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COVID-19, Scarce Resources and Priority Ethics: Why Should Maximizers Be More Conservative?

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Summary
Background. — The principle of maximization, which roughly means that we should save more lives and more years of life, is usually taken for granted by the health community. This principle is even more forceful in crises like the COVID-19 pandemic, where we have scarce resources which can be allocated only to some patients. However, the standard consequentialist version of this principle can be challenging particularly when we have to reallocate a resource that has already been given to a patient.

Methodology. — Engaging in thought experiments, conceptual analysis, providing counterexamples, and appealing to moral intuitions, we challenge the standard consequentialist version of the maximization principle and make a case for adopting an alternative deontological version.

Discussion. — In certain cases, the standard consequentialist version of the maximization principle is shown to yield intuitively immoral results. The deontological version of this principle is preferable because it can retain the merits of the standard consequentialist version without falling prey to its problems.

Conclusion. — Compared to the standard consequentialist version, the deontological version of the maximization principle can better guide the ethical decisions of the health community, even in cases where we face a scarcity of resources.

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The principle of maximization, which roughly means that we should save more lives and more years of life — is usually taken for granted by the health community \([1–4]\). This principle is even more forceful in the case of crises like pandemics where we have scarce resources which can only be allocated to a part of the patients \([5–7]\). We can even be forced to reallocate a resource that is already given to a patient. Although certain worries about this principle have already been voiced \([8]\), it seems that there is no practical alternative to this principle \([9]\). In this paper, using the deontological framework, we scrutinize the moral soundness of this principle and show its scope of applicability and its limitations.

**Intuitive counterexamples against the maximization principle**

Roughly speaking, consequentialism is an ethical framework according to which it is only the consequences that morally justify an action. As such, in evaluating an action, nothing like the intention or the character of the agent performing the action need to be taken into account. In utilitarianism, which is the most famous form of consequentialism, the consequence at stake is the net benefit of our actions. Therefore, maximizing the net benefit is the prescription of this ethical framework \([10, 11]\). As such, it is no surprise that the principle of maximization is readily adopted by utilitarians. Consequentialism is popular because it is able to solve many problems in a coherent and systematic way. Nevertheless, opponents of consequentialism have long thought about counterexamples where trying to maximize the saved lives requires actions which are intuitively harsh and abominable.

Here we briefly discuss some of the most important counterexamples raised against the consequentialism in general, which we call the Transplant case, and the Fat Man case, respectively. All of these counterexamples depict scenarios where we have to sacrifice an innocent person to save more lives. In the Transplant case, the organs of an innocent and healthy person are transplanted to five recipients who will otherwise die \([10, 12]\). If it is only benefit maximization that is at stake, then a surgeon is required to kill this innocent person to save five people. The Fat Man case, which is a form of a group of important moral thought experiments offered by Philippa Foot \([13]\) and Judith Thomson \([14]\), is about a run-away trolley heading toward 5 people where if you throw a fat man into its path, the trolley will be stopped, although the fat man will be killed. Once we understand the structure of these examples, it is easy to think of many other scenarios in which sacrificing an innocent person can save the lives of many people. The problem is, however, that all of these actions are widely held to be intuitively wrong and even abominable. Therefore, if it is only maximizing the benefit that makes a particular action morally right or wrong, then this principle is sometimes in conspicuous breach of our pre-theoretical moral intuitions and judgments. Of course, real situations can be even more complex than these scenarios. We can do our best to approximate the real cases through our models but we should always be ready to accept that real situations can outstrip our models. Furthermore, we should note that decision-making in the field of medicine has its own complexities in comparison to daily life.

