

exactly what they think about papers,” he said. “There are some younger editors who think their peer reviewers are perfectly happy to have their names made public. But I’ve heard too many times from reviewers who are absolutely horrified if their names are accidentally revealed to authors, especially older, influential ones.”

The efforts to protect the confidentiality of peer reviewers comes as an effort to move toward open peer review – in which the reviewers’ names and reviews are made public – has stalled somewhat. One recent survey, in fact, found a preference among academics for an even more secretive process, double-blind review.

## PERCEPTIONS OF PEER REVIEW

**T**he survey of 3,040 academics, 90% of whom had been reviewers, found general satisfaction with the overall peer review process. Commissioned by

the Public Research Consortium, and conducted by Mark Ware Consulting, the survey found that 85% of respondents believed peer review greatly helped scientific communication.

Some 56% of respondents expressed a preference for double-blind review, compared to 25% for single-blind review, 13% for open review, and 5% for post-publication review.

And yet, for all the support of double-blind review, it hasn’t gained wide acceptance. Editors of the open-access Public Library of Science recently abandoned double-blind peer review because too few authors requested it, and the authors were too easily identified by reviewers.

Open-peer review appeared to be gaining momentum about a decade ago. The *British Medical Journal* adopted open peer review in 1999, and *Nature* conducted a 4-month trial of open peer review but chose not to adopt the process, concluding that, “Feedback suggests that there is a marked reluctance among researchers to offer open comments.”

Maxine Clark, Publishing Executive Editor for *Nature*, said, “We are happy with our current peer review system, including our editors’ selection of peer reviewers and their management of the peer review process.”

Single-blind peer review, then, would seem to be here to stay. The newly reinforced message from the courts to journal editors, peer reviewers, authors and the public which benefits from sound science, is that confidentiality of the process is here to stay as well.

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# Vaccine Mishap, Flu Outbreak Overwhelm EDs, Highlight Lack of Surge Capacity

by **MARYN MCKENNA**

*Special Contributor to  
Annals News & Perspective*

**D**r. Rita Cydulka knew it was a bad flu season when she ran out of alphabet.

“Like most emergency rooms, we’re overcrowded and we have to use hall beds; we use letters to designate them, and we usually go from A to something like H,” said Cydulka, who is associate professor and vice-chair of emergency

medicine at Case Western Reserve University School of Medicine. “But in the height of February, we went from A to Z. And then we started again, and we went from AA to ZZ.”

Cydulka had a lot of company. After a slow ramp-up, the 2007-2008 flu season hit the US with unusual force. Flu was “widespread,” the most severe measure, in 49 of the 51 US public health jurisdictions in the third week of February, according to the Centers for Disease Control and Prevention.<sup>1</sup> In emergency departments (EDs), perennial sentinels for flu’s impact, “widespread” did not begin

to describe the problem: Talking about it, physicians around the country use words like “severe” and “slammed.”

Anecdotally, the onslaught boosted patient volume, waits to be seen, lengths of stay and ambulance diversions in large cities and small towns. That rush is over, but the departure of the harsh season has left lingering questions about public health’s inability to anticipate flu’s behavior and vaccine manufacturing’s inability to move quickly when the circulating virus undergoes genetic drift.

Above all, the bad season underlined EDs’ lack of surge capacity, a weakness that was underlined in the 2007 Institute of Medicine reports “The Future of Emergency Care”<sup>2</sup> and that could lead to disaster if EDs were faced, not with a bad influenza season, but with an influenza pandemic.

## NO MATTER WHERE IN THE COUNTRY YOU WENT, THIS FLU SEASON WAS DIRE

**I**n 4 weeks, we went from a ho-hum flu season to ridiculous overcrowding,” said Dr. Maurice Ramirez, an emergency physician who works in several in-

stitutions in north Florida. “We have had so many people that we have them, not in beds in the hallway, but in chairs with a number taped to the wall over their heads.”

“We have seen a 20% to 25% overall increase in volume,” agreed Dr. Roy Johnson, associate ED director at Mission Hospital and Regional Medical Center in Mission Viejo, CA.

“We’ve seen a tremendous amount of flu—from an anecdotal standpoint, a much busier season than in recent years,” said Dr. Peter A. Lipson, a southern-Michigan internist who sees patients at an urgent-care clinic.

“Our census for February is up 35% to 40% over normal, and it is all respiratory,” agreed Dr. David Munter, ED director at Sentara Obici Hospital in Suffolk, VA. “We set an all-time record for our hospital in February.”

Universally, physicians were impressed by how sick their flu patients were, recounting very high fevers, stridor in children, and meningitis.

“We’ve seen a lot of multi-lobar pneumonia, in 30- to 40-year-olds as well as the elderly,” said Dr. Pat O’Brien, who works in a rural emergency department 70 miles outside Tulsa, OK. “I had a 49-year-old guy come in, otherwise healthy, with a left lung completely whited out.”

