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Personal Protective Equipment Shortage Is 'Simply Unacceptable'

APIC, Inspector General find widespread scarcity, confusion

By Gary Evans, Medical Writer

Two different national surveys have found widespread shortages of personal protective equipment (PPE) and other critical hospital supplies as the United States battles the highest number of COVID-19 cases in the world. The findings come amid reports of novel coronavirus infections and deaths in healthcare workers, including at least one emergency physician and one nurse.^{1,2} There were also anecdotal reports of healthcare workers quitting work or threatening to do so if they are not going to be protected.

As this story was filed, there were reports of manufacturers ramping up PPE production, generating some hope that the chaotic situation could be resolved as the pandemic entered a critical and deadly phase in the United States.

The Association for Professionals in Infection Control and Epidemiology (APIC), which conducted a national

survey of infection preventionists (IPs), is demanding the federal government act to protect both patients and frontline healthcare workers.

"This is simply unacceptable," said APIC CEO **Katrina Crist**, MBA. "Shortages of critical PPE and disinfection supplies are jeopardizing our ability to safely treat patients and protect healthcare workers, who put their lives on the line every day."

APIC issued a call to action along with its survey results at a March 27, 2020, press conference.

"APIC is urging the federal government to act now," Crist said. "We are asking for clear communication. We need clarity on when the supplies are coming — when and where. So, in addition to asking the federal government to use all of the powers at their disposal to increase the supply — especially of respirators — we need clear communication."

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Similar findings were revealed in an Inspector General (IG) report of a phone survey conducted in late March.³

“Hospitals reported that widespread shortages of PPE put staff and patients at risk,” the report stated. “Hospitals reported that heavier use of PPE than normal was contributing to the shortage and that the lack of a robust supply chain was delaying or preventing them from restocking PPE needed to protect staff. Hospitals also expressed uncertainty about availability of PPE from federal and state sources and noted sharp increases in prices for PPE from some vendors.”

Likewise, the IG report found a demand for clear and consistent communication, as “inconsistent guidance from federal, state, and local authorities posed challenges and confused hospitals and the public.”

Hospitals reported that it was sometimes difficult to remain current with Centers for Disease Control and Prevention (CDC) guidance, which has been evolving as the dynamics of the pandemic change, the IG report noted. For example, healthcare workers are particularly concerned about a change in the CDC recommendations, which said wearing a surgical mask with a face shield for COVID-19 patients was acceptable if N95 respirators were unavailable. The CDC said the action was temporary, in part to save N95s for aerosol-generating procedures. (*See insert.*)

Conflicting Guidance, Misinformation

Respondents to the IG report cited “conflicting guidance from different government and medical authorities, including criteria for

testing, determining which elective procedures to delay, use of PPE, and getting supplies from the national stockpile. Hospitals also reported concerns that public misinformation has increased hospital workloads (e.g., patients showing up unnecessarily, hospitals needing to do public education) at a critical time.”

Although more rapid tests are coming on the market, the IG survey reflected some of the confusion and mixed messaging on coronavirus testing, which has gone through a series of exasperating changes, from largely unavailable, announced and delayed, and then rolled out as if anybody could be tested. A shortage of testing reagents, swabs, and viral transport media followed in some areas, exacerbated by concerns of using scarce PPE during testing that is needed by frontline staff.

“Hospitals reported that they were unable to keep up with COVID-19 testing demands because they lacked complete kits and/or the individual components and supplies needed to complete tests,” the IG report found. “Additionally, hospitals reported frequently waiting seven days or longer for test results. When patient stays were extended while awaiting test results, this strained bed availability, PPE supplies, and staffing.”

The testing issue also created a bottleneck in the continuum, as some long-term care facilities were refusing to take in hospital discharges until they had a negative COVID-19 test.

“Hospitals reported needing items that support a patient room, such as intravenous therapy poles, medical gas, linens, toilet paper, and food,” the IG survey found. “Others reported shortages of no-touch infrared thermometers, disinfectants, and cleaning supplies. Isolated

and smaller hospitals faced special challenges maintaining the supplies they needed and restocking quickly when they ran out of supplies.”

Running on Empty

The APIC survey of IPs was conducted between March 23 and March 25, netting 1,140 responses in all states and the District of Columbia. Of those, 233 (20%) reported their facilities had no respirators and an additional 317 (28%) said they were “almost out.” Nearly half (49%) of the respondents said they do not have enough face shields and 13% are completely out. Regarding mask supply, nearly one-third (31%) of respondents are almost out or completely out.

APIC called for immediate activation of the Defense Production Act, a 1950 law that gives the federal government broad powers to direct production of critical materials.

“The federal government must act now to produce more PPE and coordinate distribution where it is needed most,” said APIC president **Connie Steed**, MSN, RN, CIC, FAPIC. “Every minute wasted puts more lives at risk. We are asking healthcare providers to risk their own health and their families’ health to care for us.”

Supplies in the U.S. Strategic National Stockpile have been dispensed in some areas, but the consensus is that these reserves will not be sufficient and new production on a mass scale is needed to meet the novel coronavirus threat. APIC sought clarity on this issue and other aspects of the pandemic response.

