging diseases pose. She mentioned the specific goals and objectives outlined in the CDC report, which included (1) Surveillance: detect, promptly investigate, and monitor emerging pathogens, the diseases they cause, and the factors influencing their emergence; (2) Applied Research: integrating laboratory science and epidemiology to optimize public health practice; (3) Prevention and Control: efforts to enhance communication of public health information about emerging diseases and ensure prompt implementation of prevention strategies; and (4) Infrastructure: strengthening local, state, and federal public health infrastructures to support surveillance and implement prevention and control programmes. Specific objectives were listed under each goal. An activity to be addressed under this programme is the establishment of a global consortium of closely linked epidemiology/biomedical research programme/centres to promote the detection, monitoring and investigation of emerging infections, with the suggestion that the consortium could operate under the direction of an international steering committee, possibly chaired by WHO. Existing WHO networks of Collaborating Centres were specifically mentioned in this context. She also commented on the need to coordinate efforts on emerging diseases with those of other global initiatives, such as global eradication of polio and measles. She encouraged linkages between existing networks, and specific efforts that CDC has recently undertaken to improve

communications in the field, such as expanded free distribution of the Morbidity and Mortality Weekly Report, and plans to start an emerging infections bulletin.

- 4.4 **Report from Canada:** Dr Joseph Losos, Director-General of the Laboratory Centre for Disease Control of Canada spoke on his government's initiatives on emerging diseases, including a summary of the *Lac Tremblant Declaration*, the report of a meeting recently organized to formulate plans to address emerging infections. Four recommendations resulted from this meeting: (1) a national strategy for surveillance and control of emerging and resurgent infections in Canada should be developed; (2) a national strategy for communication and dissemination of information related to this topic should be developed; (3) increased funding for primary prevention programmes, as distinct from secondary or tertiary care, should be provided; and (4) expert monitoring on ethics and jurisprudence in surveillance and public health interventions should be established. He mentioned their initiatives to improve communications, and specifically invited participants to join into an electronic bulletin board that they were starting. Several specific actions were planned, including studies targeting antimicrobial resistance, nosocomial pathogens, building a virology network, and improving surveillance activities and infrastructure development, including sentinel public health units, paediatric sentinel hospitals, oncology centres, emergency room networks, and other hospital based networks. Efforts would be made to share information by electronic mail and targeted links with other established networks such as those for nosocomial surveillance and asthma. A FAX-link would be established, with expanded weekly and special reports. Specific roles for WHO, could include development and coordination of a global plan of action for emerging infections, facilitating and improving communications, especially electronic communications, creating and developing an in-house capacity to monitor, report and respond to emerging disease threats, recruiting and retaining expertise in this area, and fund raising. Following his presentation, the comment was made of the need to educate policy makers to protect and preserve surveillance capabilities, both at the national and international level, in light of current health care reform discussions.
- 4.5 **Report from the Institute of Medicine:** Dr Polly Harrison of the USA National Academy of Sciences, Institute of Medicine, explained that as a follow-up to the extremely well-received study that the Institute had done on emerging infections, they were now attempting to carry forward that concept in a Forum for Emerging Infections. Their objective will be to continue to focus US public attention on this important topic, with a goal of long-term commitment to support. She explained that the Forum would involve an expert committee of approximately 20 individuals that will meet periodically over the course of 18 to 36 months, with the objective of stimulating fresh thinking on emerging diseases, clarifying policy and research issues, and defining problems which require attention. Targets for discussion will include surveillance and response, diagnosis and treatment, drug resistance, research issues, and education, training, and public awareness. A portion of their efforts will be directed to the global implications of emerging diseases. A critical piece of information that will be required is to determine the cost to governments of emerging infections, so that a logical argument can be made for savings to be gained following interventions.

The issue of costs associated with emerging infections elicited considerable discussion, especially with regard to the cost of antibiotic resistance. Comment was made regarding the treatment costs for vancomycin, and the dramatic increase in mycotic infections during the last decade. Points were made to revise the ICD system to reflect causes of death associated with antibiotic resistance, and perhaps the formation of a working group to quantify the costs associated with antibiotic resistance.

Comments were also directed at the need to "internationalize" the efforts described during these first presentations, since the focus had been towards the developed world. Clearly the same problems are being experienced in developing countries, and it was deemed imperative that this group include a global perspective to these issues. For many African nations, this means specifically addressing malaria, tuberculosis and yellow fever. Other suggestions included linking emerging diseases with national development, and attempting to associate epidemiological data that is routinely collected, with the occurrence of emerging infections (for example, HIV and tuberculosis), and ensuring that this information is part of the major public health decision making processes of governments.