The maximization principle is also widely accepted by those working in the health institutions. It is, even, sometimes called a consensus value in the field \([1, 3]\). For example, in a recent paper on the fair allocation of medical resources during the Covid-19 pandemic, Emanuel et al. state: “saving more lives and more years of life is a consensus value across expert reports. It is consistent both with utilitarian ethical perspectives that emphasize population outcomes and with non-utilitarian views that emphasize the paramount value of each human life” \([3]\). Therefore, given the counterexamples discussed above, it is really important to make sure that this reasoning does not similarly lead to intuitively wrong actions. Although none of these examples concern the triage protocols in general, it is not hard to modify them to make them more relevant to this context. For example, Emanuel et al. state: “Because maximizing benefits is paramount in a pandemic, we believe that removing a patient from a ventilator or an ICU bed to provide it to others in need is also justifiable and that patients should be made aware of this possibility at admission.” \([3]\). We can also think about other scenarios in which reallocating a ventilator to somebody else can lead to more saved lives, for example when the person in question promises to donate a huge money for making (or buying) more ventilators, provided that he will be connected to a ventilator when all ventilators are in use. We can also think about a physician who removes a ventilator from a patient who has made a will to donate all of his money to the Covid-19 task force after his death (let’s call this the Will case). How can we rest assured that these actions are not, like the counterexamples we discussed, morally objectionable?

It should be noted that consequentialists are not fully disarmed by these putative counterexamples. Rule-consequentialists (also called indirect consequentialists), for example, believe that instead of calculating the benefits that an action brings about, we have to consider the benefits that adopting a particular rule leads to. Now, if we consider the rule that the surgeon or adopts in the transplant, then it is clear that public awareness of such rules immensely damage the public trust to the health and legal institutions and since public trust to these intuitions is crucial for their efficient functioning within the society, we should reconsider our calculations regarding the net benefit \([15]\). This maneuver is thought as an indirect way to capture the intuition of the moral wrongness of these actions. However, even if set aside the problems that bedevil rule-consequentialism in general, we think this is unclear whether the moral harshness of these actions stem from the indirect reasoning that rule-consequentialists appeal to. Rather, it seems that the damage to trust stems from the moral wrongness of these actions, not the other way around and, therefore, this response is not successful.

**Deontology ethics faces counterexamples**

The greatest advantage of deontology ethics, the main rival to consequentialism, lies in its ability to accommodate these counterexamples. According to deontology ethics,
also known as Kantian ethics, the morality of an action solely lies in complying with one’s duty, known as the Categorical Imperative, which is in force irrespective of the consequences or the desires of the agents [16,17]. Suppose that “do not kill an innocent person” is our duty. Then, according to deontology ethics, this principle should not be violated, no matter what consequences are awaiting otherwise. Immanuel Kant (1724-1804), whose name is inseparable from deontology ethics, proposes several formulations of the Categorical imperative, the interrelation between which has been subject to debate in moral philosophy. Here we confine ourselves to the most famous formulation of the categorical imperative known as the humanity formula. This is the formulation which is also most discussed by medical ethicists [8,18]. According to this formula you should “so act that you use humanity, whether in your own person or in the person of any other, always at the same time as an end, never merely as a means” [16]. As it is clear, this formula strikingly emphasizes the supreme value each human being, qua a rational agent, bears and as such explicates the obligation of respecting all people. Note that the consequentialism and deontology are not necessarily in conflict about the course of actions they prescribe; there are many cases where complying with the categorical imperative and maximizing the utility yield the same result. However, here we focus on those cases where what these frameworks prescribe are incompatible.

Kant’s injunction not to treat people as a mere means needs some clarifications. There is no denying that we always treat each other as means to certain ends. For example, when somebody is taking a taxi to go home, he is treating the taxi driver as a means to realize his/her end. It is, however, treating someone merely as a means that is problematic for Kantians. This means using a person’s body as well as his/her physical and mental capacities without his/her consent [15]. Now let’s see how deontology can accommodate the above-mentioned counterexamples to consequentialism. Killing an innocent person to transplant his/her organs to five people is treating him/her as a mere means. Similarly, stopping a run-away trolley heading towards 5 persons by throwing a fat man on the path, is clearly an instance of treating a human being as a mere means and is, as such, prohibited by the deontological framework.

