

Guest Editorials

Sang Tae Han*

Not so long ago, many thought the era of communicable diseases would soon be over. It looked as if the age-old battle between mankind and communicable diseases, such as leprosy, tuberculosis, measles and malaria, had almost been won. By the 1960s, many could have been forgiven for believing that it was only a matter of time before the work of Jenner, Pasteur, Salk, Sabin, and the countless others who had contributed to the fight against communicable diseases, would bear the ultimate fruit: their complete control and eradication. Great progress has certainly been made in the prevention and control of communicable diseases. Global eradication of smallpox has been achieved, while other communicable diseases, such as poliomyelitis and dracunculiasis, are verging on eradication. Chagas disease and neonatal tetanus are now far better controlled than in the past. However, the complacency which followed early success in the development of antibiotics and vaccine has now given way to a new realization.

Mankind may have had the upper hand for a while, but viruses, bacteria, and parasites have now proved more formidable and adaptable foes than we had once thought. Rapid and frequent international travel and trade have expedited the spread of communicable diseases from one part of the globe to another. At the same time, the number of communicable diseases has steadily increased due to rapid urbanization without adequate health infrastructures, and to ecological changes, which have increased exposure to disease vectors and reservoirs. Moreover, many pathogens, such as *Mycobacterium tuberculosis*, *Neisseria gonorrhoea*, and *Plasmodium falciparum* have shown a remarkable ability to develop resistance to drugs, a process accelerated by poor prescribing habits and antibiotic misuse. Such drug-resistant strains have caused untold suffering and have made control of communicable diseases a much more difficult task. As a result of all these factors, communicable diseases have re-emerged as a major threat to health worldwide.



Once targeted for eradication, malaria is now endemic in 91 countries and continuously threatens about 40% of the world's population. Measles has been well controlled in some places, but still remains a major contributor to morbidity and mortality among children in the rest of the world. Epidemics of dengue fever are now more common and widely distributed and, with the emergence of dengue haemorrhagic fever in the 1950s, this disease has acquired a new and fatal manifestation. Tuberculosis has also rebounded to such an extent that, in 1993, WHO took the unusual step of declaring a global emergency. In addition, international commerce and changes in the food industry have been accompanied by widespread outbreaks of new or unusual foodborne pathogens.

The re-emergence of long-known communicable diseases is unfortunately only part of the picture: the effects have been compounded by the emergence of a variety of new communicable diseases. Over the past two decades, some 30 new disease-causing organisms have been identified, including HIV, hepatitis C, Ebola virus and rotavirus. These have resulted in some of the most fatal diseases we know, such as AIDS and Ebola haemorrhagic fever. Vaccines continue to show great promise in tackling these diseases, but their success to date has primarily been with viruses rather than bacteria and parasites. Moreover, vaccines have yet to attack many of the most feared viruses, such as HIV and dengue.

In the Western Pacific Region, both emerging and re-emerging communicable diseases, such as HIV/AIDS, cholera, dengue/dengue haemorrhagic fever and diphtheria, have seriously affected many countries and areas. During 1995 and 1996, for example, cholera outbreaks occurred in the Lao People's Democratic Republic, Malaysia and Mongolia, while diphtheria outbreaks occurred in the Lao People's Democratic Republic and Mongolia. In July 1996, an *E. coli* O157:H7 outbreak affected approximately 6000 schoolchildren in Japan and, in the first half of 1997, an enterovirus outbreak was reported in Malaysia. More recently, in December 1997, the H5N1 avian influenza virus was identified among humans in Hong Kong.

The Pacific islands have so far been spared the worst effects of these emerging and re-emerging communicable diseases. Nevertheless, dengue fever is a constant threat in the Pacific. Significant outbreaks occurred in 1997 and early 1998 in several countries, including French Polynesia, the Cook Islands, Fiji, and New Caledonia. HIV/AIDS is also making slow but steady inroads. Tuberculosis shows hotbeds of activity, and tuberculosis control programmes suffer from low priority status and inadequate attention. Moreover, as in other parts of the world, the Pacific countries and areas are

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the scene of frequent and rapid international travel, urbanization, deteriorating environments, and programme complacency, all of which contribute to the problems of preventing and controlling communicable diseases.

WHO has taken up the challenge posed by the growing global threat of emerging and re-emerging communicable diseases by working with governments in preparing disease control plans and implementing emergency preparedness activities, and in mobilizing and coordinating international support. In October 1995, the Division of Emerging and Other Communicable Diseases Surveillance and Control was established at WHO Headquarters in Geneva. In April 1996, the Regional Office for the Western Pacific established the Outbreak Response Task Force to respond promptly to life-threatening communicable disease outbreaks within the Region, including those associated with natural disasters. Activities for the task force include the coordination of outbreak control, the establishment of a regional network for surveillance and information exchange, and the coordination of provision of supplies and equipment. Regional stockpiles, of items such as insecticides and cholera kits, have also been distributed in three strategic areas in the Region, including Fiji. Furthermore, in 1996, the Regional Committee for the Western Pacific declared the management and control of emerging and re-emerging communicable diseases as one of seven regional priorities. WHO also highlighted the importance of emerging communicable diseases in its 1996 World Health Report **Fighting Disease, Fostering Development** and the theme for World Health Day 1997 (7 April) was **Emerging Infectious Diseases – Global Alert, Global Response**.

