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*JAMA*. 2003;290(24):3229-3237 (doi:10.1001/jama.290.24.3229)

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# Ethical and Legal Challenges Posed by Severe Acute Respiratory Syndrome

## Implications for the Control of Severe Infectious Disease Threats

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**N**OT LONG AFTER THE FIRST REPORTS OF WHAT ultimately would be called severe acute respiratory syndrome (SARS) began to appear in February 2003<sup>1,2</sup> and as nations and the international community began to confront the spread of the new disease, it became clear that a host of ethical and legal issues had begun to surface. Indeed, not since the first years of the human immunodeficiency virus/AIDS pandemic in the mid-1980s<sup>3</sup> and the alarm over multidrug-resistant tuberculosis in the early 1990s<sup>4</sup> did it seem that so many issues touching on the core ethical questions posed by public health had to be addressed simultaneously. In several respects, SARS took society back to a pretherapeutic era with no definitive diagnostic test, a nonspecific case definition, and no effective vaccine or treatment.<sup>5</sup> From November 1, 2002, to July 1, 2003, 8445 cases were reported to the World Health Organization (WHO); among these, 5327 (63%) were from China, 1755 (20%) from Hong Kong, 678 (8%) from Taiwan, 252 (3%) from Canada, and 206 (2%) from Singapore. There were 812 deaths. Comparatively, the United States, with 73 cases (0.9%) and no deaths, was spared.<sup>6</sup>

Now that the first wave of cases has apparently ended, it is especially important to evaluate the global public health response to SARS, which focused on surveillance, isolation and quarantine, contact tracing, and travel advisories or restrictions.<sup>1</sup> Such an analysis provides the basis for thinking about the ethical and legal principles that should guide public health efforts if and when cases surface again.

Three values involving the ethics of public health were bought into tension: the duty to protect the public, which is a collective good, and the individual rights of privacy and liberty. A set of critical questions emerged:

The appearance and spread of severe acute respiratory syndrome (SARS) on a global level raised vital legal and ethical issues. National and international responses to SARS have profound implications for 3 important ethical values: privacy, liberty, and the duty to protect the public's health. This article examines, through legal and ethical lenses, various methods that countries used in reaction to the SARS outbreak: surveillance and contact tracing, isolation and quarantine, and travel restrictions. These responses, at least in some combination, succeeded in bringing the outbreak to an end. The article articulates a set of legal and ethical recommendations for responding to infectious disease threats, seeking to reconcile the tension between the public's health and individual rights to privacy, liberty, and freedom of movement. The ethical values that inform the recommendations include the precautionary principle, the least restrictive/intrusive alternative, justice, and transparency. Development of a set of legal and ethical recommendations becomes even more essential when, as was true with SARS and will undoubtedly be the case with future epidemics, scientific uncertainty is pervasive and urgent public health action is required.

*JAMA*. 2003;290:3229-3237

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- What limits on privacy are justified by surveillance designed to characterize SARS outbreaks, permit contact investigation, and open the way to other interventions?

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**See also pp 3215, 3222, and 3251.**

- What limits on liberty are justified by isolation or quarantine designed to separate the healthy from the infected or exposed?

- What restrictions of movement and economic liberty are justified by travel advisories to and from areas with SARS?

It is now clear that SARS is caused by a coronavirus that symptomatic individuals transmit through large airborne droplets. Those most at risk are individuals at close contact—family and health care workers.<sup>7</sup> However, the transmission to many patrons at a hotel in Hong Kong and the outcropping of disease among residents at a single apartment complex raise perplexing questions about modes of transmission.<sup>8</sup> There are also remaining questions about whether some individuals are especially infectious—so-called superspreaders.

These unresolved issues required sociopolitical judgments about the tolerability of risk and the role of the precautionary principle in public health. These issues similarly raised important questions about personal stigma, group prejudice, and the economic viability of businesses, cities, and countries. These questions will need to be addressed again in the event that SARS recurs or with the emergence of other airborne severe infectious threats.

