

ilies were no more likely to have established an ongoing relationship with a GP than control families (46 [38.7%] and 41 [42.7%], respectively; $P=0.5$), irrespective of whether or not they received the intervention material.

In summary, this single intervention was not sufficient to alter healthcare-seeking behaviour of families with no regular GP. It seems the motivation to obtain a GP lies with the family. Thus, it would seem necessary to design and deliver an intervention that addresses the beliefs of families about the roles of various facets of the healthcare system. With time and work pressures, ED medical staff may not be in the best position to provide such intervention.

1. Keith AR, Pirkis JE, Viney JC, et al. Delivery of primary care in hospital and community settings in Australia. *Qual Assur Health Care* 1993; 5: 137-141.
2. Weir R, Rideout E, Cook J. Pediatric use of emergency departments. *J Pediatr Health Care* 1989; 3: 204-210.
3. Davies T. Accident department or general practice? *BMJ (Clinical research ed.)* 1986; 292: 241-243.
4. Kini NM, Strait P. Nonurgent use of the pediatric emergency department during the day. *Pediatr Emerg Care* 1998; 14: 19-21.
5. Smith RD, McNamara JJ. Why not your pediatrician's office? A study of weekday pediatric emergency department use for minor illness care in a community hospital. *Pediatr Emerg Care* 1988; 4: 107-111.
6. Shesser F, Kirsch T, Smith J, Hirsch R. An analysis of emergency department use by patients with minor illness. *Ann Emerg Med* 1991; 20: 743-748.
7. Lambrow JM, DeFriesse GH, Carey TS, et al. The effects of having a regular doctor on access to primary care. *Med Care* 1996; 34: 138-151.
8. Baker DW, Stevens CD, Brook RH. Regular source of ambulatory care and medical utilization by patients presenting to a public hospital emergency department. *JAMA* 1994; 271(24): 1909-1912. □

Epidemiological modelling (including economic modelling) and its role in preventive drug therapy

Kent R Johnson,* Marissa N Lassere†

*Medical Director, Medical Technology Assessment Group (M-TAG), PO Box 5639, Chatswood West, NSW 1515; †Rheumatologist, St George Hospital, and Senior Lecturer in Medicine, University of New South Wales, Sydney, NSW. kjohnson@m-tag.net

TO THE EDITOR: In their recent article on the use of modelling in pharmacoeconomics to estimate the potential benefits, risks and costs of preventive drugs, Liew and colleagues highlighted important strengths and limitations of this technique.¹ One limitation is that modelling is discretionary: different analysts elect different models and get different answers. We argue that modelling is the first step. The next step is

testing the predictive validity of the model by systematically collecting cost and effectiveness data over a period of time. Then the predictions of the original analysis could be compared to what actually transpired.

The goal of pharmacoeconomics is the most accurate estimation of costs and benefits. The more these variables are truly study outcomes (that is, experimental and not constrained by assumptions of the economic model), the more valid the process. This will help reduce model discretion, improve data quality and increase the likelihood that the experiment could be replicated independently, the acid test of validity. In reducing the discretion inherent in pharmacoeconomics, we can allay the concerns of those who have questioned its underlying theory² and validity.³

If one does not know the benefit of a drug, one conducts a study. Equally, if one does not know the cost of a drug, one needs a study. This has been the impetus for randomisation in design of pharmacoeconomic studies, thereby decreasing reliance on economic modelling.⁴ Furthermore, there are well-tested methods for quantifying the uncertainty of estimates obtained with randomised studies. In contrast, economic modelling assesses the robustness of the model assumptions, as reflected in the estimate, using sensitivity analysis. However, this analysis cannot separate uncertainties attributable to the model assumptions, uncertainty inherent in the data put into the model, and uncertainty of outcome estimates. One is left with nostalgia for the simplicity of the null hypothesis.

How can we move forward?

To reduce reliance on modelling and to collect better data, we propose that Australia, with its "culture of evaluation",⁵ again take the lead by creating a new "conditional listing" category on the Pharmaceutical Benefits Scheme for all drugs, not just preventive therapy. This would be available for selected products with strong biological rationale but inadequate current evidence on cost-effectiveness. By necessity, these would include only high-volume/low-cost and low-volume/high-cost products, as high-volume/high-cost products are rarely developed, and low-volume/low-cost products are not problematic.

