

As pandemic spreads, will there be enough ventilators?

As the coronavirus that causes COVID-19 spreads across the United States, there are continuing concerns among hospitals, public health experts and government leaders that hospital intensive care units would be hard-pressed to handle a surge in seriously ill patients.

A key limiting factor to being able to provide good care, they say, is the number of ventilation machines — ventilators — a hospital has on hand to help the most seriously ill patients breathe.

"The coronavirus, like many respiratory viruses, can cause inflammation in the lungs," explains Dr. William Graham Carlos a pulmonary critical care specialist at Indiana University School of Medicine. "And when the lungs become inflamed, the membranes that transfer oxygen from the air into the blood become blocked."

When patients develop this type of viral pneumonia, they often require bedside ventilators which, Carlos says "can supply higher levels of oxygen and also help push air into the lungs to open them up, and afford more opportunity to get oxygen into the patient." By subscribing, you agree to NPR's terms of

use and privacy policy. NPR may share your name and email address with your NPR station. See Details. This site is protected by reCAPTCHA and the Google Privacy Policy and Terms of Service apply. Ventilators are generally a temporary bridge to recovery — many patients in critical care who need them do get better. These machines can be crucial to sustaining life in certain emergency situations. And if there is a surge in seriously ill patients, as COVID-19 spreads, ventilators could be in short supply, from hospital to hospital or nationally. And if there's an increase in very sick patients on a scale like what happened in China, Dr. Eric Toner says, the U.S. is not prepared. Toner studies hospital preparedness for pandemics at the Johns Hopkins Center for Health Security.

"We are not prepared, nor is any place prepared for a Wuhan-like outbreak," Toner tells NPR, "and we would see the same sort of bad outcomes that they saw in Wuhan — with a very high case fatality rate, due largely to people not being able to access the needed intensive care." Toner says all hospitals have some lifesaving



ventilators, but that number is proportional to the number of hospital beds in the institution. An average-sized hospital with 150 beds, for example, might have 20 ventilators. If more were needed, hospitals that need them could rent them, he says — at least for now. But if there's a surge of need in a particular community — patients with serious pneumonia from COVID-19 or pneumonia related to flu, for example — all hospitals in the area would be

competing to rent from the same place. "So that's a very finite resource" he says. The latest study available estimates there are about 62,000 ventilators in hospitals nationwide. That figure is seven years old — so the actual number could be higher.

There are also some machines in federally stockpiled emergency supplies, though the exact number isn't public. "There is a strategic national stockpile of ventilators, but the numbers are clas-

sified," says Toner. It's been "publicly stated," he says, that there are about 10,000 ventilators in the national stockpile. "That number might be a bit outdated, but it's probably about right," he says. Other estimates range from 4,000 to somewhat less than 10,000.

While any extra ventilators would be an important addition, Toner says it likely wouldn't be enough to sustain the entire country through an experience like that seen in Wuhan, China. If there's not enough capacity at one hospital, it may be possible to transfer patients to another, he says. "Not every community is going to be hit simultaneously; some cities will be badly affected while others are not so badly affected and then the wave of disease will move on." So, in some cases, Toner says, it seems likely that patients could be transferred from an area where ventilators are scarce to an area where the supply is adequate. But if hospitals continue to be overwhelmed, he says, at that point, "tough decisions would have to be made about who gets access to a ventilator and who does not."

All health care providers and hospi-

als are now working overtime to try to prevent that sort of scenario. Dr. Craig Coopersmith with Emory University School of Medicine, and a spokesperson for the Society of Critical Care Medicine, says he sees signs all across America that medical communities are working together to prepare. Evergreen Hospital in Washington State, for example, which treated some of the first U.S. COVID-19 patients in late February, this week posted online its own "Lessons for Hospitals." There has been a lot of ongoing communication, Coopersmith says, between hospitals, professional societies and individuals — in person, by phone and via shared Listservs and social media.

"In multiple ways, people are linking with each other to say 'I'm not going to do this in isolation; tell me how you're doing this, let me tell you how I'm doing this and let's share lessons with each other,'" Coopersmith says.

