



# Hospital Infection Control & PREVENTION

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## CDC to track hospital antibiotic use with new electronic NHSN module

*APIC, SHEA issuing joint paper on IP role*

By **Gary Evans**, Executive Editor



**Arjun Srinivasan**

Trying to rein in the widespread misuse of antibiotics that is driving the rise of pan-resistant infections, the Centers for Disease Control and Prevention has created an electronic tracking system that will allow hospitals to monitor and benchmark drug use much as they already do for health care associated infections (HAIs).

The landmark initiative is one of several high priority national efforts to stop the misuse and overuse of antibiotics, which are contributing to a rising tide of multidrug resistant organisms (MDROs). (See related stories, p. 4-6) The new CDC surveillance component comes with the tacit concession that data on antibiotic use — and certainly misuse — has been something of a blind spot in the public health system. The CDC is essentially applying a time-honored adage of infection prevention: "To measure is to control."

"Historically, it's been difficult to get information on exactly what antibiotics are being used in the various hospital locations," says **Arjun Srinivasan**, MD, a medical epidemiologist in the CDC's Division of Healthcare Quality Promotion. "A lot of people have pointed out that if you can't monitor it — measure it — then you don't know if you're doing well or where you could do better."

The creation of an accurate data base of antibiotic use should provide a much more detailed view of a growing national problem.

"When you look at the studies on antibiotic use it's quite clear

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that a substantial percentage of the antibiotics that we use in hospitals are used unnecessarily," Srinivasan says. "They are being given to patients who don't have infections at all, or they are being given for too long, or two antibiotics are being given when one would be sufficient. There is a great deal of improvement that we can make to reduce antibiotic use."

Antibiotic misuse can select out resistant organisms, undermine effective treatment, cause side effects, and set up patients for HAIs like *Clostridium difficile* infection. In addition, the CDC effort has a real sense of urgency due to increasing reports of gram negative infections that are becoming resistant to the full formulary.

"Hospitals around the country are seeing more patients with these gram negative infections, which are in some cases essentially untreatable," says **Steve Solomon**, MD, director of antimicrobial resistance in the CDC's Division of Healthcare Quality Promotion. "They are having to use

not just second-line, but-third line therapies like colistin."

Such drugs are problematic due to possible adverse effects and other clinical issues, but may be the last resort against gram negative pathogens like multidrug resistant strains of *Klebsiella pneumoniae* and *Acinetobacter baumannii*. With treatment so limited, no new drugs forthcoming, decolonization virtually impossible, and mortality rates reported in the 40% range, antibiotic stewardship and rigorous infection control measures are the two and only options.

Add to all that the capability of these gram negative bugs to transfer full resistance between species via plasmids, and the severity of the situation is apparent.

"The threat of untreatable infections is real," Srinivasan says.

Pilot program begins with eye to expand The new antibiotic tracking module is part of CDC's National Healthcare Safety Network (NHSN), which is currently monitoring infections in some 4,800 hospitals. The ambitious

**"Hospitals around the country are seeing more patients with these gram negative infections, which are in some cases essentially untreatable,"**

**Steve Solomon, MD**

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## Editorial Questions

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initiative will eventually include reporting information on MDROs, but the immediate focus is antibiotic stewardship.

"We are now in the process of working on a companion module for NHSN that will allow facilities to electronically track antimicrobial resistance," Srinivasan says. "Within the next couple of years, we will have both the [drug] use and the resistance pieces built into the NHSN. We are beginning with the use portion."

The CDC is piloting the program in some 70 hospitals in three states, he adds. "We were able to get some funding to support a collaboration with three state health departments and one city health department," he says. "We hope that in short order we will begin receiving information from these pilot hospitals and we can then expand from there."

In addition, any hospital that participates in the NHSN can access the system by working directly with its pharmacy software vendor to transmit data electronically from drug administration or barcoding records, the CDC advises. (See *editor's note*, p. 4).

"This is a very future-looking module because it uses entirely electronic data for the reports," he says. "The data comes directly from the hospital's medication-use system into the NHSN module, so there is no data entry that is required by a healthcare facility."

The CDC is also working with pharmacy software companies to get the system incorporated in their updated products. "It will [eventually] be part of the system," Srinivasan says. "You could basically activate that function and then your antibiotic use data will be sent directly into the NSHN. Then you as a facility can use it — it will be reported out to the various hospital locations so you can monitor your own use. We are hoping to get enough facilities participating so we can begin to report information that will allow facilities to compare themselves to similar facilities — to understand if they are above or below average with respect to antibiotic use."

Hospitals will be able to assess their antibiotic use against similar facilities and by type of unit, he says. "For example, if you are a medium size hospital in a particular location and you have one intensive care unit, roughly how much antibiotics would be used by a similar facility in a given location like a medi-

cal ward or a surgical ward?" he says. "This is much like we have done for HAIs with CLABSI rates."

As with HAIs, facilities can draw their own conclusions about their data if, for example, an outbreak spurs heavy antibiotic administration in a given unit.

"The information would be used exactly like hospitals are accustomed to using their infection rates or standardized infection ratios," he says. "A hospital may have a higher than expected infection rate but it may be that there is a very good explanation for that — very sick patients, an outbreak. This helps point you in directions to say [for example] we need to look at our antibiotic use on this particular unit because it's higher than what we have expected. Or let's go look at this unit because their use is much lower than we expected. Are they doing something we need to emulate in other [departments]?"

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## Defining the IP role

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Though preventing patient-to-patient transmission of MDROs is a given for infection preventionists, their role in the larger context of antibiotic stewardship has been less clearly defined. That is clearly in flux, though public health officials are cognizant of the multiple duties IPs are already performing.

"We think infection preventionists can play an important role in antibiotic stewardship, but it's an area where we have some work to do," Srinivasan says. "There are definitely roles for IPs, but we have to be obviously sensitive to the fact that they are already stretched beyond their limits. We need to find ways to harness the power of what they are already doing — to dual purpose it for both infection prevention and for antibiotic stewardship."