“There seems to be some confusion about the distribution and even in some pockets of the country, how to get access to the stockpile,”

said Steed, director of infection prevention and control at Prisma Health in Greenville, SC. “The role of the IP as a coach, mentor, and leader in our hospitals has never been more important. I know, as a frontline infection preventionist in the facilities where I work, how challenging this role is, but it is vital for us to help our providers every day to get through this trying time.”

APIC president-elect **Ann Marie Pettis**, RN, BSN, CIC, FAPIC, is director of infection prevention at the University of Rochester, NY.

“In New York hospitals, we are being overrun with COVID-19 patients,” Pettis said at the press conference. “Given how rapidly this virus is spreading, other states and facilities will soon face the same situation. Our survey shows that the supply shortages are widespread throughout the country. Every hospital out there is concerned about putting patients and healthcare workers at unnecessary greater risk.”

The situation could create a crisis of confidence in healthcare workers, she adds.

“The situation is causing healthcare personnel to lose faith in our guidance as IPs, as well as losing faith in the whole healthcare system,” she says. “How can we ask healthcare workers to take care of us when we really are not taking care of them?”

The Rochester community has stepped up to donate masks and create homemade ones for the hospital, she says. The donations have created a stockpile for the facility that will be drawn on as needed if medical masks run out, Pettis says.

“We are holding on to those and with the idea that our first use would be for loved ones that have to come in and see a COVID patient or for patients themselves,” she said. “We would send patients home with

one of the homemade masks — we launder those before we hand them out.”

The hospital has adopted the increasingly common practice of wearing surgical masks over N95 respirators, which protects them from getting contaminated and preserves future use.

“Eventually we could come to using the homemade masks even for our staff,” Pettis said. “We hope it does not come to that because we don’t know what the efficacy of those masks would be. But desperate times call for desperate measures.”

Fear and Science

Some practices may have to be based less on science than the mitigation of fear, Pettis added.

“As this ramps up, our staff is getting understandably more and more fearful,” she said. “We’re probably going to institute universal masking. In other words, every time staff come into work, we are going to offer them a new mask each day whether they are taking care of COVID patients or not. We are hoping soon to provide one N95 mask to everybody that would like that one. Again, it’s not scientific, but we have to give them the feeling that they are safe because their families are so worried about them coming to work.”

Torree McGowen, MD, FACEP, an emergency physician at St. Charles Medical Center in Bend, OR, is starting to see the first wave of coronavirus infections in her area.

“I am definitely concerned,” she says. “My husband is immunosuppressed, so I shower and change clothes before I leave work. I am trying very hard to stay away from my family and we are strictly socially

isolating. I am not going anywhere but work, home, and then the bare minimum that we need to do [in the community].”

Will some healthcare workers consider their safety and that of their families a higher priority than reporting for duty and caring for COVID-19 patients?

“My prayer is that doesn’t happen,” Steed said. “I think our healthcare providers are resilient and many of them went into this field to care for others. I trust — if we do everything we can, which is what APIC is trying to do — if we protect our healthcare workers, they will be more comfortable caring for sick patients. That’s why taking action now is so vital. We don’t want to end up with healthcare providers refusing to work.”

Although personal risk is part of the high calling to healthcare, those who deliver it day in and day out are

by no means immune to fear. “We have the same fears that everybody else has,” says **Wendy Dean**, MD, a psychiatrist at the Henry M. Jackson Foundation for the Advancement of Military Medicine in Bethesda, MD. “We have been kind of acculturated to manage the risk and the fear of the work that we face. We face all kinds of infectious risks all the time. The difference is that typically when we are facing those, they are known entities. We know what the algorithms are for treatment or for mitigation. The difference for coronavirus is that we don’t know any of that. It is an outsized risk, and as with anything else, we are more comfortable dealing with the known — even if it is high-risk — than dealing with the unknown. But we are going to face down that risk and do our jobs, because that is what we have trained to do.” ■

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The Forecast Calls for Pain

‘As far as we know, no one in the human species had any preexisting immunity’

There’s the proverbial glass half-full or half-empty — and then there’s the cold shot of despair that comes with considering how much of the planet COVID-19 has yet to hit.

“As bad as it has been, the worst is yet to come,” says **Daniel Lucey**, MD, MPH, FIDSA, FACP, an infectious diseases physician at Georgetown University Medical Center in Washington, DC, who is closely following the novel coronavirus pandemic for the Infectious Diseases Society of America.

He went to Singapore and Hong Kong to assess the COVID-19 response in those cities recently.

“I think the virus will come back

to China through travelers, as it already has in people returning,” he says. “While there were some cases in every one of their 31 provinces, it was mostly in Hubei province. That’s where the community immunity is for the most part in China. The rest of them — over 1 billion people — are still susceptible.”

Lucey has responded to or epidemiologically observed every major outbreak this century, including severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), Ebola, and the 2009 H1N1 flu pandemic. *Hospital Infection Control & Prevention* asked for his take on COVID-19 in the following

interview, which has been edited for length and clarity.

HIC: Historically speaking, how does this compare to previous pandemics?

