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## Chapter 7

# Saving Lives by Counting Properly Some Notes on Triage and Disaster Ethics

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**Abstract:** In disasters, multiple victims are involved that exceed the capacities and resources of emergencies available to face the necessary help. As in other areas of public health ethics, the allocation of resources and the rights and care of populations in mass casualty incidents often triumph over the priority given by mainstream bioethics to autonomy and individual rights and care. Triage is a series of standardized methods that use calculation and rank ordering in medicine. Patients are quantitatively represented by algorithmic and numerical triage systems, and some of them even categorize the victims with scales and scores. In disaster triage, consequentialist criteria consistent with this quantification of the bodies prevail that order to save as many lives as possible while making the best use of available resources, which often means to prioritize the patients who are more likely to survive.

**Keywords:** bioethics, consequentialism, disaster ethics, emergencies, public health, triage.

## Introduction

In this chapter, some implications for disaster ethics of the quantification of the bodies in the practices of triage are discussed. I will start by mentioning some distinctive changes that emerge when we turn from the typical concerns of bioethics to the framework of public health ethics. Then, I will mention some features and typologies of disasters and I will point out that the appropriate approach has to consider the entire disaster management cycle and not just limit itself to the phase of immediate response to disasters. After that, I will consider the relevance of triage practices in disasters settings, as well as the centrality of quantification in triage methods, paying particular attention to the

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distinction between algorithmic and numerical triage systems. Accordingly, I will comment on some central issues in the ethical assessment on disasters and the prevalence of consequentialist criteria in this regard. Finally, I will suggest that ethics in disasters needs a many-faceted perspective that exceeds and integrates at the same time the four principles of bioethics and the indispensability of consequentialist criteria for triage decisions.

## **1. Bioethics and Public Health Ethics**

Generally, bioethics refers to ethical, political and legal issues arising from the advances in biosciences and biotechnologies. Clinical bioethics, in turn, focus on ethical, political and legal issues relevant to clinical care and healthcare settings, and mainly concerns the interactions between healthcare professionals or researchers with their patients or research participants. It is not an exaggeration to say that principlism has remained the dominant view in clinical bioethics during the last forty years (Beauchamp & Childress, [1979] 2019). Originally conceived as *prima facie* values, each of the four principles (autonomy, beneficence, non-maleficence and justice) does not establish an absolute obligation or enjoy an inherent priority over the others, but rather it is a task of public deliberation to find the better balance between them in each application to specific cases. Despite this relational framework, autonomy and respect for persons (or better: versions of them compatible with liberal individualism) have often taken precedence over the other principles, and the issues concerning informed consent and privacy have received prominent attention in clinical bioethics and research ethics in many Western countries, where freedom and liberal individualism are highly valued.

The principlist approach mutates when bioethics goes beyond clinical ethics and has to adapted to public health areas such as resource allocation and priority setting, disease prevention and control, vulnerability in human populations, public health collaboration at international level, and mass emergencies and disasters. Certainly, the four principles remain relevant in these contexts in so far as they accommodate to the broader scope of public health interventions (Barret et al. 2016). In public health ethics, the priority given by standard bioethics to the presumptive value of autonomy and individual choice gives way to a population-based and outcome-oriented approach that focuses on promoting the social goods involved in community health. In contrasts with the individual's independence to shape personal preferences and make decisions free from interferences, a relational notion of autonomy emerges relative to the interdependence of citizens living together in a network of social relations. The notion of respect for persons can even take on a nuanced meaning in public health interventions. Likewise, the principles that call for the promotion of well being and the avoidance of harms bind the collective action of whole teams, organizations and stakeholders, and are destined not only to individuals, but to the interests and social goods of groups, communities and populations. Unlike treatment of disease via the health care provider's fiduciary relation to a patient, provision of public health encompass the prevention of disease in view

of the social determinants of health and the promotion of well being across a range of interventions and settings. By involving many types of professionals and activities besides medical personnel, professional duties accordingly to the common good reframe the value of authority derived from the epistemic superiority of the physician and the non-delegable authorization of the patient who consents (Gil, 2015). Authority regains a political and regulatory dimension, coming public health policies and health regulations to the fore, and informed consent is no longer the unique or prevalent rule, but presumed consent and social directives legitimize public health interventions as well.

Mass casualty incidents such as large emergencies and disasters are an increasingly important area of public health that poses and faces distinctive ethical challenges. In order to understand in turn the specificity of the ethics of disasters, it is useful to have an overview of the classification of disasters and its typical cycle.

