RIVISTA INTERNAZIONALE DI FILOSOFIA E PSICOLOGIA
DOI: 10.4453/rifp.2020.0022
ISSN 2039-4667; E-ISSN 2239-2629
Vol. 11 (2020), n. 3, pp. 327-340

TEMI ED EVENTI

# Ethical and cognitive challenges in the COVID-19 emergency

Chiara Lucifora[(α)] & Gustavo Cevolani[(β)]

Ricevuto: 26 giugno 2020; accettato: 30 settembre 2020

**Abstract** The global emergency caused by the spread of COVID-19 raises critical challenges for individuals and communities on many different levels. In particular, politicians, scientists, physicians, and other professionals may face new ethical dilemmas and cognitive constraints as they make critical decisions in extraordinary circumstances. Philosophers and cognitive scientists have long analyzed and discussed such issues. An example is the debate on moral decision making in imaginary scenarios, such as the famous "Trolley Problem". Similarly, dramatic and consequential decisions are realized daily in the current crisis. Focusing on Italy, we discuss the clinical ethical guidelines proposed by the Italian Society of Anesthesiology, Analgesia, Resuscitation and Intensive Care (SIAARTI), highlighting some crucial ethical and cognitive concerns surrounding emergency decision making in the current situation.
KEYWORDS: Moral Dilemmas; Cognition; Rationality; Bias; Clinical Decision Making; COVID-19

**Riassunto** *Problemi etici e cognitivi nell'emergenza COVID-19* – L'emergenza globale causata dal COVID-19 solleva problemi cruciali, sia per gli individui sia per le comunità, a molti livelli diversi. In particolare, politici, scienziati, medici e altri professionisti si trovano ad affrontare dilemmi etici e limitazioni cognitive legate a decisioni critiche in circostanze straordinarie. Sia i filosofi sia gli scienziati cognitivi hanno a lungo analizzato e discusso questi problemi. Un esempio è il dibattito sul ragionamento e le decisioni morali in scenari immaginari, come il famoso "problema del carrello". Nella crisi attuale, dilemmi drammatici di questo tipo sono all'ordine del giorno. Concentrandoci sull'Italia, discutiamo le linee guida proposte dalla Società Italiana di Anestesiologia, Analgesia, Rianimazione e Terapia Intensiva (SIAARTI), evidenziando alcuni aspetti critici, sia etici sia cognitivi, del processo decisionale in una situazione di emergenza come quella attuale.
PAROLE CHIAVE: Dilemmi morali; Cognizione; Razionalità; Bias; Decisioni cliniche; COVID-19

[(α)]Dipartimento di Scienze Cognitive, Psicologiche, Pedagogiche e Studi Culturali, Università degli Studi di Messina, via Concezione, 6 - 98121 Messina (I)

[(β)]Scuola IMT Alti Studi Lucca, Piazza San Francesco 19 - 55100 Lucca (I)

E-mail: clucifora@unima.it; gustavo.cevolani@imtlucca.it

## 1 Introduction

In December 2019, China first sounded the alarm, warning the world of the spread of a dangerous virus responsible for an acute respiratory syndrome with a high degree of transmissibility, the "Coronavirus Disease 2019" or COVID-19.[1] On 11 March 2020, the World Health Organization (WHO) declared a pandemic emergency, as the new disease spread around the globe (as we write, the WHO Health Emergency Dashboard[2] reports more than 9 million confirmed cases and around 480,000 deaths).

Italy was one of the first and most seriously affected countries in Europe. The first case was reported on February 18, 2020 and, at the moment of writing, nearly 240,000 cases and 35,000 deaths have been registered in Italy (WHO Dashboard, accessed June 26, 2020). During the very first weeks of the epidemic, Italian hospitals, nursing homes, and healthcare facilities in the most affected regions quickly collapsed due to the exceptional rise in the number of hospital admissions. This resulted in severe overcrowding (which let to the spread of the infection within the healthcare structures themselves) alongside a critical shortage of beds (especially intensive care), equipment (in particular fans), and medical-hospital staff.

On March 8, 2020, the Italian government implemented a country-level lockdown with the purpose of slowing down the spread of the virus and reducing pressure on health structures. By this time, local clinics and medical institutions had already adopted various policies in response to the crisis. For example, on March 6, 2020, the *Italian Society of Anesthesiology, Analgesia, Resuscitation and Intensive Care* (SIAARTI) published a document entitled *Clinical Ethics Recommendations for the Allocation of Intensive Care Treatments in Exceptional, Resource-limited Circumstances* (henceforth, *Recommendations*) addressed to medical and healthcare personnel.[3] The document offered clinical guidelines meant to improve and assist rational and ethical decision making by doctors and nurses performing their daily activities during the emergency. Such guidelines are broadly inspired by cost-benefit analyses and the principle of maximizing public good in the face of an objective shortage of available resources. For this reason, the document led to considerable discussion and critical commentary within as well as outside professional circles.

In this short paper, we first present the SIAARTI *Recommendations* and provide a brief overview of the ensuing debate, focusing on some crucial ethical issues that were raised by the document (Section 2). We then briefly review recent discussions on moral reasoning and ethical decision making in so-called Trolley scenarios in the philosophical, psychological, and neuroscientific literature (Section 3). Finally, we discuss some critical recommendations in the SIAARTI document which point to the challenging ethical and cognitive dimensions of reasoning and decision making in emergency situations (Section 4). As we suggest, explicit consideration of these dimensions could help shape future interventions and allow for more effective and transparent communication of healthcare policies with both professionals in the field and the general public.

## 2 The SIAARTI Recommendations

The SIAARTI *Recommendations* have two main purposes.[4] On the one hand, they aim to assist doctors and nurses with daily decisions, making explicit a shared code of conduct and thus relieving individuals from at least part of their responsibility for dramatic and "emotionally burdensome" choices. On the other hand, the document aims to make «the allocation criteria for healthcare resources explicit in a condition of their own extraordinary scarcity», thus explaining to both professionals and the general public the rationale underlying the proposed guidelines.

