

# Ontario's alternate funding arrangements for emergency departments: the impact on the emergency physician workforce

Michael J. Schull, MD, MSc;\* Marian Vermeulen, MHSc†

## ABSTRACT

**Background:** Difficulty maintaining physician staffing in emergency departments (EDs) prompted the government of Ontario to offer alternate funding arrangements (AFAs) to replace fee-for-service remuneration for physicians working in EDs.

**Objective:** To analyze the effect of AFAs on physician staffing and practice patterns.

**Methods:** We obtained Ontario Health Insurance Program fee-for-service and shadow-billing records for all physician services provided in EDs one year before and one year after implementation of an ED AFA. Only sites with reliable billing data were retained. Physicians were assigned to small/rural, community or teaching hospital groups based on their billing claims. For each hospital type, and all hospitals combined, we compared the pre- and post-AFA periods in terms of the number of physicians working regularly in the ED and their workload. As a possible unintended consequence of AFAs, we also compared physicians' involvement in primary care.

**Results:** Overall, 76.2% of eligible hospitals adopted an ED AFA, of which 49 (42.6%) were included in our study (16 small/rural, 27 community and 6 teaching hospitals). In the post-AFA period, the number of physicians working in EDs increased by 7, from 674 to 681, representing a 1.0% increase overall in the workforce ( $p = 0.84$ ). The change varied by hospital type, from a 5.8% increase in teaching hospitals to a 2.2% decrease in community hospitals, though none was significant. In the post-AFA period, the number of physicians working a moderate number of days per month increased from 190 to 214, representing a 3.2% absolute increase ( $p = 0.39$ ), and the number working few (<5) or many (>10) days per month decreased. Post-AFA, the number of physicians working in EDs who also provided primary care services decreased by 1.7%, from 544 to 535 ( $p = 0.10$ ).

**Conclusion:** Emergency department AFAs have been widely adopted in Ontario, but have not been associated with substantial changes in the overall physician workforce in EDs. However, trends toward increased physician numbers were seen in small/rural and teaching hospitals. There was little evidence of any adverse effects on the provision of primary care services by physicians.

**Key words:** emergency department; remuneration; fee-for-service; alternate funding plans; physician workforce

## RÉSUMÉ

**Contexte :** La difficulté de rétention du personnel médical dans les départements d'urgence a incité le gouvernement de l'Ontario à offrir des modes optionnels de financement (MOF) pour rem-

\*Institute for Clinical Evaluative Sciences, Toronto, Ont.; Clinical Epidemiology Unit, and Department of Emergency Services, Sunnybrook and Women's College Health Sciences Centre, Toronto; and Department of Medicine, University of Toronto, Toronto, Ont.

†Institute for Clinical Evaluative Sciences, Toronto, Ont.

Received: Aug. 31, 2004; final submission: Nov. 30, 2004; accepted: Dec. 4, 2004

*This article has been peer reviewed.*

*Can J Emerg Med* 2005;7(2):100-6

placer la rémunération à l'acte pour les médecins travaillant à l'urgence.

**Objectif :** Analyser l'effet des MOF sur la dotation en médecins et les habitudes de pratique.

**Méthodes :** Nous avons obtenu les dossiers de rémunération à l'acte et de facturation pro forma du Programme d'assurance-santé de l'Ontario pour tous les services rendus par des médecins dans les départements d'urgence un an avant et un an après l'implantation des MOF. Seuls les établissements ayant des données de facturation fiables furent retenus. Les médecins furent assignés à diverses catégories d'hôpitaux : petits hôpitaux ou hôpitaux ruraux, hôpitaux communautaires ou hôpitaux universitaires, selon leurs demandes de remboursement. Pour chaque type d'hôpital et pour tous les hôpitaux mis ensemble, nous avons comparé les périodes pré- et post- MOF en termes du nombre de médecins travaillant régulièrement à l'urgence et de leur charge de travail. Comme conséquence possible des MOF, nous avons aussi comparé l'implication des médecins dans les soins de première ligne.

