



## Chiropractic claims in the English-speaking world

Edzard Ernst, Andrew Gilbey

### Abstract

**Background** Some chiropractors and their associations claim that chiropractic is effective for conditions that lack sound supporting evidence or scientific rationale. This study therefore sought to determine the frequency of World Wide Web claims of chiropractors and their associations to treat, asthma, headache/migraine, infant colic, colic, ear infection/earache/otitis media, neck pain, whiplash (not supported by sound evidence), and lower back pain (supported by some evidence).

**Methods** A review of 200 chiropractor websites and 9 chiropractic associations' World Wide Web claims in Australia, Canada, New Zealand, the United Kingdom, and the United States was conducted between 1 October 2008 and 26 November 2008. The outcome measure was claims (either direct or indirect) regarding the eight reviewed conditions, made in the context of chiropractic treatment.

**Results** We found evidence that 190 (95%) chiropractor websites made unsubstantiated claims regarding at least one of the conditions. When colic and infant colic data were collapsed into one heading, there was evidence that 76 (38%) chiropractor websites made unsubstantiated claims about all the conditions not supported by sound evidence. Fifty-six (28%) websites and 4 of the 9 (44%) associations made claims about lower back pain, whereas 179 (90%) websites and all 9 associations made unsubstantiated claims about headache/migraine. Unsubstantiated claims were made about asthma, ear infection/earache/otitis media, neck pain, whiplash in at least half of all chiropractor websites.

**Conclusions** The majority of chiropractors and their associations in the English-speaking world seem to make therapeutic claims that are not supported by sound evidence, whilst only 28% of chiropractor websites promote lower back pain, which is supported by some evidence. We suggest the ubiquity of the unsubstantiated claims constitutes an ethical and public health issue.

The *raison d'être* of chiropractic “is to enhance the natural healing abilities of the body by correcting a malfunction of the spine called a vertebral subluxation through adjustment”.<sup>1</sup> Chiropractic is advocated as being “much more than a way of seeking relief from back pain”,<sup>1</sup> “the third largest healthcare profession in the world”,<sup>2</sup> and “entering the healthcare mainstream”.<sup>3</sup>

The relationship between chiropractic and mainstream medicine has, at times, been somewhat uneasy. For example, Chiropractic's founder, DD Palmer, was once imprisoned for practising medicine without a licence in America<sup>4</sup>—and, in New Zealand in the 1970s, the medical profession argued that chiropractic is “an unproven treatment directed at an unlimited range of disorders”.<sup>5</sup> More recently, in a survey of chiropractic brochures provided by 9 national organisations in the United States and

Canada, all were found to have made “claims for chiropractic services that have not been scientifically validated”.<sup>6</sup>

Similarly, a survey of World Wide Web claims of chiropractic colleges in the United States and Canada found that 8 out of 16 made “unsubstantiated claims for the value of chiropractic clinical care”.<sup>7</sup> In response to a fictitious email enquiry sent to 13 New Zealand chiropractors, purportedly from a concerned parent about their child’s asthma and recurrent ear infection (conditions for which there is no sound evidence to support chiropractic interventions), 12 encouraged a consultation, 9 suggested that they could treat asthma, and 8 that they could treat ear infection.<sup>8</sup>

In a small pilot study of chiropractors’ claims in their World Wide Web websites, 9 of 10 United Kingdom clinics were found to have made unsubstantiated claims about the effectiveness of chiropractic.<sup>9</sup>

Criticisms regarding unsubstantiated claims have been raised even by Doctors of Chiropractic, two of whom suggested that those outside the chiropractic profession may interpret widespread unsubstantiated claims of effectiveness as “evidence of a lack of professionalism and of quackery” that have evolved within a “tradition of dogma, fallacious reasoning, and unconventional attitudes about research and science”.<sup>6</sup>

Contrarily, many chiropractic associations and practitioners believe chiropractic is essentially based in scientific principles and supported by research, the same as is orthodox medicine.<sup>10,11</sup> This debate may be of esoteric interest only, as chiropractic is clearly thriving irrespective of criticism.<sup>3,12</sup>

Although there is evidence that some chiropractic brochures, colleges, and phone advice make claims not supported by evidence,<sup>6,7,8</sup> apart from a small pilot-study of 10 UK chiropractors,<sup>9</sup> no studies have so far tested claims made or implied on chiropractors’ Websites, from which potential first-time users of chiropractic may seek information.