The document begins by noting that the COVID-19 crisis has led to greatly increased

demand for ICU admissions, that «may cause an imbalance between the real clinical needs of the population and the effective availability of intensive resources».[5] This created a new situation, forcing doctors and nurses to adopt exceptional decision making patterns, typical of a "disaster medicine" scenario, «where criteria for access to intensive care and discharge may be needed, not only in strictly clinical appropriateness and proportionality of care, but also in distributive justice and appropriate allocation of limited healthcare resources».[6]

The latter point is a crucial one, because it acknowledges that ethical principles and the corresponding regulations will be stretched beyond their usual limits: «[a]s an extension of the principle of proportionality of care, allocation in a context of serious shortage of healthcare resources, we must aim at guaranteeing intensive treatments to patients with greater chances of therapeutic success».[7] In turn, this makes "greatest life expectancy" the central criterion in decisions concerning allocation of resources and access to intensive care, over and above the more standard principle "first come, first served".

In sum, exceptional circumstances – characterized by a high demand for treatment coupled with objective scarcity of resources – ethically justify, and rationally require that exceptional principles guide clinical decision making. In particular, the usual assessment of the «need for intensive care must be integrated with other elements of "clinical suitability", thus including: the type and severity of the disease, the presence of comorbidities, the impairment of other organs and systems, and their reversibility».[8]

On a practical level, such principles translate into specific recommendations, detailed in the 15 items presented in the SIAARTI document. Some of them are worth quoting at length:

> 3. An *age limit* for the admission to the ICU may ultimately need to be set. The underlying principle would be to save limited resources which may become extremely scarce for those who have a much greater *probability of survival* and life expectancy, in order to *maximize the benefits* for the *largest number of people*. [...]
>
> 4. Together with age, the *comorbidities* and *functional* status of any critically ill patient presenting in these exceptional circumstances should carefully be evaluated. A longer and, hence, more "*resource-consuming*" clinical course may be anticipated in frail elderly patients *with severe comorbidities*, as compared to a *relatively shorter*, and potentially more benign course in healthy young subjects. [...]
>
> 7. Under *exceptional circumstances*, when the availability of resources is *overwhelmed* by their need, a decision to deny access to one or more life-sustaining therapies, solely based on the principle of distributive justice, *may ultimately be justified*.
>
> 11. [...] When a patient is not responding to prolonged life-sustaining treatments, or severe clinical complications arise, a decision to *withhold or withdraw* further or ongoing therapies should not be postponed in a resource-limited setting during an epidemic.[9]

The above recommendations are inspired by the rationale discussed before and, from a philosophical point of view, clearly assume a "utilitarian" attitude towards the ethics of clinical decision making. We shall discuss this point in detail in the next section.

Here, we just note that the ethical stance assumed by SIAARTI triggered several interesting reactions from experts in philosophy, ethics, and theology. For example, some commentators criticized the SIAARTI document from a bioethical perspective,[10] basically arguing that a cost-benefit analysis applied to a medical scenario is at risk of implementing discriminatory practices; according to such criticisms, the only viable solution is to in-

crease healthcare resources in order to guarantee adequate and equal treatment to all who need it, thus resolving the problem at its root.

Opposing this view, bioethicists like Maurizio Mori[11] and theologians like Mauro Cozzoli[12] have defended the SIAARTI recommendations. They note that SIAARTI cannot be accused of discrimination, since patients are always different from each other, and the principle of treating them "equally" would not only be inapplicable but also morally wrong. Mori thinks that "Hippocratic equality", if not properly construed, can become immoral: for instance, if it were used to justify futile medical care, i.e., the continued provision of treatment to a patient even in absence of any reasonable hope of benefit.[13] On a different, but consonant, note, Cozzoli appeals to the principles guiding decision making in the case of organ transplants, noting that giving precedence to those who are expected to receive a greater benefit from treatment is often not only rational but also ethical.[14]

A similar debate has taken place in other countries which faced very similar situations. For example, a group of physicians from the USA[15] discuss the ethical problems raised by the necessity of re-allocating ventilators to different patients during the crisis. Their conclusion is that, although a broadly utilitarian approach to clinical ethics may be justified during an emergency, still «the concept of taking a ventilator from one patient to give to another without patient or family consent lacks adequate moral foundations».[16]

Other studies[17] have tried to address the problem by directly investigating public opinion on the relevant ethical issues. In one survey, participants were asked to choose between two alternative policies under a Rawlsian "veil of ignorance". The choice was between giving the last available ventilator to either a 65-year-old patient, who had arrived at the hospital first, or to a 25-year-old boy, who arrived a few minutes later. Participants were told that both patients had a life expectancy of up to 80 years. Moreover, participants knew that, in the imagined scenario, they had a fifty-fifty chance of playing the role of either the older or the younger patient. The results were interesting because, under the veil of ignorance, both younger and older participants favored the more utilitarian policy of giving the ventilator to the young boy over the classical "first come, first served" policy.

## 3 Moral decision making

As the authors of the *Recommendations* note, the COVID-19 emergency has brought about a scenario that "can be substantially assimilated to the field of "disaster medicine", requiring patterns of (moral) decision making different from the ones adopted in more ordinary circumstances. This kind of extraordinary choice easily reminds one of the ethical dilemmas studied in the last decades by philosophers and cognitive scientists.[18] The most famous of these is the well-known "Trolley Problem", first introduced by moral philosopher Philippa Foot in 1967, which can be presented as follows:

> You are standing next to a platform when you see a train heading towards five people tied to the tracks. The brakes of the train do not work! If you do nothing, five people will be killed. Fortunately, you are close to a railroad switch: by pulling a lever you can send the out-of-control train to another track. Unfortunately, there is a hitch: one person is tied to the other track; changing the direction of the train will inevitably result in killing this person. What should you do?[19]

This problem had an enormous influence on subsequent discussions, well beyond the original discussion that motivated it.[20] In any case, it is interesting to note that Foot herself also considered a similar example, but from a medical scenario, which she presents a few lines after introducing the Trolley Problem:

> We are about to give a patient who needs it to save his life a massive dose of a certain

> drug in short supply. There arrive, however, five other patients each of whom could be saved by one-fifth of that dose. We say with regret that we cannot spare our whole supply of the drug for a single patient, just as we should say that we could not spare the whole resources of a ward for one dangerously ill individual when ambulances arrive bringing in victims of a multiple crash. We feel bound to let one man die rather than many if that is our only choice.[21]

The situation of the example above is quite close to the one considered by the authors of the SIAARTI *Recommendations*, i.e., «allocation in a context of serious shortage of healthcare resources».

