Supplemental Figure 1

The ECOG performance and ASA scores

ECOG= Eastern Cooperative Oncology Group; ASA= American Society of Anesthesiologists.

Figure legend continued:

Development of the triage algorithm

The development of this tool was directly informed by ICU clinicians practicing in health care systems that have been overwhelmed by COVID19 patients. Specifically, practical application of the tool and usability of it in these environments was a key consideration in its design.

1. Key attributes
   1. One page in length to help clinicians make rapid decisions
   2. Focus on enabling on the spot and relatively rapid decision making which will be needed in an overwhelming pandemic.
   3. Finalize a triage tool that was “simple, easy to understand and use and most important providing for quick assessments.”
   4. Flexibility – make it adaptable to local practice, resource availability and changing circumstances of the outbreak
2. Contents
   1. In setting starting criteria for triage, the first items we chose were those whose answer could rapidly finalize the process without the need to proceed further and waste precious triage team time. Therefore, we started with clear exclusion criteria. Firstly, exclusion of those with advanced directives and then patients who are too well to gain substantial incremental benefit from ICU care, or those who otherwise refuse ICU admission.
      1. The exclusion criteria are few and the same exclusion criteria we use in ICU under normal circumstances. As White noted(24), this helps to allay some of the societal fears concerning individuals not being chosen because they are not worthy of being saved. Regarding exclusion criteria, everyone therefore gets the same fundamental chance of being admitted to an ICU during a pandemic as would occur during ‘normal’ conditions. Nevertheless, it may be difficult for some in society to accept the triage process and may harbor the concern of unfairness. This protocol may allay some of those fears, as should an objective, triage algorithm which can promote consistent decisions, which is something this tool provides.
      2. Then inclusion criteria which are again directly comparable with the major inclusion during ‘normal’ conditions.

iii. Once patients do not meet any exclusion criteria and meet the inclusion criteria, he/she enters the pool of potential ICU admissions.

* 1. After meeting inclusion criteria, and not excluded by exclusion criteria, patients are ultimately chosen for admission priority based on their priority rank from Priority 1 to 4. A prioritization score was developed by including variables that would predict short-medium term mortality (3-6 months) in the first instance and were the most compatible with quick decisions
     1. a performance score
     2. comorbidities
     3. current organ system failure

This resulted in the choice of the performance score - the simple ECOG performance score with 5 variables rather than the Clinical Frailty Scale (CFS) with 9 variables. The CFS or other equivalent performance scores may be used interchangeably, depending on local practice requirements. For comorbidities - the well-established American Society of Anesthesiologists (ASA) score with its descriptions concise, and logically arranged, rather than merely listing a large number of comorbidities/severe comorbidities as done previously. For organ system failures (OSF) – simply the number of OSF was chosen, rather than the SOFA score which requires additional calculation, assessment of missing variables, and then further prioritization. Some units may choose to utilize the SOFA score rather than the simpler bedside clinical assessment of organ failure. It should be noted that previously, the SOFA score has not been found to be helpful when retrospectively applied to epidemic data, and currently most Covid-19 patients only have single organ failure, reducing its discriminatory value. To identify patients in Priority 4 we chose general diagnoses rather than many more specific ones that have been proposed in previous papers, resulting in long, but not exhaustive lists. For instance, we suggest utilizing a generalized form relating to end-organ failure of the noted organs - brain, heart, lung, etc.

3. Internal consistency

* 1. The authors deliberated at length and concluded that the mortalities of the 3 chosen variables for the priority scores (performance score, comorbidities and organ system failures) are likely to correspond to the predicted survival percentages noted on the bottom of each priority score.
  2. The noted predicted survival percentages were calibrated with the South African consensus expert group (11), who decided to define “an incremental ICU benefit” in a resource limited setting as a 15-25% difference in mortality. We made the initial difference a little larger at 30%, to account for the increased pressure anticipated in an outbreak setting.
  3. Percentage benefit required to meet priority for admission may be changed by individual units depending on the balance of resources available, and as the severity of the outbreak evolves.

4. Tie-breaking

* 1. If more Priority 1 patients are queuing than beds available - allocation by incremental ICU benefit- saving the most life-years (evaluating mortality from both acute and chronic disorders) rather than just lives saved for acute disease should be chosen. This likely favors the young in tie-break circumstances, however our recommendation is that age should not be used as a sole triage criterion remains.
  2. If a tie for ICU admission candidates remains we recommend use first come, first served; not a random allocation lottery process.

5. External validation

* 1. As this triage algorithm was being developed, the authors recognized the lack of strict evidence-base for the recommendations. The senior author (CS) was involved in developing a triage algorithm with another committee for Hadassah Hebrew University Medical Center, the Israeli Society of Critical Care Medicine and the Ministry of Health of the State of Israel. This committee reviewed several triage algorithms and agreed that the present triage algorithm was the best currently available. Subsequently, another committee representing the Israeli National Bioethics Council which has to approve all Ministry of Health decisions on matters with ethical issues such as Covid-19 convened and also approved this triage algorithm.
  2. The authors have all been involved in leadership positions during the development of triage statements and guidelines by internationally recognized professional bodies. A number of the authors have extensive personal experience in resource driven triage on a day to day routine basis and during outbreaks.