**Résultats :** Dans l'ensemble, 76,2 % des hôpitaux admissibles adoptèrent un MOF au département d'urgence, parmi lesquels 49 (42,6 %) furent inclus dans notre étude (16 petits hôpitaux ou hôpitaux ruraux, 27 hôpitaux communautaires et six hôpitaux universitaires). Au cours de la période post-MOF, le nombre de médecins travaillant au département d'urgence passa de 674 à 681, soit une augmentation globale de 1,0 % de la main-d'œuvre ( $p = 0,84$ ). Le changement variait selon le type d'hôpital, soit d'une augmentation de 5,8 % dans les hôpitaux universitaires à une diminution de 2,2 % dans les hôpitaux communautaires, bien qu'aucune de ces variations ne soit significative. Au cours de la période post-MOF, le nombre de médecins travaillant un nombre modéré de jours par mois passa de 190 à 214, soit une augmentation absolue de 3,2 % ( $p = 0,39$ ) et le nombre de médecins travaillant peu de jours (< 5) ou plusieurs jours (> 10) par mois diminua. Au cours de la période post-MOF, le nombre de médecins travaillant au département d'urgence qui offraient aussi des services de soins de première ligne diminua de 1,7 %, passant de 554 à 535 médecins ( $p = 0,10$ ).

**Conclusion :** Les MOF dans les départements d'urgence ont été adoptés de manière générale en Ontario, mais ils n'ont pas suscité de grands changements quant aux effectifs médicaux dans les départements d'urgence. Cependant, on a remarqué une tendance vers l'augmentation du nombre de médecins dans les petits hôpitaux ou les hôpitaux ruraux et dans les hôpitaux universitaires. Il existait peu de preuves de l'existence d'effets négatifs sur la prestation de services de soins de première ligne par les médecins.

## Introduction

Medical services provided by physicians in Canadian emergency departments (EDs) have traditionally been remunerated on a fee-for-service (FFS) basis. In the mid-1990s, alternatives to FFS were introduced for small and rural EDs in Ontario,<sup>1,2</sup> usually because of difficulty maintaining adequate physician staffing and around-the-clock access to emergency services.<sup>2-4</sup> In 1999, the Ontario Ministry of Health and Long-Term Care (MoHLTC) introduced a new ED remuneration scheme known as alternate funding arrangements (AFAs).<sup>3</sup>

Under an AFA, emergency physician groups contract with the MoHLTC to provide around-the-clock physician ED coverage in return for a negotiated lump sum, and to no longer bill under the FFS system. In smaller-volume EDs, the physician group agrees to ensure that a single physician is available 24 hours a day. In larger-volume EDs, the group provides mutually agreed upon additional hours of physician coverage (e.g., double or triple coverage, as appropriate) during peak periods. The lump sum is

determined by the ED-visit volume and, in larger EDs, by patient acuity, based on *Canadian Emergency Department Triage and Acuity Scale* (CTAS) scores.<sup>5</sup> Physician groups determine for themselves the manner in which the AFA funds are distributed internally and determine the workload of each member.

Alternate funding arrangements were first offered to small/rural hospital EDs in 1999 and then, in 2000, to all Ontario EDs.<sup>3</sup> Where accepted, the AFAs replaced existing funding arrangements. The objective of this study was to evaluate the effect of the introduction of AFAs on 2 stated objectives of the program: 1) to improve physician staffing and 2) to reduce ED workload. We also sought to evaluate one potential adverse effect: reductions in the provision of primary care services resulting from physicians preferentially working in AFA EDs.

## Methods

### Data sources

The Ontario Ministry of Health and Long-Term Care pro-

vided us with the AFA initiation date for each ED in which it had been adopted. Departments were excluded from our study if they did not participate in an AFA or if they began to participate in an AFA after Mar. 31, 2002. (This ensured that a full year of post-AFA data were available.) Information on physician services was obtained from the claims records of the Ontario Health Insurance Plan (OHIP). Physicians were required to submit OHIP shadow billings following the adoption of the AFA, and the National Ambulatory Care Reporting System was used to verify the completeness of shadow billing.

### **Hospital inclusion**

Because we compared fee-for-service OHIP claims in the pre-AFA era to shadow-billing claims post-AFA, we restricted our analysis to those sites that had reliable shadow-billing claims data in both periods.<sup>1</sup> We excluded sites with unexplained decreases in OHIP claims in the post-AFA era, as well as those with a discrepancy of 20% or more between the number of patient visits in OHIP and those in the National Ambulatory Care Reporting System database in fiscal year 2001. Emergency departments that adopted the AFA at different times but reported under a common institution number were excluded because it was not possible to differentiate OHIP claims from the individual sites.

