

Translating theories of justice into a practice model for triage of scarce intensive care resources during a pandemic

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Abstract

During the COVID-19 pandemic, national triage guidelines were developed to address the anticipated shortage of life-saving resources, should ICU capacities be overloaded. Rationing and triage imply that in addition to individual patient interests, interests of population health have to be integrated. The transfer of theoretical and empirical knowledge into feasible and useful practice models and their implementation in clinical settings need to be improved. This paper analyzes how triage protocols could translate abstract theories of distributive justice into concrete material and procedural criteria for rationing intensive care resources during a pandemic. We reconstruct the development and implementation of a rationing protocol at a German university hospital: describing the ethical challenge of triage, clarifying the aspirational norms, and summarizing specific norms of fair triage and allocation for developing an institutional policy and practice model and implementing it. We reflect on how critical topics are seen by clinicians and what helped manage the perceived burdens of the triage dilemma. We analyze what can be learned from this debate regarding the difficult issues around triage protocols and their potential implementation into clinical settings. Analyzing the *ought-to-is* gap of triage, integrating abstract ethical principles into practical concepts, and evaluating those should clarify the benefits and risks of different allocation options. We seek to inform debates on triage concepts and policies to ensure the best possible treatment and fair allocation of resources as well as to help protect patients and professionals in worst-case scenarios.

KEYWORDS

distributive justice, pandemic, resource allocation, translational ethics, triage

1 | BACKGROUND

Rationing healthcare resources is complex and, in case of life-sustaining treatment, tragic.

A pandemic outbreak is different from disaster scenarios because the situation is neither spatially confined nor temporarily limited, and healthcare staff are at an increased risk of infection through exposure.

Despite devastating experiences from previous global healthcare crises, such as the influenza pandemics, we remain unprepared for public-health emergencies.¹ This puts individual physicians at risk of having to decide in isolation, relying only on their own moral reasoning. Potential consequences are unequal distribution, as well as severe

¹Kain, T., & Fowler, R. (2019). Preparing intensive care for the next pandemic influenza. *Critical Care*, 23(1), Article 337. <https://doi.org/10.1186/s13054-019-2616-1>

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emotional and moral distress in clinicians as reported from areas like Bergamo, where the surge of COVID-19 patients hit hospitals before ethically and medically reviewed guidelines became available.² Clinicians did not have unified criteria and standardized allocation protocols and, meanwhile, contested criteria like age were used instead to decide whether a patient should receive treatment or not.³ This shows that clinicians, institutions, and the public have to be better prepared for such scenarios in general. More concretely, clinicians emphasize learning from simulation-based trainings.⁴ In light of emotional, social, and psychological stress, of fears about legal repercussions, and of risks of biases, transparency and societal consensus on triage criteria are vital.⁵

The philosophical debate around distributive justice and fair allocation of scarce medical resources has long been ongoing. Although achieving consensus in some areas, the attention directed to the topic by the pandemic did not resolve it. This is reflected in the ethical heterogeneity of international triage advice,⁶ so much so that ethicists have called for adaptable multivalue frameworks.⁷ Not having a clear and agreed *ought* to inform practical approaches for triage exacerbates the challenge for clinicians worldwide.⁸

In this paper, we aim to illustrate how the ethical challenge of triage in clinical contexts can be better addressed.

2 | TRANSLATION OF ETHICAL PRINCIPLES INTO A PRACTICE MODEL

We build on the multilevel implementation framework by Sisk et al. for translating normative ethical principles into everyday practice, thereby bridging the *ought-to-is gap*.⁹ As shown in Figure 1, we first describe the ethical challenge of triage. We then outline the legal specifications set by German constitutional law, the aspirational and specific norms that define the *ought* of triage as summarized by the German Ethics Council, and their operationalization into the German triage guideline.¹⁰ To illustrate the practical implications, we summarize the development and implementation of an institutional policy and practice model at a German university hospital in late Spring 2020. Lastly, we reflect on the simulation of that practice model during the second wave of the COVID-19 pandemic and thus analyze how clinical implementation could be brought closer to the normatively well-grounded concept.

2.1 | The ethical challenge of triage

In noncrisis situations, limitations of treatment and resource allocation are based mainly on the needs of the individual patient.¹¹ Withdrawing life support is already regarded as an emotional and ethical challenge for intensivists, even if considered to be in the best interest of the patient.¹² When rationing is required, clinicians “will have to decide between patients so that we make the best use of our resources.”¹³ Hence, clinicians will need ethical guidance when facing the conflict between the duty to care for the individual and the

²Craxi, L., Vergano, M., Savulescu, J., & Wilkinson, D. (2020). Rationing in a pandemic: Lessons from Italy. *Asian Bioethics Review*, 12(3), 325–330. <https://doi.org/10.1007/s41649-020-00127-1>; Nacoti, M., Ciocca, A., Brambillasca, P., Fazzi, F., Pisano, M., Giupponi, M., Pesenti, A., Valoti, O., & Cereda, M. (2021). A Community-Based Model to the COVID-19 Humanitarian Crisis. *Front Cell Infect Microbiol*, 15(11), 639579. <https://doi.org/10.3389/fcimb.2021.639579>

³Rosenbaum, L. (2020). Facing Covid-19 in Italy—Ethics, logistics, and therapeutics on the epidemic's front line. *New England Journal of Medicine*, 382(20), 1873–1875. <https://doi.org/10.1056/NEJMp2005492>

⁴Butler, C. R., Webster, L. B., Diekema, D. S., Gray, M. M., Sakata, V. L., Tonelli, M. R., & Vranas, K. C. (2022). Perspectives of triage team members participating in statewide triage simulations for scarce resource allocation during the COVID-19 pandemic in Washington State. *JAMA Network Open*, 5(4), Article e227639. <https://doi.org/10.1001/jamanetworkopen.2022.7639>

⁵Butler, C. R., Webster, L. B., Sakata, V. L., Tonelli, M. R., Diekema, D. S., & Gray, M. M. (2022). Functionality of scarce healthcare resource triage teams during the COVID-19 pandemic: A multi-institutional simulation study. *Critical Care Explorations*, 4(1), e0627. <https://doi.org/10.1097/cce.0000000000000627>; Chuang, E., Cuartas, P. A., Powell, T., & Gong, M. N. (2020). “We're not ready, but I don't think you're ever ready.” Clinician perspectives on implementation of crisis standards of care. *AJOB Empirical Bioethics*, 11(3), 148–159. <https://doi.org/10.1080/23294515.2020.1759731>; Curiel, T. J. (2006). Murder or mercy? Hurricane Katrina and the need for disaster training. *New England Journal of Medicine*, 355(20), 2067–2069. <https://doi.org/10.1056/NEJMp068196>; Knochel, K., Adaktylos-Surber, K., Schmolke, E. M., Meier, L. J., Kuehlmeier, K., Ulm, K., Buyx, A., Schneider, G., & Heim, M. (2022). Preparing for the worst-case scenario in a pandemic: Intensivists simulate prioritization and triage of scarce ICU-resources. *Critical Care Medicine*, 50(12), 1714–1724. <https://doi.org/10.1097/CCM.0000000000005684>