The lessons learned from SARS in varying social and political contexts provide the backdrop for a set of recommendations designed primarily to inform public health decision making in all nations that share the central values of a liberal democracy, including respect for individual rights. They may have more universal applicability under international human rights law, which has global acceptance. Thus, these recommendations may serve as a standard to judge measures to impede disease transmission without unduly restricting the rights of individuals.

## SURVEILLANCE AND CONTACT TRACING

The identification and reporting of SARS cases by name to public health authorities have been central features of all national responses to the outbreak, bringing into focus the tension between surveillance as an essential public health strategy and the claims of privacy.<sup>9,10</sup> The function of surveillance, which is complicated when the case definition is uncertain and there is no diagnostic assay,<sup>11</sup> has been to identify disease clusters, map the spread of disease, understand the patterns of contagion, and detect lapses in hospital infection control practices. But, as the WHO explained, the SARS outbreak also represented “a test case” of whether name reporting, “rigorous contact tracing and other stringent public health measures can contain further spread even when very large numbers of persons may have been exposed.”<sup>12</sup>

Some countries, using a highly sensitive case definition, undertook aggressive contact tracing, tracking social, hospital, and occupational contacts during the 10 days before presumed symptom onset.<sup>13</sup> In Singapore, responsibility for the conduct of tracing was assigned to the military and in Hong Kong to the police.<sup>14-16</sup> However, in Toronto, hospi-

tals sometimes failed to meet stringent reporting obligations,<sup>17</sup> without which contact tracing cannot be conducted.

Most of the affected areas also undertook a form of surveillance more extensive than name reporting by requiring body temperatures to be taken in certain segments of the population. In Toronto and Singapore, hospital workers took their temperatures and answered health questionnaires twice a day.<sup>18,19</sup> In Singapore, taxi drivers, government workers, food servers, bank tellers, reporters, beauty parlor patrons, and hotel staff determined their body temperature once a day and wore “fever-free” stickers: the goal was that the entire population monitor their temperatures daily.<sup>20</sup> In Hong Kong, parents of schoolchildren were required to sign a daily certification that their child had no fever and bus drivers and caretakers were monitored.<sup>21</sup> In the United States, surveillance and contact tracing efforts were less aggressive,<sup>22</sup> reflecting social and cultural norms and the limited nature of the SARS outbreak.

Although the broad tradition of disease reporting in constitutional democracies includes privacy safeguards, this has not always been a priority for authoritarian regimes. Hong Kong adopted intrusive measures to track the personal contacts of SARS patients, such as the use of police detectives to locate family members and close friends.<sup>23</sup> In Singapore, the names of superspreaders were made public; in contrast, Hong Kong kept its SARS-related data on a separate computer with the intention of ultimately destroying the records.<sup>16</sup> Even in countries with strong traditions of civil rights, it was inevitable that where tracing of all close contacts occurred that the identity of individuals with SARS became clear; when broad public health measures, such as hospital or school closure, were put into place, the public identification of contacts likewise became inevitable. In Toronto, for example, when hospitals were closed the identity of no one was disclosed; yet, by implication, every hospital employee was identified and health care workers found themselves ostracized.<sup>24</sup>

SARS surveillance data also carried financial and social consequences for geographic and ethnic communities. The publication of surveillance data unwittingly called unwelcome and even injurious attention to people of particular racial or national backgrounds.<sup>25</sup> The origins of the disease in China fueled negative Chinese stereotypes. There was also evidence of overt discrimination and racism in North America.<sup>26,27</sup>

## ISOLATION AND QUARANTINE

Countries have used 2 of the oldest public health tools in response to SARS, isolation and quarantine, underscoring the tension between liberty and the imperative to protect the public's health.<sup>15</sup> Although the terms are often used interchangeably, there are technical distinctions. Isolation is the separation, for the period of communicability, of known infected persons in such places and under such conditions

to prevent or limit the transmission of infection. In contrast, quarantine is the restriction of the activities of healthy persons who have been exposed to a communicable disease to prevent disease transmission during the incubation period if infection should occur.<sup>28,29</sup> Quarantines can operate at the individual or population level. Perimeter or geographic quarantines may involve restrictions on travel to and from designated geographic areas or places.

