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Critical care capacity: The number to watch during the battle of COVID-19

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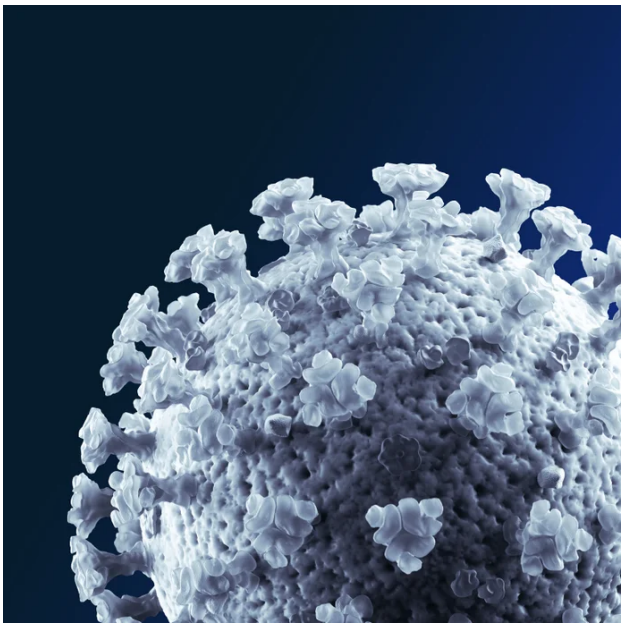
Since the explosion of COVID-19, most countries have put in place public health measures to "flatten the curve" and accepted the concomitant economic pull back. But there is another number everyone should watch now: the capacity in hospitals to deliver critical care in intensive care units (ICU) with ventilators. It is the metric that indicates whether hospital systems will be overwhelmed.

Each day the world watches the number of COVID-19 cases climb and asks: "Is it slowing yet?"

But there is another number everyone should watch now: the capacity in hospitals to deliver critical care in intensive care units (ICU) with ventilators. It is *the* metric that indicates whether hospital systems will be overwhelmed. It is *the* reason to "flatten the curve," because without more capacity more lives will be lost.



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To safeguard our lives, critical care capacity must be increased in weeks, not months. While some countries and regions may have more capacity than others all need more. It almost does not matter the cost, as every month health systems are faster ahead of the peak of patients requiring critical care, we save lives *and* $200 billion dollars in GDP.

How much should we increase capacity? It depends on the starting point of each country, but in most instances is four to five times. This increase is possible; and is part of the focus of the health response across the world. But we strongly suggest to healthcare leaders to put this sentence on top of their and their colleagues' proverbial inbox: *Start watching critical care capacity.*

Below we outline the need and possible actions to increase critical care capacity.

Since the explosion of COVID-19, most countries have put in place public health measures to "flatten the curve" and accepted the concomitant economic pull back. While the effectiveness of different approaches can be debated, these have been essential to gain control over the pandemic's growth.

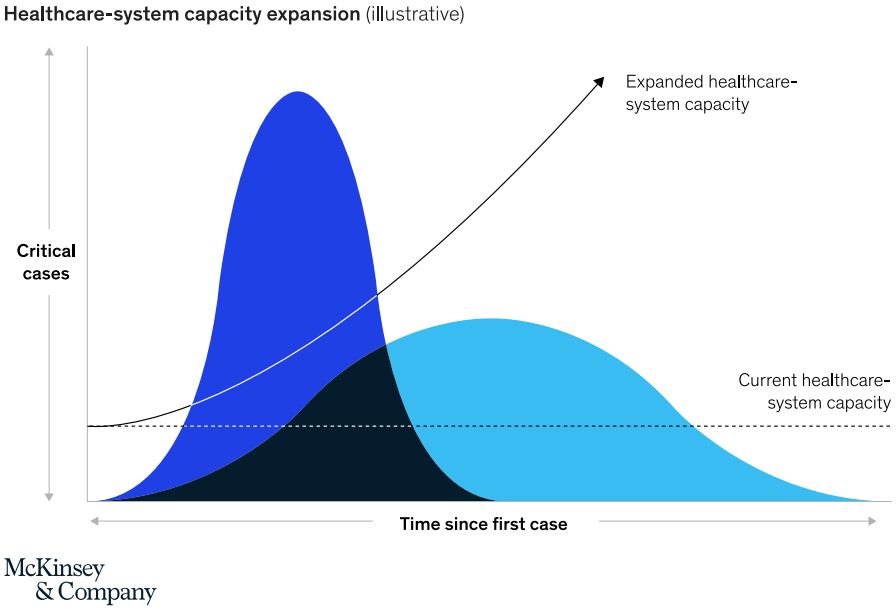
The unprecedented rise in US unemployment in recent days also portends human suffering stemming from economic turmoil. As we noted earlier this month, the virus could set the global economy back $1 trillion to 1.5 trillion in the second quarter of 2020 alone. In the United States, every four weeks of shutdown could set the economy back about $200 billion in GDP.[1] In particular, those who work in the travel, restaurant, and transportation industries are at risk, as are a large percentage of

households around the world. Even in advanced economies like the United States, 25 percent of households live from paycheck to paycheck, and 40 percent of Americans are unable to cover an unexpected expense of $400 without borrowing.

The race is now on to boost critical care capacity. Expanding healthcare system capacity is vital to saving lives, as an overwhelmed healthcare system results in a material increase in the rate of mortality and can slow our return to normalcy (Exhibit 1).

Exhibit 1

Expanding healthcare capacity is critical to saving lives.