The pandemic, he adds, is "remarkably challenging. But he sees the health care system's response to it as remarkably heartening, "with everyone working together to ensure what's best for



Fish oil supplements linked to lower risk of heart disease & death

The latest volley is a new study linking regular use of fish oil supplements to a lower risk of premature death and cardiovascular disease (CVD) such as heart attacks and strokes. New study suggests fish oil derivative may benefit heart health. "With regard to fish oil and CVD the data for the most part have been positive, albeit with some wobbling among studies. The latest study adds to the database suggesting effectiveness," said Alice Lichtenstein, the Gershoff professor of nutrition science and policy, and director and senior scientist at the Cardiovascular Nutrition Laboratory at Tufts University. She was not involved in the research.

But Lichtenstein stressed that taking fish oil tablets was no "magic bullet" and the study wasn't able to shed any light on what dose was needed to achieve a clinically meaningful effect.

This latest research, which published Wednesday in the BMJ medical journal, included nearly half a million people from the UK between 40 and 69 years old and enrolled in the UK Biobank study. Nearly a third of the 427,678 men and women in the data bank said they took regular fish oil supplements at the start of the study. Vitamin D, omega-3 supplements do not prevent cancer or heart disease, study says

Vitamin D, omega-3 supplements do not prevent cancer or heart disease, study says Using hospital and death records, the researchers kept track of participants over a nine-year period on average, and found that fish oil supplements were associated with a 13% lower risk of death, a 16% lower risk of dying from cardiovascular disease, and a 7% lower risk of cardiovascular disease events such as stroke or heart attack.

As an observational study, it can only show an association and we can't know for sure if it was the fish oil supplements alone that lowered the risk of stroke, or if other changes to people's diets or lifestyle contributed. But the authors said their analysis of the data showed that the benefits were independent of factors including age, sex, lifestyle habits, diet, medication and other supplement use. "Fish oil users were less likely to be current smokers and more likely to engage in physical activity and eat oily fish," which may be a marker of other healthy dietary habits, Lichtenstein said. "The authors attempted to control for these factors and cautiously concluded that fish oil was associated with lower rates of all cause and CVD mortality and had modest benefit in terms of CVD events." Brian Power, honorary senior dietitian at University College London Hospital and a lecturer in nutrition at UCL said that while the study was robust with a large sample size and long-term follow-up, it wouldn't change the advice he gives to patients.

Health effects of fish oil: Where do we stand? "My advice is to get omega-3 [fatty acids] from eating fish at least twice a week as part of a balanced diet," said Power, who was not involved in the study. "Even if you don't eat fish, you can get it from other sources such as nuts and seeds e.g. walnuts, soya products e.g. tofu; and green leafy vegetables." It's the omega-3 fatty acids contained in fish oil that are thought to protect against cardiovascular disease by having a beneficial effect on blood pressure, reducing inflammation and improving blood flow to the heart. Omega-3 is also found in nuts, seeds, meats, dairy products, and fats and oils.

Prescription omega-3s can help some heart patients Power said it was more important to look at overall dietary patterns rather than try to link a single nutrient to a single health outcome -- in this case cardiovascular disease. However, he said taking fish oil supplements posed no health risk. —CNN

Why even a huge medical stockpile will be of limited use against COVID-19



The United States government maintains an enormous stockpile of emergency medical supplies, and officials have already started dipping into it to help fight the novel coronavirus.

But while having a stockpile is better than not having it, experts say, there's a limit to what a stockpile can do in this crisis. "It's never going to be as big as you want, because it's just too expensive to do that," says Tara O'Toole, a former homeland security official who is now executive vice-president at a nonprofit called In-Q-Tel.

Almost everything about the stockpile is secret, for security reasons, although the broad outlines of its holdings are known. About \$8 billion worth of vaccines, pharmaceuticals, protective gear, ventilators and other kinds of medical equipment are housed in warehouses that are strategically located around the United States.

From the outside, these warehouses look ordinary. Inside, however, armed guards stand watch over a vast collection of materials. Giant freezers keep certain products cold. Locked, caged-off sections of the warehouses store controlled substances like painkillers. Rows of ventilators, which can support people who are having trouble breathing, are kept charged-up and ready to

roll at a moment's notice. When the stockpile started, back in 1999, the goal was to get prepared for unusual, unprecedented national threats, says O'Toole, who chaired an advisory committee on the stockpile for the National Academies of Sciences, Engineering, and Medicine. "The stockpile started out being very specialized, and intended to supply drugs we would need if there were a chemical, radiological, biological or nuclear attack," she explains. By subscribing, you agree to NPR's terms of use and privacy policy. NPR may share your name and email address with your NPR station. See Details. This site is protected by reCAPTCHA and the Google Privacy Policy and Terms of Service apply. That's why the stockpile contains vaccines against smallpox and anthrax, as well as antitoxins and drugs to treat radiation sickness.

