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# Hospital networks and patient transport capacity during the COVID-19 pandemic when intensive care resources become scarce

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With great interest we read the article by Heinsar et al. discussing implications for extracorporeal membrane oxygenation (ECMO) during the coronavirus disease 2019 (COVID-19) pandemic when the number of patients reaches a level that demand may overwhelm available resources [1].

While various medical resources could become scarce during a pandemic, ECMO is exposed for numerous reasons. Firstly, it is a potentially lifesaving treatment for patients that would die without; secondly, ECMO treatment is highly resource intensive and therefore may have an impact on the availability of resources for other patients [2].

Crisis standards of care may include strategies for rationing of scarce resources [3]. However, before withholding potentially lifesaving therapy including ECMO from patients in need, all reasonable efforts must be made to maintain ordinary standard of care [4].

During the COVID-19 pandemic, disease hotspots emerged, where healthcare facilities were overwhelmed and provision of standard of care was challenged or even impossible. Examples include Wuhan (China), Bergamo (Italy), New York (United States) and Heinsberg (Germany). However, at the same time, even within these affected countries, healthcare capacities were still available.

In case of imminent local overstrain, networks could be established to transfer patients to regions with lower case numbers, whether nearby or further away (Fig. 1) [5]. Thoughtful and responsible planning should include making information about free hospital and ICU beds and other potentially scarce healthcare resources, like ventilators or ECMO, at the local, regional and national level easily available to physicians. Furthermore, governments, administrations, and healthcare managers should provide transport capacity to transfer patients from congested regions to less affected regions where there are still hospital resources available. In France, when some regions were particularly affected by the pandemic, passenger trains were temporarily converted for the transfer of intensive care patients.

Registries monitoring the availability of ICU beds and definition of regional clusters for patient allocation help to ease pressure from overburdened hospitals, too. This model could be established elsewhere.

Triage committees or advanced prediction models may support decision makers in preparing for situations of scarcity; however, as soon as important resources are no longer available in sufficient quantities, structures and procedures must be in place that healthcare workers can access without any particular hurdles in order to refer or transfer patients to the places where the necessary resources are (still) available. In such situations triage committees or prediction models most likely cannot keep up with the pace and flexibility required.

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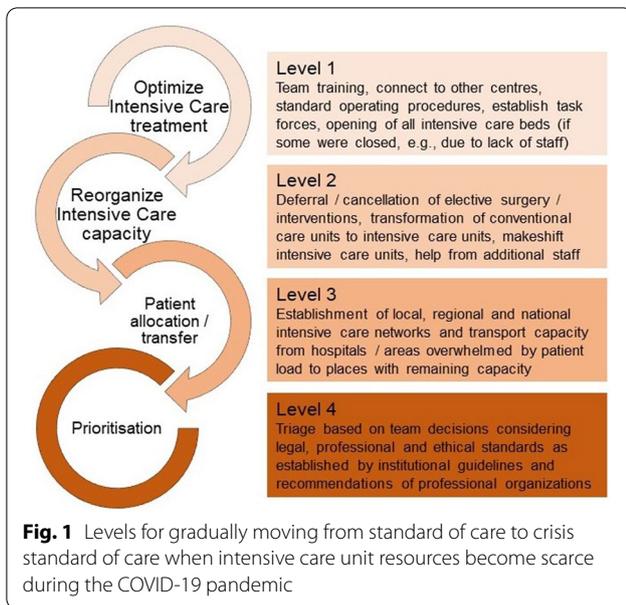
None.

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**Authors' contributions**

AS designed the paper and prepared the first draft based on preceding discussions with all co-authors. All authors reviewed the draft and approved the final version of the manuscript.

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Not applicable.

**Ethics approval and consent to participate**

Not applicable

**Consent for publication**

Not applicable.

**Competing interests**

The authors declare that they have no competing interests.

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