

For reasons of space, letters may be edited for brevity and clarity.

## Effect of flu immunization programs on ED volumes

*To the Editor:*

The Groll and Henry article on the effect of influenza immunization programs on ED volumes is an excellent effort to identify some of the predictors of ED usage and volume,<sup>1</sup> but several issues should be highlighted.

First, the extent of coverage of the population in question is critical to the assessment of the impact of immunization. This was pointed out by the authors in the Discussion, under "Limitations," but it cannot be overstated. If a significant proportion of the population does not receive vaccine in the first place, the program's impact will be muted or nonexistent. A Health Canada telephone survey of over 3500 individuals from across Canada during the 2000–2001 flu season showed that close to 70% of adults 65 years and older received influenza vaccine during the 2000–2001 influenza season. In contrast, only 40% of those 18 to 64 years of age with high-risk medical conditions and 55% of health care workers were immunized during that season.<sup>2</sup> Are these immunization rates sufficient to influence ED volumes? Not likely!

In addition, if one is trying to assess the impact of a provincial influenza immunization campaign, ED volumes are only one outcome measure — and not a sensitive one. As Groll and Henry demonstrated, influenza and pneumonia make up a small proportion of total ED visits. At St. Paul's Hospital, pneumonia, for example, accounts for about 1% of ED visits. Consequently, other

factors will have a much more profound impact on ED volumes, potentially obscuring small but meaningful benefits of a vaccination program. These other factors might include the development of new ED facilities, creation of a fast-track area, changing community demographics, changing ED processes, and even ED overcrowding itself — which has negative effects on publicity and ED volumes. The authors of this article made no attempt to compare year-by-year changes in ED volumes of influenza and pneumonia alone.

We recently measured the impact of a mass pneumococcal/influenza vaccination campaign on our ED. In November 1999 more than 8000 residents of the Downtown East Side of Vancouver were vaccinated, and we showed a 25% decrease in both ED cases of influenza and pneumonia year over year.<sup>3</sup> The drop in pneumonia volumes was seen in both admitted and discharged patients, but was not seen in lower mainland hospitals outside the Downtown (i.e., vaccination) area.

Finally, the major reason for enhanced influenza immunization programs and, even ED immunization programs, is not to decrease ED volumes, even though this is a stated objective of the Ontario government. The influenza vaccine prevents illness in approximately 70% to 90% of healthy persons younger than age 65 years. Among elderly persons living outside nursing homes or similar chronic care facilities, influenza vaccine is 30%–70% effective in preventing hospitalization for pneumonia and influenza.<sup>4</sup> Providing the vaccine in our EDs represents a community service and a way of decreasing morbidity and mortality in our patient population. Many of our patients, especially the disadvantaged and

indigent, use our facilities as their only source of medical care. We should wholeheartedly embrace the concept of ED influenza immunization in the same way we routinely provide tetanus prophylaxis.

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2. Health Canada. Influenza [information sheet]. Nov 2001. Available: [www.hc-sc.gc.ca/pphb-dgspsp/publicat/info/infl\\_u\\_e.html](http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/info/infl_u_e.html)
3. Grafstein E, Daly P, Buxton J, Thorne A. Effect of a pneumococcal vaccine program on emergency department presentations [abstract]. *CJEM* 2001;3(2):143.
4. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 1999; 48(RR-4):1–28.

## [One of the authors responds:]

I thank Dr. Grafstein for his interest in our research regarding the impact of the Ontario universal immunization program on ED volume,<sup>1</sup> and I appreciate the opportunity to respond to some of the issues he has highlighted.

I agree with Dr. Grafstein that the issue of immunization coverage is critical when evaluating the success of an immunization program. The lack of any systematic method of collection of this data by the Ontario government prior to implementing a now \$81-million program is something the Ontario taxpayers should be concerned about.