- 4.6 **Report from ProMED:** Dr Stephen Morse summarized the purpose and activities of the International Program for Monitoring Emerging Infectious Diseases (ProMED), a project funded by the Federation of American Scientists. This international group of experts was formed to encourage the development of a global infectious disease surveillance system, which will identify and quickly respond to unusual outbreaks of infectious diseases. ProMED has no capacity to conduct these efforts themselves, but rather will attempt to build networks of interested parties, promote and facilitate long-term development towards these goals, and complement and assist programmes in emerging diseases by fund raising, consensus building, and assistance in the promotion and planning of these efforts. Included in their areas of interest are the threats of biological warfare.
- 4.7 **Report from the International Society of Travel Medicine:** Dr Robert Steffen summarized the magnitude and economic impact of international travel, showing that in 1993, approximately 500 million arrivals were recorded in Africa, the Americas, East Asia and the Pacific, Europe, the Middle East and South Asia, totalling receipts of US\$ 324,080 million. Of these, approximately 40 million travellers went from developed countries to developing countries. Realizing the significant and increasing frequency of international travel, and recognizing that new microbial threats to health may have enormous costs, the Society has adopted a resolution, "Urgent appeal for creation of a new global strategy to detect emerging microbial threats to health". This resolution specifically calls upon WHO and other international organizations to: "Urgently take all necessary steps to reconceptualize, redesign, and implement a global surveillance strategy and system for the detection of emerging microbial threats to health." While Dr Steffen lauded the efforts of WHO to rapidly publish information regarding outbreaks of infectious diseases in the WER, he realized that for various reasons, all outbreaks were not always promptly reported by member states. He proposed development of an alternative, informal network,

perhaps via electronic mail, whereby unofficial information regarding current disease activity could be informally distributed. This led to a discussion of outbreak reporting, and surveillance in general, and the associated economic disadvantages placed on countries when they report outbreaks of infectious diseases. With cholera, for example, formal admission of cholera transmission by a country may directly lead to the cancellation of imports from that country by others, not only of food products, but also of other material completely unrelated to cholera transmission. Thus, WHO must overcome the economic disadvantages of formal reporting placed on member states if we are to build a reliable surveillance system.

4.8 **WHO initiatives to date:** Dr J. LeDuc, Dr F.-X. Meslin and Dr Y. Motarjemi next summarized the efforts that WHO had taken to address emerging diseases during the past two years. These have focused on improving communications with other organizations similarly concerned with emerging diseases, re-enforcing contact with WHO Collaborating Centres that may assist in global surveillance efforts, and developing a specific plan to address on a global scale antibiotic resistance zoonoses safety issues.

4.9 **WHONET, a system for monitoring antibiotic resistance:** Dr Thomas O'Brien presented a summary of WHONET, a computer programme developed by him and his colleagues over the past few years to assist hospital laboratories in management of antibiotic sensitivity results. This programme is quite flexible and is easily fitted to hospitals of various sizes or specialties. It allows systematic storage and retrieval of antibiotic sensitivity results, and easily reports data by specific area of the hospital, species of organism, or other characteristics. Dr O'Brien also discussed the biological basis for antibiotic resistance in bacteria, and demonstrated how data obtained through the use of WHONET could be managed to monitor global antibiotic resistance trends, and form the basis for targeted interventions to prolong the usefulness of various antibiotics.

5. **Discussion**

A lively discussion followed the presentations, and there was general agreement among the meeting participants that the topic of emerging infections was clearly an important issue, and that WHO should be encouraged to take a leadership role in implementing and coordinating global efforts on this topic. Several specific comments ensued:

5.1 **Programme title:** Recognizing the importance of a title for this activity, the following was proposed: GLOBAL MICROBIAL THREATS, Emerging and Re-emerging Infectious Diseases.

5.2 **Time frame:** All participants agreed that this was a major effort that would take considerable time and energy to implement. The goal should be to build for the long-term, "one brick at a time".

