

Attitude, awareness and practice of evidence based medicine among consultant physicians in Western region of Saudi Arabia

Fahad K. Al-Omari, SSC-FM, ABFM, Saeed M. Al-Asmary, FFCM, FSO.

ABSTRACT

Objectives: To assess the awareness, attitude and practice of evidence base medicine (EBM) among Al-Taif Consultant Physicians and to define the perceived barriers for practicing EBM.

Methods: It is a cross-sectional study conducted during December, 2004, at all governmental hospitals in Western region of Saudi Arabia at Al-Taif Governorate. Two hundred and eight self administrated questionnaires had been distributed to all consultant physicians in different specialties who met the inclusions criteria for this study.

Result: The response rate was 85.5% of more than 16 different specialties involved in this study with different types of qualifications. The internal consistency reliability coefficient (Cronbach's alpha), that measures current attitude, was 0.76. The majority of respondents had a positive attitude toward EBM; 97% were welcoming EBM, 48% of participants reported regular use of EBM in their daily clinical practice, 42% sometimes and 9% never practice EBM. No distributed updated clinical letters, journals or

guidelines was considered as the major barrier to practice EBM (60.3%), followed by no time available (31%) and then unavailability of internet access at locality (24%). Many of the respondents did not engage or receive formal training in the search strategy (59.3%), critical appraisal (54.8%) and (92%) would like to attend courses relevant in practicing EBM in the future ($p < 0.05$). Participants reported a low level of awareness to extracting journals, review publication and databases related to EBM.

Conclusions: Al-Taif Consultant Physicians appeared enthusiastic to utilize EBM in daily clinical practice with strong welcoming attitude to it; nevertheless, they need more knowledge and training on how to review publications, databases related to EBM and promote use of EBM in routine practice to be ensured that physicians have both the skills and knowledge to practice.

Saudi Med J 2006; Vol. 27 (12): 1887-1893

Evidence based medicine (EBM) remains a hot topic among health care providers and any observer can see that physician's attitudes towards utilizing EBM in their practice vary widely. Evidence based medicine is defined as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.¹ Doctors need to know about the studies that

show whether new ideas will work but their volume has grown enormously. What's more? Many are published in inaccessible places are not published at all, or are seriously flawed.² Evidence based medicine established its place as an important contributor to the methodological toolbox for health services research.^{3,4} Different studies demonstrate that physician's barriers to increase use of EBM were different from one

From the Department of Family Medicine, Al-Hada Military Hospital, Al-Taif, Kingdom of Saudi Arabia.

Received 11th May 2006. Accepted for publication in final form 29th July 2006.

Address correspondence and reprint request to: Dr. Fahad K. Al-Omari, Department of Family Medicine, Al-Hada Military Hospital, PO Box 7035, Al-Taif, Kingdom of Saudi Arabia. Tel. +966 555516008. Fax. +966 (2) 7543112. E-mail: dromari2003@yahoo.com

specialty to another, but the most important barrier appears to be lack of knowledge and familiarity with the basic skills in practicing EBM.⁵⁻⁷ Evidence based medicine being as one organ in relation to many others making their contribution to the body of knowledge needed for clinical decisions and policy making.^{4,8} Developing the ability to access information from the medical literature, critically appraising and applying it to patient care, requires skills that need to be taught. Despite of the ongoing challenges, learning and teaching EBM had never been easier and each year brings new and better tools to help practitioners and educators to use the best available evidence.^{9,10} Most of the studies conducted all over the world demonstrate General Practitioners and Family Physicians attitude toward EBM, consequently we find that Family Physicians and General Practitioners have a positive attitude toward EBM and believe that it improves patient care.¹¹⁻¹³ Few studies have been conducted to know physician's knowledge and attitude in other specialties; those studies revealed that physicians had a higher level of interest to incorporate EBM into their practice; however, they were enthusiastic and expressed a desire to find more information about EBM.^{6,7,14} Teaching EBM should be moved from classroom to clinical practice to achieve meaningful improvement of knowledge and skills.^{15,16} In Saudi Arabia, studies conducted about EBM addressed attitude of Primary Care Physicians towards it;^{17,18} however, only few exposes if any study has been carried out about the reaction of consultant physicians in different specialties towards EBM, skills and support necessary to incorporate EBM into their everyday practice. For the above reasons, it was decided to do this study to know the awareness and attitude of the consultant physicians in Al-Taif Governorate towards EBM and their skills to incorporate EBM into their daily practice.

