Pharmaceutical advertisements in prescribing software: an analysis

Ken J Harvey, Agnes I Vitry, Elizabeth Roughead, Rosalie Aroni, Nicola Ballenden and Ralph Faggotter

ABSTRACT

Objective: To assess pharmaceutical advertisements in prescribing software, their adherence to code standards, and the opinions of general practitioners regarding the advertisements.

Design, setting and participants: Content analysis of advertisements displayed by Medical Director version 2.81 (Health Communication Network, Sydney, NSW) in early 2005; thematic analysis of a debate on this topic held on the General Practice Computer Group email forum (GPCG_talk) during December 2004.

Outcome measures: Placement, frequency and type of advertisements; their compliance with the Medicines Australia Code of Conduct, and the views of GPs.

Results: 24 clinical functions in Medical Director contained advertisements. These included 79 different advertisements for 41 prescription products marketed by 17 companies, including one generic manufacturer. 57 of 60 (95%) advertisements making a promotional claim appeared noncompliant with one or more requirements of the Code. 29 contributors, primarily GPs, posted 174 emails to GPCG_talk; there was little support for these advertisements, but some concern that the price of software would increase if they were removed.

Conclusions: We suggest that pharmaceutical promotion in prescribing software should be banned, and inclusion of independent therapeutic information be mandated.

MJA 2005; 183: 75–79

In 1999, the Australian Government provided financial incentives for the uptake of computers by Australian general practitioners. This was followed by an increased proportion of GPs writing prescriptions with the aid of a computer, from around 50% in 1999 to more than 90% in 2004.[1] One prescribing software package (Medical Director) achieved market dominance; it is the only Australian prescribing software containing pharmaceutical advertisements.

Medicines Australia's Code of Conduct sets standards for the ethical marketing and promotion of prescription pharmaceutical products in Australia.[2] Compliance with the Code is the responsibility of the pharmaceutical companies, not the software company. We aimed to assess the location, frequency and type of advertisements for prescription pharmaceuticals appearing in Medical Director, and their compliance with the relevant sections of the Medicines Australia Code of Conduct and associated guidelines.[2,3] In addition, views on this topic posted to the General Practice Computer Group email discussion list (GPCG_talk)[4] were thematically analysed. The GPCG is the peak body for general practice computing, established in 1997, funded by the Australian Government Department of Health and Ageing, auspiced by the Australian Medical Association until 2001, and then by the Royal Australian College of General Practitioners.

METHODS

Advertisements in software

All clinical functions available in Medical Director version 2.81 (Health Communication Network, Sydney, NSW) were explored for the presence of advertising. We also used the advertising viewer program accompanying the software to sequentially access, count and study the advertisements in the program's advertisement database. This database contains most, but not all, of the advertisements that appeared when using the software. For statistical analysis, we counted advertisements that differed in at least one characteristic: size of the image, animation or information.

A template for the objective content analysis of the advertisements was developed. It included an assessment of whether the following items required by the Code were present: product name (brand and generic), company name, promotional claims, a statement to review the product information, the Pharmaceutical Benefits Schedule (PBS) listing, referral to further information, identification and details of the references.

Certain clinical functions provided additional information around banner advertisements that was not present when the advertising viewer was used. For example, an advertisement might appear in one place with the adjacent statement "Before prescribing please refer to product information in this program by clicking on MIMS PI", making the advertisement compliant with the Code. However, the same advertisement could appear in other places without such a statement (eg, in the patient educational leaflet browser, the MIMS pharmaceutical database or when viewing Consumer Medicine Information). Hence, we regarded information as present only if it was contained in the body of the advertisement.

