



# HOSPITAL INFECTION CONTROL & PREVENTION

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## The 'Vaccine Wars:' Will Science Prevail?

*Measles epidemic leads to pushback against antivaccine groups*

By Gary Evans, Medical Writer

In a year marked by more than 1,000 infections with a disease that once was eradicated in the United States, the tide of public opinion may be turning against the antivaccine movement.

As a record number of measles cases have spread to 30 states, science is starting to win the “vaccine wars,” said **Paul Offit**, MD, director of the Vaccine Education Center and an infectious disease physician at Children’s Hospital of Philadelphia.

“Frankly, it is hard to make a case that vaccines are evil in the midst of epidemics,” he said recently in Philadelphia at the annual meeting of the Association for Professionals in Infection Control and Epidemiology (APIC).

As of Aug. 1, 2019, there have been 1,172 measles cases in the United States this year, the CDC reports.<sup>1</sup> That is the most cases since 1992, and makes a distant memory of the announcement

in the year 2000 that measles had been eradicated in the United States — an accomplishment that was primarily due to childhood vaccinations.

Measles resurgence coincides with parents citing unsafe vaccines

as a reason not to immunize their children. However, there is a growing pushback against the antivaccine movement, with herd immunity threatened and the real risk of measles to immunocompromised patients and those who cannot be immunized.

“These outbreaks — as awful as

“FRANKLY, IT IS HARD TO MAKE A CASE THAT VACCINES ARE EVIL IN THE MIDST OF EPIDEMICS.”

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they are, as children have once again suffered a disease that is completely preventable — we are reaping some good from this,” Offit said. “Society is finally standing up for itself.”

In addition to several states acting to remove exemptions to childhood vaccines, there has been an accumulation of studies thoroughly debunking the claim that the measles-mumps-rubella (MMR) vaccine causes autism. One of the most recent was published this year, with researchers who investigated some 650,000 children in Denmark concluding that there is no link between vaccination and autism.<sup>2</sup>

“When you isolate the effect of that one variable — receipt of the MMR vaccine — there was no greater risk of developing autism if you got the vaccine or if you did not,” Offit said. “There are 18 studies now that have looked at that hypothesis. I would argue that this is one of the most tested hypotheses in the history of medicine. MMR vaccine does not cause autism.”

At times, public health attempts to accommodate and reassure those concerned about vaccines have been handled poorly, Offit said. For example, in the 1990s, attention turned to thimerosal, a preservative used primarily to prevent bacterial and fungal contamination of multidose vials of vaccines. To err on the side of caution, public health officials urged manufacturers to remove thimerosal from vaccines even though it posed no established threat, said Offit, who served on the CDC's Advisory Committee on Immunization Practices (ACIP) at the time.

“This was done the wrong way,” he said. “We removed thimerosal in a precipitous and frightening manner.”

The CDC announcement of the move said there was no evidence the mercury levels in thimerosal in vaccines were harmful but pharmaceutical companies were urged to remove it “to make safe vaccines even safer,” he noted.

“Well, if it is not unsafe, then taking it out doesn't make it safe,” Offit said. “It only makes it perceived to be safe, which is a very different thing. We scared people the way that we did this. We somehow felt that a tenet of risk communication was the compulsion to describe all theoretical risk, and it was done wrongly. In any case, because that was done, it really gave birth to several antivaccine groups.”

*Hospital Infection Control & Prevention* asked another national vaccine expert and long-time member of ACIP to weigh in on the thimerosal decision.

“It continues to be debated as to how wise or unwise that decision was,” says **William Schaffner**, MD, professor of preventive medicine at Vanderbilt University in Nashville.

The antivaccine movement saw the move in part as some kind of a concession, saying “they wouldn't have done that unless there was a reason for it,” Schaffner recalls.

“The reason for it was to provide some calm,” he adds. “[With the thinking being] we will henceforth make single doses without preservatives and that should keep everybody happy, even though it wasn't a problem before. I think that remains an unresolved conundrum.”

While the science now is undisputed in the medical community regarding the MMR vaccine and autism, many in the vaccine movement likely will hold to their beliefs and suspicions, Schaffner says.