Methods. This is a cross-sectional study conducted during December 2004 at Al-Taif Governorate in Western region of Saudi Arabia. There were 9 major government hospitals in Al-Taif and approximately 300 consultant physicians are working in these hospitals. This study was conducted at the following hospitals: Al-Hada Armed Forces Hospital, King Faisal General Hospital, King Abdul Aziz Specialist Hospital, Prince Sultan's Hospital, Prince Mansour's Hospital, Children's Hospital, Rehabilitation Center, Chest Diseases Hospital and Mental Health Hospital.

This study include all consultant physicians in different specialties who are practicing medicine during the study period and on a permanent job in any governmental hospital in Al-Taif Governorate,

and we exclude any consultant who is not practicing medicine, not present at time of the study, a visitor consultant or refusing to participate in this study. A modified self-administrated questionnaire from McColl¹¹ and Al-Ansary¹⁷ study was used. The questionnaire recorded the demographic data such as specialty age, gender, date of graduation from medical school, title of qualification and number of years since post graduate qualification. It also demonstrate if the participants incorporate EBM in their daily practice or not and views on the major barriers to practice. This study covers many outcome variables including respondent's attitudes towards EBM, ability to access and interpret evidence and the best method of moving from opinion-based medicine to EBM. Closed questions were used to assess awareness, perceived, usefulness of extracting journals, review publications, databases relevant to EBM, the ability to access Medline or other bibliographic databases and their understanding of technical terms considering EBM. Every questionnaire preserved in an envelop and numbered with the same number of the questionnaire. (The numbering was just to help the researcher in distribution and collection of the questionnaire). On the 10th of December 2004; the questionnaires were distributed to all Practicing Consultant Physicians including all Specialties who met the criteria of inclusion in each governmental hospital in Al-Taif Governorate. The distribution was conducted by the researcher himself either by meeting the consultant individually, which is the most frequent manner used or by meeting them during daily morning meeting with emphasis on confidentiality and anonymity. The filled questionnaires were collected in the same manner.

The data were collected and verified by hand, then coded before entry to computer. Statistical Package for Social Sciences software version 11.5 was used and a double entry method was also used to decrease data entry error. Once the data entry completed, the data were analyzed by using Chi square and other appropriate statistical tests for non-continuous variables and other appropriate tests were used. Anyhow, a pilot study was conducted at King Khaled Hospital in Jeddah Governorate. Twenty consultants were involved, 10 were from Internal Medicine, 5 were Surgeons and the remaining were Family Medicine Consultants. The pilot study led to some modifications of the questionnaire and adaptation.

Results. Two hundred and eight questionnaires have been distributed and the total number of respondents were 178, giving a response rate of 85.5%. One questionnaire was excluded from the analysis

because it was severely deficient. The mean age of participants in this study was 45.7 ± 6 years, the mean year since postgraduate qualification was 11 ± 7 years. Non-Saudi consultant physicians constitute 77.4%, and males represent the majority 91%. Regarding the participants specialties there were >16 specialties (for the sake of simplicity of analysis these specialties were grouped to 5 major ramifications of medicine) with >10 different postgraduate qualifications as reported by participants. To assess the current attitude towards EBM, 5 questions have been used, higher scores indicate more positive attitude. Scores on each of the 5 questions were summed to measure the current attitude. The internal consistency reliability coefficient (Cronbach's Alpha) of the above questions, measuring current attitude was 0.76. Generally the majority of the respondents had a positive attitude toward EBM (89% and 9.6%) were welcoming (89%) and extremely welcoming EBM. The current promotion of EBM was welcomed (97%) by all participants. **Table 1** summarizes the participant's current attitude toward EBM. Many of participants (85 [48%]) reported that they are incorporating EBM in their daily practice, 75 (42%) mentioned they are doing it sometimes and the remaining they do not incorporate EBM in their daily practice. Gender, nationality, or specialty had no significant effect on the incorporation of EBM in their daily practice (**Table 2**). Most of consultants (105 [60.3%]) mentioned that no distributed updated clinical letters, journals or guidelines as a main barrier, no personal time available was considered as the second major barrier by 55 (31.3%) participants. While only 42 (24%) of the participants thought that the main barrier is the unavailability of internet access or no computer at locality with other factors. Regarding the frequency of using Medline and other databases for literature searching during the last year, 62 (46%) participants used literature searching only from 1-30 times during the last year, accordingly they are considered as poor users, 32 (24%) considered as good users as they used Medline and other bibliographic databases for literature searching from 91-180 times during the last year and only 9% of the participants considered as very frequent user because they used Medline and other bibliographic database during the last year >180 times as they reported. Many of respondents (105 [59.3%]) reported that they did not engage or received formal training in search strategy with statistically significant difference in different specialties, ($\chi=12.3$ degree of freedom: 5, $p=0.03$). Ninety-seven (54.8%) also did not receive formal training in critical appraisal, only 64 (36%) attended courses related to EBM. However, the majority of