It is important to note that deontological ethicists make use of several peripheral doctrines in their moral reasoning to complement the categorical imperative, the most famous of which are the Doctrine of Double Effect and the Doctrine of Doing and Allowing. Roughly speaking, these doctrines concern how the mental states of the agent (particularly his/her intentions) are morally significant in fulfilling his/her duties [15]. Consequentialists, therefore, have no interest in these doctrines because for them it is only the consequences of action, not the agent’s mental states, which are morally significant. But these doctrines are essential for deontology since the mental states of the agent are of paramount importance in this framework. Let’s briefly discuss these doctrines in turn. The Doctrine of the Double Effect which can be traced back to Thomas Aquinas (1225—1274) states that doing something that has both a good consequence and a bad consequence (thus the double effect) can be morally justified provided that the following conditions are met: (1) the original action is morally good or neutral, (2) the bad consequence is not the means through which the good consequence is realized, (3) the bad consequence is not intended but only foreseen, and (4) the good consequence outweighs the bad consequence [19,20]. Aquinas himself appealed to this doctrine to justify the act of killing somebody for self-defense [19]. As a clearer example, consider again the case of the run-away trolley. If we throw a fat man on the path of the trolley to save the five persons in danger, the bad effect is obviously the means to realize the good effect and, therefore, the doctrine of double effect is not applicable here. Now suppose that we can push a lever to change the path of the run-away trolley in a way that it now only hits one single person instead of five (call this the Trolley Diversion case). As far as the Doctrine of Double of Effect is concerned, pushing the lever is morally justified, because the death of the person in question is not intended, but only foreseen. Moreover, the good effect, namely saving five people, outweighs the bad effect, and the bad effect is not a means to realize the good effect since if the person could somehow succeed to escape the trolley, the good effect would be still obtained. This Doctrine, therefore, seems to account for the asymmetry we intuitively feel between throwing the fat man on the path and changing the direction of the trolley; although the consequence is the same (one person is killed but five persons are saved).

On the other hand, we have the Doctrine of Doing and Allowing according to which, although one may not cause the death of somebody, which is killing, one may still allow the death to occur or fail to prevent it, provided that doing so brings about outweighing good consequences [21—23]. Notice that this doctrine similarly proscribes killing an innocent person to transplant his organs to five other people, executing an innocent person to stifle a forthcoming riot, and throwing a fat man on the path of a run-away trolley, because in these cases what we have is causing a death, not merely allowing it. On the contrary, pushing a lever to slide a run-away trolley to hit a single person (instead of five) is just allowing that single person’s death, not killing him. Therefore, drawing on this doctrine, this action is not disallowed by the deontological framework.

Now let’s turn to the case of allocation/reallocation of the scarce resources (like ventilators in the time of the pandemics). As far aseontology is concerned, prioritizing the allocation of the resources and even the reallocation of the already allocated resources to save more lives and more years of life are not immoral because here no one is treated merely as a means. Rather, here the death of a person is just allowed or foreseen to save more lives for which the Doctrine of Double Effect and the Doctrine of Doing and Allowing are clearly applicable. Overlooking these nuances of deontology will make it an unappealing and unfeasible ethical framework for priority ethics. For example, Chu et al. have discussed the problem of ventilator reallocation from the perspective of Kantian ethics. They conclude that “From a Kantian perspective, removing the breathing tube from one patient and giving it to another to maximize the greater good of society violates the moral imperative of never treating other people as means to ends, even if the action leads to a greater good. No matter how laudable the consequences
**Table 1** How pre-theoretical intuition, consequentialism and deontology ethics evaluate different cases of maximization.

| Maximization cases | Pre-theoretical intuition | Consequentialism | Deontology |
|--------------------|---------------------------|------------------|------------|
| Cases where a human being is treated *merely* as a means to maximize the saved lives and years of life | Disallowed | Allowed and prescribed | Disallowed |
| The transplant case | | | |
| The fat man case | | | |
| The will case | | | |
| Cases where a human being is just allowed to die without directly intending his/her death, to maximize the saved lives and year of life | Allowed | Allowed and prescribed | Allowed |
| The ordinary cases of ventilator allocation/reallocation | | | |
| The Trolley Diversion Case | | | |