- 5.3 **Coordination within WHO:** The point was repeatedly raised that there needed to be greater coordination within WHO with regard to surveillance activities and sharing of information. Dr Henderson's announcement that the Division of Communicable Diseases would serve as the Organizational focal point for emerging diseases was an excellent start. The responsibility is now with the Division of Communicable Diseases to begin internal coordination activities.
- 5.4 **Focus of Efforts at the Country Level:** While many of the presentations discussed initiatives underway in developed countries, the point was frequently made that WHO's efforts must be focused on global implementation, necessitating specific actions at the country level. Further, the programme must evolve so that specific actions are taken at that level in response to information provided. Workers in the field must be given specific advice on how to handle unknown diseases; where to seek laboratory assistance, clinical advice, or epidemiological support.
- 5.5 **Linkage of clinical, epidemiological and laboratory programmes:** The need was expressed to improve communications and collaborations between clinicians, laboratory workers, epidemiologists, associated specialists such as medical entomologists and mammalogists, and public health officials, so that all available resources are brought together when addressing problems of new or re-emerging diseases.
- 5.6 **Enhanced vaccine development:** While vaccine development is not the focus of the programme of emerging diseases, it is nonetheless an obligatory tool in the response to recognized disease challenges. Thus, the topic of how a global response would be mounted, should a reappearance of a 1918-like lethal influenza be recognized was discussed. Such an event could well lead to an even more explosive spread than was experienced in 1918, given the current population densities and rapid movement of people, and current vaccine technologies could probably not keep pace with the realities of pandemic spread in the jet era. Prompt recognition and definition of the problem will be the responsibility of the programme on emerging diseases, but the consensus was that attention should also be focused on improving vaccine technology so that an appropriate response is feasible. Nucleic acid vaccines perhaps represent a promising technology in that regard.
- 5.7 **Funding:** While the current funding crisis was recognized, there was strong sentiment that regular budget funding should be appropriated to this effort, as it was perceived to be extremely important and clearly central to the mandate of WHO. There was also discussion on the need for a specific resolution to be presented to the World Health Assembly in support of this initiative.
- 5.8 **Attempts to expand awareness of the importance of emerging infections:** Several comments were made to indicate that there was a general need for increased public awareness of emerging infections, and special efforts should be taken to educate both health care decision makers and the general public.
- 5.9 **Refugee populations and other complex humanitarian emergencies:** It was recognized that social unrest, leading to refugee populations and mass migrations, could play a significant role in the emergence or re-emergence of infectious diseases. Clearly greater attention needs to be placed on coordinating health care needs of

these select groups with those involved in surveillance for emerging diseases. A strong partnership needs to be forged in this area.

- 5.10 **Maintenance of technical capacity:** The need to maintain technical capacity among communicable disease experts in the field was repeatedly raised. Critical manpower shortages have been experienced at all organizational levels when attempting to identify skilled individuals to fill technical positions. The suggestion was made that WHO should expand its training programmes in an effort to overcome some of these shortages.
- 5.11 **Improved communications:** All participants agreed that there was a need to improve communications at all organizational levels. [Towards that goal, participants were asked to record their names, telephone and facsimile numbers, and their electronic mail address, if available. Following the meeting, an attempt would be made to establish electronic communications between participants.]
- 5.12 **Other forms of drug resistance:** While there was general agreement on the importance of antibiotic resistance surveillance, the need to monitor other forms of antimicrobial resistance was also discussed, such as malaria drug resistance, antiviral drug resistance, pesticide resistance, and others.

6. RECOMMENDATIONS

RECOMMENDATIONS were arranged under four **GOALS**, with specific **TASKS** for implementation listed under each recommendation.

6.1 **Goal 1: Strengthen Global Surveillance of Infectious Diseases.**

Recommendations:

- 6.1.1 Define global networks of WHO Collaborating Centres to recognize, report, and respond to outbreaks of infectious diseases, including investigation of clinical and epidemiological characteristics of new, emerging, and re-emerging diseases.

Tasks:

- . Local and regional partnerships for surveillance and public health response should be encouraged.
- . Regional offices should assist in eliciting the cooperation of Collaborating Centres and laboratories, defining how Centres can contribute to global surveillance efforts, and coordinating their activities.
- . Formal surveillance should be initiated using Collaborating Centres and other cooperating laboratories.