The size of the advertisement, whether it was animated, and the legibility of the generic name were assessed. Our computer screens had a resolution of 1024 × 768 pixels. Three reviewers with extensive experience in critical appraisal of drug advertisements (K J H, A I V, E R) assessed the template criteria and com-

FOR EDITORIAL COMMENT, SEE PAGE 73

School of Public Health, La Trobe University, Bundoora, VIC.
Ken J Harvey, MB BS, FRCPA, Senior Lecturer.
School of Pharmacy and Medical Sciences, University of South Australia, Adelaide, SA.
Agnes I Vitry, PharmD, PhD, Senior Lecturer; Elizabeth Roughead, BPharm, MAppSc, PhD, Project Co-Director.
Monash Institute of Health Services Research, Faculty of Medicine, Nursing and Health Sciences, Monash University, Clayton, VIC.
Rosalie Aroni, PhD, Senior Lecturer.
Australian Consumers' Association, Marrickville, NSW.
Nicola Ballenden, MA, MPH, Senior Health Policy Officer.
Kings Park, SA.
Ralph Faggotter, MB BS, General Practitioner.
Reprints will not be available from the authors. Correspondence: Dr K J Harvey, School of Public Health, La Trobe University, Plenty Road, Bundoora, VIC 3086. k.harvey@latrobe.edu.au

1 Clinical functions accompanied by advertisements

- Program installation
- Prescribing, including select drug by class, dose calculator, print prescription
- Physical activity prescription
- Record blood pressure
- Cardiovascular risk calculator
- Record height/weight/waist circumference
- Record blood glucose
- Record INR (international normalised ratio)
- Calculate respiratory function
- Gestation calculator
- Mental state examination
- Renal function calculator
- Travel medicine
- Pathology ordering
- Medical imaging ordering
- Antibiogram
- Depression recovery scale
- Asthma action plan
- Care plan
- Diabetic record
- Pain assessment
- Drug resource lookup; ie, MDRef (drug list), MIMS PI (drug information), MIMS CMI (consumer medicine information)
- Patient education material
- Medication/diagnosis suggests cardiac problems ◆

2 Extracts from the Medicines Australia Code of Conduct[2]

1.3 False or misleading claims

All information, claims and graphical representations provided to health care professionals and members of the general public must be current, accurate, balanced and must not mislead either directly, by implication, or by omission. Claims must be referenced where there is a possibility that a reader may be misled if the source of the reference is not disclosed.

3.10 Advertising in electronic prescribing software packages

3.10.6 The type size and graphics used in all advertisements must be such that allows easy and clear legibility having regard to sizes and resolution standards of screens likely to be used.

3.10.7 All advertisements must be displayed for a sufficient period to allow for viewer comprehension and the ability to access references.

3.10.10 As prescribing software packages may include information which could be shared with patients by prescribers, the content of any advertisements, particularly graphics, must be such as to not cause any offence, alarm or concern or give rise to unrealistic expectations of benefit when viewed by members of the general public, including children.

Advertisements should also not be designed to stimulate a patient's demand for the prescription of a particular product.

3.10.11 A company shall not negotiate or accept any offer from a software manufacturer to achieve a trigger or mechanism that results in the preferential presentation of its own product or a less favourable presentation of a competitor's product in a way that would directly influence a prescriber's choice. ◆

3 Compliance of advertisements*

Required information	Banner ads (%)	Large ads (%)	Total (%)
Name of supplier	19/41 (46%)	19/19 (100%)	38/60 (63%)
Statement to review the Product Information	4/41 (10%)	8/19 (42%)	12/60 (20%)
Pharmaceutical Benefits Schedule (PBS) listing†	4/41 (10%)	18/19 (95%)	22/60 (37%)
Further information available on request	1/41 (2%)	5/19 (26%)	6/60 (10%)
Substantiating references	2/41 (5%)	5/19 (26%)	7/60 (11%)

* Advertisements that included promotional claims were assessed for compliance with Sections 3.10.3, 3.10.4 and 3.10.5 of the Medicines Australia Code of Conduct (basic information).[2] † In nine advertisements, the only statement was "refer to PBS book", or "PBS now" or "refer to primary advertisement", rather than specific PBS-listed clinical indications. These advertisements have been considered noncompliant, as the Code requires all PBS listings, including any restrictions, to be included in the body of the advertisement or elsewhere on the screen via the software package. ◆

pared each advertisement with relevant provisions of the Code independently. For objective measures, such as presence or absence of a statement, any difference between reviewers was resolved by re-examination of the advertisements and discussion. Legibility of the generic name was considered a more subjective assessment, and individual variation in this assessment was not modified.