However, even on the assumption that 100% of Ontarians were immunized and all influenza eliminated in

Ontario, our research<sup>1</sup> and others<sup>2</sup> have found that respiratory disease accounts for approximately 10% of the admissions to the ED in Ontario, and we found that over a 5-year period influenza and pneumonia combined accounted for 0.34% of visits. Based on these numbers, we concluded that even by removing all influenza cases it is hard to see how this will significantly impact overall ED volume.

As Dr. Grafstein points out, the outcome of reducing ED volume is not a sensitive measure, and there are many different and very complex issues that combine to affect ED volume. He further mentions, and I would like to stress, that this outcome was chosen by the Ontario government as 1 of only 2 reasons for implementing this program.<sup>3</sup> I would like to add that it is not an outcome that would be chosen by most researchers examining the efficacy of such a program without sufficient empirical evidence that influenza had a major impact on ED volume. However, because it was the reason given for initiating a universal immunization campaign this is why we chose to study it.

Finally, I would like to separate the issue of the potential public health benefits of vaccination for influenza from that of ED volume. As stated by Dr. Grafstein, immunization has been shown to reduce mortality and morbidity in populations at high risk for complications from influenza,<sup>4,5</sup> and Ontario has been providing free influenza vaccinations to this population since 1984. Although the cost and effectiveness of mass immunization programs for low-risk individuals has been questioned,<sup>6-10</sup> targeting and enhancing the immunization rates of high-risk people may be a more cost-efficient and efficacious way to further reduce hospitalization and mortality within the population. One way to accomplish this goal may be ED immunization programs. Our study fo-

cused only on the goal of reducing ED volume and the ability of a universal influenza immunization program to achieve this end.

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1. Groll D, Henry B. Can a universal influenza immunization program reduce emergency department volume? *CJEM* 2002;4(4):245-51.
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#### To the Editor:

Groll and Henry<sup>1</sup> are to be commended for tackling the complex and controversial issue of influenza and its relationship to ED utilization. They com-

pared annual influenza rates across Ontario with total winter ED visits at selected EDs and found that the two were not related. They concluded that influenza does not impact ED volume and that influenza vaccination is unlikely to alleviate ED overcrowding. These conclusions have substantial public health implications. However, we are concerned that their methods may be flawed and their conclusions premature.

For each city, their analysis was based on 5 observations (i.e., 5 years). Not only was the power to detect a difference limited, but such a small number of observations may seriously compromise the stability of the statistical model used. Further, the use of such standard models to examine longitudinal data is often plagued by autocorrelation, since the data does not fulfill the assumption that observations are independent from each other (e.g., the volume of a given ED in one year is associated with its volume the next).

The outcome measure was also problematic. As the authors note, total ED volume fluctuates widely due to many factors, and ED overcrowding has not been shown to be related to ED volume in several studies.<sup>2,3</sup> This is mainly because the majority of ED patients are young, low-acuity patients, often with minor injuries, who are unlikely to contribute substantially to overcrowding.<sup>4</sup> Hence, the increasing overcrowding likely relates not so much to changes in total ED volume, but to an older and sicker ED patient population, more of whom may require admission than in the past.

If influenza is a contributor to this phenomenon, one would be more likely to detect the effect by focusing on older patients with complications of influenza likely requiring admission, such as pneumonia, asthma/COPD and congestive heart failure, all of which

have been shown to be related to influenza outbreaks.<sup>5</sup> The authors looked at only some of these conditions, and only for all age groups combined, and again with limited power. Other studies have found significant associations between influenza outbreaks and ED overcrowding,<sup>6</sup> as well with increased ED utilization by the elderly.<sup>7</sup>

For all of these reasons, conclusions regarding the absence of benefit of influenza vaccination campaigns on ED utilization are likely premature and possibly incorrect. A full understanding of the impact of influenza outbreaks on EDs is still lacking.

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department overcrowding [abstract]. *Acad Emerg Med* 2002;9(5):515.

#### [One of the authors responds:]

I appreciate the comments by Drs Schull and Mamdani on our study of influenza and ED volume.<sup>1</sup> I agree with their conclusions that our study needs to be repeated with a larger number of hospitals and for a longer time period, and hope that this will be accomplished in the near future. I also feel that a full understanding of the impact influenza on ED volume is lacking. However, I feel that this research should have been undertaken prior to the launching of the universal influenza immunization campaign.