In the last decades, the Trolley Problem (in many different variants and along with other scenarios more or less similar to the one quoted above) has been extensively used by researchers interested in the theoretical and empirical investigation of moral reasoning, i.e., how people reason and decide about moral issues. In this kind of research, it is often assumed that Trolley problems can be used to test people's intuitions with respect to two patterns of moral reasoning, broadly inspired by two different philosophical theories (or families of theories) on morality.

The first, "consequentialist" approach, historically represented by authors such as J. Bentham and J.S. Mill, roughly maintains that a moral action is one that maximizes happiness, or absence of pain, for the greatest number of people.[22] The label "consequentialism" refers to the fact that, under this approach, the morality of some action, decision or behavior is evaluated by assessing the consequences of that decision for the people involved: «we should do whatever will produce the best overall consequences for all concerned».[23] In the traditional jargon (inherited by present-day economists in the path of von Neumann and Morgenstern)[24] this leads to the principle of "maximizing expected utility" for the greatest number of stakeholders, hence the label "utilitarianism".[25]

In consequentialist philosophy, moral decision making is basically reduced to a sort of cost-benefit analysis. On the opposite side, we find philosophers and ethicists who tend to disregard the consequences of actions and decisions as virtually irrelevant to their morality. This is the approach of so-called deontologists, the most famous being Immanuel Kant, who proposed the "categorical imperative" as the only rational guide to moral decision making: «Act only according to that maxim whereby you can, at the same time, will that it should become a universal law».[26] According to deontological theories, the morally correct choice has not much to do with the consequences of different actions, but with whether or not they respect the fundamental rights and duties of people.[27]

The above quick survey of the two main theories of moral reasoning on the market will suffice for our purposes. What is worth noting here is that the Trolley Problem can be used, and is commonly used, as a "litmus test" to evaluate one's inclination towards either consequentialism or deontology. The intuition is that if you choose to pull the lever and activate the exchange in order to send the train on the secondary track, then you are (more or less consciously) favoring a consequentialist view, preferring to sacrificing one person to save five lives. Instead, if you refuse to pull the lever, you are supposed to do so in order to respect the rights (especially the right to life) of the innocent individual on the other track even at the cost of the five lives that will be lost, thus leaning towards deontology.

When such choices are experimentally investigated (both in the lab and with online questionnaires), the majority of participants choose to pull the lever and sacrifice only one person in the standard version of the problem as described above.[28] The same holds in recent experiments concerning so-called *Autonomous Driving Systems*, where participants are required to decide what a self-driving car should do in emergency situations (conceptually similar to the Trolley Problem) involving the killing of different groups of persons.[29] For example,

the biggest such experiment, the "*Moral Machine*" online platform at MIT,[30] has collected 40 million decisions on moral dilemmas from participants in 233 countries. Despite important individual and cultural differences, the study suggests a global preference to save more lives, to save the younger over the elderly, and to save humans over animals.

This kind of empirical evidence seems to point to widely shared utilitarian inclinations in most people. In turn, this may seem to justify ethical guidelines, like those proposed by SIAARTI, broadly inspired by consequentialist principles. As we shall see in a moment, however, interpreting such results and assessing the robustness of consequentialist intuitions among professionals and the public requires considerable caution and attention to detail.

## 4 Cognitive aspects of moral decision making

The ethical guidelines provided by the SIAARTI document can be rationally motivated by a cost-benefit analysis of the allocation of healthcare resources under conditions of extreme scarcity, and ethically justified by appealing to a consequentialist (utilitarian) view of moral decision making. Still, the critical reactions triggered by the SIAARTI recommendations, both among experts and professionals and among the general public, show that it is often not easy for policy makers to justify and communicate such issues effectively.

In the following, we survey some evidence that helps us better understand the main aspects of this challenge and can improve communications and policy design on such issues.

### *4.1 Fast and slow thinking*

In the last decades, different research lines in psychology, behavioral economics, and cognitive science in general have settled on a broadly shared view – called the dual-system or dual-process theory – of human reasoning and decision making, including moral decision making, as discussed in the previous section. In a nutshell, dual-process theory assumes that human choices and decisions are the result of two different "systems" – called system 1 and system 2, and respectively associated with "fast" and "slow" thinking, in the now famous metaphor by Nobel prize winner Daniel Kahneman – that work in parallel in order to interpret available information, evaluate options, and reach a final verdict on what to do.[31] System 1 is a kind of "default" reasoning process which proceeds very quickly, in a basically unconscious and automatic manner, to provide us with an "intuitive", effortless take on the situation enabling quick decisions (as when an experienced driver continuously adapts his driving style to the traffic situation). System 2 is a higher-level, conscious process, much slower and more effortful than system 1, which assists us in making thoughtful choices in a reflective and controlled manner (as when we make a complex arithmetic calculation or a cost-benefit analysis before buying a car). In most situations, system 1 is sufficient to reach appropriate decisions in a very effective way, following our "gut feelings";[32] when this is not possible, system 2 can intervene in order to correct and override fast, intuitive reasoning. In some circumstances, which have been carefully studied in a long series of experiments, problematic decisions ideally requiring a "slow" solution are instead addressed in a "fast" mode: when this happens, we fall prey to so-called cognitive biases, which in turn can push us towards mistaken or ineffective decisions. This "heuristics and bias" view has vastly improved our understanding of human reasoning and decision making, highlighting a number of factors influencing our choices and possibly leading them astray.