Emergency departments were categorized as small/rural, community, or teaching departments based on established Ontario Hospital Association criteria.<sup>6</sup> For each included ED we compared the year prior to the AFA introduction with the year after. We used algorithms<sup>1</sup> developed at the Institute for Clinical Evaluative Sciences to identify physician services provided in EDs (for ED analyses) and in primary care settings (for primary care analyses). Visits were excluded if the OHIP claim had invalid sex or health insurance number data, or where the patient was not an Ontario resident at the time of the ED visit. For ED staffing analyses, a physician's claims were included only if he or she was regularly practising in the ED, which was defined as having at least 100 ED patient assessments per year and having worked at least 10 days per year; days worked were counted only if at least 5 patients were seen.<sup>1</sup> OHIP claims do not allow us to determine the number of hours worked in a given day, hence days comprised of longer or shorter ED shifts could not be differentiated. We calculated the number of physicians who were new to or stopped working in the ED in the post-AFA period. Physicians who stopped regular ED work could have continued to bill for primary or other medical services in Ontario, moved out of the province, retired or died. New physicians had not worked regularly in a study ED in the pre-AFA period and

this could have included those providing primary or other medical services, newly graduated physicians, physicians new to Ontario, or those who had worked previously in an ED that did not shadow bill.

### **Analysis**

The primary outcome was the number of physicians working regularly in an ED pre- and post-AFA for all hospitals combined, and for each hospital type. Secondary outcomes included: 1) comparison of physician workload in the 2 periods (the proportion of physicians working few [ $<5$ ], moderate [ $5-10$ ] or many [ $>10$ ] days in the ED per month and the number of ED patients seen per day worked); and 2) a comparison of primary care services provided by physicians also working in EDs in the 2 periods (i.e., the number of physicians working regularly in primary care). Statistical testing was done by means of paired *t* tests or chi-squared tests as appropriate (SAS software, version 8.2, SAS Institute, Cary, NC).

### **Results**

As of October 2003, 115 out of 151 eligible hospitals in Ontario had adopted an ED AFA, of which 49 were included in our study. The rate of AFA adoption varied from 93.8% in teaching hospitals to 67.4% in community hospitals (Table 1). In the pre-AFA year, a total of 968 466 patient visits occurred in study EDs, compared with 960 000 in the year post-AFA introduction, representing a net decrease of 8466 visits (0.9%). The median age and sex distribution of ED patients did not change meaningfully from the pre- to post-AFA period.

### **Physician workforce**

In the 49 EDs studied there was a small net increase in the number of physicians working regularly, from 674 in the pre-AFA period to 681 in the post-AFA period, representing a 1.0% increase in the overall workforce ( $p = 0.84$ ). Eight physicians were added to the 6 teaching hos-

**Table 1. Adoption of emergency department alternate funding arrangements (AFAs), by hospital type**

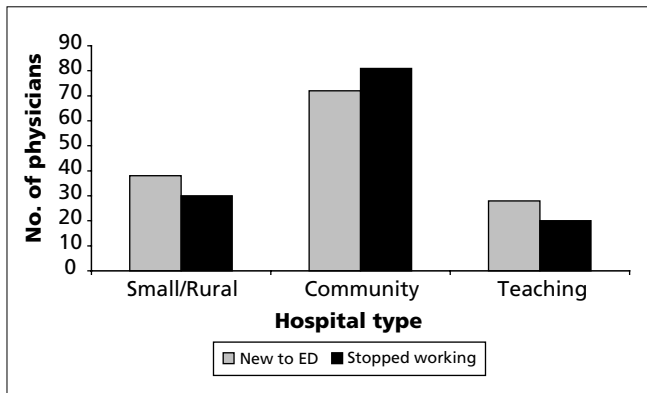
Hospital type	No. (and %) of hospitals		
	Eligible for AFA	Adopted an AFA	Included in study
Small/rural	40	36 (90.0)	16 (44.4)
Community	95	64 (67.4)	27 (42.2)
Teaching	16	15 (93.8)	6 (40.0)
<b>Total</b>	<b>151</b>	<b>115 (76.2)</b>	<b>49 (42.6)</b>

pitals, representing a 5.8% increase in the workforce ( $p = 0.30$ ), and 8 physicians were added to the 16 small/rural hospitals, representing a 4.6% increase ( $p = 0.13$ ). In contrast, the 27 community hospitals saw a net decrease of 9 regular physicians, representing a 2.2% workforce reduction ( $p = 0.34$ ). These small net differences masked larger fluctuations in the composition of the physician workforce (Fig. 1). In the post-AFA period, 108 of 674 (16.0%) physicians who had been working in study EDs stopped regular ED work, and 115 new physicians began regular work. The largest absolute change occurred in community hospitals, where 81 physicians left regular