## 2. Disasters: Types and Cycle

There is a distinction between the lay and expert views of the disaster. What is often perceived as a disaster by the layperson might be better described as something tragic, horrible and nightmarish. In Spanish it is usual to describe it as “Dantesco” by reference to the picture of the hell in *The Divine Comedy*. From the perspective of health and humanitarian organizations, disasters are events that result in a demand for services that exceeds available resources of the affected communities (see, for instance, the definitions provided by WHO 2008, UNDRR, 2017, and Songer, 2008). Various classifications have been offered accordingly. The most common description points to the major general causes of disasters and distinguishes between natural and anthropogenic disasters, making in turn subdivisions according to etiological descriptors. However, both natural and human-related factors are often involved in most disasters. They can also be defined in view of their impacts on societies. According to one classification (Barilan et al., 2014), disaster scenarios can be divided into three prototypes. “Well-circumscribed disasters” are those impacting societies that function well in terms of social coordination, material infrastructures and public policies, so the shortage in provision of care may often be technical and temporary. “Disruptive disasters”, on the other hand, are those that wreak havoc on the material and communitarian infrastructures of the society, so the provision of care largely depends on the reparation of infrastructures and the reinstatement of public health and public order. Finally, “double disasters” ravage impoverished and unstable societies because of poor infrastructures and a deficient social fabric, so international or foreign humanitarian aid is required.

For many decades the prevailing approach in dealing with disasters was focused on response and recovery. However, pre-disaster actions to minimize the disaster risks and to plan for would-be responses are encouraged nowadays alongside the immediate response that follows a catastrophic event and the long-term phase of return to normalcy. The mitigation and preparedness phases occur when a society develops improvements to effectively confront the foreseeable impacts of disaster in advance. These four, of-

ten overlapping phases form an ongoing process that implies a wide range of activities, as well as civil society engagement, intersectoral collaboration, and political decision making. Importantly, “the complete disaster management cycle includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure” (Warfield, 2004).

Obviously, disasters in their specific contours can never be anticipated in their entirety. However, as far as mitigation measures and planning ahead may take place for certain disasters in their broad contours, the degree to which the latter will force and constrain rescue efforts might be reduced and the scarcity of resources might be compensated to a certain extent. In this sense, the situation in a major “well-circumscribed disaster” is not entirely beyond human control nor, thereby, beyond the moral judgment, being this more difficult in “disruptive disasters” and “double disasters”.

However, in the midst of disasters, when the number of victims exceeds the capacities to provide medical care and assistance, humanitarian organizations and health care teams are the actors that are most involved in the immediate response. Disaster ethics is primarily concerned with evaluating such efforts to deal with emergency relief.

### **3. Triage in Emergencies and Disasters**

The term “triage” refers in medicine to a practice of sorting, categorizing and priority setting. Historically it took on a meaning of classifying war casualties into groups in order to systematise medical care in the battlefield. After the development of emergency medical systems since the 1970s, multiple civilian triage systems emerged for prioritizing patients in the emergency rooms and for allocating scarce resources, for instance, in organ donation and transplantation. In emergency medicine, triage refers to the processes and techniques of classification and selection of wounded patients for treatment and transportation according to their severity and life condition. Triage is also a series of standardized methods of rank ordering in public health emergencies, particularly those that overwhelm ordinary resources and capacities of the affected community to cope a pandemic or a disaster situation. In contrast to ordinary circumstances of emergencies, survivability in these cases enters besides severity and other medical information into the triage equation. When patients are triaged in mass casualty incidents, the assessment determines the type and priority of care to be received based on the urgency, the acuity and the potential for survival. Importantly, the healthcare and humanitarian decisions taken in mass disaster triage regarding the order of treatment and the sort of critical care are always based on both technical and ethical criteria.

There are multiple triage methods and protocols that have been adopted by different countries and health systems. Generally, these triage methods can be classified at least in three different ways (Castro et al., 2015). According to their polarity, there are interventions with two contrary and exclusive options (trapped vs. non-trapped, conscious vs. unconscious victims), three-sided methods as in the classic criteria for severity (victims

who will die no matter what you do, victims who will get little benefit from a lot of effort, and victims who will be benefited a lot with a little), and the internationally recognized four-color code (red, yellow, green and black in order of priority). Bipolar and three-sided classifications have been typically used in initial chaotic phases. But as soon as trained professionals with advanced life support skills take action, more sophisticated methods take into account both physiological and anatomical aspects. These other classifications according to the basic vital functions and / or injuries of the victims are needed for the aforementioned colour code (and others of three or five colours as well) to make sense. I will say something else shortly. Finally, a common classification is based on the location and level of care at which the triage takes place (Christian, 2019). Primary triage systems are designed to assess patients in the field in order to determine the priorities for treatment and transport, while secondary triage instruments are designed to further assess and prioritize victims for treatment, especially when resources are severely limited and in view of a significant delay either in transportation or at the receiving hospital. Since victims often have evolving injuries and will continue to deteriorate, reassessment by way of secondary and even tertiary instruments within the hospital is often necessary.