Public health authorities implemented containment strategies in countries with diverse sociopolitical and constitutional traditions, ranging from China, Hong Kong, Vietnam, and Singapore to Canada and the United States.<sup>30</sup> Most jurisdictions confined patients in their homes or general hospitals, but others considered the construction of special infectious disease hospitals, as in Guangdong province and Hong Kong.<sup>31</sup> In Asia and Canada, authorities ordered mass quarantines or closures for schools, hospitals, factories, hotels, restaurants, places of entertainment, or residential buildings.<sup>32-35</sup> In the United States, New York City issued a 10-day hospital quarantine order for a foreign tourist.<sup>36</sup> The city of San Jose, Calif, held an incoming flight from Tokyo on the tarmac for several hours to investigate a potential SARS case.<sup>37</sup>

Some countries, particularly the United States, sought voluntary separation of exposed patients,<sup>38</sup> but others used more intrusive forms of enforcement. In Singapore, where thousands were subjected to quarantine, authorities used thermal scanners, Web cameras, and electronic bracelets to enforce quarantine, supervised by a security agency.<sup>39</sup> In Hong Kong, the police department's electronic tracking system was used to enforce quarantine.<sup>40</sup> In Beijing and Taipei, hospitals with SARS cases quarantined staff and patients. In Canada, a high school was closed and 1500 students ordered to home quarantine because of a single case involving a student with symptoms of SARS. Ontario's commissioner of public health warned that he had the authority to hospitalize those who failed to adhere to the order.<sup>41</sup>

## TRAVEL RESTRICTIONS

The role of a physician from Guangdong province, China, as a source of infection to hotel patrons in Hong Kong, who then carried the disease to Singapore, Toronto, and Vietnam, led to an early focus on the role of international travel in the spread of disease. In a striking observation, the WHO asserted that it "regard[ed] every country with an international airport, or bordering an area having recent local transmission, as a potential risk for an outbreak."<sup>39</sup>

As a consequence, the WHO issued "the toughest travel advisories in its 55-year history" when in April and May 2003 it recommended the postponement of all but essential travel to high-risk SARS areas.<sup>39</sup> At one time or another, advisories were issued for Hong Kong, the Guangdong province of China, Beijing, Shanxi province, Toronto, Tianjin, Inner Mongolia, and Taiwan.<sup>42</sup> Such geographically specific travel advisories were historically unprecedented. To prevent the

spread of SARS from outbreak areas, the WHO also recommended screening all international departing travelers for symptoms of SARS or exposure to those with the disease before embarkation. Individuals with fevers were "requested" to postpone their journeys.<sup>43</sup> In Vietnam, Hong Kong, and Singapore, air travelers were screened for high body temperatures with either digital thermometers or thermal-imaging scanners.<sup>44-48</sup> Thus, the imperative to interrupt the spread of SARS through travel restrictions placed limits on privacy, freedom of association, and liberty.

In the United States, President Bush added SARS to the list of quarantinable diseases in early April 2003,<sup>49</sup> and in May the Department of Homeland Security announced that immigration and customs agents were authorized to detain travelers who appeared to be ill with SARS-associated symptoms.<sup>50</sup> Reflecting the level of national anxiety, prominent universities sought to impose their own restrictions. In early May, the University of California at Berkeley, acting on the advice of a local health official, cancelled a summer program for students from China.<sup>51</sup> Some universities discouraged friends and families from traveling to commencement exercises. Harvard prohibited students and faculty from using university funds to travel to China, Hong Kong, Singapore, and Taiwan.<sup>52</sup>

Reflecting the rapidly changing understanding of the nature and tolerability of risk associated with casual contact, public health agencies ultimately cautioned against such restrictive measures. In mid May, the Centers for Disease Control and Prevention (CDC) stated it would not "recommend . . . the cancellation or postponement of classes, meetings or other gatherings that would include travelers from areas with SARS."<sup>53</sup> The WHO, reflecting similar concerns, stated, "the best defense is not exclusion."<sup>9</sup>

## ETHICAL AND LEGAL RECOMMENDATIONS FOR RESPONDING TO SEVERE INFECTIOUS DISEASE THREATS

The WHO concluded that the prompt reporting of cases involving symptoms suggestive of SARS, early identification and isolation of patients, "vigorous contact tracing," and the confinement of close contacts had effectively contained the outbreak: SARS had been curtailed and "driven back out of its new human host."<sup>54</sup> Whether this prognosis is correct—eradicationism has a troubled history—or whether the next flu season will witness a recrudescence of disease remains to be seen. But the fact that a rapidly spreading disease with high case fatality rates was quickly brought under control by some combination of these measures is beyond question.