Lucey: There are other coronaviruses, SARS, MERS, and those that cause the common cold. This is lower respiratory — this is pneumonia. This is the first coronavirus pneumonia that has caused a pandemic in humans. There are the influenza pandemics, and of course HIV/AIDS. The 2009 flu pandemic wasn’t as bad as everyone feared it would be. You have to go back pretty far to the really bad pandemic of flu from 1918 to 1920 that everyone still talks about. The

influenza pandemics of 1957-58 and 1968-69 were not nearly as bad as the 1918 pandemic, but they were worse than 2009. HIV is in its own [category] because it is not spread through the air. For me, this coronavirus pneumonia is its own unique viral pandemic. We don't have anything to compare it to — I don't think it is comparable to SARS or MERS coronaviruses. I don't think you can compare this coronavirus pandemic to seasonal influenza because it is much worse than that. As far as we know, no one in the human species had any preexisting immunity. In that sense, it is like pandemic flu, which there have only been four of in the last 100 years. What that means is this virus is likely to continue even in June, July, and August here in the Northern Hemisphere. Of course, it will be winter in the Southern Hemisphere, so I think it's going to go year-round and spread — even though it will likely slow down during our summer. But it won't go away like seasonal flu does in the summer. Pandemic flu in 2009 didn't go away. Again, the key issue is that nobody has any [preexisting] immunity. There is no vaccine and so far, no proven treatments.

HIC: What do you think will be the impact of COVID-19 in the Southern Hemisphere during our summer in the United States?

Lucey: It's going to get much worse in the coming weeks and months ahead. In winter in the Southern Hemisphere, it is going across South America, Southern Africa, parts of Indonesia, and Australia. We don't know how bad it is going to be, but it is pretty clear the United States did not take appropriate precautions, so it is going to be much worse than it otherwise would have been. I don't have confidence in how less-developed

countries around the world, including the Southern Hemisphere, are going to take adequate precautions to avoid what has happened in Italy, Spain, and the United States. What are they going to do? They are not going to have [enough] healthcare PPE (personal protective equipment). It is going to be much worse than anything that we have seen, really, since 101-102 years ago.

HIC: While no one apparently had preexisting immunity, do you think that people who survive coronavirus infection will be immune?

Lucey: Yes, that is the assumption. For almost every infectious disease — with HIV, rabies, and some others being exceptions — if you survive, you have some immune response and usually there are measurable antibodies and T cells. Then you are generally protected against that exact same virus at least for some period of time — months, years, or sometimes for life, like smallpox. One implication or action of this assumption is taking the blood plasma that has antibodies from people who have survived and giving it to people who are still very sick in intensive care. China started doing that in early February. The FDA (Food and Drug Administration) has not [approved] compassionate use therapy to take the blood of people who have survived and infuse the antibody part, the plasma, into people who are very sick. [Although it is] not proof that survivors are immune, it is an action based on the assumption that the antibodies would kill or neutralize the virus in someone who is still very sick and has a lot of virus, for example, someone who is in intensive care or on a ventilator.

HIC: Is there any indication whether those who have had mild or asymptomatic cases would also

have sufficient antibodies to confer immunity?

Lucey: I haven't seen any data on that. I'm sure it is being studied. I would agree that in a mild case, the antibody titers would not be as high as in a more severe case where you have more virus and a much stronger [immune response]. If you survived, I would presume you would have higher levels of antibodies. The Chinese have been somewhat quietly talking about these asymptomatic cases. When I was in Shanghai and Hong Kong in February, they had asymptomatic cases, and now they are admitting they have many more. People who are asymptomatic are diagnosed by finding the virus via PCR (polymerase chain reaction). But to my knowledge no one has reported finding antibody titers in people who are asymptomatic or just mildly symptomatic — just from people who were very sick and survived. Hopefully, there will be some good news about therapies. In May 2020, there will be some results made public from randomized controlled trials in China. Hopefully, they will be well-designed studies that give us some answer about some treatment or prophylaxis that actually is shown to be effective in a randomized controlled trial.

HIC: What do you think about the new Centers for Disease Control and Prevention (CDC) recommendation allowing people to wear face masks in public?

Lucey: In every outbreak I've gone to with respiratory spread — from SARS in 2003 to COVID-19 in China and Hong Kong — everybody wears a mask. And if you don't wear it properly, somebody will call you out on it and say, "Put your mask on properly." To me, it's not just the mask — it's the culture, the mentality. There is a heightened sense

of awareness that you must take many measures that might seem very small or insignificant. Disinfecting and wiping down elevator buttons is now being done in America. In Hong Kong, they did that in 2003 and are doing it now.

There is an obvious contradiction in what the American people were told: “Surgical masks do not protect you against viral infection, so the public shouldn’t wear masks.”

Then, [on] March 10, the CDC comes out and says it’s OK for

healthcare workers to wear just a surgical mask [and face shield] when you are doing a nasopharyngeal swab for coronavirus. What is this really about? It is about this almost unconscionable U.S. national shortage of N95 respirators. ■

COVID-19 Response: From Panic to Complacency

Antibody tests may become a big part of response in near term

Even as the COVID-19 pandemic virus rages in some areas of the United States, there has been marked complacency in others, where public health pleas to stay at home and practice social distancing have been ignored by some.