respondents (163 [92%]) reported that they would like to attend courses relevant for practicing EBM in the future. Fifty-five percent of Saudi Consultant Physicians attended courses related to EBM compared to 31% of Non-Saudi. The difference was statistically significant ($\chi=7.9$, degree of freedom: 0.2, $p=0.005$). However, 51 (28.8%) of the participants mentioned that the most appropriate method to move from opinion based to EBP was by learning the skills of EBM, also, 44 (24.9%) of participants mentioned the above method with others methods such as seeking and applying EBM summaries or by using

Table 1 - Current attitude towards evidence base medicine (EBM).

Items	Number of physician (%)	
<i>Current attitude towards the current promotion of EBM</i>		
Extremely welcoming	75	(42.4)
Welcoming	97	(54.8)
Unwelcoming	4	(2.3)
Extremely unwelcoming	1	(0.6)
<i>Attitude of most of consultant colleagues towards EBM</i>		
Extremely welcoming	16	(9)
Welcoming	142	(80.2)
Unwelcoming	19	(10.7)
<i>Usefulness of research finding in daily Patients' management</i>		
Extremely useful	42	(23.7)
Useful	130	(73.4)
Useless	3	(1.7)
Extremely useless	2	(1.1)
<i>Percentage of clinical practice is currently evidence-based</i>		
<25	22	(12.5)
26-50	37	(21)
51-75	68	(38.6)
>75	49	(27.8)
<i>Practicing EBM improve patient care</i>		
Strongly agree	96	(54.2)
Agree	76	(42.9)
Disagree	5	(2.8)
<i>EBM is of limited value in practice because much of consultants lack of scientific base</i>		
Strongly disagree	28	(15.8)
Disagree	97	(54.8)
Agree	46	(26)
Strongly agree	6	(3.4)
<i>General attitude</i>		
Extremely welcoming	17	(9.6)
Welcoming	155	(87.6)
Unwelcoming	5	(2.8)

Table 2 - Incorporation of evidence base medicine (EBM) in daily practice by gender, nationality and specialty of participants.

Parameters	Do you incorporate EBM in your daily practice?								P-value
	Yes		No		Sometime		Total		
	n	(%)	n	(%)	n	(%)	n	(%)	
Gender									0.15
Males	77	(48.4)	13	(8.2)	69	(43.4)	159	(100)	
Females	8	(44.4)	4	(22.2)	6	(33.3)	18	(100)	
Nationality									0.22
Saudi	21	(52.5)	1	(2.5)	18	(45)	40	(100)	
Non-Saudi	64	(46.7)	16	(11.7)	57	(41.6)	137	(100)	
Specialty									0.9
Surgery	28	(47.5)	8	(13.6)	23	(39)	59	(100)	
Medicine	28	(50.9)	4	(7.3)	23	(41.8)	55	(100)	
Pediatric	8	(38.1)	2	(9.5)	11	(52.4)	21	(100)	
Obstetrics/Gynecology	9	(56.3)	2	(12.5)	5	(31.3)	16	(100)	
Family Medicine	4	(50)			4	(50)	8	(100)	
Others	8	(44.4)	1	(5.6)	9	(50)	18	(100)	

EBP guidelines or protocols. In general, participants have a low level of awareness of journals, review publication and databases related to EBM (Table 3). Saudi Consultant Physicians were more aware of Ovid evidence based medicine reviews and use it more frequently than Non-Saudi. This difference was statistically significant ($\chi= 10.9$, degree of freedom: 3, $p=0.012$). Many of the respondents had some understanding of the technical terms used in EBM; however, there are statistically significant differences between understanding technical terms used in EBM and different specialties. All family medicine consultant physicians reported that they understood and could explain technical terms related to EBM and there are significant differences between them and other consultants from other different specialties in understanding and explain technical terms (Table 4).

