


Ethical decision making during a healthcare crisis: a resource allocation framework and tool

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ABSTRACT

The COVID-19 pandemic has strained healthcare resources the world over, requiring healthcare providers to make resource allocation decisions under extraordinary pressures. A year later, our understanding of COVID-19 has advanced, but our process for making ethical decisions surrounding resource allocation has not. During the first wave of the pandemic, our institution uniformly ramped-down clinical activity to accommodate the anticipated demands of COVID-19, resulting in resource waste and inefficiency. In preparation for the second wave, we sought to make such ramp down decisions more prudently and ethically. We report the development of a tool that can be used to make fair and ethical decisions in times of resource scarcity. We formed an interprofessional team to develop and use this tool to ensure that a diverse range of stakeholder perspectives were represented in this development process. This team, called the clinical activity recovery team, established institutional objectives that were combined with well-established procedural values, substantive ethical principles and decision-making criteria by using a variation on the well-known accountability for reasonableness ethical framework. The result of this is a stepwise, semiquantitative, ethical decision tool that can be applied to resource allocation challenges in order to reach fair and ethically defensible decisions. This ethical decision tool can be applied in various contexts and may prove useful at both the institutional and the departmental level; indeed this is how it is applied at our centre. As the second wave of COVID-19 strains healthcare resources, this tool can help clinical leaders to make fair decisions.

INTRODUCTION

Over the past year, as the COVID-19 pandemic has strained existing resources, healthcare professionals have been obliged to make decisions under extraordinary pressures—decisions that have had significant consequences for patients and providers. Now, 1 year later, we have learnt much about the disease caused by the SARS-CoV-2, but how to make decisions on the allocation of scarce clinical resources is less clear. As the second wave of the pandemic spreads across the world, hospitals continue to face difficult resource allocation decisions that require ethical and efficient priority-setting tools.¹ Healthcare institutions must balance the needs of patients facing disease progression (whose care was previously delayed), manage emerging health conditions, and care for the second or third wave of COVID-positive patients. This is the current situation at University Health Network (UHN),

a multisite academic healthcare institution in Toronto, Canada that is publicly funded through the provincial government agency, Ontario Health (OH). UHN offers services across the continuum of care including emergency medicine, critical care, comprehensive cancer care, tertiary/quaternary surgical services, complex cardiac care and the highest volume transplant programme in North America.²

During the first wave of the pandemic, in response to an OH directive, UHN decreased clinical activity uniformly across programmes and services.³ As a result, many patients experienced delays in their scheduled care (apart from those requiring ‘emergency/urgent’ care; eg, select cancer and cardiac procedures, and systemic and radiation therapy already in progress). Such delays are especially problematic for those with time-sensitive, life-threatening, limb-threatening or vision-threatening diseases, or severely morbid conditions such as malignancy, end-stage organ failure, advanced cardiac disease or conditions that severely affect quality of life. Patients undergoing scheduled procedures (often described as ‘elective’ procedures) have been significantly affected and face significant wait times as these services require in-hospital care.

In the first wave of COVID-19, uniform decreases in clinical activity were instituted in anticipation of a high demand for hospitalisation. This demand did not materialise, however, and our in-hospital bed occupancy remained at 60% with significant unused operating room and intensive care unit (ICU) capacity. In planning for the second wave, hospital/clinical leadership highlighted a desire to ramp-down clinical activity differently than in the first wave. Key objectives included maintaining clinical activity for as long as possible, decreasing activity gradually and decreasing no more than necessary to free resources required to care for both existing UHN patients and new COVID-19 patients. It was also recognised that asymmetrical reductions in activity across care-types and programmes would prevent many of the adverse effects experienced in the first wave.⁴ To guide decision making, we employed an ethical framework using a well-established fair and transparent deliberative process called ‘accountability for reasonableness’ (A4R).⁵ This framework informed the development of an ethical decision tool that was applied proactively, and at multiple levels of clinical activity decision-making as necessitated by the pandemic’s second wave.

