

# The Urge to Build More Intensive Care Unit Beds and Ventilators: Intuitive but Errant

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Throughout the coronavirus 2019 (COVID-19) crisis, much attention has been devoted to the fraught question of how to allocate intensive care unit (ICU) beds and mechanical ventilators if the supply of these resources is insufficient to provide them to all patients considered to be in need. Contemplating such tragic choices naturally conjures thoughts that we might have avoided these dilemmas by rapidly manufacturing new beds and ventilators at the first sign of a looming pandemic, or by rapidly converting existing beds and machines such that they could be used to expand the supply of critical care resources. These ideas stem from the natural human heuristic and conventional clinical ethos to mount unstinting effort toward saving the lives of those who fall ill. These views are also psychologically reinforced by the instinct to deploy aggressive medical technology to win the “war” against the pandemic.

Indeed, the instinct to save the lives of the desperately ill, which exemplifies the “rule of rescue” (1), is so intuitively powerful as to make it hard for humans to even consider competing approaches. No one would condone a response to the COVID-19 pandemic that did not include using the nation's full supply of critical care resources. However, the drive to build even more beds and ventilators will do more to assuage public anxiety and outrage than to reduce overall mortality, owing to both the poor outcomes among patients with COVID-19 receiving mechanical ventilation and the diversion of clinical workforces.

We argue that supply-side investments in critical care in the midst of the pandemic would not substantially improve population health in the short term and would worsen it in the long term. As psychologically disruptive as it may be to consider not expanding the critical care supply, such expansions would magnify the already considerable skew of U.S. health care toward intensive care. We further argue that even modest improvements in public health measures, such as physical distancing (which might be promoted by infomercials featuring sports or movie stars) and training more health care workers to become expert in serious illness communication, would be more effective than investments in critical care for improving short-term population health.

Before COVID-19, the United States had more ICU beds and ventilators per capita than nearly any other country (2). Indeed, an assessment of ICU occupancy and ventilator use revealed that during noncrisis times, the United States has a glut of critical care resources. In any given hour, only two thirds of ICU beds are occupied and only one third are occupied by patients receiving mechanical ventilation (3). Although these num-

bers have been starkly different during the COVID-19 crisis, they highlight our substantial existing capacity to care for those most likely to benefit from critical care.

As a result of this extant capacity, adding ventilators and ICU beds would make critical care delivery less efficient. Indeed, many studies have shown that when ICU beds are tight, critical care is increasingly allocated to patients who benefit from it, without increasing overall mortality (4–6). Building more beds and ventilators would offset these efficiencies of scarcity, increasing the already high mortality rates observed among patients with COVID-19 who require mechanical ventilation (7). Although the total number of survivors might increase to an extent, so too would the burden of chronic critical illness.

The second reason that building more ICU beds and ventilators will not deliver the hoped-for life savings is that they are not the scarcest resources during the current pandemic. Most projections indicate that ward beds and healthy critical care clinicians will be more scarce than ICU beds or ventilators (8). Thus, expansions to the ventilator supply may carry adverse consequences for population health by requiring the redeployment of non-critical care clinicians and beds, such that non-critically ill patients may become critically ill and even die.

Such workforce redeployment reveals a third reason to doubt the benefits of increasing critical care capacity: the adverse consequences for clinician effectiveness and well-being. Although building beds and ventilators may prevent the moral distress that certain clinicians would otherwise feel in having to make life-or-death choices about allocation, redeployment would likely increase burnout among clinicians who are unaccustomed to working in critical care environments. Asking physicians who have not contemplated a ventilator since medical school to manage the sickest ventilated patients, particularly without adequate personal protective equipment, could adversely affect the long-term health of the clinical workforce.

Fourth, every dollar spent building more ICU beds and ventilators would save more lives if instead spent on more testing for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), contact tracing, and personal protective equipment, or on promoting adherence to physical distancing. Indeed, using the COVID-19 Hospital Impact Model for Epidemics (8), we projected that even a doubling of the ventilator supply would not save as many lives as a 40% decrease in physical contact. And the sooner in a region's epidemic trajectory such policies were implemented, the greater the benefit of distancing, and the less the benefit of ventilator production.

Other, less obvious initiatives might also yield greater benefits to short-term population health. For example, palliative care clinicians and others with excellent skills in serious illness communication and symptom management are among the scarcest of all health care resources (9). Thus, COVID-19 leads us to utilize our preexisting glut of critical care resources, but it also magnifies the preexisting shortage of palliative care clinicians. Although expanding the palliative care workforce will not save lives, it may offer a societal investment superior to that of critical care expansion, given the resultant benefits in quality of life for patients and their family caregivers.

Finally, in a nation in which nearly 1% of gross domestic product is already allocated to critical care, further growth should be approached with extreme reticence. History suggests that any COVID-19-induced expansions to the critical care supply may unfortunately be hard to reverse once the pandemic ends. Supply-induced demand—or, “if you build it, they will come”—was a hallmark of U.S. critical care well before COVID-19 (10). Having experienced this pandemic, we will find it difficult to shrink the critical care supply for fear of being underprepared for the next pandemic.

Our natural moral reasoning precludes us from withholding available critical care, even from patients with remote chances of benefiting from it, and the same reasoning motivates us to expand critical care during times of need. But even if building more ICU beds and ventilators neither crowded out opportunities for other more effective initiatives nor exacerbated critical care excesses in the future, it would ultimately represent the triumph of deeply human instincts over optimal policy.

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