National vs. international journals: views of medical professionals in Croatia

Sambunjak, Dario; Huić, Mirjana; Hren, Darko; Katić, Milica; Marušić, Ana; Marušić, Matko

National vs. international journals: views of medical professionals in Croatia

Dario SAMBUNJAK[†]

Mirjana HUIC

Darko HREN

Milica KATIC

Ana MARUSIC

Matko MARUSIC

[†]Corresponding author

Note: This study was financially supported by the Croatian Ministry of Science, Education and Sports project 'Influence of a science journal on the Croatian medical community' (No. 108-1080314-0245) to Matko Marušić. A 300-word abstract of this article was presented at the Council of Science Editors Annual Meeting in Vancouver, Canada, May 16-20, 2008

Abstract

Scholarly journals, especially in non-English-speaking countries, may perform very different functions depending on whether they are published for national or international audiences. A total of 466 academic physicians and non-academic general practitioners in Croatia were surveyed on their knowledge about two Croatian medical journals: *Liječnički vjesnik* (published in Croatian) and *Croatian Medical Journal* (published in English). The physicians

were also surveyed about the importance of all national and international journals published in Croatia, and the types of articles they think should be published in these journals. More respondents rated national (n=329, 72.6%) than international journals (n=275, 63.5%, $P<0.001$, Wilcoxon test) as very important for the medical profession. On the other hand, publishing in international journals was more often rated as important than publishing in national journals (n=184, 42.5% vs. n=125, 27.8%; $P<0.001$, Wilcoxon test). Guidelines for clinical practice were rated as the most important publication item in national journals, and original scientific articles in international journals.

Introduction

Scholarly journals are one of the principal media of communication within a scientific community. Biomedical journals in particular have gained importance with the introduction and development of the concept of evidence-based medical practice[1]. Medical professionals spend a considerable amount of time reading scholarly journals[2-5] and consider these journals important for their clinical practice[5-7].

The impact of a journal on the scientific community, as measured by the number of citations to published articles, is often perceived as a correlate of its quality[8]. Despite criticisms [9-11], the impact factor (IF) calculated by Thomson Scientific (formerly the Institute for Scientific Information) has become a yardstick for judging the quality not only of journals, but also of the scientists who publish in them. However, in applied disciplines - rather than pure research disciplines - this does not always hold true: some of the journals viewed by physicians as being most important do not have high impact factors[5,6], and many journals with a large distribution and readership do not have IFs at all[12]. This is even more the case with journals

published for a purely national market, particularly if they are published in non-English languages; these journals often have a long publication history and a clear professional and societal role[13-15], yet they struggle to maintain the inflow of manuscripts[16,17] or to survive market challenges[18]. This contradiction is clearly exemplified in the field of medicine: on the one hand, medical science is undoubtedly international – there are clear benefits from rapid global transmission and dissemination of knowledge in the English language; on the other hand, daily medical practice continues to be carried out in the local language and may confront specific local health issues. Moreover, not all medical practitioners are proficient in English, so they try to keep abreast of the literature by reading national journals in their own language[19]. Among other potential users of national journals are policy-makers or medical professionals working abroad[20].

Despite the warnings that the demise of non-English-language medical journals could lead to 'a loss of innovative potential, medical tradition, and diversity for the medical community at large'[21], an increasing number of national journals are shifting to English as their language of publication, in both economically developing[22] and developed[23] countries. This move is commonly justified by the desire to increase the international visibility and to break out of the 'vicious circle of inadequacy'[24]. The goal of small journals is to become included in the prestigious Thomson Scientific databases such as Science Citation Index (SCI)[12,25], to obtain an impact factor, and thereby to become more attractive for potential contributors. This is obviously in line with the interests of journal editors, who aspire to a broader pool of submissions, and with those of authors, who want to publish their articles in more visible and widely-read journals. However, the change in language of publication is not necessarily in the interest of the majority of journal readers – medical practitioners.

We surveyed medical professionals, both those working in academic institutions and in non-academic general practices, to explore how much they read, and what they know about two Croatian general medical journals - one national journal published in the local language, and one international journal, published in English. A further aim of this study was to explore the opinions of medical professionals on how important Croatian national and international journals are in general, what importance should be attributed to reviewing for and publishing in these journals, and which types of articles should be given priority in these journals. For the purposes of our study, we defined national journals as all Croatian scientific journals published in the Croatian language, and international journals as all Croatian scientific journals published in a foreign language (primarily English).