Discussion. Consultant Physicians are the planner in the managements of their patients and are trainer and motivators for their resident physicians towards learning and practicing EBM. Response rate of 85.5%, which is considered as a good response rate of questionnaire survey in comparison with other studies.^{5,11} This is because most of the participants were keen to cooperate and enthusiastic to EBM and the proper distribution and collections of questionnaires play an important role. As expected, the majority of the respondents of Al-Taif Consultant Physicians had a welcoming attitude

toward EBM which is a good sign of promoting the use of EBM in the clinical practice to improve patient management. Compared to other studies, 97.2% of respondents have a welcoming attitude to EBM, which is higher than those in Australia (82.7%),⁷ and other studies on attitude of Primary Care Physicians and General Practitioners towards EBM, In UK¹¹ most of the respondents were welcoming toward the current promotion of EBM (50%), also in the Riyadh region¹⁷ (60%), and Eastern Saudi Arabia.¹⁸ Other reviews have suggested that EBM is less relevant to general practice than other specialties because it mainly addresses the biomedical perspective of diagnosis from a doctor centered paradigm.^{19,20} The higher percentage found in this study sample may be because they are more aware about EBM especially all of them were consultants; however, this difference may also be related to difference in specialties. Another explanation could be due to the growing interest and activities related to EBM interest locally and worldwide. In spite of that, only 48% of them incorporate it in daily clinical practice and 9.6% were not practicing it as they reported. In this regard, it is interesting to compare our results with McAlister study,⁷ they found 33.11% participants were always using EBM in clinical practice and 8.3% of them never use it which indicates that most physicians are not actually skeptical about the value and concept of EBM, but its application to routine practice is constrained by certain barriers. However, different

Table 3 - Awareness of databases relevant to evidence based medicine (EBM) as reported by participants

Databases	Unaware		Aware but not used		Read		Used*	
	n	(%)	n	(%)	n	(%)	n	(%)
Evidence-based medicine (from the BMJ publishing group)	51	(29)	42	(24)	52	(30)	29	(17)
Effective health care bulletins (from York)	108	(65)	46	(28)	12	(7)	1	(0.6)
Cochrane database of systematic reviews (part of Cochrane library)	70	(41)	51	(30)	27	(15)	22	(13)
Database of abstracts of reviews of effectiveness (DARE) (another part of Cochrane library)	100	(59)	43	(25)	17	(10)	9	(5.3)
Best evidence (database of ACP Journal Club + evidence based medicine)	90	(54)	52	(31)	14	(8)	12	(7)
Ovid evidence based medicine reviews	81	(48)	51	(30)	23	(13.6)	14	(8.3)
Other EBM web sites (Internet)	40	(23)	23	(13)	68	(40)	38	(22)

*Used to help in clinical decision making.

Table 4 - Understanding technical terms related to evidence based medicine (EBM) according to specialty.

Speciality	Technical terms					
	Relative risk	Absolute risk	Odds ratio	Confidence interval	Systematic review	Meta analysis
Medicine (%)	45	54.5	23.6	32.7	50.9	43.6
Surgery (%)	33	45.8	10.2	13.6	35.6	28.8
Obstetrics/Gynecology (%)	68	68.8	43.8	37.5	62.5	81.3
Pediatric (%)	28	28.6	33.3	25.0	47.6	33.3
Family Medicine (%)	100	87.5	75.0	100.0	87.5	87.5
Others (%)	50	38.9	38.9	38.9	38.9	38.9

studies demonstrated barriers to practice EBM. Igbal¹⁴ found that the main barrier to practice is general dental practitioners was lack of available time which was the main barrier to general practitioners (36.3%) according to McColl et al¹¹ study. McAlister⁶ found that the main barrier of practicing EBM is the lack of relevant evidence (26%) and newness of the concept (25%), which is not addressed in this study. Al-Taif Consultant Physicians identified the major barrier of practicing EBM is the unavailability of updated clinical letters, journals or guidelines (60.3%), while lack of time was the second major barrier of practicing it. However, patients over-load possibly would also be translated into lack of time. Consultant physicians have less patient overload compared to