That a common set of public health interventions worked in contexts as different as China, Vietnam, Singapore, Taiwan, Hong Kong, and Canada should not mask the fact that public health measures are embedded in broader sociopolitical contexts. Coercive strategies reflect conceptions of individual rights, the legitimacy of state intrusions, and the appropriate balance between security and liberty. Mea-

asures tolerable in an authoritarian regime would not be tolerated in a liberal democratic state. What then is acceptable in constitutional democracies? What ethical norms and legal principles should guide preparations for what may follow? The specific answers will, of course, depend on the scale of any future epidemic—a handful of cases may call for less rigorous measures than hundreds of cases. Nevertheless, the following principles should guide policy makers in the event of any outbreak.

We take as a starting point the centrality of the precautionary principle for the ethics of public health. The principle stipulates an obligation to protect populations against reasonably foreseeable threats, even under conditions of uncertainty.<sup>55</sup> First articulated in the context of environmental hazards, the precautionary principle seeks to forestall disasters and guide decision making in the context of incomplete knowledge. Given the potential costs of inaction, it is the failure to implement preventive measures that requires justification. Proponents of the precautionary principle explicitly defend their position by noting that entities that threaten the environment are best able to bear the burdens of regulation. Opponents warn that the imposition of such burdens may stifle economic progress and scientific innovation.<sup>56</sup> The principle has not been explicitly invoked in the context of epidemic threats where preemptive actions may burden individuals and impose limits on their freedoms. Nevertheless, the precautionary principle has implicitly guided public health interventions designed to limit or forestall epidemic outbreaks.

For nations that share the central values of a liberal democracy, safeguards of individual rights must bound the precautionary principle. Consequently, the least restrictive/intrusive alternative, fairness and justice (both procedural and substantive), and transparency provide the basis for effective public health actions that are not unduly burdensome on individual rights.

Requiring the least restrictive/intrusive alternative that can effectively achieve a legitimate public health goal represents a means to impose limits on state interventions consistent with the traditions of privacy, liberty, and freedom of association. The standard does not require public health authorities to adopt measures that are less effective but does require the least invasive intervention that will achieve the objective. How to strike the balance between degrees of efficacy and invasiveness will inevitably remain a matter of controversy.

Justice requires that the benefits and burdens of public health action be fairly distributed, thus precluding the unjustified targeting of already socially vulnerable populations. Therefore, a careful assessment of the burdens attendant on public health interventions is necessary. Procedural justice requires a fair and independent hearing for individuals who are subjected to burdensome public health action. Due process requirements are inherently important because fair hearings affirm the dignity of the person; due pro-

cess is also instrumentally important because it best ensures accurate decision making.

Finally, transparency requires government officials to make decisions in an open and fully accountable manner. It further demands civic deliberation and public participation in the policy-making process. Individuals should understand the facts and reasons justifying public health interventions, the goals of intervention, and the steps taken to safeguard individual rights.

When taken together, the precautionary principle, the least intrusive/restrictive alternative, justice, and transparency underscore the importance of using voluntary rather than coercive measures whenever possible. Although mandatory measures and recourse to coercion may be necessary, efforts designed to elicit the voluntary cooperation of those at risk of acquiring or transmitting infectious diseases are preferable. Mass persuasion and public education to prevent panic and encourage risk avoidance are thus essential features of public health. From an ethical perspective, such efforts are desirable because they enhance the public's health without burdening personal interests in privacy and liberty. From a pragmatic perspective, such efforts reduce the necessity of invoking the coercive power of the state that may provoke resistance at a juncture when cooperation is essential. The following recommendations address the challenges that will be posed to public health by future outbreaks of SARS or other epidemic threats.