The two main questions now are: What do we control? Where should we focus?

Growing healthcare capacity at lightning speed

Critical care capacity reflects ICUs, required hospital supplies, patient ventilator units, plus a trained workforce that has what it needs to do its job. While some of the following are already in motion, leaders are likely to want to consider the following actions, taken in tandem:

- **Cease all non-emergent care across hospitals and other sites of care**, which would free up to 30 percent bed capacity, caregiver capacity, and a portion of ventilator and personal protective equipment (PPE) capacity almost immediately. Many countries around the globe have already done this.
- **Increase critical supplies—such as PPE, ventilators—to keep current facilities fully functional and keep healthcare workers protected.** Please see Exhibit 2 below for actions we can deploy now that could expand available supplies in six to eight weeks.
- **Train additional frontline staff (for example, nurses trained on mechanical ventilator care) to deliver capacity expansion.** Curricula to upskill healthcare workers in a matter of days have been developed in Asia and Italy. Independent healthcare providers across all countries may want to deploy similar plans in order to increase workforce numbers.
- **Build out of alternate hospital capacity (for example, field hospitals, converting outpatient/ambulatory facilities to acute, converting non-healthcare facilities to acute—hotels, dorms).** Make-shift hospitals were built in a matter of weeks in

China earlier this year as they dealt with the biggest surge of patients. With the assistance of the United States Army Corps of Engineers, FEMA, and mobilizing the military, at a wartime pace, the United States could likely build required bed capacity in waves in six weeks. These would not be facilities that in any regular time would be considered hospitals but could meet the needs of the affected population in extremis.

- **Activate strategic healthcare capacity** within military or other defense healthcare systems around the globe.
- **Accelerate approval of treatments**, as well as scale-up of manufacturing and distribution of the treatments that reduce severity or duration of critical care requirement, thereby reducing length of stay.

Exhibit 2

A number of supply- and demand-side levers that healthcare stakeholders could explore to reduce the gap in the market.

● Easiest ● Most difficult

	Lever for exploration	Examples for healthcare stakeholders to potentially consider	Estimated time to impact	Ease of implementation
1. Supply	Identify all remaining inventory in market	• Identify and gather all remaining N-95 inventory currently in the market (e.g., work with manufacturers/ distributors to re-direct N-95s going to non-medical facilities or personnel to go to healthcare providers)	Immediate	◑
	Increase capacity of existing N-95 suppliers	• Ramp up production of major N-95 suppliers through investments, collaboration between manufacturers, exploration of alternative filter media • Convert capacity in plants of current suppliers not dedicated to N-95s to produce N-95s where similar processes exist	Medium term	◑
	Import from other geographies	• Explore importing from countries overseas where N-95s or suitable alternatives may be available, export restrictions dependent	Medium/ short term	◑
	Source from adjacent industries (non-medical)	• Explore standing up new manufacturers (e.g., convert textile plants) • Identify and source alternative substitutes from non-medical industries	Medium term	◔
2. Demand	Prioritize and extend usage	• Prioritize use of N-95s for only critical activities if determined appropriate • Explore extending use of N-95s across encounters where possible	Immediate	◔
	Re-use / reprocess	• Explore developing guidelines for re-use of N-95s • Process N-95s for re-use in line with rapidly emerging evidence and guidelines (e.g., heat decontamination)	Medium term	◑
	Adjust clinical workflow	• Explore designating specific areas of facility for treatment of COVID-19 patients, reducing need for N-95s across HCPs in other areas	Medium term	◑
	Adjust care team guidelines	• Explore developing guidelines on critical staff needed for care of COVID-19 patients and subsequently N-95s	Immediate	◔

All guidelines should be created alongside Infection Prevention teams and be in accordance with CDC and local DOH policy guidelines

Source: Expert interviews

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Slowing the demand for critical care

Most countries and states/provinces have deployed public health measures to slow the spread of the virus (for example, physical distancing, shelter-in-place, closing of public areas such as beaches and basketball courts). Without a vaccine or prophylactic treatment in sight the risk of resurgence of spread remains real. At the same time, given the large impact of these public health measures on people's livelihoods, all leaders are seeking a balance of managing critical care demand growth while alleviating the sharp pullback in economic activity. A few actions may be critical to achieving these twin goals:

- Realize maximum curve-flattening impact from the public health measures already deployed (which have driven the sharp economic pullback). While social norms and political systems vary around the world, more rigid application of distancing measures means that they will be more effective and can be dismissed more quickly. A number of countries have used technology effectively to support effective physical distancing (for example, the use of phone-based passes to minimize congestion in grocery stores). Create social and economic incentives for those in quarantine, perhaps including community-funded food delivery, income guarantees, solutions around caregiving needs, and job-security guarantees.
- Exponentially scale-up testing capacity and contract tracing capability. While some countries currently have too many cases to trace all contacts, the ability to test rapidly and isolate those at highest risk of infecting others will help contain a future resurgence

in cases. For countries with few cases to date, rigorous testing can prevent escalation to the point where critical care capacity is strained. Mass-testing in early hot spots such as South Korea and temperature screening, testing, and contact tracing deployed in Singapore are examples of such approaches.

Start watching critical care capacity. Reporting is improving. We encourage leaders to help increase critical care capacity to the extent they can. This will hopefully save lives and livelihoods, especially for the most vulnerable members of our society. It can be done!

1. Sven Smit, et al., *Safeguarding our lives and our livelihoods: The imperative of our time*, McKinsey & Company, March 2020, mckinsey.com.

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