Who decides? Establishing the clinical activity recovery team

The clinical activity recovery team (CART) is an advisory group established by the UHN executive team whose mandate is to develop a safe, ethical and measured approach to decrease and increase clinical activity in response to pandemic pressures. CART included representatives from hospital administration, pharmacy, diagnostics, bioethics, finance, professional practice, facilities, intensive care, anaesthesiology, surgery and various medical disciplines (ranging from internal medicine, to psychiatry, to family and community medicine). It also included patient representatives, and those leading support services (ie, logistics) for essential supplies, those managing bed allocation and flow, human resources, infection prevention and control, and occupational health/health Services. In total 41 individuals participated in the CART (online supplemental appendix 1). After being struck, CART planned to address its mandate in four phases. First, it would identify the institutional objectives that fell within its mandate, as well as the ethical principles and decision-making criteria which would guide allocation decisions. Second, it would construct a tool based on these objectives, principles and criteria that could be used to assess proposed changes to clinical activity. Third, it would use this tool to construct an algorithm, or ‘blueprint’ that would guide the institution’s clinical activity adjustments for the coming months. Finally, it would reconvene as needed to revise these blueprints based on feedback and ongoing need. CART met on a regular basis to complete these phases by reviewing resource capacity (human resources, ICU and in-patient capacity, drug supply) and clinical activity levels against proposed activity level plans, and judging when and how decreases in clinical activity would occur in response to the demands of the pandemic. As an advisory group to the UHN executive, CART would deliver a ‘blueprint’ of clinical activity which would then be ratified by the UHN executive and implemented throughout the organisation.

Establishing institutional objectives aligned with government direction

Throughout the pandemic, OH released a number of guidance documents to manage resource levels at hospitals across the province to ensure continued care for current and future patients. CART’s multiphased activity modification plan was developed to complement and comply with these guidelines.

To anticipate and respond to challenges posed by a second wave of COVID-19, CART determined that any decreases in clinical activity must meet one of the following institutional objectives:

1. Ensure medicines and medical equipment are available to patients in greatest need (this included preservation of in-patient and ICU capacity).
2. Maintain flexible and adequate staffing to ensure care for all patient populations.
3. Conserve and ration personal protective equipment for all (staff, patients and caregivers).
4. Prevent or reduce viral exposure whenever possible.

Engaging an ethical decision-making process

A4R is a practical decision-making framework for priority setting that has been used in various areas of healthcare to support fair resource allocation. It is a process-based rather than an outcomes-based framework, focusing on how decisions ought to be made rather than on the outcomes of those decisions. The A4R framework states that institutions make ‘fair’ priority-setting decisions if: (1) rationales for priority setting are transparent and publicly accessible (publicity condition); (2) rationales can be considered by fair-minded people to be relevant to priority setting in that context (relevance condition); (3) there is an avenue to appeal the decision and the rationale supporting it (appeals condition) and (4) there is a way to ensure that these three previous conditions are met (enforcement condition).⁶ These procedural values are supplemented by the additional values of agility/efficiency, trust and solidarity, which were elaborated to recognise the unique context of the decisions and the importance of maintaining good relationships with hospital partners and our broader social and cultural communities (table 1). Their implementation was supported by CART through a series of well-defined steps (figure 1).

Identifying key ethical principles

While procedural values inform the decision-making process, substantive principles inform the development of criteria for priority-setting. Substantive principles are foundational values that stakeholders consider when identifying criteria and implementing a priority-setting framework. Bedrock principles of biomedical ethics (beneficence/non-maleficence, autonomy, and equity/consistency) were included in the framework as they are

