

27 WHAT DID WE LEARN FROM SARS?

“History teaches us that men and nations behave wisely once they have exhausted all other alternatives.”

- Abba Eban, Israeli Minister of Foreign Affairs, 1966–1974

With the SARS virus contained, we can now look back at the 2003 global epidemic through the rosy spectacles of hindsight and congratulate ourselves on a major public-health success. Self-congratulation, however, is unbecoming, and often based on selective memory. But the nations affected by SARS certainly deserve recognition for their efforts to control a frightening and obstinate new disease. Their international partners can, in general, be proud of the way they worked together with the affected countries. The efforts recalled here deserve to be remembered and recorded, either because they were effective and led to the end of the outbreaks or because they were ineffective or inefficient. We recall as well some of the administrative, organizational, and institutional factors that may have helped or hindered the success of the control operations.

LESSON 1: WE WERE LUCKY THIS TIME

The SARS virus could have become a constant threat to human health in the world we live in. It did not. Thanks to the intense and skilful efforts of the governments of all affected areas, together with their regional and international partners, the virus was contained.

Certain characteristics of the SARS virus made containment possible. Infected individuals usually did not transmit the virus until several days after symptoms began and were most infectious only by the tenth day or so of illness, when they develop severe symptoms. Therefore, effective isolation of patients was enough to control spread. If cases were infectious before symptoms appeared, or if asymptomatic cases transmitted the virus, the disease would have been much more difficult, perhaps even impossible, to control.

The chains of transmission could be broken at various points. The incubation period was relatively long (two to 10 days, with a median of five days), giving more time for contacts to be traced and isolated before they fell ill and became

infectious themselves. The incubation period also dictated how long contacts had to be supervised. If the incubation period were longer, observation or quarantine would have been much more difficult to manage.

SARS being largely an urban disease, concentrated in relatively well-equipped hospitals, it was easier to detect cases and trace contacts, isolate patients, limit infection, and therefore control the spread of the disease. Reporting was also more reliable.

Still, many questions remain. Why did the outbreaks stop so abruptly in Viet Nam after such an explosive start? There is no doubt that the strict application of infection-control measures was critical, but they were far from perfect. In particular, several patients were transferred from the Hanoi-French Hospital to Bac Mai Hospital at a stage of their illness when transmission should have been very likely. But despite the potentially serious lapses, there were no new cases. Apparently many SARS cases were simply not very infectious.

Why did the Philippines not have a huge epidemic? Certainly, case investigation was done well, and contact tracing was exemplary, thanks to the energy of the Secretary of Health and to the expert work of the field epidemiologists. But, again, things were not perfect. Isolation of patients and contacts was less than ideal. And thousands of overseas workers returned to celebrate the Holy Week before Easter from Hong Kong (China) and other countries where the virus was still spreading. Only one from Canada brought the infection back with them.

Using the research data that have accumulated since the human epidemics stopped, the epidemiology of those situations and others like them should be re-examined. There are certainly better explanations than “good luck”. There is certainly still much that we do not understand about this disease.

LESSON 2: TRANSPARENCY IS THE BEST POLICY

In this globalized age, the world community expects accurate, complete, and timely information about diseases that do not respect international borders. Within countries, as modern communications technology makes people better informed and more sophisticated, they expect their governments to provide transparent, up-to-date information about communicable diseases that may threaten their communities. Governments will be held accountable, both internationally and nationally, for failures in conveying straightforward, reliable information.

Some of the affected countries did not acknowledge openly and squarely the presence of SARS, downplayed its extent, and attempted to prove that it was something else. Delays in acknowledging the presence of the disease contributed to a general mistrust of public health information. In China, for example, the severe respiratory infection eventually known as SARS was allowed to spread unreported in the southern province of Guangdong for at least three months,

from November 2002, before its existence was even acknowledged. When the disease broke out in Guangzhou City, hospitals were caught unprepared, as others were in subsequent outbreaks in Beijing, Inner Mongolia and Shanxi. Inadequate infection-control measures amplified the outbreak, which eventually spread to Hong Kong, where the international airport is one of the busiest in the world. Hong Kong's hospitals were infected, and the disease was carried by travellers to Toronto, Singapore, Hanoi, and eventually around the world.