primary care physicians. There are many ways of increasing the time available for practicing EBM, this time could be spent more efficiently by changing the emphasis of postgraduate education away from lectures and towards training in accessing and interpreting evidence and then spending time putting these skills into practice.²¹ Unavailability of internet access or computer facilities was the third barrier as reported; accordingly most of EBM resources now are electronic which reflects the low level of awareness and skills in searching and appraisal during practicing EBM.²² The largest proportion was >50% of the participants chose learning the skills of EBM namely to identify and appraise the primary literature or systemic reviews oneself as the appropriate method

to move from opinion based to EBM either in current using in practice or in the future use, also this method was chosen as the best in Riyadh region (42.6%)¹⁷ and (57%) in UK¹¹ thought that the best method was by using evidence based guidelines or protocols developed by colleagues for use by others, which contradistinguish our findings. Higher percentage of participants has not received formal training in search strategy, critical appraisal and not attended courses in EBM could be explained by low numbers of courses related to EBM in Al-Taif Province. Nevertheless, the majority of them like to attend a course in EBM in the future. However, this results are similar to Veness et al,⁷ which found the majority (70.2%) of respondents never had attended an EBM course, most indicated interest in such training and also Al-Ansary and Khoja¹⁷ study. There are variations between different specialties in training relevant to EBM, for example all family consultant physicians had formal training in critical appraisal and this is statistically significant and most of them had a formal training in search strategy and attended courses related to EBM. Critical appraisal and search strategy are of the requirements of post graduate qualifications for family physicians. Several randomized and non-randomized studies have evaluated the effects of teaching EBM to postgraduates. Both standalone courses and integrated teaching improve knowledge.¹⁶ Participants had low level of awareness of review publications and databases relevant to EBM, only few make use of them in clinical decision making. However, this result is similar to results found in other studies.^{6,7,11,17} According to the practical definition of EBM, the practice of EBM involves integrating individual clinical expertise with the best available external clinical evidence from systematic research. So, without using current best evidence from their sources, physicians will be at risk of being out-dated in practical management of patients. Because, all Family Medicine consultant physicians had received formal training in critical appraisal; thus, they were more comfortable to understand the technical terms related to EBM than other consultant physicians in other specialties. However, in Riyadh region¹⁷ only 2.3% of the participants attended the courses in critical appraisal so some of them reported poor understanding of technical terms related to EBM. The ability to understand and interpret technical terms is a key element in practicing EBM and poorly understanding these terms would hamper interpretation of evidence and make it more difficult.

In conclusion, Al-Taif consultant physicians of more than 16 different medical specialties almost

show welcoming attitude toward EBM, many of them incorporate it in their daily practice. No distributed updated clinical, letters, journals or guidelines were mentioned as the major barrier to practice EBM while lack of personal time as the second barrier. Many of them were considered as poor users for Medline and other bibliographic databases for literature searching during the last year. There is a statistically significant difference between consultant physicians of different specialties who received formal training in critical appraisal of published literature, furthermore there is statistically significant difference between Saudi and Non-Saudi Consultant Physicians attending previous courses related to EBM, despite that the majority of respondents would like to attend courses relevant to practice EBM. A positive attitude of participants toward EBM have shown low level of awareness of journals, review publication and other databases related to EBM, besides that there is statistically significant difference between consultant physicians of different specialties comprehending the technical terms related to EBM. Subsequently our recommendations were to increase the awareness towards EBM to all members of medical teams including higher medical authorities to provide good media for learning and practicing EBM. Conversely, Saudi Council for Health Specialties already decided to incorporate EBM (training and practicing) for all residents in any training program, which is excellent step but need more encouragement, activation and evaluations. Providing Modern Medical Library in each hospital with liberal access to the internet is becoming a necessity for the current modern practice. Providing physicians with updated clinical letters, journals and guidelines is needed to implement EBM in routine practice and good time management is highly recommended as each physician should have own special educational time. Organizing courses to increase knowledge and train physicians in research methodology, critical appraisal and other skills of EBM by other consultants who are already accomplished EBM as a practical method in the medical community. Further, research is recommended to assess knowledge of EBM in all clinical practical sitting including nursing practice and to assess any improvement achieved.