Table 1 Institutional procedural values

Value	The decision-making process must...
Fairness	Promote a just distribution of resources, as well as just access to resources
Agility/efficiency	Be agile and flexible, adapting to the changing situation as it unfolds
Relevance	Be based on reasons/criteria fair-minded people can agree are relevant and be carried out by people who are credible and accountable.
Publicity/transparency	Be an open and transparent process, which enables affected stakeholders to appreciate and understand the rationale for allocation decisions. Decisions and reasons for decisions/criteria should be communicated to stakeholders, including patients/families and the public (as appropriate).
Revision	Be recorded and iteratively revised based on emerging information, and stakeholder concerns, for example, there must be formal mechanisms to bring forward new information to appeal or raise concerns about particular allocation decisions and to resolve disputes.
Empowerment/inclusiveness	Be explicitly centred on stakeholder views, and meaningfully involve stakeholders whenever possible.
Enforcement/accountability	Ensure that decision-makers are answerable for their actions and inactions to ensure that these fair process principles are sustained. The defence of decisions should be grounded in evidence, in contextual awareness, and in the ethical values and principles identified.
Trust	Enhance trust by upholding the process values enumerated above. In particular, ongoing communication with stakeholders and adherence to values/principles is essential to engendering trust.
Solidarity	Build, preserve and strengthen interprofessional, interinstitutional and intersectoral collaboration and mutual support, recognising the intrinsic interdependencies of programmes and sites, as well as that of the hospital system with other health and social services.



Figure 1 Steps for the development and implementation of clinical activity change interventions.

principles familiar to the major users and stakeholders in the tool, namely physicians, health partners and the government. Although these principles are generally invoked in the context of patient-specific decisions, we found that they could, with appropriate specification, be rendered applicable to our context. These principles were nuanced over the course of several iterative meetings of CART to suit the context and to ensure that stakeholders had a shared understanding of the meaning of these terms.^{7 8} For example, an elaboration of the principle of autonomy was required; due to resource constraints, respect for autonomy was understood to imply empowering patients with the information needed to make decisions about their care options rather than offering access to all desired services. Stakeholders affirmed additional principles (many of which had been recommended by a ministry-led bioethics table) as relevant to our work in the context of the pandemic. For example, CART noted that the preventive measures taken should be calibrated to respond to the level of risk seen in current practice, in accordance with the principle of proportionality. Other principles critical to healthcare resource management were OH-guided extensions of those used in non-crisis times, such as the principles of being evidence-informed and of stewardship (to prevent waste of scarce resources). Additionally, the precautionary principle was embedded throughout based on our experience in managing the SARS outbreak in 2003; this manifested as taking early and decisive preventive measures to protect public health even in the absence of complete information and scientific certainty.⁶ The result was a set of seven ethical principles that informed the development of decision-making criteria (table 2).

Outlining decision-making criteria

Once key ethical principles were identified, refined and agreed-upon, decision-making criteria were identified that could be applied in situations requiring changes in clinical activity (table 3). These were adapted from similar criteria developed for resource allocation in other healthcare contexts. CART used an iterative and deliberative approach as outlined in the implementation of A4R (figure 1) to refine criteria and identify additional relevant to ramping-down clinical activity across programmes. Some of these criteria were familiar to stakeholders and were uncontroversial as they are applied routinely in other contexts (eg, emergency operation booking priority-setting). These included: urgency of medical need, impact on life (likelihood of benefit, degree of benefit), wait time for therapy, and the availability of appropriate alternative treatment options. The latter criterion was newly available in this situation given the recently expanded capacity for most on-site ambulatory services to be delivered with a virtual platform; this enabled continued access to these services while achieving our institutional objectives. In the context of the second wave, CART considered how to allocate healthcare resources fairly in light of the lingering effects of the first wave (including the >4500 patients on procedure wait-lists). Our final criterion, consideration of whether a service represented a specialised service at UHN, arose through reflection on our role as a provincial (and sometimes national) resource. Some procedures, such as organ transplantation, are performed solely or largely at UHN, such as organ transplantation. As such, CART reasoned that ramping-down UHN's transplantation programme would have a more significant