### *4.2 The role of emotions and contextual factors*

One important contribution from the heuristic and bias literature has been the detailed study of a number of "supposedly irrelevant" factors which actually influence our decisions depending on the specific "architecture of

choice" in which the decision takes place.[33] Such factors – which may vary from different ways of presenting the relevant options to decision makers to psychological or even perceptual features of those options – can trigger systematic and predictable reactions by system 1, even if they are apparently irrelevant from a "rational" point of view. This insight has also been applied to the study of moral reasoning and decision making. Let's consider the following variant of the standard Trolley Problem discussed in section 3:

> You are on an overpass in the company of a fat man, while you are looking at a damaged train that is heading for 5 people standing on the platform. The only way to save the 5 people is to push the fat man down and stop the cart, causing him to die. What should you do?[34]

This scenario, due to moral philosopher Judith Thomson,[35] can be referred to as the "Footbridge" problem, in order to distinguish it from the classical, "Bystander" problem discussed in Section 3. As expected, experimental participants confronted with the Footbridge problem tend to refuse to push the man, or to judge this action as immoral, even if they were ready to sacrifice one life to save five in the Bystander problem. For example, in a study by Hauser and colleagues,[36] two thousand subjects evaluated both versions of the Trolley problem. In the Bystander problem, 89% of them judged pulling the lever to be moral; in the Footbridge Dilemma, only 11% of them considered it morally admissible to push the man.

This kind of experimental evidence poses problems for a strictly utilitarian view, where one assumes that the only relevant factor in assessing the morality of the relevant actions is the ratio of saved to lost lives. Of course, one may point to various differences between the two scenarios, since it is known that moral judgment and reasoning is sensitive to the distinction between "killing" and "letting die",[37] as well as to the one between causing harm "directly" or "indirectly".[38]

Still, the opposing responses to the Bystander and the Footbridge versions of the Trolley problem clearly challenge the basic intuition underlying consequentialist moral theories.

To resolve this tension, utilitarian philosopher and neuroscientist Joshua Greene recruits a dual-process account of moral reasoning. His idea, roughly, is that while consequentialist decision making depends on slow, rational, cost-benefit reasoning, deontological intuitions are more related to fast, automatic assessment of the relevant features of the choice-making situation. According to Greene,[39] the Bystander problem is an "impersonal" dilemma, which only requires the participant to perform a "cold" action like operating a lever; in such a situation, moral reasoning is appropriately performed at the level of system 2, leading to a rational, consequentialist choice. In contrast, the Footbridge problem represents a "personal" or "hot" problem, requiring a violent action of physically pushing a fellow man to his death. This immediately triggers a strong negative emotional reaction, which activates system 1 and overrides any potential system 2 decision, resulting in a purportedly deontological choice.

In a famous study, Greene and colleagues[40] put this theory to test using fMRI, finding that impersonal moral dilemmas tend to activate brain areas related to high-level reasoning and cognition (the dorsolateral prefrontal cortex and the inferior parietal lobe), more than personal moral dilemmas, which primarily involve the amygdala and other areas associated with emotion processing, social cognition, and empathy.

Without trying to assess Greene's interpretation of these results or their robustness, one important point is worth noting. The available evidence strongly suggests that, even assuming that a shared, uncontroversial theory of moral judgment and reasoning (like, e.g., consequentialism) is available in a given domain, one should expect emotions and other contextual factors to systematically bias moral evaluation and reasoning. With

reference to the SIAARTI document, this means in turn that, quite independently from the validity of its recommendations and their utilitarian foundation, negative reactions on the part of both the professionals involved and the public must be expected. Conversely, taking into account theoretical and empirical contributions from philosophy and cognitive science on moral dilemmas may help to better shape and communicate guidelines so as to avoid morally negative reactions.[41]

### *4.3 Clinical ethics and competing moralities*

Another interesting prediction tested by Greene and collaborators concerns the moral intuitions of healthcare professionals from different specializations. In particular, one would expect that medical doctors and nurses, on the one hand, and public health professionals (for instance, epidemiologists), on the other hand, will react in different ways when confronted with Trolley dilemmas and similar scenarios.

The idea is that physicians and other practitioners are trained to reason on a "individual" or personal level: accordingly, they tend to treat each single patient as a unique person bearing inviolable rights and to follow the basic "first, do not harm" rule and the Hippocratic oath in each specific situation. This suggests that the majority of medical doctors and nurses may adhere to a Kantian or deontological perspective when assessing both real and imaginary cases like the Trolley dilemmas. On the contrary, epidemiologists and public health professionals are used to reasoning within a "collective" or "social" dimension: their choices do not primarily affect a single individual, but a population or community in its entirety. Consequently, they may be more inclined to reason in consequentialist terms, favoring cost-benefit analyses and following a utility maximizing rule, when faced with the very same scenarios.

In an unpublished work, based on the doctoral dissertation of Katherine J. Ransohoff,[42] Greene and colleagues asked a number of doctors and healthcare professionals to evaluate both the Trolley problem and other moral dilemmas from the philosophical literature, and more realistic medical scenarios, involving decisions on drug rationing, quarantining an infected patient, and so on.[43] They found two main results. First, participants' judgments on Trolley-like dilemmas correlated with their judgments on more realistic dilemmas. Second, their results confirmed the prediction that public health professionals tend to be more utilitarian than both doctors and ordinary people. In sum, moral judgment and reasoning about the same situation can be influenced by the training, expertise, and specialization of the decision maker.

