

Characteristics of participants in the Early Hepatitis C Intervention Project at last interview

Age, sex	Employment	Polydrug use	Place of residence	Current mental illness*	Attendances		IDU change‡	Persistent viraemia‡
					At 5 nominated appointments	Total†		
19, F	No	Yes	NFA	Yes	3	6	Reduced IDU	Yes
21, F	Part-time	Yes	NFA	Yes	3	5	Reduced IDU	No
21, M	No	Yes	NFA	Yes	3	4	No IDU at enrolment	Yes
24, M	Voluntary	No	Rental	Yes	1	1	Denied IDU ever	Yes
30, M	Casual	Yes	NFA	No	2	4	No IDU	Yes
36, M	No	Yes	Parents	Yes	1	4	Unknown	Yes
38, M	Full-time	Yes	NFA	Yes	2	3	Reduced IDU	No
43, M	Full-time	No	Rental	Unknown	1	1	Unknown	No

IDU=injecting drug use. NFA=no fixed abode.

*Mainly depression, anxiety and personality disorder. †Includes self-initiated visits.

‡Determined by polymerase chain reaction.

issues may be a more effective approach to the care of people with recent HCV infection.

1. Commonwealth Department of Health and Aged Care. National Hepatitis C Strategy 1999-2000 to 2003-2004. Canberra: The Department, 2000.
2. Jaeckel E, Cornberg M, Wedemeyer H, et al. Treatment of acute hepatitis C with interferon alfa-2b. *N Engl J Med* 2001; 345: 1495-1497. □

Serial correlation and confounders in time-series air pollution studies

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TO THE EDITOR: The recent article by Johnston et al is an important contribution to the small but growing body of literature on the health effects of particulate matter (PM) pollution derived from bush or forest fire.¹ The authors studied an important wood smoke PM exposure in Australia and

showed consistent associations between higher concentrations of PM and emergency department presentations for asthma. Most research on the effects of PM has focused on motor-vehicle-derived PM pollution.^{2,3}

However, Johnston et al do not appear to have accounted for serial correlation in their data. Measurements connected in time, such as repeated measurements of the same population, are likely to be correlated and not independent.⁴ Further, school holidays have been shown to influence hospital admission rates.⁵ The major Northern Territory school holidays in June and July are in the middle of the study period.

Johnston et al adjusted for some important confounders in their analysis (acute respiratory infections and weekdays/weekends).¹ However, in time-series data, especially those dealing with asthma, serial correlation, as well as other potentially important confounders such as school holidays and temperature and humidity, should also be assessed. It may be that, even after appropriate adjustments for serial correlation and potential confounders, the

rate ratios found by Johnston et al may not alter appreciably. However, it would have been useful for the investigators to have at least discussed any effects that controlling for serial correlation and other potential confounders might have had on their findings.

1. Johnston FH, Kavanagh AM, Bowman DMJS, Scott RK. Exposure to bushfire smoke and asthma: an ecological study. *Med J Aust* 2002; 176: 535-538.
2. Kunzli N, Kaiser R, Medina S, et al. Public-health impact of outdoor and traffic-related air pollution: a European assessment. *Lancet* 2000; 356: 795-801.
3. Pope CA, III. Epidemiology of fine particulate air pollution and human health: biologic mechanisms and who's at risk? *Environ Health Perspect* 2000; 108: 713-723.
4. Schwartz J, Spix C, Touloumi G, et al. Methodological issues in studies of air pollution and daily counts of deaths or hospital admissions. *J Epidemiol Community Health* 1996; 50: S3-S11.
5. Storr J, Lenney W. School holidays and admissions with asthma. *Arch Dis Child* 1989; 64: 103-107. □

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IN REPLY: Jalaludin and colleagues query the potential effects that serial correlation and confounding by school holiday time periods may have had on our finding of an association between particulates derived from bushfire smoke and asthma presentations.¹

As previously discussed by Schwartz, time series analyses are important to control for serial correlations, particularly those due to the effects of seasonality and weather fluctuations.² Our study did not cover a number of seasons. It was conducted during one tropical dry season, a period characterised by remarkably stable day-to-day weather conditions.³ For this reason, we believe that the effects of any autocorrelation would have been negligible. It is of interest that the development of statistical methods for analysing time series of count data during the 1990s, and analysis of large studies of particulate pollution using these methods, did not have an important effect on the conclusions reached by earlier studies.⁴

There is evidence that hospital admissions for asthma fall during school holidays.⁵ Anecdotal reports of more regional fires suggest that, if anything, particulate concentrations over Darwin might increase at these times. A reanalysis

Asthma presentations and exposure levels of PM₁₀* (µg/m³)

Same-day PM ₁₀ category (µg/m ³)	Rate ratio for asthma presentations (95% CI)	
	Original analysis†	Revised analysis‡
< 10	1.0	1.0
10- $<$ 20	0.90 (0.60-1.35)	0.84 (0.43-1.63)
20- $<$ 30	1.11 (0.74-1.69)	1.13 (0.58-2.18)
30- $<$ 40	1.18 (0.72-1.97)	1.21 (0.58-2.50)
≥ 40	2.38 (1.46-3.90)	2.47 (1.21-5.01)

*Particles of 10 microns or less in aerodynamic diameter per cubic metre. †Adjusted for influenza-like illness and weekday. ‡Adjusted for influenza-like illness, weekday and school holiday periods.

of our data including school holiday periods as a potential confounding factor did not appreciably alter our results in either the continuous (revised incidence rate ratio [IRR], 1.26; 95% CI, 1.12–1.41, compared with original IRR, 1.20; 95% CI, 1.09–1.34) or categorical analysis (see Table).