Table 2 Key ethical principles

Principle	Decision-making criteria must...
Beneficence/non-maleficence	Strive to limit harm wherever possible. Activities that have higher implications for morbidity/mortality if delayed too long should be prioritised over those with fewer implications for morbidity/mortality if delayed too long.
Autonomy	Empower patients and their families to make informed decisions about their care.
Equity/consistency	Promote equity and fairness by treating like cases alike and not disadvantaging already vulnerable groups. Equity requires that all persons in the same categories (eg, at different levels of urgency) be treated in the same way unless relevant differences exist.
Evidence informed	Be grounded in the best available evidence, data and guidelines/recommendations from government/government agencies.
Proportionality	Ensure that measures taken to protect the public (or individuals) from harm should be proportionate to the level of risk consistent with current best practice, or best available evidence regarding a particular risk.
Reciprocity	Attempt to mitigate impacts (including consideration of psychological impacts) on healthcare staff, physicians and learners.
Stewardship	Take into account the impact of changes in clinical activity on all resources, including consideration of and impact of decisions on relationships between providers and patients, and across the system.

detrimental effect on our population than would the ramp-down of other services which are also offered by partner institutions in the community. In general, consideration of specialised service may be particularly relevant for institutions that are ‘centres of excellence’ to which rare or complex problems are referred. Notably, CART identified relevant criteria (table 3) but refrained from assigning weight to each criterion, instead leaving prioritisation to individual programmes in recognition of their expert understanding of how their patient groups ought to be ranked. These criteria included the medical need (urgency and severity of the medical issue), the impact on life (quality of life), the degree of specialisation of the service (to what degree is the service available elsewhere), the availability of other treatment options (whether similar services could be offered in a safer/alternative fashion, eg, virtual clinics), the length of the waitlist (where all else is equal, the service with the greater backlog is prioritised), and the impact on other resources (eg, a delayed procedure may require additional chemotherapy).

Creating an ethical decision tool for wave 2 clinical activity ramp-down

The institutional objectives, procedural values, key ethical principles and decision-making criteria identified through the implementation of A4R with CART were synthesised into a tool (online supplemental appendix 2) designed to enable fair decision making at multiple levels of the organisation.⁹ At UHN, the tool is first employed by CART to inform decisions for implementing asymmetrical changes to activities across programmes.

Once a programme or division is informed that service reduction is required, the tool is used by programme directors to inform decisions within each programme. Critically, this tool was not designed to make comparisons at the individual patient level (eg, between two patients who each need the only available intensive care bed). Instead, the tool is employed to aid allocation resource decisions involving departments, services, and practices in general. As such, clinicians ‘at the bedside’ are not involved in activity modulation decisions, except with respect to their involvement in the CART.

The use of the tool requires seven steps beginning with the comprehensive identification of relevant stakeholders to inform decision making. These stakeholders define the problem and consider potential solutions. Each solution is then evaluated in light of its concordance with the key ethical principles (table 2) and decision-making criteria (table 3) and is assigned a score (one point for each principle or criterion it fulfils). This produces a semiquantitative assessment of potential solutions and enables direct comparisons of approaches, allowing stakeholders to identify and implement what they believe to be the most fair and appropriate course of action. The final steps of the tool relate to the values of relevance, and publicity/transparency and engender trust and promote solidarity. Transparency is embedded in the process by ensuring that decisions and rationales are communicated and documented appropriately; in addition, details about the CART and the blueprint itself are posted on the institutional intranet and were sent in an email to all hospital staff. There are also prompts for stakeholders to appeal decisions with which