Interestingly, the authors of the SIAARTI recommendations anticipated this issue by explicitly acknowledging that doctors and nurses might be suspicious, for cultural reasons, of adopting utilitarian thinking in health matters:

> It is understandable that the clinicians, by culture and training, are not accustomed to reasoning with criteria of maxi-emergency triage, as the current situation has exceptional characteristics.
> The availability of resources does not usually enter the decision-making process and the choices of the individual case, until resources become so scarce as do not allow treating all patients who could hypothetically benefit from a specific clinical treatment.[44]

Again, further exploration of the empirical literature on different reasoning styles in moral matters may help in clarifying and communicating critical issues like those discussed by the SIAARTI document.

### *4.4 Irrelevant alternatives and unreasonable choices*

A standard principle of rational decision making, called "regularity", prescribes that

the choice between two options should not be affected by the addition of new, "irrelevant" alternatives. More precisely, suppose that, when offered a choice between an apple and an orange, you prefer the apple; but, when the choice is among the apple, the orange, and a banana, you now prefer the orange. Your choice sounds a bit strange, if not utterly unreasonable, exactly because it violates the regularity principle.

A number of experiments have, however, shown that people's choices tend to violate the regularity principle.[45] In other words, under predictable circumstances, adding a third alternative to the original set of two options systematically modifies people's preferences and hence their decisions. A possible explanation of this phenomenon[46] is that, when the choice between two options is "hard", for instance, because they are quite similar and one is not clearly preferable to the other, adding a third option which is clearly inferior or superior to one of the two makes the choice between the two easier, thus relieving the decision maker from a highly conflictual decision.[47] Conversely, if one option is clearly preferable to another, adding a third alternative similar to the first tends to increase preference for the second, since the choice now becomes harder and more conflictual.

Of course, choices and decisions in medical settings are often hard and highly conflictual in this sense. Thus, one can expect that the "disturbance effects" documented in the psychological literature may also distort the preferences of healthcare professionals, for instance, when choosing between different treatments to administer or deciding which patient should be treated first. To test such effects, Redelmeier and Shafir conducted a study involving 352 neurologists and neurosurgeons. Participants had to evaluate imaginary but realistic clinical scenarios and express their preferences for treatments or patients or other relevant options. One such scenario involved a decision on who, among several patients awaiting carotid artery surgery, should be treated first given a temporary limitation in operating room availability. The three patients were described as follows:

> Patient 1 is a 52-year-old employed journalist with transient ischemic attachment experienced as transient aphasia. She has had one such episode occurring 10 days ago, which lasted approximately 12 hours. [...] Past medical history is remarkable for past alcoholism (no liver cirrhosis) and mild diabetes (diet controlled).
>
> Patient 2 is a 72-year-old retired policeman with a transient ischemic attack experienced as left hand paralysis. He has had two such episodes during the last 3 months, with the last occurring 1 month ago. [...] He has no concurrent medical problems and is in generally good health.
>
> Patient 3 is a 55-year-old employed bartender with transient ischemic attachment experienced as transient monocular blindness. She has had one such episode 1 week ago, which lasted less than 6 hours. [...] Past medical history is remarkable for ongoing cigarettes smoking (since 15 years of age at a rate of one pack per day).[48]

The experimental participants had to decide who they would operate on first. However, half of them received a "basic" scenario involving only two patients, i.e., Patient 1 and Patient 2; the other half received the "expanded" scenario where the choice was among all three patients, including Patient 3. The results confirmed that the added alternative had a strong effect on choice: only 38% of the physicians choose to operate first on Patient 2 in the basic scenario, compared to 58% of those evaluating the expanded scenario. As the authors of the study write:

> Whereas patient 2 might be considered a reasonable candidate, selecting one of two similar women over the other is harder to justify, both to oneself and to others. Apparently, the difficulty in deciding be-

tween the two similar patients, patients 1 and 3, led many physicians to avoid this decision and recommend operating on patient 2 instead.[49]

The scenario considered in the experimental study described above is clearly similar to many real-life situations that doctors might face in their daily activities. In the emergency scenario brought about by COVID-19 which motivated the SIAARTI recommendations, such "hard choices" can only become more frequent and critical. As a consequence, implementing the guidelines in practice can be challenging even when the relevant criteria (patient's age, comorbidities, probability of survival, etc.) are clear and agreed-upon in advance. For this reason, paying attention to the cognitive aspects of decision making, as exemplified by the phenomenon of preference distortion considered here, appears of crucial importance to the effectiveness of clinical and ethical recommendations.

## 5 Conclusions

In this note, we have discussed some crucial aspects of current reactions to the COVID-19 emergency in the light of the cognitive and philosophical literature on rational decision making and moral reasoning.

Focusing on the clinical ethical guidelines released by the *Italian Society of Anesthesiology, Analgesia, Resuscitation and Intensive Care* (SIAARTI) in the early days of the pandemic, we highlighted some of the ethical and cognitive challenges facing physicians, nurses, healthcare professionals, and policy-makers in their daily work during the crisis. In particular, we suggested that the philosophical and ethical discussion of so-called Trolley scenarios may provide a useful framework to reason about such challenges, especially if some crucial results from the cognitive science of reasoning and decision making are taken into account.[50]

As we argued, these contributions are essential to gain a solid understanding of real human decision making processes and the many factors (especially emotions and aspects of choice-architecture) which may influence and possibly distort them. In turn, considering such factors in the design of clinical and ethical guidelines and their communication is crucial for improving the effectiveness of current responses to the COVID-19 emergency.

## Acknowledgements

Gustavo Cevolani acknowledges financial support from the Italian Ministry of Education, Universities and Research (MIUR) through the grant n. 201743F9YE (PRIN 2017 project "From models to decisions").

