

The case for a Pacific public health surveillance network

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Introduction

It's a small world. We say this from our human perspective, but it's a small world for viruses, bacteria, and parasites too. Our microbial companions accompany us wherever we go — as we crowd into urban areas, board jets at airports, mill around at bars and sports stadiums, and generally mix ourselves up all over the world. The social and cultural changes for humans in the 20th century have been profound. We increasingly recognize that the changes for microbes have been profound, too.

Perhaps the two most significant contributors to this phenomenon are (1) the massive shift of population from rural and relatively-isolated communities to urban areas; and (2) the replacement of international ship travel for a select few by international jet travel for millions.

The population shift to high density areas has resulted in many more opportunities for viruses and bacteria to pass from one person quickly to many others. If you are a virus, the city is the place to meet people. The situation is worsened by the pressure on water supply and sanitation systems and by crowded living conditions.

The age of jet travel has enabled the viruses and bacteria of the world to reach new and distant places while they are still fresh and eager to make new acquaintances. It is a truism that a person can be infected on one side of the world, board a

plane while in an early and yet healthy stage of incubation, and step off hours later on the other side of the world, a few hours or days before the incubation period ends and the virus or bacteria presents itself by the millions once again to the outside world, half a world away. In 1996, there are few places on the globe, and few people, and few viruses and bacteria, more than one or two days from any other. The age of the ship as a floating quarantine station is long gone.

These realities, coupled with dramatic changes in the ecosystem, evolutionary pressures on organisms of all kinds, war, millions of refugees, poverty, a rapidly growing world population, and a host of other factors, are the backdrop and the basis for a new branch of public health: that devoted to newly emerging and re-emerging infectious diseases.

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But it is not only infectious diseases that demand our attention. In many countries, including those of the Pacific, the latter half of the twentieth century has brought other kinds of epidemics: heart disease, diabetes, excessive alcohol use, motor vehicle accidents, obesity, hypertension. These epidemic diseases may not be contagious, but they are certainly spreading. In many of the Pacific island countries, non-communicable diseases are overtaking communicable diseases as causes of morbidity and mortality, or have already done so, at least in the adult half of

the population.

Fortunately we have developed many tools to combat these threats to health. Our understanding of the risk factors for diseases, and their transmission, distribution, and prevention, has increased tremendously in a few decades, as has our arsenal of vaccines, pharmaceuticals, and other interventions, and our ability to diagnose, characterize, and implement specific control measures for an epidemic. Although it often seems the diseases are winning, we can only imagine how much worse things might be were it not for advances in public health.

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The resources to fight these battles are not nearly so evenly distributed around the world as are the people and the microbes involved. The concentration of money, laboratories, information, and public health training in a small number of relatively wealthy countries creates a resource imbalance; yet the public health challenge is universal. Some things must be shared.

In the Pacific the cities are smaller, the distances are greater, and the wars are more verbal than military, but this global situation affects our part of the world too. The Pacific island countries also present their own set of challenges — widely scattered populations, many ethnic groups and languages, expensive and often unreliable communication and transportation links, limited funds for public health and therefore inadequately developed public health infrastructures, insufficiently-accurate data for decision-making, limited laboratory capabilities, and few human resources at technically-skilled levels. Public health staff who face these barriers often work in isolation, with very limited access to an intellectual or resource support network. The individual efforts are often impressive, but the capacity to have a positive impact beyond a very local area is constrained by all of the above factors.

A public health surveillance network

How could a network help, and how might it function? Although there have been many *ad hoc* or short-term responses, such as external support in time of public health crisis, and although there are agencies, like WHO and the South Pacific Commission, which provide ongoing technical support on request, there has never been a concerted long-term effort to establish a Pacific-wide, country-based support network and response capability. Establishing a network of people, linked by computer, would allow members to pool their knowledge and experiences, and to draw on the intellectual resources of the group as a whole. The existing, largely untapped technology is more than adequate to allow each member of a network to have ready access to the world of public health knowledge and information — to search the literature for answers to specific questions, to take advantage of the published and unpublished experiences of others in dealing with public health problems, and to share one's own experiences and lessons.