Table 3 Decision-making criteria

Criterion	Elaboration
Medical need	Without the service/programme being delivered, there is a high implication for morbidity/mortality. There is urgency and severity (seriously debilitating or life-threatening condition) associated with patients waiting for the service/programme.
Impact on life	Benefit is defined as quality of life. What is the likelihood of benefit for the patient? What is the degree of benefit for the patient?
Specialised service	What is the core set of specialised services provided at (INSTITUTION) that patients would not otherwise be able to access? To be considered with medical need—if care can be done elsewhere, could be deprioritised.
Other treatment options	Clinical procedures should be offered in the context of a range of treatment and care possibilities. What are the other options? (Shared care? Virtual Care? Modified treatment options?) How do their risks/benefits compare? Where appropriate, palliative care should be offered as an alternative, and patient choice must be respected.
Length of wait/backlog	Where all else is equal (eg, likelihood of benefit, likelihood of harm), if evaluating multiple programmes against a fixed resource, the programme with a larger backlog would be prioritised. Where all else is equal, and in consideration of above, a patient waiting longer should receive access before a patient who has waited for a shorter period of time.
Impact on other resources	What is the impact on resource utilisation (eg, having to use additional chemotherapy because of delayed procedure)? Some specialised services may require complex interdisciplinary care. Consider the need to preserve resources for the second wave of the pandemic/influenza season.

they disagree and to identify when the decision-making process ought to be evaluated or revised. Appeals to the CART's decisions can be made in several ways. Any member of the CART can raise concerns and trigger a meeting of the CART; however, appeals can be made independently of CART, by appealing to the UHN executive. Physicians and other staff can appeal to the UHN executive through their departmental leaders, while patients, family members and members of the public can appeal through the UHN Patient Experience Office. Such appeals trigger a meeting of the CART to allow further deliberation, with oversight by the UHN executive.

Applying the A4R ethical decision tool

CART applied the Ethical Decision Tool to plan the institutional ramp-down blueprint with respect to surgical, ambulatory, and procedural services, outlining three ramp-down 'phases': A, B and C. Services in phase A are only modestly decreased from baseline, while services in phase C are maximally decreased. CART used the tool to establish a ramp-down plan that identifies the proportion of baseline activity to which each programme would be limited for each phase (understanding that programmes may be in different phases simultaneously). Once ratified by the UHN executive team, CART's ramp-down blueprint was used to modulate levels of clinical activity based on the week-to-week changes in COVID-related service demands without the need for routine involvement of the CART working group.

The decision to trigger a change in clinical activity is made by clinical leaders based on a daily report containing data on bed allocation, staff redeployment needs and availability, direction from external (local, regional, provincial or federal) health authorities, and institutional pandemic 'triggers'. Triggers include emergency department volumes, inpatient and ICU capacity, 24-hour rolling COVID-19 patient admission rates, staff self-isolation rates, staff availability and patient-provider ratios. Based on these inputs, clinical leaders decide either to: (1) maintain the current level of clinical activity, (2) change staffing ratios for a limited period of time, or (3) decrease clinical activity. In the event that a decision is made to ramp-down activity, CART's blueprint is consulted to determine what changes will produce the resource required (staffing, beds, etc). This process allows UHN to proactively manage clinical activity in real-time as COVID-related hospital needs fluctuate over the course of the pandemic.

In applying the tool to create a blueprint for ramping-down clinical activity, notable trends emerged demonstrating the usefulness of the A4R framework and the value of the ethical and decision-making criteria that the group agreed on. As previously noted, the transplant programme was prioritised due to the specialist nature of the service and need to be stewards of scarce resources. Consequently, it has only experienced a reduction to 70% of baseline activity in phase C. Our belief in the importance of medical need and impact on life were borne out in the contrasting plans for cancer and non-cancer surgery. Cancer surgery is preserved at 80% in Phase A and drops to a minimum of 30% in phase C, whereas non-cancer surgery is expected to drop to 30% in phase A and to be reduced to urgent activity only during phases B and C. We also considered the effects that reductions in one service might have on others; for example, diagnostic procedures were allocated a relatively higher proportion of baseline activity based on the fact that these services are needed to support prioritised procedural activity.

An additional trend that emerged was that services which tend to provide care for patients who are less acutely ill, or whose medical conditions were deemed less urgent, are subjected to

repeated and sustained decreases in activity. For instance, at our institution, the CART determined that a greater degree of clinical activity would be granted to the neurosurgical service given a greater potential for quality and quantity of life gains for these patients as compared with the patients served by some other surgical services such as orthopaedic surgery or plastic surgery. This reflects a larger trend observed when applying this framework. We have recognised that patients with lower acuity illness are systematically disadvantaged by our current approach. The CART and UHN executive identified that sustained use of the same blueprint violated our ethical principles, and as a result, has resolved to regularly re-evaluate and rebalance these blueprints.