⁶Jöbges, S., Vinay, R., Luyckx, V. A., & Biller-Andorno, N. (2020). Recommendations on COVID-19 triage: International comparison and ethical analysis. *Bioethics*, 34(9), 948–959. <https://doi.org/10.1111/bioe.12805>; Meier, L. J. (2022). Systemising triage: COVID-19 guidelines and their underlying theories of distributive justice. *Medicine, Health Care and Philosophy*, 25(4), 703–714. <https://doi.org/10.1007/s11019-022-10101-3>

⁷Emanuel, E. J., Persad, G., Upshur, R., Thome, B., Parker, M., Glickman, A., Zhang, C., Boyle, C., Smith, M., & Phillips, J. P. (2020). Fair allocation of scarce medical resources in the time of Covid-19. *New England Journal of Medicine*, 382(21), 2049–2055. <https://doi.org/10.1056/NEJMs2005114>

⁸Antommaria, A. H. M., Gibb, T. S., McGuire, A. L., Wolpe, P. R., Wynia, M. K., Applewhite, M. K., Caplan, A., Diekema, D. S., Hester, D. M., Lehmann, L. S., McLeod-Sordjan, R., Schiff, T., Tabor, H. K., Wieten, S. E., & Eberl, J. T. (2020). Ventilator triage policies during the COVID-19 pandemic at U.S. hospitals associated with members of the association of bioethics program directors. *Annals of Internal Medicine*, 173(3), 188–194. <https://doi.org/10.7326/M20-1738>; Aquino, Y. S. J., Rogers, W. A., Scully, J. L., Magrabi, F., & Carter, S. M. (2022). Ethical guidance for hard decisions: A critical review of early international COVID-19 ICU triage guidelines. *Health Care Analysis*, 30(2), 163–195. <https://doi.org/10.1007/s10728-021-00442-0>

⁹Sisk, B. A., Mozersky, J., Antes, A. L., & DuBois, J. M. (2020). The “ought-is” problem: An implementation science framework for translating ethical norms into practice. *American Journal of Bioethics*, 20(4), 62–70. <https://doi.org/10.1080/15265161.2020.1730483>

¹⁰Ethikrat, D. (2020). *Solidarität und Verantwortung in der Corona-Krise. Ad-hoc Empfehlung*. <https://www.ethikrat.org/fileadmin/Publikationen/Ad-hoc-Empfehlungen/deutsch/ad-hoc-empfehlung-corona-krise.pdf>; Marckmann, G., Neitzke, G., Schildmann, J., Michalsen, A., Dutzmann, J., Hartog, C., Jöbges, S., Knochel, K., Michels, G., Pin, M., Riessen, R., Rogge, A., Taupitz, J., & Janssens, U. (2020). Decisions on the allocation of intensive care resources in the context of the COVID-19 pandemic: Clinical and ethical recommendations of DIVI, DGINA, DGAI, DGIIN, DGNI, DGP, DGP and AEM. *Med Klin Intensivmed Notfmed*, 115(Suppl. 3), 115–122. <https://doi.org/10.1007/s00063-020-00709-9>

¹¹Carlet, J., Thijs, L. G., Antonelli, M., Cassell, J., Cox, P., Hill, N., Hinds, C., Pimentel, J. M., Reinhart, K., & Thompson, B. T. (2004). Challenges in end-of-life care in the ICU. *Intensive Care Medicine*, 30(5), 770–784. <https://doi.org/10.1007/s00134-004-2241-5>

¹²Braganza, M. A., Glossop, A. J., & Vora, V. A. (2017). Treatment withdrawal and end-of-life care in the intensive care unit. *BJA Education*, 17(12), 396–400. <https://doi.org/10.1093/bjaed/mkx031>

¹³Rubin, M. A., & Truog, R. D. (2017). What to do when there aren't enough beds in the PICU. *AMA Journal of Ethics*, 19(2), 157–163. <https://doi.org/10.1001/journalofethics.2017.19.2.ecas3-1702>

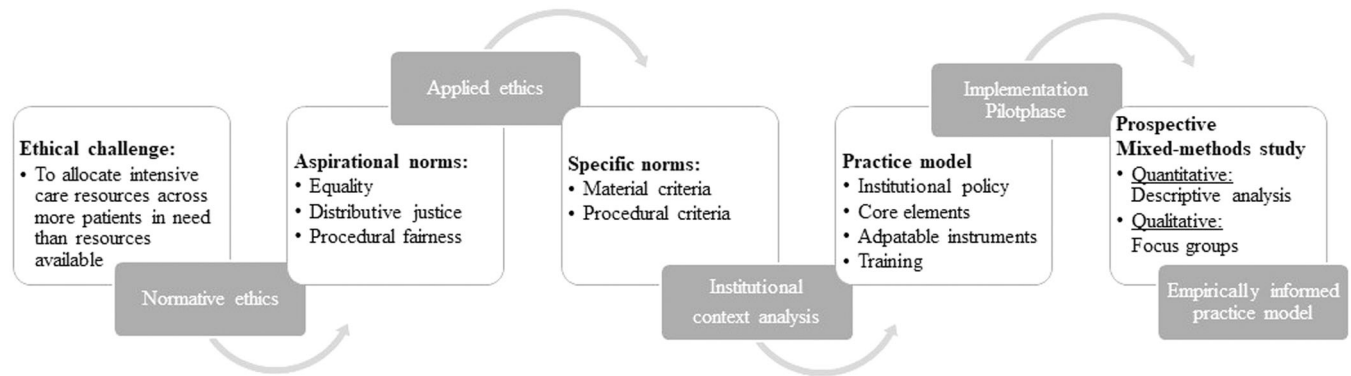


FIGURE 1 Framework for the implementation of ethical norms applied to pandemic triage concepts. Source: Adapted from Sisk et al. (2020).

stewardship of resources for the public.¹⁴ Ethically, arguments for individual and public health obligations must be balanced within constitutional specifications and assimilated in institutional contexts. This requires transparent and objective material criteria as well as procedural defaults, which allow allocation of resources without discriminating on the basis of personal characteristics like age, social status, or disability.¹⁵ Clinicians worldwide face similar challenges in triage, but the legal specifications are different. Implemented in 1949 after World War II, the German constitution is grounded in Kantian ideals about the equality of all humans. It prohibits weighing the worth of human lives. No human should be used as a means for another, but only as ends in themselves.¹⁶ This notion is integrated in the constitutional postulate to protect and guarantee human dignity, an eternally irrevocable moral demand.¹⁷ To illustrate, in the aftermath of the September 11th attacks, the German constitutional court ruled that a passenger airline taken over by terrorists en route to a large crowd must not be shot down by German authorities (§ 14 Abs. 3 LuftSiG).¹⁸ Sacrificing individuals on the plane to save the members of the crowd is irreconcilable with the passengers' constitutionally granted right to life and human dignity—they may not be treated 'as mere objects' towards an end only. Even if they are deemed not to survive the crash and would hence die only minutes later, the important moral distinction is that it happens at the hands of terrorists and not sanctioned by German government officials.