The sellers would then collect prospective data to substantiate cost-effectiveness of the products or would have them delisted. This would be truly innovative and, like the Pharmaceutical Benefits Advisory Committee itself, a first for the Commonwealth. Certainly, no other jurisdiction is even considering this, let alone proposing systematic study.

With better data, we would learn which models and model assumptions yield accurate predictions. Of course, many challenges and difficulties will need to be addressed regarding this proposal, but in our opinion none are insurmountable, and the benefits of a program of this type clearly exceed the risks.

Competing interests: K R J was a medical regulator for the United States Food and Drug Administration from 1985 to 2001, and now works for M-TAG, a private company that performs clinical, epidemiological and health economic evaluations of drugs, devices and technology.

1. Liew D, McNeil JJ, Peeters A, et al. Epidemiological modelling (including economic modelling) and its role in preventive drug therapy. *Med J Aust* 2002; 177: 364-367.
2. Johnson K. Cost-effectiveness analysis: assessing the assumptions behind the assumptions. *J Rheumatol* 2000; 27: 1565-1567.
3. Kassirer J, Angell M. The Journal's policy on cost-effectiveness analyses. *N Engl J Med* 1994; 331: 669-670.
4. O'Brien B, Drummond M, Labelle R, Willan A. In search of power and significance: issues in the analysis of stochastic cost-effectiveness studies in health care. *Med Care* 1994; 32: 150-163.
5. Salkeld G, Mitchell A, Hill S. Pharmaceuticals. In: Mooney G, Scottton R, editors. Economics and Australian health policy. Sydney: Allen and Unwin, 1999: 115-136. □

Danny Liew,* John J McNeil,† Anna Peeters,‡
Stephen S Lim,§ Theo Vos¶

*Lecturer, NHMRC Postgraduate Medical Scholar and Clinical Pharmacology Fellow; †Professor and Head of Department; ‡Postdoctoral Research Fellow; §Lecturer and PhD Scholar, Epidemiological Modelling Unit, Department of Epidemiology and Preventive Medicine, Monash University Central and Eastern Clinical School, Alfred Hospital, Melbourne, VIC 3004; ¶Head of Unit and Senior Epidemiologist, Department of Human Services, Melbourne, VIC. danny.liew@med.monash.edu.au

IN REPLY: We agree with Johnson and Lassere about the value of longitudinal studies, especially clinical trials, in assessing healthcare benefits and costs. They are critical to informing clinical practice and health policy.

If it were possible to conduct these studies across a wide variety of settings, representing the range of "real life" practice, then there would be little need for epidemiological modelling. However, this is not possible. Clinical trials (with or without cost components) will only ever be conducted over relatively

short durations, on circumscribed populations and under tightly controlled conditions.

A key, but often overlooked, issue is whether the results of studies are externally valid (generalisable). Indeed, the evidence base that dictates clinical practice and health policy should comprise data that are both internally and externally valid.

We do not suggest that epidemiological modelling replace longitudinal studies (in fact, modelling depends critically on robust prospective data); rather, it complements these studies by providing a means to assess their external validity.

We are also mindful of the limitations of epidemiological modelling, as outlined in our article,¹ and acknowledge the importance of ensuring rigour in the methods.

Our article dealt with generating the data needed for sound economic evaluation, by taking into account the long-term benefits, risks and costs of treatment strategies, and “real-life” health service conditions. This is distinct from the issue of whether “conditional listing” on the Pharmaceutical Benefits Scheme should be implemented for drugs that are yet to be proven cost-effective.

1. Liew D, McNeil JJ, Peeters A, et al. Epidemiological modelling (including economic modelling) and its role in preventive drug therapy. *Med J Aust* 2002; 177: 364-367. □

Screening mammography and mortality

Peter C Gøtzsche

Director, Nordic Cochrane Centre, Rigshospitalet, Department 7112, Blegdamsvej 9, Copenhagen Ø, DK-2100, Denmark pcg@cochrane.dk

TO THE EDITOR: In a recent letter in the Journal,¹ Rodger writes that breast screening is unlikely to affect overall mortality and notes that this “gives the lie to the conclusions of Olsen and Gøtzsche’s overview, which are based only on overall mortality”.