Karen Hoffmann, RN, MS, CIC, FSHEA, FAPIC, a clinical instructor of infectious diseases at the University of North Carolina’s School of Medicine in Chapel Hill, recalls the near-panic and fear during the emergence of AIDS in the 1980s.

“With the COVID-19 outbreak in the U.S. population, it appears mixed messaging by media and federal agencies has led to a large percentage of the country not wanting to believe this is a real outbreak,” she says. “This resulted in a slow rate of compliance — or even open noncompliance — with social distancing and stay-at-home recommendations.”

A ‘Super-Spreader’

This is the result, in part, of a stealth aspect of the novel SARS-CoV-2 virus. It can spread from people who have mild illness or appear to be asymptomatic, yet still can cause severe disease and death in the elderly and those with underlying medical conditions. The Centers for Disease Control and

Prevention (CDC) recently reported 16 COVID-19 cases that were transmitted in social gatherings.¹

“In this cluster, extended family gatherings, a birthday party, funeral, and church attendance, all of which occurred before major social distancing policies were implemented, might have facilitated transmission of SARS-CoV-2 beyond household contacts,” the CDC reported.

In an example of the “super-spreader” phenomenon, the index patient apparently was able to transmit infection to 10 other persons, despite having only mild symptoms that did not require medical care.

“Within three weeks after mild respiratory symptoms were noted in the index patient, 15 other persons were likely infected with SARS-CoV-2, including three who died,” the CDC reported.

Given the stealth nature of the virus and the considerable chaos that has accompanied its emergence, it is perhaps not surprising that some people find it counterintuitive that they actually are in a pandemic, even as it accelerates in the United States — the nation that now has the highest number of COVID-19 cases in the world.

There is even some level of complacency in healthcare workers

in areas where there are few or no reported cases of COVID-19, says **Hamad Husainy**, DO, FACEP, an emergency physician at Helen Keller Hospital in Sheffield, AL.

“I will say in general for our staff, it hasn’t become as real as it has in other parts of the country,” Husainy says. “They seem to be a little complacent, and I hope when this is all said and done they can look at me and say, ‘You were wound a little too tight.’”

Given the lean stock of N95s, masks are worn over respirators that may be used indefinitely, he explained.

“With regard to PPE [personal protective equipment] we really have not been well-prepared,” Husainy says. “We have literally two boxes of N95 masks in the entire hospital. We are being asked to take one and use it until further notice — until it gets visibly soiled or breaks or what have you. In dire circumstances, you do dire things.”

The hospital plans to use powered air purifying respirators (PAPR) — which can be cleaned and reused — in the emergency department if suspected coronavirus cases begin presenting.

“Right now, we are reserving them for the emergency medical staff,” he says. “In the ICU [intensive care

unit], these patients have already been delineated as who is at risk and who is not. In the emergency room, people come in and you have to find that out. It's a reality that we are going to run out of N95 respirators. My prediction is that our only option is going to be to use the PAPRs when we have to intubate somebody or place a patient on a ventilator."

Husainy urges his coworkers to remain on guard, reminding them that some healthcare workers were infected before there was recognized transmission in the community.

In the early days of AIDS, a bloodborne disease, there were fears and speculation that it was spreading through the air or other means that were ultimately proven false. With no treatment, a diagnosis in those days was tantamount to a death sentence, and some healthcare workers died of needlesticks and other blood exposures.

"A large percentage of all staff were panicked to have to care for these patients," Hoffman says. "When they did enter the room, some wore all the PPE they could find — head covers, double gloves, masks, and booties. Although there was initial concern of respiratory transmission, that was quickly ruled out. However, the fear to care for the known or suspected AIDS patients carried on for years."

For the most part, healthcare personnel and the public have a healthy fear of COVID-19, but in some areas — exacerbated by mixed messages and a shortage of tests and PPE — the anxiety is at the early AIDS level.

"Certainly, this has been more extensive than anything I can remember in terms of epidemics and epidemics of anxiety," says **William Schaffner**, MD, professor of preventive medicine at Vanderbilt University. I think the concern

and the anxiety resembles the introduction of HIV [in 1981] more than anything else that I can remember."

The Question of Immunity

Part of the fear and anxiety is being driven by the unknowns, including definitive evidence that those infected will become immune for some time period.

"That is certainly the hope," Schaffner says. "If you look at the human coronaviruses — the ones that cause the common colds, you do get strain immunity — but it begins to wane fairly quickly after about a year. But that kind of immunity would be terribly important in blunting a resurgence of this virus in the fall. It might be a bridge to the time we can get a vaccine deployed."

Anthony Fauci, MD, director of the National Institutes of Health National Institute of Allergy and Infectious Diseases, also recently commented on this issue in a live-streamed interview with the *Journal of the American Medical Association*.

"Right now, we don't think that this [SARS-CoV-2] is mutating to the point of being very different," Fauci said. "So, we are making a reasonable assumption that this virus is not changing very much. If you get infected in February and March — and then recover — that next September or October I believe that person is going to be protected. We are not 100% sure. But I think that is a reasonable assumption."

Antibody tests are now coming on the market that could detect if someone has generated an immune response to a prior COVID-19 infection.