## **SURVEILLANCE AND CONTACT TRACING: THE LIMITS OF PRIVACY**

Surveillance, as an epidemiological measure and a call to intervene, raises issues regarding the limits of privacy. The question of when, if ever, the confidentiality of the clinical relationship might be breached has challenged policy makers since the late 19th century, when health officials undertook modern disease surveillance. Although physicians have historically resisted public health intrusions, the absence of legal and ethical challenges to the practice in recent decades—the debates over reporting the names of patients with human immunodeficiency virus were a striking exception<sup>57</sup>—suggests that name-based surveillance has been recognized as an acceptable limit on privacy. The state, of course, has to meet rigorous standards: demonstrate an important need to know and intervene, make decisions openly, consult with the relevant communities, and use data only for legitimate public health purposes.

### **An Important Need to Know and Intervene**

Name reporting is crucial in facilitating public health interventions such as contact tracing and isolation or quarantine, thus necessitating the subordination of privacy interests to the common good. In the context of a communicable disease such as SARS, which has a high case fatality rate, it is important to know who is infected and who was exposed to target interventions. Reporting SARS cases with-

out names would be less intrusive but also ineffective. Consequently, name reporting would meet the least intrusive alternative standard.

Physicians and hospitals have a moral obligation to report all SARS cases to ensure the most effective public health interventions and that the benefits and burdens of privacy invasions are equitably distributed. Where public health authorities have so directed, such obligations may be required as a matter of law. The US Supreme Court has held that mandatory name reporting constitutes "a reasonable exercise of the state's broad police powers" when people's names are stored in a secure manner.<sup>58</sup>

### **Transparency Regarding Uses, the Potential for Disclosure, and Harm**

The privacy-limiting nature of name reporting imposes on health departments an obligation to educate the public about the nature of ongoing surveillance and the way in which case reports will be used. It is imperative not only to determine how privacy will be protected but also to account for the practical limits of privacy, particularly as contact tracing is undertaken. When coworkers, neighbors, or classmates are told that they may have been exposed to SARS, the identity of the sick and missing index case may become apparent even if names are not used.

Those who are interviewed in contact tracing need to be given an appreciation of why they have a moral obligation to reveal the names of those they might have exposed. The willingness to cooperate may rest on their understanding of the public health needs and the practical limits of privacy. Protection of the needs and interests of those who are identified as sick or exposed is essential.

### **Consultation With the Community at Risk to Minimize Stigma**

Diseases that may differentially affect segments of the population have usually imposed the additional burden of social opprobrium. Public health officials may inadvertently amplify the process as they conduct their surveillance activities.<sup>59</sup> Although they may not be able to prevent stigmatization, officials have an obligation to take steps to mitigate the suffering that may attend their efforts by underscoring the irrationality and inequity of ethnic stereotyping. Consultation with representatives of the communities most at risk will be important for instrumental reasons and as an expression of social solidarity.

### **Legitimacy of Public Health Purpose**

The breach in privacy represented by mandatory notification can only be justified if systems are in place to ensure that reported data are used solely for legitimate public health purposes. Surveillance is warranted if it is directed, for example, to reducing morbidity and mortality or directing resources to those who require treatment but not to achieve punitive ends. Although it may prove appropriate for the

health system to call on law enforcement to fulfill public health mandates (eg, enforcing quarantines), health professionals should have exclusive responsibility for eliciting the names of contacts and instructing individuals about precautionary measures.

Just as physicians and hospitals have a moral obligation and may be legally required to report cases to public health authorities, nations have an obligation to report aggregate, nonidentified data on SARS outbreaks to the WHO to facilitate the coordination of international control efforts. It was the months-long failure of China to report its outbreak that delayed an effective international public health response. These obligations are also grounded in binding treaty obligations. The WHO's International Health Regulations (IHRs), originally adopted in 1951, require member states to notify the WHO of cases of cholera, plague, or yellow fever.<sup>60</sup> The WHO is currently revising the IHRs to include all public health emergencies of international concern through reliance on "global information networks."<sup>61</sup> SARS would likely be included in this broadened definition. In May 2003, the 56th World Health Assembly adopted a resolution that called SARS an international public health emergency and urged member states to report cases to the WHO "promptly and transparently."<sup>1</sup>