In that regard, the CDC has been working with the Association of Professionals in Infection Control and Epidemiology (APIC), which was preparing to issue a position paper on IPs and antibiotic stewardship as this issue of *Hospital Infection Control & Prevention* went to press. APIC will issue the paper as a joint statement with the Society for Healthcare Epidemiology of America (SHEA), says **Russ**



Russ Olmsted

**Olmsted**, MPH, CIC, APIC president and an infection preventionist at St. Joseph Mercy Health System in Ann Arbor, MI.

"Part of the purpose of this paper is to outline some of the key things I think a lot of

IPs have been doing for quite some time," he says. "This kind of crystallizes the notion that their work really does inform the antibiotic stewardship program. There is sensitivity about this issue. We don't want to promote a program that is going to add tasks on to [the IP], but this is really just recognizing that the IP is part of the stewardship program."

Indeed, there are already Joint Commission patient safety goals to reduce MDROs and the Centers for Medicare and Medicaid services is very interested in assessing antibiotic resistance issues as part of its hospital oversight and inspection activities. Many hospitals already have antibiotic stewardship committees, and IPs can be critical contributors by sharing the data they gather to prevent HAIs.

"We are not necessarily advocating that IPs go out and do something like medication utilization review in real time," Olmsted says. "But in the daily work we already do we are obviously focused on certain organisms. That data can be used in a couple of ways to help inform the stewardship program whether they are hitting the right target. It's also kind of a metric for assessing the impact of the infection program."

The link between antibiotic use and infection control is strikingly direct with *C. diff*, which has spread widely in hospital outbreaks involving a particularly virulent strain. Transmission occurs primarily in health care facilities, where exposure to antimicrobial drugs sets up the gut for onset of disease, triggering diarrhea that leads to a contaminated patient environment by the spore-forming anaerobic bacillus. Prior administration of fluoroquinolones

in particular seems to trigger the appearance of cases, but a 2008 APIC *C. diff* survey found that only about half of responding hospitals had antibiotic stewardship programs in place. (See cover story in HIC, Dec. 2008.)

Olmsted and colleagues at his facility were able to substantially reduce *C. diff* infections by focusing on antibiotic use. "We can't prove cause and effect but it looks like it was related to better use of antibiotics," he says. "We lessened use of some of these classes of antibiotics and saw a very significant [*C. diff*] drop."

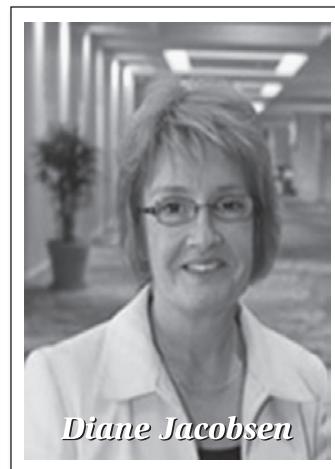
Similarly, IPs can help connect the dots between other problem HAIs and antibiotic use patterns.

"The infection preventionists bring that rich surveillance data to that table," Olmsted says. "It's useful to see if there are trends or changes with the reduction of a certain class of antibiotics. The other thing we do is prevent the movement of the MDROs through good standard or transmission-based precautions. That also supports stewardship."

[Editor's note: To access a list of pharmacy software vendors who are working with CDC's new antibiotic use tracking system, see the Society for Infectious Disease Pharmacists website at [www.sidp.org](http://www.sidp.org)] ■

## CDC pilots drug use improvement system

*Quality group develops driver tool*



Diane Jacobsen

As a key complement to its new antibiotic use tracking system, the Centers for Disease Control and Prevention is partnering with the Institute for Healthcare Improvement (IHI) in a pilot program to prevent overuse and misuse of antibiotics

in hospitals.

"We know across hospitals that there are

opportunities to address the overuse and misuse of antibiotics," says **Diane Jacobsen**, MPH, CPHQ, director of the IHI in Cambridge, MA. "For example, limiting [therapy] to the narrowest spectrum antibiotics that are appropriate or effective would be a huge step to minimize the risk of *C. diff* and other antibiotic-related adverse events."

The new program uses the IHI "Driver Diagram and Change Package," a quality improvement approach that has been used successfully in other areas.

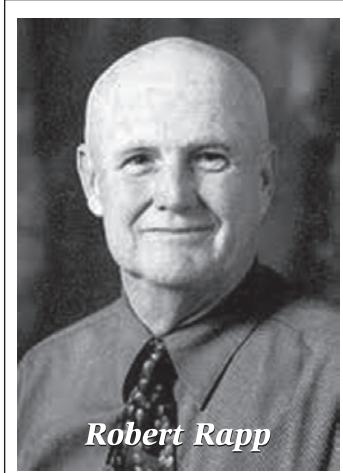
"We see this as a critical component of our efforts to promote better use of antibiotics in hospitals and healthcare facilities," says **Arjun Srinivasan**, MD, a medical epidemiologist in the CDC's Division of Healthcare Quality Promotion. "This fits hand in glove with [the CDC antibiotic-use tracking system.] We want people to implement interventions to improve use, but then we also want them to measure use so that they know if their interventions are being successful."

According to the IHI, the driver tool is designed to help organize "theories and ideas about the changes an organization can make to improve outcomes."

The IHI antibiotic program was not available for review as this issue went to press, but officials provided some highlights. Jointly developed by CDC and IHI with guidance and input from a variety of experts, the driver diagram lays out a number of practical steps that hospitals can follow. Ultimately, the idea is to embed the fundamental changes required for antibiotic stewardship in the system of care, especially at the points of care.

"It basically works on improving systems of care," Srinivasan says. "We looked critically at the way antibiotics are used, looked at the available information that has been published, and broke it down into components. We looked for all the different places where antibiotic use could potentially be improved."