The purpose of the current study was therefore to investigate the websites of chiropractic associations and practitioners, in Australia, Canada, New Zealand, the United Kingdom, and the United States, regarding direct or indirect claims to treat seven conditions that are not supported by sound evidence from well-designed controlled trials: asthma, headache/migraine, infant colic, colic, ear infection/ache/otitis media, neck pain, and whiplash (Table 1). These conditions were chosen for investigation as from experience we were aware that they frequently appear in chiropractic literature, despite a lack of sound supporting evidence.

We accept that some studies purportedly demonstrate the effectiveness of chiropractic. However, when case studies, non-controlled, non-randomised, or non-peer reviewed studies were excluded, as they do not constitute quality evidence in any hierarchy of which we are aware, and systematic reviews or randomised control trials (if systematic reviews were not available) were consulted instead, we could find no evidence of chiropractic effectiveness for the seven conditions. Claims regarding lower back pain were also reviewed as evidence suggests it may respond to chiropractic spinal manipulations<sup>13</sup> and thus might reasonably be expected to be robustly promoted in chiropractors’ websites.

**Table 1. The best current evidence for conditions commonly referred to by chiropractors**

Condition	Type of evidence (ref)	Conclusions
Asthma	Cochrane review <sup>14</sup>	There is insufficient evidence to support the use of manual therapies for patients with asthma*
Back pain (lower)	Cochrane review <sup>13</sup>	No evidence that spinal manipulation is superior to other standard treatments for acute or chronic low back pain*
Colic	None found	No evidence
Infant Colic	Health Technology Report <sup>15</sup>	No convincing evidence*
Ear infection/ache/otitis media	Only a feasibility study is available <sup>16</sup>	No sound evidence
Headache/migraine	Systematic review <sup>17</sup>	...no rigorous evidence...*
Neck pain	Cochrane review <sup>18</sup>	...evidence did not favour spinal manipulation/mobilisation done alone...*
Whiplash	Systematic review <sup>19</sup>	No controlled clinical trials...*

\*Verbatim.

## Method

A search for chiropractors' websites and chiropractic associations on the World Wide Web was carried out between 1 October 2008 and 26 November 2008, using the internet search engine Google, with the appropriate domain extension for Australia, Canada, New Zealand, the United Kingdom, and the United States. The keywords, were 'chiropract\*' AND 'association', 'chiropract\*' AND 'organisation', 'chiropract\*' AND 'society', and 'chiropractor'.

All international and national associations and the first 40 chiropractors' websites returned for each country would form the sample for review. Sponsored links were not included, as these may be high profile practices with little in common with the average practice.

Our convenience sample was limited to 40 websites for each country as most chiropractors were clearly using one of two common templates for their websites and further data collection would therefore contribute little. We believe that a convenience sample is the best strategy for the current study as it would replicate the results of a World Wide Web based search by a member of the public seeking information about chiropractic; had we randomly sampled from a register of practitioners in each country, then we may have found websites not readily returned on a member of the public's search of the World Wide Web.

In the first 300 New Zealand search results, using the keyword 'chiropractor', 32 chiropractor websites were returned. To increase the New Zealand sample size, a second search using the keyword 'chiropractic' was conducted; as a result, 8 further chiropractor websites were returned. All reviewed materials were saved in both electronic and hard copy.

The material thus located was systematically checked by one author (AG) for evidence of claims regarding any of the above-named conditions. The criterion deemed sufficient to conclude evidence of a claim was that the condition would be mentioned by name on the website. Evidence would thus include direct claims (e.g. chiropractic may help with headaches) or indirect claims (e.g. conditions for which people consult chiropractors include headache).

If an association or advertisement mentioned a condition of interest as not suitable for chiropractic treatment (e.g. a person suspecting they had condition X should consult their general medical practitioner), then it would not be interpreted as an unsubstantiated claim. Whenever the phraseology used in the reviewed materials was ambiguous about a particular condition, we (EE & AG) classified the website or association as not making an unsubstantiated claim. Evidence of claims for other conditions was also noted in a non-systematic fashion if they seemed sufficiently extraordinary to be noted.

## Results

Two international and 7 national chiropractic associations were identified (see note 1 to Table 2 for names/countries of the associations). Chiropractic associations and chiropractors' claims (direct or indirect) about the 8 conditions are shown in Table 2.

