Global Health Network Overview

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Ebola virus, breast cancer, homicide, war, famine, AIDs... Is the world becoming sicker? Most definitely not. If we examine life expectancy, it is clear that remarkable improvements in health have occurred this century. In almost all developed and most developing countries there has been a 25 year increase in life expectancy. This increase is greater than that which we have seen at any time in the world. The increased longevity was almost exclusively due to public health. It has been estimated that almost 24 of the 25 year increase was due to simple public health measures such as sanitation, immunization, changing life styles, improved nutrition, etc. The first two eras of public health this century were that of sanitation and immunization. The 3rd age will be that of Information, which will begin in the 21st century.

Public Health is information transfer. Public Health scientists read literature and talk with colleagues to generate ideas. They write grants to obtain resources to conduct research. Public health research is information, research as data collection, analysis and manuscript preparation are all information transmission. Public health researchers publish results to transmit information to our colleagues and the world. Results are read by public health workers to improve health, and surveys monitor what if any effects these public health measures have upon health.

The problem is that the technologies that form the backbone of public health information transmission in general are antiquated, the telephone, postal systems and fax. We now are in an information revolution where rapid, almost free, transmission of data is now available. If public health were to harness this revolution, there could be a rapid improvement in public health.

We have begun a discipline called tele-preventive medicine. This discipline consists of the use of the Internet to bring and collect quantities of information from large number of healthy people to prevent disease. It is different from tele-medicine which targets high band width information to a small number of sick people to "cure" disease. It is likely that a telepreventive medicine

approach will have a much greater effect to improve the health of the world than that for telemedicine.

The Internet evolved from the Department of Defense in the early 1960s and 1970s. In the 1990s the Internet revolution exploded. Almost all of epidemiology, and in fact all of science in the US came onto to the Internet, since 1990 with E-mail. The speed to which this is occurring is astonishing, in 1990 few scientists had access to E Mail, now science could not be done with out electronic communications. Just 3 years ago there were only 200 home pages on the Internet, and few outside computer science had heard about home pages and the world wide web. Now there are over 650,000 home pages, with most of the Universities having a page and almost all familiar with WWW and homepages. However, public health needs to improve its information infrastructure.

The significance of this effort is that now the information systems in public health world wide are weak and expensive. An Internet backbone using the latest technologies would strengthen our field

The second major importance of the proposed research is that we have created a Global Health Network. With this we have assembled a team of global telecommunications/health experts from the World Bank, NASA, IBM, WHO, PAHO, and elsewhere. These are people who have networked much of the United States and the world, and are responsible for much of the global development on the Internet. These technology and health experts feel that a telepreventive medicine approach is the optimal way for improving epidemiology, public health, and global health.

Progress Report:

We are entering the Information Age of public health. Everything we do in public health involves information. The latest information technology can change completely the fabric of global health

We propose to use the Internet as an information "glue" that will tie together the divergent parts and divergent individuals locally to globally. We will employ this structure to create what we and others have described as the "collective intelligence" for global health.

Al Gore has written that the United States current national information policy "resembles the worst aspects of our old grain policy which left grain rotting in thousands of storage files while people were starving". We have warehouses of used global health information and expertise "rotting". Telecommunications will provide access to these for developed and developing countries alike.

In early 1993 a group of experts banded together. Dr. Ronald LaPorte from the University of Pittsburgh began to pull together a group from very divergent backgrounds, but with a mission to improve global health through the application of the latest cost-effective information technologies to prevent disease. Included in this group is Anthony Villasenor, the former head of the NASA scientific Internet, and the former head of the Federal Networking Council. The NASA scientific Internet is one of the first networks for scientists, and is currently the largest science network. Due to his close connection with the University of Pittsburgh during the past 4 years he was appointed as an adjunct faculty member. He brought the Internet to NASA, New Zealand, Australia, Japan, Latin America, and Russia.. Eugene Boostrom, M.D., Dr. Ph is a major leader of telepreventive medicine at the World Bank. He has been responsible for some of the efforts to network Africa, and the development of systems to review information on the Internet among many other areas. Dr. Hong-Kyu Lee from Seoul National University has helped to guide the GHNet in Asia. Shunichi Akazawa is the developer of the WHO Home page. Carlos Gamboa, M.D. is leading much of the effort of telecommunications at PAHO. We have several other people who have joined us on the effort. Naoko Tajima from Tokyo, helped to develop the early concepts of this in the mid 1980s.

The Global Health Network consists of 8 components:

1. Connectivity: Dr. Eugene Boostrom and Anthony Villasenor have been connecting the countries of Africa. We have also determined the status of connectivity of public health in Japan and the US and are starting to connect them. For the US at the state health department level there is good connectivity, and over 50% have home pages. At the local level conductivity is very poor, with most counties not even having electronic mail, and less than 10% having home pages. We are actively developing training courses to bring public health workers onto the information superhighway.

2. Disease Monitoring: We are working with NASA and WHO to establish a global monitoring system for emerging diseases. Once established this could also form a backbone for monitoring of conditions world wide.