In the Pacific, the fight against emerging and re-emerging communicable diseases will require joint collaborative efforts among all countries and areas to prevent the spread of diseases from one part of the region to another. WHO collaborates with various nongovernmental and governmental organizations, such as the Pacific Community and Unicef, in controlling communicable diseases in the Pacific. In the future, such joint action will become increasingly necessary for rapid dissemination of information among countries and areas in the region, as well as for timely and effective response to disease outbreaks.

While the optimism of 20 or 30 years ago may have been premature, it is clear that we have many weapons at our disposal. I hope that this issue of *Pacific Health Dialog* will initiate a rational and committed approach to the problem of emerging and re-emerging communicable diseases, and may result in action that ensures the health of Pacific people.

Marcus H. Samo*

It is commonly recognized that capability to respond to emerging and re-emerging diseases in the Pacific and the world varies considerably from place to place. In the U.S.–Pacific jurisdictions of American Samoa, Commonwealth of the Northern Mariana Islands, Guam, Federated States of Micronesia, Republic of the Marshall Islands, and the Republic of Belau, efforts have been intensified to improve local capacity for the effective and efficient response to emerging and re-emerging diseases. These efforts often come in the form of technical assistance through experts, and in funding support from agencies in the USA and other donor countries, philanthropic foundations, and local grassroots groups. However, the chance for success for any project in building capacity depends on the resources of each island, type of training available to them, and the relevance of such training application.

So with all these efforts to improve local capacity, why is there such a gap in responding to emerging and re-emerging diseases in the Pacific? This editorial offers personal observations and some explanations as to what might contribute to the islands' ability to have a sound infrastructure system for epidemiologic investigation and surveillance (EIS). I use the Federated States of Micronesia (FSM) as an example.

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The gap between effort and result is a consequence of a lack of integration among three important areas: knowledge, resources, and practice.

Knowledge. Applying what you learn and learning what you apply are important aspects of the learning process that contribute to what we call knowledge.

This knowledge not only perfects itself over a long period of time but also moulds an individual into a competent, effective and efficient user of knowledge, a process that often discourages many people in the interim. This must be the basis of EIS training for the isolated Pacific islands.

The training opportunities for capacity building in disease surveillance and investigation available in the FSM are short-term in nature, piecemeal, and not a process amenable to

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long-term learning. In a few cases, a candidate out of the entire 73-physician workforce (FSM Department of Health Services (July 1997). **Number of Practising Physicians in the Federated States of Micronesia**) would be sent off-island for a two-week training. The candidate, after successfully completing the training may find that some of the training materials and facilities are not based on the real working environment.

Resources. Resources are required in several areas, including manpower, funds, technology, and training. In order to have a reliable EIS system that would enhance rapid notification during disease outbreaks, a diagnostic and clinical laboratory is also necessary. Most hospitals in the FSM have only the rudimentary resources. To have specimens confirmed, they must be shipped overseas. This practice delays the availability of accurate and timely information, which is of hallmark importance in EIS.

Practice. The ideal practice is that after an individual has acquired new knowledge and skills during training, these must be applied to the work situation. As pointed

out earlier, some training is not relevant to local circumstances. This is often because of a lack of resources, such as staff support, supplies, and funds which play an important role in transferring and sustaining the application of learned skills. When that is the case, the individual is left to improvise with whatever resources are available, which may mean relying on support from others or allocating resources from other area to support this purpose. In a time of shrinking resources, this practice is not conducive to systematic EIS infrastructure development.

We suggest that the following are factors that contribute to inadequate disease surveillance and response:

- *Inadequate diagnostic capability.* There are limited resources in terms of manpower, training, skills and medical supplies such as reagents, etc.
- *Geographic isolation.* There is a time lapse in ordering supplies, administering tests, and sending specimens off-island and getting the results back.
- *Inadequate standard protocols* for epidemiologic investigation and surveillance.
- *Incomplete vaccine response.* Although 100% of infants in a given year may be vaccinated, 10-15% will not develop immunity, due to inherent biologic vaccine failure.
- *Limited interest in epidemiologic investigation and surveillance.* There is no full-time medical or public health epidemiologist.
- *Inadequate resources* in case finding, tracking and man-

agement. Resources such as computer software application, support staff, and diagnostic abilities are limited.

- *Lack of role models.*
- *Highly mobile population.*
- *Self-learning theory.* We are more likely to respond and take preventive measures after the stimulus strikes us.

In addition we suggest the following to improve epidemiologic infrastructure development:

- *Provide training.* It is vital that capacity building takes precedence and becomes a pre-requisite for all training programs. Equally important, training objectives must be geared toward local circumstances whenever possible. On-site and on-the-job training should take advantage of linking training activities with hands-on applications.
- *Provide opportunities for mentorship.* After training, junior trainees (researchers, medical professionals, etc.) should be followed through by senior partners who are on-site practitioners.