“There has been a certain

turnaround in public sentiment, but it's not as though this group of people involved has suddenly changed their minds and every parent is bringing in their unimmunized children," Schaffner says. "I think there will continue to be people who wish to exercise their 'freedom' or options and withhold their children from vaccination, science be darned."

## 18th Century Antivaxxers

While it may seem like a relatively recent phenomenon, the antivaccine movement began with the first vaccine, Offit told APIC attendees. In 1796, Edward Jenner developed a smallpox vaccine using the antigenically similar cowpox virus.

"There were antivaccine movements born within a year of that invention," he said, showing inflammatory editorial cartoons from the time depicting people turning into animals after receiving the smallpox vaccine.

"We look at this picture and we laugh, but some of the objections that are raised about vaccines today are about as biologically plausible as this picture," Offit said.

For example, Offit said he was asked recently about the rumor that vaccines contain fetal embryonic cells of both males and females, causing some people to become transgender after immunization.

"I answered that question the only way one reasonably could," he deadpanned. "Yes, that's exactly how it happens."

The modern antivaccine movement began in 1982 with the pertussis vaccine, as televised news coverage showed horribly disabled

children who had been immunized recently.

"The parents all told the same story," he said. "My child was fine, then they got this whole-cell pertussis vaccine and look at what happened. This really created the notion in this country for the first time that vaccines might be doing more harm than good."

**"I WOULD ARGUE THAT THIS IS ONE OF THE MOST TESTED HYPOTHESES IN THE HISTORY OF MEDICINE. MMR VACCINE DOES NOT CAUSE AUTISM."**

The result was congressional hearings, sensational press coverage, and litigation that led to the closure of several vaccine manufacturers. With manufacturers facing the expense of lawsuits, the cost of the pertussis vaccine rose from 19 cents in 1980 to \$12 in 1986, he said.

"The number of oral polio vaccine makers declined from three to one, measles vaccine makers from six to one, and pertussis vaccine makers from eight to one," Offit said. "The one pertussis vaccine maker left was about to leave the business. They were spending more money defending lawsuits than they were making from vaccines. We were about to lose vaccines in the United States in the mid-1980s."

Passage of the federal National Childhood Vaccine Injury Act in 1986 was able to "stop the bleeding" and stabilize vaccine production. But

a national antivaccine movement continued and developed more sophisticated marketing techniques to cast doubt on vaccine safety.

Epidemiological studies over the next decade showed that pertussis vaccine was not associated with increased risk for epilepsy, developmental disorders, or brain damage.

"Genetic studies 25 years later, now that we had the tools at hand, showed that the children [shown on TV] had something called Dravet syndrome, which had nothing to do with vaccines," Offit said. "But these studies came far too late to stem the fear that the pertussis vaccine was causing permanent harm."

## Measles and the Damage Done

In 1998, *The Lancet* infamously published a since-retracted "study" that fueled fears that the MMR vaccine may cause autism. The journal's editors retracted the article in 2010 after years of controversy and criticism from the medical community. The journal cited several "incorrect" elements and the lack of ethics committee oversight in concluding, "we fully retract this paper from the published record."<sup>3</sup>

But the damage was done and the false link between autism and the MMR vaccine eventually resulted in measles outbreaks, first in the United Kingdom and then later in the United States.

"Many people in the United Kingdom chose not to vaccinate their children," Offit said. "Thousands of people made that choice. Hundreds of people were hospitalized with measles, and there were four children who died."

As parents in the United States subsequently refused to vaccinate their children, a series of measles outbreaks began that continues today.

“The only reason that it has come back is because a critical number of parents have chosen not to vaccinate their children,” he said. “I really think this has turned public sentiment against the antivaccine movement. I think the tide has turned.”

The media now is more skeptical of antivaccine claims, and most parents with autistic children do not blame MMR vaccination as the cause, Offit said.

“A study reassuringly found that 85% of parents with children with autism don’t believe that vaccines were the cause,” he said. “You may hear from this very vocal, politically savvy, media-connected group who believe that vaccines cause autism. But that is not true of most parents whose children are on the spectrum.”

Another favorable sign is that recent films and documentaries placing vaccines in a critical light and lionizing the antivaccine movement have not found much of an audience, he said. Hopes were buoyed in the antivaccine movement when Donald Trump was elected president after linking vaccines and autism in one of the presidential debates, Offit said. However, no subsequent action has been taken in that regard, and

administration health officials have underscored the safety of the MMR vaccine during the current measles outbreak.