As local medical and public-health staff battled heroically with the virus, they learnt important lessons about its epidemiology and infectivity, occupational risk factors, and infection control in hospitals. If shared earlier, these lessons would have been invaluable to other countries as the virus reached their shores.

LESSON 3: PUBLIC HEALTH IS A SERIOUS BUSINESS

In a globalized world, where people and products travel vast distances virtually in an instant, threats to health, whether real or imagined, can be economically disastrous. The economic devastation wreaked by SARS is well documented. Billions of dollars were lost by countries ill prepared for such losses, particularly in the tourism, hospitality, and transport industries. A clearly reasoned, well-planned, and effectively managed and publicized response to such threats is important in mitigating the damage to the economy, and to public confidence in government.

Here Singapore set a very positive example. When the epidemic emerged in this island state, the Government had to make difficult policy decisions. Would its officials be content with hoping that SARS would burn itself out quickly and not need stringent measures that would certainly result in accusations of human-rights violations, extreme expenditures of public money, and a weakened economy? Or would they take the strong measures needed to contain this threat to public health? The officials chose to act and stop the spread of the disease. The unprecedented public-health effort, which included a well-planned campaign to enlist the commitment of the public, was a 21st-century model for epidemic control.

SARS also showed the importance of committing enough resources right from the start. Massive resources went to controlling the outbreaks almost as soon as they appeared, although in the view of some people, the relatively few cases and deaths, compared with those from other public-health challenges such as tuberculosis, hardly justified the level of spending. In retrospect, spending to get rid of the new public-health threat was infinitely more cost-effective than having to apply resources continuously over time to control the disease. No further outbreaks occurred, neither in the winter of 2003–2004 nor in the next one. If SARS had become endemic, the resources required to root it out would have been enormous, especially in the winter months, and the impact on the health system would have been incalculable.

Speaking for many others in the Region, a senior Chinese expert privately referred to SARS as “the best thing that has ever happened to public health in China”. The public-health bureaucracy, under one of the most able ministers in the Government, has gained a new standing. Relations between the provinces and the centre have greatly improved. Reporting systems have been updated and streamlined, and important information usually flows regularly and with dispatch. Epidemiological services have never been better. Public-health workers, proud to be part of this high-profile and now clearly successful effort, are seen as the heroes they often are.

LESSON 4: HUMAN-RIGHTS ISSUES MUST BE ATTENDED TO

In Hong Kong, Taipei, and Singapore, stopping the spread of SARS meant taking drastic measures. Privacy issues and human rights were hotly debated. If the governments involved had not acted decisively, however, the virus could have spread further and become endemic. The experience suggests that there should be international standards for the carefully considered use of countermeasures against dangerous communicable diseases, such as accessing police databases and imposing quarantine. Community surveillance, for example, may be effective, but could infringe on personal freedoms if used inappropriately.

LESSON 5: THE MEDIA PLAY A CRITICAL ROLE IN PUBLIC-HEALTH EMERGENCIES

Perhaps never before in history had the media been so involved in a public-health emergency. At the height of the epidemics, the world was deluged daily with more than 4,000 articles in English alone. Until then, only the war in Iraq had generated more headlines. Predictably, the reporting was uneven in quality. The media were sometimes accused of overstating the epidemics, causing panic and therefore serious economic damage to affected countries. While this accusation may be partly true, overall the media were in fact important allies of the health workers. They generally behaved responsibly and insisted on accurate statistics, precise scientific descriptions, and expert opinions.

