

# PROJECT ON ADDRESSING ETHICAL ISSUES IN PANDEMIC INFLUENZA PLANNING



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*Hippocrates explaining the importance  
of contagion in the plague epidemic*

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## ETHICS OF PUBLIC HEALTH MEASURES IN RESPONSE TO PANDEMIC INFLUENZA

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## I. An Ethics and Human Rights Framework

National and global strategic plans take a variety of forms, but share a common set of tools for preventing spread and ameliorating the burden of highly pathogenic influenza. Many of the barriers to effective interventions are technical and have been thoroughly discussed.<sup>1</sup> This report focuses on the formidable ethical challenges that have yet to receive sufficient attention.<sup>2</sup> While many countries have developed plans for combating pandemic influenza, unfortunately the vast majority do not mention ethical issues. Those countries that do consider the ethical implications do not do so in a comprehensive way.

Pandemics can be deeply socially divisive, and the political response to these issues not only impacts public health preparedness, but also is important to a good and decent society. It is for this reason that it is particularly important to show respect for public health ethics and international law, particularly human rights law, when developing national policy for pandemic influenza. This section sets out the relevant ethical and human rights principles that should be considered when planning to combat a highly pathogenic pandemic influenza outbreak.

### A. International Human Rights

The basic characteristics of human rights are that they: inherent in all people because they are human; they are universal, so that people everywhere in the world are “rights-holders;” and they create robust duties on the state.<sup>3</sup> State duties encompass the obligation to *respect* so that states do not interfere directly or indirectly with the enjoyment of human rights; *protect* so that states take measures to prevent private actors from interfering with the right; and *fulfil* or facilitate so that states take positive measures (e.g., legislative, budgetary, and promotional) to enable and assist individuals and communities to enjoy rights. Basic human rights are protected under international law so that a state can no longer assert that systematic maltreatment of its own nationals is exclusively a domestic concern.<sup>4</sup>

The main sources of human rights law are the Universal Declaration of Human Rights, two international covenants on human rights (ICCPR and ICESCR), and an optional protocol.<sup>5</sup> The United Nations has promulgated numerous treaties dealing with specific human rights violations including racial and gender discrimination, the rights of the child, genocide, and torture.<sup>6</sup> Human rights are also protected under regional systems, including those in the Americas, Europe, and Africa.<sup>7</sup>

*The Universal Declaration of Human Rights (UDHR).* The UDHR, adopted in 1948, identified specific rights and freedoms that deserve promotion and protection. The UDHR was the organized international community’s first attempt to establish “a common standard of achievement for all peoples and all nations” to promote human rights (Preamble). The UDHR represents a milestone in the struggle of humanity for freedom and human dignity, stating that human rights are self-evident, the “highest aspiration of the common people (Preamble).” Article 1 proclaims: “All human beings are born free and equal in dignity and rights.”

The Universal Declaration is not a treaty, but a resolution with no explicit force of law. Nevertheless, its key provisions have so often been applied and accepted that they are now widely considered to have attained the status of customary international law.<sup>8</sup> The United Nations’ General Assembly has declared that the principles embodied in the Universal Declaration “constitute basic principles of

international law.”<sup>9</sup> Moreover, it has “acquired a moral and political authority equal to that of the (United Nations) Charter.”<sup>10</sup> In any event, the Declaration has inspired and influenced many international conventions and is reflected in national constitutions, legislation, and in the decisions of national and international tribunals.

Most relevant to the ethics of public health interventions, the UDHR provides that all people have: the right to freedom from arbitrary arrest, detention, or exile (article 9 UDHR); the right of movement and residence within and between the borders of each state (article 13 UDHR), and the right to freedom from discrimination. While the UDHR served as the preliminary description of rights, two binding covenants followed.

*International Covenant on Civil and Political Rights (ICCPR) & International Covenant on Economic, Social and Cultural Rights (ICESCR).* The ICCPR imposes an immediate obligation “to respect and to ensure” civil and political rights. A sister covenant, the ICESCR, requires state parties:

to take steps, individually and though international assistance and co-operation, especially economic and technical, to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized ... by all appropriate means, including particularly the adoption of legislative measures.

The language of “progressive realization” and “maximum resources” may have been inserted because economic and social rights typically require greater funding and more complex solutions than civil and political rights. Still, the Committee on Economic, Social and Cultural Rights, established by the ICESCR, made clear that states parties do have immediate obligations. “Steps” towards the goal of full realization “must be taken within a reasonably short time.” States parties have “a minimum core obligation to ensure the satisfaction of ... each of the rights.” The Committee also said that states parties should immediately implement legislation and judicial remedies to ensure non-discrimination in the exercise of economic and social rights (Art. 2(1)).<sup>11</sup>

These covenants provide a number of rights that are relevant to the implementation of public health interventions: the right to freedom from cruel, inhuman, or degrading treatment or punishment; the right to freedom of movement and residence; the right to freedom from arbitrary detention; and most notably the right to health.

The right to health encompasses the international obligation for all nations to promote and protect the health of its civilians, especially by facilitating access to basic health care services. The right to the health is, however, not equivalent to a right to health care nor is it an absolute right. It must be evaluated against both the means available to the state and the biological and socio-economical characteristics of the individual concerned.<sup>12</sup> Furthermore, the right to health cannot be seen in a vacuum; it depends on the realization of other human rights such as the right to life, the right to privacy and the right to non-discrimination. The right to health thus encompasses a broad spectrum of socio-economic factors en has to be extrapolated to the underlying determinants of health such as hygiene, housing, environment, and clean drinking water.<sup>13</sup>

*Regional Conventions: European Convention on Human Rights and Fundamental Freedoms and its Protocols (ECHR), American Convention on Human Rights and the Banjul Charter on Human Rights and People’s Rights.* The European Convention on Human Rights and Fundamental Freedoms and its protocols (“European Convention”), the American Convention on Human Rights (“American Convention”),

and the Banjul Charter on Human Rights and People's Rights ("Banjul Charter") identify many of the same rights and liberties as the Universal Declaration. Public Health measures could violate the right to privacy,<sup>14</sup> the right to be free from inhumane or degrading treatment,<sup>15</sup> the right to freedom of movement,<sup>16</sup> and the right to be free from discrimination.<sup>17</sup>

### *B. Valid Limitations on Human Rights*

Human rights have transcending value, but international law does allow restrictions when necessary for the public good. Under the UDHR, the sole purpose for the limitation of rights is to secure "due recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order and general welfare in a democratic society" (Art. 29(2)). States may not "perform any act aimed at the destruction of any of the rights and freedoms" proclaimed in the Declaration (Art. 30).

The two covenants diverge in their treatment of permissible derogations and limitations. The ICCPR's most fundamental guarantees are so essential as to be absolute and no state, even in a time of emergency, may derogate from them. The ICCPR, however, allows states parties "in time of public emergency that threatens the life of the nation" to suspend most other civil and political rights (Art. 4). (See Table 7-4). The state must officially proclaim the public emergency and cannot engage in discrimination. The principal conditions for restraints on civil and political rights are that they must be prescribed by law; enacted within a democratic society; and necessary to achieve public order, public health, public morals, national security, public safety, or the rights and freedoms of others.<sup>18</sup> However, states parties may not impose restrictions aimed at the destruction of rights or their limitation to a greater extent than provided in the Covenant (Art. 5(1)).<sup>19</sup>

*The Siracusa Principles*, conceptualized at a meeting in Siracusa Italy, are widely recognized as a legal standard for measuring valid limitations on human rights.<sup>20</sup> The Principles make clear that even when the state acts for good reasons, it must respect human dignity and freedom. Echoing the language of the ICCPR, the Siracusa Principles require that state limitations must be: in accordance with the law; based on a legitimate objective; strictly necessary in a democratic society; the least restrictive and intrusive means available; and not arbitrary, unreasonable or discriminatory. International tribunals have relied on the Siracusa Principles to require states to use the least restrictive measure necessary to achieve the public health purpose.<sup>21</sup>

It is far more difficult to think about legitimate limitations on economic, social, and cultural rights. The ICESCR permits "such limitations as are determined by law only in so far as this may be compatible with the nature of these rights and solely for the purpose of promoting the general welfare in a democratic society (Art. 4)."<sup>22</sup> Since the ICESCR includes a "right to health," it is best to conceptualize as valid "limitations" those measures necessary to attain health protection for the population. For example, the Covenant requires states parties to take steps to prevent, treat and control epidemic, endemic, and occupational diseases (Art. 12(2) (c))." Thus, compulsory measures such as vaccination, treatment, or isolation would be permitted only if necessary to protect the public's health.