For example, unbroken lines of communication are required to ensure therapy is "deescalated" to the narrowest appropriate spectrum, Jacobsen notes. "That is one of the areas that we are focusing on – deescalating to the antibiotic that is most appropriate once you have that culture and sensitivity information back," she says. "But that requires a robust com-



**Robert Rapp**

munication system so that the information is reported back and acted on once the cultures and sensitivities are done. Sometimes that can fall by the wayside. "

Indeed, the increasing loss of effectiveness of critical antibiotics is directly linked to this practice, which occurs sometimes because the physician is reluctant to change drugs if the patient seems to be improving, says **Robert Rapp**, PharmD, a professor of pharmacy at the University of Kentucky Chandler Medical Center.

"Say you have started three drugs for your patient's infection," he says. "You get the cultures back and it happens to be susceptible to a narrow spectrum agent like ampicillin. Then you need to de-escalate to ampicillin and stop the other three. We frequently don't do that. We too frequently just say, 'I'm not sure I believe the culture at this point, my patient is doing a little better, I'm just going to go with what I have.' Frankly, that's killing us."

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### **Role of IP key, but varies**

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Eight hospitals have agreed to serve as the pilot testing sites for the program. In selecting them, the CDC and IHI looked to engage hospitals of different sizes, areas of expertise, and geographic locations that were willing to test the program across a variety of conditions. The sites include:

- Community Hospital, Tallahassee, AL;
- Centerpoint Medical Center, Independence, MO;
- Rogue Valley Medical Center, Medford, OR;
- St. Francis Medical Center, Peoria, IL;
- Seton Medical Center, Austin, TX;
- The Reading Hospital and Medical Center, West Reading, PA;
- Ronald Reagan UCLA Medical Center, Los Angeles, CA;
- WellStar Cobb Hospital, Austell, GA.

An epidemiologist with experience in quality improvement, risk management and infection control, Jacobsen says the role of the infection preventionist will vary across the eight facilities.

"Some of them definitely have included the infection preventionists and/or an epidemiologist on their team," she says. "Others may not, depending upon the structure that they have within the hospital. But as far as the level of interest — the importance of the expertise of that role within an overall antibiotic stewardship program — clearly it is key."

Similarly, some of the hospitals may have different systems of diagnostics or rapid testing, but the IHI driver program underscores communication more than a reliance on technology, she says.

"You can have the best [rapid diagnostics] in the world but if that information doesn't get communicated to the bedside than what good has it done?" Jacobsen says. ■

## Fed plan faces a complex problem

### *Multiagency group hones ambitious plan*

While emerging multidrug resistant gram negative rods are a prime topic of current concern, there is a sobering reminder that longstanding foes have not exactly been vanquished. Consider, for example, methicillin-resistant *Staphylococcus aureus* (MRSA), long the tyrant king of healthcare associated infections (HAIs). The Centers for Disease Control and Prevention estimates that 15,000 patients die every year due to infection with MRSA.

Overall, some 90,000 Americans annually acquire serious infections caused by antibiotic resistant pathogens, according to **Steve Solomon**, MD, director of antimicrobial resistance in the CDC's Division of Healthcare Quality Promotion.



**Steve Solomon**

A broad collaboration of federal agen-

cies is being brought to bear on the issue, with the spear point being Federal Government's Interagency Task Force on Antimicrobial Resistance, he explains. The task force recently published the latest draft of its "Public Health Action Plan to Combat Antimicrobial Resistance" (<http://1.usa.gov/uBLgNA>), which outlines the government's national strategy for preventing infections with antibiotic resistant pathogens.

"The federal plan has four main sections — surveillance, prevention and control, research and product development," Solomon tells *Hospital Infection Control & Prevention*. "Certainly there are issues relevant to healthcare epidemiology and infection control. A lot of the focus of the plan is on resistance problems in the healthcare environment — both from the standpoint of surveillance and from the various intervention initiatives, including the importance of antimicrobial stewardship."

A commonly lamented problem is that there are not sufficient profit incentives to entice the private sector to develop new antibiotics for resistant pathogens. Thus the research goals of the plan include supporting "the development of novel broad spectrum antimicrobials with dual indications for community-acquired infections and biodefense threat agents.

... Conduct and support clinical research to evaluate the safety and efficacy of novel drugs and vaccines for pathogens where resistance threatens effective treatment."

Indeed, with no new drugs expected to alleviate the problem any time soon, the primary strategies are antibiotic controls and infection prevention.

"You want to prevent the emergence of resistance — which is where the stewardship comes in — and you want to do an excellent job with infection control," Solomon says. "It prevents the transmission of these resistant pathogens to patients and it helps prevent the spread of colonization. That is the other big problem. These patients get colonized, they go out and go home or they go to other health care settings."

### **Attacking problem on all fronts**

Some of the federal plan's overarching goals

in the area of prevention and control of antibiotic resistance (AR) include the following. The goals are in various stages of planning and implementation.

- Implement and evaluate the impact of community-based interventions, such as vaccination campaigns and the promotion of appropriate antibiotic use to reduce the spread of AR microorganisms, rates of disease, and antimicrobial use, and to improve patient outcomes.
- Estimate the effectiveness of pneumococcal and influenza vaccines on drug-resistant infections caused by those pathogens.
- Evaluate factors that influence the prescribing practices of primary care physicians, including academic detailing and benchmark analysis.
- Identify and promote successful AR prevention and control programs in healthcare settings that utilize existing recommendations for preventing transmission of AR organisms.
- Establish state-based MDRO and *Clostridium difficile* prevention collaborative in at least 10 states.
- Evaluate impact of the CMS-Quality Improvement Organization MRSA prevention.
- Evaluate impact of the Department of Veterans Affairs National MRSA prevention initiative Explore the expansion of prevention initiatives to include other MDRO including *C. diff* and multidrug-resistant gram-negative pathogens.
- Facilitate initiation of at least one regional, multi-center prevention collaborative in which acute and long-term care facilities address prevention of multi-drug resistant infections in a coordinated manner.
- Identify factors that reduce transmission of drug-resistant pathogens, including infection control, in veterinary, agriculture and aquaculture settings.
- Identify factors important for assuring that antimicrobial drugs are used judiciously in veterinary, agriculture and aquaculture environments.
- Promote infection control education at all stages of training and practice for healthcare workers in human and veterinary medicine.
- Complete basic infection control curriculum for posting on the CDC website.
- Develop a plan for infection control educa-

tion of veterinary medicine workers.