In 2020, when the triage guideline was developed and conceptualized as outlined here, there was no legal regulation on pandemic triage in

Germany. Only at the end of 2022 did the German Parliament pass the new infection protection law¹⁹ that explicitly excludes ex-post triage. This implies that all patients whose treatment has already begun and is still indicated are excluded from triage consideration. The current legislation represents a strict deontologic position that would likely lead to more deaths than other approaches.²⁰ Clinicians, however, are still asked to solve the dilemma: keeping up critical care through rationing of life-saving resources, with continuously incoming patients.

2.2 | From the aspirational norm to the specific norm

To address the ethical challenge of triage, it is important to describe the *oughts*, which are existing normative claims but are controversial. This is beyond the scope of this paper, and has been attempted elsewhere, to comprehensively delineate all ethical norms, values, and principles relevant to a fair pandemic triage.²¹ Here, we focus on the aspirational norms that underpin the German triage guideline developed by the German Society for Intensive and Emergency Medicine (DIVI) in conjunction with the German Society for Ethics in Medicine (AEM) in March 2020.²² At the same time, the German Ethics Council published an ad hoc recommendation about solidarity and responsibility during the pandemic, which included theoretical guidance about distributive justice and resource allocation in the context of German constitutional law.²³ The norms of these documents can be summarized as follows:

¹⁴Institute of Medicine, & Committee on Guidance for Establishing Standards of Care for Use in Disaster Situations. (2009). Guidance for establishing crisis standards of care for use in disaster situations: A letter report. In B. M. Altevogt, C. Stroud, S. L. Hanson, D. Hanfling, & L. O. Gostin (Eds.), *Scarce resources, demand for healthcare services, and standards of care*. National Academies Press (US). <https://doi.org/10.17226/12749>

¹⁵Ethikrat, op. cit. note 10, p. 4.

¹⁶Kant, I., Schneewind, J. B., Baron, M., & Kagan, S. (2002). *Groundwork for the metaphysics of morals*. In A. W. Wood (Ed.), (pp. 46–47). Yale University Press. <http://www.jstor.org/stable/jctt1njwjt>

¹⁷Dürig, G. (1956). Der Grundrechtssatz von der Menschenwürde: Entwurf eines praktikablen Wertesystems der Grundrechte aus Art. 1 Abs. I in Verbindung mit Art. 19 Abs. II des Grundgesetzes. *Archiv des öffentlichen Rechts*, 81 (N.F. 42)(2), 117–157. <http://www.jstor.org/stable/44303797>

¹⁸Press release of Federal Constitutional Court. (2006). <https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/DE/2006/bvg06-011.html>

¹⁹Press release of the Federal Ministry of Health. (2022). Retrieved August 8, 2022, from <https://www.bundesgesundheitsministerium.de/presse/pressemitteilungen/fortentwicklung-infektionsschutzgesetzes-ifsg.html>

²⁰Bartenschlager, C. C., Brunner, J. O., & Heller, A. R. (2022). Evaluation von scorebasierten Ansätzen für die Ex-post-Triage auf Intensivstationen während der COVID-19-Pandemie: eine simulationsbasierte Analyse. *Notfall + Rettungsmedizin*, 25(4), 221–223. <https://doi.org/10.1007/s10049-022-01035-7>

²¹Teles Sarmiento, J., Lirio Pedrosa, C., & Carvalho, A. S. (2022). What is common and what is different: Recommendations from European scientific societies for triage in the first outbreak of COVID-19. *Journal of Medical Ethics*, 48(7), 472–478. <https://doi.org/10.1136/medethics-2020-106969>; Aquino, Y. S. J., et al., op. cit. note 8, p. 4; Meier, op. cit. note 6, p. 4.

²²Marckmann, G., et al., op. cit. note 10, p. 4.

²³Ethikrat, op. cit. note 10, p. 4.

- There should be equal treatment of all human beings.
- Human dignity should be respected.
- Everybody has a right to life, health, and freedom from harm.
- There should be procedural justice to enable fair triage decision-making.

Translating these norms into more specific, clinically applicable rules in the German triage guideline is addressed directly at clinicians and included the following:

- I. All patients who are critically ill should be assessed thoroughly and individually including early evaluation of their respective preferences. Those whose therapy is indicated and who agree to ICU treatment should be considered for allocation.
- II. Resources should be allocated among all patients requiring life-sustaining intensive care: (a) regardless of their COVID-19 infection status; (b) regardless of whether they are already being treated or not; and (c) clinicians should neither categorically exclude patients nor favor or disadvantage them based on age, sex, ethnicity, social status, or disability and chronic conditions.
- III. The criterion of likelihood to survive to hospital discharge should be used for allocation to minimize triage-related deaths.
- IV. The process of decision-making should be transparent and consistent. Therefore, an interdisciplinary, interprofessional consensus-based decision-making approach, clear accountabilities, communication, and documentation structures need to be defined and organized.