After a widely publicized outbreak of measles at Disneyland, California passed a law in 2015 eliminating personal or philosophical beliefs as an exemption to childhood vaccinations for school attendance. With West Virginia and Mississippi, that resulted in three states with medical exemptions only. Several other states are considering or are in the process of taking similar action to close loopholes to childhood immunizations.

“This is really dramatically different from where we were in the early 1980s,” Offit said.

Showing a slide of a young boy with leukemia speaking at a hearing on the bill in California, Offit said his testimony was essentially the voice of society.

“He knew that he couldn’t be vaccinated,” he said. “He got up the microphone and said, ‘What about me? Don’t I count? I depend on you to protect me.’ There really wasn’t much the antivaccine people could say to that.”

Although many of the claims and fears are false, there are rare risks associated with immunizations, he noted. For example, the oral polio vaccine, which is no longer used in the United States, could cause polio in rare cases, Offit said.

“The oral polio vaccine was really the only live attenuated vaccine that had the capacity to revert to a virulent or wild-type virus and cause polio,” he said. “It happened in roughly one per 2.4 million doses. It was a rare but real phenomenon.”

Similarly, the yellow fever vaccine is a rare cause of yellow fever, and the influenza vaccine has been linked to Guillain-Barré paralytic syndrome at a rate of about one in 1 million immunizations.

“It’s OK to let people know about that, but autism is not an issue,” Offit said. “The antivaccine folks have also embraced this notion that vaccines are causing chronic diseases like chronic fatigue syndrome, pain, multiple sclerosis, and diabetes. That is not true. Their platform is built on sand.” ■

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# CDC Gears Up as Ebola Outbreak Escalates in Africa

*WHO sounds alarm after cases reach major city*

The CDC is stepping up efforts to fight an Ebola outbreak that is threatening to spread beyond the borders of the Democratic Republic of Congo (DRC).

The World Health Organization (WHO) recently declared an international health emergency in DRC after an Ebola case appeared July 14 in Goma, a city of 2 million people that has connecting flights to global air travel. As of Aug. 2, there have been four cases in Goma, WHO reports.<sup>1</sup>

“Right now, we have about 15 people on the ground in the DRC and in Goma responding to the outbreak,” said **Henry Walke**, MD, MPH, director of the Division of Preparedness and Emerging Infections at the CDC. “We plan on doubling that number of responders in the next month and maintaining a presence in Goma, [DRC capital] Kinshasa, and perhaps in other large urban areas to prepare for the spread of the outbreak.”

As of July 31, 2019, there have been 2,713 Ebola cases in DRC, including 148 healthcare workers. Overall, 1,813 people have died of Ebola during an outbreak that started in the DRC on Aug. 1, 2018. On July 8, 2019, WHO declared a Public Health Emergency of International Concern.<sup>2</sup>

The CDC activated its emergency response in June, allowing the agency to provide more resources and fast-track its response. As of July 31, more than 200 CDC personnel have been deployed in the area, Walke said at a CDC press conference.

“There are no cases of Ebola in the United States,” he emphasized. “At this time, we believe the risk to the U.S. from the current Ebola outbreak in DRC remains low, based on the travel volume.”

“ONGOING VIOLENCE, COMMUNITY DISTRUST, AND OTHER UNPRECEDENTED PROBLEMS HAVE COMPLICATED THE PUBLIC HEALTH RESPONSE.”

There are no direct flights between DRC and the United States, and fewer than 16,000 people a year travel to the United States from DRC, he said.

“However, risk of spread from DRC into neighboring countries is high,” Walke said. “The CDC is coordinating with health officials in DRC, Uganda, Rwanda, and South Sudan.”

Civil unrest and armed conflict in DRC have made it difficult to contain the outbreak, which is spreading despite an apparently effective experimental Ebola vaccine.

“Ongoing violence, community distrust, and other unprecedented problems have complicated the public health response,” Walke said.

The Ebola response also has been undermined by people wary of both the vaccine and the intensive questioning and follow-up after detection of a case.

“In terms of trust from the community, it is not only related to vaccine,” he said. “It is also related to basic public health measures, which include case identification, early isolation, and then monitoring the contacts of that case.”