GPCG_talk discussion forum

All email postings to GPCG_talk with the subject "Ads in EHR software" were collected from the discussion sequence that occurred between 6 and 31 December 2004, and a thematic analysis performed manually. The emails were in response to an initial posting by one of the authors (KJH), suggesting that pharmaceutical advertisements in clinical software should be banned and replaced with unbiased information resources. Critical examination of the ensuing discussion was viewed as a means of exploring the views of a self-selecting group of physicians who were both articulate and confident in discussing this issue.

The discussion strand was initially read by two authors (RA, KJH) and coded for emergent themes. Representative quotations of the agreed themes were then selected, including contrasting views.

This research was approved by the La Trobe University Health Sciences Faculty Human Ethics Committee.

RESULTS

Advertisements in software

Advertisements were found in 24 clinical functions of Medical Director (Box 1). Some advertisements appeared randomly, while others were targeted toward the particular clinical function in use.

Several identical advertisements had multiple entries in the database; others only appeared once in the database, but appeared preferentially in relevant clinical functions. The advertising viewer displayed 79 different advertisements for 41 prescription pharmaceutical products marketed by 17 companies, including one generic manufacturer. There were 20 large advertisements (750 × 500 pixels; all static images) and 59 banner advertisements (480 × 75 pixels; 36 static images; 23 animated, containing multiple images).

The generic name was judged illegible by one or more reviewers in 44 of 79 (56%) advertisements, representing a potential breach of Section 3.10.6 of the Code (Box 2). Some animated advertisements were also adjudicated to be in potential breach of Section 3.10.7 (Box 2). Sixty advertisements made a promotional claim, including 41 (69%) of the banner advertisements and 19 (95%) of the large advertisements. If a claim is made, the Code requires additional information to be present. Fifty-seven (95%) advertisements appeared noncompliant with one or more of these requirements (Box 3).

4 Examples of potential breaches of Section 1.3 of the Medicines Australia Code of Conduct (false or misleading claims)

Product	Claim	Concerns
Asasantin SR (dipyridamole plus aspirin)	Prevents twice as many strokes as aspirin alone	Potentially misleading. A Cochrane review noted that benefit was found in only a single trial in patients with cerebral ischaemia,[5] and concluded that more reliable evidence is needed on whether this combination is more effective than aspirin alone.
Avandia (rosiglitazone)	Avandia is well tolerated with no clinically relevant drug interactions	Potentially misleading. No warning on safety issues. In a recent Australian study, 11%, 58% and 21% of patients suffered from hypoglycaemia, weight gain and peripheral oedema, respectively; two patients developed pulmonary oedema. The drug was discontinued in 22%, mainly because of poor tolerance.[6]
Celebrex (celecoxib)	A large body of evidence showing no significant increase in cardiovascular risk	Potentially misleading. Therapeutic Goods Administration official warnings state that celecoxib may confer an increased risk of cardiovascular events.[7] A similar claim has been found to breach the Code.[8]
Ciproxin (ciprofloxacin)	First line treatment for otitis externa	Potentially misleading. *Therapeutic guidelines: antibiotic* does not list this product for otitis externa.[9]
Luvox (fluvoxamine)	Well tolerated	Potentially misleading. Reported adverse effects of fluvoxamine (and other selective serotonin reuptake inhibitors) include nausea, nervousness, agitation, diarrhoea, constipation, headache and insomnia.[10]
Patanol (olopatadine)	Safer and more effective than an ocular steroid	Does not provide supporting references. We were unable to locate a clinical trial comparing olopatadine with ocular steroid.
Stilnox (zolpidem)	Helps patients get the right quality and quantity of sleep	Potentially misleading. Delirium, hallucinations, and nightmares have been reported with this drug,[11] which may potentially affect sleep. ◆