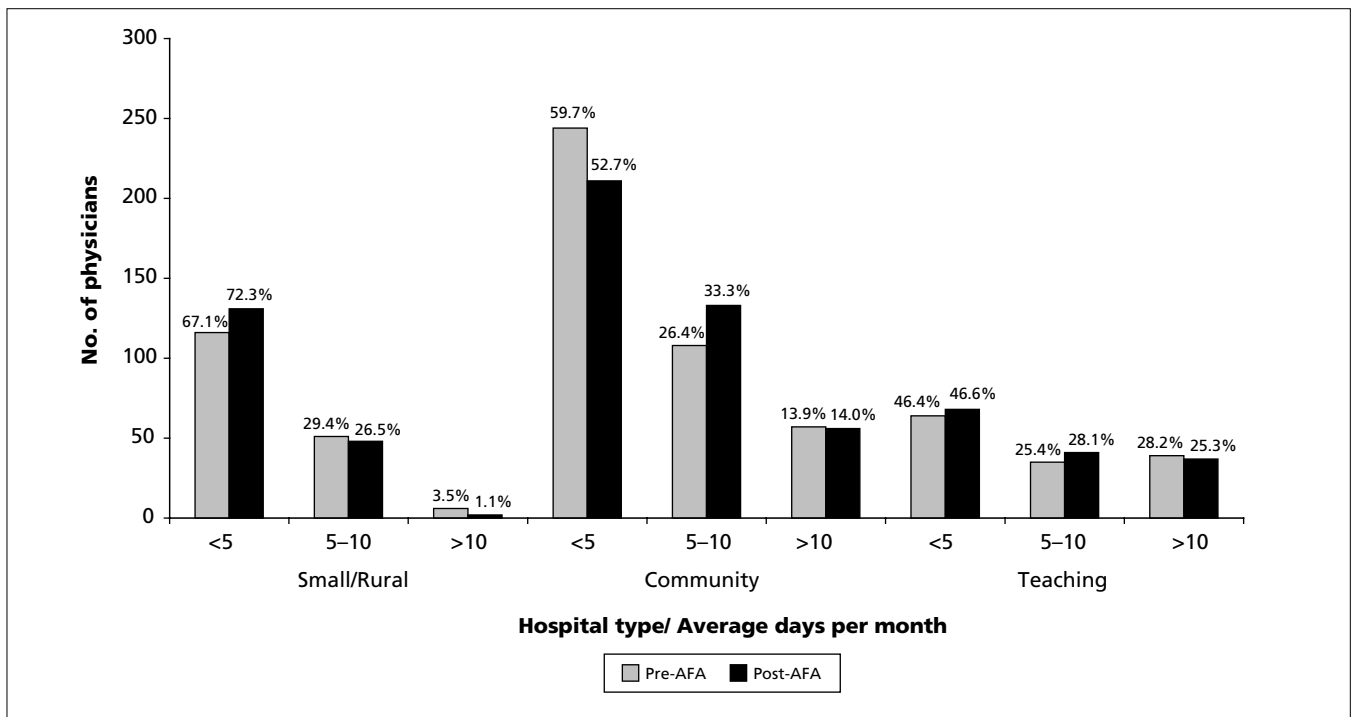
ED work in the post-AFA period and 72 new physicians began regular ED work. In teaching hospitals, 20 physicians left regular ED practice and 28 new practitioners began regular ED practice.

**Physician workload**

Emergency department workload among physicians providing emergency services was measured in terms of the average number of days worked in the ED per month (Fig. 2) and ED patients seen per day. Pre- and post-AFA, the greatest proportion of physicians worked few (<5 d) days per month and the smallest proportion worked many (>10 d), regardless of hospital type. Overall, there were small non-significant changes in the number of ED days worked during the post-AFA period. The largest change occurred in the number of physicians working a moderate (5–10 d) number of days per month: from 190 to 214 physicians, representing a 3.2% absolute increase ( $p = 0.39$ ). Fewer physicians worked many and few days per month. The trends varied by hospital type. In community hospitals a trend toward increased ED days worked was seen, with a decrease of 13.4% in the proportion of physicians working few days per month, and an increase of 23.0% in the proportion of physicians working many. In small/rural hospitals the opposite trend was seen, with an increase of 12.9% in the proportion of physicians working few days per month.