are, the moral imperative should never be violated, ’even if the heavens falls’” [8]. The Doctrine of Double Effect is also discussed by Chu et al. and is found inapplicable to the case of ventilator reallocation: ”But, the bad effect (death) cannot be considered as morally good or morally neutral; and the patient posed no threat to society and therefore, the act of withdrawing ventilator support was neither morally good nor morally neutral. Furthermore, the death of the patient was used as a means to achieve the greater good for society” [8]. Both reasons are, however, flawed. First, it is not clear how the patient (namely his/her body, and physical and mental capacities) is treated as a means in the case of ventilator reallocation. What we have here is analogous to the case of the run-away trolley heading five persons and reallocating the ventilator is like pushing the lever to direct the trolley toward the single person. Second, Chu et al.’s rejection of the Doctrine of Double Effect is similarly flawed. Of course, ”the bad effect (death) cannot be considered as morally good or neutral”. But this is clearly a misinterpretation of the Doctrine of the Double Effect; it is a conceptual truth that bad effect cannot be considered as morally good or neutral. What the doctrine requires is that the original action, considered narrowly enough to become separate from the good and the bad effects, should not be morally bad. Ventilator reallocation, thus considered, is morally neutral. It is like pushing a lever in the case of the run-away trolley. Specifying this action as killing a patient is begging the question. Therefore, the conclusion that Chu et al. arrive at does not follow from a tenable deontological framework and acting as Chu et al. suggest, we believe, is not something that those adhering to deontology should endorse.

Therefore, pace Chu et al., deontology converges with consequentialism in the normal cases of ventilator reallocation. This, however, does not mean that we cannot think about more complicated cases regarding the ventilator reallocation where what deontology and consequentialism prescribe come apart. Recall the Will case where a person connected to a ventilator has made a will to donate all of his properties to the national Covid-19 Task Force after his/her death. The doctor who is, somehow, aware of this will, decides to remove the ventilator. By doing so, he thinks, he can give the ventilator to somebody else with better or equal prognosis, and at the same time, helps a number of other patients who will directly and indirectly benefit from the huge donation of this rich man. Consequentially speaking, this is a moral action but there is no way that deontology can allow this action. First of all, the Doctrine of Double Effect does not apply here because killing the rich man is directly intended by the Doctor (this is how his will can be put into effect). Moreover, here the rich man is used as a mere means. In fact, his life is considered as a barrier to the huge money that would be otherwise donated to the health institution according to his will. If this counterexample works, then there are plausibly other complex examples as well where the allocation/reallocation of the scarce resources to maximize the benefits is morally objectionable according to the deontological framework.

To wrap up, maximization in the context of scarcity can be used, but, as we argued, a more nuanced version of this principle is needed which is bolstered by deontology rather than consequentialism. We showed that the consequentialist version of the maximization principle can, in certain cases, lead to intuitively wrong actions which are ruled out by the deontology-driven maximization principle and, as such, the latter should be favored over the former. Therefore, unlike what Chu et al. argue, we can use the maximization principle in the context of scarcity, even when we adopt the deontological framework.

**Future direction**

New conditions bring about new moral problems; if we consider consequentialism and the maximization principle it endorses as the default framework in medical ethics, it is likely that we make intuitively objectionable
decisions which are clearly proscribed from the perspective of deontology. Nonetheless, contrary to what some have argued, deontology does not reject all cases of maximization out of hand. However, as we saw in the Will case discussed above, even among the maximization cases which are acceptable according to deontology, adding some subtleties can significantly change the situation and make the case morally wrong. There are two ways that our discussion can be useful for policy makers and individual caregivers. First, a successful health policy, particularly in cases like pandemics, requires as much support as possible from practitioners and people. As we saw, the consequentialist maximization principle can, occasionally, lead to morally problematic decisions and have also been resisted by certain thinkers adhering to the deontological framework (Chu et al.). The version of the maximization principle we put forward, however, retains the merits of the standard maximization principle while remaining immune to its problems. Therefore, what we propose enjoys a more acceptance which is a clear advantage. Second, as we showed in the Will case, one can also think about scenarios in which the deontology-driven maximization principle and its consequentialist counterpart come apart in their prescriptions. Although this was not a real scenario, we hope it still shows the plausibility of believing in the existence of such cases. Table 1 outlines how our pre-theoretical intuition, consequentialism and deontology evaluate the maximization cases. As it is evident in the table, deontology fares better in explaining the intuitively wrong cases of maximization, while it is also able to accommodate the acceptable cases. For this reason, we suggest that consequentialism and the maximization principle it endorses should not be the default option and the deontological framework is better able to ethically guide the practice of medicine, even in cases like pandemics.