"There are a lot of companies trying to get them out, so they could be used for finger pricks with little devices and read within minutes," Schaffner says. "This would be extraordinarily helpful in managing the healthcare and first responder environment. Then actually going out in communities and making an assessment about what proportion of the population is immune — it could help us get people with prior experience with the virus back to work."

These tests certainly have great promise to affect the coronavirus response, but the antibody diagnostics must be validated carefully before they are distributed widely, Fauci emphasized.

"There have been international incidents where a country has ordered millions of these tests from another country — only to find that they don't work," he said. "We have to validate these tests — that's absolutely critical, otherwise you will go down a path that will be very misleading."

In some sense, public health has been a victim of its own success, with antibiotics, vaccines, and antiviral therapies creating the illusion that the U.S. healthcare system was ready for any threat, Fauci said.

"We let it slip, and boy, this should be a lesson for the future," he said. "My hope is that when we get out of this — which we will — we will take a really good look at the long-term investments in the public health infrastructure. We should never again be in a position like this and have to scramble in response. This is historic. We all know the history of what happened in 1918, when we did not have hardly any of the interventions or the capabilities that we have now. You see what is happening in New York City, that is beyond sobering — that is really terrible." ■

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Petition Demanding PPE for Healthcare Workers Has 1.7 Million Signatures

‘We are the supply chain that needs to be protected’

An online petition demanding personal protective equipment (PPE) for healthcare workers to treat suspected or confirmed COVID-19 patients had about 1.7 million signatures as this story was filed.¹

Created by three physicians, the petition calls for 3 million signatures and will be presented to both houses of Congress and the Trump administration eventually. As others have noted, the petition cites a key change in Centers for Disease Control and Prevention (CDC) guidelines allowing the use of surgical masks instead of N95 respirators for COVID-19 patients.

“This shift does not come in response to overwhelming evidence, rather to a supply chain issue,” the petition states. “[The CDC has said] ‘when the supply chain is restored, facilities with a respiratory protection program should return to use of respirators for patients with known or suspected COVID-19.’”

The CDC statement, which essentially acknowledges that the droplet precautions with surgical masks are a step down from the respirator level needed to protect workers, has been misinterpreted by some hospitals, the petition claims.

“As a result of these recommendations, many hospitals have taken the CDC recommendations to mean that face masks are the preferred PPE, rather than a less desired (and potentially less safe)

alternative,” the petition states. This has resulted in rationing of respirators for procedures, such as intubation and bronchoscopy, during which the virus is more likely to become aerosolized, the petition notes.

“Considering the mortality risk and lack of data to support a step-down to surgical masks, N95 masks should continue to be the standard PPE for care of COVID-19 patients,” the petition states. “As a physician, I do not know how long it takes to make an N95 mask, but I do know how long it takes to train a physician, a nurse practitioner, a physician’s assistant, a respiratory therapist or nurse. We are the supply chain that needs to be protected.”

Nurse Union Demands Action

In a similar development, National Nurses United (NNU), the largest union of registered nurses in the United States, is sending letters to governors and hospital employers in 18 states.² The states with NNU members among their nursing force include Alabama, Arizona, Colorado, Florida, Georgia, Illinois, Iowa, Kentucky, Kansas, Maine, Maryland, Missouri, Nevada, North Carolina, Ohio, Texas, and West Virginia.

The NNU is demanding that nurses not only have the PPE they need, but that states and employers

provide them with housing and childcare as needed to remain on the job.

“NNU has heard too many reports of nurses sleeping in their cars or garages to protect their families from potential infection, and far too many reports of nurses being told to use their sick or vacation time to cover precautionary leave after being exposed,” NNU Executive Director **Bonnie Castillo**, RN, said in a statement. The NNU demands include provisions for child care and elder care as needed so nurses can stay on the job as schools and facilities close. The NNU asks hospitals not to assign nurses at high risk of complications from COVID-19 infection to care for these patients. Other NNU demands include:

- Notify all nurses who have come into contact with a suspected or confirmed COVID-19 patient or hospital staff member who has been exposed.

- Implement universal masking of all workers, while maintaining a protocol of N95 respirators for nurses caring for suspected or confirmed COVID-19 patients.

- Provide universal testing of all hospital employees and make retesting available upon request to avoid false negatives. ■

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C. difficile Infections Decrease in Hospitals, But Increase in Community

Decline in hospitals despite use of more sensitive tests

Clostridioides difficile infections (CDIs) are declining in U.S. hospitals, as measures over the last decade to reign in antibiotic use and improve infection control appear to be working.

A recently published study documents the findings, reporting that CDIs in 10 Centers for Disease Control and Prevention (CDC) surveillance sites fell in hospitals but increased in the community.¹ There were 15,461 CDIs at these surveillance sites in 2011, including 10,177 healthcare-associated infections (HAIs) and 5,284 community-associated cases. The overall numbers in 2017 were similar in total, but the HAIs dropped to 7,973 and the community cases increased to 7,539. *Hospital Infection Control & Prevention* spoke to **Alice Guh**, MD, the lead author of the paper and a medical officer at the CDC.

HIC: You report that the estimated hospital burden of *C. difficile* infection in the United States declined from 2011 through 2017, despite the increasing use of the more sensitive nucleic acid amplification tests (NAAT). Can you elaborate on this finding?

