



# Rates of adverse events among hospital admissions and day surgeries in Ontario from 1992 to 1997

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**H**as the quality of health care been compromised by system-wide changes in Ontario's health care system? We tried to answer this question by examining the rates of adverse events among Ontario residents admitted to hospital or undergoing day surgery from fiscal years 1992 to 1997.

We used data processed by the Canadian Institute for Health Information and maintained by the Ontario Provincial Health Planning Database. The adverse events were classified as misadventures ("misadventures to patients during surgical and medical care" [ICD-9 codes E870-E876]), complications ("surgical and medical procedures as the cause of abnormal reaction of patient or later complication, without mention of misadventure at the time of the procedure" [ICD-9 codes E878-E879]) or adverse drug reactions ("drug, medicaments and biological substances causing adverse effects in therapeutic care" [ICD-9 codes E930-E949]).<sup>1</sup> To calculate the rates we divided the number of adverse events by the total annual number of hospital admissions or day surgeries. To account for the contribution of possible changes in the age and sex distribution of the hospital or day-surgery population, age- and sex-adjusted rates were calculated using the direct method of adjustment and the 1996 Ontario population estimates as the standard population.<sup>2</sup>

Fig. 1 shows that, although adverse events among pa-

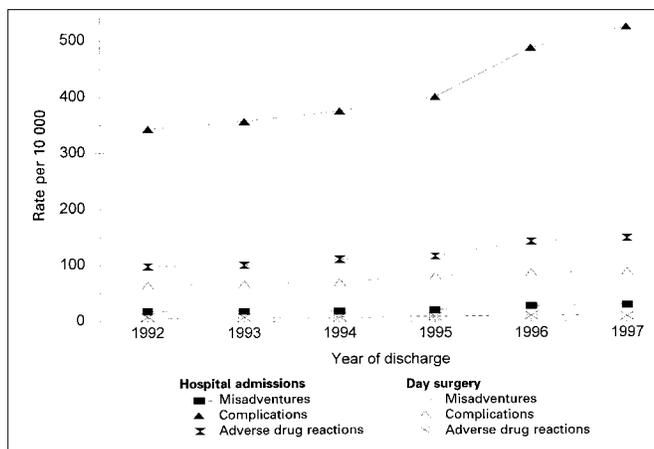


Fig. 1: Age- and sex-adjusted rates of adverse events per 10 000 hospital admissions or day surgeries in Ontario from 1992 to 1997.

tients admitted to hospital were relatively rare, there was a small, yet consistent, increase in the rates between 1992 and 1997: misadventures increased from 18 to 30 per 10 000, complications from 330 to 500 per 10 000 and adverse drug reactions from 104 to 162 per 10 000. Adverse events in day surgery were less common, although the rate also rose between 1992 and 1997: misadventures from 5.2 to 11.6 per 10 000, complications from 65.2 to 95.1 per 10 000 and adverse drug reactions from 8.1 to 10.8 per 10 000.

We acknowledge the existence of potential biases in our analysis, although it is likely that these will tend to underestimate rather than overestimate the true extent of the problem.<sup>2-8</sup> It is also important to emphasize that adverse events in themselves do not always reflect poor practice; for example, it would be difficult to prevent an adverse drug reaction arising from a first-time prescription. We suggest 2 possible explanations for the findings. First, reporting or coding practices may have changed and, second, the quality of care may have declined. A third explanation, that the severity of illness and comorbidity of people being treated may have increased, seems unlikely because the rates were age-adjusted as a way of controlling for severity, and increases were also seen among patients undergoing day surgery, who, by definition, are healthier than those treated in hospital.

We believe that, although changes in Ontario hospitals have not had a substantial impact on the quality of care as measured by adverse events, there has been a troubling increase in the trend in hospital complication rates. The reasons for this are unclear. Further study is needed to determine the trend in adverse events for specific procedures, to validate these rates using re-abstraction studies augmented by expert clinical opinion, and to identify strategies for preventing adverse events.

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