O’Brien’s hospital’s small intensive care unit, which has only 6 beds, was full the day that patient arrived; he sent him to the next hospital in another town, where the ICU was full as well. That was the first and most obvious consequence of the flu season: a pile-up of patients in the admit queue, in the ED itself, in waiting rooms and in ambulances heading both towards hospitals and away from them.

“We were certainly boarding more patients in January and February than at any other time in the past year,” said Dr. Enrique Enguidanos, medical director of the ED at Providence Everett Medical Center near Puget Sound.

“Starting in January, our elopements were at an all-time high,” said Dr. Amy Conley of University Community Hospital in Tampa.

And Dr. Dave Ross, who works in the ED of Colorado Springs’ Penrose Hospital and is medical director of the city’s primary ambulance service, said: “In Jan-

uary and February, our call volumes were the highest they have ever been. We were just struggling.”

The crunch the flu season created in EDs was exacerbated by a surprising factor: the number of healthcare workers who got sick.

Cydulka, of Case Western, caught the flu. So did her spouse and 3 children. So did Dr. Judith Tintinalli, professor and chair emeritus at the University of North Carolina Hospitals in Chapel Hill. “I got very sick,” she said. “I had fever and shaking chills. I had to miss 2 and a half shifts.”

The news of physicians falling ill with flu is surprising because, of course, they were vaccinated. But a hallmark of this harsh flu season has been the number of patients who arrived at EDs with flu symptoms but mystified what was making them so sick—because they had had the flu shot.

“We have seen a countable number of patients—a large enough number to notice—who were rapid-test positive for flu but had been vaccinated appropriately,” said Dr. Peter A. Lipson, a Michigan internist who works in a hospital-based urgent-care clinic.

## INEFFECTIVE VACCINE

**A**necdotal evidence that the flu vaccine was not effective is widespread. In early February, Washington, DC-area occupational physician Dr. Michael Sauri tallied his patients who tested positive for flu but insisted they had been vaccinated, and came up with 25%. The proportion so impressed him that he put a post on the international disease-warning listserv ProMED.<sup>3</sup> “I got quite a bit of response from all over the United States, Egypt, Australia, the Caribbean,” he said in an interview a month later.

There has been little hard data so far to support the widespread clinical impression of vaccine failure. In March, a team from the Naval Health Research Center in San Diego reported in a poster at the International Conference on Emerging Infectious Diseases that the vaccine’s effectiveness against H1N1 strains of flu was only 71%.<sup>4</sup> And in early April, the CDC reported in preliminary data posted on its website that the current vaccine would not have protected

against 24% of the influenza A/H1N1 isolates, 76% of the influenza A/H3N2 isolates and 95% of the influenza B isolates sent to the agency since the flu season began—an extraordinarily low rate of vaccine coverage.<sup>5</sup>

Flu-virus drift in mid-season is a known and unpredictable phenomenon, and the significant divergence between the 2007-2008 vaccine and the 2007-2008 season’s circulating viruses could easily seem like bad luck. But in fact, it was a known risk to public health authorities from the season’s start.

It became public—but was little-noticed—during spring 2007 vaccine-component discussions at the Food and Drug Administration’s Vaccines and Related Biological Products Advisory Committee (VRBPAC). During that meeting, committee members discussed that the virus had begun drifting during the previous Southern Hemisphere flu season, but added that flu-vaccine manufacturers had not yet been able to achieve a seed strain for industrial use.<sup>6</sup>

The CDC concurred. “We did not have a viable egg isolate that could be used by the manufacturers. And so it was necessary to continue to use the [existing] virus in the vaccine,” Dr. Nancy Cox, the CDC’s most senior flu scientist, said in a February 22 press briefing held after the agency acknowledged the vaccine’s diminishing effectiveness.<sup>7</sup>

Some emergency physicians who dealt with last winter’s flu onslaught are distressed the CDC did not publicize the vaccine mismatch, arguing that they could have started care earlier and forestalled the most serious symptoms. “If we had known that the vaccine was not as effective, we could have been testing people who said they had been vaccinated,” said Munter, in Virginia. “I personally would have been testing many more of the elderly patients in an attempt to get them on antivirals.”

But testing might not have helped—because patients, like physicians, assumed that since they had been vaccinated, they could not have the flu. By the time the seriousness of patients’ symptoms drove them to seek care, several physicians said, they were outside the 2-day window in which flu antivirals might have reduced their illness.

With the flu season safely over, some ED physicians have bent their attention to extracting lessons for next year.

A few are concerned that the apparent vaccine failure—which in a few patients could also be waning immunity due to the long lag between vaccination and flu exposure—will turn patients against vaccination in the future. In other flu seasons where vaccine supply has suffered problems—manufacturing difficulties, late vaccine delivery, an early-arriving season—flu-vaccine uptake has been dented the following year.

“We hear from patients that they took the flu shot and they got sick, so they are not going to take the shot again because it doesn’t work,” Cydulka said.

Others, seeing illness among their ED staff, are concerned for the failure in infection control it may indicate.