- Develop interagency programs in collaboration with regulators, payers, professional societies and other stakeholders to promote effective hand hygiene strategies in communities and healthcare settings and to foster the use of biomedical devices and behaviors that prevent the transmission of infectious organisms in community settings.
- In collaboration with academic partners, complete research studies that evaluate the impact of novel technologies for measuring hand hygiene adherence in the healthcare setting.
- Identify factors and strategies that promote appropriate antimicrobial use (*i.e., best practices*) or discourage inappropriate use in all types of healthcare settings, including inpatient and outpatient facilities, clinics and offices. Facilitate the implementation of these strategies.
- Examine the impact of improved antimicrobial use on adverse events associated with antimicrobials, especially *C. diff* infections.
- Evaluate the benefits and potential unintended consequences of clinical guidelines and policies that bear on antimicrobial use and affect patient care, reimbursement, or other areas of medical practice (*e.g., increased use of antimicrobial agents in emergency rooms for unconfirmed community-acquired pneumonia*).
- Develop, implement, and evaluate treatment algorithms for management of common clinical syndromes frequently treated with antibiotics (*e.g., ventilator-associated and community-acquired pneumonia, acute bronchitis and sinusitis, and asymptomatic bacteriuria and sexually transmitted diseases.*) ■

## HCW flu shot rates hit a record high

### *Self-protection cited over pt safety*

More health care workers than ever are receiving the influenza vaccine. A national survey shows that by mid-November, about 78%

of them had been vaccinated — a rate that is almost double the rate of about five years ago.

Yet pressure continues to build for hospitals to boost their rates higher. A subgroup of the National Vaccine Advisory Committee issued draft recommendations in December that call for health care employers to "strongly consider a policy of employer requirement for influenza immunization" if they have not achieved a 90% vaccination rate.

Influenza vaccination rates will be publicly reported as a quality measure by the Center for Medicare and Medicaid Services, starting in 2013. And the Joint Commission accrediting agency revised its influenza vaccination standard to require hospitals to improve vaccination rates annually "with a goal of achieving the 90% rate established in the national influenza initiatives for 2020."

"We're always pleased to see vaccination rates going up among all health care personnel," says **Megan Lindley**, MPH, an epidemiologist with the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention, which conducted the survey. "We'd like the rates to continue to rise toward the Healthy People 2020 goal [of 90%] and to be higher in other health care settings."

The highest vaccination rates were among physicians and dentists (77.6%); nurse practitioners and physician assistants (76.8%); and nurses (58.7%). Long-term care facilities had the lowest flu vaccination rates, at 45.1%. The online survey of about 2,500 health care workers took place in early to mid-November, so the numbers could climb slightly by the end of the influenza season, Lindley says.

"I do think this is an encouraging report card," says **William Schaffner**, MD, chair of the Department of Preventive Medicine at Vanderbilt University in Nashville, TN, and president of the National Foundation for Infectious Diseases.

"We are doing better in having health care workers accept the vaccine," he says. "We're doing better in having the [health] systems offering and providing the vaccine in a way

that's persuasive and [easily accessible]. That said, it's clear that we still have a substantial challenge ahead of us."

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### ***One in six report mandate***

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The push for a 90% flu vaccination rate has led a growing number of hospitals to implement mandatory policies. About one in six (17.3%) of all health care workers said their employers required them to receive the vaccine — but the proportion may be significantly higher in hospitals.

Meanwhile, the H1N1 pandemic may have convinced health care workers that influenza can be a serious — and even deadly — illness. When asked why they received the flu vaccine, 81.5% of the health care workers responding to the survey said they wanted to protect themselves. Only 42.6% said they received the vaccine to protect their patients.

The CDC recommends universal vaccination — that everyone six months and older to get the flu vaccine. Flu shots are now widely available in grocery stores and pharmacies and the flu shot reminders are ubiquitous. "The message is getting out there about the importance of everybody getting the influenza vaccine to protect themselves," says Lindley.

Yet health care workers are also aware of the shortcomings of the flu vaccine. Of those who said they "will definitely not" get the flu vaccine, about a third (31.6%) said they "don't think flu shots work." A recent meta-analysis revealed that on average the flu vaccine has an efficacy rate of about 59%.

Infection preventionists and employee health professionals should be candid when health care workers ask about the vaccine's effectiveness, advises Schaffner. But they also should emphasize that the vaccine can prevent many cases of influenza and that it's the best way to protect yourself from flu, he says. "It prevents illness. It prevents complications such as pneumonia and hospitalization, and deaths," he says.

To boost vaccination rates, IPs and employee health professionals should check the vaccination status of employees they see for other reasons, and they should continue to offer the vaccine throughout the flu sea-

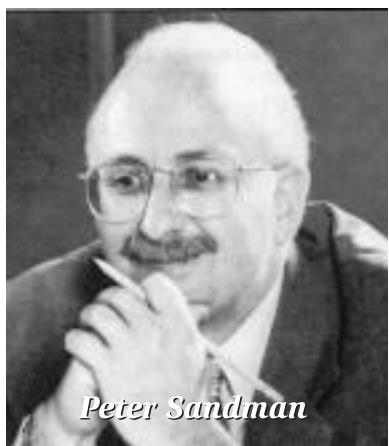
son, Schaffner says. "If you are industrious, I would wager you could improve your institutional immunization rate by at least 10% by that mechanism alone," he says.

