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EDITORIAL

Medical dominos: impact of COVID-19 care on the health of the population

Allan Garland[1*] and Andrea Cortegiani[2,3]

In this issue of the journal, Zampieri et al. set out to evaluate the influence of the coronavirus disease 2019 (COVID-19) pandemic on adult, non-COVID-19 patients admitted to 165 intensive care units (ICUs) in 45 Brazilian hospitals [1]. They used several statistical techniques to compare hospital mortality in the 2020 cohort to 2011–2019 cohorts. This historical comparison period accounted for existing temporal trends, to go along with adjustment for severity of acute illness using SAPS 3 predicted mortality. This was a large study including more than 514,000 patients. Trends prior to the 2020 pandemic included a quadrupling of admissions; small, linear declines in median age (from 64 to 61 years) and SAPS 3 scores (from 43 to 41); and a monotonic decline in mortality (from 11 to 5.6%). While the 2020 non-COVID cohort of 68,000 reversed the trend in admissions, total ICU admissions continued to grow due to more than 21,000 critically ill patients with COVID-19. While age and SAPS 3 of the 2020 non-COVID-19 patients continued to decline, their unadjusted mortality rose to 6.4%. In two separate analyses, risk-adjusted mortality in 2020 rose significantly. Adding evidence that it was due to the pandemic was an analysis showing that adjusted mortality of non-COVID-19 patients undulated in parallel with the number of COVID-19 admissions. Secondary analysis indicated that this effect was most marked for those with the highest SAPS scores. While this study used rigorous methology, it has a few limitations. The authors could have strengthened their analyses using additional variables to adjust for case mix differences over time. Generalizability might be questioned for a study from one country where hospital mortality of ICU patients is relatively low. And while they point to analyses consistent with a causal relationship between the pandemic and worse outcome of non-COVID-19 ICU patients, and to possible mechanistic pathways for such a relationship, causality remains to be proven.

However, the authors identify one aspect of a broad and extremely important issue, i.e., the consequences of a single-minded emphasis on caring for all patients with COVID-19 on the healthcare, and health, of the rest of society. A virtually universal response to the pandemic has been to shift healthcare workers and other resources towards acute and ICU care of COVID-19 patients. It is clear that this has severely limited the ability of other domains of hospital care, and of outpatient clinics, to care for their patients [2, 3]. (Online Supplement for: paragraph 2 Supplementary References.)

A report from a major academic teaching hospital in Boston indicated that "Normal daily operations were halted, and the focus shifted to a pandemic response mode". Hospitalizations for major causes of morbidity and death have generally declined [4], while excess deaths from causes other than COVID-19 have risen [5]. Possibly contributors include people avoiding medical care due to fear of infection [6], reduced quality of care due to inadequate resources to care for such patients [3, 7], and burnout among overburdened healthcare workers. (Online Supplement for: paragraph 3 Supplementary References.)

But consequences of reduction in care for those with chronic conditions may well exceed the pandemic effects on acute care for non-COVID-19 patients. Chronic diseases drive the majority of healthcare costs; over half of adults have a chronic disease, with over one-third having two or more of them [8]. The pandemic has interfered with medical services to people with cancer, heart

*Correspondence: agarland@hsc.mb.ca
[1] Departments of Medicine and Community Health Sciences, University of Manitoba, 820 Sherbrook Street, Room GF-222, Winnipeg, MB R3A 1R9, Canada
Full author information is available at the end of the article