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References
[1] Biddison LD, Berkowitz KA, Courtney B. Ethical considerations: care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. Chest 2014;146:e145s–55s.
[2] Bayer R, Bernheim RG, Crawley M, Daniels N, Goodman K, et al. Ethical considerations for decision making regarding allocation of mechanical ventilators during a severe influenza pandemic or other public health emergency. Atlanta: Centers for Disease Control and Prevention; 2011. https://www.cdc.gov/about/advisory/pdf/VentDocument_Release.pdf.
[3] Emanuel E, Persad G, Upshur R, thome B, Parker M, et al. Fair allocation of scarce medical resources in the time of Covid-19. N Engl J Med 2020;382:2049–55.
[4] Zucker H, Adler KP, BerensDP, Bleich JD, Brynner R, et al. Ventilator allocation guidelines. New York state department of health task force on life and the law; 2015. https://nysba.org/app/uploads/2020/05/2015-ventilator_guidelines-NYS-Task-Force-Life-and-Law.pdf.
[5] Vawter DE, Garrett JE, Gervais Kg, Prehn AW, DeBruin DA, Tauer CA, et al. For the good of us all: ethically rationing health resources in Minnesota in a severe influenza pandemic; 2010. https://www.health.state.mn.us/communities/ep/surge/crisis/ethics.pdf.
[6] Patient Care Strategies for Scarce Resource Situations. Minnesota Department of Health; 2020. https://www.health.state.mn.us/communities/ep/surge/crisis/standards.pdf.
[7] California SARS-CoV-2 pandemic crisis care guidelines. California Department of Public Health; 2020. https://www.cdph.ca.gov/Programs/CID/DCDC/PDH%20Document%20Library/COVID-19/California%20SARS-CoV-2%20Crisis%20Care%20Guidelines%20-%20June%202020.pdf.
[8] Chu Q, Correa R, Henry TL, McGregor KA, Stoklosa H, Robinson L, et al. Reallocating ventilators during the coronavirus disease 2019 pandemic: Is it ethical? Surgery 2020;168:388–91.
[9] Angelos P. Tragic choices and the reallocation of ventilators. Surgery 2020;168:396.
[10] Sinnott-Armstrong W. Consequentialism. The Stanford Encyclopedia of Philosophy; 2019. https://plato.stanford.edu/entries/consequentialism/.
[11] Hooker B. Rule Consequentialism. The Stanford Encyclopedia of Philosophy; 2016. https://plato.stanford.edu/archives/win2016/entries/consequentialism-rule/.
[12] Rivera-López E. The moral murderer. A (more) effective counterexample to consequentialism. Ratio 2012;25:307–25, http://dx.doi.org/10.1111/j.1467-9329.2012.00544.x.
[13] Foot P. The problem of abortion and the doctrine of double effect. Oxford Rev 1967;5:5–15.
[14] Thomson JJ. Killing, letting die, and the trolley problem. The Monist 1976;59:204–17.
[15] Alexander L, Moore M. Deontological Ethics. The Stanford Encyclopedia of Philosophy; 2020. https://plato.stanford.edu/archives/win2020/entries/ethics-deontological/.
[16] Kant I. Groundwork for the metaphysics of morals. Translated and Edited by M. Gregor. Cambridge: Cambridge University Press; 1998.
[17] Johnson R, Cureton A. Kant’s moral philosophy. The Stanford Encyclopedia of Philosophy; 2019. https://plato.stanford.edu/archives/spr2019/entries/kant-moral/.
[18] Donaldson CM. Using Kantian ethics in medical ethics education. Med Sci Educator 2017;27:841–5.
[19] McIntyre A. Doctrine of double effect. The Stanford Encyclopedia of Philosophy; 2019. https://plato.stanford.edu/archives/spr2019/entries/double-effect/.
[20] Woodward PA. The doctrine of double effect. Notre Dame: University of Notre Dame Press; 2001.
[21] Kamm FM. Action, Omission, and the Stringency of Duties. University of Pennsylvania Law Rev 1994;142:1493–512.
[22] Kamm FM. Morality, mortality: volume ii: rights, duties and status. New York: Oxford University Press; 1996.
[23] MacMahan J. The Ethics of Killing. Oxford: Oxford University Press; 2003.