- *Encourage junior professionals to be inquisitive investigators and to publish their efforts to lay claim to their intellectual property.*

- *Keep it simple: Don't lose sight of the importance of carrying out your work in the simplest way possible.*

- *Use the appropriate technology.* It is difficult to keep up with rapidly changing technology. We should always remember that an appropriate technology is one that allows us to be beneficiaries, not dependants.

- *Emphasize practical over theoretical.* Practical applications are often better understood than are theoretical and abstract points.
- *Project resourcing.* After training, provide funds to support epidemiologic projects for trainees. □

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Michael J. O'Leary*

Emerging communicable diseases. At times this seems simply a trendy topic, a fad. Dramatic accounts in the media blend fact and fiction to highlight yet another way in which our world seems to be deteriorating. Is this real, or are we simply newly aware? Obviously every human disease had its origin, its premier index case, somewhere, at some time. But the pace at which this is now occurring appears unprecedented.

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The list of newly-emerged diseases exceeds 30 in the past 25 years. Granted many of these are caused by newly-recognized rather than truly "new" human pathogens. But coupled with the re-emergence of old threats, such as tuberculosis, and the rapid development of drug resistant strains of others, such as gonorrhoea, we are faced with a dilemma which was not anticipated 30 or 40 years ago when the era of communicable diseases was thought to be all but over.

Papers in this issue highlight many of the factors which have brought us to this state: population mobility, urbanization, weakening of family and community restraints on behaviour, environmental degradation, even climate change. As the WHO Regional Director, Dr ST Han points out in his message to open this issue, the Pacific has been relatively spared so far. But the winds are beginning to blow. Four papers in these pages deal with HIV/AIDS, whose impact in the Pacific islands is just starting, but which can only get worse. Tuberculosis is the subject of four more papers, testifying to its perceived threat to the health of Pacific peoples. Two comprehensive review papers address dengue, a serious epidemic disease posing a continuing threat throughout the Pacific, and especially visible in 1997 - 1998. We have in this issue papers which bring less well-known, but potentially serious or epidemic conditions to our attention: leptospirosis, cryptosporidiosis, acute haemorrhagic conjunctivitis and other enteroviral diseases, campylobacter, ciguatera. Missing are any papers on cholera, but its global resurgence and periodic forays into the Pacific are cause for continuing concern.

At the same time we must appreciate the progress which has been made. Leprosy is steadily approaching a level of control which may signal its elimination as a public health problem in the Pacific, although perhaps falling short of complete eradication. Initiatives on filariasis, particularly the availability of a new drug and the implementation of mass drug administration, hold great promise (although we remain chastened by the lessons of the past). Probably the most significant achievements have occurred in the control of vaccine-preventable diseases. Starting with smallpox eradication, we appear on the way to other lasting accomplishments: poliomyelitis is in the final stages of certification of its eradication in the Pacific; hepatitis B, a perennial scourge, is now being tamed through the wide availability of an effective vaccine; and a major initiative is now underway to achieve lasting control in the Pacific of measles, still a major cause of morbidity and mortality in children around the world.

With these successes, we can too easily forget the devastation such diseases once caused. A paper in this issue by

Morens on the Fiji measles epidemic of 1875 is a vivid reminder of our past, a view of an emerging disease of an earlier Pacific era. The more recent history of emerging diseases is well-documented in books published on the subject in the last few years. Two examples may be found in the book review section here. The interested reader can find plenty of others. To bring us from the past to the present, Ostroff, in a perspective article in this issue, confronts and elucidates many of the emerging disease threats we face today.

We must ultimately, of course, do more than identify problems. This is a critical first step: to "know the enemy". But we require carefully-considered strategies to reduce the adverse impacts of our human interactions with the environment and with each other; to prevent further development of antibiotic resistance; to recognize new threats quickly; and to

take effective action to prevent or mitigate their effects. Several papers in this issue deal with such matters on a disease-specific level. Those which take a broader view focus largely on capacities for public health surveillance and response. These include the four papers in the "Pacific Health Institutions" section of the journal, and include, for example, the importance of ensuring an appropriately trained and supported cadre of public health professionals in the Pacific. A network of such individuals, drawn from a variety of government, organizational, institutional, and agency sources, must understand thoroughly the principles and techniques of public health surveillance. Even more important, they must have the knowledge, motivation, capacity, and political and administrative support to respond in an effective way. This requires sound practical training, as discussed in two of these articles, institutional commitment, and an effective information and communications network. An already functioning example of the latter is described in Souarès' article on PACNET, and a specific case is proposed by Lewis to link the monitoring of disease occurrence with climate change.

Pacific Health Dialog has become an important source of knowledge and information on health issues in the Pacific. Such knowledge must be translated into action. We must now draw on the experience of the past, build capacity in the present, and engage in the serious planning and commitment required for the future in order to effectively address the dangers of the many emerging and re-emerging communicable diseases. It is in this spirit that this issue of *Pacific Health Dialog* has come to pass. We appeal to all concerned readers to join in this effort. □

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