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Emergency departments (EDs) provide a useful window through which shifting substance use patterns can be observed as risk factors for injury, overdose, and poisoning across different communities. This chapter describes a methodology for systematic sampling of late-night ED presentations that has been used as one component of a comprehensive alcohol and other drug (AOD) monitoring system in two cities in Western Canada (“the ED Monitoring Study”). It also assesses the feasibility of combining self-report and objective tests in measuring AOD use, and outlines two different challenges that occurred with response rates during the course of the study. In the study, ED patients were interviewed between 9 p.m. and 4 a.m. on weekends at two sites in Victoria and Vancouver, British Columbia, Canada. Standardized survey instrument, breathalyzer, and saliva drug tests were administered. The survey assessed the reason for the ED visit as well as alcohol/drug use history (lifetime use, past 12 months, one month, and six hours before injury/illness). In Vancouver, where the larger of the two hospitals was located, a revised systematic sampling strategy was required to avoid missing potential patients. In addition, low patient participation in Vancouver led to implementation of incentives to increase the response rate. The use of self-report measures identified objective measures, although the reverse was true in the case of use of illicit drugs. The overall monitoring approach proved to be viable and achieved a

satisfactory rate of participation. Among other indicators, the study found an increasing trend in alcohol use and decreasing use of illicit drugs over the four years the surveillance study was conducted.<sup>1</sup>

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While the acute effects of risky alcohol use and other substance use contribute to the bulk of alcohol and drug-caused deaths in Canada, historically they have not been systematically monitored. Tracking the rates of serious harms related to alcohol and other drug (AOD) across time and location within the general population is necessary to implement widespread policies that can address them. Emergency departments (EDs) provide a window into emerging trends of risky patterns of alcohol use and other substance use and are useful venues for monitoring injury, illness, and other acute harms. A great proportion of trauma is found in EDs, where alcohol has been shown as a major risk factor for injury (1, 2) and the impact of alcohol consumption on acute conditions (e.g., injuries) is related to both volume and pattern of drinking (3, 4). Previous international studies have found injured patients more likely to be drinking before the event and to be heavier drinkers in general than non-injured patients presenting to the same ED at the same time (5, 6). Late-night and early-morning presentations

<sup>1</sup> More information on the ED surveillance study is available at: [www.AODMonitoring.ca/EmergencyDepartments](http://www.AODMonitoring.ca/EmergencyDepartments)

Š f ~ † f Ž • ‘ „ † † • ‹ † † • — ‹ Đ ‹ † † f • † • ’ senting sites in downtown areas of two cities with substantial and very visible street-entrenched illicit drug using populations using survey items similar to those of other surveys conducted by the broader BC AOD Monitoring Project in terms of drug terms used, time periods considered, and related harms. One initial challenge to overcome when monitoring AOD-related ED presentations is that are at least partially caused by substance use. Individuals presenting to EDs late at night and in the early hours of the morning on weekends are known to have a high rate of prior substance use contributing to their injury or illness (7, 19). The hours (9 p.m.–4 a.m.) and days (Friday and Saturday) of study were chosen because they were likely to capture the highest use of alcohol and other drugs among ED attendees, thereby providing a window through which emerging trends in substances being used separately and in combination could be observed.

In an earlier examination of this topic, Stockwell, Macdonald, and Sturge (8) noted that national and international statistics on alcohol-related harms tend to emphasize estimates of total numbers of deaths (e.g., (9)) or total economic costs (e.g., (10)) but rarely report trends or variations across place and time. Monitoring such trends can be valuable as a means of guiding the development and evaluations of interventions at the national, regional, and local level (11, 12). While a single estimate of lives lost and economic impacts can raise awareness and build momentum toward new policy initiatives, the monitoring of trends using repeated measures provides a stronger emphasis on whether prevention and treatment policies are being well directed and are effective in practice. When monitoring is done on a continual basis or includes very frequent assessments, this is often termed “surveillance” (13, 14). Continuous monitoring or surveillance of alcohol use and other substance use in the ED has the potential to identify new and emerging patterns of risk for serious injury, overdose, and poisoning events in a timely way that may inform strategies aimed at preventing future occurrences.

In this chapter, an example of implementation of a surveillance system designed for ongoing monitoring in an ED setting in two cities (the “ED Monitoring Study”) is presented. Also outlined are some of the initial challenges that arose as the monitoring study became established, and the ways in which those obstacles were subsequently overcome. The ED Monitoring Study is part of a broader AOD monitoring system in British Columbia (BC) (Canada) (the “BC Alcohol and Other Drug Monitoring Project”) that collects comprehensive data on rates of alcohol-, tobacco- and illicit drug-caused hospitalizations and deaths (15); patterns of substance use in the general population, among school students, and among high-risk populations (16); province-wide data on alcohol sales (17); presentations to the addictions treatment system; and illicit drug seizures (18). The ED Monitoring Study component complemented these approaches by collecting data in two

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### Data collection sites

Sampling was conducted among patients presenting at the EDs of Royal Jubilee Hospital (RJH) (Victoria, BC) and Vancouver General Hospital (VGH) (Vancou-

ver, BC). VGH is a specialist trauma center providing services in almost all medical specialties. RJH provides comprehensive acute care to the downtown population in Victoria. These two sites were chosen because their downtown catchment areas include entertainment districts and venues frequented by users of illicit drugs.