Most promotional claims included broad slogans such as "Your first choice CCB", "Power Plus", "Power you can trust", "You can't keep a good woman down". We did not systematically assess the accuracy of all claims. However, certain claims (Boxes 4 and 5) appeared to be in breach of Section 1.3 (Box 2). In addition, advertisements positioned in clinical functions designed to be shared with patients appeared to be in potential breach of Section 3.10.10 (Box 2).

GPCG_talk discussion forum

The topic of "Ads in EHR software" on GPCG_talk attracted 29 contributors, primarily GPs, who posted 174 emails on this topic over 4 weeks. Initial coding of the debate indicated that, with one exception, there was little support for advertisements in clinical software. However, some contributors were worried that legislative measures to remove pharmaceutical promotion from prescribing software would increase its price. Others noted that software with equivalent functionality is available at a similar cost but, in the absence of standards for electronic health records, it is not easy to change software. There was support for balancing the selective information provided by promotional material with more objective sources of therapeutic information such as *Therapeutic guidelines*[12] and the *Australian medicines handbook*[13] and the *Australian adverse drug reactions bulletin*.[14]

Subsequently, more detailed analysis revealed five major themes (Box 6). Views were expressed in support of both sides of each of these themes.

DISCUSSION

Our analysis of pharmaceutical advertisements in prescribing software raised a number of methodological issues. Assessment of legibility proved problematic, as reviewers of differing age and visual acuity varied in their assessment. Nevertheless, all agreed that up to half the advertisements had illegible generic names. The Code states that information in advertisements should be legible, but provides no legibility criteria for electronic media. Like others, we believe that the generic name (and other important information) should be reproduced at the same size, font, colour and background as the brand name in all adver-

5 Example of a potentially misleading claim

The claim "a large body of clinical evidence showing no significant increase in cardiovascular risk" is arguably misleading in view of official warnings from the Therapeutic Goods Administration that celecoxib may increase the risk of cardiovascular events.[7] ◆

6 Representative comments from the GPCG_talk electronic discussion forum, grouped into themes

First Theme: Vulnerability to advertisements

a) Doctors are less vulnerable than other members of the society

"I still maintain that my clinical decisions are not adversely influenced by advertising. But a wise person learns to sift the wheat from the chaff."

"I believe that those worthy of their responsibilities balance their sources of information."

b) Doctors are equally vulnerable

"There is a great pretence that we are invulnerable to advertising."

"There were also ads on the bottom of many pop-up screens, which are much harder to evade, because you need to read the pop-up screen. Explain for me how you evade those ads."

"Although . . . I have never found one [GP] who admitted they were influenced by the ads, just annoyed, I cannot discount the fact of underlying subliminal technology day in and day out, working on unsuspecting minds. And I support the statements made on the list that it must have been demonstrated to work or the companies would not continue to purchase their random spots in the software!"

c) Drug companies would not pay for advertisements if they were ineffective

"The market leader is primarily a software package delivering advertisements to doctors while they use their software to collect medical records in the process."

"Every dollar of the advertising budget is reviewed, benchmarked against generated revenue, and accounted for several times each year. Advertising streams that don't produce the desired effect are pruned quickly as failed advertising companies can tell you."

"The pharmaceutical industry is not a charity with the noble goal of bolstering HCN's pockets for nothing in return. They pay dearly for advertising BECAUSE IT WORKS!"