The specific norms I and II express the egalitarian part of the distributive principle based on considerations of equal human dignity. In contrast, purely outcome-driven utilitarian principles would aim to maximize the use of available resources with regard to overall survival and efficiency, that is, favor patients with the highest chance of survival for the longest time and the shortest expected time on ICU. Yet, such principles neglect individual rights to care and to inherent human dignity. Patients with chronic diseases, disabilities, or the elderly would consistently not be considered for treatment.²⁴ Egalitarian principles, on the other hand, emphasize equal opportunity, with some even suggesting redistribution of goods to rectify inequalities²⁵ or recommending nonmedical approaches, such as random allocation when solving a tie situation.²⁶ As outlined above, the egalitarian principles of the German constitution do not allow for purely utilitarian value judgments regarding whose survival is most beneficial.²⁷ Therefore, the authors of the guideline relied on, to

some extent, utilitarian outcome-based criteria (survival to hospital discharge regardless of expected lifespan) and on the right of equal access to intensive care resources: each critically ill patient has the equal right to be individually assessed and considered for triage. This shows the attempt to integrate utilitarian and egalitarian concepts of justice.²⁸

Regarding equality, the German triage guideline also excludes category-based decision-making such as an age-related cut-off point suggested in other guidelines.²⁹ Further, it was clarified that ethnicity, social status, or other demographic variables are not allowed to influence any individual or rationing decision.³⁰ In Germany, this also implies that healthcare workers would not be prioritized, as is the case in some other countries, for example, Canada.³¹ Likewise, patients with disabilities have to be assessed in an equal manner as any other patient. Disabilities or chronic complex conditions would only be taken into account for triage when significantly relevant to prognostic assessment. This has to be evaluated with specific interdisciplinary expertise and a team-based approach.³² Some authors also propose considering social inequalities when making allocation decisions.³³

The German guideline focuses on the current critical illness and makes no value judgment regarding access to health care due to prior inequalities or on the basis of quality of life. Every critically ill patient in the hospital should be included in triage, regardless of whether treatment is already being given or is to be initiated. This approach requires re-evaluation of ongoing treatment and repeated triage of patients under intensive care.

It seems contradictory to apply likelihood of survival that statistically depends on, for example, age and comorbidities. However, the outlined procedural approach ensures equal access, individual assessment, and re-evaluation for every patient. Particularly since there is no accurate prognostic scoring system, there is a major need to ensure inclusion of all information by best scientific and clinical expertise and to provide procedural fairness. However, it is highly important to differentiate the patient-centered evaluation of the benefit for the individual decision to limit treatment from a distributive triage decision that implies withholding or withdrawal

²⁴Savulescu, J., Vergano, M., Craxi, L., & Wilkinson, D. (2020). An ethical algorithm for rationing life-sustaining treatment during the COVID-19 pandemic. *British Journal of Anaesthesia*, 125(3), 253–258. <https://doi.org/10.1016/j.bja.2020.05.028>

²⁵Dworkin, R. (1981). What is equality? Part 2: Equality of resources. *Philosophy and Public Affairs*, 10(4), 283–345.

²⁶Tate, A. J. M. (2022). Rethinking the ethics of pandemic rationing: Egalitarianism and avoiding wrongs. *Cambridge Quarterly of Healthcare Ethics*, 31(2), 247–255. <https://doi.org/10.1017/S0963180121000633>

²⁷Ethikrat, op. cit. note 10, p. 4.

²⁸Supady, A., Curtis, J. R., Abrams, D., Lorusso, R., Bein, T., Boldt, J., Brown, C. E., Duerschmied, D., Mataxa, V., & Brodie, D. (2021). Allocating scarce intensive care resources during the COVID-19 pandemic: Practical challenges to theoretical frameworks. *Lancet Respiratory Medicine*, 9(4), 430–434. [https://doi.org/10.1016/s2213-2600\(20\)30580-4](https://doi.org/10.1016/s2213-2600(20)30580-4)

²⁹Hurst, S., Filipovic, M., Heise, A., Kronen, T., Rüttsche, B. and Schaffert, B. (2013). *Intensive care triage under exceptional resource scarcity. Guidance on the application of Section 9.3 of the SAMS Guidelines "Intensive-care interventions"*. (2013) Retrieved August 8, 2022, from <https://www.samw.ch/en/Ethics/Topics-A-to-Z/Triage-intensive-care-medicine.html>

³⁰Dutzmann, J., & Michalsen, A. (2021). "Triage-Empfehlungen" der Fachgesellschaften: Hintergrund, Zusammenfassung und Kommentar [Triage recommendations of the specialist societies: Background, summary and comments]. *Chirurg*, 92(2), 128–133. <https://doi.org/10.1007/s00104-021-01354-4>

³¹White, D. B., & Lo, B. (2021). Mitigating inequities and saving lives with ICU triage during the COVID-19 pandemic. *American Journal of Respiratory and Critical Care Medicine*, 203(3), 287–295. <https://doi.org/10.1164/rccm.202010-3809CP>; Jöbges, S., et al., op. cit. note 6, p. 4.

³²Scully, J. L. (2020). Disability, disablism, and COVID-19 pandemic triage. *Journal of Bioethical Inquiry*, 17(4), 601–605. <https://doi.org/10.1007/s11673-020-10005-y>

³³White & Lo, op. cit. note 31, p. 9.

due to shortage of resources and considers public health obligations to some extent.

In line with not using a previous disability as a factor or definite risk in triage, it was concluded that previous treatment or admission to the ICU should also not be understood as a factor or definite risk when making impartial triage decisions. The German triage guideline highlights the human dignity-based judgment to not instrumentalize one human for the benefit of another. However, in this case, there are equals with an equal claim to benefit from healthcare resources that cannot be equally granted due to circumstances.

To prevent disadvantages and discrimination, the German Guideline recommends the likelihood to survive the current intensive care treatment as a criterion for allocation (specific norm III), and does not consider long-term outcome or quality of life.³⁴ This conforms to the requirement for equal treatment as each patient has a likelihood to survive to hospital discharge that can be objectively assessed, particularly over time.³⁵ It makes no prediction or judgment about the quality or duration of life after discharge. Such considerations are ethically controversial and impractical as they would require complex and difficult prognostics in a crisis situation when time and information are already limited.³⁶ Long-term outcome and quality-of-life considerations would also introduce bias. Patients with pre-existing conditions that affect the quality of life or limit life expectancy could be at higher risk to be systematically disadvantaged, deprioritized, or even excluded from treatment.³⁷

The specific norm IV expresses a commitment to procedural justice. Procedural justice specifies the fairness of decision-making processes focusing on transparency, control, and on the principles of consistency, competency, benevolence, and voice.³⁸ Leventhal already outlined consistency, bias suppression, accuracy, correctness, representativeness, and ethicality as criteria for procedural justice.³⁹ It is beyond the scope of this paper to provide a detailed analysis, but procedural justice is a prerequisite for triage protocols. The German triage guideline states that there should be a previously agreed on, transparent, and consistent process of decision-making with clear accountabilities and competencies. It should aim to reach a consensus among the interdisciplinary and interprofessional team members and provide a concept for managing dissent. The result of

the process should be clearly documented and communicated to all relevant parties involved.

2.3 | From specific norms to an institutional practice model

Developing and implementing a triage practice model cannot solve the ethical dilemmas as such. Still, it is essential to guide triage, protect patients, and support front-line clinicians.