I stress "universal immunization," because, as Drs. Schull and Mamdani point out, "the majority of ED patients are young, low-acuity patients, often with minor injuries, who are unlikely to contribute substantially to overcrowding. Hence, the increasing overcrowding likely relates ... to an older and sicker ED patient population, more of whom may require admission than in the past."<sup>2,3</sup> However, the older, high-risk patients were not the primary target of the universal immunization campaign, and they have been provided free influenza vaccinations since the 1980s.<sup>1</sup> If one concludes that the high-risk population is responsible for ED overcrowding then concentrating efforts on increasing their immunization compliance may be a more effective strategy. None of the above information changes the fact that ED volume is highest in the summer, when there are few influenza cases.<sup>1,3</sup>

Finally, Drs. Schull and Mamdani state that "other studies have found significant associations between influenza outbreaks and ED overcrowding,<sup>4...</sup>". Unfortunately, the outcome of ambulance diversion as a measure of ED overcrowding is not universal nor uniform, as many hospitals are simply not

able to divert ambulances. Furthermore, ambulance diversion is an administrative decision and can be based on several criteria such as beds available outside the ED and ED staffing, and these may vary at different hospitals. Using ambulance diversion as the outcome in Kingston, for example, would result in no relationship between ED volume and diversion, because Kingston is not able to divert ambulances.

Once again, I thank Drs. Schull and Mamdani for their interest in this research and look forward to more studies on the impact of influenza immunization on ED volume.

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1. Groll D, Henry B. Can a universal influenza immunization program reduce emergency department volume? *CJEM* 2002;4(4):245-51.
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#### In-flight emergencies

*To the Editor:*

Drummond and Drummond's excellent review of medical emergencies in flight correctly highlights British Airways (BA) leadership in on-board medical equipment.<sup>1</sup> I must add to this BA's superb staff training and organization. I have been involved in 3 episodes of

providing medical support in an aircraft, one with BA. During the BA flight the staff spontaneously provided relevant medical information from a ground hospital within 30 minutes. I had not even considered asking them for this, yet they managed to access data faster than the health records department in my own institution can. In addition, BA was the only airline that ever sent me a thank you note, despite the fact that the other carriers scrupulously took down my details — presumably to have someone to blame in the event of a lawsuit!

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**Reference**

1. Drummond R, Drummond AJ. On a wing and a prayer: medical emergencies on board commercial aircraft. *CJEM* 2002;4(4):276-80.

**Correction**

*To the Editor:*

Dr. Jonathan Davidow's Resident Issues article<sup>1</sup> in the July 2002 issue of *CJEM* evokes memories of the awards dinner in Hamilton, at which the residents of Canadian EM training programs bestowed on me the CAEP EM Teacher of the Year Award. I am still incredulous at the honour, and the accolades from current and former residents were unforgettable. I would like to again congratulate my younger fellow recipients, who both have a phenomenal future in front of them. I believe that emergency medicine is fortunate to have capable young men and women with the same positive attributes as Drs. Jason Frank and James Thompson.

Dr. Davidow's article describes many milestones accurately; however there is one necessary correction regarding my role in developing the first EM program at McGill. Although I was

one of the early clinical teachers and instituted the first formal EM teaching rounds, I cannot claim any part in the actual development of the Family Medicine – EM residency program. That honour belongs to Drs. Judy Levitan and Victor Einagel, the first program director and academic coordinator. Since then, others, including Brian Connolly, Marc Afilalo, Bernard Unger, Peter Duffy, Stephen Rosenthal and Jerman Chrigwin have worked tirelessly to move the McGill program forward.

Now, that I have rendered unto Caesar what was due to Caesar I can go back and indulge in reading Jonathan Davidow's kind words over and over again.

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**Reference**

1. Davidow J. CAEP 2002: Residents' Section Awards. *CJEM* 2002;4(4):302-3.

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