(As indicated below, three specific networks could be established immediately)

- 6.1.2 Global trends of antimicrobial resistance should be monitored by Collaborating Centres and Laboratories.
- . A dedicated global network of Collaborating Centres, laboratories and hospitals should be established.
 - . WHONET-3 computer programme for data management should be provided to each member of the network.
 - . A quality control programme should be created and maintained.
 - . Proficiency testing should be instituted.
 - . Regularly scheduled surveillance reports should be submitted to local, regional or international centres.
 - . Prompt analysis should be made of surveillance reports, with specific, targeted interventions recommended to assist contributing laboratories to overcome identified problems.
 - . Surveillance information should be periodically reported in regional or international publications.
- 6.1.3 Zoonotic and foodborne diseases should be monitored through cooperations with existing and newly designated Collaborating Centres or laboratories.
- . Collaboration should be strengthened with existing FAO and OIE zoonotic diseases surveillance efforts.
 - . National focal points for surveillance of foodborne disease should be identified and a network of Collaborating Centres and laboratories created.
- 6.1.4 Virus diseases should be addressed through a global network of Collaborating Centres and laboratories.
- . The existing network of Arbovirus and Haemorrhagic Fever laboratories should be maintained and strengthened.
 - . Existing surveillance efforts on HIV should be coordinated with surveillance of other viral diseases.
 - . The influenza network of Collaborating Centres and laboratories should be maintained and strengthened.

- . Surveillance efforts associated with global eradication campaigns for polio and measles should be coordinated with surveillance of other infectious diseases.
- . Surveillance efforts for other vaccine preventable diseases should be coordinated with global surveillance of infectious diseases.

6.2 Goal 2. Strengthen the International Infrastructure Necessary to Recognize, Report and Respond to Emerging Infectious Diseases.

6.2.1 Laboratory capabilities should be maintained and strengthened.

- . Diagnostic reagents should be available in cooperating laboratories to allow prompt, accurate diagnosis of common and unusual infectious diseases.
- . Collaborating Centres should assist in preparation, quality control, and distribution of diagnostic reagents not commercially available, with the ultimate goal of regional self-reliance in diagnostic reagents production and delivery.
- . Laboratories should be properly equipped to conduct routine diagnostic testing.

6.2.2 Training opportunities for staff involved in monitoring emerging infectious diseases should be encouraged.

- . Training programmes should be initiated to assist in technology transfer to Collaborating Centres and laboratories.
- . Expertise in rare or unusual infectious diseases should be maintained.
- . Short and long-term internships, perhaps at WHO and WHO Collaborating Centres, and elsewhere, should be established.
- . Countries should endeavour to create career tracks to encourage retention of trained individuals.

6.2.3 Communications among Collaborating Centres and with WHO local, regional and headquarters offices should be streamlined.

- . Frequent informal communications by telephone, FAX, letter and E-mail should be encouraged.
- . Development should continue of electronic linkages for computer conferencing, data transfer, mutual analytical support and information exchange.

- . Pilot projects in communications should be encouraged, including links with the private sector and certain national capacities.
- . Periodic meetings of Centre Directors should be encouraged both on a regional and global basis.
- . Formal communications between WHO country representatives, regional offices, and headquarters should be streamlined, building upon existing systems.
- . Information gathered should be rapidly disseminated under specific plans, and formal co-authored publications should be encouraged.

6.3 **Goal 3. Create an Applied Research Programme**

- 6.3.1 Focus on problem definition, diagnosis, epidemiology and prevention of infectious diseases that are increasing, re-emerging, or emerging and are established as real or potential public health priorities locally or regionally.
- 6.3.2 Support special efforts on diagnostic techniques appropriate for developing countries.
- 6.3.3 Encourage the development and maintenance of quality assurance programmes in local or regional partnerships.
- 6.3.4 Collaborate with other interested organizations locally, regionally or internationally through commonly developed and implemented protocols, shared data, collaborative analysis, mutual support, and joint presentations and publications.
- 6.3.5 Evaluate and set standards for basic public health actions such as simple hygiene, encourage public health education, and evaluate disease avoidance and prevention strategies.

6.4 **Goal 4. Strengthen International Capacity for Infectious Disease Prevention and Control**

- 6.4.1 Develop specific guidelines for prevention and control of newly emerging and re-emerging infectious diseases.
 - . Zoonotic diseases
 - . Parasitic diseases
 - . Foodborne diseases
 - . Emerging viral and bacterial diseases
 - . Therapeutic advice and policy considerations

- 6.4.2 Develop recommendations to minimize the impact of antimicrobial resistance.
- . Encouragement of new cycles of antibiotic development
 - . Improve prescribing practices
 - . Consider using antibiotics in combination
- 6.4.3 Improve methods of communication and dissemination of information to ensure that guidelines reach the appropriate target groups.