Guh: NAAT has greater sensitivity for *C. difficile* than other diagnostic assays. Therefore, we would expect an

associated increase in the incidence of CDI with increasing use of NAAT. However, we found the opposite result. Based on data reported from the [CDC] Emerging Infections Program, the percentage of all cases diagnosed by NAAT increased from 55% in 2011 to 84% in 2016, with a slight decrease to 83% in 2017. Despite the increase in NAAT use over much of this period, the national burden estimate of healthcare-associated CDI decreased from 306,500 in 2011 to 235,700 in 2017. Moreover, when NAAT use was held constant at 55% over this period, we observed a significant decrease in the adjusted national burden estimate of healthcare-associated CDI, supporting a true decline in CDI.

HIC: You report that *C. difficile* was reduced as adjusted 6% annually. What does this mean the total percentage reduction was over 2011 through 2017 period?

Guh: The adjusted burden estimate of healthcare-associated CDI decreased annually by 6%, resulting in a 36% decrease between 2011 and 2017.

HIC: Could this be some kind of surveillance artifact, or do you believe these are real reductions in patient infections?

Guh: Laboratories serving the surveillance catchment areas report

all positive *C. difficile* test results to the Emerging Infections Program staff and are audited at least annually to ensure cases are not missed. Therefore, it is not likely that our results are due to under-reporting. However, with the increasing emphasis on diagnostic stewardship to reduce inappropriate testing, it is possible that fewer *C. difficile* tests have been ordered over time, which could have partly contributed to the decreased rates of healthcare-associated CDI. Nonetheless, I think adherence to recommended infection prevention measures also played a role, and our results likely reflect a real reduction in CDI burden.

HIC: What can you ascribe this reduction to? Is there any way to measure the effect of the increasing emphasis on antibiotic stewardship? For example, you cite the association between fluoroquinolones and *C. difficile*.

Guh: Several factors likely contributed to the reduction in healthcare-associated CDI, including increased attention to diagnostic stewardship to reduce inappropriate testing; implementation of antibiotic stewardship interventions, particularly those targeting fluoroquinolone use; and increased adherence to recommended infection prevention measures. Our analysis was not

designed to measure the effect of antibiotic stewardship on CDI rates.

HIC: You and the co-authors noted that adherence to recommended infection-prevention practices may also have decreased HAIs, as shown by several successful local and regional initiatives for the prevention of *C. difficile* infection. Can you elaborate on this and give an example of a successful infection control intervention?

Guh: Local or regional CDI prevention initiatives have included a number of different interventions, ranging from the use of standardized infection prevention and environmental cleaning protocols to receiving onsite assessments of antimicrobial stewardship. A key factor for the success of these initiatives is the sharing of knowledge and strategies and lessons learned through regular discussions among participating facilities (e.g., monthly teleconferences).

HIC: Does the lack of decline in community *C. difficile* mean that more infections will continue to be introduced by hospitalized patients? Does this community reservoir pose an ongoing threat to hospital success?

Guh: The lack of decline in community-associated *C. difficile* could potentially affect the burden of healthcare-associated CDI through importation of *C. difficile* into hospitals. According to unpublished CDC data, approximately 30% of patients hospitalized with CDI are community-associated.

HIC: While a direct foodborne link has not been established, toxigenic *C. difficile* has been cultured from retail meat and vegetables. Is it thought *C. difficile* can remain viable after food is cooked? Is the CDC actively looking at this potential source?

Guh: Although prior studies have indicated that *C. difficile* spores can survive cooking of meat and

other foods, to date, there have been no known foodborne outbreaks associated with CDI. We have conducted a case-control study to identify potential risk factors for community-associated CDI and did not find any significant association with consumption of various food types, including red meat, poultry, or fresh vegetables. In this same case-control study, approximately 14% of patients with community-associated CDI had no recent antibiotic use or outpatient healthcare exposures, suggesting that they might have had another source of exposure or risk factor for CDI. ■

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OSHA Tells Inspectors to Use Discretion in Enforcing Respirator Fit-Testing

Action taken in light of expanding COVID-19 outbreak

Responding to respirator shortages during the outbreak of novel coronavirus, the Occupational Safety and Health Administration (OSHA) has issued a memorandum allowing “enforcement discretion” by compliance officers citing the Respiratory Protection standard (29 CFR § 1910.134).

“OSHA recommends HCP [healthcare personnel] employers follow existing CDC [Centers for Disease Control and Prevention] guidelines, including taking measures to conserve supplies of these respirators while safeguarding

HCP,” the agency memo stated. “One such measure is that health-care employers may provide HCP with another respirator of equal or higher protection, such as N99 or N100 filtering facepieces, reusable elastomeric respirators with appropriate filters or cartridges, or powered air-purifying respirators (PAPR).”¹ OSHA instructed its field offices to exercise enforcement discretion on the annual fit-testing requirement as long as employers:

- Make a good-faith effort to comply with 29 CFR § 1910.134.
- Use only National Institute

for Occupational Safety and Health (NIOSH)-certified respirators.