**Table 2. Chiropractic association and chiropractor website claims regarding the eight conditions**

Condition	Associations that imply each condition helped by chiropractic <sup>1</sup>	Advertisements that imply conditions can be treated by chiropractic					Total N=200
		AUS n=40	CAN n=40	NZ n=40	USA n=40	UK n=40	
Asthma	ACA, BCA <sup>2</sup> , CCA, CPA, ICA	29	28	24	16	7	104 (52%)
Back pain (lower)	ACA, CAA, CCA, ICA	5	10	12	16	13	56 (28%)
Colic	BCA	27	25	21	12	13	98 (49%)
Infant colic	CCA, CPA	3	4	2	1	7	17 (9%)
Ear infection/ache/otitis media	ACA, BCA, CCA, ICA, WCA	30	28	22	16	14	110 (55%)
Headache/migraine	ACA, BCA, CAA, CCA, CPA, ICA, NZCA, UCA, WCA	36	39	31	34	39	179 (90%)
Neck pain	ACA, BCA, CCA, CAA, CPA, NZCA	37	39	24	32	37	169 (85%)
Whiplash	BCA, CCA	29	31	20	19	32	131 (66%)
	Total	196	204	156	146	162	

1. ACA = American Chiropractic Association (US), BCA=The British Chiropractic Association (UK), CAA=Chiropractors' Association of Australia (AUS), CCA=The Canadian Chiropractic Association (CAN), CPA=The Chiropractic Patients Association (UK), ICA=International Chiropractors Association (Int), NZCA=New Zealand Chiropractors' Association (NZ), UCA=The United Chiropractic Association (UK), WCA=World Chiropractic Alliance (Int).

2. The BCA refers to infant asthma, not asthma *per se*.

There was evidence that 190 (95%) chiropractor websites make unsubstantiated claims regarding at least one of the conditions. Only 56 (28%) chiropractor websites and 4 of the 9 (44%) associations appeared to explicitly mention lower back pain, although tentative evidence suggests it may respond to chiropractic manipulation,<sup>13</sup> whilst 179 (90%) websites and all 9 associations mentioned headache/migraine, which is not supported by sound evidence. When claims for colic and infant colic were collapsed into a single heading, 76 (38%) of chiropractor websites were found to make unsubstantiated claims about all the conditions for which there is a lack of sound supporting evidence.

There was evidence that some chiropractic associations make unsubstantiated claims about conditions outside the scope of this survey; for example, allergies, arthritis, immune system, longevity, osteoarthritis. There was also evidence that some chiropractor websites make unsubstantiated claims regarding conditions outside the scope of this survey; for example, attention deficit hyperactivity disorder, cancer, epilepsy, immune function, infertility. In the case of infertility, one chiropractor's website printed what we believe is the extraordinary claim of research showing that 14 of 15 women unable to conceive, some for up to 10 years, had given birth after beginning regular chiropractic care.

## Discussion

Our results provide evidence that the professional chiropractic organisations of Australia, Canada, New Zealand, the United Kingdom, and the United States make or imply therapeutic claims that are not backed up by sound scientific evidence. Perhaps as a consequence, many chiropractor websites of these countries follow suit.

Most healthcare professionals associate chiropractic with musculoskeletal problems. Yet, several of the conditions claimed to respond to treatment are clearly not musculoskeletal by nature (e.g., asthma, otitis, colic). One way to understand this finding is to consider it within the wider context of chiropractic history.

The birthday of chiropractic is said to be September 18, 1895. On this day, D. D. Palmer manipulated the spine of a deaf janitor allegedly curing him of his deafness.<sup>20</sup> Palmer's second patient, a man suffering from heart disease, was also claimed to be cured.<sup>21</sup> Following these early successes, Palmer articulated his theory of chiropractic, coining the term "innate intelligence" (or "innate") for the "energy" or "vital force" he believed to be the essence of life. The "innate" is said to regulate all body functions. The presence of a "vertebral subluxation" inhibits, according to Palmer, its flow. Chiropractic is "a system of healing based on the premise that the body requires unobstructed flow through the nervous system of...innate intelligence".<sup>22</sup>