During COVID-19 pandemic triage, an ethical issue deliberated by philosophers in theory suddenly became reality and a tremendous burden to all involved. In addition, there was a lack of evidence on how to implement a fair triage procedure. In Germany, structures for triage in catastrophes were available, but not in case of ongoing scarcity in intensive care.

Preparation for catastrophes needs to address the lack of implemented practice models and training to avoid risks for patients, families, and healthcare professionals.⁴⁰ Many institutions across the world developed guidelines and protocols ad hoc during the pandemic, sometimes without the involvement of relevant stakeholders.⁴¹

In Germany, interdisciplinary professionals of intensive care and medical ethics contributed to the triage guideline, which builds on the four aforementioned norms and already integrates some prerequisites of the *Is*. In order not to violate the physicians' professional duty to care for all patients, for example, purely egalitarian approaches such as lottery or "first-come, first served" were excluded.⁴² However, the involvement of other stakeholders could have further reduced risks of disadvantage or discrimination.

In the following, we explain how we operationalized the specific norms given in the German triage guideline into a hospital policy and practice model in late Spring 2020. Implementing a guideline means assimilating a policy into a particular institutional context. Therefore, we considered the Consolidated Framework for Implementation Research⁴³ and applied some methods of participatory research. The deficiency of public debates and the lack of a legal regulation for pandemic triage complicated a community-based participatory project that engages public and representatives of vulnerable groups.

³⁴Marckmann, G., et al., op. cit. note 10, p. 4.

³⁵Beil, M., Sviri, S., Flaatten, H., De Lange, D. W., Jung, C., Szczeklik, W., Leaver, S., Rhodes, A., Guidet, B., & van Heerden, P. V. (2021). On predictions in critical care: The individual prognostication fallacy in elderly patients. *Journal of Critical Care*, 61, 34–38. <https://doi.org/10.1016/j.jcrc.2020.10.006>; Ferreira, F. L., Bota, D. P., Bross, A., Melot, C., & Vincent, J. L. (2001). Serial evaluation of the SOFA score to predict outcome in critically ill patients. *JAMA*, 286(14), 1754–1758. <https://doi.org/10.1001/jama.286.14.1754>; Souter, M. J., Blissitt, P. A., Blosser, S., Bonomo, J., Greer, D., Jichici, D., Mahanes, D., Marcolini, E. G., Miller C., Sangha, K., & Yeager, S. (2015). Recommendations for the critical care management of devastating brain injury: Prognostication, psychosocial, and ethical management. *Neurocritical Care*, 23(1), 4–13. <https://doi.org/10.1007/s12028-015-0137-6>

³⁶Emanuel, E. J., et al., op. cit. note 7, p. 4.

³⁷Marckmann, G., et al., op. cit. note 10, p. 4.

³⁸Lee, M. K., Jain, A., Cha, H. J., Ojha, S., & Kusbit, D. (2019). Procedural justice in algorithmic fairness. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW), 1–26. <https://doi.org/10.1145/3359284>

³⁹Leventhal, G. S. (1980). What should be done with equity theory? In K. J. Gergen, M. S. Greenberg, & R. H. Willis (Eds.), *Social exchange: Advances in theory and research* (pp. 27–55). Springer US. https://doi.org/10.1007/978-1-4613-3087-5_2

⁴⁰Biddison, L. D., Berkowitz, K. A., Courtney, B., De Jong, C. M., Devereaux, A. V., Kisson, N., Roxland, B. E., Sprung, C. L., Dichter, J. R., Christian, M. D., Powell, T., & Task Force for Mass Critical, C. (2014). Ethical considerations: Care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. *Chest*, 146(4 Suppl.), e1455–1555. <https://doi.org/10.1378/chest.14-0742>; Ehmann, M. R., Zink, E. K., Levin, A. B., Suarez, J. I., Belcher, H. M. E., Daugherty Biddison, E. L., Doberman, D. J., D'Souza, K., Fine, D. M., Garibaldi, B. T., Gehrie, E. A., Golden, S. H., Gurses, A. P., Hill, P. M., Hughes, M. T., Kahn, J. P., Koch, C. G., Marx, J. J., Meisenberg, B. R., ... Kachalia, A. (2021). Operational recommendations for scarce resource allocation in a public health crisis. *Chest*, 159(3), 1076–1083. <https://doi.org/10.1016/j.chest.2020.09.246>; Butler, C. R., et al., op. cit. note 5, p. 4; Curiel, T. J., et al., op. cit. note 5, p. 4.

⁴¹Antommara, A. H. M., et al., op. cit. note 8, p. 4.

⁴²Marckmann, G., et al., op. cit. note 10, p. 4.

⁴³Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science*, 4, 50. <https://doi.org/10.1186/1748-5908-4-50>

During times of an acute crisis, such a project could not have been carried out so quickly to develop an applicable protocol for dealing with the ongoing crisis. To actively involve professionals and to collaborate from the beginning, we set up a taskforce with institutional stakeholders: intensivists, medical ethicists, legal experts, and process managers at our hospital. In a multistep approach, we analyzed the current clinical processes of ICU resource allocation; where we identified difficulties with implementation, the taskforce defined new structures as described below. In addition to development and implementation, we conducted a prospective simulation study as a real-world situated study that included trainings for intensivists and the newly developed institutional instruments: prioritization team and ad hoc ethics team as described below.⁴⁴

2.4 | Institutional practice model: Characteristics and implementation

As a first step, we summarized the specific norms and the key principles from the German guideline, to inform clinicians, the clinical ethics committee, and the clinic management board. Second, the taskforce conducted an interdisciplinary, participatory workshop. Practitioners from all medical specialties as well as representatives of legal service, quality management, and the clinic management board contributed. We applied an adapted Victorian calling approach with the following themes:⁴⁵

- Intensive care resources: coordination, accountabilities, human resources.
- Collaborative decision-making and assessment of likelihood to survive to hospital discharge: process, assurance, and criteria.
- Documentation and communication: Implementation, IT, and data protection.

This workshop illustrated that important issues still remained vague and required clarification:

- How to carry out the whole prioritization process including defining the time frame, personal resources, accountabilities, and stepwise procedure from the admission of patients to assessment and evaluation up to triage decisions,
- How to define new institutional instruments such as a prioritization team (triage team) and an ad hoc ethics team, and
- How to ensure transparent documentation and communication including a support system for bedside clinicians.

To answer these questions, hospital process management supported the interdisciplinary taskforce, and both systematically analyzed the relevant clinical settings and procedures in four half-day meetings. Here, we scrutinized the entire policy and practice model in detail before starting the implementation process. The core elements and the newly developed instruments of our triage practice model are summarized in Table 1 and shown in Figure 2.

