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Triage in a Pandemic: Equity, Utility, or Both?

PAUL WALKER, MB BS, PHD

Abstract

In terms of the setting of priorities for resource allocation, two general principles are important. These are *equity* and *utility.* Based on these two concepts, there are two historically discrete models for triage of limited resources. These are the French egalitarian model based on equity and the British military model based on utility. Modern paramedic and emergency room care in multiple casualty situations favors the triage model based on utility. Modern ICU care favors the triage model based on equity. There are issues to be addressed in both triage responses. In a pandemic, both the utilitarian model and the equity model are active, and their applicability changes as the trajectory of the pandemic progresses.

Keywords: *Pandemic, triage, equity, utility*

Introduction

'Triage' is the process of deciding the order or priority of treatment of ill or injured patients, usually in settings where available resources are not limitless. 'Pandemic' refers to an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.

In terms of deliberation aimed at the setting of priorities for resource allocation, two general principles are important. These are *equity* and *utility* (Verweij 2009). *Equity*, as the basis for triage, aims for an allocation of resources which is fair, right, and just—for example, mitigating health disparities and avoiding discrimination on non-medical grounds. Equity is not the same as equality. Equity means allocating resources based on the needs of the recipients. Equality means giving everyone exactly the same resources. *Utility*, as the basis for triage, aims for an allocation of resources which maximizes one or more outcomes—for example, number of lives saved.

Although Kant and other duty-based ethicists have argued that humans should be seen as ends in themselves and hence intrinsically valuable (Kant 1956, 62–65), traditionally principles of triage in multiple casualty situations are utilitarian (NYTFLL 2015, 33; Bazyar, Farrokhi, and Khankeh 2019; Clarkson and Williams. 2020). In situations of multiple casualties, limited resources (for example, numbers of trained rescuers and available equipment for resuscitation) are directed to salvage the greatest number of lives. This utilitarian response thus requires compromise of ethical principles centered upon the autonomous health needs of any one individual, in favour of the aggregated health needs of the greater number. For example, following a motor vehicle accident, four patients are moderately injured but will likely live with sufficient resuscitation, while one is severely injured and will likely take most of the resuscitative team's resources. The four patients are prioritised for treatment over the

one very severely injured patient. This argument can only run so far though. Consider now that although the four have been resuscitated, to survive long term each requires an organ transplant—one a heart, one a liver, one a kidney, and the fourth a lung. You know there is one young healthy patient waiting in your clinic for a check-up. Despite the obvious utilitarian attraction, it is impermissible to harvest four of her organs in order to save the four accident victims.

Historically, there are two distinct models for triage of limited resources, based on conceptions of equity and of utility. These are regularly, but erroneously, conflated (Jonsen 1990; Baker and Strosberg 1992). After explaining the difference, I will argue that in a world pandemic both models are active, but their applicability changes as the trajectory of the pandemic progresses.

Models for Triage

The *egalitarian model* dates from the Napoleonic era, where Baron Dominique Jean Larrey saw privileged officers being carried in early by their manservants, though less-severely injured than poorer soldiers who had to get themselves to the hospital tents. He set out to prioritize treatment of the most dangerously wounded first. Larrey's model is thus based on equity, without regard for "rank or distinction" (Beecher 1969, 110; Kirby 2010, 758).

The *utilitarian model* dates from the 18th Century, where the British hospitalists John Aitken and Thomas Percival aimed to maximize utility, which in warfare is success in battle. So, priority treatment was given to those who can most expeditiously be returned to active duty in order to defend the compound, over those who had more severe injuries preventing their rapid return to active duty (Churchill 1952; Kirby 2010, 758). Thus in Northern Africa during World War 2, prioritizing the war effort, penicillin was given to those soldiers laid low with syphilis, in preference to those with war injuries (Beecher 1969, 280–281). This utilitarian model of triage prioritises the greatest good for the greatest number.

Shifting Models in a Pandemic: Utility Early

As noted above, in modern paramedic or emergency room care of multiple casualty situations, the utilitarian (British military) triage model which aims for the greatest good for the greatest number via saving the greatest number of casualties, is favoured.

Since at least the 2003 emergence of SARS 1, pandemic preparedness priorities also favour the utilitarian model of saving as many lives as possible (Kass et al. 2008, 228; Verweij 2009; Kirby 2010, 758; Fiest et al. 2020, 412). Arguably, this is good both for individuals and for the community (with caveats about quality of life). Within the utilitarian triage model, the treatment of healthcare workers (HCWs) is prioritised so as to return them to the front line, where they can potentially save more lives. Ancillary benefits accruing to the prioritisation of HCWs are that they are encouraged to turn up for work, safe in the knowledge they will be prioritised for treatment if infected.