- Use CDC and OSHA methods to optimize the supply of N95s and prioritize their use.
- Perform initial fit tests with each employee using the same model, style, and size respirator that the worker will be required to wear.
- Inform HCP the annual fit-testing of N95 filtering facepiece respirators is suspended to preserve and prioritize the supply of respirators.
- Explain the importance of performing a fit check at each

donning to ensure an adequate face seal, in accordance with the procedures outlined in 29 CFR § 1910.134, Appendix B-1.

- Conduct a fit test if there are any physical changes to the employee that may affect respirator fit (e.g., facial scarring, dental changes, cosmetic surgery, or obvious changes in body weight) and explain to workers that if their face shape has changed since

their last fit test, they may no longer be getting a good facial seal with the respirator.

- Remind HCP to inform their supervisor or their respirator program administrator if the integrity and/or fit of their N95 is compromised.

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Published March 14, 2020. <https://www.osha.gov/memos/2020-03-14/temporary-enforcement-guidance-healthcare-respiratory-protection-annual-fit>

Scientists Warn Pandemic May Not Decline in Warmer Weather

One reason is the lack of preexisting human immunity

Seasonal influenza and common human coronaviruses typically fall off in warmer seasons, as heat and humidity diminish transmission sharply. There has been some hope that this will happen with SARS-CoV-2 novel coronavirus, giving the United States a summer respite against a relentlessly accelerating pandemic. The National Academy of Sciences looked at this question in a recently issued report, concluding in so many words, “Don’t count on it.”¹

“There is some evidence to suggest that SARS-CoV-2 may transmit less efficiently in environments with higher ambient temperature and humidity,” the report stated. “However, given the lack of host immunity globally, this reduction in transmission efficiency may not lead to a significant reduction in disease spread without the concomitant adoption of major public health interventions. Furthermore, the other coronaviruses causing potentially serious human illness, including both [the original] SARS-CoV and MERS-CoV have not demonstrated any evidence of seasonality following their emergence.”

Again, limited data support a waning of cases in warmer and more humid seasons, yet none are without caveats. Indeed, Australia and Iran reported outbreaks of the novel coronavirus in their typical “summer” climates.

“A decrease in cases with increases in humidity and temperature elsewhere should not be assumed,” the report concluded. “Given the lack of immunity to SARS-CoV-2 across the world, if there is an effect of temperature and humidity on transmission, it may not be as apparent as with other respiratory viruses for which there is at least some preexisting partial immunity.”

Moreover, pandemic influenza strains have not historically fallen into seasonal patterns, but have demonstrated a second wave of infections before receding.

“There have been 10 influenza pandemics in the past 250-plus years — two started in the northern hemisphere winter, three in the spring, two in the summer, and three in the fall,” the Academy reported. “All had a peak second wave approximately six months after emergence of the virus in the human population, regardless of when the initial introduction occurred.” ■

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COMING IN FUTURE MONTHS

- What will be the new normal post-COVID-19?
- Patient handwashing is the next wave
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- Is it time for public masks in flu season?



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CME/CE QUESTIONS

- 1. An Inspector General report that surveyed hospitals about COVID-19 stated which of the following?**
 - a. Many healthcare workers thought personal protective equipment requirements were "overkill."
 - b. Recovered patients clearly showed a protective immune response.
 - c. The shortage of N95 respirators has been exaggerated in the media.
 - d. Some long-term care facilities were refusing to take in hospital discharges until patients had negative COVID-19 tests.
- 2. Association for Professionals in Infection Control president-elect Ann Marie Pettis, RN, BSN, CIC, FAPIC, said homemade face masks donated by the Rochester, NY, community were:**
 - a. politely refused because of lack of standardization.
 - b. stockpiled for use if needed.
 - c. immediately distributed to non-patient care workers, such as clerical and housekeeping.
 - d. worn by healthcare workers for pictures distributed to thank the community.
- 3. The Centers for Disease Control and Prevention reported that one patient transmitted infection to 10 other people. In the common vernacular, what is this type of patient called?**
 - a. Patient zero
 - b. An outlier
 - c. Super-spreader
 - d. Viral shedder
- 4. William Schaffner, MD, professor of preventive medicine at Vanderbilt University, said that, based on other coronaviruses, those infected with COVID-19 should have:**
 - a. immunity that begins to wane after about a year.
 - b. immunity for life.
 - c. immunity against the novel coronavirus, severe acute respiratory syndrome, and Middle East respiratory syndrome.
 - d. no immunity.

Figure 1. Use Personal Protective Equipment (PPE) When Caring for Patients with Confirmed or Suspected COVID-19

Before caring for patients with confirmed or suspected COVID-19, healthcare personnel (HCP) must:

- **Receive comprehensive training** on when and what PPE is necessary, how to don (put on) and doff (take off) PPE, limitations of PPE, and proper care, maintenance, and disposal of PPE.
- **Demonstrate competency** in performing appropriate infection control practices and procedures.

Remember:

- PPE must be donned correctly before entering the patient area (e.g., isolation room, unit if cohorting).
- PPE must remain in place and be worn correctly for the duration of work in potentially contaminated areas. PPE should not be adjusted (e.g., retying gown, adjusting respirator/facemask) during patient care.
- PPE must be removed slowly and deliberately in a sequence that prevents self-contamination. A step-by-step process should be developed and used during training and patient care.