3. Global Health Network University: We are working with the Soros foundation to develop epidemiology/public health distance learning programs in Russia, Romania and Ghana. The British Medical Association is very interested in working with us to put on to the Internet their epidemiology books and epidemiology articles into the local languages. The funding from Soros is targeted to the foreign centers. We are developing the technologies for voice

video teaching. We are to use the picture tel system, to have Dr. Boostrom teach classes across the world. This system, however, is too expensive for regular use, therefore we will employ the inexpensive Internet based system called Cu seeme to assess the cost-effectiveness for global teaching.

4. Networking health related non-government organizations: NGOs provide much of the care and information to people and doctors world wide. We have been networking for example, the Latin America Diabetes Association, Minority Health amongst others.

5. Research Information servers: We have been particularly interested in the use of the Internet for research communications. We wrote a very controversial article in the British Medical Journal titled the "Death of Biomedical Journals" in which we predicted that in 10 years journals will die, something to which we still very much believe. We have recently published several other papers questioning the need for the current copyright policies. One of the papers was published in the British Medical Journal, and was commented upon by the head editors of the BMJ, Lancet, Annals of Internal Medicine, and JAMA. We just developed an ambitious project to test the type of research communication of the future. We wrote a paper titled "Scientists assassinate journals". This was put on the Internet in various different formats, including a lay version, a scientific version, an editorial version, and a hypertext comic book. In addition, this was presented in English, Japanese, Portuguese, and Spanish. We have announced this to the major journals, and many are linking to us. Once one comes into the page they can call up a form to rate the paper, as well as to provide a critique. We have been receiving excellent comments. This is the first time to our knowledge that a single scientific communication has been put to the test.

We are also developing systems for rating research communications on the web using experts and the readership. The World Bank has been very interested in the development of this area as a means to evaluate communication.

6. Cyberdoc training: A cyberdoc is an individual trained in medicine/public health and the use of the Internet. Information transfer provide an extremely important component to health. Physicians, public health workers and health workers in general need to be trained on the Internet, and technical people need to be trained in health to become cyberdocs. We have set up short term training courses as part of the National Public health meetings in Japan as well as the US to train people to use the Internet. In addition, we have 4 students who are being training in both public health and telecommunications. These students have been funded through various sources. We propose to establish training programs in telecommunications for public health.

7. Research communication availability for developing countries: A critical problem for developing countries is that they cannot obtain access to the latest journals. Moreover there is little interchange so that developing countries can provide their information to developing countries. For example, over 25% of the scientists of the world are in developing countries, yet developing countries only represent .6% of the articles in the British Medical Journal, .5% in the Lancet, and .05% in the NEJM.

We have developed the architecture for targeted access server . We have a publication likely to be published in the British Medical Journal. With a targeted access server, Science can be made available to Uganda, Peru, and parts of Mongolia for free. In these countries, there likely are no sales, nor any possibility of future sales, but people are dying, and epidemiology and public health can help. The Lancet could open up their journal to parts of China, Romania, and Bolivia, and Nature Medicine to Bulgaria, Thailand, and Haiti.

But will the journals accept this? We have found remarkable interest, currently the British Medical Journal, the Annals of Internal Medicine, the Lancet, Journal of the American Medical Association, plus all 8 AMA journals, all 8 of the Canadian Medical Association Journals and several other journals. A group representing 50 additional journals have expressed an interest. Currently over 70 journals have agreed to participate. No journal as yet has refused our request. The cost to develop this system is very small, to open up the pipeline of epidemiologic and public health information to and from developing countries.

8.Home page: We have created a global health network home page (http:www.pitt.edu/HOME/GHNet/GHNet.html). It is a one stop shopping center for public health information. This home page has won numerous awards. The highest award was that it was rated in the top 100 of the 250,000 home pages by PC Magazine. During the past year over 100,000 individuals world wide have come to visit our page. We are requesting funding for the maintenance and development of this home page. We plan to construct a diabetes epidemiology and prevention home page as well as a cardiovascular disease epidemiology and prevention home page on the Internet.

Our research productivity has been rising. We have published or submitted for publication 39 papers/letters, in peer review journals, 11 of which have been in the Lancet and the British Medical journal. In 1994, 1 paper, 1995 6 papers and 1996 11, currently in 1997 as of Feb. 1, 1997 3 papers have been published, and 6 accepted for publication. Enclosed is the list of publications for the Global Health Network.

We recently were identified as being in the top 6 research programs in health of the 25,000 Internet based programs by the Global Information Infrastructure awards. All the other 5 health programs had million dollar budgets

and were targeted towards telemedicine, ours was the only low budget program which was so honored targeted towards epidemiology/prevention.

The British Medical Journal editors have stated that the Global Health Network was the reason that they, and the Lancet came onto the Internet. One of the editors of the British Medical Journal, Tony Delamothe has been collaborating with us for 3 years and has just joined our GHNet task force. The BMJ is making their journal available to the world through the Internet, despite having a readership of 110,000, the third leading journal.

Based upon these efforts we want to bring public health into the 21st century by applying some of the interests of the Global Health Network to Epidemiology.

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