As the epidemics progressed, government public-health programmes made current, complete, factual information available to dispel misunderstanding and panic. They received support from WHO, which took the importance of the media to heart, to an extent previously unheard of. The Headquarters in Geneva assigned skilful media officers. At the Regional Office in Manila, an experienced and highly able press officer, newly appointed, collaborated with the technical staff in fielding hundreds of telephone calls daily, appearing on radio and television, and releasing information regularly to the press. In Beijing and Hong Kong, the most badly affected cities, WHO press officers relieved the country office of media demands that threatened to overwhelm it. WHO Representatives

in Viet Nam, China, and the Philippines dealt with the media most effectively. Much of the interest came from within Asia—from Hong Kong and other parts of the region where representatives of major international media organizations were based. The Regional Office had never been so challenged.

The efforts were fortunately well received by the media. Despite the general taste in the media for institution bashing, the Organization got surprisingly little bad press. A senior reporter for an international newspaper remarked that he had never seen an international organization—or group of countries—be so forthright with the press. For that reason, he said, unfair attacks were highly unlikely.

On the other hand, besides the regular briefings, more proactive, systematic, and thoughtful dealings with the press and the general public might have resulted in a better-informed public and less panic.

For the partnership between WHO and the media to be most productive, much more needs to be done, as the events of 2005—avian flu and the health effects of the Indian Ocean earthquakes and tsunamis—suggest. The Organization should give this matter continued serious attention.

LESSON 6: 21ST CENTURY SCIENCE PLAYED A RELATIVELY SMALL ROLE IN CONTROLLING SARS; 19TH-CENTURY TECHNIQUES CONTINUED TO PROVE THEIR VALUE

While modern science had its role, none of the most modern technical tools had an important role in controlling SARS. Sequencing the genetic code of the virus, for example, helped identify the origin and spread of the virus but did not really help to control it. Even identifying the virus itself added nothing substantial to control efforts, particularly since diagnostic tests were severely limited. But laboratory tests were helpful in confirming SARS infections, especially in clinically atypical cases.

Most important in controlling SARS were the 19th-century public-health strategies of contact tracing, quarantine, and isolation.

LESSON 7: PARTNERSHIPS WORKED, BUT THE PARTNERS NEED TO CLARIFY AND AGREE ON THEIR RELATIVE ROLES

Possibly the greatest triumph from the SARS experience was how fiercely and well national governments, international public health institutions, donor agencies, and other bodies (including the media) laboured together for six months to control the outbreaks.

Governments. Within countries the ministry of health usually took the lead. But the higher levels of government always stayed deeply involved to ensure a multisectoral response. The foreign affairs, agriculture, home affairs, transport,

and other ministries all looked forward to a speedy end to the epidemics. The collaboration had perhaps the most dramatic effect in China when the Government finally decided to wage an all-out war against SARS. A highly effective monitoring and reporting system materialized almost at once, a community-based surveillance and disease-control system was installed, and, most amazingly, a 1,000-bed isolation hospital went up in little more than a week. In Singapore, Senior Minister Lee Kwan Yew, whose wife was quarantined after possibly being exposed to SARS in the outpatient unit of a hospital, gave an extraordinary talk to the nation. The galvanizing effect of this “fireside chat” by a greatly respected leader can hardly be overestimated. And airport authorities collaborated admirably in screening departing and arriving passengers, even if not many cases were detected or prevented that way.

Inter-governmental associations. ASEAN+3 arranged meetings on subjects ranging from case detection to airport measures among senior political figures and heads of national bureaucracies. Although hastily planned and organized, these meetings helped enlist high-level commitment, collaboration, and support. But given the difficulty and expense of organizing such meetings, perhaps more could have been accomplished. A general plan could be developed for meetings of this type, stressing the priorities and the need to recommend practicable forms of cooperation. Before a communicable disease emergency occurs, potential roles could be considered for the inter-country mechanisms of countries in the Region, based on their comparative strengths, and plans of action might be drawn up and tested in simulated conditions.

Government collaboration with international agencies. An impressive amount of goodwill surfaced during the SARS outbreaks. By and large, government agencies set rivalries aside; governments were forgiving of minor incidents of high-handedness by foreign consultants and agencies; and friendly, productive channels of information were maintained throughout. Clearly, in outbreaks within their sovereign territory national governments must be in the driver’s seat. In all the affected countries in Asia the governments expected WHO, the most prominent international partner of the ministry of public health, to take the lead in coordinating external inputs. This seems to have worked well in most cases. The Director of the United States Centers for Disease Control and Prevention, for one, announced several times that her agency would work with governments through WHO. If WHO’s Member States agree that this system was indeed effective and should be a model for future actions of this sort, they should draw up a resolution that clearly says so.