### **ISOLATION AND QUARANTINE: THE LIMITS OF LIBERTY**

Isolation and quarantine, as ancient measures to separate the healthy from those infected or exposed, raise questions about the limits of liberty.<sup>62</sup> Certainly, such separation is warranted to avert significant risks of transmission. But beyond that, there are questions of the level of risk that justifies loss of liberty, the social and economic harms, and potential for using public health as a subterfuge for discrimination. One US court, for example, invalidated an early 20th-century quarantine in San Francisco, Calif, that operated exclusively against the Chinese community, concluding that public health officials had operated with an "evil eye and an unequal hand."<sup>63</sup> We recommend the following criteria to assess the ethical and legal justification for isolation and quarantine: scientific assessment of risk, targeting restrictive measures, a safe and humane environment, fair treatment and social justice, procedural due process, and the least restrictive alternative.

### **Scientific Assessment of Risk**

We suggest a hierarchy of cases, ranging from the most easily justifiable to those that may be viewed as problematic, based on the scientific certainty that the patient is infectious and poses a risk to others. Isolation of a confirmed SARS case during the period of infectiousness is firmly supported by legal tradition and ethics.<sup>64</sup> All legal systems, as well as international human rights, permit governments to infringe on personal liberty to prevent a significant risk to the public.<sup>65</sup> In the liberal tradition, the harm principle jus-

tifies restrictions on liberty to avert tangible harms to third parties.<sup>66</sup> Since those with SARS pose a direct threat to close contacts, their liberty can be justifiably restrained. However, if a SARS case is unconfirmed or if the individual simply has been exposed or is suspected of being exposed, the justification for restricting liberty is less clear.

Faced with the prospect of a significant risk—measured in terms of the probability of transmission and the severity of harm—populations should be protected, even in the context of medical uncertainty. The precautionary principle provides a justification for such restrictions: government may act to prevent tangible harms to the population even without complete scientific information. Consequently, from a public health perspective, individual movement can be restrained to avert transmission until potential infectiousness can be ruled out.

### Targeting Restrictive Measures

In principle, restrictive measures should be limited to those known to be infectious. But in the case of SARS, the uncertainty about how wide to cast the net of quarantine for exposed, asymptomatic individuals is framed by the absence at this juncture of a diagnostic assay that can rapidly distinguish between the infected and merely exposed with high specificity. Were such a test available, it would be possible to screen exposed individuals, subjecting only those who were infected—but not yet symptomatic—to isolation. Under such circumstances, individuals would have the choice of being tested and, if test results are negative, being freed from the burden of quarantine; those choosing not to be tested would be subject to quarantine.

### A Safe and Habitable Environment

Since isolation and quarantine are designed to promote well-being and not to punish the individual, public health authorities have the obligation to provide quarters that are decent and not degrading. Jails and prisons are unacceptable settings for confinement. Patients should have adequate health care, protection from further exposure to SARS, the necessities of life such as food and clothing, and means of communication with family, friends, and attorneys. For those diagnosed as having SARS, places of confinement should be safe for the patient, caregivers, and family members. Ideally, patients should be placed in hospitals or other health care settings that offer skilled medical and nursing care, infection control, and isolation facilities. Consequently, public health preparedness requires strengthening the health care system through planning and resources to ensure adequately trained staff, infection control methods and equipment, and negative pressure isolation rooms.<sup>67</sup>

Contemporary public health practice favors “sheltering in place,” preferably in a person’s home.<sup>68</sup> Home confinement is less restrictive, more humane, and more likely to achieve public acceptance. Nevertheless, home quaran-

tines can only be morally justified in contexts where residential units permit exposed but asymptomatic individuals to remain confined without imposing risks on those with whom they live. Sheltering in place assumes voluntary compliance. Yet, enforcement of home quarantine may necessitate limits on privacy and may have an impact on dignity as well, involving, for example, surveillance cameras; electronic bracelets, placards, or notices; and the presence of police guards. Home quarantine also can create divisions based on social class, because the poor may not have homes adequate to protect the unexposed.