**(Editor's note: Comment deadline is Jan. 16th.** NVAC announced it would take comments on the recommendations through Jan. 16, 2012. NVAC, which advises the secretary of Health and Human Services, is scheduled to meet Feb. 7. The draft report and recommendations are available at <http://1.usa.gov/tfDVY0>.) ■

## Is flu shot efficacy being oversold?

*Study shows it reduces flu by 59%*

Getting a flu shot doesn't provide as much protection as was previously reported, according to new analysis of more than 5,000 studies. Now it's time to be honest about the limitations of the vaccine to build trust with health care workers, says an international expert in risk communication.



Peter Sandman

"There is evidence that health care workers underestimate the value of the vaccine. Do they underestimate the value of the vaccine because the sales pitch hasn't been

aggressive enough or because it's been too aggressive and dishonest?" says **Peter Sandman**, PhD, a risk communication consultant based in Princeton, NJ.

"Over the long haul, you can't ground public health in the ethics of a bad used car salesman. And that's what they've done. They've gotten away with it much longer

than they would have if it wasn't public health," he says.

The evaluation of flu studies, published in *Lancet Infectious Diseases*, showed that even when the influenza vaccine is well-matched to the prevailing strain, its efficacy is only 59% for laboratory-confirmed flu in people 18 to 65 years of age.<sup>1</sup>

Just a couple of weeks before the study was published online, the Centers for Disease Control and Prevention revised its online information about flu vaccine effectiveness. Previously, the agency had said well-matched inactivated influenza vaccine was 70% to 90% effective. CDC now reports that "recent [randomized controlled trials] of inactivated influenza vaccine among adults under 65 years of age have estimated 50-70% vaccine efficacy during seasons in which the vaccines' influenza A components were well matched to circulating influenza A viruses."<sup>2</sup> "We have said for a long time that there's a range of vaccine effectiveness. We have said for a long time that we need better vaccines," says CDC spokesman **Tom Skinner**, who says the CDC and vaccine manufacturers are working toward developing improved influenza vaccines. "But the vaccines that we have now are all that we have. Vaccine continues to be the single most important thing people can do to protect themselves against flu."



Michael Osterholm

Disease Research and Policy (CIDRAP) and lead author of the study.

"Overall, we just have a lot of work to do in the flu world," he says. "Overstating the

effectiveness of this vaccine doesn't help anybody."

### **'Clarion call' for a better vaccine**

Both Osterholm and Sandman agree that getting the flu vaccine is important. So why is the issue of flu vaccine effectiveness so important?

Currently, there's little incentive to invest in a new vaccine technology, says Osterholm, who urges public health officials to issue a "clarion call" for a better vaccine. "When you have a vaccine that's promoted by the public health community as being effective, and it's cheap, why would you spend a billion dollars to produce another one?" he says.

Meanwhile, health care workers already have some doubts about the efficacy of the vaccine. In an Internet-based survey of almost 2,000 health care workers conducted by the Centers for Disease Control and Prevention, only about half (54%) of unvaccinated health care workers agreed with the statement, "Influenza vaccination can protect me from getting influenza." Less than half (46%) of those unvaccinated employees said getting the flu vaccine was worth the time and expense.<sup>3</sup>

The rationale for vaccinating health care workers is to protect vulnerable patients. But Osterholm notes that there's little data to support commonly held beliefs about the flu vaccine. For example, there's no evidence that influenza vaccination can lead to "herd immunity," or prevention of outbreaks because most people are vaccinated, he says.

"We find there are a lot of facts that are stated in the flu world that hardly can be called facts," he says.

Even the widely cited 1997 article that found a reduction of mortality in long-term care when health care workers were vaccinated had a major caveat: Because of the low number of flu cases in the study, the authors stated, "[W]e do not have any direct evidence that the reductions in rates of patient mortality and influenza-like illness that were associated with HCW vaccination were due to prevention of influenza."<sup>4</sup>

"It really points out that there is a relative absence of good data to evaluate the effectiveness of these vaccines," Osterholm says.

A vaccine that prevents 59% of influenza is still a good bet, says Sandman. But he argues that it isn't good enough to support mandatory vaccination programs that require masking of unvaccinated employees. After all, about 40% of the vaccinated workers are also unprotected, he says.

"Anyone who claims they do science-based medicine and science-based health policy ought to be looking at the Osterholm study," he says.

### **Efficacy varies by age, vaccine**

The flu vaccine remains the best tool to protect health care workers and their patients from influenza, agrees Osterholm. But he also highlights important differences in the protection it provides for different populations. This also has implications for health care worker vaccination.

Osterholm and colleagues analyzed 5,707 studies from 1967 to early 2011 and found only 31 that met their strict criteria. Vaccine efficacy was determined by randomized controlled trials that examined risk of acquiring influenza after vaccination, and vaccine effectiveness was determined by observational studies that measured relative flu risk after vaccination based on lab-confirmed influenza.

The analysis of flu studies showed that:

The live attenuated influenza vaccine (LAIV) is very efficacious for children but not for adults. In randomized, controlled studies, the LAIV showed an impressive 83% efficacy in children 6 months to 7 years old. However, there were not studies that met the inclusion criteria to demonstrate efficacy in older children. Osterholm notes that one study showed LAIV was 50% less efficacious in adults than the trivalent inactivated vaccine (TIV). "[The] differences could be related to the inability of the live attenuated viruses to infect some adults because of their past exposure to similar strains," the authors speculated.<sup>5</sup>

Although more research is needed, those results call into question the practice of giving the nasal vaccine to health care workers who want to avoid a shot. Today, if you're a young child you should be getting LAIV, and if you're an adult you should be getting TIV," says Osterholm.

Efficacy of the trivalent inactivated vaccine has not been established for children or adults over 65.

There were no randomized, controlled trials involving solely people over 65 or children aged 2 to 17, Osterholm and colleagues reported. About a third (35%) of observational studies showed significant effectiveness of the TIV against lab-confirmed flu. Meanwhile, the match of TIV to the prevailing strains did not show the expected influence. "Our study could not identify a close relationship between match and vaccine effectiveness," says Osterholm. "We had studies in years that there were very, very good matches and in years that there were poor matches in which the effectiveness data were identical."

