rounding efforts to provide effective care for this population. Following the early example of St. Vincent's Hospital in New York City, HCHP physicians in Boston, Miami, Houston, and several other cities are fully integrated into the clinical and educational programs at teaching hospitals, and their presence has facilitated both access to and continuity of care for homeless persons. Academic medical centers can thus play pivotal roles in promoting health care as a basic human right and facilitating its delivery to poor and underserved communities.

The patient with frostbite reminds us that cost-effective primary and preventive care for homeless people is possible if providers are willing to bring care directly to the streets and shelters. Even universal insurance coverage would not ensure universal access, especially for those whose next meal and night's shelter are far more pressing than health care needs. Successful health care delivery to this population will require personalized attention, round-the-clock availability of a primary care provider, extended physician's visits, and assistance with visits to specialists. Market forces and a desire for improved professional fulfillment have recently led some physicians to launch so-called concierge practices with similar attributes. Although the social circumstances of the patients may be diametrically opposed, there are similar opportunities for immense job satisfaction for physicians who provide health care for homeless persons.

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Planning for Epidemics — The Lessons of SARS

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In terms of sheer drama, the emergence of the severe acute respiratory syndrome (SARS) rivaled the most exotic Michael Crichton thriller. A novel viral strain spread in "wet markets" from an obscure animal to food handlers; through a rural province in southern China; to Hong Kong, by way of an ill Chinese physician who had traveled to attend a wedding; and in one night at a Hong Kong hotel, from that man to at least 12 other people. These 12 returned to their five home countries and created multiple chains of transmission that, over the course of the next four months, led to more than 8000 cases of SARS, resulting in almost 800 deaths in 27 countries, representing every continent.

The lessons of SARS are strong and clear and will influence preparedness planning for epidemics for at least the next several years. First, animal pathogens — whether SARS-associated coronavirus, West Nile virus, monkeypox virus, avian influenzavirus, or the prion agent of bovine spongiform encephalopathy (mad cow disease) — can pose major risks to human health. Second, with modern transportation and communication, a problem affecting a remote province of China one day can become everyone's problem the next day. Third, the capabilities of molecular virology are tremendous. Within a matter of weeks, the coronavirus that causes SARS was identified, and the sequence of its genetic backbone determined. Fourth, the epidemiologic histories alone were sufficient to permit the chains of SARS transmission to be traced. Fifth, the Centers for Disease Control and Prevention (CDC), the World Health Organization, and local public health agencies can work together well to create the necessary surge capacity. Sixth, basic infection-control measures work well, although SARS is particularly unforgiving when there are lapses in adherence or in laboratory biosafety. Finally, and perhaps most striking, one person can have an enormous impact — whether the ill physician whose travel from Guangdong province to Hong Kong resulted in a pandemic or the ill physician,

Group	Intervention	Public Health Issues	Infection-Control Issues
Patients with cases	Case management	Open reporting of cases and surveillance results	When to institute incident command system
Patients with potential cases	Infection control at health care facilities	Case definition, epidemiologic history	Appropriate isolation (depending on mode of transmission)
Contacts of patients with cases	Contact tracing and investigation, assessment of need for quarantine and community containment	Diagnostic tests Duration of communicability When to open emergency operation centers Onset of communicability (before or after onset of symptoms) Incubation period Modes of transmission (airborne, large droplets, contact) Role of environmental and animal reservoirs (for source containment) Vaccine availability	Role of superspreaders and high-risk procedures Diagnostic tests and treatments Safety measures for clinical and research laboratories Surge capacity (isolation beds, masks, equipment; ventilators; emergency room space; health care worker backup; morgue) Respiratory hygiene in emergency room and clinics
Persons who are healthy but worried	Education, communication, and risk assessment		

Figure. Public Health and Infection-Control Measures during Major Outbreaks of Communicable Diseases.
During the SARS outbreak in Toronto in 2003, for every patient with SARS, there were approximately 10 patients with potential cases of SARS, 100 contacts of patients with SARS, and 1400 healthy but worried people. The order in which the public health and infection-control issues are listed reflects the order in which the groups and interventions appear.

Dr. Carlo Urbani, who alerted the world health community to the SARS epidemic but ultimately died from the disease.