Donning (putting on the gear):

More than one donning method may be acceptable. Training and practice using your healthcare facility's procedure is critical. Below is one example of donning.

- 1. Identify and gather the proper PPE to don.** Ensure choice of gown size is correct (based on training).
- 2. Perform hand hygiene using hand sanitizer.**
- 3. Put on isolation gown.** Tie all of the ties on the gown. Assistance may be needed from another HCP.
- 4. Put on NIOSH-approved N95 filtering facepiece respirator or higher (use a facemask if a respirator is not available).** If the respirator has a nosepiece, it should be fitted to the nose with both hands, not bent or tented. Do not pinch the nosepiece with one hand. Respirator/facemask should be extended under chin. Both your mouth and nose should be protected. Do not wear respirator/facemask under your chin or store in scrubs pocket between patients.*
 - **Respirator:** Respirator straps should be placed on crown of head (top strap) and base of neck (bottom strap). Perform a user seal check each time you put on the respirator.
 - **Facemask:** Mask ties should be secured on crown of head (top tie) and base of neck (bottom tie). If mask has loops, hook them appropriately around your ears.
- 5. Put on face shield or goggles.** Face shields provide full face coverage. Goggles also provide excellent protection for eyes, but fogging is common.
- 6. Perform hand hygiene before putting on gloves.** Gloves should cover the cuff (wrist) of gown.
- 7. HCP may now enter patient room.**

Doffing (taking off the gear):

More than one doffing method may be acceptable. Training and practice using your healthcare facility's procedure is critical. Below is one example of doffing.

- 1. Remove gloves.** Ensure glove removal does not cause additional contamination of hands. Gloves can be removed using more than one technique (e.g., glove-in-glove or bird beak).
- 2. Remove gown.** Untie all ties (or unsnap all buttons). Some gown ties can be broken rather than untied. Do so in gentle manner, avoiding a forceful movement. Reach up to the shoulders and carefully pull gown down and away from the body. Rolling the gown down is an acceptable approach. Dispose in trash receptacle.*
- 3. HCP may now exit patient room.**
- 4. Perform hand hygiene.**
- 5. Remove face shield or goggles.** Carefully remove face shield or goggles by grabbing the strap and pulling upward and away from head. Do not touch the front of face shield or goggles.
- 6. Remove and discard respirator (or facemask if used instead of respirator).*** Do not touch the front of the respirator or facemask.
 - **Respirator:** Remove the bottom strap by touching only the strap and bring it carefully over the head. Grasp the top strap and bring it carefully over the head, and then pull the respirator away from the face without touching the front of the respirator.
 - **Facemask:** Carefully untie (or unhook from the ears) and pull away from face without touching the front.
- 7. Perform hand hygiene after removing the respirator/facemask** and before putting it on again if your workplace is practicing reuse.

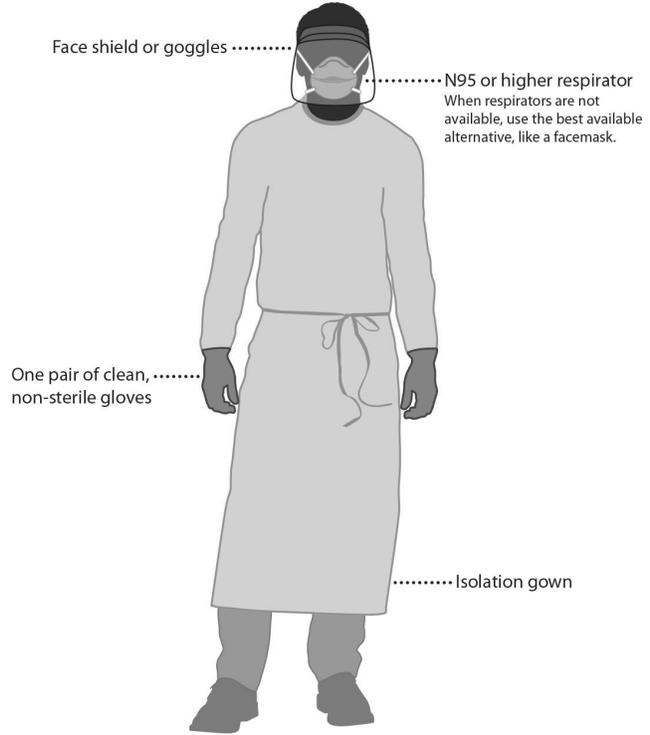
*Facilities implementing reuse or extended use of PPE will need to adjust their donning and doffing procedures to accommodate those practices.

NIOSH: National Institute for Occupational Safety and Health

Source: Centers for Disease Control and Prevention, https://www.cdc.gov/coronavirus/2019-ncov/downloads/A_FS_HCP_COVID19_PPE.pdf

Figure 1. Use Personal Protective Equipment (PPE) When Caring for Patients with Confirmed or Suspected COVID-19, continued

Preferred PPE – Use N95 or Higher Respirator



Acceptable Alternative PPE – Use Facemask



Source: Centers for Disease Control and Prevention, https://www.cdc.gov/coronavirus/2019-ncov/downloads/A_FS_HCP_COVID19_PPE.pdf