Adjuvants produce only a modest increase in effectiveness.

Adjuvants were used in Canada and Europe to boost the effectiveness of the H1N1 pandemic vaccine. Four studies showed a median vaccine effectiveness of 69%, according to the analysis. Yet interestingly, older adults who had been exposed to the pandemic strain in their childhood apparently retained substantial immunity 60 or 70 years later. "There's a lot we don't know about the human immune response to the influenza infection and vaccine," says Osterholm.

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## CNE/CME Instructions

To earn credit for this activity, please follow these instructions.

1. Read and study the activity, using the provided references for further research.
2. Log on to [www.cmcity.com](http://www.cmcity.com) to take a post-test; tests can be taken after each issue or collectively at the end of the semester. First-time users will have to register on the site using the 8-digit subscriber number printed on their mailing label, invoice or renewal notice.
3. Pass the online tests with a score of 100%; you will be allowed to answer the questions as many times as needed to achieve a score of 100%.
4. After successfully completing the last test of the semester, your browser will be automatically directed to the activity evaluation form, which you will submit online.
5. Once the completed evaluation is received, a credit letter will be e-mailed to you instantly. ■

## CNE/CME Objectives

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

- Identify the clinical, legal, or educational issues encountered by infection preventionists and epidemiologists;
- Describe the effect of infection control and prevention issues on nurses, hospitals, or the health care industry in general;
- 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. ■

## COMING IN FUTURE MONTHS

■ CMS post-Berwick –  
HAs still a priority

■ Joint Commission  
supplement on  
infection control  
compliance

■ HH signs: Can  
certain words or  
combinations make all  
the difference?

■ Cool education tool:  
Nano Bugs!

■ Top 10 OSHA  
citations for 2011

## CNE/CME Questions

1. Some of the problems caused by antibiotic overuse and misuse include:
  - A. selecting out resistant organisms
  - B. side effects
  - C. increased risk for *Clostridium difficile* infection
  - D. All of the above
2. The Association of Professionals in Infection Control and Epidemiology is recommending that infection preventionists begin conducting weekly antibiotic utilization reviews in their facilities as part of a new emphasis on multidrug resistant organisms.
  - A. True
  - B. False
3. Which word or term is commonly used to describe the important practice of scaling back antibiotic administration as appropriate based on culture results?
  - A. zero tolerance
  - B. ratchet down
  - C. deescalate
  - D. rapid descent
4. A subgroup of the National Vaccine Advisory Committee issued draft recommendations in December that call for health care employers to "strongly consider a policy of employer requirement for influenza immunization" if they have not achieved vaccination rate of:
  - A. 75%
  - B. 80%
  - C. 85%
  - D. 90%

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# Hospital Infection Control & PREVENTION

*For 35 Years The Leading Source Of News And Comment On Infection Prevention*

## Infection preventionists have both work success and job stress

### *Exploding responsibilities in a strong career field*

Infection preventionists are keeping their heads above water in a brutal economy, though they may be understandably confused about which hat they have on them.

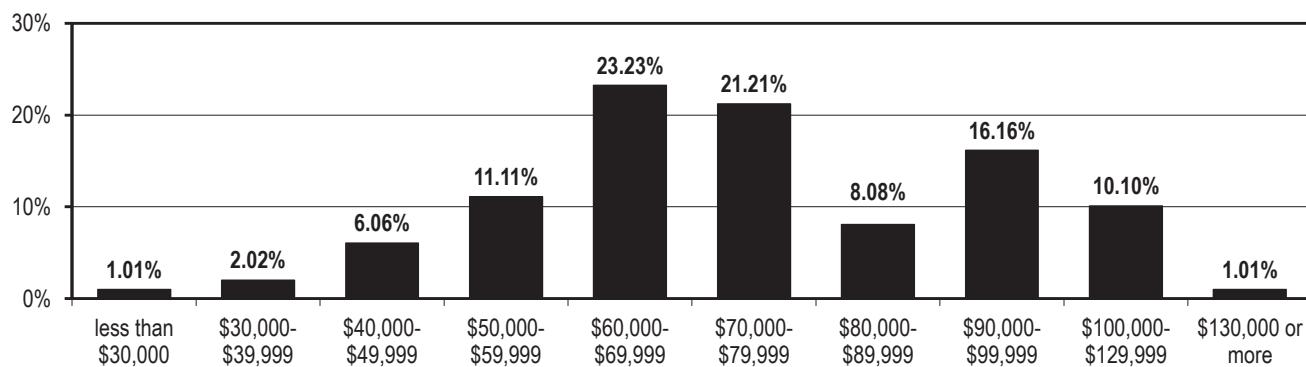
With rapidly expanding duties in the hospital and a wealth of consulting opportunities beyond, IPs have job security at a somewhat stressful price.

"I have the sense that folks are feeling a lot of concern about the data requirements and data management needs," says **Russ Olmsted**, MPH, CIC, 2011 president of the Association of Professionals in Infection Control and Epidemiology (APIC). "Those have really