Second Theme: Cost as an arbiter of choice

a) Banning drug advertisements would increase the price of prescribing software

"Proposal 1 [a ban] makes life for the MAJORITY of Australian GPs worse (I doubt they will move software easily and instead will simply have to pay more for MDW — they won't thank you for that), and does not make the outcomes for patients clearly better and if in fact, it results in a consultation fee increase, it makes their lot worse (they won't thank you for that)."

b) It is a myth that advertising-free software is more expensive

"There is quality non-advertising software available at a comparable price."

Third Theme: Views on advertising are ideologically based

a) Banning is ideologically sound

"Real choice is informed choice. Advertising limits your capability of informed choice. Can't you see that?"

"The only way to 'fix' this situation for those who care is to change programs."

"There is another way; the same way that the government eliminated MD software from automatically ticking the 'Brand substitution not permitted box'!"

b) Banning is ideologically unsound

"How do you address the issues of: Freedom of speech? Freedom to promote your product legally in an open market?"

Fourth Theme: Ease of use operates as the arbiter of choice

a) Difficult to learn new software given time limitations

"One of my doctors absolutely resented the change from MDW, and it led to some serious dissatisfaction for a short while. The new software we used was not perceived as user friendly, and some people are just not flexible enough to learn to do the same thing in different ways."

b) But possible

"I changed — no data loss, a week or two to get used to a new EHR and away we go."

Fifth Theme: Drug advertisments and morality

a) Morally repugnant

"I would prefer the GPCG to say that putting pharmaceutical ads in software is a practice which you hope to see stamped out by legislation in the near future :)-."

"Advertising within medical notes I feel crosses into a new territory. It gets deeper into our clinical encounter."

b) Morally irrelevant

"Advertising exists. That's the reality. Don't try to kill it — it has some good qualities. It's not the concept of advertising that's bad — but it's sometimes the content. There really are bigger issues and problems in the world."

c) Morally desirable

"You don't like ads because the only guys with deep pockets to pay for lots of expensive ads are drug companies. Why don't we stop whingeing about drug companies and realise that they do their job superbly." ◆

tisements, labelling, product and consumer information.[15,16]

Despite the difficulties inherent in counting the advertisements, our study showed that doctors who use Medical Director (and patients who observe the screen) are exposed to many pharmaceutical advertisements. Furthermore, many of the advertisements were judged noncompliant with one or more requirements of the Code. Common problems included missing information, illegible generic names, and claims that were unsubstantiated or appeared not to be in accord with the published literature.

Lack of appropriate PBS listing information was a particular concern, as Medicines Australia and its member companies agreed to implement an initiative in the 2002 federal budget that all pharmaceutical promotional items would include detailed PBS information.[3]

Although direct-to-consumer advertising of prescription pharmaceuticals to consumers is prohibited in the *Therapeutic Goods Act 1989* (Cwlth), the Code appears to condone it in Section 3.10.10 (Box 2). Many clinical functions in Medical Director, if shared and discussed with patients, are likely to assist them. However, most of these functions contain advertisements for prescription pharmaceuticals.

Given the array of problems we found, it seems that many pharmaceutical companies may not be providing advertisements in compliance with the Code, despite the efforts of Medicines Australia. In addition, finalised Code complaints show that some companies have been associated with repeated code breaches over several years, despite the sanctions applied by Medicines Australia.[17-19] This failure of the self-regulatory process has important public health implications. Pharmaceutical promotion has been shown to influence physicians' prescribing[20] and to result in PBS cost blowouts due to prescribing of more expensive drugs.[21] Pharmaceutical promotion in prescribing software, occurring at the time of physician–patient decision-making, may be more powerful than promotion in medical journals, gimmicks and giveaways.

