

The Public's Trust and Help in an Epidemic

D.A.Henderson, M.D., M.P.H.
Center for Biosecurity
University of Pittsburgh Medical Center
May 23, 2006

Over the past half century, we in North America have had only a very limited experience in dealing with epidemic disease and thus systems of response have been little tested. Certainly, there were flu pandemics in 1957 and again in 1968 but neither proved to be a serious test of our health system. Hospitals were full but there were many more hospital beds available at that time and the disease itself was substantially milder than 1918 influenza.

There were outbreaks of poliomyelitis in the 1950s that tested the capacity of a some hospitals to provide and staff a sufficient numbers of respirators. Dramatic pictures portray this but most persons are surprised to learn that in the peak polio year, there were only 25,000 paralytic cases nation-wide and only a small proportion of these had the bulbar form of polio that required a respirator. We have had outbreaks of hepatitis, West Nile encephalitis, whooping cough, salmonellosis and a whole host of other diseases but virtually all have been geographically localized; most have been short-term in duration; and few have seriously tested our medical care system. Virtually all have been handled by the existing public health and medical care staffs, occasionally with support from the Red Cross. Seldom has a broader public participation been sought, however useful it might have been.

For some 12 years ending in 1967, I myself was on the Atlanta CDC staff with broad responsibilities for surveillance and the Epidemic Intelligence Service. The staff then was small and thus many of us acquired a considerable practical "shoe leather" experience in dealing with epidemic problems. However, as the CDC staff grew larger and the number of infectious disease outbreaks diminished, expertise at CDC greatly diminished, as it has in state and local health departments and in our academic centers as well.

This was all too evident in the handling of the October 2001 anthrax problem. Like so many outbreaks of an uncertain nature, it was characterized initially by

apprehension completely out of proportion to the inherent risk; by senior health officials assuring everyone that all was OK and that the situation was in hand when, in fact, it was apparent to everyone that it wasn't. There was a tidal wave of press coverage, much of it by so-called "beat" reporters who were not well-informed about science and who sometimes fell victim to any number of self-styled experts who were often equally ill-informed but who sounded authoritative. Public health staff with a limited practical knowledge of what should be done mustered such limited staff as they had and did their best. Meanwhile, "first responders" who knew how to decontaminate persons exposed to chemicals but knew nothing about biological weapons, were hosing down whole groups of people and quarantining groups without purpose -- all of this covered immediately and in Technicolor by CNN.

In many cities today, pandemic flu could generate a similar response because few municipalities have given serious thought to preparation and have not yet tried to digest the 250 page National Pandemic Flu plan. Little thought has been given to the predictable tidal wave of sick patients and how they are to be cared for; nor who will be available to care for them. It isn't rocket science to run through the arithmetic as to how many patients there might be based on present assumptions and to recognize that there will be a critical need for volunteers and volunteer groups, that elementary training in some medical procedures will be needed and that there will be large-scale needs to assure that supplies continue to be delivered, phone banks manned to respond to question -- but I need not go on. There are serious challenges, barely addressed as yet today, and I would note that were the pandemic form of H5N1 to begin person-to-person transmission, we could be witnessing a rapidly spreading epidemic as early as September, much as the disease spread both in 1918 and 1957.

Over the past 40 years, I have been deeply engaged in dealing with the control and eradication of one disease -- smallpox -- and, from 1985, in the control and attempts to eradicate a second disease -- polio. For the smallpox program, there was a World Health Organization budget of only \$2.5 million that was intended to deal with programs in 40 countries. The endemic countries, almost without exception, were the poorest of the poor and they had few resources to contribute. Whether we thought a broad public involvement was a good idea was irrelevant, there was simply no choice but to draw into

the program many volunteers from local areas. For large-scale vaccination, the technique most often used was to have an advance team of two visit the target areas and to enlist the help of the village headman, the local religious leader and the school principal. They were asked to identify the best sites for vaccination and to mobilize the population. On vaccination day, local people provided the organization and often served to tabulate the numbers vaccinated. As experience was gained, it became apparent that vaccinators could readily be trained within a period of 15 to 20 minutes, so expanding the team's capacity. It was impressive to me how responsive, enthusiastic and reliable so many were when asked to actively participate, almost always with no more payment than a verbal "thank you"

For detection of cases, we came to rely on local school children. Classes would be shown a picture of a smallpox case and asked if there were any cases like this in their village. It was truly remarkable how much 9 to 12 year olds know about what is going on in their villages and who is sick and with what. It was sometimes better information than we could obtain from health centers and hospitals.

Two important caveats were learned very early in the program and generally applied. The first was never to use the police or military to enforce vaccination. Civil authorities, in their eagerness to assure cooperation, would sometimes bring in the police or military to assure that all got vaccinated. This invariably led to large numbers running off into the forest or hiding or engaging in fights. Affirmative support by local civil and religious leadership was usually all that was needed. I believe this is appropriate today and in our own country.