As the pandemic approach to triage, prioritising the saving of as many lives as possible appears simple and clear, and is likely to help inspire confidence in health

departments and government policies. Medical exclusion criteria aside, two points of clarification to the phrase 'save as many lives as possible' are important.

First, giving consideration to incorporating into 'number of lives saved' a measure of number of years of life saved and number of quality-adjusted or disability-adjusted years of life saved, is potentially important. There are precedents for this consideration. Guidelines for the allocation of lungs for transplantation allow for expected duration of survival after transplantation ("the difference between expected lifetime with versus without a transplant"), not simply avoidance of death ("expected lifetime without a transplant") (Egan et al. 2006, 1226).

Second, public health initiatives during a pandemic such as border closures, self-isolation, social distancing, and working from home inflict significant collateral financial and social damage on society and our way of life. Hence, from the perspective of governments, allocation of resources in a pandemic under the utilitarian model could move beyond mere numbers and quality of lives saved, and could aim at saving as many specific lives as possible. This is in order to maximize specific utilities—utilities which are potentially useful in the post-pandemic recovery phase. These might include prioritising saving the lives of workers in border protection and policing in order to maintain the law, order, and the safety of citizens. Community or public goods such as happiness or economic viability may be prioritised, as may social infrastructure. Hence prioritising lives to be saved as those who work in sanitation, counselling, or entertainment; or financial security such as workers in banks and other financial institutions, over saving 'average' citizens (Kass et al. 2008). Guidelines from the University of Pittsburgh assign a priority score for allocation of a ventilator that incorporates giving priority to individuals who perform tasks vital to the public health response (White and Halpern 2020, 7).

Ideally, determining the actual basis for utilitarian triage decisions about prioritisation of certain lives over others from a community or public good perspective would be based upon a clear and transparent articulation of the outcomes to be maximised. Kirsten Fiest's et al. (2020) recent systematic review of the allocation of intensive care resources during an infectious disease outbreak identified 83 articles. Of these, 30 explicitly stated which ethical principles guided the development of their triage criteria. Twenty based their protocols on the basis of helping the greatest number to survive (stewardship), 5 based resource allocation on societal contributions (reciprocity), and only 4 reported engaging the public to prioritize triage criteria (Fiest et al. 2020, 8–9). Additionally, despite prior experience of influenza epidemics, many institutional COVID-19 policies may have been determined within a relatively short space of time (Antommaria et al. 2020, 193). This suggests that the societal and governmental utility priorities above are uncommonly discussed in this context. Our era is characterized by an expansion of world travel and migration, which has brought people from widely disparate cultures and belief-systems into our communities. The resultant socio-cultural, ethno-national, and religious diversity is both deep-reaching and results in conflicting conceptions of equality versus justice and liberty versus autonomy; bringing about a far-reaching moral pluralism (Walker and Lovat 2019, 72). Achieving consensual agreement as to which utilitarian outcomes should be prioritised is important, but will likely be both challenging and time-consuming.

Shifting Models in a Pandemic: Equity Later

In modern ICU care, efforts are made to restrict admissions to the very sick and to accelerate the discharge of less severely ill patients (Kirby 2010, 758). This is done in order to give critical care priority to very sick individuals, who are expected to benefit the most from such intervention (while not thought to be futile). Once the patient is no longer severely unwell and becomes only moderately unwell, they are discharged from the ICU to an intermediate-level care unit. Thus, current ICU triage practice is closer to the egalitarian (French) model for triage than the utilitarian model in that admission is based solely upon the severity of illness, resources are allocated according to need, and there is no discrimination based upon officer status vs. enlisted man—than to the utilitarian model (Kirby 2010, 758).

The changing applicability of triage models based on utility and equity to a health service or hospital, as the course of a pandemic progresses, may be equally applicable to an individual patient. Consider an adult with diabetes, lung, and heart disease. In a pandemic she is more vulnerable to infection and once infected, has a poorer survival prognosis. The equity model for triage would point toward priority vaccination aiming to prevent disease. However, once infected, with a poorer survival prognosis and limited resources, arguably the utilitarian model would point away from active treatment.

Shifting Models in a Pandemic: Utility Revisited

In summary thus far, although the utilitarian model for triage of limited resources may begin the pandemic response, once a patient is ill enough to reach an ICU, the basis for triage switches to the egalitarian model, wherein the most severely ill (but not futile) patients are given priority admission into an ICU, and less-severe patients are not admitted.