We operationalized the requirement of equal access to health-care resources through the following rule:

All patients should be considered for treatment, regardless of whether they are newly admitted or already receiving treatment.

As stressed, the infection protection law currently, as of early 2023, prohibits limiting life-sustaining treatment due to shortage of resources. The March 2020 version of the guideline included ex-post triage and reallocation.

An overview of all patients who were currently being treated in the ICU and should be considered for triage requires detailed information and effective communication. Early preparation was therefore an essential part of a triage practice model. Implementing procedural justice, the next rule describes the equal and accurate assessment of all patients:

Before a triage decision is made, all ICU patients have to be assessed carefully in an equal and standardised manner regarding their individual likelihood to survive to hospital discharge.

Therefore, the triage model for our hospital was conceptualized in three phases, as presented in Figure 2. The preparation period (phases A and B) is a core element. It should definitely be operationalized with regard to time constraints and the complexity of interdisciplinary team-based decision-making. This preparation period was integrated into the institutional pandemic crises management plan. It entails preparing for the worst-case scenario before resources become severely depleted. This is how the team-based decision-making procedure and interdisciplinarity can be implemented to ensure transparency and objectivity:

A consensus-oriented, team-based, interdisciplinary approach is needed to minimize potential biases, disadvantages and discrimination when assessing the criterion of likelihood to survive current ICU treatment and making triage decisions.

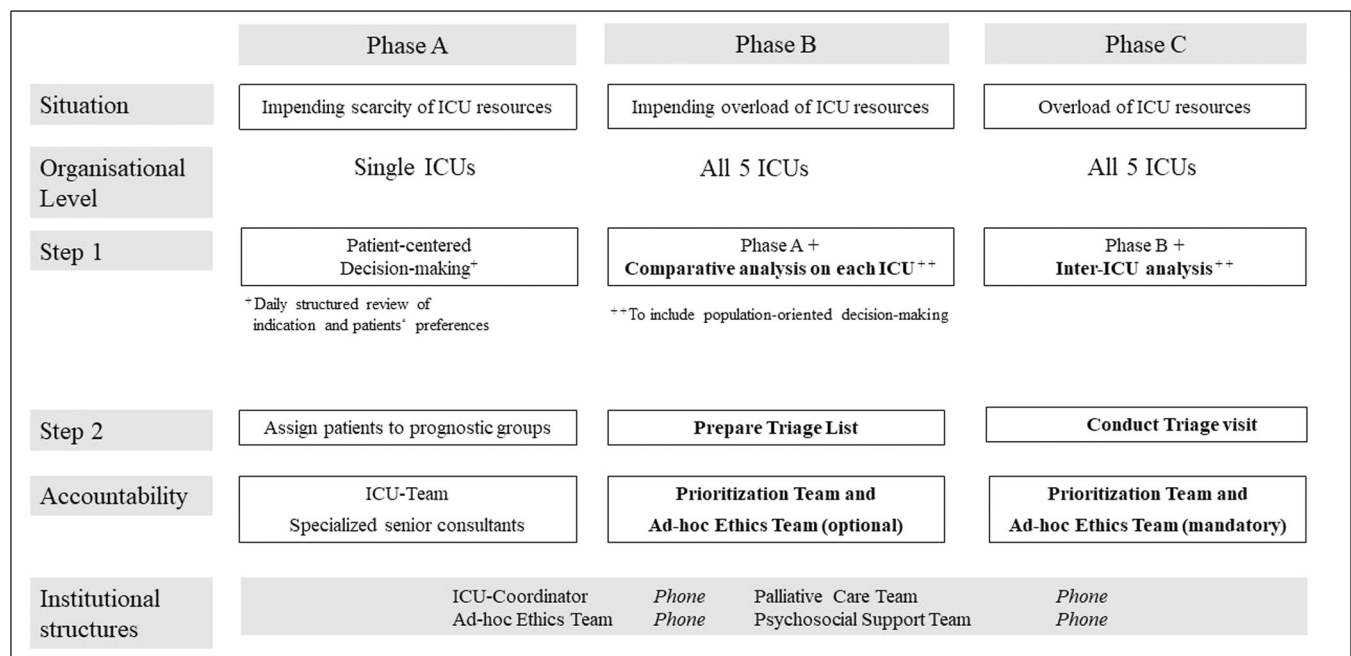
To provide best expertise, senior physicians from relevant specialties should be involved during the preparation period, with a team of intensivists serving as the prioritization team. Including medical ethicists was optional in phases A and B, but mandatory for triage decisions. For this, the clinicians explicitly requested ethical support, whereas patient-centered decision-making in phases A and

⁴⁴Knochel, K., et al., op. cit. note 5, p. 4.

⁴⁵Defila, R., Giulio, A. D., & Kaufmann-Hayoz, R. (2015). "Victorian Calling"—eine Tagungsmethode für den transdisziplinären Dialog. In M. Niederberger & S. Wassermann (Eds.), *Methoden der Experten- und Stakeholdereinbindung in der sozialwissenschaftlichen Forschung* (pp. 141–164). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-01687-6_8

TABLE 1 Translational process from norms to a practice model for the allocation of scarce intensive care resources during the COVID-19 pandemic in Germany, including core components and adaptable instruments.

| Normative ethics (aspirational norms) | Applied ethics (specific norms) | Intervention (practice model) |
|---|---|--|
| Egalitarianism: Principle of equality | Random principle (Lottery) | Not applied so far because this principle is opposed to the duty to care and the professional ethics code |
| Egalitarianism: All lives are of equal value | <p><i>Substantive criteria:</i> To refuse age, residual lifespan, social status, pre-existing disease, disability, or vaccination status nor QALYs as criterion</p> <p><i>Procedural criteria:</i> To ensure equal access to resources for COVID-19 and non-COVID-19 patients</p> | Preparation Phase A + B to ensure that every patient will be assessed and (re-)evaluated ^a Interdisciplinary team-based assessment and re-evaluation of likelihood of surviving current ICU treatment and documentation in Phases A-C ^a Patient-centered individual decision-making as long as possible and providing all measures to prevent triage including augmenting existing resources and regularly checking regional, national, and international ICU resources ^a |
| Utilitarianism: Benefits and cost-effectiveness Maximize benefits To save the greatest number of lives. To consider remaining lifespan/to save most life years | <p><i>Substantive criteria:</i> Likelihood to survive current ICU treatment to hospital discharge According to German constitutional law, lifespan considerations are not permitted</p> | |
| Rule of rescue: Duty to care Do not harm To minimize the number of preventable deaths | To consider ethical equivalence of withholding and withdrawing of treatment | To implement re-evaluation of already started treatments and repeated triage ^a |
| Procedural fairness: Objectivity Transparency Consistency Reasonableness | <p><i>Procedural criteria:</i> Interdisciplinary, team-based collaborative decision-making Documentation Communication on ICU, at the clinic, with patients, families, and the public</p> | To implement the interdisciplinary assessment and re-evaluation as a collaborative approach with defined accountabilities and communication structures Prioritization/Triage Team ^b Ad hoc Ethics Team ^b Survey form ^b |

^aCore components.^bAdaptable instruments.**FIGURE 2** The 3-Phase-Triage Practice Model at a German university hospital during the COVID-19 pandemic.