#### **4. Quantification in Triage Practices**

Human beings (and also other organisms, as it happens, for instance, in the conservation of endangered species) are quantitatively represented by triage methods. To begin with, the numbering is characteristic of registration and labeling, particularly by the Medical Emergency Triage Tags, which allow identifying the injured people and visualizing their classification. More generally, quantification in terms of grades and levels, ranks and scores is a common procedure with which triage systems objectify the prognostic judgments about the condition of patients. Some of these instruments even categorize and label the human subjects according to the numerical outcomes obtained from scoring their injuries and measuring their vital signs, which may of course be decisive for their evolving condition in the course of pandemics or in the aftermath of the mass casualty incidents.

The following are among the most commonly used triage systems at the international level (see Schultz and Lieser, 2012, and Bazyar et al., 2019). Simple Triage And Rapid Treatment/Transport (START) offers an algorithm for patient assessment in less than 60 seconds; Jump START is a modified and paediatric version to assess the triage status of children, including their level of consciousness by AVPU scale (alert, responsive to voice, responsive to pain, unresponsive). CareFlight Triage is similar to the START method, although assessment of mental status is done prior to assessment of respiration and circulation. Triage Sieve is also similar to the START method, but does not consider the criterion of obeying the commands. Their differences notwithstanding, all these triage tools are algorithmic in nature: victims are successively assessed by a series of criteria of vital signs and other functions and then assigned to one of the four categories accordingly, i.e. those of the well-known colour code in order of priority: red for victims that require im-



mediate intervention, yellow for victims with no immediately life threatening conditions, green for victims with minor injuries, and black for hopelessly ill. Interestingly, the Spanish Prehospital Advanced Triage Method (Arcos et al., 2016) and other protocols don't consider the black colour in the classification of the injured individuals.

There are also numerical triage systems. Sacco Triage Method (STM) use a physiological 0-4 score for respiration, pulse and motor response to predict patients' probability of survival and rates of deterioration, taking also into account the timing and the information about available resources such as transport and facilities. STM rates the chances of recovery and deterioration of the injured people, allocating them among three groups: those with a global score of 0 to 4 obtain a survival probability rate of less than 35% and are tagged as black, those with a score of 5 to 8 and 49-85% probability of survival are likely candidates to receive rapid treatment, and those with a score of 9 to 12 may reach a survival probability rate of more than 90%. On the other hand, Secondary Assessment of Victim Endpoint (SAVE) and Triage Sort are secondary systems that assess the victims in the order of acuity assigned by primary triage tools. SAVE calculates the probability of survival to identify those who qualify for care and those who do not, given the available resources; and Triage Sort, originally the secondary method of Triage Sieve, is a four-steps system that ranks the acuity of victims. Their differences notwithstanding, all these numerical triage systems assign a certain number to each assessed criterion, "and after evaluating all the criteria a total number is given to the injured person. Based on this final score, the injured person will be placed in a particular class according to specific colours" (Bazyar et al., 2020, p. 7). More recently an electronic triage system that consists of two types of electronic tags and an electronic server combines both algorithmic and number-based approaches in order to continuously monitor the vital signs and physiological condition of the casualties of disasters and to show the real-time priorities and changes of these casualties (Sakanushi et al., 2013).

Some triage systems incorporate independent scoring tools. For instance, the second step of the Triage Sort consists of the Revised Trauma Score (RTS), a well-known physiological scoring system designed for classifying the vital signs of any patient. The weighted sum of the three scores of the RTS (Glasgow coma scale, systolic blood pressure and respiratory rate) indicates the severity of the injuries and makes possible the consequent –and again numerical- assignment of priorities. Other existing scoring tools are the Prehospital Trauma Index (PTI), the Injury Severity Score (ISS) and Sequential Organ Failure Assessment (SOFA). In the PTI, victims are scored (systolic blood pressure, respiratory rate, pulse and consciousness) resulting in a weighted sum between 0 and 24, where 24 identifies the worst outcome and scores lesser than 3 indicate minor trauma. ISS assess the severity of traumatic injuries and represents by numbers the threat to life associated with them by using the Abbreviated Injury Scale, an anatomical-based coding system designed to classify the injuries in any body region on a six-point ordinal scale. Finally, SOFA uses a score range of 0 to 4 to quantify the number and severity of organ failure in six organ systems (respiratory,

blood, liver, cardiovascular, renal, and neurological), thereby helping to predict mortality in patients in critical situation.