"In many cases, the Strategic National Stockpile is the only source for particular pharmaceuticals. And it is the only buyer for some of these pharmaceuticals," says Greg Burel, who directed the stockpile program before retiring last year. "Our Strategic National Stockpile is the envy of the world that understands these things and knows what's there." Over time, the mission of the stockpile has expanded to include preparations for pandemic influenza and

threats like hurricanes and earthquakes. It has anti-flu drugs, generic medical supplies like gloves and needles, and even quick-to-assemble medical centers complete with beds. The stockpile can fill gaps in supply chains or respond to sudden surges in demand caused by emergencies, says O'Toole, but "it is not big enough, and it can never be big enough to replace the supply chains." "It's a bridge," she says. "It's not a replacement for the private sector." That means there could still be shortages of critical items, as it will take time for manufacturers to ramp up production.

Take masks, for example. Steven Adams, the acting director of the stockpile program, says it currently holds about 30 million simple surgical masks, and 12 million of the more protective N95 masks that are certified by the National Institute for Occupational Safety and Health. But that's not much compared to what will be required to combat coronavirus. "The demand of 300 million would be anticipated in the initial response," Adams tells NPR. "These are estimates and different experts have, of course, different opinions. But I think the general view is that probably 300 million a month would be a likely scenario for a full-scale pandemic influenza, which is the primary basis for modeling." Already,

Washington state has requested hundreds of thousands of masks from the stockpile, and has gotten shipments. More requests are sure to come in. The federal government says it wants to buy 500 million domestically-made masks over the next year and a half. "You know, we wish we had everything that we needed on the shelf all the time, but we have to be respectful of the appropriations Congress provides and live within those. Sometimes that means that we have to make difficult trade-off decisions," says Burel, who explains that buying one item for the stockpile might mean not buying another item, or buying less of it.

"We're always trying to play that balancing act in such a way that we make the best possible investment to cover all the broad areas of risk that the Strategic National Stockpile is asked to respond to," Burel adds. How many ventilators does the stockpile have? Burel won't give a figure — just says it's a lot. Some sources suggest that it's at least 4,000, and professional groups have trained respiratory care experts to use the machines. If things get bad enough to need all those ventilators, however, hospitals may be struggling to have enough staff to operate them. In the end, even if the federal government can provide some supplies from the stockpile, it will be up to state and

New coronavirus can live on surfaces for 2-3 days — here's how to clean them

How long can the new coronavirus live on a surface, like say, a door handle, after someone infected touches it with dirty fingers? A study out this week finds that the virus can survive on hard surfaces such as plastic and stainless steel for up to 72 hours and on cardboard for up to 24 hours.

"This virus has the capability for remaining viable for days," says study author, James Lloyd-Smith, an assistant professor of ecology and evolutionary biology at the University of California, Los Angeles, who researches how pathogens emerge.

Although the World Health Organization had previously estimated the survival time on surfaces to be a "few hours to a few days" based on research on other coronaviruses, this is the first study by scientists at a federal laboratory to test the actual virus causing the current pandemic, SARS-CoV-2.

The study is out in preprint form and expected to be published.

Interestingly, some surfaces are less hospitable to SARS-CoV-2. For instance, the virus remained viable on copper for only about four hours. By subscribing, you agree to NPR's terms of use and privacy policy. NPR may share your name and email address with

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It's useful to know how long it can stay alive of course, because the virus can contaminate surfaces when an infected person sneezes or coughs. Virus-laden respiratory droplets can land on doorknobs, elevator buttons, handrails or countertops — and spread the virus to anyone who then touches these surfaces. To test the survival time of the virus, scientists at the Rocky Mountain Laboratories in Montana, part of the National Institutes of Health, conducted a series of experiments comparing the novel coronavirus with the SARS virus (a similar coronavirus that led to an outbreak back in 2003).

