Prioritization and Use of Limited Resources During an Influenza Pandemic

Chapter 5

In crisis situations, citizens often look to the government to manage the allocation of scarce essential resources. Many essential resources are likely to be limited in the event of an influenza pandemic. In particular, there will be a sudden increase in demand for medical supplies such as vaccines, antiviral medications, and ventilators. These demands, as well as the large numbers of ill persons, will stress the healthcare system's limits. Furthermore, large numbers of ill persons may make it difficult to maintain the normal functioning of many critical industries. As a result, there may be insufficient supplies of food, fewer essential services provided (eg, reduced frequency of garbage pick-up), and restrictions on certain utilities. Deciding who should have priority to receive limited resources during an influenza pandemic will be among the most difficult ethical dilemmas facing government officials, policy makers, and healthcare providers. Therefore, it is important to develop a framework for allocation decisions prior to the onset of a pandemic, and it is important to educate healthcare providers, policy makers, and the general public about the framework. These difficult allocation decisions should be based on widely-accepted, reasonable criteria. During an influenza pandemic, the reasoning behind the prioritization and distribution of limited resources should be acceptable to any group of individuals seeking to cooperate with others on mutually justifiable terms.[1] To gain public support, the reasoning, as well as the process used in developing the criteria, should be open and transparent.

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In its effort to gather public input into the processes for prioritizing resources in the event of an influenza pandemic, the Centers for Disease Control and Prevention (CDC) conducted the Public Engagement Pilot Project on Pandemic Influenza (PEPPPI) in 2005.[2,a] PEPPPI sought public input to identify the priorities which should be used to guide the distribution of limited influenza *vaccines*. While the PEPPPI goals were to develop a framework to distribute limited vaccines, a similar framework could be developed for the distribution of any type of limited healthcare resource, including antivirals, hospital beds, and ventilators. The Task Force considered five different ways of prioritizing limited healthcare resources:

- *Priority should be given to assure the functioning of society.* This goal would give priority in the distribution of limited resources to people who help in vaccine production and distribution, provide health and life-saving services, or are needed to maintain civil order or assure the provision of other critical services (ie, utilities, food distribution, or communications industries).
- *Priority should be given to reduce the incidence or spread of disease.* Under this system of prioritization, individuals who are most likely to contract or spread the disease would be given priority in the distribution of limited

a The participants discussed five potential goals in distributing limited vaccines: (1) save those most at risk; (2) put children and younger people first; (3) limit the larger effects on society; (4) use a lottery system; or (5) use the principle of "first come, first serve."

resources. These individuals may be people in certain professions (eg, healthcare providers or law enforcement personnel) who may contract the disease and inadvertently spread it to others (prior to being symptomatic), or other subpopulations who are more likely to spread the disease. For example, during a regular flu season, children are generally the most likely to spread the disease[3] although this may vary depending on the epidemiology of the pandemic influenza strain.

- *Priority should be given to reduce illness, hospitalizations, and death due to influenza.* Priority for limited healthcare resources should be given to those most likely to benefit from the resources. The population who would be most likely to benefit from the resources will vary based on the epidemiology of the particular outbreak and the resource being considered.[b] This priority group could include those who are more likely to catch the disease or those at greatest risk of influenza complications. Depending on the resource, it also might mean identifying those subpopulations who have the best chance of surviving the disease, but only if they get the resource as soon as possible.
- *Priority should be given to protect people with the most years of life ahead of them.* Priority for limited healthcare resources should be given to individuals who have the most productive years left to contribute to society. This goal would help ensure that younger people are given a priority for limited resources, as they have more years left to live.
- *There should be no groups that receive priority for the distribution of limited healthcare resources, in order to ensure that everyone has an equal chance of being protected.* Instead, individuals would be eligible for limited resources on a first-come, first-serve basis or through a lottery.

The Task Force recognized that these goals were not an exhaustive list of potential prioritization options.[c] Further, the priority given to the allocation of certain preventive resources (eg, vaccines) may not be the same as the priority that should be given to the allocation of limited healthcare resources needed for a patient who is already sick (eg, ventilators or hospital beds). One way to conceptualize the allocation decisions is to classify medical resources as either *pharmaceutical* or *nonpharmaceutical*. Furthermore, the resources may be used to either *prevent* someone from getting sick or to treat someone who has already contracted the disease. There may be reason to distribute vaccines and antivirals to healthcare workers and workers in critical industries so that they can maintain the basic infrastructure of society. However, this same priority system may not apply equally well to the distribution of hospital beds and/or ventilators, as seriously ill healthcare workers or other critical workers are less likely to be in a position to provide the critical services. Further, clinical factors

b For example, although the expectation is gererally that children and the elderly will be most at risk ofr mortality, some indications are that young adults may be more susceptible; for example, in the 1918 influenza, mortality rates were highest in 20-44-year-olds.

c Further, this was not an exhaustive list of possible prioritization principles. Additional objectives could include the quality of life years left or the life cycle principle. This idea is that "each person should have an opportunity to live through all the stages of life," modified to give priority to 20-year-olds over 1-year-olds because "the older individuals have more developed interests, hopes and plans but have not had an opportunity to realize them."[4]

may dictate that a ventilator might be more appropriate for one person over another irrespective of their regular job responsibilities. In addition, there may be different priorities established at different stages of the pandemic. For example, in the early stages of a flu pandemic, there may be a reason to limit vaccines to health professionals and to exposed individuals to prevent or impede the spread of the disease. Later, as vaccines become more widely available, there may be a broader group of individuals who should be in the priority list.