### *C. Public Health Ethics*

These international human rights principles stress the importance of individual rights and freedoms, but make it clear that these freedoms can be restricted when the public's health is threatened.

Striking this balance between the individual and the collective can be a difficult task, especially under conditions of scientific uncertainty and crisis. Therefore, it is important to articulate the values of public health ethics that should influence pre-pandemic planning.

*Public Health Necessity.* Public health powers are exercised under the theory that they are necessary to prevent an avoidable harm. Early meanings of the term “necessity” are consistent with the exercise of police powers: to necessitate was to “force” or “compel” a person to do that which he would prefer not to do, and the “necessaries” were those things without which life could not be maintained.<sup>23</sup> Government, in order to justify the use of compulsion, therefore, must act only in the face of a demonstrable health threat. The public health officials must be able to prove that they had “a good faith belief, for which they can give supportable reasons, that a coercive approach is necessary.”<sup>24</sup>

The standard of public health necessity requires, at a minimum, that the subject of the compulsory intervention must actually pose a threat to the community. In the context of infectious diseases, for example, public health authorities could not impose personal control measures (e.g., mandatory physical examination, treatment, or isolation) unless the person was actually contagious or, at least, there was reasonable suspicion of contagion. While this standard is obviously resistant to precise definition, it is important that countries clearly delineate the what criteria for suspicion will be used and provide procedural safeguards.

*Reasonable and Effective Means.* Under the public health necessity standard, government may act only in response to a demonstrable threat to the community. The methods used, moreover, must be designed to prevent or ameliorate that threat. In other words, there must be a reasonable relationship between the public health intervention and the achievement of a legitimate public health objective. Even though the objective of the legislature may be valid and beneficent, a public health intervention must be an effective means of combating the public health threat. A policy that entails personal burdens and economic costs is only justified if the government can demonstrate that there is a reasonable chance of protecting the public’s health.<sup>25</sup> Because it is extremely difficult to exactly define “reasonable chance” for all potential situations, the government has the burden of proof and has to engage in ongoing evaluation of the public health intervention and its effectiveness.

*Proportionality.* The public health objective may be valid in the sense that a risk to the public exists, and the means may be reasonably likely to achieve that goal—yet a public health regulation is unethical if the human burden imposed is wholly disproportionate to the expected benefit. Public health authorities have a responsibility not to overreach in ways that unnecessarily invade personal spheres of autonomy. This suggests a requirement for a reasonable balance between the public good to be achieved and the degree of personal invasion. If the intervention is gratuitously onerous or unfair it may overstep ethical boundaries.

*Distributive Justice.* This ethical principle requires that the risks, benefits, and burdens of public health action be fairly distributed, thus precluding the unjustified targeting of already socially vulnerable populations. Tom Beauchamp and James Childress view distributive justice as the “fair, equitable, and appropriate distribution in society determined by justified norms that structure the terms of social cooperation.”<sup>26</sup>

In the context of public health, the principle requires that officials act to limit the extent to which the burden of disease falls unfairly upon the least advantaged and to ensure that the burden of interventions themselves are distributed equitably.<sup>27</sup> Thus, in the exercise of compulsory powers, distributive justice requires a fair allocation so as not to unduly burden particularly vulnerable populations. Distributive justice has been viewed as so central to the mission of public health that it has been described as its core value. As Dan Beauchamp has said, “The historic dream of public health...is a dream of social justice.”<sup>28</sup>

Distributive justice does not merely require a fair allocation of risks and burdens. It also recognizes that public health often distributes benefits such as vaccines, treatment, or other services. Problems of fair benefits allocation arise under conditions of scarcity, where there is a competition for resources. This might occur, for example, with a scarcity of medical treatment in the midst of an influenza pandemic.

*Trust and Transparency.* Public health officials have the responsibility to involve the public in the process of formulating public health policies as well as to explain and justify any infringement on general moral considerations. Public health officials should honestly disclose relevant information to the public. Accordingly, citizens should have the right to request and receive information. Moreover, citizens’ input should be solicited.<sup>29</sup>

The need for transparency stems in part from the government’s ethical imperative to treat citizens with respect, by offering reasons for policies that infringe moral considerations.<sup>30</sup> Transparency is also essential to create and maintain public trust and accountability.<sup>31</sup> Openness and accountability are important to public health governance because of their intrinsic value and capacity to improve decision-making. Citizens gain a sense of satisfaction by participating in policy making and having their voices heard. Even if government decides that personal interests must yield to common needs, the individual feels acknowledged if she is listened to and her values are taken into account.

Transparency also has instrumental value because it provides a feedback mechanism—a way of informing public policy and arriving at more considered judgments. Open forms of governance engender and sustain public trust, which benefits the public health enterprise more generally. Without public support, and the voluntary cooperation of those at risk, coercive public health interventions would be difficult to achieve. The populace must be able to trust that their government is acting in their best interests.

In the following sections, we examine ethical issues raised by the major public health interventions available for combating influenza. These interventions often present hard tradeoffs between population health on the one hand and personal (e.g., autonomy, privacy, and liberty) and economic (e.g., trade, tourism, and business) interests on the other. Each section will begin by describing the public health intervention and explaining how implementation can be ethically problematic. An ethical solution to these problems will then be articulated. However, this ideal will often be difficult for countries to realize; the crisis situation created by a pandemic will put incredible strains on the best laid plans. Furthermore, given the globe’s diversity of economic resources, governance structures, and cultural norms, it is unreasonable to assert that there is one set of ethical ideals. Thus, each section will also discuss the mitigating factors that might make an ethical “ideal” impracticable. The accompanying recommendations are designed to promote the ultimate ethical ideal, but that are also sensitive to the practical realities of a pandemic. However, before beginning the ethical analysis

of specific public health interventions, it is useful to define these tools, as well as to articulate some of the general themes that run throughout this report.

## II. Public Health Interventions

Given the limitations of medical countermeasures, public health interventions will be vital for slowing the spread of an emerging pandemic.<sup>32</sup> This section will briefly identify and describe the various interventions (see table 5). Subsequent sections will discuss these interventions in more detail, focusing on the ethical issues raised by each of the traditional public health interventions, drawing lessons from past influenza pandemics<sup>33</sup> and the outbreaks of Severe Acute Respiratory Syndrome (SARS).<sup>34</sup>

### **Table 5. Brief Descriptions of the Relevant Public Health Interventions**

**Surveillance** is the continued watchfulness over the distribution and trends of risk factors, injury, and disease in the population through the systematic collection, analysis, and interpretation of selected health data for use in the planning, implementation, and evaluation of public health practice.

**Animal/Human Interchange** consists of strategies used to diminish the risk of an infectious agent jumping from an animal species to human. Interventions include separation of animal and human populations; occupational health and safety in animal work (e.g., infection control and disinfection); and control of diseased or exposed animal populations (e.g., culling).

**Community Hygiene** is the community use of basic hygienic measures (e.g. hand-washing, cough etiquette) to reduce risk of transmission of virus.

**Hospital Infection Control** involves the use of technical strategies in hospitals (e.g., particulate respirators, surgical facemasks, hand sanitizers, disinfectants, vaccines) to prevent medical personnel from becoming vectors for spread of a virus.

**Social Distancing** is a strategy used to decrease contact between people, thus minimizing opportunities for the disease to spread. Social distancing measures can include closing public places, cancelling public events, and encouraging people to remain in their homes.

**International Travel and Border Control** measures are designed to check the global spread of infected individuals and goods. Techniques can include: entry or exit screening, reporting, health alert notices, collection and dissemination of passenger information, travel advisories or restrictions, and physical examination or management of sick or exposed individuals.

**Quarantine** is the restriction of the activities of *healthy* persons who have been exposed to a case of communicable disease, during its period of communicability, to prevent disease transmission during the incubation period if infection should occur.

**Isolation** is the separation, for the period of communicability, of *known* infected persons in such places and under such conditions as to prevent or limit the transmission of the infectious agent.