In the classic “ring” method used against smallpox, the idea is to vaccinate contacts of cases and go out another layer and vaccinate the contacts of those contacts.

“As we try to implement contact tracing and identify people who need vaccination, it’s a very mobile population,” he said.

## International Emergency

In declaring an international emergency, WHO is calling for international aid and assistance while emphasizing that it would be counterproductive to shut down travel to the region.

“One of the reasons they held off in making the emergency declaration, even though many people felt the conditions had been met previously, was out of fear that countries would implement travel and trade restrictions,” says **Jennifer B. Nuzzo**, DrPH, SM, a senior scholar at the Johns Hopkins Center for Health Security. “Everybody thinks that is a bad idea,” she tells *Hospital Infection Control & Prevention*. “That is not the way you try to control the spread

of Ebola. It can really slow down the response because aid workers, supplies, and other resources can't get into the region where they are needed."

The Ebola outbreak primarily has infected people in the DRC provinces of North Kivu and Ituri.

The four cases in Goma, including two deaths, have raised fears of Ebola spreading to other regions on the continent. It also could open a path out of Africa for the deadly virus. Although there are no direct flights to the U.S., Goma flights to Ethiopia, for example, can connect for travel to the U.S., Europe, and Asia. The incubation period for Ebola is two to 21 days, with most cases showing symptoms at eight to 10 days.

As confirmed on July 14, the first case in Goma traveled there by bus and visited a local clinic for illness. He died the same day while transferring to an Ebola treatment center. Two weeks later, an unrelated case in Goma was identified, a miner who subsequently infected his child and spouse, WHO reported.

"Other suspected cases among contacts are awaiting test results," WHO said.

While the outbreak response in DRC has been undermined by civil unrest and violence, Goma has a public health presence that already included advisors from the CDC, Nuzzo says.

"[The CDC] was able to participate in the Goma investigation, and they found that some of the PPE that was used in evaluating the [first] patient had been taken home [by caregivers]," she says. "Those are the kind of problems that may go unnoticed unless you have a very keen eye on what is going on. That is enormously helpful. If there is any good news, I think it is the occurrence of cases

closer to where the CDC personnel are located."

## Healthcare Worker Deaths

Of the 148 healthcare workers infected, unverified reports indicate at least 40 have died of Ebola. In addition, marauding militia groups vying for control of the region have attacked healthcare workers in some 200 incidents, resulting in seven deaths and 58 wounded.<sup>3</sup> No infections or deaths have been reported in deployed CDC personnel.

As previously reported, healthcare workers in DRC are receiving the experimental Ebola vaccine, but the efficacy of immunization was not clear as this report was filed. The WHO reported one incident in which two healthcare workers were infected with Ebola despite receiving the vaccine. The vaccine has demonstrated high efficacy in one clinical trial,<sup>4</sup> but is used now on an unprecedented scale.

"Studies so far have suggested a very high rate of vaccine effectiveness, but you can envision there are some people who won't have a protective response as the numbers get larger," Nuzzo says. "In many of these cases, it is more likely they were vaccinated too close to when the exposure occurred. They weren't able to mount a full protective response. Sometimes, they have been vaccinated after an exposure."

The vaccine appears to be effective against mortality, but it is difficult to determine the efficacy with any precision during an ongoing outbreak, **Anthony Fauci**, MD, director of the NIH National Institute of Allergy and Infectious Diseases, said at the CDC press conference.

"Certainly, there have been infections among individuals who have been vaccinated," Fauci said. "The potential benefit of the vaccine is that in those who were vaccinated and did get infected, the mortality rate is extremely low. In fact, I don't think any of them who have died were vaccinated."

There have been reports of nosocomial transmission within healthcare settings and treatment centers, but the proportion of these cases within the overall outbreak is unclear.

"In some cases, it is healthcare workers getting sick and treating patients," Nuzzo says. "In other cases, it is a patient going to a health facility for entirely different reasons and they end up sitting next to an [undiagnosed] Ebola patient. These might be places like smaller health clinics where people are bringing their kids for malaria treatment or something else."

Efforts to ensure a steady flow of PPE and reinforce proper use have been mixed.