Conduct and protection of international staff. International staff and consultants contributed expertise and energy in all the affected countries. In general, they behaved with admirable professionalism and in genuine collegiality with their national hosts. But in a very few cases, complaints of “data smuggling” and withholding of information in hopes of early publication were heard. Some

complaints may have been prompted by distrust of “neo-colonial” approaches; others may have had at least some basis in fact. It must be emphasized that consultants and other foreign experts work in foreign countries only at the invitation of the governments and with their support.

Soon after the outbreaks made the news, it became impossible to arrange transport home or to regional medical centres for individuals who may have been infected. Even the international medical “rescue” agencies refused to transfer these people to isolation and care facilities. The issue of insurance and liability for consultants on short-term contracts was never fully resolved. In anticipation of future outbreaks of communicable diseases, these issues should be discussed and approaches agreed upon, to protect the individuals involved as well as the agencies coordinating the investigation and management of epidemics.

LESSON 8: MODERN MODES OF COMMUNICATION DRAMATICALLY CHANGED THE WAY WE WORK

The use of modern methods of electronic communication to control a major disease outbreak was perhaps without precedent in the history of public health. WHO Headquarters and the Regional Office in Manila communicated by telephone dozens of times a day from the very first days of the epidemics, often several times in a single hour. The result was constantly updated information and synchronized reporting.

A Singaporean physician who had treated his country’s first cases of SARS and then attended a medical conference in the United States of America became feverish while flying from New York to Singapore, via Europe. On his way, he called a friend in Singapore to say that he was ill. The friend at once phoned the Health Ministry, and the senior epidemiologist at the ministry relayed the information by phone to the Communicable Diseases Director at the WHO Regional Office in Manila. A call from the Director to Geneva roused an officer of the Emergency Response office in the middle of the night. He alerted German public health authorities and officials at the Frankfurt airport. Barrier infection-control equipment was rushed to the airport, and the physician and his family, as soon as their plane landed, were whisked off to an isolation facility. As a result, although the Singaporean physician, his wife, his mother-in-law, and a flight attendant were confirmed to have SARS, they eventually recovered fully and returned to Singapore. (The German physician who supervised their successful treatment later helped treat Dr Carlo Urbani of WHO. Despite expert care, however, Dr Urbani died of the disease he had first characterized.)

The multiparty teleconference connected many participants at different sites through office telephones, mobile phones, and specially designed multi-microphone telephones in conference rooms. At the Regional Office, teleconferences constantly under way, it seemed, in the operations room, took up much of the working day. A nightly teleconference at 10 p.m., Manila time,

and usually lasting well over an hour, involved the Director-General and her staff in Geneva; regional offices in Manila, New Delhi, Cairo, Harare, and Washington, DC; WHO country offices in Beijing, Hanoi, Bangkok, and Kuala Lumpur; and consultants in Singapore and Hong Kong. There were often up to 50 participants. As the outbreaks waned, these mega-conferences became less frequent, taking place on weekends only when needed, and eventually happening only twice or thrice weekly.

The conferences lacked focus. While some participants were being briefed on the global outbreak, others were dealing with minute details. Inevitably, some participants took the opportunity to promote themselves; others were daunted by the high level of participation. It was an inefficient way to synchronize figures—case and death totals, for example—and the variety of participants, which included journalists in some offices, made politically sensitive discussion (such as negative remarks about government actions) risky. As the focus and usefulness of the conference became less and less clear, participants in the Manila office, who had generally been working continuously for 16 hours before then, began to show the strain and to participate with much less enthusiasm. Such conferences must be expertly planned in the future.