## Notes

[1] Cf. F. ZHOU, T. YU, R. DU, *Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study*, in: «The Lancet», CCCXCV, n. 10229, 2020, pp. 1054-1062.
[2] Cf. https://extranet.who.int/publicemergency, last consulted on June 26th, 2020.
[3] Cfr. M. VERGANO, G. BERTOLINI, A. GIANNINI, G. GRISTINA, S. LIVIGNI, G. MISTRALETTI, F. PETRINI, SIAARTI, *Clinical ethics recommendations for the allocation of intensive care treatments in exceptional, resource-limited circumstances*, Italian Society of Anesthesia, Analgesia, Resuscitation, and Intensive Care(SIAARTI), March 16th, 2020.
[4] *Ibid.,* p. 3.
[5] *Ibidem*.
[6] *Ibidem*.
[7] *Ibidem*.
[8] *Ibidem*.
[9] *Ibid.*, pp. 5-6 - emphasis in the original.
[10] Cfr., e.g., I. CAVICCHI, *Gli anestetisti-rianimatori alla prova, fallita, con l'etica medica*, in: «Quotidiano Sanità», May 9th, 2020 – URL: http://www.quotidianosanita.it/scienza-e-farmaci/articolo.php?articolo_id=82279.
[11] Cfr. M. MORI, *Le raccomandazioni degli anestetisti e la fine dell'uguaglianza ippocratica*, in: «Quotidiano Sanità», May 13th, 2020 – URL: https://www.quotidianosanita.it/scienza-e-farmaci/articolo.php?articolo_id=82530
[12] Cfr. M. COZZOLI, *A chi dare la precedenza? Riflessioni etiche sulle raccomandazioni della SIAAR-*

*TI*, in: «Quotidiano Sanità», May, 9th, 2020 – URL: http://www.quotidianosanita.it/studi-e-analisi/articolo.php?articolo_id=82770

[13] Cfr. M. MORI, *Le raccomandazioni degli anestetisti e la fine dell'uguaglianza Ippocratica*, cit.

[14] Cfr. M. COZZOLI, *A chi dare la precedenza? Riflessioni etiche sulle raccomandazioni della SIAARTI*, cit.

[15] Cfr. Q. CHU, R. CORREA, T.L. HENRY, K.A. MCGREGOR, H. STOKLOSA, L. ROBINSON, S. JHA, A. ANNAMALAI, B.S. HSU, R. GUPTA, D.U. PATTON, L.A. MORENO-WALTON, C. BUTTS, C. CHAI, S.R. KUY, *Reallocating ventilators during the COVID-19 pandemic: Is it ethical?*, in: «Surgery», vol. CLXVIII, n. 3, 2020, pp. 388-391.

[16] *Ibidem*.

[17] Cfr. K. HUANG, R. BERNHARD, N. BARAK-CORREN, M. BAZERMAN, J.D. GREENE, *Veil-of-Ignorance reasoning favors allocating resources to younger patients during the COVID-19 crisis*, preprint, doi: 10.31234/osf.io/npm4v.

[18] Cfr. P. SOMMAGGIO, S. MARCHIONI, *Tragic choice in the time of pandemic*, in: «BioLaw Journal», vol. 2, 2020, pp. 453-458.

[19] D. EDMONDS, *Would you kill the fat man? The trolley problem and what your answer tells us about right and wrong*, Princeton University Press, Princeton 2014, p. 9.

[20] The original version of the example, which is used alongside many others in Foot's discussion of catholic views on abortion, asks us to consider «the driver of a runaway tram which he can only steer from one narrow track on to another; five men are working on one track and one man on the other; anyone on the track he enters is bound to be killed». The main difference between this and the now standard version is the fact that here the moral decision maker, being the driver of the trolley, is arguably more directly involved and bears more personal responsibility in the decision.

[21] P. FOOT, *The problem of abortion and the doctrine of the double effect*, in: «Oxford Review», vol. V, 1967, pp. 5-15, here p. 3.

[22] Cfr. B. HOOKER, *Ideal code, real world: A rule-consequentialist theory of morality*. Oxford University Press, New York/Oxford 2000; S. DARWALL (ed.), *Consequentialism*, Blackwell, Oxford 2003; J.D. GREENE, *Moral tribes: Emotion, reason, and the gap between us and them*, Penguin, New York 2013.

[23] J.D. GREENE, *Moral tribes*, cit., p. 107.

[24] Cfr. J. VON NEUMANN, O. MORGESTERN, *Theory of games and economic behaviour*, Princenton University Press, Princeton 1944.

[25] Since they are immaterial for our purposes, we skip here the philosophical discussion about the conceptual differences between consequentialism and utilitarianism, as well as among different variants of these positions.

[26] I. KANT, *Grounding for the metaphysics of morals* (1785), translated by J.W. ELLINGTON, Hackett, Indianapolis 1993.

[27] Cfr. T. HILL, *Human welfare and moral worth: Kantian perspectives*, Oxford University Press, Oxford/New York 2002; S. DARWALL, (ed.). *Deontology*, Blackwell, Oxford 2003.

[28] Cfr. J.D. GREENE, *Moral tribes*, cit.; M.R. WALDMANN, J.H. DIETERICH, *Throwing a bomb on a person versus throwing a person on a bomb: Intervention myopia in moral intuitions*, in: «Psychological Science», vol. XVIII, n. 3, 2007, pp. 247-253.

[29] Cfr. J.F. BONNEFON, A. SHARIFF, I. RAHWAN, *The social dilemma of autonomous vehicles*, in: «Science», vol. CCCLII, n. 6293, 2016, pp. 1573-1576.

[30] Cfr. E. AWAD, S. DSOUZA, R. KIM, J. SCHULZ, J. HENRICH, A. SHARIFF, J.-F. BONNEFON, I. RAHWAN, *The moral machine experiment*, in: «Nature», vol. DLXIII, n. 7729, 2018, pp. 59-64.

[31] Cfr. D. KAHNEMAN, P. SLOVIC, A. TVERSKY (eds.), *Judgment under uncertainty: Heuristics and biases*, Cambridge University Press, Cambridge/New York 1982; D. KAHNEMAN, *Thinking, fast and slow*, MacMillan, Basingstoke 2011.

[32] Cfr. G. GIGERENZER, *Gut feelings: Short cuts to better decision making*, Penguin, New York 2008.