"Purchasing additional PPE doesn't necessarily lead to systemic change in behaviors and practices," Nuzzo says. "At one of the hospitals, they had given people a lot of masks, gloves, and gowns. But then people reported blood on the floor and they were wearing flip-flops. It's not just necessarily about the equipment; it is also about training and education and safe practices beyond using gloves and gowns."

Johns Hopkins is one of 10 designated Ebola treatment centers in the United States that have enhanced capabilities such as designated biocontainment units and other control and treatment measures. The 2014 outbreak in West Africa was characterized by a lot of confusion about PPE, particularly the finding

that healthcare workers frequently contaminated themselves doffing the equipment. That may have been a factor in the case of two Dallas nurses who contracted Ebola but survived after caring for a dying patient from West Africa. The basic PPE needed is considerable in the new tiered system in the United States, even for frontline hospitals that will be looking to quickly hand off a patient to one of the Ebola assessment facilities.<sup>5</sup> ■

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# MERS Still a Threat in Saudi Arabia

*Spread within healthcare facilities a major risk*

Although it has not been sustained in other countries following introductions and outbreaks, Middle East Respiratory Syndrome (MERS) coronavirus has established an endemic presence in the Kingdom of Saudi Arabia since it emerged in 2012, the World Health Organization (WHO) reports.<sup>1</sup>

As of June 30, 2019, there have been 2,449 laboratory-confirmed cases of MERS reported, with 84% in Saudi Arabia and the rest in 27 other countries, including the United States. There have been 845 MERS deaths, resulting in a mortality rate of 35%. MERS is a zoonotic virus that has established a reservoir in camels on the Arabian Peninsula.

“Limited, nonsustained, human-to-human transmission, mainly in healthcare settings, continues to occur, primarily in Saudi Arabia,” the WHO reported. “The risk of exported cases to areas outside of the Middle East due to travel remains significant.”

While there has been community transmission, MERS is a particular threat to spread in healthcare settings.

“[T]ransmission in healthcare settings is believed to have occurred before adequate infection prevention and control procedures were applied and cases were isolated,” WHO reported. “Investigations at the time of the outbreaks indicate that aerosolizing procedures conducted in crowded emergency departments or medical wards with suboptimal infection prevention and control measures in place resulted in human-to-human transmission and environmental contamination.”

Since the last WHO update on June 30, 2018, 52 of the 97 secondary cases reported were associated with transmission in healthcare facilities. These cases included 23 healthcare workers. Patient infections occurred in those sharing rooms or wards with MERS patients. Some visitors also were infected.

“Though not unexpected, these transmission events continue to be deeply concerning, given that MERS is still a relatively rare disease about which medical personnel in healthcare facilities have low awareness,” WHO concluded.

Global awareness of MERS generally is low, and cases may be missed due to nonspecific initial symptoms.

“With improved compliance in infection prevention and control, namely adherence to the standard precautions at all times, human-to-human transmission in healthcare facilities can be reduced and possibly eliminated with additional use of transmission-based precautions,” WHO noted. ■

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# CMS Deadline Nears, But Infection Control in Long-Term Care a Challenge

The churn of staff turnover and administrative changes in long-term care may make it difficult for many facilities to meet an impending federal requirement to establish infection prevention programs.

The Centers for Medicare & Medicaid Services (CMS) deadline for a designated and trained infection preventionist (IP) in long-term care facilities is Nov. 28, 2019. CMS issued a final rule<sup>1</sup> on the requirements in 2016, with deadlines for various provisions of compliance phased in annually thereafter. CMS and the CDC are offering free training to meet this requirement, but there are signs that some long-term care facilities will struggle to comply.

IP turnover is a significant barrier in developing effective infection control programs in long-term care facilities, said **Margaret Drake**, MT, ASCP, CIC, infection preventionist at the Nebraska Department of Health and Human Services.

Drake presented survey results<sup>2</sup> underscoring the problem recently in Philadelphia at the annual conference of the Association for Professionals in Infection Control and Epidemiology (APIC). An online survey of 222 nursing homes netted 64 responses from those with IP responsibilities at the facility. Drake and colleagues sought information on turnover in the last two years, both factors contributing to it and assessments of its effect on the IP position.

“The IP position turned over within a year 39% of the time, and by two years over half of them have left,” Drake said.

In addition, all IPs reported

performing at least one additional responsibility in addition to their infection control role, some citing up to four additional duties.