We, as a society, value the inherent social worth of all individuals. Thus, the priority an individual receives for limited healthcare resources should not be based on his or her preinfection health condition or disability status. Ethically, the goal of the treatment is to return the patient to his or her preinfection condition. The equity principle in Appendix A outlines a list of characteristics by which allocation decisions should not be made, such as race, color, religion, nationality, ethnicity, gender, age, disability, sexual orientation, geography, economic status, or insurance status.

Scenario: Three patients are afflicted with the flu and in need of a ventilator but only one ventilator exists. The three patients are a 10-year-old, a 40-year-old physician, and a 65-year-old retiree. Suppose that without the ventilator, the 70-year-old has a 30% chance of survival, the 40-year-old has a 50% chance of survival, and the 10-year-old has a 40% chance of survival. Who should get the priority to use the ventilator, and on what grounds should the decision be made? What if the 70-year-old was not retired, but an infectious disease doctor who had previously been treating patients with the pandemic influenza? Should the decision be changed?

Overall, the ultimate goals of all allocation methods are to minimize deaths, illness, and social disruption. Any prioritization list will be controversial as some people will benefit and others will not. Nonetheless, the Task Force members believe that having a priority system that serves different goals (depending on the different healthcare resources) is better than offering services on a first-come, first-serve basis. Given this framework, the Task Force created a recommended prioritization system that recognizes different goals for different resources: vaccines, personal protective equipment, antivirals, and curative resources.

There will be a very limited supply of vaccines when they are first made available. Once they are available, priority should be given to healthcare workers or other critical workers who are at increased risk of contracting the disease. This will help ensure the basic functioning of society and that there are sufficient healthcare personnel to care for people who become ill. Allocation also should be made with the goal of minimizing the spread of the disease among high-risk populations. Ultimately, the federal government may issue mandates or recommendations for how to distribute vaccines. (See Appendix D for recommended priority lists.) If mandatory, state and local agencies will be required to follow these guidelines. However, there is likely to be some discretion in how vaccines should be distributed within priority groups. In that event, the state should follow the recommendations specified herein.

Personal protective equipment will be critical early during a pandemic, when vaccines are not yet available. Personal protective equipment and other nonpharmaceutical prevention resources may be the only way to minimize the likelihood of contracting the virus. These limited resources should be first allocated to healthcare workers or other critical workers who are at increased risk of contracting the disease and to those who are at increased risk of spreading the disease. These individuals would include healthcare workers with direct patient care (including physicians, nurses, and nurse aides caring for people infected with the virus), public safety officers or ambulance drivers who are

working with infected people, and other critical workers at increased risk.

The Task Force identified a different priority system for allocating limited *antivirals* to treat those people who were infected with the pandemic influenza. In a regular flu season, certain individuals are more likely to experience serious complications from contracting the flu. These individuals, including the very young, very old, and those with high-risk conditions, are less likely to survive if they catch the flu. While the epidemiology of an influenza pandemic is not yet known, presumably there will be some individuals who are at higher risk of dying if they become sick. These individuals should have priority for antiviral medications. In addition, other healthcare workers or critical workers necessary to maintain the functioning of society during the pandemic should be given priority, so that they can recover their health and return to work. As with vaccines, the federal government will likely issue guidelines for the distribution of antiviral medications. (See Appendix E for recommended distribution list.) If there is discretion, the state should follow the guidelines specified herein.

Priority for these *curative resources*, such as ventilators or other limited hospital services, should be given to those who are most likely to benefit. The decision should be based on two related factors: the severity of the illness and the likelihood of recovery if provided the healthcare resources. Individuals who are critically ill but who are not likely to survive even if given the healthcare services should not have as high a priority as someone who is equally ill but who is likely to survive. The decision regarding who should obtain the limited healthcare resource should be based solely on clinical or epidemiological factors. Individuals who do not receive these potentially life-saving resources should still be eligible to receive palliative care.[5]

Table 5.1
Task Force's Recommended Priority System

	Pharmaceutical	Nonpharmaceutical
Prevention	Vaccines	Personal Protective Equipment (i.e., masks)
	Goal: Assure the functioning of society and secondarily prevent spread of disease	*Goal: Assure the functioning of society and minimize the spread of disease*
Treatment	Antiviral Medications	Treatment Services (i.e., ventilators, hospital beds)
	Goal: Minimize illness, hospitalizations and death, and secondarily assure the functioning of society	*Goal: Reduce illness, hospitalizations and deaths*

The Task Force's recommended priority system is shown below in Table 5.1:

Even though a person may fall into a priority group, he/she may be unable to obtain needed vaccines, antiviral medications, or access to other healthcare resources if the resources are unavailable. Ideally, allocation methods should be based on clinically-based algorithms akin to organ transplantation prioritization methods, which identify clinical considerations that would guide the provision of services to one individual over another. For example, someone who would normally fall into one of the priority groups for vaccines may not be an appropriate candidate because they have a severe egg allergy

Recommendation 5.1: **Limited healthcare resources should be allocated according to the following criteria:**

(a) Allocation of vaccines (pharmaceutical prevention resources) should be made with the primary goal of assuring the functioning of society and the secondary goal of minimizing the spread of the disease.