B was perceived as more familiar and ethics support was only required in case of uncertainty or dissensus.

Transparent communication and psychosocial support structures should prevent loss of trust, minimize risks of bias, and allow sharing of responsibility. Following this, further rules for implementation were:

The triage practice model also should include transparent communication between hospital team, patients and families as well within the institution.

Best possible care has to be provided for those patients who would not receive intensive care treatment or where this would be discontinued.

To ensure that all information was readily and comprehensively available, a triage survey form was adapted from the German guideline. This allows to compile all information, to use them for the comparative analysis and subsequent triage decisions. The process analysis also elaborated the steps after triage decisions would have been made, how to provide further treatment as best as possible, and how to support clinicians. Besides the existing psychosocial support team and clinical ethics committee, we developed the following new institutional instruments and defined the accountabilities, duties, and schedules as shown in Figure 2:

- A *Prioritization/Triage Team*, established as a combination of treating and nontreating intensivists (one from internal medicine and another from anesthesiology) to execute the preparation and the triage decisions.
- An *Ad hoc Ethics Team* in the form of an interdisciplinary taskforce recruited from the clinical ethics committee to support the prioritization team.
- A *Psychosocial support Team for Crises* for patients, families, and HCPs.
- An *Institutional policy* including a *patient survey document* and *materials* to support implementation, such as presentations, written information, and pocket cards.

The prioritization/triage practice model was piloted and evaluated in a prospective simulation study in a real-world context at a German university hospital. The mixed-methods approach enabled us to gain deeper insights into the perspectives of intensivists who had to face a double-agent role as treating physicians and as triage team members during the simulation, which we described in detail elsewhere.⁴⁶

3 | DISCUSSION

In some countries, patients dying due to triage was a tragic reality, even in some traditionally well-resourced settings. In such a healthcare crisis, the primary duty of clinicians to care must be

rebalanced with the duty to steward scarce resources under pressure. Under ordinary circumstances, when allocating clinical resources, patient-centered decision-making does not take into account benefits for the whole group of patients or wider population health. In a situation of absolute scarcity, no triage protocol can save all patients' lives. Therefore, societies, public, and medical communities had to grapple in terms of which values and principles should inform triage guidelines, which protocols should be implemented, and how. They debated which criteria should guide triage, and how many preventable deaths are acceptable in healthcare crises. Although no debate can fully resolve such ethical dilemmas, and legal requirements differ among countries, scrutiny of the applied norms in triage guidelines and their operationalization are important steps to provide guidance for clinicians at the bedside. An ethical allocation of scarce intensive care resources demands a clear translation of normative claims and an analysis of the clinical context to realize the implementation of guiding values and procedural justice. "The best ethical framework is only as good as its implementation," remarked Ezekiel Emanuel and referred to this necessity to translate ethical concepts into the clinical context.⁴⁷

The main goal of triage protocols is to prevent loss of life in a fair and transparent manner to protect patients and support healthcare professionals. Allocating resources among *all* critically ill patients gained wide consensus.⁴⁸ Disagreement was strongest regarding substantive exclusionary or comparative allocation criteria, such as short- or long-term survival, age, life cycle, saving most lives or most life-years, or giving priority to healthcare workers.⁴⁹ A controversial debate is also ongoing about implementation challenges: who should make triage decisions and how to minimize bias and prevent discrimination.⁵⁰ In Germany, a major discussion is ongoing regarding the ethical and legal acceptability of re-evaluating already initiated life-sustaining treatment and implementing ex-post triage decisions. Mathematical simulations showed that applying a combination of score-based clinical assessment of likelihood of survival with ex-post triage policy led to the lowest average mortality rate compared to nine other policies, including a first come, first served or random allocation policy.⁵¹ This approach demands the procedure of

⁴⁷Emanuel, E. J. (2022). *16th World Congress of Bioethics (WCB)*. IAB.

⁴⁸Emanuel, E. J., et al., op. cit. note 7, p. 4.

⁴⁹Blair, B., Mulla, A., Frolic, A., & Christian, M. (2021). Canadian emergency medicine and critical care physician perspectives on pandemic triage in Covid-19. *Critical Care Medicine*, 49(1), 65; Christian, M. D., Devereaux, A. V., Dichter, J. R., Rubinson, L., Kisson, N., Task Force for Mass Critical Care, & Task Force for Mass Critical Care. (2014). Introduction and executive summary: Care of the critically ill and injured during pandemics and disasters: CHEST consensus statement. *Chest*, 146(4 Suppl.), 85–345. <https://doi.org/10.1378/chest.14-0732>; Frolic, A., Kata, A., & Kraus, P. (2009). Development of a critical care triage protocol for pandemic influenza: Integrating ethics, evidence and effectiveness. *Healthcare Quarterly*, 12(4), 54–62. <https://doi.org/10.12927/hcq.2009.21054>; Sprung, C. L., Joynt, G. M., Christian, M. D., Truog, R. D., Rello, J., & Nates, J. L. (2020). Adult ICU triage during the coronavirus disease 2019 pandemic: Who will live and who will die? Recommendations to improve survival". *Critical Care Medicine*, 48(8), 1196–1202. <https://doi.org/10.1097/Ccm.0000000000004410>

⁵⁰Aquino, Y. S. J., et al., op. cit. note 8, p. 4; Jöbges, S., et al., op. cit. note 6, p. 4; Meier, op. cit. note 6, p. 4.

⁵¹Bartenschlager, C. C., et al., op. cit. note 20, p. 9.

⁴⁶Knochel, K., et al., op. cit. note 5, p. 4.

repeated triage that considers all patients, those who are already being treated, and those just arriving at the hospital.