Videoconferences were held intermittently during the outbreaks. The conferences, at which key government figures and WHO officials sat arrayed before flags or emblems and addressed speeches to one another, were time-consuming; had to be held in a specially fitted room, away from the scene of action; were prone to technical disruptions; and served little purpose other than the political benefits that might accrue from participants being able to see one another face to face.

The Internet proved its public-health worth during the outbreaks. Email reached such a huge volume (upwards of 400 messages a day for key staff) that it could not be relied on to transmit breaking news—the telephone was better suited for that. But email was ideal for sending figures, documents, reports, guidelines, training presentations, tables, graphs and photos instantly, and was used fully for that purpose. Ground rules should be established for the use of email in future outbreaks.

The Canada-based Global Public Health Intelligence Network (GPHIN) has shown how the Internet can be used more creatively, and much can be learned from their experience [see Chapter 2].

LESSON 9: CLEAR TRAVEL GUIDANCE IS NEEDED

In the handling of the SARS outbreaks, this aspect was possibly the most controversial. The effect of the travel advisories on the overall global epidemic cannot be ascertained. WHO was accused of overplaying the danger of the epidemics, and of thereby being partly to blame for their economic severity.

Others questioned whether WHO even had a mandate for such drastic action. It must be remembered that the world was confronted with a highly infectious, frequently fatal disease for which the cause was not known, the modes of transmission were not understood, and no effective treatment was available. Health-care workers were disproportionately affected, and the virus was seen to spread by international travel. Its emergence had been sudden and explosive, and for a while at least it seemed as if the world was coming to an end.

WHO, in fact, was reluctant to recommend travel restrictions. When it did take this step for the first time, many countries had already asked their citizens to avoid non-crucial travel to affected areas, or had recommended even broader restrictions. Some had criticized what they saw to be WHO's timid reluctance to act decisively. But the WHO advisories, once issued, were taken very seriously, perhaps even more so than those of the United States. The Organization's mandate to take a similar step in the future must be made absolutely clear. Hopefully, the revised International Health Regulations will define the circumstances where such action is warranted, and the steps that should be taken before a firm recommendation is made to avoid certain destinations.

LESSON 10: ANIMAL HUSBANDRY AND MARKETING PRACTICES SERIOUSLY AFFECT HUMAN HEALTH

The SARS outbreaks, particularly in southern China, exposed shocking but all too common practices in the exotic food trade. Although it is still unclear how wild animals destined for human consumption help spread SARS, the ways in which they are handled, marketed, and slaughtered pose obvious dangers to human health. Good veterinary habits are rare in markets where live animals are sold for the table. Aside from the question of cruelty in handling and slaughtering, animals that would never meet in the wild are kept close to one another, often in stacked cages, raising the risk of cross-infection and the emergence of new pathogens potentially dangerous to man.

If the practice is to continue—and it will certainly be difficult to eradicate, or even make less prevalent, given increasing affluence in the region and the taste for exotic dishes—measures should be implemented for the least dangerous methods of provision of these exotic species for human consumption.

For domestic animals and poultry, the very close proximity of animal pens and cages to human habitation in many crowded settlements would also appear to make zoonotic infections more likely. This issue is especially relevant to the current H5N1 situation.

LESSON 11: WHO SHOULD BE ON THE FRONT LINES?

WHO was effective as the prime partner of national ministries of health, worldwide, in the region, and in the individual affected countries. The Organization not only helped with policy development and coordination, but also reassigned its own staff, redefined their terms of reference, provided emergency supplies and equipment, and fielded expert consultants. However, the question remains: Is WHO the most appropriate organization to plan and implement such activities in the field? Could the Organization take on this role again, in an emergency perhaps more complex? Earlier in its history, WHO had provided Member States with a wide range of field workers: epidemiologists, laboratory technologists, sanitarians, clinicians, and nurses, among other specialists. WHO country teams were large, young, and mobile. However, demands on the Organization have changed over the years. Member States today seldom request WHO staff to directly implement or participate in disease control operations. Staff numbers in country offices have shrunk, and the functions of WHO country teams have leaned more towards health planning, standards setting, research, high-level consultation, and policy formulation.