Opening Statement by Dr Ralph Henderson
Assistant Director-General

Ladies and Gentlemen,

On behalf of Dr Hiroshi Nakajima, Director-General of WHO, it gives me great pleasure to welcome you to the World Health Organization on the occasion of this consultation on Emerging Diseases. We have gathered an exceptional group of experts representing a wide range of technical skills and diverse interests, and I would open my comments by first personally thanking each of you for taking time from your busy schedules to participate in this important and formative meeting. We are especially honoured to have Dr Joshua Lederberg participate and serve as Chairman. During the course of this consultation, you will hear presentations from several of your colleagues about the current status of various efforts now being considered to address the problem of emerging diseases. As we all realize, however, the concept of "emerging diseases" is still novel and our thoughts on this subject continue to evolve, and there is at present no "best" approach to the problem. Consequently, we have left the entire second day open for discussion and deliberations, and we hope that during this time you, as national and international experts in the field, can help to define those critical roles that WHO can best play in implementing a global initiative on emerging diseases.

The current pandemic of AIDS first focused our attention on the question of emerging infectious diseases; however, the concept of new pathogens with the potential to cause widespread disease is not new. Indeed, medical scientists have recognized for decades that pathogens can and do mutate, that changing human behaviour can lead to new threats of disease, and that as humans invade further into new areas of the world, previously unknown diseases may be encountered. Likewise, shifts of large segments of the population of many countries from rural environments to urban centres have led to overcrowding in many cities, poor sanitation, and a re-emergence of diseases such as tuberculosis, which were at one time thought to be controlled.

This is not the first foray of the World Health Organization into the arena of emerging diseases. We have for many years played a key role in responding to emerging microbial threats to health. One of the most successful programmes has been the global monitoring of influenza viruses, and the subsequent annual coordination of the influenza vaccine formulation. Through a closely linked network of laboratories worldwide, cooperating with centralized reference facilities, new strains of influenza viruses are rapidly isolated and characterized, and this information is then provided to vaccine manufacturers to assist them in their selection of the following year's vaccine composition.

WHO is also a focal point for surveillance of global infectious diseases, and under International Health Regulations, all countries must report to WHO cases of cholera, plague, and yellow fever. This information is then widely disseminated through prompt publication in the *Weekly Epidemiological Record*. This system has proved its worth many times over in rapidly alerting the world to outbreak conditions, and in helping to coordinate emergency responses. The recent recognition of a new strain of cholera is but one dramatic example.

Likewise, for many years the World Health Organization has coordinated an international network of Collaborating Centres, which has proved essential in rapidly recognizing changing disease conditions at the local level. These are often Centres of technical excellence, and they represent a tremendous resource which has not been fully utilized in the past. They are distributed throughout the world, and in many areas they play a critical role in advising WHO on a wide variety of health issues, as well as in implementation of national, regional, and global programmes for many different technical areas. At present, there is a great disparity between the existing capabilities of some Centres and their full potential. One of the objectives of our initiative will be to improve communication with and the technical capacity of these Centres, so that all will be equally prepared to recognize "common diseases", resulting in them being better prepared to recognize "unusual" diseases, should they be encountered. We envisage this network playing a key role in global surveillance of emerging infectious diseases.

We know that many factors influence the emergence of new diseases, and that a wide range of technical skills and expertise will come into play when addressing this problem. Nonetheless, most diseases currently being discussed as "emerging", fall under the broad category of communicable diseases. Recognizing this, and realizing the need for a single point for coordination of this initiative, we have elected to make the Division of Communicable Diseases the focus within WHO for emerging diseases. This does not mean that all work will be actually carried out within this Division, but rather that it will exercise programmatic leadership, and serve to coordinate activities throughout the Organization, as well as pursue its own specific initiatives in the field.

We realize that this initiative will require funding. While we hope to use to the fullest extent possible the inherent expertise and resources already available through our Collaborating Centres, we nonetheless recognize that additional resources will be required to accomplish many of the goals we have already set, as well as those that will be articulated during this consultation. We will be actively seeking to obtain these additional resources and hope that a number of you may be able to help support our requests.

In closing, let me wish you all an enjoyable stay in Geneva, and a most productive meeting. I believe that your topic is especially timely, and I will follow your deliberations with great interest.

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