Acknowledgment. The authors would like to thank Drs. Abdulsalam Al-Shehri, Baker bin Sadeq, Abdulhameed Hassan, Lubna Al-Ansary and Tarik Al-Saeed for their advice and support. We would like also to thank all the respondent consultant physicians in Al-Taif Governate who spared their valuable time to answer the questionnaires; also extend our thanks to the pilot test participants in King Khaled Hospital, Jeddah Governate, Jeddah, Kingdom of Saudi Arabia.

References

1. Sackett DL, Rosenberg WMC, Gray JAM, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ* 1996; 312:71-72
2. Davidoff F, Haynes B, Sackett D, Smith R. Evidence based medicine: a new journal to help doctors identify the information they need. *BMJ* 1995; 310: 1085-1086.
3. Gordon G, Drummond R. Users Guides To The Medical Literature: A Manual for Evidence Based Clinical Practice. United States: American Medical Association; 2002.
4. McDonald IG, Daly JM. The anatomy and relations of evidence-based medicine. *Aust N Z J Med* 2000; 30: 385-392.
5. Scott I, Heyworth R, Fairweather P. The use of evidence-based medicine in the practice of consultant physicians. Results of a questionnaire survey. *Aust N Z J Med* 2000; 30: 319-326.
6. McAlister FA, Graham I, Karr GW, Laupacis A. Evidence-Based-Medicine and the Practicing Clinician. *Journal of General Internal Medicine* 1999; 14: 236.
7. Veness M, Rikard-Bell G, Ward J. Views of Australian and New Zealand radiation oncologists and registrars about evidence-based medicine and their access to Internet based sources of evidence. *Australas Radiol* 2003; 47: 409-415.
8. Kerridge I, Lowe M, Henry D. Ethics and evidence based medicine. *BMJ* 1998; 316: 1151-1153.
9. Bradt P, Moyer V. How to teach evidence-based medicine. *Clint Perinatol* 2003; 30: 419-433.
10. Moawad MA. Physician attitudes toward evidence-based medicine: is there room for improvement? *Ann Saudi Med* 2004; 24: 423-424.
11. McColl A, Smith H, White P, Field J. General practitioner's perceptions of the route to evidence based medicine: a questionnaire survey. *BMJ* 1998; 316: 361-365.
12. Freeman AC, Sweeney K. Why general practitioners do not implement evidence: qualitative study. *BMJ* 2001; 323: 1100.
13. Tracy CS, Dantas GC, Upshur REG. Evidence-based medicine in primary care: qualitative study of family physicians. *BMC Family Practice* 2003; 4: 6.
14. Igbal A, Glennly AM. General dental practitioners' knowledge of and attitude towards evidence based practice. *Br Dent J* 2002; 193: 587-591.
15. Fritsche L, Greenhalgh T, Falck-Ytter Y, Neumayer HH, Kunz R. Do short courses in evidence based medicine improve knowledge and skills? Validation of Berlin questionnaire and before and after study of courses in evidence based medicine. *BMJ* 2002; 325: 1338-1341.
16. Coomarasamy A, Khan KS. What is the evidence that postgraduate teaching in evidence based medicine changes anything? A systematic review. *BMJ* 2004; 329: 1017.
17. Al-Ansary LA, Khoja TA. The place of evidence-based medicine among primary health care physicians in Riyadh region, Saudi Arabia. *Fam Pract* 2002; 19: 537-542.
18. Al-Baghlie N, Al-Almaie SM. Physician attitudes towards evidence-based medicine in eastern Saudi Arabia. *Ann Saudi Med* 2004; 24: 425-428.
19. Jacobson LD, Edwards AGK, Granier SK, Butler CC. Evidence based medicine and general practice. *Br J Gen Pract* 1997; 47: 449-452.
20. MacAuley D. The integration of evidence based medicine and personal care in family practice. *Ir J Med Sci* 1996; 165: 289-291.
21. Dawes M. On the need for evidence-based general and family practice. *Evidence-Based Med* 1996; 1: 68-69.
22. Sabri AA, Qayyum MA. The problem of evidence-based medicine in developing countries. *CMAJ* 2006; 175: 62.