Limitations

This tool is institution and program-focused and does not attempt to assess the needs of individual patients or patient categories. This means that no particular demographic of patient receives preferential treatment; however, there are opportunities for inadvertent marginalisation of particular subsets of patients. For example, in-person hospital-based psychiatric services have been reduced owing to the capacity to conduct outpatient psychiatric consultations in a remote fashion; however, this has the potential to exclude patients who lack reliable access to the internet or a suitably private space to engage in confidential conversations. We sought to mitigate this risk by constructing the CART with a large diversity of individuals, including patient partners, and representation from the Social Medicine Portfolio; however, we recognise that despite our efforts, our perspective inevitably will be limited and opportunities for oversights will still arise. In addition, because our tool does not provide guidance on individual patient management, deciding how to prioritise patients accessing a 'ramped-down' clinical service remains in the hands of individual practitioners. It is possible, therefore, that clinicians may—inadvertently or otherwise—marginalise a particular group of patients as they prioritise within a restricted range of clinical activity.

This tool seeks to follow the A4R model; however, we recognise that our tool is not publicised to the extent that some may advocate to fulfil the 'Publicity' criterion of A4R. For instance, the tool is not completely and transparently posted on a public facing website, nor is it actively publicised, for instance in the form of a press release from the institution.

Towards a broad application of the tool

While we believe that the tool described here can successfully be applied to high-level priority setting around the world, we acknowledge that it will need to be adapted to address local and institutional needs and resources. When applying this tool elsewhere, these values and principles must be re-interpreted (and perhaps supplemented or eliminated), weighed and revised to ensure that they align with the needs of the populations served.

The importance of a novel approach

The A4R Ethical Decision Tool presented here is both timely and useful. While the principles and values related to resource allocation decision making have been extensively discussed in the literature, they have not been synthesised into a pragmatic tool for the purposes of allocating scarce healthcare resources during a pandemic.¹⁰⁻¹² Frameworks have been proposed to aid in ethical decision making in other contexts of resource scarcity, such as the diagnosis and management of rare diseases or on a broader policy level.^{13 14} Similarly, frameworks to guide the ethical allocation of scarce research funds have been proposed.¹⁵

None of these frameworks are directly applicable to the health-care crisis we currently face.

A critically important feature of our approach is our commitment to engaging a diverse interprofessional team to ensure that the needs of all patient groups are represented. A key factor to our success is that stakeholders come to the discussion not as advocates representing the interests of their programmes, but as expert participants committed to ethical principles that promote the good of the community as a whole. It is this willingness to set aside programme, specialty and personal interests that enables us to achieve a stable consensus.

The advantage of our tool is its potential for broad implementation and its relative ease of use. By design, it employs A4R procedural values to guide decision making in a pseudoalgorithmic fashion based on local and regional contexts. It is our hope that, in contrast to some of the more abstract frameworks currently available, our A4R adaptation can be adapted and deployed by healthcare leaders across the globe to guide ethical decision making in times of crisis such as these.

SUMMARY

The A4R Ethical Decision Tool can be applied broadly to help guide fair and ethical resource allocation decision making in a variety of contexts, but it is especially relevant as institutions attempt to balance competing needs during the second wave of the COVID-19 pandemic. This tool is suitable for deployment in almost any healthcare institution, irrespective of size or specialisation and can be applied at multiple organisational levels, including institutional, departmental and programmatic. In resource-limited settings, prioritisation must occur, and while the outcome may not satisfy all stakeholders, an A4R decision tool such as this can ensure that the decision-making process is inclusive and ethically defensible. When time is of the essence and stakes are extraordinarily high, such a tool can enhance efficiency and reduce moral distress.

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