When there are competing claims to resources, clinicians should keep in mind that the loss of each life is equal harm, regardless of its estimated length or quality after discharge.⁵² Clinicians should act as responsible stewards of resources and keep this harm as small as possible by allocating scarce resources in a way that saves more lives than fewer lives.⁵³

In developing a practice model, we applied participatory research methods to anticipate and address challenges in the clinical context upfront and later to evaluate the triage practice model in a real-world simulation study. The collaboration between relevant stakeholders enabled better mutual understanding and promoted the development of instruments to prepare for the following major implementation barriers in the envisaged setting: the team-based decision-making procedure and the comparative assessments of patients in order to balance patient needs when not all can be treated (a situation that fortunately, to this day, never occurred in Germany). It was vital to include the perspective of intensive care physicians in the development process as they would both treat individual patients and allocate resources. Prioritization decisions should never be made by a single physician alone, but should be ensured as an interdisciplinary and interprofessional collaborative effort⁵⁴ and differs from collaboration under nonpandemic conditions regarding the time frame, resources, and criteria of the procedure. Therefore, all healthcare professionals involved need to be trained in ethical and legal foundations of triage, crisis standards of care, and the current practice model.

Some studies reported the moral ambiguity and anguish of bedside physicians and the risk of violating their personal and professional integrity if they had to make triage decisions, even following ethically informed guidelines. On the other hand, they also stressed their skills and knowledge as bedside clinicians regarding assessing patients and providing excellent care.⁵⁵ International debates suggest that a triage team should not include those physicians who are currently directly treating the respective patients,⁵⁶ but this controversy is still ongoing.⁵⁷ Both the German guideline and our practice model favor including the expertise of the

treating clinicians who know the current trajectory of patients' disease best. International surveys of clinicians involved in triage or triage simulation showed that they felt that performing triage would violate their professional integrity. Still, at the same time, they stressed the benefit of comprehensive clinical information as a baseline for prognostic assessment. This was true regardless of the composition of the triage teams and if they were the attending clinicians or not.⁵⁸ Studies further showed that clinicians accept their responsibility in crisis situations and their readiness to switch from advocating for the individual patient to decision-making that integrates individual and public health interests.⁵⁹ These findings underline our strategy to engage front-line clinicians in developing, implementing, and evaluating a triage model. A critical issue is the shortage of personnel resources in such a crisis. Therefore, further research should investigate support tools to spare personnel for patient care.

Empirical data show that the role of ethicists is mainly to facilitate decision-making and "help clarify thinking."⁶⁰ As part of our practice model, an ad hoc ethics team was formed and trained for triage to support team-based, consensus-oriented decision-making. Notwithstanding, a broader public debate as well as legal clarity are required to deal with other sensitive and controversial issues, such as re-evaluation and ex-post triage. The participation of representatives from vulnerable groups in developing guidelines and practice models further improves mutual understanding to increase preventive measures and to minimize disadvantages of patients with chronic conditions, pre-existing disabilities, or other vulnerable groups.

In summary, implementing ethical values and principles and concrete ethical norms into clinical practice requires a careful and comprehensive analysis of clinical settings and perspectives of individuals involved. Future studies should comparatively analyze concrete practical implications and consequences of different triage models as well as the perspectives of the people involved to inform future ethical practice and theoretical debate.

4 | CONCLUSION

During the Covid-19 pandemic, triage became a real-world scenario also in countries with well-sourced healthcare systems. The theoretical debate about triage is still ongoing and does not delineate a clear *ought* of how scarce resources should be fairly allocated. However, the practical need to allocate life-sustaining treatments demands guidance even in the absence of conceptual and legal consensus. Applied norms should reflect a broader public and scientific consensus. Such a framework is the basis of institutional triage protocols, but it does not already consider the barriers and challenges of clinical context. The fears and burdens of healthcare professionals,

⁵²Ethikrat, op. cit. note 10, p. 5.

⁵³Pugh, J., Wilkinson, D., Palacios-Gonzalez, C., & Savulescu, J. (2021). Beyond individual triage: Regional allocation of life-saving resources such as ventilators in public health emergencies. *Health Care Analysis*, 29(4), 263–282. <https://doi.org/10.1007/s10728-020-00427-5>; Ehmann, M. R. et al., op. cit. note 40, p. 12; Emanuel, E. J., et al., op. cit. note 7, p. 4.

⁵⁴Christian, M. D., Joynt, G. M., Hick, J. L., Colvin, J., Danis, M., & Sprung, C. L. (2010). Critical care triage. *Intensive Care Medicine*, 36, S55–S64. <https://doi.org/10.1007/s00134-010-1765-0>; Moreno, R. P., Rhodes, A., & Chiche, J. D. (2009). The ongoing H1N1 flu pandemic and the intensive care community: Challenges, opportunities, and the duties of scientific societies and intensivists. *Intensive Care Medicine*, 35(12), 2005–2008. <https://doi.org/10.1007/s00134-009-1706-y>; Christian, M. D., et al., op. cit. note 49, p. 18; Emanuel, E. J., et al., op. cit. note 7, p. 4; Marckmann, G., et al., op. cit. note 10, p. 4.

⁵⁵Chuang, E., et al., op. cit. note 5, p. 4.

⁵⁶Maves, R. C., Downar, J., Dichter, J. R., Hick, J. L., Devereaux, A., Geiling, J. A. ... Care, A. T. F. M. C. (2020). Triage of scarce critical care resources in COVID-19: An implementation triage for regional allocation an expert panel report of the Task Force for Mass Critical Care and the American College of Chest Physicians. *Chest*, 158(1), 212–225. <https://doi.org/10.1016/j.chest.2020.03.063>; Ehmann, M. R. et al., op. cit. note 51, p. 17.

⁵⁷Tian, Y. J. A. (2021). The ethical unjustifications of COVID-19 triage committees. *Journal of Bioethical Inquiry*, 18(4), 621–628. <https://doi.org/10.1007/s11673-021-10132-0>

⁵⁸Chuang, E., et al., op. cit. note 5, p. 4; Curiel, T. J., et al., op. cit. note 5, p. 4; Knochel, K., et al., op. cit. note 5, p. 4.

⁵⁹Butler, C. R., et al., op. cit. note 4, p. 4; Chuang, E., et al., op. cit. note 5, p. 4.

⁶⁰Butler, C. R., et al., op. cit. note 4, p. 4.

the lack of appropriate support systems, and the lack of training in rationing and triage may impede the implementation of triage protocols. Therefore, involving relevant stakeholders early on and promoting interdisciplinarity for the development of a triage practice models improve acceptance and applicability.

Empirical research allows to investigate the consequences of different practice models and the implications of applied values and principles. Both normative guidance and empirical knowledge need to be integrated for the realization of ethically informed practice models to face dilemmas such as triage in reality.

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CONFLICTS OF INTEREST STATEMENT

Alena Buyx is chair of the German Ethics Council. Kathrin Knochel is member of the German Interdisciplinary Association for Intensive Care and Emergency Medicine and one of the authors of the German guideline about Decisions on the allocation of intensive care resources in the context of the COVID-19 pandemic. The remaining authors declare no conflict of interest.

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