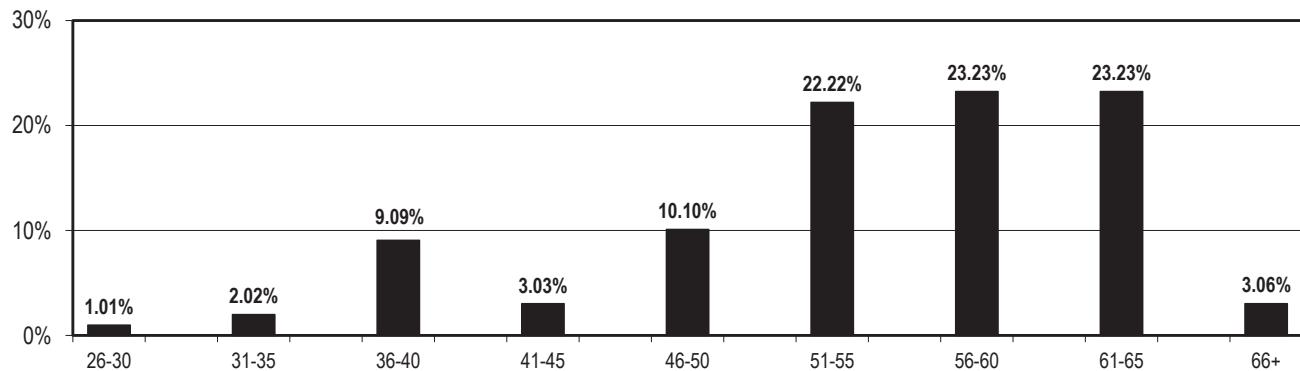
escalated and that is going to continue with CMS and other demands for reporting. IPs are feeling pretty harried in trying to respond to all of these requests."

Indeed, the Centers for Medicare and Medicaid Services (CMS), is becoming increasingly reluctant to reimburse hospitals for healthcare associated infections (HAIs) it considers preventable. All the while, individual states are demanding HAI data and consumers have the increasing expectation that infection rates are fully transparent. While that has ratcheted up the stress levels, IPs have responded with a powerful bottom-line result: rates of key HAIs are falling nationally.

### What is your annual gross income from your primary health care position?



# What is your age?



(See *Hospital Infection Control and Prevention* Nov. 2011, cover.) This success has positioned the profession as a "winner" in healthcare reform and economic discussions, but is that translating down to the individual program level?

Though perhaps not to the degree deserved, there are some good signs for IPs. For one, 65% of those responding to the annual *HIC* salary survey reported they received a raise in the last year. Not bad when one is working in a badly bruised economy, though it must be said that the vast majority of the wage hikes were of the modest variety. Overall 59% reported an increase of 1% to 3%, while 6% were compensated an additional 4% to 6%. Unfortunately, another 28% of IPs

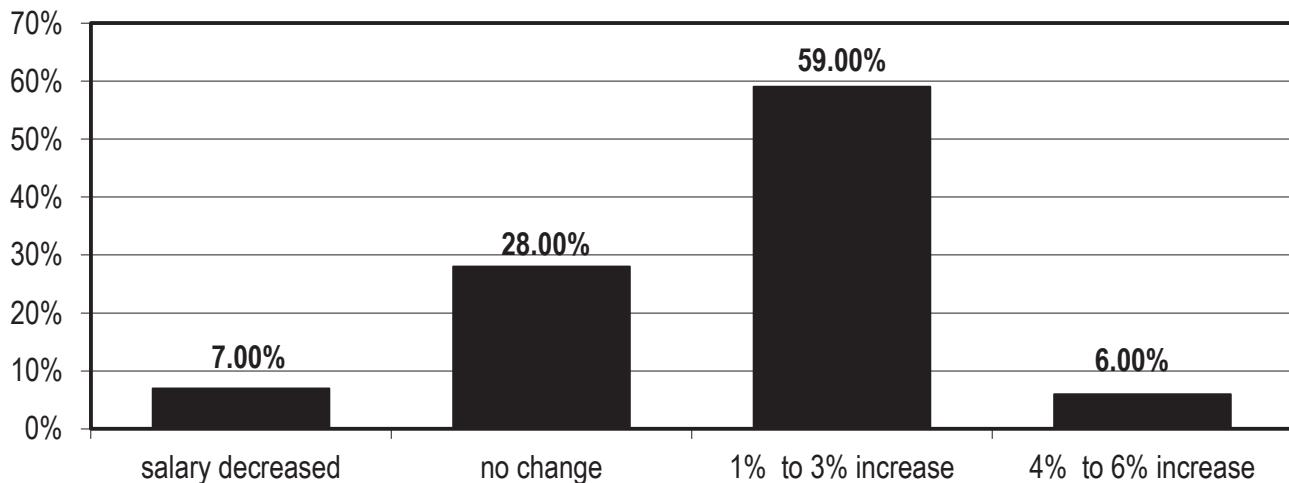
reported no raises and 7% suffered a pay cut.

Our 2011 survey found that that IPs were drawing a median salary in the \$70,000 to \$79,999 range. In salary percentage breakdowns, 10% were making \$49,999 or less; 11% were paid \$50,000 to \$59,999; and 23% had salaries in the \$60,000 to \$60,999 range. Another 21% were drawing wages in the \$70,000 to \$70,999 range.

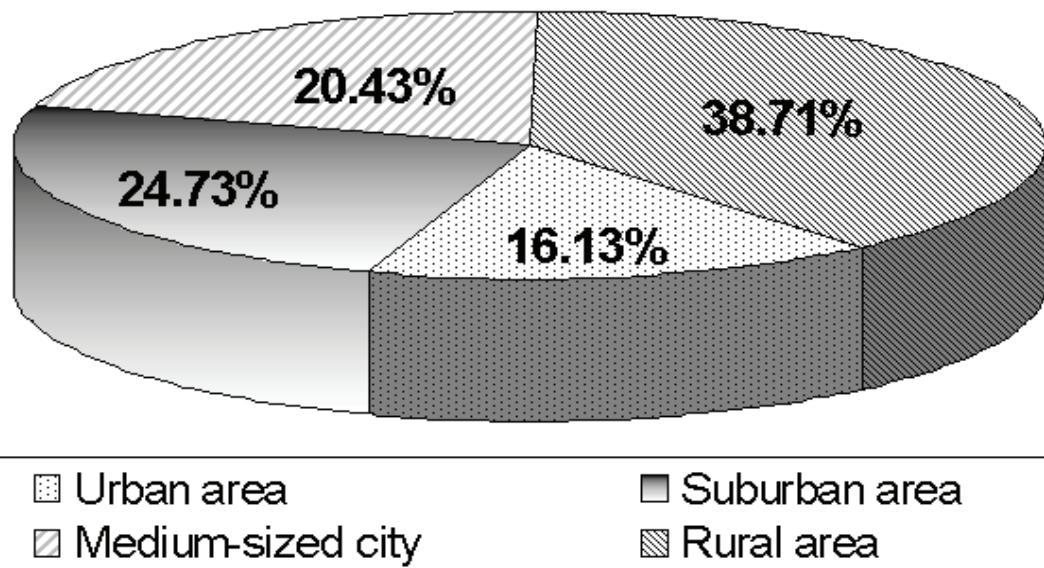
## Calling all consultants

While hospital demands are on the rise, there is also a new frontier of consulting opportunities as state and federal regulators increasingly