### Fair Treatment and Social Justice

Fairness may require consideration of compensation, particularly for the poor who lose vital income during isolation or quarantine. When public health authorities require people to forgo their freedom for the common good, equity requires that the financial burden be borne by the community as a whole. To do so will require a fundamental, and no doubt controversial, departure from historical practice. Such measures were taken in Taiwan where “Persons who completed quarantine received the equivalent of US \$147. Quarantined persons could request other social services from local health and civil affairs departments.”<sup>69</sup> There is currently an intense policy discussion about this matter in Canada. A broad public debate of how best to achieve equity is therefore necessary. Among the possibilities are ensuring that sick pay benefits—where they are contractually available—be guaranteed to those deprived of the ability to work because of quarantine; the provision of basic welfare benefits to those without access to sick pay; and an extension of disaster relief now available to communities faced with flood, storms, and earthquakes when the Federal Emergency Management Agency is called on. The potential cost of such measures should not be permitted to limit the capacity of officials to impose isolation and quarantine when necessary for the public’s health.

### Procedural Due Process

Due process requires the right to be heard by an independent tribunal in a timely manner with representation by an attorney. The US Supreme Court has noted that civil confinement constitutes “a significant deprivation of liberty” that “can engender adverse social consequences.”<sup>70</sup> Although some may argue that home quarantine need not trigger a full-blown hearing, we believe that anyone deprived of liberty under color of law, whatever the place of confinement, should have available a due process hearing. In a public health emergency, it may be necessary to confine individuals before a hearing is held, but a speedy hearing should, if requested, follow. We make these observations aware of the vast logistical complications of hearings in the event of mass quarantines. Ensuring a well-functioning judicial system with trained attorneys and knowledgeable judges will prove challenging.

### The Least Restrictive Alternative

Even if all of the foregoing conditions are satisfied, public health authorities should resort to isolation or quarantine only if it is the least restrictive/intrusive alternative. During the first SARS outbreak, broad quarantines were justifiable because of the uncertainties of risk. If careful examination of that experience reveals that more circumscribed measures would serve the public good, more narrowly drawn quarantines would be appropriate.<sup>70</sup>

### TRAVEL ADVISORIES AND RESTRICTIONS: LIMITS ON THE FREEDOM OF MOVEMENT

The right to travel within a nation or internationally is vitally important legally, economically, and politically. Travel is important to well-being, because it enables people to pursue their goals, associate with their family and friends, and conduct business. The freedom of movement is recognized as a basic right within countries,<sup>71</sup> regionally,<sup>72,73</sup> and globally.<sup>74</sup> The US Supreme Court declared, “[f]reedom of movement and of residence must be a fundamental right in a democratic State.”<sup>75</sup> The United Nations similarly finds that “[l]iberty of movement is an indispensable condition for the free development of a person.”<sup>76</sup>

International law affords a right to travel within one's country.<sup>77</sup> Individuals also have the human right to leave and return to their country of origin.<sup>78</sup> Yet, these rights may be permissibly restricted on public health grounds.<sup>79</sup> The right to travel, although fundamental, is not unlimited: “Freedom does not mean that areas ravaged by flood, fire or pestilence cannot be quarantined . . . [to protect] safety and welfare.”<sup>80</sup> Countries may also restrict these rights to protect “public health or . . . the rights and freedoms of others.”<sup>73</sup> Furthermore, IHRs (article 30.1.a) oblige health officials to take all practicable steps to prevent the departure of any individual known or suspected of being infected with a communicable disease that poses a serious public health threat.

Thus, we maintain that government cannot abridge the right to travel without a legitimate public health purpose and that restrictions must be narrowly drawn and targeted. Although private entities such as universities are not bound by national constitutions or international law, they are bound by the basic moral considerations that should inform public policies that infringe the right to travel.

### Limiting Travel Is Justified by a Legitimate Public Health Purpose

Restricting travel by those with SARS, and even those recently exposed to SARS, poses few moral quandaries. There is no right to board conveyances if in so doing one imposes ineliminable risks on others. Nor is there a right of entry into a country if one is sick with an infectious condition marked by high case fatality rates. Consequently, screening passengers before embarkation and at borders is legally and morally appropriate.