**Fig. 1. Physicians who started/stopped working in the emergency department post-AFA (alternate funding arrangement).**



**Fig. 2. Average number of days per month worked by physicians providing services in emergency departments.**

The second measure of workload was patients seen per ED day worked. In the post-AFA period, the mean number of patients seen per physician-day increased in small/rural hospitals (from 13.0 to 15.0;  $p = 0.14$ ) and community hospitals (from 15.0 to 16.7;  $p = 0.01$ ), but remained unchanged in teaching hospitals (14.3 in both periods;  $p = 0.82$ ). The 90th percentile represents the maximum number of patients per day, in 9 out of 10 days. We found an increase in the 90th percentile in small/rural hospitals (24.5 to 27.0), suggesting more days when physicians saw a very large patient volume. The 90th percentile number remained essentially unchanged in community and teaching hospitals.

### Physician involvement in primary care

In the pre-AFA period, a total of 544 physicians who worked in EDs also regularly provided primary care services, compared to 535 in the post-AFA period, a net decrease of 9 physicians (1.7%,  $p = 0.10$ ) (Table 2). In the post-AFA period, 56 physicians who had been providing primary care services stopped doing so, and 47 physicians who had not provided regular primary care services pre-AFA began to do so. Proportionally, the largest decrease in the provision of primary care was seen among physicians working in teaching hospital EDs (14.0%,  $p = 0.30$ ) versus a 2% drop among those working in community hospital EDs ( $p = 0.05$ ), and a 3.5% ( $p = 0.37$ ) increase among those in small/rural hospital EDs.

## Discussion

Between 1999 and 2003, over three-quarters of Ontario's EDs adopted AFAs and abandoned the FFS system. This represents a rapid and substantial shift away from the FFS system, which had been the remuneration method for 70%–80% of physicians working in Canadian EDs in the mid-1990s.<sup>7</sup> The uptake of the AFA program has been

greatest in small/rural and teaching hospitals, with adoption rates of over 90%; at community hospitals, over two-thirds have signed on. Overall, we found a small non-significant increase in the number of physicians providing ED services in the first year post-AFA; however, the small overall change masks substantial but offsetting trends in different hospital types, whereby the 16 small/rural and 6 teaching hospitals increased their physician workforce by 5% and 6% respectively, and the community hospitals reduced their workforce by 2%. Only in community hospitals did the number of physicians who stopped working in EDs exceed the number who started working.

These data, combined with the substantially lower AFA adoption rate in community hospitals, suggest that the program may have been most appealing to the physicians in small/rural and teaching hospitals, and less so in community hospitals. The trend toward increased physician staffing may represent an AFA-related stabilization of the physician workforce in small/rural and teaching hospitals, at least in the short-term. This is notable given that previous research has found that the number of physicians working in Ontario's EDs declined steadily by 21% between 1993 and 2000.<sup>1</sup> While only small changes in staffing in the short term may be anticipated as a result of the introduction of an AFA, physicians may be more satisfied with their remuneration, leading to a more stable ED workforce.

The decision to adopt an AFA is based largely on the perceived financial benefit, and remuneration in the Ontario AFA depends on ED volume. Emergency departments with annual volumes up to 27 500 visits are remunerated on the basis of 24 hr/d of single-physician coverage, with the hourly rate varying from \$110 to \$150/hr depending on ED volume. Academic health science centres and EDs with more than 27 500 visits/yr are funded through a formula according to their volume and acuity case-mix, based on CTAS scores. Physician groups in these hospitals are given a lump sum and a required number of physician-hours of ED coverage. For very low-volume EDs (i.e., typical small/rural hospital), or lower-volume higher-acuity EDs (i.e., typical teaching hospital), the increase in remuneration with the AFA formula as compared with the FFS system in some cases was substantial.

The lower adoption rate of the AFA among community hospitals and the trend toward a decrease in the number of physicians working in the ED post-AFA in that setting likely reflect several key differences. Community hospital physicians earn more in the FFS system than do physicians in other hospitals,<sup>7</sup> which may be due to higher volumes of lower-acuity patients, and their physician groups

**Table 2. Involvement in primary care by physicians working in emergency departments in the pre- and post-AFA periods**

Hospital type	No. of physicians in primary care / Total no. of physicians in study (and % of total)*		Net change (and %)
	Pre-AFA	Post-AFA	
Small/Rural	141/173 (81.5)	146/181 (80.7)	+5 (+3.5)
Community	353/409 (86.3)	346/400 (86.5)	-7 (-2.0)
Teaching	50/138 (36.2)	43/146 (29.5)	-7 (-14.0)
Total	550/674 (81.6)	554/681 (81.4)	-9 (-1.7)