Based upon this notion, chiropractors use spinal manipulations to correct subluxations to treat a very broad range of conditions: "95% of all diseases are caused by displaced vertebrae, the remainder by luxations of other joints".<sup>23</sup> Broadly similar to our findings, early chiropractic pamphlets hardly mention back pain or neck pain, but assert that, "chiropractic could address ailments such as insanity, sexual dysfunction, measles and influenza".<sup>24</sup>

More recently the chiropractic profession split into those aligned to Palmer's original teachings (the "straights") and those who also used treatments other than spinal manipulation and focussed on musculoskeletal problems (the "mixers"). For many years it seemed that the mixers dominated and chiropractors tended to fashion themselves as back pain specialists using many forms of non-pharmacological treatments. Now there is evidence that this process might be reversing. In 1991, hardly any UK chiropractors admitted treating conditions other than spinal problems.<sup>25</sup> In 2003, 69% of all UK chiropractors felt confident to treat visceral/organic conditions,<sup>26</sup> currently this figure stands at 74%.<sup>27</sup>

In the US, "nearly 80% of chiropractors teach a relationship between subluxation and internal health",<sup>28</sup> 88% of US chiropractors believe that subluxation contributes to

over 60 % of all visceral ailments and 90% feel that chiropractic treatments should not be limited to musculoskeletal conditions.<sup>29</sup> The American Chiropractic Association stresses that chiropractic care is not limited to back pain, neck pain or other musculoskeletal disorders,<sup>30</sup> and most chiropractic texts discuss spinal manipulation as a treatment for “visceral disorders”,<sup>e.g.31,32,33,34</sup> Based on the data presented here, the situation seems to be similar in the other English-speaking countries.

Unsubstantiated claims of the nature described above may put patients at risk and are simply at odds with the notion that chiropractic is in any way scientific. As evidence of these claims is so widespread, we suggest this amounts to a public health issue. If, for instance, a child suffering from severe asthma is treated with ineffective spinal manipulation instead of effective drug therapy, there is an increased chance that this patient’s life might be lost. In this context, one must, of course, also consider the direct risks of spinal manipulation, which evidence suggests may be considerable<sup>35,36,37</sup> (although it is noted that orthodox medicine is by no means free of risk<sup>38</sup>).

A survey of UK chiropractors shows that 90% of them believe they support evidence-based practice principles,<sup>39</sup> and their code of ethics states that “chiropractor’s provisions of care must be evidence-based...”.<sup>40</sup> The data summarized above suggest that chiropractors fail to abide by their own rules, although we suspect this is not intentionally but due to the paucity of science in their curriculum.

The same code of ethics also regulates chiropractor’s advertising and provides that “the information used must be factual and verifiable. The information must not be misleading or inaccurate in any way.”<sup>40</sup> The ethical guidelines in Canada, New Zealand, and the United States are similar, but the Chiropractors’ Association of Australia does not appear to prescribe guidelines for advertisements. Claims such as those disclosed here in chiropractors’ websites, in our view, violate the most fundamental rules of medical ethics: beneficence, non-maleficence and autonomy.<sup>41</sup> This has further important practical implications; for instance, informed consent is not a realistic possibility if it is given based on misleading information.<sup>42</sup>

Our analyses have some important limitations. Web-based information can only generate an indirect picture of what might happen in actual clinical practice, even although it may be the first place that potential patients may use. However, more direct ways to ascertain such information seem to confirm the bleak impression gained by our surveys: direct questioning of chiropractors, for instance, revealed that the advice issued by them is frequently not responsible. New Zealand and UK chiropractors have been shown to recommend chiropractic for childhood asthma,<sup>8,43</sup> Canadian chiropractors have recommended treatment for an 11 year old female assessed as healthy by an experienced paediatric orthopaedic surgeon,<sup>37</sup> and many UK chiropractors advise parents against immunisation of their children.<sup>43</sup>

Future research in this area should seek to explore differences in the degree to which the practices of “mixers” and “straights” are successful; that is, does claiming to treat conditions that are clearly not of musculoskeletal origin lead to a more successful practice; for example, in number of consultations and financial remuneration. The extent to which chiropractor websites make unsubstantiated claims could also be explored in relation to length of time since graduating in chiropractic, as new

graduates are more likely to believe their scope of practice extends beyond the treatment of back, head, and neck pain.<sup>37</sup>

Finally, the healthcare community at large might investigate ways of minimizing the risk to patients caused by unsubstantiated claims, particularly insofar as patients may delay or fail to seek out orthodox care.