In sum, most of algorithmic and numerical triage systems rank victims after the assessment of their physiological parameters. Besides checking the vital signs, such as respiratory rate (breaths per minute), heart rate (beats per minute) and palpable pulse or pressure for bleeding (capillary refill time), other physiological criteria as motor response, mental status and level of consciousness sometimes are measured as well. Some triage systems count and value injuries and traumas. By numerically recording the functional and / or anatomical aspects, some triage systems destine patients for effective and feasible treatments according to the quantification of the severity scales and, in some cases, the calculation of probabilities for survival as well.

Triage practices have become an essential component in the disaster and emergency relief teams and strategies. In the respond to mass casualty incidents, assessment of triaged patient aims to maximize expected survivors, which means prioritizing the immediate or red-tagged patients and occasionally the delayed or yellow-tagged ones and often (recommending) withholding or withdrawing care for those with mild conditions and those critically ill with little chance of recovery. But then implicit ethical criteria have to make it explicit the soundness of such a serious decision-making. So to say, values are indispensable for numbers to count.

## 5. Ethical Criteria in Disaster Triage

Different normative criteria can be applied to the selection of patients for treatment and transportation. Some of them may operate in triage protocols performed during ordinary emergency circumstances when sufficient technical and human resources are available.

That is the case of the rule “first come, first served”. But this allegedly egalitarian rule would be permitting morally arbitrary outcomes if the chances of benefiting the first ones are markedly low while the last served’s less bad life expectancy is put in greater danger or ruined. In disaster scenarios, this rule becomes an unfair sentence for all those who could be left behind despite of having higher chances of survival.

“Saving anyone regardless her condition, and as many as you can” is an egalitarian rule that aims to protect the claims of each and all of those who are affected in an emergency from an impartialist view of fairness. The rationale behind it is the idea of the respect for persons. However, this “everything for everyone” rule binds the professionals to care for the integrity of any person so far as it is humanly possible and, obviously, the rule will remain mandatory as long as the emergency or humanitarian interventions have sufficient resources for every victim who needs them. In mass casualty incidents, treating - more or less indiscriminately - “as many as you can” will likely leave behind many others salvageable casualties.

The former criterion assumes that all victims should be given an equal chance of being saved. Another criterion explicitly states that the best way of giving everyone equal chance to be saved is to leave the decision of whom to treat to chance. Although this “equal chances criterion” was conceived for

persons in similar conditions (Taurek, 1977; Parfit, 2012), the rule of tossing a coin or arranging a lottery can be viewed as a plainly egalitarian procedure for triage while less arbitrary than the rule of “first come, first served” and occasionally less paralyzing than the “everything for everyone” rule.

Instead of drawing lots for safeguarding equity, an impartialist but prioritarian rule demands to arrange casualties according to the needs-based objectivity criterion and to help first those who are worst off than others, even the sickest or those most critically injured. According to this priority view, those in greatest need should be helped first because of their comparative disadvantage and should stand to gain from an increased level of care regarding scarce (material, technical and personnel) resources.

The former four criteria for prioritizing patients for care converge on viewing the maximal efficiency of the outcomes as something secondary. On the contrary, it is the outcome-orientation of the consequentialist rule of “doing the most good for the most people” what makes it to triumph over these other criteria when applied to triage after a mass casualty event. Triage in disasters aims to save as many lives as possible while making the best use of the limited available resources. While the aforementioned criteria seek to allocate scarce resources and to select disaster victims for help with equity, even when the likely result may be that many lives that could have been saved will be lost (Veatch, 2005), the priority -in the consequentialist rule- is for the aggregate good, even if it is unfair to those who are worse off or in greatest need. Certainly, the impartial rules of “everything for everyone” or “the most serious cases must be treated first” may be sound for triaging victims in ordinary emergencies as far as the problem of allocation is manageable. However, as Georges Annas put it once, “although utilitarianism is generally not seen as a proper decision-making rule for medical treatment decisions, it is almost universally cited as the basis for triage decisions in mass emergencies, as in doing ‘the best we can for the most people’” (Annas, 2010, p. 277). In the midst of a disaster, multiple victims are involved that exceed the capacities and resources of emergencies available to face the necessary help. In these extraordinary circumstances, not all victims can be (equally) treated: the same persons that would receive emergency aid and care in a normal hospital context may be not eligible for receiving immediate treatment or even could be left untreated.