Similar concerns about pharmaceutical promotion in prescribing software were posted to the GPCG_talk discussion forum. Those who contribute opinions to the GPCG_talk forum are a self-selected group of computer enthusiasts who are not shy of engaging in an often robust exchange of views; although they are unlikely to be representative of all GPs, their opinions are of value. The Australian Consumers' Association (ACA) has also conducted an online poll of consumers on this subject, and this revealed a high level of disquiet.[22] The ACA poll can be criticised for asking leading questions and being subject to manipulation by people voting more than once. Regardless, both GPCG_talk and the ACA poll show that we are not the only ones perturbed by pharmaceutical promotion in prescribing software.

Our concern is not just the apparent violations and Code inconsistencies, although we hope that Medicines Australia will address these issues. We are also concerned that an industry that spends 2–3 times as much money on marketing as on research and development[23] distorts the information flow to health professionals and consumers, creating unhealthy and expensive prescribing habits as well as consumer expectations of a "pill for every ill".[24] A Dutch study concluded that, on balance, pharmaceutical marketing is welfare-negative because it results in doctors prescribing more expensive drugs.[25] Just as public health campaigns have progressively reduced promotional avenues for the tobacco and alcohol industries, we believe the same should happen with pharmaceutical promotion — drug advertisements in clinical software are a good place to start. Without such action, the current unsustainable growth of PBS costs is unlikely to moderate.

In conclusion, a substantial proportion of advertising in Medical Director appears to lack compliance with the Medicines Australia self-regulatory Code of Conduct. Compliance is the responsibility of the pharmaceutical companies, not that of the software companies. Some will argue that the solution to this problem is to tighten the Code with respect to prescribing software and encourage better compliance by pharmaceutical companies; another consideration might be for software companies to play a role in assessing compliance. However, given the potential public health consequences of promoting prescription pharmaceuticals through software shared with patients, we argue that pharmaceutical promotion should be eliminated from prescribing software. In addition, as contributors to GPCG_talk noted, there is an urgent need for the Australian Pharmaceutical Advisory Council and the Australia Health Information Council to formulate a health information policy that ensures that Australian best-practice information resources are incorporated into clinical computer systems in both hospital and general practice.

ACKNOWLEDGEMENTS

Heather Jones and Deborah Monk from Medicines Australia provided helpful information on regulatory matters. Contributors to the General Practice Computer Group Talk (GPCG_talk) email discussion forum provided vigorous and thoughtful opinions on the topic. In particular, we thank Dr Andrew Magennis, Medical Director, Health Communication Network (HCN) for responding to the debate and making a copy of HCN's prescribing software (Medical Director) available for evaluation.

COMPETING INTERESTS

KJH, AIV and RF are members of Healthy Skepticism (www.healthyskepticism.org), an organisation that aims to improve health by reducing harm from misleading drug promotion. KJH has had a long relationship with Therapeutic Guidelines Limited as author, Chairman of the Antibiotic Writing Committee and Board Member. He was also a member of a World Health Organization Expert Working Party that devised WHO Ethical Criteria for Medicinal Drug Promotion. AIV is a Consultant Editor at the Australian Medicines Handbook. ER is a Board Member of Therapeutic Guidelines Limited and a subscriber to Healthy Skepticism.