### III. General Ethical Themes

#### A. Community Participation

WHO's constitution of 1948 states that "Informed opinion and active co-operation on the part of the public are of the utmost importance in improving health."<sup>35</sup> Community participation in pandemic preparedness and response is critically important and ethically required. The ethical principles of trust and transparency require that the public be involved in decisions that will affect it. During a pandemic, many actions taken will impose losses on members of society, both in terms of money and autonomy. Similarly, actions not taken will leave society at risk of disease. Balancing the risks of action and the risks of inaction will require education of, and input from, the public in whose name public health policymakers will be acting. This will help to ensure that the policies ultimately adopted are well-suited to local circumstances and values.

At the national level, community participation will include advocacy, delivery of services, cost-sharing and support to patients. Each person should have the opportunity to contribute to public discourse and thus must be adequately informed, so that the citizen is enabled to participate in his or her own affairs and not simply a member of the population to be "managed" by the authorities. Priorities need to be identified based on fundamental requirements in a community, its expectations and financial capacity. Thus, an ethically appropriate policy in one country, or even one city, may be ethically inappropriate in another, due to varying norms, benefits from an intervention, or losses imposed by it.

Community participation has a positive impact on the success of project development and implementation, on the promotion of a sense of responsibility, and can even lead to a decreased alienation among socially excluded groups.<sup>36</sup> Time and resource constraints may considerably complicate community outreach programs during a pandemic. Consequently, governments must gain the public's trust by providing them with adequate and accurate information well in advance. Of course, some issues will develop very quickly or unexpectedly during a pandemic, precluding advance information. In this case, governments should provide necessary information as quickly as possible, and community involvement in decision making should be as great as allowed by the circumstances of a situation. When expediency does not allow full involvement by the community before policies are enacted, a post-enactment review process is particularly important to ensure transparency and accountability, and it should incorporate community involvement.

#### B. Expanded Research Agenda

The use of all possible strategies must be considered because a specific intervention's effectiveness is difficult to predict and evaluate. The key question is: which measure, or combination of measures, works best at each stage of the pandemic? A number of considerations make this difficult to answer. First, evidence of effectiveness is often historical or anecdotal, with few systematic studies.<sup>37</sup> Second, an intervention's effectiveness depends on the transmission pattern, which cannot be fully understood in advance.<sup>38</sup> Third, an intervention's usefulness depends on the pandemic phase. In the pandemic alert period, surveillance, medical prophylaxis, and isolation are important tools. Yet, during a pandemic, the focus shifts to delaying spread through non-pharmaceutical measures.<sup>39</sup> Evaluation of effectiveness is important not only from a public health perspective, but also from an ethical perspective. To the extent that interventions impose costs and burdens on individuals or the

population, they are ethically warranted only to the extent that they are effective and proportionate in terms of benefits and burdens.

Multiple, targeted approaches are likely to be most effective, but they can have deep adverse consequences for the economy and civil liberties. As such, governments should employ the least restrictive option possible. Given this principle, and the uncertain utility associated with public health interventions, evidence of effectiveness is important and relevant to the ethical implications of public health interventions. Measures that entail serious liberty or economic costs cannot be pass ethical muster unless there is adequate evidence that they are effective. Adequate resources for population-based research are urgently needed.<sup>40</sup> Thus it is ethically important to encourage research whenever possible.

### *C. Resource Allocation*

Perhaps the greatest ethical issues of pandemic preparedness and response deal with the allocation of scarce resources. A pandemic will overtax the immediately available resources of even the richest countries on the planet; less wealthy countries likely will be overwhelmed. In 1918, influenza-related mortality was highest in the least developed parts of the world and lowest in the wealthiest countries.<sup>41</sup> Given the greater baseline levels of mortality, the higher prevalence of HIV/AIDS (and many other diseases such as malaria and tuberculosis), and reduced access to health care that is found in many developing countries, one can reasonably expect these countries to experience greater morbidity and mortality from influenza in a modern pandemic as well. At the same time, these countries will have the least resources available to protect their citizens and to slow transmission of the disease.

The demands of distributive justice require that resources be expended equitably, with attention paid to meeting the needs of those who are most vulnerable. In the context of pandemic influenza, this means that resources must be used in the fashion that can alleviate the greatest amount of human suffering and death, with particular attention to people who suffer systematic disadvantage. If the developing world is at the greatest peril from the disease, then wealthy countries have a duty to assist them to provide the greatest degree of protection that is feasible given the worldwide scarcity of resources. Developed countries have an obligation to do what is possible to prevent the burdens of an influenza pandemic from falling most heavily on those people who are already the least advantaged. Furthermore, the principle of utilization of effective means requires that wealthy countries assist less wealthy countries in pandemic response. Furthermore, at least early in a pandemic, both wealthy and developing countries will be benefited by resource sharing. Models of influenza transmission indicate that a pandemic can be stopped if adequate resources are utilized early on,<sup>42</sup> but all available measures are expected only to slow transmission once a full-fledged pandemic is underway.<sup>43</sup> To the extent that a pandemic is likely to begin in a less developed country, effectiveness of the intervention demands that wealthy countries assist poorer countries combat a nascent pandemic.

Additionally, in all countries, a fair system for allocating health-promoting resources must be developed. The demand for medical care, hygienic measures, and other resources is likely to exceed the supply, so it is important that they be allocated in an equitable manner. This should be done with attention paid to obtaining the greatest degree of health promotion possible. Resources also should be distributed in a non-discriminatory fashion. To the extent possible, there should be transparency and broad participation in the rationing scheme.

#### *D. International Cooperation and Coordination*

The protection of the public health and national risk management is primarily the responsibility of national authorities. All countries thus should develop a national influenza preparedness plan. In designing a justifiable containment strategy, each state needs to consider state-specific factors such as national political structures and principles, educational and cultural environment, the prevalence of the virus, and the strengths and weaknesses of the national health care system. While different national approaches are ordinarily not a problem, considerable variation could prevent or delay an efficient response in a multi-country public health emergency.<sup>44</sup> Cooperation among national authorities and coordination by international bodies is thus necessary.<sup>45</sup> The WHO global influenza preparedness plan, checklist for influenza pandemic planning, and the new WHO pandemic influenza draft protocol for rapid response and containment are meant to “assist member states and those responsible for public health, medical and emergency preparedness to respond to threats and occurrences of pandemic influenza.”

Particular emphasis on cooperation and coordination can be seen in WHO's International Health Regulations (2005) (IHR(2005)), a revision of the 1969 text. The purpose and scope of the Regulations are “to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.” The IHR(2005) introduces the term “public health emergency of international concern,” defined as an extraordinary public health event which is determined to constitute a public health risk to other States through the international spread of disease; and to potentially require a coordinated international response. The Regulations require countries to develop, strengthen and maintain core public health capacities to detect, assess, and notify WHO of events that may constitute a public health emergency of international concern via National IHR Focal Points in each State Party.<sup>46</sup>

In June 2007, the IHR(2005) will become legally binding on all WHO Member States except those that have rejected them or submitted reservations. However, in light of the concern surrounding avian influenza, in May 2006 the 59<sup>th</sup> World Health Assembly adopted Resolution 59.2, calling upon WHO Member States to comply immediately and voluntarily with those IHR(2005) provisions relevant to the pandemic influenza risk.

There is also a need for cooperation between international agencies. The response to a pandemic, especially in its early stages, will be borne by many international agencies; among them will be the WHO, FAO, and OIE. Additionally, national entities will be responsible for picking up international burdens during a pandemic, such as the United States CDC. It will be important for knowledge gained by one entity to be disseminated quickly to other entities. Further, given the scarcity of resources that will be available to stem a pandemic, it will be important that work done by one agency not be unnecessarily duplicated by others. This has implications for distributive justice as well; particularly in the most resource-constrained parts of the world where much of the technical response will be conducted by international agencies, efforts spent unnecessarily will trade off with other, potentially life-saving efforts.

#### **IV. The Public Health System: Surveillance**

Surveillance is the backbone of public health, providing essential data to understand the epidemic threat and inform the public: early warning, transmission characteristics, incidence and prevalence, and targeted response. Surveillance strategies include rapid diagnosis, screening, reporting, case management reporting, contact investigations, and monitoring trends.

It is clear that surveillance will be necessary to quickly identify and respond to a pandemic influenza outbreak. The revised IHR require member states to notify the WHO of all events which may constitute a “public health emergency of international concern.” Consequently, once a country identifies a signal suggesting human-to-human transmission, the country is expected to immediately begin investigations and simultaneously notify WHO of the event since any human influenza caused by a new subtype must be reported to WHO. The “triggering criteria” of early pandemic activity cannot be fully set out ahead of time. Public health officials should thus be vigilant and report all plausible signals that a pandemic virus may be emerging.