English is not my first language, but according to my English-English dictionary “give the lie to” means either “to disprove” or “to accuse of lying”, and a related adjective is “mendacious”. In actual fact, however, in our Cochrane Review,² we carefully analysed both breast cancer mortality and all-cancer

mortality. We found breast cancer mortality to be an unreliable outcome that is biased in favour of screening. For deaths ascribed to any cancer, including breast cancer, we found a relative risk of 1.02 (95% CI, 0.95–1.10) for the two trials with medium-quality data,^{3–5} and a relative risk of 1.00 (95% CI, 0.91–1.10) for the only trial with poor-quality data that reported all-cancer mortality.⁶ If it were true that screening reduced breast-cancer mortality by 30%, as some Swedish researchers have claimed,⁷ then the expected relative risk for all-cancer mortality should not be greater than 0.95. These findings should raise concern rather than complacency.

Another, recent indication that things are not what they purport to be is provided by the results of the large Two-County study. A Swedish overview of the randomised trials reported a 10% reduction (95% CI, 0.73–1.11; absolute

reduction, 5.0/1000 to 4.5/1000) in breast-cancer mortality for one of the two counties,⁸ whereas the authors of the Two County study reported a 24% reduction (95% CI, 0.62–0.93; absolute reduction, 5.7/1000 to 4.3/1000),⁹ with the same type of statistics, within the same age group of women (40–74 years), and after a similar follow-up (1.2 v 1.3 million women-years).

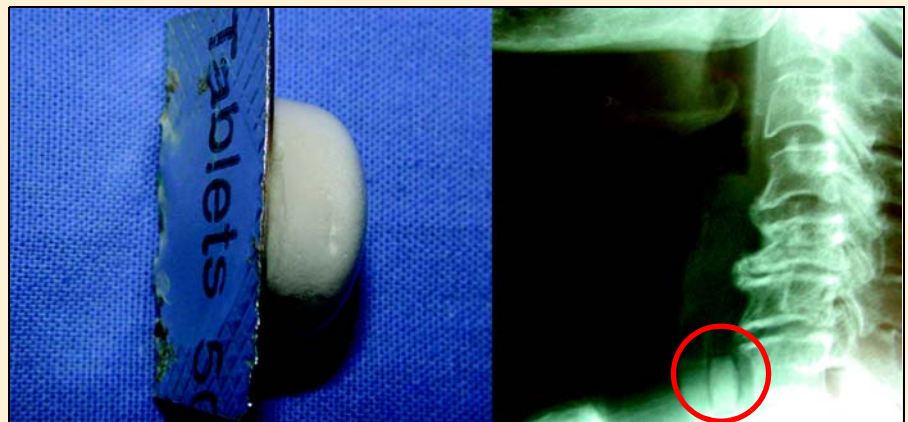
The conclusion in our Cochrane Review is: “The currently available reliable evidence does not show a survival benefit of mass screening for breast cancer (and the evidence is inconclusive for breast cancer mortality).” I would not have expected Rodger, as an editor of the Cochrane Breast Cancer Group that approved and published our Cochrane Review, to talk about “giving the lie” to our results.

Competing interests: None identified. The views expressed are mine and are not necessarily the views of the official policy of the Cochrane Collaboration.

snapshot

A bitter pill to swallow

AN ELDERLY PATIENT with diabetes presented with oesophageal obstruction after taking a regular dose of metformin. A lateral neck radiograph confirmed the presence of an obstruction in the upper oesophagus. The patient underwent rigid oesophagoscopy, at which time the tablet, complete with packaging, was removed (see Box). The patient went on to make a full recovery.



**Peter A Monksfield,* Olivia J H Whiteside,*
Stuart C A Winter,† Nicholas B Steventon,‡ Graham J Cox§**

*Senior House Officer, †Registrar, ‡Clinical Lecturer, §Consultant Surgeon
Department of Otolaryngology, Radcliffe Infirmary, Oxford, OX2 6HE, UK
pmonksfield@talk21.com