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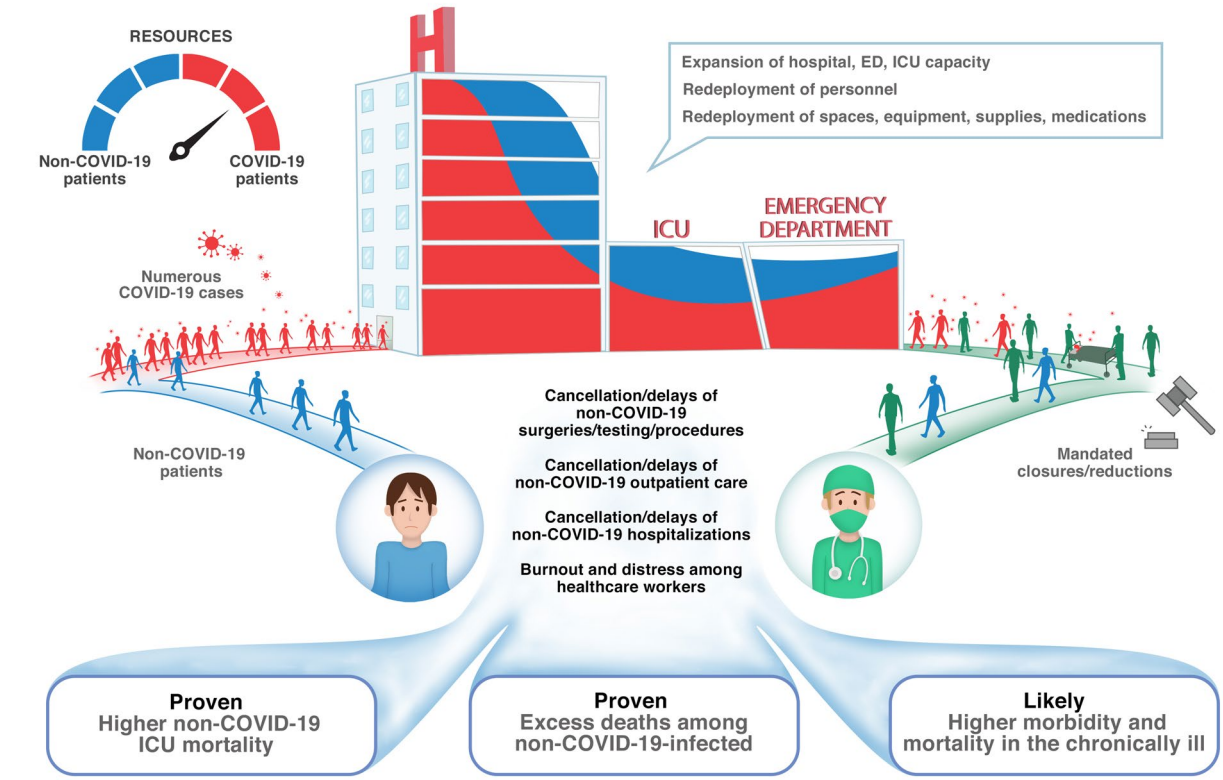

Fig. 1 Flow diagram of how the COVID-19 pandemic may affect healthcare for people without COVID

disease, neurologic disorders, and other chronic conditions [2, 9, 10]. While reductions in unnecessary care may account for some of the observed decreases, we must have serious concern about if and how the pandemic has influenced relevant medical and psychosocial outcomes for the much larger populations of people with chronic conditions, or who develop such conditions but suffer delays in diagnosis due to the pandemic, or experience acute, time-dependent conditions. (Online Supplement for: paragraph 4 Supplementary References.)

In other words, we must recognize that prioritizing COVID-19 care over all other medical conditions may have the net effect of harming society. This calculus necessitates balancing the needs and outcomes of those with, versus without, COVID-19. Much is known about the former, including that it varies between and within countries [11]. In North America, approximate hospitalization and mortality rates among those affected with COVID-19 are 7% and 1.7%, respectively [12]. Mortality among all those hospitalized has been less than one in four [12], approximately one-third for those admitted to an ICU [13], but approximately half or more of the small fraction of cases that required invasive mechanical ventilation [14]. As medical resource reallotment has largely been oriented towards increasing capacity to care for critically ill COVID-19 patients, particularly those requiring mechanical ventilation, it is necessary for society and decision-makers to carefully reflect on the big picture. Considerations of triage with palliation during the pandemic has mainly been focused on rationing ICU beds and mechanical ventilators among those with respiratory failure [15]. But given the relatively high mortality of the comparatively small group of mechanically ventilated COVID-19 patients which have dominated our attentions and driven resource redeployment, and the detrimental health effects on a much larger portion of the world's population of attempting to care for all of them, we must question the net value to society of such a single-minded emphasis on providing care to the most severely ill patients with COVID-19. High quality research on the effects of the pandemic on these larger populations is urgently needed to provide policy makers with the complete picture they need to make informed, difficult decisions about how to allocate scarce medical

resources (Online Supplement for: paragraph 5 Supplementary References.) (Fig. 1).

Supplementary Information
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Author details
[1] Departments of Medicine and Community Health Sciences, University of Manitoba, 820 Sherbrook Street, Room GF-222, Winnipeg, MB R3A 1R9, Canada. [2] Department of Surgical Oncological and Oral Science (Di.Chir. On.S), University of Palermo, Palermo, Italy. [3] Department of Anesthesia Intensive Care and Emergency, Policlinico Paolo Giaccone, Palermo, Italy.

Declarations

Conflicts of interest
The authors declare that they have no relevant conflicts of interest related to the topic or the authors of the editorialized manuscript.

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As an editorial, ethics approval for this submission was not required.

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