

against the Urbani SARS-associated coronavirus as quickly as possible, in case the outbreak cannot be contained. The development of drugs and vaccines for SARS will also provide new strategies for the prevention and treatment of other coronavirus diseases of animals and humans.

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1. Peiris JSM, Lai ST, Poon LLM, et al. Coronavirus as a possible cause of severe acute respiratory syndrome. *Lancet* 2003;361:1319-25.

SARS and Carlo Urbani

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On February 28, the Vietnam French Hospital of Hanoi, a private hospital of about 60 beds, contacted the Hanoi office of the World Health Organization (WHO). A patient had presented with an unusual influenza-like virus. Hospital officials suspected an avian influenzavirus and asked whether someone from the WHO could take a look. Dr. Carlo Urbani, a specialist in infectious diseases, answered that call. In a matter of weeks, he and five other health care professionals would be dead from a previously unknown pathogen.

We now know that Hanoi was experiencing an outbreak of severe acute respiratory syndrome (SARS). Dr. Urbani swiftly determined that the small private hospital was facing something unusual. For the next several days, he chose to work at the hospital, documenting findings, arranging for samples to be sent for testing, and reinforcing infection control. The hospital established an isolation ward that was kept under guard. Dr. Urbani worked directly with the medical staff of the hospital to strengthen morale and to keep fear in check as SARS revealed itself to be highly contagious and virulent. Of the first 60 patients with SARS, more than half were health care workers. At a certain moment, many of the staff members made the difficult decision to quarantine themselves. To protect their families and community, some health care workers put themselves at great personal risk, deciding to sleep in the hospital and effectively sealing themselves off from the outside world.

In some ways, the SARS outbreak in Hanoi is a story of what can go right, of public health's coming before politics. First-line health care providers quickly alerted the WHO of an atypical pneumonia. Dr. Urbani recognized the severity of the public health threat. Immediately, the WHO requested an

emergency meeting on Sunday, March 9, with the Vice Minister of Health of Vietnam. Dr. Urbani's temperament and intuition and the strong trust he had built with Vietnamese authorities were critical at this juncture. The four-hour discussion led the government to take the extraordinary steps of quarantining the Vietnam French Hospital, introducing new infection-control procedures in other hospitals, and issuing an international appeal for expert assistance. Additional specialists from the WHO and the Centers for Disease Control and Prevention (CDC) arrived on the scene, and Médecins sans Frontières (MSF, or Doctors without Borders) responded with staff members as well as infection-control suits and kits that were previously stocked for outbreaks of Ebola virus. The Vietnam French Hospital has been closed temporarily, and patients with SARS are cared for in two wards of the public Bach Mai Hospital, with the assistance of a team from MSF. No new cases in health care workers have been reported, and the outbreak in Vietnam appears to be contained. By dealing with the outbreak openly and decisively, Vietnam risked damage to its image and economy. If it had decided to take refuge in secrecy, however, the results might have been catastrophic.

Dr. Urbani would not survive to see the successes resulting from his early detection of SARS. On March 11, he began to have symptoms during a flight to Bangkok. On his arrival, he told a colleague from the CDC who greeted him at the airport not to approach him. They sat down at a distance from each other, in silence, waiting for an ambulance to assemble protective gear. He fought SARS for the next 18 days in a makeshift isolation room in a Bangkok hospital. Dr. Carlo Urbani died on March 29, 2003.

SARS is a pandemic of our global age. In just a few weeks, SARS had spread through air travel to at least three continents. Conversely, in the same amount of time, researchers working in no fewer than 10 countries have collaborated to identify the virus, sequence its genome, and take steps toward rapid diagnosis. It is now hoped that the large strides taken in basic research will quickly lead to therapeutic advances or a vaccine.

Health care workers continue to be on the front line. Apart from the index patient, all the patients in the Vietnamese outbreak who died were doctors and nurses. In Hong Kong, approximately 25 percent of patients with SARS have been health care professionals, including the chief executive of the hospital authority. The intensive care wards are full — a situation that is exacerbated by the staffing difficulties presented by the hundreds of SARS cases affecting medical personnel. It is becoming difficult to import additional infection-control equipment, since countries where the suits are manufactured are holding onto their stocks as they brace themselves for outbreaks of SARS within their own borders. Once effective drug therapy has been found, similar problems may arise with availability and distribution, especially if the effective treatment turns out to involve a relatively rare and expensive drug, such as ribavirin.

It remains to be seen whether the number of new SARS outbreaks will ebb or whether what we have seen to date is indeed the leading edge of a much larger pandemic. Currently, the attack rate in Hong Kong is approximately 2 cases per 10,000 population over the course of two months. This rate compares favorably with the seasonal attack rates of influenza-like illness, which reached 50 cases per 10,000 population in one week this winter in Europe.



Dr. Carlo Urbani.

In 1999, Dr. Urbani was president of MSF–Italy and a member of the delegation in Oslo, Norway, that accepted the Nobel Peace Prize. Although he would be gratified that so much has been accomplished with respect to SARS in such a short time, he would certainly point out that the other diseases he worked with — such as the human immunodeficiency virus and AIDS, tuberculosis, and malaria, which kill millions of people each year — deserve to be treated with similar urgency. Whatever the future direction of SARS, it is clear that Dr. Urbani's decisive and determined intervention has bought precious time and saved lives. We remember Dr. Urbani with a mixture of pride in his selfless devotion to medicine and unspeakable grief about the void his departure has left in the hearts of his colleagues around the world.

From Médecins sans Frontières (Doctors without Borders) U.S.A. (B.R.), Belgium (M.V.H.), Vietnam (D.S.), and Italy (N.D.)