[33] Cfr. R.H. THALER, C.R. SUNSTEIN, *Nudge: Improving decisions about health, wealth, and happiness*, Penguin, New York 2009.

[34] D. EDMONDS, *Would you kill the fat man?*, cit., p. 37.

[35] Cfr. J.J. THOMSON, *Killing, letting die, and the trolley problem*, in: «The Monist», vol. LIX, n. 2, 1976, pp. 204-217.

[36] Cfr. M. HAUSER, F. CUSHMAN, L. YOUNG, R. KANG-XING JIN, J. MIKHAIL, *A dissociation between moral judgments and justifications*, in: «Mind & Language», vol. XXII, n. 1, 2007, pp. 1-21.

[37] Cfr. F. CUSHMAN, L. YOUNG, *Patterns of moral judgment derive from nonmoral psychological representations*, in: «Cognitive Science», vol. XXXV, n. 6, 2011, pp. 1052-1075.

[38] Cfr. E.B. ROYZMAN, J. BARON, *The preference for indirect harm*, in: «Social Justice Research», vol. XV, n. 2, 2002, pp. 165-184.

[39] Cfr. J.D. GREENE, *Moral tribes*, cit.

[40] Cfr. J.D. GREENE, R.B. SOMMERVILLE, L.E. NYSTROM, J.M. DARLEY, J.D. COHEN, *An fMRI investigation of emotional engagement in moral judgment*, in: «Science», vol. CCXCIII, n. 5537, 2001, pp. 2105-2108.

[41] Along the same lines, a recent opinion survey by Romero-Rivas and Rodríguez-Cuadrado suggests a connection between "fast and slow" reasoning and the physical and/or psychological health status of participants in relation to the COVID-19 emergency. The authors interpret their results as suggesting that subjects more concerned or affected by the disease would favor System 1, providing deontological responses; while subjects less concerned or distant would favor System 2, making utilitarian choices. Cfr. C. ROMERO-RIVAS, S. RODRÍGUEZ-CUADRADO, *Moral decision making and mental health during the COVID-19 pandemic*, 2020, preprint, doi: 10.31234/osf.io/8whkg.

[42] Cfr. K.J. RANSOHOFF, *Patients on the trolley track: The moral cognition of medical practitioners and public health professionals*, 2011, Doctoral Dissertation, Harvard University.

[43] J.D. GREENE, *Moral tribes*, cit., pp. 128-131.

[44] Cfr. M. VERGANO, G. BERTOLINI, A. GIANNINI, G. GRISTINA, S. LIVIGNI, G. MISTRALETTI, F. PETRINI, SIAARTI, *Clinical ethics recommendations for the allocation of intensive care treatments in exceptional, resource-limited circumstances*, cit.

[45] Cfr. A. TVERSKY, E. SHAFIR, *Choice under conflict: The dynamics of deferred decision*, in: «Psychological Science», vol. III, n. 6, 1992, pp. 358-361.

[46] E. SHAFIR, I. SIMONSON, A. TVERSKY, *Reason-based choice*, in: «Cognition», vol. XLIX, n. 1-2, 1993, pp. 11-36.

[47] This explains a well-known phenomenon in marketing, known as the "decoy effect": in a choice between X and Y, adding an option Z which is clearly *inferior* with respect to Y systematically increases the probability of Y being chosen over X (here Z functions as the "decoy").

[48] D.A. REDELMEIER, E. SHAFIR, *Medical decision making in situations that offer multiple alternatives*, in: «JAMA», vol. CCLXXIII, n. 4, 1995, pp. 302-305, here p. 303.

[49] *Ibid.*, p. 304.

[50] For reasons of space, we limited our discussion in two ways. First, we only discussed the SIAARTI recommendations; however, it would be interesting to extend the analysis to other similar documents and to make comparisons between them. For instance, the *Swiss Academy of Medical Sciences* (ASSM) also published a document with recommendations for intensive care treatments in case of scarcity of resources, which was also broadly inspired by a utilitarian view of moral reasoning and raised similar issues to the ones discussed here (cfr. D. SCHEIDEGGER, T. FUMEAUX, S. HURST, M. SALATHÉ, *Covid-19-Pandemic. Intensive care medicine: Triage in case of bottlenecks*, 2020, Swiss Academy of Medical Sciences, URL: https://www.samw.ch/en/Ethics/Topics-A-to-Z/Intensive-care-medicine.html).
Second, we just described three possible determinants of moral decision making (the role of emotions and intuitive reasoning in Trolley scenarios; the influence of different medical specializations; the influence of additional options on clinical choices) among many discussed in the literature. Again, expanding our analysis in this respect would be necessary, but we have to leave this for another occasion.

## References


AWAD, E., DSOUZA, S., KIM, R., SCHULZ, J., HENRICH, J., SHARIFF, A., BONNEFON, J.-F., RAHWAN, I. (2018). *The moral machine experiment*. In: «Nature», vol. DLXIII, n. 7729, pp. 59-64.

BONNEFON, J.F., SHARIFF, A., RAHWAN, I. (2016). *The social dilemma of autonomous vehicles*. In: «Science», vol. CCCLII, n. 6293, pp. 1573-1576.

CAVICCHI, I. (2020). *Gli anestetisti-rianimatori alla prova, fallita, con l'etica medica*. In: «Quotidiano Sanità», May 9th, online available at the URL: http://www.quotidianosanita.it/scienza-e-farmaci/articolo.php?articolo_id=82279.

CHU, Q., CORREA, R., HENRY, T.L., MCGREGOR, K.A., STOKLOSA, H., ROBINSON, L., JHA, S., ANNAMALAI, A., HSU, B.S., GUPTA, R., PATTON, D.U., MORENO-WALTON, L.A., BUTTS, C., CHAI, C., KUY, S.R. (2020). *Reallocating ventilators during the COVID-19 pandemic: Is it ethical?*. In: «Surgery», vol. CLXVIII, n. 3, pp. 388-391.