##### *A. Global Responsibility to Develop Core Surveillance Capacities*

Ideally, all countries should have the capacity to perform core surveillance functions. However, such a recommendation is vacant without adequate resources for poor countries, which lack the resources for animal or human surveillance and containment of outbreaks.<sup>47</sup> Specifically, in large parts of Africa and Asia, the capacity for veterinary and human surveillance is limited or nonexistent.<sup>48</sup> Many developing countries are being pressured to improve their existing surveillance infrastructure. However, doing so may divert resources from areas in which needs are much greater in order to achieve goals that are more in the interest of developing countries. It is, for example, very hard to convince the government of a poor country with much of its population infected with HIV or malaria to invest scarce resources towards the monitoring of a potential influenza threat.<sup>49</sup> Developed countries should be aware of this trade-off and take measures, most suitably in the form of increased investment and capacity building, to ensure that enhanced surveillance does not occur at the expense of managing the multitude of ongoing public health threats many developing countries face. Protecting global health requires governments around the world to cooperate and collaborate.

Many countries have recently recognized this ethical imperative, pledging \$1.9 billion to meet the costs estimated by the World Bank to contain avian influenza.<sup>50</sup> However, this money will only temporarily address the need for surveillance. The avian flu threat might not manifest itself for years, and future pandemics are almost certain to occur. Thus, it would be ethically desirable to pursue the larger goal of creating sustainable public health systems across the globe. To this end, the World Health Organization’s Commission on Macroeconomics and Health estimates that industrialized countries would have to spend \$27 billion in 2007 to meet global needs for essential public health services.<sup>51</sup>

##### *B. Mitigating Privacy and Autonomy Risks*

Surveillance poses privacy risks as government collects sensitive health information from patients, travellers, migrants, and other vulnerable populations.<sup>52</sup> The IHR require States to keep data “confidential and processed anonymously as required by national law.” Many countries have data protection statutes, but these laws make exceptions for surveillance in the context of a public health threat.<sup>53</sup> Countries should enact public health information privacy laws to require justifiable criteria for data disclosure and to prohibit wrongful disclosures, for example, to employers, insurers, and

immigration or criminal justice authorities.<sup>54</sup> Whenever a government authorizes or mandates the disclosure of identifiable health data, the proposed use, the reason for disclosure, and the extent to which third parties can have access should be made public.

In a crisis situation, however, it might be necessary to disclose information without any undue delay. When the immediate use of the information is necessary for an important public health purpose and is restricted to the confines of the public health system, disclosure can be warranted. In order for the disclosure to be justifiable the identity of the affected person should be protected as much as possible. The inclusion of any uniquely identifiable characteristics, such as a name, government identification number, fingerprint, or phone number should especially be avoided when the information is released outside of the public health system. Cases should stay anonymous or encrypted when reasonably feasible. In any event, the right to privacy and personal autonomy require that only the minimum amount of information necessary to achieve the goal will be released and to as few people as possible. Dignity and respect for the person should be protected. A breach of the right to privacy can result not only in economic harms such as unemployment or loss of insurance or housing, but also in social and psychological harms.

Screening and testing can pose serious threats to a person's privacy and bodily integrity. Ideally, public health officials need to receive the individual's informed consent prior to performing any medical tests. Although education programs will often lead to voluntary testing, mandatory testing might be necessary to advance the public good. Interference with the right to bodily integrity and the right to refuse testing rarely may be permissible when the mandatory testing policy is clearly necessary and effective in protecting the public health, when it is performed by competent public health officials, and when the least intrusive means are being used. At a minimum, compulsory testing should be limited to individuals known or at least suspected to be infected and should be done in a fair and non-discriminatory way. The people whose rights are being infringed should be informed of the reasons for the infringement. As in all cases of the use of coercion, it should be the last resort and used only if voluntary or less restrictive means are ineffective.

## **V. Limiting Animal/Human Pathogen Interchange**

Close proximity between animals and humans poses serious risks as novel pathogens mutate and jump species.<sup>55</sup> Live bird markets, travelling poultry workers, fighting cocks, and migratory birds are vectors for spreading avian influenza.<sup>56</sup> Recently, Influenza (A) H5N1 has also spread to tigers<sup>57</sup>, leopards<sup>58</sup>, pigs<sup>59</sup> domestic cats<sup>60</sup> and stone martens.<sup>61</sup> Consequently, a critical early preventive strategy is to limit animal/human interchange. Strategies to diminish the risk include separation of animal and human populations; health and safety in animal farming; and management of diseased or exposed animals. For example, animal health authorities should require four interventions, used successfully in the United Kingdom during the Bovine Spongiform Encephalopathy (BSE) outbreaks in the 1990s: comprehensive screening for the virus; restrictions on movement of humans and animals into and out of infected areas; culling of infected animals; and disinfection of affected areas.

### *A. Avoiding proximity*

Safe farming practices and the separation of animals and humans are critically important from a public health and economic perspective. Avoiding proximity between animals and humans can reduce the risk that the avian H5N1 virus will mutate and jump species.<sup>62</sup> The separation is hard to accomplish however given a culture of close contact between animals and humans in most countries.

The domestication of poultry is often necessary for family survival.<sup>63</sup> In many African and Asian countries, backyard chickens are kept not only for food but also as pets.<sup>64</sup> In Hong Kong, thousands of residents are avid birdwatchers and Kowloon's famed Bird Garden is one of the world's largest marketplaces for exotic birds of all kinds.<sup>65</sup> In London, Paris and Venice, thousands of pigeons attract many tourists to the market squares. In a different vein, recent discoveries of the H5N1 virus in domestic cats has caused many families to lock their pets inside.

Policies such as the separation of animal and human populations can not only cause economic hardship but also social unrest, given cultural norms. In Thailand and the Philippines, for example, cockfighting is both a source of income and a national pastime. While fighting cocks are both victims and culprits in the bird flu epidemic, citizens are reluctant to sacrifice their cultural traditions for a potential public health threat. Governments and health care sectors should publicize clear rationales for such separation orders and should initiate and facilitate constructive public discussion about measures that can be taken to suppress the transmission of the virus.

### *B. Due Process and Compensation for Culling Decisions*

Given that disease containment strategies can have a profound impact on the lives of individuals, it is ethically imperative that governments carefully construct their animal control policies. While mass slaughter of diseased and exposed animals seems to be the most logical way to achieve eradication of H5N1, it raises significant ethical concerns. A massive culling of birds can have a devastating economic toll on the poultry industries of the affected nations and the livelihoods of all classes of poultry owners, producers and their employees. There are approximately 6 billion chickens and 850 million ducks in the Southeast Asia region, where the area accounts for about one-quarter of the world's poultry trade. Two countries currently affected by the avian influenza outbreaks, China and Thailand, account for 15% of the global poultry trade. Economic studies further indicate that those hardest hit by culling of flocks are individual farmers for whom poultry production is their sole source of income generation.<sup>66</sup>

Furthermore, while culling has already played an important role in combating the current avian influenza strain, more convincing scientific evidence of its effectiveness in combating a pandemic influenza is needed for it to be ethically acceptable. In 1997 public health officials in Hong Kong decided to cull the entire population of 1.5 million birds, claiming afterwards that they had ended the threat by doing so. The virus nevertheless, reappeared soon thereafter. Moreover, the appearance of H5N1 in wild birds and mammals has significantly diminished the possible advantages culling could bring.

In order for culling decisions to be justified, the public benefit should outweigh the personal and economic burdens placed on individuals. Judicial procedures are necessary to ensure that a fair balance will be struck between the interests of society and of the affected individuals. Governments should incorporate due process into their culling procedures by creating an a priori procedure for fair reviews of a decision to cull. Affected individuals should receive some notice of the proposed containment measure and be permitted to consult a counsel. If they cannot afford counsel, one should be appointed to them at the government's expense. A subsequent hearing should be held as soon as possible after the decision to cull. The hearing should be held before an independent and accountable tribunal as to allow farmers and families to protest erroneous or arbitrary decisions. Ideally, individuals should be allowed to appeal the tribunal's final order.

The extent to which procedures can be implemented depends, however, on the urgency of the emergency and the availability of resources. Public health officials might have to mitigate the ideal procedural standards given the circumstances. Therefore, at the very least, to ensure non-discrimination and proportionality, public health officials need to publicly justify their decision and the criteria applicable to the proposed measures. Moreover, the process by which decisions are made should be open to scrutiny and the basis upon which decisions are made should be publicly accessible. Transparency and community participation in the decision-making process will enhance trust and acceptance. Post hoc review measures should be put in place to ensure that decision makers are accountable for their actions.