In the lab, "they'd pick up the virus from the surfaces that had been contaminated and then put [the virus] into cell cultures," he explains. Then the researchers documented whether the virus could infect those cells in the dish. They did this multiple times, for both the viruses, at various time points. "Big picture, the [two viruses] look very similar to each other in terms of their stability in these environments," Lloyd-Smith says. Lloyd-Smith says these findings establish a good ballpark

estimate for the survivability of the virus on these surfaces. "In a laboratory experiment, the conditions are pretty carefully controlled and constant," he says. By comparison, "in the real world, conditions fluctuate" — conditions like temperature, humidity and light. So the survivability may vary, too.

For instance, if the virus contaminates a sunny windowsill or countertop, it may not last as long. "Ultraviolet light can be a really powerful disinfectant and we get a lot of UVA light from the sun," says Daniel Kuritzkes an infectious disease expert at Brigham and Women's Hospital. "Direct sunlight can help rapidly diminish infectivity of viruses on surfaces," he says. He was not involved in the new research.

Much is still unknown about the virus's survivability on other types of surfaces like clothing, or carpeting. Kuritzkes says that based on prior research, it seems that "flat surfaces and hard surfaces are more friendly to viruses than cloth or rough surfaces." And how about food? "Food is probably not a major risk factor here," Kuritzkes says. That's because most infection from the new coronavirus starts with the respiratory system, not the digestive tract. So infection comes from getting the virus on your hands

and then touching your own eyes, nose and mouth. "Of more concern would be utensils, and plates and cups that might be handled by a large number of people in a cafeteria setting, for example," he says. So, what can you do to protect yourself? Well, you've likely already heard this. Wash your hands. And wipe down shared surfaces.

Follow these tips for cleaning surfaces — your own and public ones. Wipe right: Use ammonia or alcohol-based products. Skip the baby wipes. Maintaining awareness of the many surfaces you touch during the day and cleaning them with approved products will help curb the spread of the coronavirus. "The good thing about COVID-19 is that it does not require any unique cleaning chemicals to disinfect hands and surfaces," says Andrew Janowski, an infectious disease expert at Washington University School of Medicine and St. Louis Children's Hospital. COVID-19 is the disease caused by the current coronavirus, Good old-fashioned soap and water does the trick. You can also use a wipe, but make sure you use an alcohol-based wipe, not baby wipes, which may not be effective, Janowski says. And given that wipes are hard to come by at many stores at the moment, you can instead

buy an EPA-registered disinfecting spray, such as one on this list from the Center for Biocide Chemistries, recommended by the Centers for Disease Control and Prevention and by Dr. David Warren, an infectious disease specialist at Washington University School of Medicine in St. Louis.

Or make a bleach-based spray yourself. You can make a DIY cleaning spray by mixing 4 teaspoons bleach per quart of water, according to the CDC.

Yes, you've heard it a hundred times. So do it, already! Especially after you've been out in public, touching a lot of surfaces. Lather up with soap and scrub for 20 seconds. (Two times the "Happy Birthday" song, or sing "Baby Shark" — you'll get midway through Daddy Shark.) And be thorough. Spend some time rubbing the backs of your hands as well as the front, interlace your fingers and pull them through, soap up each thumb with the opposite hand and, finally, to keep your fingernails virus-free, lightly scratch them against your palm.

Hand sanitizer is effective at killing viruses, too, although hand-washing is preferred, according to the CDC. If you can't get to a sink, hand sanitizer is a good backup plan — just make sure it's at least 60% alcohol. Given the short-

age of hand sanitizers in some stores and reports of price-gouging online, there's lots of interest in DIY hand sanitizer. We've seen lots of recipes calling for a combination of rubbing alcohol and aloe vera gel, like this one from Wired. "On paper, if a recipe can maintain the alcohol concentration above 60%, it should be effective against SARS-CoV-2," says Andrew Janowski, but he says getting it just right might be trickier than you think. If in doubt when making these homemade sanitizers, soap and water are still effective against the virus.

So you've just washed your hands and you're feeling squeaky clean. Then you pick up your cellphone, and guess what? It's covered with potential pathogens. "Studies have shown that smartphones surfaces are covered in bacteria, including bacteria that can cause serious infections like Staphylococcus species," says Judy Guzman-Cottrill, an infectious disease expert at Oregon Health & Science University.

And phones are often held close to the eyes, nose and mouth, where germs can enter the body. So wipe it down often. And you don't have to rub down your phone for long if you're using an alcohol-based sanitizer. "Just a few seconds should be sufficient to disinfect,"