Workload was the most commonly cited factor for turnover, followed by compensation and nursing leadership turnover. Overall, 55% reported turnovers in director of nursing positions, which often translated to new duties and expectations under the new administrator. Survey respondents’ comments on how changes in leadership affected the IP role included:

- “Different perspectives, priorities, and expectations;”
- “Difference of opinion in the way things should be done [and on] the importance of infection prevention;”
- “Lack of direction and focus on several areas of concern due to the changes in management and administration;”
- No consistency, learning curve.

Of those reporting administrative changes, 60% said they had two directors of nursing in the last two years and 26% had three, she reported.

“You cannot continue to have a consistent program when you have a change in leadership and have to stop and turn in another direction,” Drake said.

The survey revealed 59% of the IPs in a facility had been on the job less than a year and 16% less than two years. In terms of the effect of IP turnover, some respondents said it was unclear what the previous IP did and where they should assume duties.

“There is no consistency for the staff,” she said. “Then, there is the

learning curve. It takes time to not only learn what the previous person was doing, but what should even be your role as the IP.”

Drake and colleagues intervened on behalf of a nurse at one facility who had to work the night shift as well as the IP role.

“We talked to the administration and said she needs protected time,” she said. “[They] talked to her and gave her some protected time, but recently there was turnover in administration, and she is back on nights again.”

Another IP in long-term care was surprised to learn from the health department that the CMS mandate included duties beyond antibiotic stewardship, which she was told was her primary role.

“She didn’t have a desk, a computer — nothing,” Drake said. “When the administrator is not behind the IP program, it is not going to fly.”

Asked what would prevent turnover, respondents said nursing leadership stability, opportunity for professional development, and overall satisfaction.

“Some said the reason they stay is that they feel a responsibility for the residents,” Drake said. “I see that in all areas of nursing. You really feel responsible for your patients and that is who you are there for.”

Similar trends were found in another APIC study in which researchers examined skilled nursing facilities (SNFs), which have been linked to transmission of multidrug-resistant bacteria across the healthcare continuum. A pilot survey of 12 IPs in SNFs was conducted last year as part of a

larger project to reduce healthcare-associated infections by improving collaboration between long-term care and hospitals.

“Over half of the 12 IPs had five years or less experience in infection prevention,” the researchers reported.<sup>3</sup> “All of the IPs had other responsibilities such as staff education and development, occupational health, or assistant director of nursing. Ten months into the 12-month pilot year, seven of the 12 IPs had left their IP position.”

Despite the turnover, the facilities remained enrolled in the project, and

the research team helped the new IPs take on the role.

“Limited IP experience and turnover will pose a significant challenge for SNFs in trying to meet CMS mandates,” the researchers concluded. “Strategies should encourage relationships with experienced IPs to assist SNFs in training and retaining IPs.” ■

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# Infection Prevention Expertise Lacking on Water Management Teams

Water management plans to control *Legionella* and other waterborne pathogens in healthcare settings have become a priority since a CMS memo<sup>1</sup> in 2017 ordered such measures to protect patients.

Infection preventionists (IPs) should be a key member of these water management teams, but almost half the facilities consulted by *Legionella* experts did not have an IP on the committee, said **Laura Morris**, MT (ASCP), CIC, education coordinator at the Special Pathogens Laboratory (SPL) in Pittsburgh.

“IPs have that knowledge of microbiology, so I am really stressing that the importance of you being on that team,” Morris said recently in Philadelphia at the annual conference of the Association for Professionals in Infection Control and Epidemiology (APIC).

Morris and colleagues analyzed data from healthcare facilities with which the SPL has consulted since June 2017 — after the initial CMS

memo — to assess water safety programs, perform risk assessments, and test for *Legionella*. They found that of 83 healthcare facilities, IPs were involved in water safety plans at only 43.<sup>2</sup> In 71 of the water safety teams, the facilities management (i.e., engineering) was represented. Overall, 73% of the consultations were performed in acute care facilities. Overall, 87% of facilities had a “proactive,” ongoing water management plan, Morris said. However, 13% of the facilities established a water management plan only after identifying patient infections.

“They were developed due to an outbreak or a case,” Morris said. “The alarming part is that of 42% of these ‘reactive’ teams did not have an IP on their team.”