As in other areas of public health, the prevailing bioethical criterion in such cases of allocation of resources and priority setting is not the principle of autonomy, according to which each individual should be treated as irreplaceable and unique, nor is the trust relationship between doctor and patient as basic as in normal clinical situations, nor is informed consent explicitly required for legitimizing the medical interventions, nor is the confidentiality of personal data considered inviolable. In a sense, the rights and care of populations triumph over the absolute protection of personal integrity of any individuals. In the context of large-scale disasters, it is usual for the healthcare professionals to work applying the presumed consent as a default rule. Moreover, it is not uncommon that some victims receive only dignified comfort care and therapy as assessed and deemed necessary by healthcare providers. In other words, the satisfaction of autonomy claims are



less imperative than paternalist directives during large-scale disasters, when the overwhelming numbers of victims may not leave healthcare workers the option of listening to the informed will of the patients and reasonable rejecting with other professionals the wishes of the relatives. Then, from a moral point of view, a reasonable medical paternalism can have more ethical weight than the explicit consent and the demands and wants of the victims. Likewise, confidentiality may be infringed in situations where it is necessary to monitor, survey and report certain diseases and casualties for the sake of public health. Hence, it is pretty possible that the right to privacy becomes suspended for public good reasons in multiple-casualties scenarios.

In response to disaster victims, consequentialist criteria prevail that call for the greatest good for the greatest number and that give priority to the reduction of both suffering and loss of (quality of) life and to the selection and care of patients who are more likely to survive (Tännsjö, 2019; Savulescu, Persson and Wilkinson, 2020). In triaging people the math must be done and consequentialism is the approach that does the math best: “the force of quantification is the strength of utilitarian arguments” (Jonsen, 1986, p. 174). It takes into account the amount of medical resources that have to be allocated and the therapeutic periods to be respected, and places the premium on the advantages for health that the most effective interventions likely provide, including those in triage protocols that assign numeric scores on scales for evaluating the functional and/or anatomical conditions in any patient. It concerns above all the estimation of the objective value of the number and quality of human lives, so even the sound comparisons between patients’ standardized measuring of severity and survivability enter into the triage equation. Not to count properly in response to every concrete case, not to compensate the loss suffered by one person with a gain made by other persons’ probabilities of survival and recovery, even their quality-adjusted aggregate years, and not to manage the available supplies accordingly would mean a waste of these scarce resources and overburdened personnel efforts and a betrayal of the greatest objective good they can aspire. In other words, it would mean committing an inexcusable ethical wrong.

## Conclusion

The standard and mainstream bioethical approach (a principlist one, focused on ordinary clinical situations and oriented by individualistic and liberal views) shows clear limitations when it is applied to deal with many mass casualties emergency situations and in the most exceptional situations of disasters. One of the reasons for this is that contemporary bioethics highly prizes individuals’ choices and individual rights, while disasters require a broader approach encompassing the rights and the care of populations. Another reason is that resources and personnel are overwhelmed in disasters scenarios, which forces to consider a consequentialist view as overriding. In a sense, this view embraces the bioethics principles of seeking benefits and avoiding harms while making cost-benefits estimations operational. More specifically, consequentialism functions as the default solution for triage decisions in mass emergencies, in which it is usually combined with other subaltern criteria, and

is therefore a key for the disaster ethics. It is only by counting appropriately that patients should be prioritized and treated in disaster scenarios, and that the hard solutions to the most awkward questions turn legitimate.

However, a narrow consequentialist approach should also give way to a more comprehensive view on the ethics in disaster situations. Interventions to assure a prompt assistance to victims of a disaster have both temporal and structural restrictions, and a broader vision from public health ethics is required. This broader vision comprehensively addresses the many complex ethical issues that arise throughout the interrelated cycle of disaster management. The reductive and short-term conception of disaster, that is, the ordinarily accepted one and the typically conveyed by the media focusing on the immediate aftermath, frames the dominant approach to triage issues. Things are different when disaster management tackles moral issues and appropriate actions at all stages in the cycle. Notwithstanding the centrality of ethical consequentialism in the triage performed by the humanitarian and medical teams in the midst of mass casualties incidents, the stronger involvement, the coordination and the integration of activities and improvements over the pre-disaster phases of mitigation and preparedness are also crucial for defining and dealing with the ethical questions that bear the humanitarian works in the field. Since the ethics of disaster is not restricted to the reaction during and immediately following the disaster, the proper response consists partly in the previous collective responsibility and engagement. According to this “respons(e)bility requirement” or responsibility to respond mandate, as we could call it, a complex and multi-sided (diachronic, structural and holistic) perspective is needed that reframes disaster ethics alongside with the public health policies and, due to the impact of the latter on – and its interrelation with – other legitimate public policies, also with the democratic determination of the future direction of the political community.

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