In conclusion, we have presented evidence that many of the direct or indirect claims made by chiropractors and their organisations around the world are not supported by current sound evidence. This, we feel, raises important issues and may even put lives at risk. We therefore urge the chiropractic community to address this situation adequately and urgently.

**Competing interests:** None known.

**Author information:** Edzard Ernst, Director, Complementary Medicine, Peninsula Medical School, University of Exeter, Exeter, England; Andrew Gilbey, Lecturer, College of Business, Massey University (Turitea Campus), Palmerston North, New Zealand

**Correspondence:** Andrew Gilbey, College of Business, Massey University, Private Bag 11 222, Palmerston North, New Zealand. Email: [a.p.gilbey@massey.ac.nz](mailto:a.p.gilbey@massey.ac.nz)

#### References:

1. New Zealand Chiropractor's Association. Frequently asked questions: Do I still need to see a chiropractor if there is no pain? <http://www.chiropractic.org.nz/frequently-asked-questions> Accessed 1 December 2008.
2. Roughan S. Setting the record straight: New Zealand Chiropractors' Association response. *N Z Med J.* 2008;121(1280):72–73. <http://www.nzma.org.nz/journal/121-1280/3222/content.pdf>
3. Meeker WC, Haldeman S. Chiropractic: A profession at the crossroads of mainstream and alternative medicine. *Ann Intern Med.* 2002;(136):216–27.
4. Kremer R. Strength in diversity: Professional and legislative opportunities in primary care by the recognition, defining and promotion of the licensure of chiropractic medical education, competencies and skills. *J Chiropr Med.* 2002;1(4):139–148.
5. Dew, K. Apostasy to orthodoxy: debates before a commission of inquiry into chiropractic. *Sociol Health Illn.* 2002;22(3):1310–1330.
6. Grod JP, Sikorski D, Keating JC. Unsubstantiated claims in patient brochures from the largest state, provincial and national chiropractic associations and research agencies. *J Manipulative Physiol Ther.* 2001;24:514–9.
7. Sikorski D, Grod JP. (2003). The Unsubstantiated Web Site Claims of Chiropractic Colleges in Canada and the United States. *J Chiropr Educ.* 2003;17(2):113–119.
8. Holt S. The responses of alternative practitioners when approached about common childhood illnesses. *N Z Med J.* 2008;121(1283):114–116.
9. Ernst E. The ethics of chiropractic. *N Z Med J.* 2008;(121)1281:96.
10. Roughan S. Colquhoun's opinion versus science—a response from the New Zealand Chiropractors' Association. *N Z Med J.* 2008;121(1281):99–101.
11. The Canadian Chiropractic Association. Chiropractic Health Care Commission – Manitoba. <http://www.ccachiro.org/client/cca/cca.nsf/web/A667B070372C0BCA85256D3600559607?OpenDocument> Accessed 21 January 2009.
12. Cooper RA, Laud P, Craig L, Dietrich CL. Current and Projected Workforce of Nonphysician Clinicians *JAMA.* 1998;280:788–794.