The economic impact of culling decisions, especially on small farmers, is significant. So far, the virus has already led to the deaths of about 200 million birds, around US\$20 billion worth of consequences for the countries affected, and led to the impoverishment of millions of small farmers whose livelihoods depend on poultry. Consequently, the principles of distributive justice and reciprocity require adequate compensation as an ethical imperative.<sup>67</sup> This could include provision of alternate sources of food if culling involves depleting a family's source of nourishment. A recommendation of this nature will be vacant, however, without financial aid from developed countries.

In light of the economic consequences, when poultry export industries and the livelihood of farmers are at stake, it is uncertain that affected countries and individuals will be sincere about reporting the extent to which their flocks are infected.<sup>68</sup> Adequate compensation and open communication will, however, increase the incentive to report outbreaks. In addition, education programs should be directed to decreasing the stigma and social hostility towards the infected people and countries. International cooperation and coordination will be essential.

### *C. Mitigating the Economic Impact of Trade Restrictions*

Avian influenza causes severe financial and trade impacts. Industry profitability, employment, household livelihoods, and, potentially, food security, are being adversely affected by recent H5N1 outbreaks in many countries around the globe. Hundreds of millions of domesticated fowl have been culled or have died of infection, devastating domestic poultry production.<sup>69</sup> The overall impact of the current strain of avian influenza hurts all livestock sectors by increasing price volatility and generating uncertainties in markets. The short-term costs to economies are considerable; the long-term implications for trading patterns, policy formulation, investments and overall industry developments will be substantial.<sup>70</sup>

The detection of the avian influenza virus threatens not only to transform the eating habits of the population, but also to sharply curtail the export market. Countries and regions have introduced large-scale import controls and bans. For example, the U.S. and India ban the import of all birds (Class: Aves) from affected areas;<sup>71</sup> European authorities ban poultry and feathers from the Black Sea region;<sup>72</sup> Japan bans the import of all poultry products from France (even foie gras packaged before a major outbreak on a French turkey farm),<sup>73</sup> and China, Japan, Malaysia, Singapore, and the Republic of Korea banned imports from the United States following a reported outbreak of a less virulent strain of avian influenza.<sup>74</sup> Some countries even prohibit the import of birds from nations that vaccinate their flocks, arguing that the vaccines (although usually protective) mask symptoms in infected birds.<sup>75</sup> When considering a trade restriction, ethical considerations should balance the risk to the public's health against the harm that will be done by the restriction.

Both international and individual country agencies, including the World Health Organization and the World Trade Organization, have supported and adopted the position that trade bans should be based on science and established rules. Nuisance bans on poultry imports because of small, localized outbreaks of the H5N1 virus in exporting countries, should be avoided. In May 2005, the OIE advised to “allow trade to occur from certain zones (geographical areas) or from compartments (a group of farms, an enterprise, or another managed unit) within a country even though avian influenza may be present in a completely separate zone or compartment in that country.”<sup>76</sup> To that end, the regionalization of bans should be promoted. Timely dissemination of all relevant information about influenza outbreaks, interactions among animal and human health authorities, and rapid containment and eradication of the virus where it has emerged are necessary conditions for regional bans to be effective.

## **VI. Community Hygiene and Hospital Infection Control**

Hygienic measures to prevent the spread of respiratory infections are broadly accepted and have been widely used in previous influenza pandemics<sup>77</sup> and the SARS outbreaks, although with uncertain benefits.<sup>78</sup> Infection control includes hand-washing, disinfection, respiratory hygiene (etiquette for coughs, sneezes, spitting), and personal protective equipment (PPE) (masks, gloves, gowns, eye protection).<sup>79</sup> Evidence supports hand hygiene and hospital infection control measures, but the effectiveness of disinfection, respiratory hygiene, and PPE in the community is unclear.<sup>80</sup> Research is needed to understand the appropriate role of community hygiene in a future pandemic. For example, mask use was common, even legally required, in the 1918 influenza pandemic and SARS outbreaks, but no controlled studies have evaluated its effectiveness.<sup>81</sup>

### *A. Encouraging Community Hygiene*

Even if hygienic measures are effective, professionals and the public must use them properly and sustainably. Infection control is challenging (e.g., appropriately-fitted N95 respirators) and must be used reliably until the risk subsides. Studies demonstrate inconsistent infection control in hospitals, and the general public has not uniformly adopted even basic hygiene practices such as hand-washing.<sup>82</sup> During the SARS epidemic, people in affected areas used protective measures inconsistently.<sup>83</sup>

It is important that the public be informed of the need for hygienic measures, and that accurate information, including the uncertainty of the effectiveness of the recommended interventions, be provided. In past epidemics, misinformation has been rampant, and this has led to substantial public anxiety, reliance on word of mouth for knowledge, and purchase of ineffective and expensive products.<sup>84</sup> Issues of distributive justice arise because ineffective or inaccurate communications will impact the most marginalized members of society most heavily: those without access to alternative, credible sources of information and those for whom wasting resources would have the greatest adverse effects. Furthermore, the public has a dignitary interest in being provided adequate information to make informed decisions about its own health.

Consequently, public education campaigns grounded in the science of risk communication are important, as the acceptability of health measures is vital to community adherence. The information disseminated through public education campaigns should be clear, uncomplicated, non-sensationalistic or alarmist and as reassuring as possible. Research indicates that panic is generally

rare during civil emergencies, but that providing clear, consistent, credible information that instructs the public about how it can protect itself will further assist the public in coping with fear of emergencies and help to protect it.<sup>85</sup> It is important to avoid information that fails to treat members of the public as rational agents; instead the public should be treated as a partner, enhancing the principle of transparency.

Ideally, as part of planning for community level preparedness, it will be important to account for variations in settlement patterns. Different types of settlements (i.e. cities, towns, rural communities) will present unique risks and challenges in the event of a pandemic. Similarly, communities can have unique cultural characteristics (e.g. religion, race, ethnicity) that can interact with emergency preparedness endeavours. In many places, public education campaigns may be made more difficult by multiple languages being spoken in a community and by varying levels of literacy and access to media. Preparation plans must take account of these geographic and cultural differences. They must also take steps to include diverse media sources. This can be accomplished by encouraging community involvement in the planning and implementation process and by utilizing leaders from many subpopulations in communities.

A lack of mass media infrastructure will impede broad dissemination of information in some areas. Resource constraints also prevent some populations from receiving messages that are distributed via media that are costly to acquire, and a lack of governmental infrastructure may make dissemination of messages much more difficult. Furthermore, in some areas, media may not be available that caters to particular subpopulations and portions of the population may have insufficient education for easy dissemination of messages.

However, countries should strive to reduce these problems by utilizing communication networks that are available. Healthcare workers and trusted sources in communities should be consulted and informed about community hygiene measures so that they can assist communication efforts. They can also help to tailor messages and make them accessible to target audiences. Messages should be posted in places where all members of communities are likely to see them, such as markets.

### *B. Ensuring the Appropriate Use of Hospital Infection Control*

The SARS-associated coronavirus was spread efficiently in hospitals that did not adopt strict infection control.<sup>86</sup> Disinfection, hand hygiene, PPE, and aerosol-generating procedures should be standard hospital practices.<sup>87</sup> Because of the historical high attack rate of influenza among health care workers,<sup>88</sup> the high degree of transmission from people not demonstrating clinical illness,<sup>89</sup> and the ease of transmission in crowded areas,<sup>90</sup> health practitioners who do not practice strict infection control may amplify disease transmission. Since hospital infection control is inconsistent, it is vital to train health care workers and monitor the use of infection control measures. This possibly could be done through the use of legal oversight or licensing requirements.

There are ethical concerns regarding use of hospital infection control. The first of these is an issue of distributive justice. The level of resources that can be dedicated to infection control will vary substantially between and within countries, and a fair system of allocating scarce infection control resources should be developed. It is also important to involve hospital staff in planning for the implementation of heightened infection controls and to devise a fair system for determining who carries out tasks that involve enhanced risk. Such a process enhances the transparency of the plan. Cultural sensitivity should be employed and control methods that require restricting valued personal

and cultural behaviours (such as the shaving of beards to properly fit masks) should be carried out through consultation with affected people. Additionally, one should ensure that policies that are implemented reflect the best available scientific research.