# In the past year, how has your salary changed?



# Where is your facility located?



focus on infection prevention across the care continuum. The CMS is already targeting ambulatory care, and long term care is slated to be one of the next priorities for the Department of Health and Human Services (HHS) national “Action Plan to Prevent Healthcare-Associated Infections.” In addition, CMS has essentially fiscally empowered more facilities to take post-acute care patients. The vast majority of skilled nursing facilities nationwide now admit post-acute care patients, including many with well-established infection risk factors like the presence of central lines.

As a result of such trends, APIC’s consulting service business tripled in size from 2010 to 2011.

“We have seen a fair uptick in the amount of APIC consulting,” Olmsted says. “Some of that is data validation for state-based requirements for reporting. We have folks who are trained to go into the hospitals and make sure the measurements are accurate.”

In any case, there is likely to be a continuing demand for infection prevention services in the hospital and beyond, as HAIs remain a high federal priority.

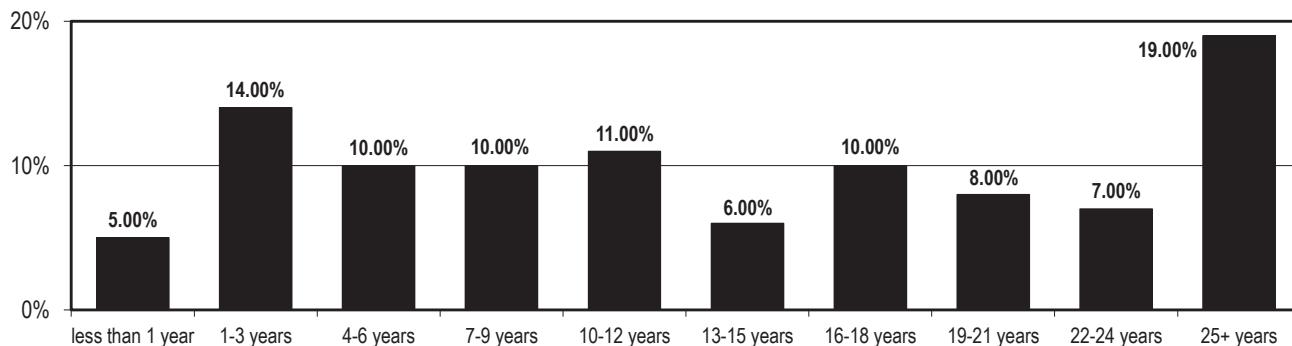
“When you look at the tiers of the HHS action plan, clearly dialysis facilities and ambulatory surgery will have increased needs of resources

in terms of education and training for infection prevention,” Olmsted says. “To me, it looks very positive in terms of the growth opportunities, not only in acute care but across the network of care.”

There has been concern that there may not be sufficient numbers of IPs to meet such demands, particularly due to longstanding projections of a national nursing shortage. However, a recently published study found that economic conditions and other factors are making nursing a growth career. On the heels of shortages in the 1980s and 1990s, the authors reported that “between 2002 and 2009 … the number of full-time-equivalent registered nurses ages 23–26 increased by 62%. If these young nurses follow the same life-cycle employment patterns as those who preceded them—as they appear to be thus far —then they will be the largest cohort of registered nurses ever observed.”<sup>1</sup>

“There seem to be new students entering the field of nursing to meet that significant need,” Olmsted says. “Typically the majority of APIC members have nursing backgrounds — somewhere around 85%. But most of the new nurses who enter the field will go into clinical areas first for career development for say, one to five years. So even though we do have a good influx of

# How long have you worked in infection control?



nurses entering the work force, relatively few of those are going to go immediately into infection prevention. They will go into direct staff nursing and gain experience doing patient care."

There will be plenty of "second-career" IP jobs waiting for them, as nearly half of the respondents to the HIC survey were at least 56 years old. Indeed, job security is virtually a given. While the national unemployment rate hovered at 9% in the fall of 2011, the unemployment rate for registered nurses was just above 3%, according to

the U.S. Bureau of Labor Statistics (BLS). Health care overall will add more jobs between 2008 and 2018 than any other industry, and wages are projected to rise by 22% in that timeframe – twice as fast as the national average, BLS says.

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## Certification may boost market value

As infection preventionists elevate their roles within the hospital and expand consulting services, consider professional certification to enhance your image and market value.

The Certification Board of Infection Control and Epidemiology, Inc. (CBIC) provides the credentialing for the Association of Professionals in Infection Control and Epidemiology (APIC).

IPs who have the CIC (certified in infection control) behind their names show a clear commitment to patient safety. Moreover, the link between certification and improved quality of care is starting to show up in the research, says **Michelle Farber**, RN, CIC, President-elect of APIC.

"We are looking at the research to demonstrate not only the value of a return for administrators for investing in the certification of their IPs, but also to demonstrate the patient-safety link to that," she says. "The model we are really looking is the critical care nurses and what they have done to promote certification."

It makes intuitive sense that an organization that would promote professional certification would place a high value on patient safety, but it still may be a tough sell with today's tight health care budgets to get resources and fees for the testing and materials. Currently, there are some 4,600 CICs nationally, with 84% being members of APIC.