The epidemic consequences of and control measures for emerging diseases are governed to a large extent by their modes of transmission. Diseases spread by the airborne route, such as measles and varicella, have great epidemic potential in nonimmune populations. SARS appeared to be spread mostly through large respiratory droplets, which require close contact (i.e., coming within 3 ft of an infectious person); survival of the SARS-associated coronavirus on environmental surfaces and recovery of the pathogen from stool also raise the question of spread through contaminated objects. Control efforts were complicated by opportunistic airborne spread, the occasional "superspreader," and the apparently heightened risk to health care personnel during aerosol-generating procedures such as intubation. Because SARS did not appear to be communicable before the onset of symptoms and because communicability increased as patients became more ill, the spread in many countries occurred predominantly in the households of persons with imported infections and in hospitals.

The epidemiology of SARS contrasts markedly with that of influenza, the other potentially pandemic respiratory viral infection that has attracted a great deal of attention during the past several months owing to global outbreaks of avian influenza. Because influenza is often contagious during the 24 hours before the onset of symptoms, has a short incubation period (two to four days) and a short duration of communicability, and infrequently leads to hospitalization, the spread of epidemic influenza occurs primarily in the community, where it poses a great threat to nonimmune persons. Influenza kills as many as 30,000 persons in the United States each year but only occasionally spreads within hospitals. Controlling our next influenza pandemic will require substantial preventive and treatment efforts in the community and among outpatients. In the meantime, concern about avian and pandemic influenza and the SARS epidemic have

led to a reassessment in the United States of "respiratory hygiene and cough etiquette." New CDC recommendations suggest implementing "source containment" (e.g., use of face masks and spatial separation) among outpatients with potentially infectious respiratory illnesses.[1]

For epidemic-preparedness planning, a major lesson of SARS is that even without diagnostic tests and even given the relatively nonspecific clinical presentation of the disease (its onset as an undifferentiated febrile illness), the use of a carefully obtained epidemiologic history was quite successful for case ascertainment, clinical management, infection control, and the tracking of chains of transmission. Therefore, initial caregivers have the key responsibility to "think SARS" — or to think in terms of the current epidemic disease — and to obtain the appropriate history. The recent high-profile epidemics (e.g., those of SARS, West Nile virus, anthrax, and monkeypox) were all first identified by alert clinicians. National and global surveillance programs are essential, but primary caregivers have the critical role in an early-warning system.

The most reassuring lesson of our experience with SARS in 2003 is that careful adherence to basic public health and infection-control measures (see Figure) — such as source containment, case management, contact investigation, infection control at health care facilities, and community containment — led to the global control of a snowballing epidemic within four months, despite the lack of a rapid diagnostic test, a vaccine, and an effective therapy. The recent reemergence of SARS in China emphasizes the issues of infection control in research laboratories, greater timeliness in case reporting, and aggressive use of screening and isolation of patients with respiratory symptoms in areas where SARS is endemic. Because the response to emerging infectious diseases is often not amenable to randomized, controlled trials, we must look to critical evaluations of our approach to these problems, as outlined in the report by Svoboda and colleagues in this issue of the *Journal* (pages 2352–2361), when preparing for future epidemics.

Key lessons from the experience in Toronto include the need for surge capacity (e.g., to evaluate up to 100 contacts for every case identified), the recognition that all public health is local (incomplete surveillance and unrecognized cases in one hospital resulted in a second wave of SARS), the importance of communication with the public and with health care providers (there were more than 300,000 calls to a SARS hotline), and the value of using objective measures for risk assessment. The details used for risk assessment, such as the duration of isolation and that of quarantine, are important not only for infection control, but also for determining the economic effects of an epidemic. In Toronto, the public health response curtailed commerce and travel, which cost businesses hundreds of millions of dollars. Finally, measures that would seem extreme under usual circumstances may become commonplace during epidemics. The experience with SARS has led to the reexamination of long-unused public health laws and measures, such as quarantine and even the "cordon sanitaire" (the closing off of an entire neighborhood or group from external contacts). The legal, social, and economic effects of such measures need to be explored before our next test.

For now, emerging infectious diseases and epidemics are inevitable. We may not know the what or the where. But recent lessons, especially those regarding surveillance, surge capacity, communication, risk assessment, and adherence to infection-control measures, should guide us in preparing for the next challenge. In the end, every outbreak of infectious disease breeds two more outbreaks in panicked succession — the spread of fear, followed by a rash of urgent meetings. To lessen the next panic, health care personnel must meet, plan, and hold local drills now.

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