Ideally, nations should create training and monitoring programs to ensure that hospitals effectively utilize standard infection control procedures. Training programs should be based on available science to maximize effectiveness and should strive to provide practitioners with the information needed to minimize risks both to their own and their patients' health. Programs should be created with the involvement of practitioners and implementation at health care facilities should be adapted to the specific features of the institution.

There are limitations that may impede countries' abilities to implement an ideal training and monitoring program. Some countries will lack the resources to purchase adequate PPE for a disease of long duration. Furthermore, some countries may lack sufficient health infrastructure to implement new programs on a speedy basis. Civil unrest may impede monitoring of programs and legal infrastructure may have to be developed to enforce compliance with training and monitoring efforts.

For countries facing substantial limitations, alternatives to the ideal exist. The strictness of infection control may have to be relaxed; for example, surgical masks may have to be substituted for N95 respirators. There is evidence that surgical masks could be placed over N95 masks and replaced as necessary, allowing the N95 to be used for a longer period of time.<sup>91</sup> If areas do not have access to isolation rooms, segregating infectious patients into separate wards or hospitals or recommending home stay for mildly ill patients may be appropriate. Additionally, training without full monitoring of compliance may be necessary should monitoring be infeasible.

Countries will also have to develop a method to ration scarce protective equipment. Governments will have to determine how to distribute masks and other PPE in a fair manner. Such plans should give serious consideration to questions of justice and seek to find a rationing scheme that protects health to the greatest degree possible. Plans should be devised openly, with an opportunity for both experts and the lay public to be heard. It is important that a fair process be enacted and that scarce resources not be distributed as a benefit for political support or in a discriminatory fashion.

Additionally, policymakers will also have to address the problem of critical shortages in infection control and patient care equipment (e.g., particulate respirators, surgical facemasks, hand sanitizers, disinfectants, ventilators, intensive care beds).<sup>92</sup> Given the potential duration and scope of a pandemic, which may constitute several waves of outbreaks, even stepped-up production of PPE will be overwhelmed by the demand, especially if use in hospitals and the community is widespread. International collaboration will be needed to address this problem. Further research is needed to develop reusable respirators<sup>93</sup> and to determine the effectiveness of alternatives to N95 respirators.<sup>94</sup> It is critical that research is conducted collaboratively in the various countries where it occurs, and that information is broadly distributed in a fashion that fosters trust and transparency. Cooperation between companies, governments, and researchers will facilitate improved production and greater efficiency at meeting shortages of equipment.

## VII. Decreased Social Mixing/Increased Social Distance

Past experience shows that social separation and community restrictions form a significant response to pandemics.<sup>95</sup> There is limited evidence that school closure reduces seasonal influenza transmission,<sup>96</sup> and it is assumed, but not proven, that decreased social mixing slows the spread of respiratory disease.<sup>97</sup> Thus, in the face of pandemics, societies have closed public places (schools, childcare, workplaces, mass transit) and cancelled public events (sports, arts, conferences). As fear rises, the public itself may shun public gatherings. Predicting the effect of policies to increase social distance is difficult as infected persons and their contacts may be displaced into other settings, and individuals may voluntarily separate in response to perceived risk.<sup>98</sup> For these reasons, additional research needs to be conducted on behaviour during epidemics and the effects of social distancing on transmission.

Social separation, particularly for long durations, can cause loneliness and emotional detachment; disrupt social and economic life (education, trade, business); and infringe individual rights. Community restrictions raise profound questions of faith (religious worship), family (funeral attendance), and protection of the vulnerable (food, water, clothing, medical care).

### *A. Government Authority and Accountability*

Undoubtedly, most judicial systems would uphold reasonable community restrictions, but legal and logistical questions loom: who has the power and under what criteria to order closure and for what period of time? What threshold of disease should trigger closure and should thresholds be different for different entities? Under what circumstances should compensation for closures be paid? What should be the penalties for non-compliance? Enforcement and assurance of population safety remain critically important, but unanswered, questions in most countries.

One might fear that governments would implement strict restrictions on personal liberties unnecessarily, by implementing restrictions before they are needed, extending them beyond a disease crisis, or enacting restrictions that do not decrease influenza transmission. In these situations, closures could encroach on the important values of necessity and proportionality. Furthermore, it is important to remember that restrictive policies will be borne most heavily by those with the fewest resources, so errant social distancing actions have distributive justice implications. Lastly, one might worry that governments would use social distancing in a discriminatory fashion, scapegoating ethnic or religious minorities, or that governments might use social distancing as a means to pretextually crack down on dissidents who assemble to protest.

Ideally, questions of government authority and accountability would be answered by policy decisions made before a pandemic hit and created as part of an open and transparent process that encourages input from all portions of society. Governments should explicitly define who has the power to order social distancing strategies, and for what period of time. Governments should also clearly state the criteria under which such power is exercisable and clearly delineate the legitimate bases for any differential treatment. Penalties should be proportional to offences and not based on irrational fears or discriminatory beliefs.

However, one must recognize that detailed pandemic influenza preparations are not the highest priorities for many countries that are dealing with important and immediate concerns. Furthermore, some countries lack the legal and governmental infrastructures to implement the ideal plan outlined

above. In such countries, fully determining issues of government authority and accountability prior to a pandemic may be extremely difficult. One should also note that pandemics are difficult to predict, and information acquired as a pandemic evolves may render some of what is presently believed about various social distancing strategies obsolete.

At the very least, though, governments should dedicate themselves to non-discrimination and transparency before an influenza pandemic occurs. It is important that governments implement social distancing policies fairly and with as broad of involvement in planning as possible. This will not only safeguard important ethical considerations, but will also improve the likelihood that the public will accept social distancing as a means to slow disease transmission. Given that compliance with social distancing instructions will be difficult to enforce, public acceptance is critical to measures' success.

### *B. Workplace Closings*

Workplace and school closings present difficult ethical issues. Apart from the uncertainty of their effectiveness, the most important are questions of distributive justice. Workplaces represent the livelihoods of both employees and entrepreneurs, so closing them can cause severe financial hardships. Additionally, lost profits due to closures may cause companies to go out of business, leading to job losses and other economic hardships. These problems may have a significant effect even on those people who possess a safety net, but for people living at a subsistence level, the effect of lost income could be far worse. If closures remain in place for any significant duration, such people may be unable to pay for shelter, food, or medicine.

Ideally, public health authorities should work cooperatively with industry and trades unions, prior to an emergency, in an effort to establish mutually agreeable work closure procedures. However, one can imagine a situation where workplace closings are recommended or required, but a business chooses to remain open. Employment protections are needed for workers who wish to comply with a social distancing order against the wishes of their employer. Similarly, one can imagine businesses closing in compliance with instructions, but workers' needs for income causing them to seek other work. Government needs mechanisms to encourage compliance with a social distancing order. Though governments should retain the legal power to enforce closures if absolutely necessary, it would be preferable to subsidize lost profits and incomes as necessary. The latter approach was used extensively in countries affected by SARS for people placed in quarantine.<sup>99</sup>

Practical constraints prevent some countries from being able to enact this solution. Many countries have more pressing needs to which the government must attend than addressing a potential pandemic. Furthermore, some countries may be unable to provide compensation for closure. In 1918, each of the waves of the pandemic lasted for several months, and most locations were hit by multiple waves.<sup>100</sup> The amount of resources needed to compensate for lost income or profits for this amount of time may well be out of the reach of many of the world's governments.

In light of these constraints, governments should, at the very least, weigh seriously the risks to health and welfare from workplace closures and other social distancing measures against those risks that might be prevented by closures' effects on disease transmission. For each country, the balance of risks may be resolved differently, depending on the countries resources and the number of people living at or below a subsistence level. Countries should consider tactical closures if necessary. Perhaps only those entities that most facilitate transmission should be closed. Schools have been

identified as a primary driver of seasonal influenza<sup>101</sup> and are believed to be a substantial factor during pandemics also. Countries might also consider using closures as a means to buy time for other preparations; closures could be implemented until the level of disease in a community exceeds a predetermined level and then relaxed, with the hope of slowing the initial spread of disease through the community.

