Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Ethical Rationing of Personal Protective Equipment to Minimize Moral Residue During the COVID-19 Pandemic

Charles E Binkley, MD, FACS, David S Kemp, JD

This article proposes systems for the fair distribution of scarce resources to healthcare providers. It builds on classic ethical structures and adapts them to the equitable distribution of personal protective equipment (PPE) to clinicians at risk of contracting novel corona virus-19 (COVID-19). The article also defines systems of allocation that are generally considered unethical and are to be avoided. We emphasize that policies must be transparent, collaborative, applied equally, and have a system of accountability. It is recognized that unless the supply of PPE is quickly replenished, or viable alternatives to traditional equipment are devised in the coming days to weeks, hospitals and healthcare systems will face the difficult task of rationing PPE to at-risk clinicians. This paper suggests an ethical framework for that process. (J Am Coll Surg 2020;230:1111−1113. © 2020 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

During a pandemic, preparation focuses on equitable distribution of scarce resources to patients. The Centers for Disease Control and Prevention (CDC) issued a statement in 2007 guiding the just distribution of vaccines and antivirals,[1] and another statement in 2011 regarding distribution of ventilators[2] when a pandemic influenza or other public health emergency occurs. Although the scarcity of antivirals, vaccinations, and mechanical ventilators was anticipated, the lack of adequate personal protective equipment (PPE) for healthcare providers was not.

Because of increased global demand, current projections suggest an inadequate supply of PPE to protect clinicians at risk for novel corona virus-19 (COVID-19). This imminent shortage has led to calls for enactment of the Defense Production Act and the accelerated production of medical equipment.[3] Hospitals and physicians have resorted to making personal appeals for donation of PPE,[4] and the CDC issued guidelines for optimizing the supply of N95 respirators.[5] Notwithstanding these efforts, clinicians are understandably concerned about their risk of contagion and the ability of systems to assure their safety as they care for patients.

Given the urgency to make decisions about the allocation of these scarce resources, hospitals must implement policies regarding allocation of PPE to at-risk clinicians. These policies must be scientific and ethical, and consider the rightness or wrongness of an act based on its consequences. Here we propose systems based on utilitarianism, social worth, reciprocity, and protection of vulnerable clinicians. No one system will be perfectly acceptable for a particular hospital, so each will have to adopt a hybrid approach that takes into consideration the specific values and circumstances of that hospital, essentially choosing the least negative options.

Two points here cannot be overemphasized. First, these are extreme measures intended to be implemented only in the worst-case scenario, in which adequate PPE is not available and patients must be treated. Any rationing of PPE must be limited in duration. Principles and assumptions that are not typically ethical may sometimes be justifiably invoked in pandemics. Second, procedural justice is of utmost importance. If leaders fail to provide guidance and establish policy, leaving clinicians to fend for themselves, the moral residue will linger long after the pandemic has abated.[6] The default first-come, first-served approach is not ethically acceptable. Regardless of the underlying ethical principle(s) that ultimately informs their policy-making, hospitals must establish a method for allocating scarce PPE that is collaborative, transparent, and equitable.

The utilitarian principle allocates resources based on achieving the most good for the greatest number of people, essentially maximizing net benefits. Utilitarian principles have previously been applied to the allocation of scarce resources to patients. Here, we apply it to the distribution of a limited supply of PPE to clinicians, proposing 2 approaches. The first considers consequences to clinicians; the second assesses overall benefit to patients.

Disclosure Information: Nothing to disclose.

Received March 26, 2020; Accepted March 31, 2020.

From ProNobis Health, San Francisco, CA (Binkley) and UC Berkeley School of Law, Berkeley, CA (Kemp).

Correspondence address: Charles E Binkley, MD, FACS, ProNobis Health, 584 Castro St, #207, San Francisco, CA 94114. email: binkley@pronobishealth.org

https://doi.org/10.1016/j.jamcollsurg.2020.03.031
ISSN 1072-7515/20

Under the first approach, limited PPE would be distributed to protect the greatest number of clinicians. This could entail policies such as using the minimal level of protection necessary for a given setting or procedure, matching the level of protection to the risk of the procedure, or contact based on scientific recommendation. To avoid unnecessary use of PPE, only high-acuity procedures that require PPE should be performed, and hospitals should avoid having unnecessary staff in settings where PPE is required.