## Increasing Pathogen

Data from the CDC show that there has been a 5.5-fold increase in

*Legionella* since 2000.<sup>3</sup> About 10% of all people who acquire *Legionella* die, but the mortality rate increases to 25% for those hospitalized or in long-term care. Numerous outbreaks have been traced to the waterborne pathogen becoming aerosolized and inhaled in shower mist, spas, medical equipment, and decorative fountains. For example, a reservoir of standing water in the plumbing of a hospital under renovation led to a *Legionella* outbreak that infected 10 patients, including two who died.<sup>4</sup>

That likely is an underestimate of the true burden of disease because clinical testing is inconsistent, Morris said. Possible reasons for the increase include: more testing, more susceptible patients, and *Legionella* becoming more predominant in the environment.

“The answer is not clear, but most experts agree that it is probably a combination of all three,” she said.

A key point of clarity is that an effective water management plan could prevent an estimated

90% of outbreaks related to any of the aforementioned factors, she said. The CDC created a toolkit to guide the implementation of water management programs.<sup>5</sup>

IPs can play key roles on water management teams with insights into medical devices, procedures, and construction and renovation that could contribute to waterborne infections, Morris said.

“When you are looking through your daily surveillance, you may identify *Legionella* and other waterborne pathogens through clinical tests,” she said. “Are you noticing trends, or do you have a cluster? When your hospital is considering new procedures, think ‘Will this contain water or use water?’”

The value of IP input has shown time and again in hospital construction and renovations, as patients could be vulnerable to dustborne fungal infections and other threats. This relationship with facility management and prior collaborations could be leveraged to be involved in the water management team, she noted.

“We are really emphasizing the need to build that relationship,” Morris said. “Visit their world, learn their language, and ask questions.”

Likewise, IPs should be aware of water treatments and any *Legionella* testing. “If they are testing for *Legionella*, what tests are they using?” she asked. “Are they using a quick test or the gold standard of culture? This is an area where you as an IP need to have input.”

Routine testing for *Legionella* has been somewhat controversial. CMS amended its original memo last year to clarify testing decisions should be made at the local level.

“Facilities must develop and adhere to policies and procedures

that inhibit microbial growth in building water systems that reduce the risk of growth and spread of *Legionella* and other opportunistic pathogens in water,” according to the memo.<sup>5</sup> “CMS does not require water cultures for *Legionella* or other opportunistic waterborne pathogens. Testing protocols are at the discretion of the provider.”

## Testing Issues

The testing conundrum goes back, in part, to the enduring belief that *Legionella* species are ubiquitous in water systems. The theory is that it will be found in testing, regardless of the infection threat.

“We want to test to assess the risk,” Morris recommended. “It is a myth that all buildings have *Legionella*. Only about 50% in studies have been shown to have *Legionella*. You want to assess that risk to find out if you are in that 50%.”

For facilities that are in the 50% portion that test positive, water treatment and engineering controls should be implemented before patient infections appear, she said.

“Really, we want to test to protect our patients,” Morris said. “Factors that make it more important to do testing is if you are having difficulty controlling your [water] system, and if you have cases of *Legionella* disease.”

Repeat testing can be used to verify the efficacy of water treatment and safety plans. The CDC recommends using a testing method that can detect all types of *Legionella*, not just *L. pneumophila* typically implicated in outbreaks. “Testing the environment for *Legionella* is really the only way to validate if your program is working,” Morris said.

If it is determined additional water disinfection is needed, weigh factors like effect on water quality and the ability to maintain an effective residual treatment.

“No one should die from a preventable disease caused by a bacterium in water,” Morris said. “It can and should be prevented. This might require you to go your C-suite to make the business case, as with our many of our infection prevention initiatives. The most important point is that this is a patient safety initiative.”

Discuss the cost of a water safety management program with proactive testing compared to an outbreak, she recommended.

“Once the health department gets involved, there is a lot of testing and a lot of measures that they will have you do. That can exceed \$100,000,” she said. “There is also loss of business, public relations, and possible litigation.” ■

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## APIC Raises IP Profile on YouTube

What is an infection preventionist (IP), and what does he or she do?

For many years, patients, the public, and even some fellow healthcare workers were not fully aware of the critical role IPs played behind the scenes. The IP profile has been raised dramatically over the last decade by national efforts to reduce healthcare-associated infections, the rise of antibiotic resistance, and emerging infections like Ebola.