### *C. Provision of Necessities*

If people are instructed to avoid public places, such as markets, stores, and pharmacies, or if those places are required to close, there will be a need for people to procure food, medicine, and other necessities. Similarly, stoppage of mass transit may prevent people from being able to access facilities that remain open, and it may prevent some people from being able to seek medical care. There is a distributive justice concern relevant to all of these issues: those with the least resources are least likely to be able to procure additional resources before closures occur. They are also the least likely to have private transportation available to seek medical care, so they are both less likely to be able to receive care and more likely to have to remain in homes with infectious people.

Ideally, governments would set up networks for the distribution of necessary provisions to citizens' homes. Distribution would be conducted in a manner that takes into account ease of access in particular communities. It should be consistent and reliable, and it should provide necessities such as food and medicine for the duration of social distancing measures. It should also be conducted in such a manner as to minimize interaction with potentially infectious people, and those people responsible for distributing provisions should use infection control precautions to decrease the likelihood that they will vector disease. Transportation for medical care should be provided as needed by personnel who are appraised of the risks involved in transporting potentially infectious people and provided with appropriate personal protective equipment to protect both him or herself as well as to prevent acting as a disease vector. Similarly, a program should be put in place for the removal of bodies from homes in a safe and efficient manner.

Resource constraints and logistical difficulties are likely to impede such a program in many areas. Many governments may lack the resources to provide food, medicine, and other necessities to its citizens during a pandemic. Even if the resources are available, the workforce needed to conduct distribution may be absent, especially at the height of a pandemic when a substantial number of people would be ill. Furthermore, there may be an insufficient number of people who desire to interact closely with potentially infectious people to allow such a system to function. This may be especially true for medical transport and mortuary services.

At the least, governments should try to facilitate the provision of resources before areas are affected by disease. To the extent possible, governments should give advance warning of disease and make recommendations about what food, medicine, and other supplies should be stockpiled and in what quantities. If they are able, governments should provide these for people unable to afford their necessities. Governments should provide access to medical care to the greatest extent possible, perhaps by re-tasking public safety officers to this purpose. Governments should also provide a means by which people who have recovered from influenza, and thus presumably would be immune, could volunteer to assist others in the provision of necessities.

## VIII. International Travel and Border Controls

Transnational public health law is increasingly important in global health, as evidenced by the WHO's International Health Regulations and national agencies' proposed communicable disease regulations.<sup>102</sup> These legal initiatives reflect recommendations for border controls by WHO.<sup>103</sup> Transnational containment measures can be far-reaching: entry or exit screening, reporting, health alert notices, collection and dissemination of passenger information, travel advisories or restrictions, and physical examination or management of sick or exposed individuals. These kinds of powers were exercised in Asia and North America during the SARS outbreaks, although their effectiveness is unestablished.<sup>104</sup> The IHR<sup>105</sup> also authorize sanitary measures at frontiers or on conveyances: inspection, fumigation, disinfection, pest extermination, and destruction of infected or contaminated animals or goods.

### *A. Economic Impact of International Travel and Border Controls*

Sovereign nations seek to safeguard their citizens' health from external threats, even in a global world where people, animals, and goods rapidly diffuse across state boundaries. Although border protection is legitimate, it can severely disrupt travel, trade, and tourism. The World Trade Organization (WTO) defends free commerce, but permits science-based trade restrictions to protect the public's health.<sup>106</sup> As with trade restrictions, protection of the public's health needs to be balanced against the global economic impact of any travel restrictions or border control policies. Closure of borders, as has been discussed in Australia, New Zealand, and the United States, will have an enormous global economic impact. World travel and tourism account for about 10% of global GDP and 8% of global jobs generating more than \$4 trillion in economic activity and over 200 million jobs in 2005.<sup>107</sup> During the SARS outbreaks, tourist arrivals in Asia dropped 30-80% for various countries in the region. After travel bans were put in place, almost half the planned international flights to Southeast Asia were cancelled. Even Australia, which was largely unaffected by the disease, saw a 20% decline in international arrivals. Even if countries will not officially close their borders during an influenza pandemic, as is the plan in Canada, voluntary social distancing would disrupt trade, transport and travel.<sup>108</sup> In fact, studies suggest that European travel bookings have already diminished due to H5N1 fears.<sup>109</sup>

Given the sensitivity of economic disruptions of trade and travel during a pandemic, international coordination of border control policies to avoid misunderstanding and promote cooperation will be essential. Although the economic impact will be considerable for both developed and developing countries, the long-term consequences will be harder to overcome for the latter. Industrialized countries should be aware of this when making decisions with transnational impact. Governments should only take those measures that are necessary to address the actual risk to the community. Travel and border control measures should be implemented in a non-discriminatory fashion, and only when the harms caused by the intervention are proportionate to the benefits.

### *B. Governmental Transparency and Coordination*

Recognizing the transboundary nature of travel advisories as well as the economic impact they can have on affected countries, it should be left to the WHO to issue transparent and clearly justified travel recommendations in accordance with the revised IHR. For their part, individual countries should communicate all relevant information on the emergence of a public health threat to the international community. This responsibility is related to the surveillance duties and the issues that

accompany them. Ultimately, it is the responsibility of the national government to use whatever policy instruments they have available to ensure that they can comply with the requirements of the new IHR. Reporting and surveillance responsibilities may be beyond the capacity of developing countries. The industrialized countries should show solidarity and be open in the way they carry out health protection responsibilities.

Fear of infection and uncertainty about the risk and virulence of the virus can have a negative impact on the global economy. Reactive and uncoordinated national actions to close borders or embargo trade could give the wrong message in the early days of pandemic emergence and inadvertently fuel fears at the point of emergence. Public fears and economic reactions in the early stages of the SARS epidemic were amplified by concerns that some governments were withholding information about the disease. To avoid unwarranted travel disruptions and economic burdens governments have the responsibility to honestly disclose credible scientific information as early as possible.

### *C. Civil Liberties*

International travel and border control can also infringe upon civil liberties. The freedom of movement is a basic right protected by national laws and international treaties, but it is subject to limits when necessary for the public's health.<sup>110</sup> In particular, these strategies can present serious risks to privacy. For example, containment measures may require the travel industry to collect and disclose passenger data.<sup>111</sup> Privacy burdens are justified only if necessary to obtain high-quality surveillance data and in accordance with fair information practices as set out in the surveillance section. To avoid discrimination and to ensure proportionality, public health officials should inform the affected individuals about the reasons for the infringement, the intended use of the information and the extent to which third parties can have access to the data.

## **IX. Isolation and Quarantine**

The terms “quarantine,” “isolation,” and “compulsory hospitalization” are often used interchangeably, but they are in fact distinct. The modern definition of quarantine is the restriction of the activities of asymptomatic persons who have been exposed to a communicable disease, during or immediately prior to the period of communicability, to prevent disease transmission.<sup>112</sup> In contrast, isolation is the separation, for the period of communicability, of known infected persons in such places and under such conditions as to prevent or limit the transmission of the infectious agent.<sup>113</sup> Quarantine and isolation can be accomplished by various means, including having the person stay in his or her own home, restricting travel out of an affected area, having the individual or group stay at a designated facility.<sup>114</sup> Whatever techniques are used, it is important to treat symptomatic, potentially exposed, and non-exposed populations differently. For example, it would be inappropriate to place infected individuals in the same room as those who are only potentially exposed.

Isolation and quarantine were widely used in Asia and Canada during the SARS outbreaks in 2003.<sup>115</sup> In Toronto, between 13,000 people<sup>116</sup> and 30,000 people,<sup>117</sup> were quarantined. In Beijing and Taiwan those numbers were even higher: 30,000 people in Beijing and 131,000 people in Taiwan.<sup>118</sup> While quarantine and isolation played a major role in the containment of SARS, they will be less appropriate as containment measures during a pandemic influenza. Unlike SARS, influenza's transmission characteristics allow little time for isolation and quarantine.

However, if isolation of infected persons, quarantine of exposed persons, and quarantine of a geographic area (cordon sanitaire) are effective, they are the most complex and legally/ethically controversial public health powers. Although the form may differ, they always represent a significant deprivation of an individual's liberty in the name of public health. Quarantine and isolation represent the tension between the interests of society in protecting and promoting the health of its citizens and the interests of individuals in civil liberties such as privacy, non-discrimination, freedom of movement, and freedom from arbitrary detention.<sup>119</sup> While these civil liberties are protected by both universal and regional human rights declarations and conventions, large-scale public health threats can require extraordinary measures by the government. Coercive public health powers such as quarantine and isolation can be legitimate when justified by carefully balancing the public health interests of society against the freedom of the individual.<sup>120</sup> To pass the balancing test, the benefits to the public should outweigh the burdens or harms quarantine may place on individuals. In addition each country should comply with the Siracusa principles, a set of internationally agreed upon legal principles that establish the justified conditions for the restriction of civil liberty.<sup>121</sup> These principles hold that restrictions of liberty should be legal, proportionate, necessary, and by the least restrictive means that are reasonably available.