Taking this thinking one step further, as the pandemic relentlessly progresses, a more complex decision-making situation may arise involving re-allocation of resources. Consider a military hospital which accepts civilian patients for treatment, but in a battlefield surge must transfer civilian patients under their care to a local hospital which may not have the expertise or equipment to keep them alive, in order to follow their duty to prioritize the care of injured soldiers (O'Mathúna 2016, 10). In a pandemic, although only required in a particularly dark scenario, existing guidelines acknowledge that if there is a shortfall in available ventilators, there may arise the need to re-allocate existing ventilators to those with greater survival prognosis, rather than have the situations where "patients unlikely to survive were allowed indefinite use of ventilators" (White and Lo 2020, 1774; NYTFLL 2015, 61–71; White and Halpern 2020, 3–4).

In 2006 in the UK, it was estimated that during an influenza pandemic, between four and five times the number of ventilated intensive care beds would be required than were available (Marsh 2006). In 2020 in the US, it was estimated that during COVID-19, each available ventilator might be required to service between 1.4 and 31 patients (Truog, Mitchell, and Daley 2020, 1973). Thus, it may be that decisions need to be made about limiting the duration of care for patients who do not improve rapidly (Marsh 2006, 791). It could reach the point where switching off the ventilator

of someone already on life-support, in order to benefit someone else with a better survival prognosis, may be required. Or, monitoring and then taking someone off their ventilator if they are not progressing well enough or sufficiently quickly using indices such as the Sequential Organ Failure Assessment (SOFA). Of 29 US hospitals with a ventilator triage policy and associated with the Association of Bioethics Program Directors, 95% used a version of the SOFA score (Antommaria et al. 2020, 191) plus discrete time intervals for reassessment. Once taken off life support, the ventilator-dependent patient would then die. These actions are difficult to justify under traditional ethical frameworks. From the perspective of the patient already on the ventilator, the action breaches the principles of autonomy (the removal of ventilator support is not taken at the patient's or relative's request), beneficence, non-maleficence (because death will follow), and justice (the removal of ventilator support is not taken because treatment is deemed futile, and in ordinary, non-pandemic times, the ventilation would have continued). One solution widely proposed is triage teams or committees, discrete from the clinical care teams, to make the decision.

My point here is that arguably, the triage model is challenged once more. The triage model for getting *into* the ICU in the latter stages of a pandemic is based on equity—treating the most seriously ill (matching resources to those with the greatest need). While the triage model for getting *out of* the ICU (involuntarily) switches back to triage based on utility—saving the most lives.

Conclusion

There are issues to be addressed about both the triage response founded on equity and the triage response founded on utility. Both of the two underlying models of triage have challenges in their practical application. In a pandemic, both models are active, and their applicability changes as the trajectory of the pandemic progresses.

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References

Antommaria, A. H. M., T. S. Gibb, A. L. McGuire, P. R. Wolpe, M. K. Wynia, M. K. Applewhite, A. Caplan, D. S. Diekema, D. M. Hester, L. S. Lehmann, R. McLeod-Sordjan, T. Schiff, H. K. Tabor, S. E. Wieten, and J. T. Eberl. 2020. "Ventilator Triage Policies During the COVID-19 Pandemic at U.S. Hospitals Associated With Members of the Association of Bioethics Program Directors. " *Ann Intern Med* 173 (3): 188–194. https://doi.org/10.7326/m20-1738.

Baker, Robert, and Martin Strosberg. 1992. "Triage and Equality: An Historical Reassessment of Utilitarian Analyses of Triage. " *Kennedy Institute of Ethics Journal* 2 (2): 103–123.

Bazyar, Jafar, Mehrdad Farrokhi, and Hamidreza Khankeh. 2019. "Triage Systems in Mass Casualty Incidents and Disasters: A Review Study with A Worldwide Approach." *Open Access Macedonian Journal of Medical Sciences* 7 (3): 482–494. https://doi.org/10.3889/oamjms.2019.119.

Beecher, Henry K. 1969. "Scarce Resources and Medical Advancement." *Daedalus* 98 (2): 275–313. www.jstor.org/stable/20023879.

Churchill, Edward D. 1952. "Surgical Implications of the Evacuation and Distribution of Battle Casualties." In *Battle Casualties: Incidence, Mortality and Logistic Considerations*, edited by Beebe Gilbert W and Michael E De Bakey, 242–257. Springfield, Ill.: Charles C. Thomas.