(b) Allocation of nonpharmaceutical prevention resources (such as personal protective equipment) should be made with the goal of assuring the functioning of society and preventing the spread of the disease.

(c) Allocation of antivirals (pharmaceutical treatment resources) should be made with the primary goal of minimizing illness, hospitalization, and death and the secondary goal of assuring the functioning of society.

(d) Allocation of nonpharmaceutical treatment resources (eg, ventilators and hospital beds) should be made with the goal of reducing illness, hospitalization, and death.

or have reacted to other flu vaccines in the past. Similarly, if there are two individuals who need a ventilator, a decision may need to be made about who is most likely to survive if provided the ventilator. The equipment also may guide who receives the services. Ventilators for newborns will not work for adults and vice versa. It may not be possible to develop such algorithms early in the course of the pandemic, when data are limited about the prevalence of the disease among certain subpopulations and about long-term survival rates. In fact, such algorithms might not ever be possible.

There are many concerns regarding how one should prioritize and choose between individuals who need the healthcare resources. There are many studies that show that certain groups in our society do not have the same access to services or receive the same services as others, including the uninsured,[6,7] racial and ethnic minorities,[8] and people with disabilities.[9] The inequities in our current system are likely to be exacerbated during a pandemic. To try to reduce this likelihood, it is important to develop systems in advance of a pandemic to ensure that resource distribution decisions are made on objective, clinical, or epidemiological factors, and not based on subtle subconscious prejudices or due to overt political or financial influence. Ideally, allocation guidelines should be developed at the state level in advance of a pandemic. Individual healthcare institutions should use these guidelines when allocating limited resources. This will help prevent wide discrepancies across healthcare systems in the allocation of limited resources and minimize the likelihood that inappropriate factors are used to make decisions.

Even with state-level allocation guidelines, there may be times when healthcare providers or institutions are faced with individual decisions about who should receive a potentially life-saving resource (for example, if two people present at the hospital at the same time with equal chances of survival if provided with the healthcare services). To the extent possible, teams of providers within healthcare organizations—rather than individual practitioners—should be involved in these difficult allocation decisions. Such decisions should adhere to the ethical principles that value all human lives. The decisions should be based on clinical evidence and not on the patient's race, color, religion, nationality, ethnicity, gender, age, disability, sexual orientation, geography, economic status, insurance status, or other conditions if they do not affect the clinical outlook of the patient. Further, to the extent possible, individuals who do not make the priority list for life-sustaining care should be provided palliative care.[5]

Recommendation 5.2:

(a) During an influenza pandemic, disease control and medical decisions should be based on clinical factors, the epidemiology of the spread of disease, and assuring the functioning of society. Decisions about which people to treat and what services to provide during an influenza pandemic *should not be made* based on socioeconomic or other factors unrelated to these criteria.

(b) Healthcare organizations need to create mechanisms in advance of a pandemic to ensure that clinical decisions are made according to the ethical principles set out in these guidelines.

The ideal method of allocating limited resources is to have a transparent process by which those decisions are made. Such a process would involve multiple perspectives and external consultation. It is necessary to try to include as many stakeholders as possible, as well as to educate the public as much as possible, in order to reduce potential public concern associated with resource distribution.[d] When stakeholders from a variety of groups are included in the decision-making process, it is less likely any particular group will be marginalized and, at least in its perception, unfairly treated by rationing decisions. Carefully educating the public on the need to prioritize and ration prior to a pandemic may help the public understand why a particular allocation system has been adopted and why it is in everyone's overall best interests to adhere to it. (See Recommendation 4.2.) The advance notice may help people adjust to and prepare for the difficult decisions that may affect them later. The unfortunate alternative is for people to discover that resources are limited only when they need the resources and cannot access them, which can lead to significant anger and panic.

Despite advance notice and preparation, there still is the possibility for public panic and attempts to procure limited resources in the event of shortages. For example, during Hurricane Katrina, some individuals broke into closed grocery stores to obtain needed food. Thus, it may be necessary to protect the people who have responsibility for distributing limited resources.

Recommendation 5.3: State, local, and national law enforcement should provide appropriate protection, based on available resources, for individuals and organizations in custody of and responsible for distribution and administration of limited resources such as vaccines and antiviral medications.

d Information should be available through multiple media and venues, including but not limited to the internet, newspapers, television, radio, etc., and in the multiple languages spoken by residents of North Carolina.

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