AFA = alternate funding arrangement  
\*Proportion of emergency physicians who also practise in primary care settings.

may be less likely to pool ED FFS earnings. The adoption of an AFA may have represented less benefit and more change than in other settings (Dr. Andrew Affleck, President, Canadian Association of Emergency Physicians: personal communication, June 2004). Among physicians working in EDs, the number of days worked in the ED changed only slightly following the AFA introduction. Most physicians continued to work few (<5) ED days per month, a trend that was accentuated in the post-AFA period in small/rural hospitals. Across all hospital types, fewer physicians were working many (>10) ED days per month in the post-AFA period. The reduced number of ED days worked by small/rural and teaching hospital physicians coincided with increased numbers of physicians working in those EDs, and these 2 trends may have a positive effect in terms of increasing staffing flexibility and reducing physician burnout.

The trend toward reduced days worked in the ED overall is again notable because it is opposite to a previously documented trend of increasing workload seen between 1993 and 2000.<sup>1</sup>

Trends toward small increases in the number of patients seen per physician per day were also noted for some hospitals. This may simply represent longer shift lengths, as opposed to an increase in the number of patients seen per hour, since most of the EDs in our study are higher-volume community and teaching hospitals. Many of these hospitals would have increased their physician-hours of ED staffing after adopting the AFA, but because we saw only small increases (or decreases) in the number of physicians working in these EDs, staffing these extra hours would likely have required longer shifts, resulting in more patients per physician per day (though not necessarily more patients per hour). It is unclear how such a trade-off of longer ED hours per day versus fewer ED days per month might affect performance, stress and job satisfaction, nor what the ideal ED workload is to avoid burnout while maintaining skills in dealing with acutely ill patients.

Prior to the introduction of ED AFAs, over 80% of physicians providing ED services in Ontario also provided primary care outside of the ED. This varied from 86% among community hospital physicians to 36% among teaching hospital physicians. We found little evidence that the AFA program exacerbates shortages in the provision of primary care services. Indeed, post-AFA, we found a small net increase in the number of physicians working in small/rural hospital EDs who also worked in primary care, which is important given that these communities are often those where primary care provider shortages are most acute.

### **Limitations**

In this before/after study, we could not account for other long-term temporal trends such as patterns of health care utilization and physician practice patterns; however, we are not aware of any other important changes in the organization or delivery of physician services that would have affected the interpretation of our findings. Similarly, we only studied one year post-AFA introduction, which may not be sufficient to identify long-term impact. Our statistical tests do not account for temporal trends or correlation within our data, but one year of post-intervention data would be insufficient for time series analysis regardless of the length of the pre-period. The quality of OHIP billing may have differed in the 2 periods, hence we were careful to limit our analysis to sites with reliable data in both periods. This careful scrutiny required the exclusion of some hospitals, potentially affecting the generalizability of our results. The distribution of small/rural, community, and teaching hospitals in our study was similar to that found across the province, and we included a similar proportion of each in our sample, hence our results are likely generalizable to other AFA hospitals in Ontario. However, they may not be applicable to hospitals that remained FFS because factors that affect the decision to adopt an AFA agreement are likely to affect the impact of an AFA as well. The extent to which our results are generalizable outside of Ontario is unknown. We are not aware of changes to OHIP billing claims or codes that would have affected our study, however, given that all claims in the post-AFA period were shadow billings, less scrutiny may have been given to the accuracy of coding, potentially affecting our results.

### **Conclusion**

Only a few years after their introduction, AFAs have become the dominant payment method for physician services in Ontario EDs, suggesting the program is popular with physicians. One-year data suggest that AFAs have not caused significant changes in the overall physician workforce, although there are trends toward increased physician numbers and reduced ED days worked in both small/rural and teaching hospitals. This is consistent with anecdotal reports saying AFAs have enhanced physician recruitment in these settings (Dr. Andrew Affleck, President, CAEP: personal communication, June 2004). Fewer community hospitals adopted the AFA, and those that did experienced trends toward decreased staffing and increased days worked in the ED post-AFA. This suggests that the AFA may be less well suited for some community hospitals. Finally, it appears that the provision of primary care services remained stable following the introduction of AFAs.

**Competing interests:** None declared.

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**Correspondence to:** Dr. Michael J. Schull, G-106, Institute for Clinical Evaluative Sciences, 2075 Bayview Ave., Toronto ON M4N 3M5; 416 480-6100 x3793, fax 416 480-6048, [mjs@ices.on.ca](mailto:mjs@ices.on.ca)