The second caveat was never to impose quarantine, i.e. forcing contacts of patients who were otherwise well to be sequestered in their home or in a building. Isolation of patients was routine and most were kept at home, there being no effective therapy for smallpox. Family members were vaccinated, checked daily for symptoms but were otherwise free to come and go as they wished. When efforts were made to quarantine family members, it usually resulted in some families hiding cases and their contacts in consequence, not being vaccinated. Interestingly, such was a similar pattern of response to quarantine in Toronto among some families with SARS patients.

Given the success of the smallpox program, it raises the question of whether quarantine has a practical, positive role to play in the control of other diseases and, more specifically, pandemic influenza. I believe it does not. No program of quarantine or of school closure, for example, has been shown to deter the spread of influenza. Such efforts as might be made to quarantine contacts of influenza patients, for example, is almost certainly a waste of time and probably counter-productive to fostering the most productive possible working support to sustain community functioning. This is counter to certain recommendations in the National Influenza Plan which advises that it might be useful to quarantine whole families or perhaps schools or nurseries which have housed a patient. It is superficially an attractive idea and certain models, for what they may be worth, have been supportive. Practically, however, experience has shown the concept of quarantine to be at least 50 years out of date. It simply reflects once again the lack of practical expertise and a modern understanding of disease epidemiology and control.

The importance of public involvement in disease control could not be better illustrated than what has taken place with respect to poliomyelitis. The historical importance of the March of Dimes initiative, harking back to the 1930s, to raise funds for treatment of polio and for research will, I know, be vividly portrayed by Dr. David Oshinsky in his recent book. Stemming from this, of course, have been a gamut of disease-specific initiatives strongly supported by various citizen groups interested in progress in disease research and care.

There is, however, a quite extraordinary series of events that bear relating and these pertain to the polio control and eradication program. An interesting approach to vaccination emerged in the 1960s, soon after the Sabin oral polio vaccine was licensed. Here was an unusual vaccine that required only that 2 or 3 drops be placed on a sugar cube and put in the child's mouth. No needle or syringe was required and, in fact, the question soon arose as to why such a vaccine could not be administered by any lay person. This was not a welcome idea to organized medicine but it was difficult to argue otherwise. It was proposed to introduce the new vaccine in each of the major cities with a program intended to vaccinate all children under 10 years of age on a single day. Thus was born what was called the SOS program – Sabin on Sunday. Health departments protested that they simply did not have adequate personnel to stage such a program.

However, the Junior Chambers of Commerce, a national club for young executives, offered its services. Working with the health departments in a somewhat uneasy team, SOS programs were successfully mounted in many cities with a response rate of 80 to 90%. This truly was a program of unusual scope and unique in concept. Mass vaccination programs to counter epidemics were not a new idea but to mount such a program for preventive vaccination was something unique.

In the 1980s, Albert Sabin advanced the argument that to control polio it would be a great advantage to vaccinate large numbers of children on a given day, thereby seeding the population with a vaccine virus and perhaps inhibiting spread of the wild poliovirus. At the same time, Sabin went to Rotary International and eloquently argued for global support by Rotary in order to extend polio control world-wide. Rotary agreed to help and set as a goal for its member clubs, as a group, to raise \$100 million by the 100th anniversary date of Rotary which, as I recall was 2004. Meanwhile, Brazil was dispensing poliovaccine in hospitals and health centers but coverage was not much better than 60%. So, in 1984, Brazil decided to undertake a national program and to vaccinate all children under 5 years on a single day. This inevitably required participation of a large volunteer group and a considerable organization. Coverage reached 90%. Such National Immunization Days have been conducted twice a year since that time with continuing high levels of acceptance and the day has become a festive holiday-like celebration. The Rotarians played an important role in the Brazilian program and subsequently in global polio eradication, providing publicity, logistics, and many other functions, now joined by a number of other organizations. Meanwhile, polio vanished from Brazil. Other Latin American countries followed suit and in 1991, under the direction of the Pan-American Health Organizations, polio vanished from the Americas. The idea of National Immunization Days was taken up by other countries and, indeed, India vaccinated somewhat over 100 million children on one such national day. Meanwhile, Rotary's contributions to the program have passed the \$500 million mark.

This is a heartening story and an encouragement to others. However, I still have the sense that public health and medical care staff are still somewhat leary of voluntary organizations and have difficulty in accepting them as full partners in policy formulation and strategy development. In significant part, I believe the problem lies in the fact that

we have allowed our public health infrastructure to wither in most parts of the country as curative medicine has dominated the calendar. Public health departments are now typically understaffed and underpaid and understandably less than receptive to making the special efforts that are needed to explore, let alone put in place significantly different programs that involve greater communication and involvement of the public and voluntary groups. This is changing. In response to national security concerns, the federal government has begun funding at state and local levels a broad-based development program for “public health emergency preparedness”. About \$1 billion per year is provided and although this would appear to be a generous allocation, it has to be spread over 50 states and many different municipalities. Initiatives, however, are now being taken and I would be optimistic that more opportunities will emerge that will provide for closer, more effective relationships between citizens and the public health and medical communities.