13. Assendelft WJJ, Morton SC, Yu EI, et al. Spinal manipulative therapy for low-back pain. *Cochrane Database of Systematic Reviews* 2004, Issue 1. Art. No.: CD000447. DOI: 10.1002/14651858.CD000447.pub2.
14. Hondras MA, Linde K, Jones AP. Manual therapy for asthma. *Cochrane Database of Systematic Reviews* 2005, Issue 2. Art. No.: CD001002. DOI: 10.1002/14651858.CD001002.pub2.
15. Husereau D, Clifford T, Aker P, et al. Spinal manipulation for infantile colic. *Canadian Coordinating Office for Health Technology Assessment* 2003; (Technology report no 42).
16. Sawyer CE, Evans RL, Boline PD, et al. A feasibility study of chiropractic spinal manipulation versus sham spinal manipulation for chronic otitis media with effusion in children. *J Manip Physiol Ther* 1999;22(5):292–267.
17. Fernandez-de-Las-Penas C, Alonso-Blanco C, Cuadrodo ML. Are manual therapies effective in reducing pain from tension-type headache?: A systematic review. *Clin J Pain*. 2006;22(3):278–285.
18. Gross A, Hoving JL, Haines T, et al. Manipulation and mobilisation for mechanical neck disorders. *Cochrane Database of Systematic Reviews* 2004, Issue 1. Art. No.: CD004249. DOI: 10.1002/14651858.CD004249.pub2.
19. Ernst E. Chiropractic spinal manipulation for whiplash injury? A systematic review of controlled clinical trials. *FACT*. 2009;2:85–86.
20. Wardwell W. History and evolution of a new profession. St. Louis, MO. Mosby-Yearbook; 1992.
21. DeVocht JW. History and overview of theories and methods of chiropractic: a counterpoint. *Clin Orthop Relat Res*. 2006;444:243–249.
22. Martin SC. The only truly scientific method of healing. *Chiropractic and American Science* 1895-1990.1994;85:207–227.
23. Homola S. Bonesetting, chiropractic and cultism. Panama City, FL: Critique Books; 1963.
24. Palmer BJ. Chiropractic proofs. Davenport, Iowa; 1903.
25. Pedersen P. A survey of chiropractic practice in Europe. *Europ J Chiropractic*. 1994;42:3–28.
26. Wilson FJH. A survey of chiropractors in the United Kingdom. *Eur J Chiropract*. 2003;50:185–198.
27. Pollentier A, Langworthy JM. The scope of chiropractic practice: a survey of chiropractors in the UK. *Clin Chiropractic*. 2007;10:147–155.
28. Chiropractic News Digest 2003, June 11, <http://www.chirobase.org/18CND/03/03-02.html> Accessed 3 December 2008.
29. McDonald W, Durkin K, Iseman S, et al. How Chiropractors Think and Practice. Ada, OH; Institute for Social; Research, Ohio University; 2003.
30. American Chiropractic Association. About chiropractic. [http://www.amerchiro.org/level2\\_css.cfm?t1id=13&t2id=61](http://www.amerchiro.org/level2_css.cfm?t1id=13&t2id=61) Accessed 3 December 2008.
31. Redwood D. Chiropractic. In Micozzi MS, ed. *Fundamentals of complementary and integrative medicine*. (3rd Edition). St Louis: Elsevier; 2006.
32. Gay RE. Chiropractic. In Yuan CS, Bibber EJ, Brent AB. eds. *Textbook of complementary and alternative medicine*. 2nd ed. Abingdon: Informa Healthcare; 2006.
33. Wiles MR. Visceral disorders related to the spine. In: Gatterman MI, ed. *Chiropractic management of spine-related disorders*. Baltimore: Williams & Wilkins; 1990;379–96.
34. Swenson RS. Clinical investigation of reflex function. In: Haldeman S. ed. *The modern developments in the principles and practice of chiropractic*. 2nd ed. rev. Norwalk, CT: Appleton Century Crofts. 1992;105–14.
35. Ernst E. Adverse effects of spinal manipulation: a systematic review. *J R Soc Med*. 2007;100:330–8.
36. Rubinstein SM, Leboeff-Yde C, Knol DL, et al. Predictors of adverse events following chiropractic care for patients with neck pain. *J Manip Phys Ther*. 2008;31:94–103.

37. Benedetti P, MacPhail W. Spin doctors: The chiropractic industry under examination. Toronto, Ontario: Dundurn Press; 2002.
38. Helmreich RL (2000). On error management: lessons from aviation. *BMJ* 2000;320: 781–785.
39. General Chiropractic Council. Consulting the profession: A survey of UK chiropractors. [http://www.gcc-uk.org/files/link\\_file/ConsultTheProfession.pdf](http://www.gcc-uk.org/files/link_file/ConsultTheProfession.pdf) Accessed 1 December 2008.
40. General Chiropractic Council. Code of Practice and Standard of Proficiency. [http://www.gcc-uk.org/files/link\\_file/COPSOP\\_8Dec05.pdf](http://www.gcc-uk.org/files/link_file/COPSOP_8Dec05.pdf) Accessed 1 December 2008.
41. Fisher F. Medical ethics today: its practice and philosophy. London, England: British Medical Association; 1993.
42. Ernst E, Cohen M. Informed consent in complementary and alternative medicine. *Arch Intern Med.* 2001;161:2288–92.
43. Schmidt K, Ernst E. Letter to the Editor: Are asthma sufferers at risk when consulting chiropractors over the Internet? *Respiratory Med.* 2003;97:104–5.
44. Schmidt K, Ernst E. MMR vaccination advice over the Internet. *Vaccine.* 2003;21:1044–7.