Principles

Although it is difficult to predict the evolution of a multipurpose, multifocal network, we can discuss a few basic principles. First, the membership should be open and accessible to all interested parties. The more people involved, and the more countries involved, the greater the possible wealth of shared information. Second, the locus of "control" should be

decentralized, allowing all participants a democratic opportunity to inform and shape the network and to communicate without external control. A network should primarily be individual- and country-based, rather than regionally- or "externally"- driven. Third, while the members define a network, it still requires a secretariat, a central clearinghouse for issues or information that require either consensus, or a unified regional perspective. The secretariat function could rotate or could be agreed upon to reside in a permanent location

Functions

There are many potential functions of a network. A very important one is to **reduce the isolation** in which many Pacific public health professionals work. The capacity to quickly and inexpensively communicate with colleagues can ease this substantially. Even to be a passive observer of communications among others is educational, even liberating. An important purpose of such an initiative is to build the links among health statisticians, epidemiologists, public health professionals, and other interested persons, in an information-sharing and support network. This may be accomplished by e-mail, perhaps with an electronic bulletin board, and, as things evolve, with teleconferencing and videoconferencing. ProMED is a useful global example of informal networking among professional colleagues.

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A second purpose is for **data transfer**, particularly for disease surveillance. Regional sharing of information is currently accomplished by reports sent by mail or fax to regional agencies, with summaries returned at intervals by mail. This is slow and incomplete. There is little sharing of disease notification data directly between countries. Electronic formats could standardize, streamline, and broaden this communication.

A third important function is that of an **early warning system**. A specialized aspect of disease surveillance generally, this would address the concerns raised in the opening paragraphs of this paper. The recognition of, and response to, periodically-introduced diseases in the Pacific, such as cholera, dengue, or measles, has frequently been accomplished in national isolation. The South Pacific Commission in particular has done a commendable job for many years in summarizing and redistributing the information they receive, but the timeliness, accuracy, and distribution of the summary data suffer from constraints inherent in the system. An electronic network could substantially reduce this problem, and allow at least the possibility of preventive action.

A fourth possibility is to **harmonize regional data collection and dissemination** — to reduce the burden of duplicative or low priority data demands; to facilitate the ability of

regional agencies and countries to collaborate in collecting, sharing, and using data; and to “speak the same language” in the development and provision of health indicator and other information. Related to this is the development of **centralized databases**, stripped of individual identifying information, and accessible to all authorized users. An obvious example is Pacific island demographic data, disaggregated when possible, and made available, officially, by national offices of statistics, health statistics, or census. Once appropriate agreements and safeguards are in place, all authorized users who need demographic data would have electronic access to an officially-sanctioned and standardized source. Such databases could be developed also for monthly notifiable disease data, nutritional data, health workforce information, results of surveys, and many other purposes.

A fifth purpose of a network is that of **technical support**. It would allow public health professionals in the Pacific to share their personal stores of knowledge and information with others, and to draw on the experience of their colleagues, by providing a forum for easily and quickly asking questions and receiving answers. Because of the current state of e-mail and Internet connections, such two-way communication and support can just as easily extend beyond the Pacific, to draw on the support and expertise of people anywhere in the world who have information relevant to the problems of the Pacific. In linking the scattered, individual voices of public health in the Pacific, a few other benefits may be expected — from unity comes strength. A network of professionals, clearly and effectively addressing public health problems, is more likely to attract the support of others: support for outbreak investigation and control, for important health surveys and operational research, for disease control initiatives, for the development of public health infrastructure, and for other activities for which resources are scarce in the Pacific. Two important areas that require substantial support and lend themselves to a (Pacific) regional approach are training in public health sciences, and public health laboratory support. Both of these are generally weak, and would benefit from carefully-developed regional planning.

The above functions can be achieved in the Pacific by exploiting the data transport mechanism supplied by the Internet, now commercially available in several Pacific island countries. For those not yet served by the Internet, remote access via telephone lines or Peacesat is a tested valid alternative. In particular, networks based on the Internet offer these services:

- **World Wide Web:** To dynamically and interactively share documents, photographs, and graphics, and to distribute databases.
- **e-mail:** To exchange electronic mail between and among users.
- **FTP:** To transfer data files.
- **Newsgroups:** To establish dialogues among users on any topic. Any user can start a “thread” by posting a question and can receive answers from experts located anywhere in the world. Active newsgroups can provide a comprehensive understanding of almost any topic.

Conclusion

The time is right for a Pacific regional public health surveillance network. Data demands on public health workers are great, yet the lack of timely and accurate information is bemoaned by many; the capacity to interpret and act on data is sadly deficient; and the work that is done by public health professionals, while often commendable, is done in isolation and with very limited access to support. Yet the technology to address many of these issues is available and affordable, and support exists or could be tapped

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if common cause and solidarity is established. We have the concept, the models, and the means; with the motivation we can make this happen.

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References

Available from the author on request. □