1. Johnston FH, Kavanagh AM, Bowman DMJS, Scott RK. Exposure to bushfire smoke and asthma: an ecological study. *Med J Aust* 2002; 176: 535–538.
2. Schwarz J, Spix C, Touloumi G, et al. Methodological issues in studies of air pollution and daily counts of deaths or hospital admissions. *J Epidemiol Community Health* 1996; 50: S3–S11.
3. Gill AM, Moore PHR, Williams RJ. Fire weather in the wet dry tropics of the World Heritage Kakadu National Park, Australia. *Aust J Ecology* 1996; 21: 302–308.
4. Lumley T. Statistical training for epidemiologists: a view from afar. *Australas Epidemiologist* 2001; 8(4): 5–7.
5. Storr J, Lenney W. School holidays and admissions with asthma. *Arch Dis Child* 1989; 64: 103–107. □

Work-related stress: care and compensation

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TO THE EDITOR: The editorial by Steven and Shanahan on work-related stress¹ indicated that claiming Medicare benefits for a workers compensation injury is specifically precluded. It also identified a need for guaranteed certainty of cost reimbursement for treatment.

Medicare benefits are payable for professional services that are wholly covered by workers compensation, unless there is a reimbursement arrangement with the insurer.² The patient may be bulk billed or given a private account. The recovery of any benefits paid once a settlement or judgement is made does not involve the practitioner.

It is not claiming the benefit which is precluded, but keeping it if an outcome favourable to the plaintiff ensues. My understanding is that unsuccessful claims are rebatable under Medicare for clinically relevant medical services. The medico-legal expenses incurred, for example for reports, do not qualify, as they are not medically necessary. The fees are a private matter, as are any treatment charges in excess of the Medicare rebate. Herein lies the uncertainty.

1. Steven ID, Shanahan EM. Work-related stress: care and compensation [editorial]. *Med J Aust* 2002; 176: 363–364.
2. Medicare benefits schedule book. General explanatory notes. Section 3.6. Canberra: Department of Health and Aged Care, 1 November 2001. □

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IN REPLY: What Carroll says is correct, but Section 3.6 of the general explanatory notes of the *Medicare benefits schedule book* also states that "The only exception to this is where a person has entered into a *reimbursement arrangement* with a compensation insurer. In such cases a Medicare benefit is not payable".¹

While it may be arguable as to what actually constitutes a *reimbursement arrangement*, the situation is further clarified by Section 13.2.1 of the same schedule, which states:

"Medicare benefits are not payable in respect of a professional service in the following circumstance:

(b) where the medical expenses for the services are in relation to a compensable injury or illness for which the patient's insurer or compensation payer has accepted liability. However, if medical expenses relate to a compensable injury or illness and the insurer or compensation payer is disputing liability, Medicare benefits are payable until liability is accepted".

1. Medicare benefits schedule book. General explanatory notes. Section 3.6. Canberra: Department of Health and Aged Care, 1 November 2001. □

The Avoid Stroke as Soon as Possible (ASAP) general practice stroke audit

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TO THE EDITOR: In an article in the 1 April issue of the Journal,¹ Sturm et al reported

on a GP-based stroke audit ("ASAP") and stated that "the information obtained is likely to be representative of most Australian general practice environments". Without further information, we cannot be as confident.

First, their sampling strategy was unconventional. Of all registered GPs from five Australian States and one Territory who were initially approached in May 2000, only 10.2% ($n = 1850$) of eligible GPs expressed interest in participating in the study. From each of 22 "geographical regions", up to 18 GPs were recruited, initially by random sampling and then by replacement, to obtain a sample of 396 GPs, of whom 321 (81%) provided data. No GP data by State and Territory or "geographical region" were provided to allow readers to judge the possibility of sampling bias. Unpublished data from our own GP survey about stroke issues in New South Wales raise this possibility. We conducted a postal survey of 490 randomly selected GPs from November 2000 to February 2001 (response rate, 60%). None of the 296 participating GPs stated they were enrolled in a stroke clinical audit.

Second, although patients were clustered within GPs, no intracluster correlations (ICCs) were reported. Outcomes (eg, disease morbidity and risk factors) for patients recruited from general practices tend to be correlated at the GP level.² ICCs quantify the extent to which individuals within clusters (such as a GP's practice) are similar to each other relative to individuals from other clusters. Conventional formulas for calculating confidence intervals assume that the ICC is zero (ie, no clustering). Yet, where correlation within clusters does exist (ie, $ICC > 0$), the effective sample size is reduced and the associated CIs are inevitably wider. For any given ICC greater than zero, larger cluster sizes also further reduce the effective sample size. Applying appropriate formulas,³ we calculated effective sample sizes for risk factors in the ASAP

Effective sample size, assuming three different magnitudes of intracluster correlation (ICC)

Risk factor	Actual n	Effective n if ICC = 0.015	Effective n if ICC = 0.05	Effective n if ICC = 0.1
Total				
Hypertension	14 280	8643	4499	2670
Hypercholesterolaemia	12 516	7973	4317	2608
Smoking	14 297	8649	4500	2670
Diabetes	13 767	8455	4449	2653
Atrial fibrillation	14 194	8611	4490	2667
Stroke/transient ischaemic attacks	14 321	8657	4502	2671