REFERENCES

1 General Practice Computing Group. PIP (Practice Incentives Program). February 2004 update. Available at: http://www.gpcg.org/topics/pip.html (accessed May 2005).
2 Medicines Australia. Code of Conduct. Edition 14. Canberra: Medicines Australia Inc, 2003. Available at: http://www.medicinesaustralia.com.au/html/coc_full.asp (accessed May 2005)
3 Medicines Australia. Code of Conduct. Edition 14 Guidelines. Version 3. Canberra: Medicines Australia Inc, 2004. Available at: http://www.medicinesaustralia.com.au/html/coc_full.asp (accessed May 2005).
4 General Practice Computing Group. Listservs: GPCG_talk. Available at: http://www.gpcg.org/listservs/index.html (accessed May 2005).
5 De Schryver ELLM, Algra A, van Gijn J. Dipyridamole for preventing stroke and other vascular events in patients with vascular disease. *Cochrane Database Syst Rev* 2002; (2): CD 001820.
6 Hussein Z, Wentworth JM, Nanverkis AJ, et al. Effectiveness and side effects of thiazolidinediones for type 2 diabetes: real-life experience from a tertiary hospital. *Med J Aust* 2004; 181: 536-539.
7 Therapeutics Goods Administration. Potential safety risks with Celebrex. Media statement. 18 December 2004. Available at: http://www.tga.gov.au/media/2004/041220_celebrex.htm (accessed Jun 2005).
8 Burton B. Pfizer Australia is fined for misleading promotion of celecoxib. *BMJ* 2005; 330: 1230.
9 Therapeutic guidelines: antibiotic. Version 12. Melbourne: Therapeutic Guidelines Ltd, 2003.
10 Therapeutic guidelines: psychotropic. Version 5. Melbourne: Therapeutic Guidelines Ltd, 2003.
11 Prescribing benzodiazepines ... ongoing dilemma for the GP. *NPS News* 2002; No. 24. Available at: http://www.nps.org.au/resources/NPS_News/news24/news24.pdf (accessed Jun 2005).
12 Therapeutic guidelines. Melbourne: Therapeutic Guidelines Ltd, 2005.
13 Australian medicines handbook. Adelaide: Australian Medicines Handbook Pty Ltd, 2005.
14 Adverse Drug Reactions Advisory Committee. Australian adverse drug reactions bulletin. Canberra: Therapeutic Goods Administration, 2005. Available at: http://www.tga.gov.au/adr/aadrb.htm (accessed May 2005).
15 Hassali A, Stewart K. Quality use of generic medicine. *Aust Prescriber* 2004; 27: 80-81.
16 Gould-Hurst P. Quality use of generic medicine [letter]. *Aust Prescriber* 2005; 28: 30-31.
17 Medicines Australia. Code of Conduct Committee outcomes July–December 2004. Canberra: Medicines Australia Inc, 2005. Available at: http://www.medicinesaustralia.com.au/html/coc_full.asp (accessed May 2005).
18 Medicines Australia. Code of Conduct. Annual report 2004. Canberra: Medicines Australia Inc, 2004. Available at: http://www.medicinesaustralia.com.au/html/coc_full.asp (accessed May 2005).
19 Medicines Australia. Code of Conduct. Annual report 2003. Canberra: Medicines Australia Inc, 2003. Available at: http://www.medicinesaustralia.com.au/html/coc_full.asp (accessed May 2005).
20 Avorn J, Chen M, Hartley R. Scientific versus commercial sources of influence on the prescribing behaviour of physicians. *Am J Med* 1982; 3: 4-8.
21 Dowden J. Coax, COX and cola. *Med J Aust* 2003; 179: 397-398.
22 Australian Consumers' Association. Prescribing software (and poll). Sydney: Australian Consumers' Association, 2005. Available at: http://www.choice.com.au/viewArticle.aspx?id=104588&catId=100386&tid=100008&p=1 (accessed May 2005).
23 Profiting from pain: where prescription drug dollars go. Families USA Publication No. 02-105. Washington, DC: Families USA, 2002. Available at: http://www.familiesusa.org/site/DocServer/PPreport.pdf?docID=249 (accessed May 2005).
24 United Kingdom House of Commons Health Committee. The influence of the pharmaceutical industry. London: Stationery Office, 2005. Available at: http://www.publications.parliament.uk/pa/cm200405/cmselect/cmhealth/42/42.pdf (accessed May 2005).
25 de Laat E, Windmeijer F, Douven R. How does pharmaceutical marketing influence doctors' prescribing behaviour? The Hague: CPB Netherlands Bureau for Economic Policy Analysis, 2002. Available at: http://www.cpb.nl/nl/pub/bijzonder/38 (accessed May 2005).

(Received 12 Apr 2005, accepted 21 Jun 2005) ❑