### The Right of Return to a Person's Home Country Should Not Be Denied

International human rights law entitles individuals to return to their country of citizenship. The reasoning is that people have a right to a place to reside and should not suffer the indignity of forced exclusion from their home country. In emergency situations, however, this principle may be limited when infectious individuals pose a risk to others on international conveyances. As soon as it is safe to do so, individuals infected with or exposed to SARS should be permitted to return to their home countries.

### Travel Advisories to SARS-Affected Areas Are Warranted to Accurately Inform the Public

Travel to areas marked by SARS outbreaks poses a different set of issues. Travel advisories or warnings that inform individuals about the risks of travel to certain locales are not problematic. Indeed, it would represent a failure of public health responsibility not to issue such warnings. Since they pose potentially severe economic consequences, travel warnings should be based on reliable epidemiological evidence.

### Travel Restrictions to SARS-Affected Areas Are Justified Only Where Return Travel Imposes a Serious Risk to Others

More complex and troubling is the imposition of travel restrictions to SARS outbreak areas, such as those that were imposed by some US universities. Competent adults, in general, have the right to assume risks, once informed of the consequences of their decisions. However, when travel to an outbreak area poses a risk of acquiring a fatal illness and where return travel might impose hazards on others, the case for restrictions is enhanced by the harm principle. For example, in an uncontrolled generalized outbreak, travel restrictions could be justifiable. In such a situation, exceptions for scientists and health care workers who may be critical to disease control and for journalists providing news coverage should be made. Nevertheless, where outbreaks are largely restricted to health care institutions, restrictions on travel would be overbroad.

### CONCLUSION: ACTING UNDER SCIENTIFIC UNCERTAINTY

The first reports of SARS from China, coming after months of delay, provided the occasion for an extraordinary international mobilization of public health resources. At the WHO there was consternation that if preventive measures were not put in place rapidly a worldwide pandemic might emerge.<sup>15</sup> It was necessary to take action despite the CDC's acknowledgment in April 2003 that the scientific community had an incomplete understanding of SARS and its mode of transmission.<sup>81</sup> It was appropriate for public health authorities to act on worst-case scenarios based on assump-

tions of how an airborne disease might spread. When a cluster of cases in a single apartment complex was identified in Hong Kong, the possibility of more efficient modes of transmission could not be discredited.

The precautionary principle—even when limited by the least restrictive/intrusive alternative, justice, and transparency—dictated that restrictive measures be imposed to halt the spread of SARS. It is not surprising that those primarily concerned with civil liberties would be troubled by the measures taken, that they would argue that in face of uncertainty greater deference be given to the rights of individuals. Nor is it surprising that those whose economic interests might have been harmed by travel advisories saw an “overblown” reaction that they feared would be ruinously costly.<sup>15</sup>

There is no way to avoid the dilemmas posed by acting without full scientific knowledge. Failure to move aggressively can have catastrophic consequences. Actions that prove to have been unnecessary will be viewed as draconian and based on hysteria. The only safeguard is transparency. International and national public health agencies must be willing to make clear the bases for restrictive measures and openly acknowledge when new evidence warrants reconsideration of policies. Adoption of ethical recommendations will be a necessary concomitant of epidemic control in democratic societies. Public health decisions will reflect in a profound way the manner in which societies both implicitly and explicitly balance values that are intimately related and inherently in tension.

**Funding/Support:** The Center for Law and the Public's Health at Georgetown University and Johns Hopkins University are supported by the CDC and the Alfred P. Sloan Foundation, New York, NY.

**Disclaimer:** The contents of this article do not necessarily represent the views of the CDC. Mr Gostin, a health law and ethics editor for JAMA, was not involved in the editorial review or decision to publish this article.

**Acknowledgment:** We acknowledge support of the Office of the Dean at the Columbia University Mailman School of Public Health for hosting a meeting entitled “Ethical Challenges Posed by SARS” on June 18, 2003, and support by the Visiting Scholars Program at the Institute for the Medical Humanities, University of Texas Medical Branch, Galveston.

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A wise man, therefore, proportions his belief to the evidence.

—David Hume (1711-1776)