#### *A. Legal Authority*

Authority for isolation and quarantine should be clear and lawful, with fair procedures and criteria based on risk. A government's jurisdiction and power should be contained within clear boundaries proscribed by law, which create accountability to the public generally and to affected communities in particular. These public health powers restrict individual autonomy and liberty. Therefore, any law authorizing their use should clarify the criteria under which a person may be quarantined. Statutory criteria should incorporate rigorous scientific measures of risk, and be structured to allow quarantine only when necessary for the public's health. Measures as coercive as quarantine and isolation should be used when a disease is known to be contagious, through extensive scientific study, and should be limited to people who have in fact been exposed to the disease.<sup>122</sup>

Resource and time restraints in circumstances of scientific uncertainty can, however, necessitate immediate government action without prior medical testing of each individual. In addition, the availability of accurate tests and competent medical staff can be limited. At a minimum, the state's power should, however, be exercised fairly, and never as a subterfuge for discrimination. In a crisis situation, reasonable suspicion based on known contact with the H5N1 virus can suffice to issue a quarantine or isolation order. However, to ensure the legitimacy of the measures taken, the decision to use restrictive measures need to be made in an open, fair and legitimate manner. The public has a right to know the legitimate public health reasons for restricting liberty. Public health authorities should fully and honestly disclose their reasons for action and allow community participation. Transparency will enhance public trust and acceptance of the proposed containment measures.<sup>123</sup>

#### *B. Due Process (Natural Justice)*

Due process, or natural justice, is central to the ethical application of isolation or quarantine. In addition to substantive protections, judicial procedures are necessary to ensure the legitimate use of isolation and quarantine. Fairness here is specified in terms of the process, rather than the outcome. Although it is desirable that only those that are really infected with H5N1 are being confined, infallibility cannot be guaranteed. The feasible goal is to try to protect the public's health while minimizing human rights violations and ethical concerns.

Of particular concern is the protection of groups of people (especially minority populations) from the inappropriate use of state power. Regardless of a country's judicial system and infrastructure, exercise of the power to restrict individual movement should comply with the Siracusa principles and the ICCPR, both of which require that such actions not be arbitrary, unreasonable or discriminatory. As such, countries should have procedural mechanisms for groups to challenge the unjustified use of quarantine or isolation power. Furthermore, isolation or quarantine orders should only be valid for a scientifically justifiable period of time. Public health officials should publicly justify their decision and re-evaluate their order on a regular basis, thus ensuring the legitimacy of the decision-making process and the accountability of the decision makers.

Beyond collective challenges, many judicial systems uphold the ideal that individuals have a right to their own due process. While this value is legitimate, it should be noted that individual hearings may not be feasible during a pandemic. Many countries do not possess the judicial infrastructure to cope with the sheer number of hearings that would be required by a mass quarantine. Furthermore, existing infrastructure will be strained by the morbidity and mortality associated with a highly pathogenic influenza pandemic. However, in developed countries with strong judicial infrastructures, individualized due process should be maintained to the extent feasible given the conditions imposed by the pandemic.\*

### *C. Monitoring and Enforcement: voluntary or least intrusive means*

Quarantine and isolation should be voluntary whenever possible, and when that is impossible, should be enforced by the least intrusive means available. Research in the aftermath of SARS showed that people understood and accepted the need for restrictive measures. Many perceived it as their civic duty and were willing to sacrifice their right to freedom of movement.<sup>124</sup> However, if governments expect full voluntary compliance, the decisions need to be made in an open and fair manner and society should ensure that those who are quarantined or isolated receive adequate care and do not suffer unfair economic burdens.<sup>125</sup>

While Canadians generally complied voluntarily with quarantine requests, public health officials in other countries such as China, Hong Kong, and Singapore had to use more coercive measures. If necessary, justified, and within legally prescribed boundaries, public health officials should be allowed to enforce containment measures.<sup>126</sup> The least restrictive measures should be applied first, followed by a graded application of more restrictive measures when evidence indicates their necessity.<sup>127</sup> In Hong Kong, for example, barricades and tape were used to confine infected residents in a large housing complex.<sup>128</sup> In Singapore, three telephone calls were made per day to the home of each

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\* When circumstances allow it, individuals should receive notice of the hearing and be permitted to speak with a legal representative. This will provide the quarantined individual with an opportunity to prepare for a hearing, which should be held as soon as possible after a quarantine order is issued. The hearing should be held before an independent and accountable tribunal, not the body that made the initial decision. The principle of due process is not so elastic as to permit less-than-independent hearings on matters of personal liberty. The European Court of Human Rights found a similar scheme in the United Kingdom to violate Article 5 of the European Convention on Human Rights.\* Article 5 requires a hearing by a "court" that is independent of the executive and the parties to the case. Any quarantine or isolation regulations should conform to this standard.

Temporary quarantine and isolation without notice or hearing may be implemented if a delay in imposing the isolation or quarantine would significantly jeopardize the public health authority's ability to prevent or limit the transmission of a contagious disease to others. The public health authority should, however, seek ratification by a court or another independent body authorizing the quarantine or isolation within a reasonable time given the circumstances.

individual in quarantine to confirm that the individual was there.<sup>129</sup> Surveillance cameras were placed in homes where people were quarantined and, to avoid fraud, inhabitants were required to take their temperature on camera.<sup>130</sup> Also electronic wrist- or ankle-bands were used as enforcement measures.<sup>131</sup> Singaporeans, moreover, faced a fine of over US\$5,000 for breaching home quarantine orders.

Acknowledging that different countries have different norms and needs, different enforcement measures can must be viewed in the context of what a given society considers to be a reasonable means of ensuring compliance. At a minimum, the monitoring and enforcement measures adopted should have a reasonable and proportionate relation to the achievement of the public health objective and should be implemented in a fair and non-discriminatory manner to ensure privacy and bodily integrity. In addition, all measures taken should be culturally accepted. The citizens should collectively approve more coercive measures such as life imprisonment and execution after public disclosure of the reasons and criteria applicable to the proposed measures.<sup>132</sup>

#### *D. Ensuring Safe, Humane Implementation of Isolation or Quarantine*

When the protection of a community's health requires that individual liberty and autonomy are restricted, the principle of reciprocity obliges society to provide those affected with all the necessities of life. During quarantine, this includes being housed in safe, humane conditions, receiving high quality medical care and psychological support. Recent studies have confirmed that quarantine imposes some serious financial and psychological hardships on the affected individuals. About 30% of quarantined individuals suffer from posttraumatic stress disorder and depression.<sup>133</sup> All countries should be required to provide and pay for all these basic needs. Furthermore quarantine needs to be implemented in a humane, sensitive manner. For example, the IHR 2005's provisions on care and treatment of persons detained for health reasons include references to the need for sensitivity on gender, religious, and ethnic sensitivity issues.

Distributive justice requires that officials limit the extent to which the personal and economic burdens of a public health threat fall unfairly upon individual citizens. A lack of resources and amenities should be addressed in the most fair and equitable possible way. Governments as well as national and international organizations should stockpile medical supplies and food. A pandemic influenza will require a vision of solidarity among nations and asks for collaborative approaches that set aside traditional values of self-interest and territoriality.

## **X. Conclusion**

Preparing for an influenza pandemic forces society to face a number of difficult challenges, many of which transcend mere scientific effectiveness. Public health emergencies raise serious ethical issues that are central to society's commitment to freedom and social justice. Even when effective, public health interventions can have deep adverse consequences for economic and civil liberties. It is vital that individual rights are only sacrificed when necessary to protect the public's health. As such, laws must clearly establish the criteria under which government can exercise emergency powers. These laws must also provide adequate due process and ensure that any infringements on individual rights are minimized.

The threat of an influenza pandemic is real. If the threat manifests, millions of lives will be lost. Widespread death would be catastrophic, but the tragedy will be even worse if society ignores these

ethical questions. An immediate political and social response to these ethical concerns is crucial, so that in the event of being faced with a pandemic, we are equipped – scientifically as well as ethically – to deal with its impact.

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