COZZOLI, M. (2020). *A chi dare la precedenza? Riflessioni etiche sulle raccomandazioni della SIAARTI*. In: «Quotidiano Sanità», May, 9th, online available at the URL: http://www.quotidianosanita.it/studi-e-analisi/articolo.php?articolo_id=82770.

CUSHMAN, F., YOUNG, L. (2011). *Patterns of moral judgment derive from nonmoral psychological representations*. In: «Cognitive Science», vol. XXXV, n. 6, pp. 1052-1075.

DARWALL, S. (ed.) (2003), *Consequentialism*, Blackwell, Oxford.

DARWALL, S. (ed.) (2003). *Deontology*, Blackwell, Oxford 2003.

EDMONDS, D. (2014). *Would you kill the fat man? The trolley problem and what your answer tells us about right and wrong*, Princeton University Press, Princeton.

FOOT, P. (1967). *The problem of abortion and the doctrine of the double effect*. In: «Oxford Review», vol. V, pp. 5-15.

GIGERENZER, G. (2008). *Gut feelings: Short cuts to better decision making*, Penguin, New York.

GREENE, J.D. (2013). *Moral tribes: Emotion, reason, and the gap between us and them*, Penguin, New York.

GREENE, J.D., SOMMERVILLE, R.B., NYSTROM, L.E., DARLEY, J.M., COHEN, J.D. (2001). *An fMRI investigation of emotional engagement in moral judgment*. In: «Science», vol. CCXCIII, n. 5537, pp. 2105-2108.

HAUSER, M., CUSHMAN, F., YOUNG, L., KANG, R., XING, J., MIKHAIL, J. (2007). *A dissociation between moral judgments and justifications*. In: «Mind & Language», vol. XXII, n. 1, pp. 1-21.

HILL, T. (2002). *Human welfare and moral worth: Kantian perspectives*, Oxford University Press, Oxford/New York.

HOOKER, B. (2000). *Ideal code, real world: A rule-consequentialist theory of morality*, Oxford University Press, New York / Oxford.

HUANG, K., BERNHARD, R., BARAK-CORREN, N., BAZERMAN, M., GREENE, J.D. (2020). *Veil-of-Ignorance reasoning favors allocating resources to younger patients during the COVID-19 crisis*, preprint, doi: 10.31234/osf.io/npm4v.

KAHNEMAN, D. (2011). *Thinking, fast and slow*, MacMillan, Basingstoke.

KAHNEMAN, D., SLOVIC, P., TVERSKY, A. (eds.) (1982), *Judgment under uncertainty: Heuristics and biases*, Cambridge University Press, Cambridge / New York.

KANT, I. (1993). *Grounding for the metaphysics of morals* (1785), translated by J.W. ELLINGTON, Hackett, Indianapolis.

MORI, M. (2020). *Le raccomandazioni degli anestetisti e la fine dell'uguaglianza ippocratica*. In: «Quotidiano Sanità», May 13th, online available at the URL: https://www.quotidianosanita.it/scienza-e-farmaci/articolo.php?articolo_id=82530.

RANSOHOFF, K.J. (2011). *Patients on the trolley track: The moral cognition of medical practitioners and public health professionals*, Doctoral Dissertation, Harvard University.

REDELMEIER, D.A., SHAFIR, E. (1995). *Medical decision making in situations that offer multiple alternatives*. In: «JAMA», vol. CCLXXIII, n. 4, pp. 302-305.

ROMERO-RIVAS, C., RODRÍGUEZ-CUADRADO, S. (2020). *Moral decision making and mental health during the COVID-19 pandemic*, preprint, doi: 10.31234/osf.io/8whkg.

ROYZMAN, E.B., BARON, J. (2002). *The preference for indirect harm*. In: «Social Jus-

tice Research», vol. XV, n. 2, pp. 165-184.

SCHEIDEGGER, D., FUMEAUX, T., HURST, S., SALATHÉ, M. (2020). *Covid-19-Pandemic. Intensive care medicine: Triage in case of bottlenecks*, Swiss Academy of Medical Sciences, online available at the URL: https://www.samw.ch/en/Ethics/Topics-A-to-Z/Intensive-care-medicine.html).

SHAFIR, E., SIMONSON, I., TVERSKY, A. (1993). *Reason-based choice*. In: «Cognition», vol. XLIX, n. 1-2, pp. 11-36.

SOMMAGGIO, P., MARCHIONI, S. (2020). *Tragic choice in the time of pandemic*. In: «BioLaw Journal», vol. II, pp. 453-458.

THALER, R.H., SUNSTEIN, C.R. (2009). *Nudge: Improving decisions about health, wealth, and happiness*, Penguin, New York.

THOMSON, J.J. (1976). *Killing, letting die, and the trolley problem*. In: «The Monist», vol. LIX, n. 2, pp. 204-217.

TVERSKY, A., SHAFIR, E. (1992). *Choice under conflict: The dynamics of deferred decision*. In: «Psychological Science», vol. III, n. 6, pp. 358-361.

VERGANO, M., BERTOLINI, G., GIANNINI, A., GRISTINA, G., LIVIGNI, S., MISTRALETTI, G., PETRINI, F., SIAARTI (2020). *Clinical ethics recommendations for the allocation of intensive care treatments in exceptional, resource-limited circumstances*, available at https://bit.ly/2UyQ6I3.

VON NEUMANN, J., MORGESTERN, O. (1944). *Theory of games and economic behaviour*, Princenton University Press, Princeton.

WALDMANN, M.R., DIETERICH, J.H. (2007). *Throwing a bomb on a person versus throwing a person on a bomb: Intervention myopia in moral intuitions*. In: «Psychological Science», vol. XVIII, n. 3, pp. 247-253.

ZHOU, F., YU, T., DU, R. (2020). *Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study*. In: «The Lancet», CCCXCV, n. 10229, pp. 1054-1062.