“Many EDs are more lax at this than they should be,” said Tintinalli of Chapel Hill, who wore a mask at home and slept in a different room to avoid giving her husband the flu she contracted at work. “If there’s an outbreak, nurses should be giving out masks at triage.”

The summertime gap between flu seasons is the perfect time to work on such issues, and to examine how to increase at least virtual capacity, said Enguidanos of Puget Sound. “I try every year in late spring to approach my administrative team, to say, ‘Let’s see what we can do to change our processes for the upcoming flu season.’ Now is the time to start preparing. It takes 6 to 9 months to make the operational changes you will need.”

## CROWDING, THE REAL PANDEMIC

**D**r. Peter Viccellio, vice chairman of the department of emergency medicine at State University of New York-Stony Brook Health Sciences Center, and originator of the “full capacity protocol” for reducing ED crowding,<sup>8</sup> cautions though that linking crowding just to flu season trivializes a year-round problem.

“We use flu as an excuse to make newsworthy comments about overcrowd-

ing, but [overcrowding] is a far more endemic and fundamental problem than that,” he said.

Still, the severe crunch of this flu season underlines the near-universal lack of surge capacity at a time when much of public health is examining the possibility of an influenza pandemic. “This is not as bad as the mildest pandemic we can imagine,” said Dr. Eric Toner of the University of Pittsburgh Medical Center’s Center on Biosecurity, who has analyzed hospitals’ lack of preparation for pandemics.<sup>9</sup> “This is a teaching moment for hospital administrations. Emergency departments being overwhelmed is not a problem that can’t be fixed.”

## BRACING FOR DISASTER

**I**n Florida, Ramirez—who in addition to being an emergency physician is also a disaster-readiness consultant—watched the flu season with alarm. Many of the flu cases he saw last winter in EDs along the Jacksonville corridor were children with significant pneumonias, both primary viral pneumonias and ones with bacterial co-infections.

“So what we have is not just a viral drift that takes us away from immunity, but a drift that takes us toward the kind of disease we saw in 1918: Hitting the young hard with an overwhelming pneumonia,” he said. “We just shifted toward the exact type of disease we are afraid of for the next pandemic.”

He ticked off the flu season’s components: significant genetic drift, lagging vaccine manufacturing, overwhelmed EDs. “These are exactly the things we ought to be prepared for in an influenza pandemic, and we were not prepared,” he said. “We ought to consider this flu season as a warning.”

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- Centers for Disease Control and Prevention. Weekly Report: Influenza Summary Update Week 8, 2007-2008 Season. Available at: <http://www.cdc.gov/flu/weekly/weeklyarchives2007-2008/weekly08.htm>. Accessed March 31, 2008.
- Institute of Medicine. *Hospital-Based Emergency Care: At the Breaking Point*. 2007.
- ProMED Mail. “Influenza Virus, Vaccine Response: Request for Information”. *International Society for Infectious Diseases*. Available at: [http://www.promedmail.org/pls/otn/f?p=2400:1001:801027682071931:::F2400\\_P1001\\_BACK\\_PAGE,F2400\\_P1001\\_ARCHIVE\\_NUMBER,F2400\\_P1001\\_USE\\_ARCHIVE:1202,20080209.0528,Y](http://www.promedmail.org/pls/otn/f?p=2400:1001:801027682071931:::F2400_P1001_BACK_PAGE,F2400_P1001_ARCHIVE_NUMBER,F2400_P1001_USE_ARCHIVE:1202,20080209.0528,Y). Accessed March 31, 2008.
- Hawksworth AW, Grass RM, Faix DJ, et al. Effectiveness of the 2007-08 Influenza Vaccine: Preliminary Data from US Military Basic Training Centers. *International Conference on Emerging Infectious Diseases 2008*. Atlanta; 2008.
- Centers for Disease Control and Prevention. Weekly Report: Influenza Summary Update Week 12, 2007-2008 Season. Available at: <http://www.cdc.gov/flu/weekly/weeklyarchives2007-2008/weekly12.htm>. Accessed March 31, 2008.
- Vaccines and Related Biological Products Advisory Committee. Vaccines and Related Biological Products Advisory Committee meeting, Wednesday, February 28, 2007. *Food and Drug Administration*. Available at: <http://www.fda.gov/ohrms/dockets/ac/07/transcripts/2007-4282t2.htm>. Accessed March 31, 2008.
- Centers for Disease Control and Prevention. CDC OFFICIALS HOLD A NEWS CONFERENCE ON INFLUENZA. 22 February 2008. Available at: <http://www.cdc.gov/od/oc/media/transcripts/2008/t080222.htm>. Accessed March 31, 2008.
- Berthold J. “Making room for more patients”. *ACP Hospitalist*. Vol February 2007. American College of Physicians; 2007.
- Toner E, Waldhorn R, Maldin B, et al. Hospital preparedness for pandemic influenza. *Biosecur Bioterror*. 2006;4(2): 207-217.