It surprised many that WHO could change its methods. Now, all of a sudden, WHO had created a “war room” coordinating function at headquarters and regional offices, and was sending staff to the field to investigate the outbreaks and implement control measures. Others wondered how the Organization could enlist overnight the participation of hundreds of consultants and dozens of partner agencies. WHO identified effective field workers and appropriate agencies through personal contacts, and innovatively reprogrammed available funds. Donor governments responded quickly and generously.

This time the arrangement worked. Can it work in an outbreak that might be more complex and prolonged? If WHO is to take on this responsibility in the future, it must clarify the roles of partner agencies and identify potentially available experts of proven worth. To act quickly, it should be able to mobilize resources rapidly and access stockpiles of supplies and equipment. Networks like GOARN can provide high-quality laboratory support and short-term expertise at very short notice, but a longer-term situation will require months or more of continued support from large numbers of people.

LESSON 12: WITH NATIONAL DISEASE SURVEILLANCE SYSTEMS IN DISREPAIR, INFORMAL AVENUES OF REPORTING MUST BE TAKEN SERIOUSLY

The SARS outbreaks revealed how ineffective disease surveillance and outbreak alert systems are in most countries, apart from the wealthier ones. Even where surveillance systems are well developed, they seldom function adequately as “early warning systems” because of inherent bureaucratic delays

and insufficient collaboration among response agencies. Specifically, in most countries, information exchange, joint analysis, and monitoring do not take place between health care facilities (especially private ones) and the public health authority. As a result, “informal” reports have become crucial in identifying and monitoring outbreaks.

Ubiquitous mobile telephones and text messaging, mushrooming Internet cafés, newspaper websites, email and “blogs” with their instant information and opinions—these informal channels are much more likely to report unusual disease events first, long before government releases do. Without official information and analysis, rumours can spiral out of control, spreading fear and panic. Governments must become better able to collect credible information and report it early. They must replan their disease surveillance systems, assign them to adequately trained people, and supervise their operation.

LESSON 13: TRAINING AND EXPERTISE IN BARRIER NURSING AND HOSPITAL INFECTION CONTROL ARE SADLY DEFICIENT IN THE REGION

This important topic deserves separate mention. Unlike other expertise needed to deal with SARS, infection-control practices were poorly developed in many countries of the region. Support staff and administrative personnel, and even nursing and medical professionals, knew little about how to protect themselves from contagious diseases. Outside the capitals, isolation procedures were quite primitive. There was little understanding of personal protection measures and patient rooms set up to limit air- and fomite-borne spread. Most hospitals lacked even the most basic equipment. The “developed” countries of the region had the expertise, but could transfer it only with difficulty to hospitals where conditions were less than ideal. Now national authorities, with the help of WHO and other agencies, are well placed to establish or strengthen training in infection control for physicians and nurses.

CONCLUSION

The SARS epidemics of 2003 showed what countries with limited resources, in collaboration with international partners, are capable of doing to limit outbreaks of disease. In many ways, the odds were stacked on the side of success. The virus itself was amenable to control, and the potential economic impact of a serious disease spread by international travel was such that governmental commitment was guaranteed. One would hope that such commitment, both by national governments and the international community, could be enlisted in support of less dramatic events, with less immediate economic importance, posing less of a threat to privileged citizens of industrialized countries. Many examples of inadequate commitment can be cited: the African malaria situation,

or the global tuberculosis problem, or even localized but devastating conditions such as Ebola or Marburg virus.

The SARS experience has not been examined critically enough, and the lessons learnt have not been thoroughly analysed. It is repugnant to think of the SARS outbreaks, which killed nearly 800 human beings, as a “dry run” for the next major, perhaps even more deadly, outbreak. But it would be tragic if we did not learn from the experience of 2003 and make the most of it. We would not be fulfilling our responsibilities to those, including our medical colleagues and friends, who died of SARS.

excerpt from

SARS

How a global epidemic
was stopped

Part V. The way forward

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Brian Doberstyn

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