As a result, APIC created a video that features IPs explaining what they do and what aspects of the job they particularly enjoy. The video can be used to raise awareness among the public, patients, medical personnel, and recruit new IPs into the profession. (*The video can be viewed at: <https://bit.ly/2QbC4aN>.*)

"A couple of years ago, we in leadership in APIC realized we needed to make sure that we appeal to the next generation," says **Pat Jackson**, RN, MA, CIC, FAPIC, an IP at Children's Medical Center of Dallas. "I've been in it for 25 years. This new generation does things differently and thinks differently."

In planning the video, which features several IPs at the University of Maryland, Jackson and APIC colleagues talked to focus groups of IPs with different levels of experience.

"The first group had been in the field for eight to 10 years," she says.

"The second group of IPs were much newer, with one to five years of practice."

One reason recruitment should be more focused is the abiding theme over the years that IPs discover the field haphazardly rather than seek it out. "As I go around to new IPs, I ask, 'How did you get into this job?'" Jackson says. "Almost exclusively it is by accident. 'Somebody left and I filled in,' or 'Somebody approached me about it.' It wasn't them seeking out infection prevention. We wanted to create something to show what IPs do and who we are."

Interviews in the focus groups and IPs commenting in the video reveal common themes in the appeal of the profession, from its unpredictable nature to the opportunity to work with a wide variety of other healthcare fields.

"One thing people like about it is that it seems every day is something different," she says. "It's Ebola or a problem with sterilization processes. Others said they really like the investigative part of it — being a detective and trying to figure out why this infection happened."

Empowered by federal regulations and growing public awareness, the IP office no longer is a silo for crunching numbers. There are opportunities for personal and professional growth that appeal to new IPs. "The networking and the whole multidisciplinary nature of the

job," Jackson says. "When you're in infection prevention, you touch all different parts of the hospital. That really appealed to them."

In terms of recruiting, the video is shown in nursing schools and in programs that offer master's degrees in public health.

"I know in our APIC membership right now it is weighted toward the older years," she says. "For the livelihood of our profession, we want to continually get the younger population to join us."

APIC is about to undertake a new strategic plan for the future, and recruiting and retaining professionals will be a key focus, she says. "The intended audience for the video is recruitment, but also anyone who maybe doesn't understand what infection prevention does," she says. "I have shown it internally in my own hospital. People who don't work in infection prevention think we are just doing surveillance and collecting data. They don't realize what a large scope that we have and all of the things that we do."

One intangible benefit of the video is instilling a sense of pride in the long-practicing veteran IPs who have saved many a patient life by preventing infections. "Personally, I have probably seen that video at least 10 times, but every time I watch it at the end I just have this extreme feeling of being so proud to be a part of this profession," Jackson says. ■



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## CME/CE QUESTIONS

1. **According to Paul Offit, MD, the modern antivaccine movement in the United States began with childhood disabilities falsely linked to the vaccine for:**
  - a. measles.
  - b. pertussis.
  - c. smallpox.
  - d. tetanus.
2. **Which is one of the three states that have passed laws allowing only medical exemptions to childhood immunization for school attendance?**
  - a. Texas
  - b. Mississippi
  - c. Montana
  - d. Florida
3. **As of July 31, 2019, there have been 2,713 Ebola cases in the Democratic Republic of Congo, including 148:**
  - a. funeral operators.
  - b. children under 18 years.
  - c. people who died of Ebola.
  - d. healthcare workers.
4. **In updating its memo on Legionella in healthcare facilities in 2018, CMS clarified that testing for the pathogen:**
  - a. must be performed by culture.
  - b. is required at least once annually.
  - c. is at the discretion of the provider.
  - d. must be verified by CMS surveyors.

## CME/CE OBJECTIVES

Upon completion of this educational activity, participants should be able to:

1. Identify the clinical, legal, or educational issues encountered by infection preventionists and epidemiologists;
2. Describe the effect of infection control and prevention issues on nurses, hospitals, or the healthcare industry in general;
3. Cite solutions to the problems encountered by infection preventionists based on guidelines from the relevant regulatory authorities, and/or independent recommendations from clinicians at individual institutions.