Clarkson L, and Mollie Williams. 2020. "EMS Mass Casualty Triage." StatPearls [internet]. StatPearls Publishing. Last Modified 2020 Sep 8. https://www.ncbi.nlm.nih.gov/books/NBK459369/.

Egan, T. M., S. Murray, R. T. Bustami, T. H. Shearon, K. P. McCullough, L. B. Edwards, M. A. Coke, E. R. Garrity, S. C. Sweet, D. A. Heiney, and F. L. Grover. 2006. "Development of the New Lung Allocation System in the United States." *American Journal of Transplantation* 6, no. 5p2: 1212–1227. https://doi.org/https://doi.org/10.1111/j.1600-6143.2006.01276.x.

Fiest, Kirsten M., Karla D. Krewulak, Kara M. Plotnikoff, Laryssa G. Kemp, Ken Kuljit S. Parhar, Daniel J. Niven, John B. Kortbeek, Henry T. Stelfox, and Jeanna Parsons Leigh. 2020. "Allocation of Intensive Care Resources During an Infectious Disease Outbreak: A Rapid Review to Inform Practice." *BMC Medicine* 18, no. 404: 1–17. https://doi.org/10.1186/s12916-020-01871-9.

Jonsen, Albert R. 1990. *The New Medicine and the Old Ethics*. Cambridge, Mass.: Harvard University Press.

Kant, Immanuel. 1956. *Critique of Practical Reason.* Translated by Lewis White Beck. New York: Liberal Arts Press.

Kass, Nancy, Jean Otto, Daniel O'Brien, and Matthew Minson. 2008. "Ethics and Severe Pandemic Influenza: Maintaining Essential Functions through a Fair and Considered Response." *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science* 6: 227–236. https://doi.org/10.1089bsp.2008.0020.

Kirby, Jeffrey. 2010. "Enhancing the Fairness of Pandemic Critical Care Triage." *Journal of Medical Ethics* 36 (12): 758–761. https://doi.org/10.1136/jme.2010.035501.

Marsh, Richard. 2006. "Hard Decisions Will Have to Be Made: View from Intensive Care." *BMJ (Clinical research ed.)* 332 (7544): 790–791. https://doi.org/10.1136/bmj.332.7544.790.

NYTFLL (New York State Task Force on Life and the Law). 2015. *Ventilator Allocation Guidelines.* New York State Department of Health (New York, USA). https://www.health.ny.gov/regulations/task_force/reports_publications/docs/ventilator_guidelines.pdf.

O'Mathúna, Dónal. 2016. "Ideal and Nonideal Moral Theory for Disaster Bioethics." *Human Affairs* 26 (1): 8–17. https://doi.org/doi:10.1515/humaff-2016-0002.

Truog, Robert D., Christine Mitchell, and George Q. Daley. 2020. "The Toughest Triage—Allocating Ventilators in a Pandemic." *New England Journal of Medicine* 382 (21): 1973–1975. https://doi.org/10.1056/NEJMp2005689.

Verweij, Marcel. 2009. "Moral Principles for Allocating Scarce Medical Resources in an Influenza Pandemic." *Journal of Bioethical Inquiry* 6 (2): 159–169. https://doi.org/10.1007/s11673-009-9161-6.

Walker, Paul, and Terence Lovat. 2019. "Dialogic Consensus in Medicine—A Justification Claim." *The Journal of Medicine and Philosophy* 44 (1): 71–84. https://doi.org/10.1093/jmp/jhy038.

White, Douglas B., and Scott D. Halpern. 2020. "Allocation of Scarce Critical Care Resources During a Public Health Emergency: Executive Summary. " University of Pittsburgh School of Medicine (Pittsburgh: University of Pittsburgh School of Medicine). https://bioethics.pitt.edu/sites/default/files/Univ%20Pittsburgh%20-%20Allocation%20of%20Scarce%20Critical%20Care%20Resources%20During%20a%20Public%20Health%20Emergency.pdf.

White, Douglas B. and Bernard Lo, "A Framework for Rationing Ventilators and Critical Care Beds During the COVID-19 Pandemic," *Journal of the American Medical Association* 323, no. 18 (2020): 1773–1774, http://jamanetwork.com/article.aspx?doi=10.1001/jama.2020.5046.

Paul Walker, OAM MBBS PhD FRACS FACS, is a Surgeon and Conjoint Professor in Surgery and the Clinical Unit in Ethics and Health Law, in the Faculty of Health and Medicine, University of Newcastle, NSW, Australia.