The second way of allocating limited resources based on utilitarian principles is to offer protection to those clinicians who are able to do the most good for the greatest number of patients. This is, at best, a difficult calculus and one that is certain to cause moral distress. This standard would favor protecting those clinicians whose work could save the most patients from suffering and death, giving PPE preferentially to clinicians whose temporary or permanent absence from clinical practice due to infection with COVID-19 would harm the greatest number of patients. When distributing limited resources, such as PPE, to clinicians during a pandemic, an egalitarian approach that treats all clinical roles as equal may not serve the ultimate goal of achieving the most good for the greatest number of patients. Some clinicians are better poised to save more patients than other clinicians. This utilitarian principle would favor protecting those clinicians who are best able to save the most patients. This does not necessarily mean offering no protection to other clinicians, but instead, offering alternative or unproven methods of protection.

Social worth is a criterion that may be ethically justified in the unique setting of a pandemic. It was the basis of the CDC's guidelines in 2007 for the distribution of vaccines and antivirals during an influenza pandemic in which "preserving the functioning of society" was the goal.[1] This recommendation arose from the recognition that some members of society are critical to its function. Applied to PPE, social worth would require assessment not of how many lives a clinician could save, but the instrumental value of that clinician in providing patient care, both during and after the pandemic. Social worth is not typically an acceptable criterion for distributing resources and should be invoked only if absolutely necessary and justified in limited circumstances.

The principle of reciprocity, particularly when considering clinicians' risk of contracting infectious diseases from patients, has been applied to the distribution of limited resources. Under this principle, those who put themselves at the greatest risk are prioritized with the most protection. Historically, this applied to the reservation of medication and services for clinicians who contracted an illness during their clinical duties and subsequently required treatment. The justification is not that preserving the clinician's function is good because the clinician can go on to help others or that the clinician has social worth, but that there is a reciprocal benefit based on risk undertaken.

Protection of vulnerable populations is of specific concern during a pandemic, potentially because of greater susceptibility to infection and/or lack of access to limited resources. Prioritizing PPE on the basis of degree of clinicians' intrinsic vulnerability, rather than procedural or role-specific vulnerability, is another consideration. Vulnerable clinicians may include those who are immunosuppressed, pregnant, or with significant medical comorbidity, whereby the severity of infection may be increased. These clinicians would be preferentially given PPE.

There are some criteria for allocation of PPE that are not acceptable. As mentioned previously, a "first-come-first-served" policy is patently unacceptable and will have long-lasting negative moral effects. Allocation systems based solely on seniority or position are also unacceptable. When considering allocation based on utilitarian principles or social worth, the assessment must be patient centered; the estimate of worth is not that of the individual clinician, but his or her value to patients and to society. Nor is there an ethical basis for distribution that prioritizes a clinician's economic value. Finally, social considerations such as race, ethnicity, sexual orientation, and sex are morally irrelevant.

It is difficult to think about rationing PPE to clinicians, particularly recognizing that decisions may expose some to a greater risk of infection. However, if these decisions must be made, they should be based on sound scientific and ethical principles, executed transparently and equitably, and subject to accountability. It is essential that we minimize any moral residue from decisions made during this pandemic so that once it is over we can get about the task of rebuilding.

Author Contributions

Study conception and design: Binkley, Kemp
Acquisition of data: Binkley, Kemp
Analysis and interpretation of data: Binkley, Kemp
Drafting of manuscript: Binkley, Kemp
Critical revision: Binkley, Kemp

REFERENCES

1. Centers for Disease Control and Prevention. Ethical guidelines in pandemic influenza. February 15, 2007. Available at:

https://www.cdc.gov/od/science/integrity/phethics/docs/panflu_ethic_guidelines.pdf. Accessed March 22, 2020.
2. Centers for Disease Control and Prevention. Ethical considerations for decision making regarding allocation of mechanical ventilators during a severe influenza pandemic or other public health emergency. July 1, 2011. Available at: https://www.cdc.gov/about/advisory/pdf/VentDocument_Release.pdf. Accessed March 22, 2020.
3. Pelosi Calls on Trump to Speed Production of Critical Medical Equipment. Reuters. March 19, 2020. Available at: https://www.reuters.com/article/us-health-coronavirus-usa-pelosi/pelosi-calls-on-trump-to-speed-production-of-critical-medical-equipment-idUSKBN21625Y. Accessed March 22, 2020.
4. Padilla M. 'It Feels Like a War Zone': Doctors and Nurses Plead for Masks on Social Media. New York Times. March 19, 2020. Available at: https://www.nytimes.com/2020/03/19/us/hospitals-coronavirus-ppe-shortage.html. Accessed March 22, 2020.
5. Centers for Disease Control and Prevention. Strategies for optimizing the supply of N95 respirators. Updated February 29, 2020. Available at: https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html. Accessed March 22, 2020.
6. Dean W, Talbot SG, Caplan A. Clarifying the language of clinician distress. JAMA 2020;323:923–924.