## Subjects

Subjects were interviewed one Friday and one Saturday night per month (9 p.m.–4 a.m.) at both sites. Completed interviews were obtained from 1 277 subjects across both sites between April 2008 and September 2011. Patients were between 17 and 75 years of age, spoke English, and gave written consent. Patients who posed a safety risk, came to the ED with a police escort, or were unable to correctly answer comprehension questions about the study were excluded.

## Interviewers

Two interviewers worked in tandem on each shift. The interviewers were generally graduate or undergraduate students, medical residents, or nurses who were carefully selected and given in-depth training in administering the questionnaire and conducting the two objective tests.

## Sampling strategy

A systematic strategy was used to select subjects from patients presenting during the study period. Patients were approached once they had been registered in the Emergency Department Information System (EDIS), with the most recent being ap-

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breathalyser (Intoximeters Inc, St. Louis, MO, USA).

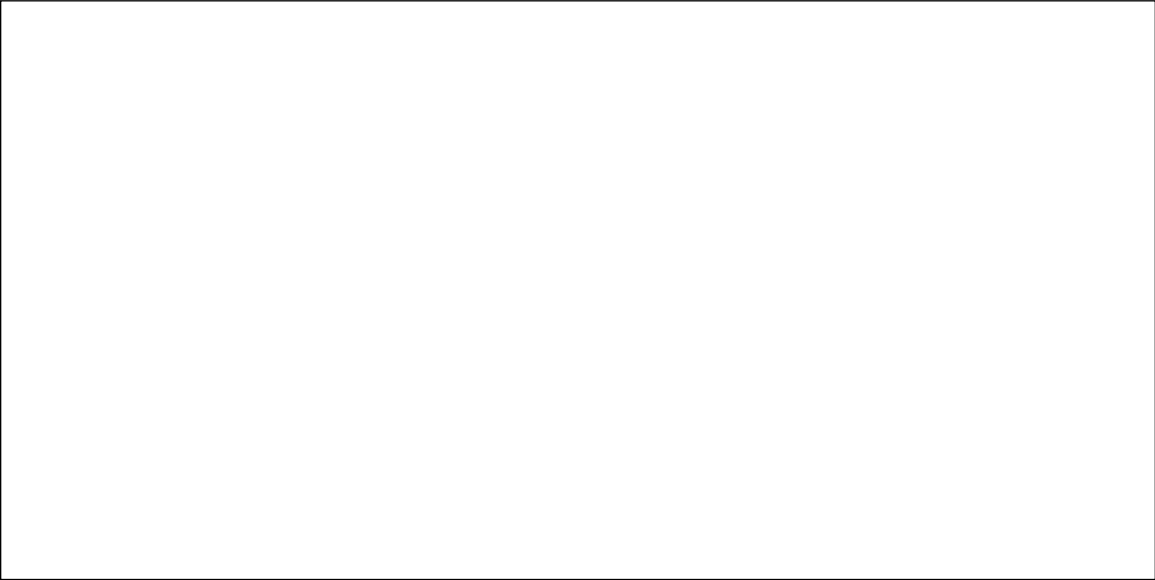
The instruments were calibrated once a month using  
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 accuracy of readings. The breathalyzer test requires the subject to blow into a sterile disposable mouth-piece for 5–8 seconds after which the machine provides an electronic BAC reading.

These breathalyzer units were chosen for the project for their ease of use, portability, and unobtrusiveness. Similar devices are used by law enforcement in various other venues such as workplace testing, EDs, occupational health centers, and drug and alcohol treatment centers. Previous ED studies (e.g., (19, 25 Š f ~ † ... ' • Đ ( " • † † - Š f - - † • - • ... ' " † Ž f - † ™ † Ž Ž with self-reported alcohol consumption, especially when the delay between last drink and a breath test is accounted for. Delays of longer than two hours,





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ASSIST scores over the study period (data not shown).

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This chapter described the implementation of an ongoing surveillance system designed to monitor substance use and related harms of patients attending EDs at two sentinel sites in two cities in the Canadian province of British Columbia. Initial challenges were described as well as an evaluation of the objective tools used as part of the study. Descriptive results of different measures of substance use and related harms further illustrated the utility of monitoring EDs on an ongoing basis.

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a general decline in consumption (39) Reported use of illicit drugs in the past 30 days (excluding cannabis) in 2011, possibly a result of changes in availability of these substances or of the growing trend toward use of pharmaceutical drugs as a substitute for illicit drugs in this province. More than one-third of patients who attended the ED late at night on the weekends reported moderate or severe problems similar harms from use of cannabis. These patterns remained fairly steady over the study period, with that the harms associated with alcohol and cannabis use remain a consistent and ongoing concern. In addition, alcohol was the substance most commonly reported as contributing to a range of acute injuries bringing patients to the ED for treatment.

breathalyzer test, which is designed to capture recent alcohol consumption, appeared to be more effective than the saliva test, which is designed to measure recent drug use. These late-night interviews, which primarily gathered data on high-risk ED attendances involving use of alcohol and other drugs, also recorded routinely-collected electronic data on attendees to the ED who might not neces-

The purpose of this surveillance study was the routine collection of survey and objective test data that, over time, provided useful information on trends and prevalence of late-night use of alcohol and other drugs among respondents in an ED setting. While two objective measures were used, the

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