Subjects and Methods

Journals

Liječnički vjesnik (*LV*) is a monthly, peer-reviewed professional journal, published in Croatian, with abstracts in English. It is an official journal of the Croatian Medical Association, established in 1877, and distributed to all members free of charge, since subscription to the journal is included in the membership fee. *LV* publishes articles under the following sections: Original Articles, Clinical Observation, Drugs and Procedures, Reviews, Advice in Pharmacotherapy, Health Care, Letter to the Editor, Obituaries and News. A substantial majority of authors who publish in *LV* are from Croatia. The journal is indexed in MEDLINE/PubMed, Elsevier's database Scopus and partially in EMBASE/Excerpta Medica. At the time of the study, information on the *LV* was available online on the web-site of the Croatian Physicians' Society; article abstracts are available online since 2007 (http://www.lijecnicki-vjesnik.hlz.hr).

Croatian Medical Journal (*CMJ*) is a bimonthly, peer-reviewed scientific journal, published in English. It was established in 1991 and is an official journal of the Croatian Academy of Medical Sciences; the journal is owned by the four Croatian schools of medicine. *CMJ* publishes articles under the following sections: Cover Page, Editorial, Basic Science, Clinical Science, Public Health, Student *CMJ*, Medical Education, Columns, Book Reviews, and Correspondence. The *CMJ* authors come from all around the world[26]. *CMJ* is indexed in MEDLINE/PubMed, Thomson Scientific's databases Current Contents/Clinical Medicine and Science Citation Index-Expanded, EMBASE/Excerpta Medica, and Scopus. The full content of the journal is freely available at http://www.cmj.hr.

Participants

In October 2005, the survey instrument and a stamped addressed envelope were sent by regular mail to 430 faculty members at all four Croatian schools of medicine (Zagreb, Rijeka, Osijek, Split), and to 343 Croatian general practitioners (GPs) from a representative sample developed for an earlier study. The sample was constructed from the list of all GPs working in Croatia in 2001 (n=2408), and was stratified by age, gender, vocational training, practice size, and geographical distribution. GPs were chosen as the control group *vis-a-vis* academic physicians because they are the most numerous group of physicians in Croatia and they work mostly alone, without much incentive to read medical journals regularly.

A week after the initial mailing, a thank-you letter with a reminder was sent to all addresses, and a month later an additional mailing of survey instruments, together with stamped addressed envelopes, was performed. A total of 198 (46%) faculty members and 87 (25%) GPs returned the questionnaires. To increase the number of responses from GPs in our study, we surveyed attenders of a postgraduate course (which is a part of the specialist training in

family medicine) and a Croatian congress of family medicine. The final number of questionnaires filled out by GPs was 272. Eleven of them were faculty members and were analysed with the group of academic physicians. There was no significant difference in gender distribution between the group of GPs who answered the postal survey and the group of GPs that were surveyed at the postgraduate course and the congress (P=0.278, χ^2-test). GPs in the former group were older than those in the latter group (median±interquartile range=47±8.75 vs. 45±10, P=0.001, Mann Whitney U test), but we considered this difference not to be sufficiently large significantly to affect the results of the analyses.

For seven respondents it was not possible to identify whether they were academic physicians or non-academic GPs, so they were not included in the comparisons between the two groups. The total number of respondents was 466.

Survey instrument

The questionnaire (see Appendix), in Croatian, consisted of three parts. The first part collected the respondents' demographic data: gender, age, specialty (if any), academic degree, academic rank, field of work, weekly hours spent in reading medical journals, and self-assessed knowledge of English. The second part of the questionnaire aimed to assess the respondents' knowledge of *LV* and *CMJ*. Questions were posed about the language and frequency of the journals, geographic origin of the majority of authors who publish in the journals, the databases in which the journals are indexed, and the professional societies with which the journals are affiliated. In this part of the questionnaire, the respondents were also asked how often they read *LV* and *CMJ*, how they access the journals, if they have ever submitted manuscripts to or published articles in either of the journals, and if they would be willing to serve as reviewers for *LV* or *CMJ*. In the second part of the questionnaire, all questions were either single-choice or multiple-choice.

The third part of the questionnaire explored respondents' opinions about Croatian national and international medical journals in general. The former were defined as those published in Croatian, and the latter as those published in English. The respondents were asked to rate the importance of different types of journal articles (original research articles, review articles, case reports, systematic reviews and meta-analyses, translations of important articles from the world literature, guidelines for clinical practice, articles on Croatian medical terminology, articles on health policy, and biographies of eminent physicians); the importance of publishing articles by authors from different countries or groups of countries (Croatia, South-East Europe, transition countries, developing countries, developed countries), and focusing on readership from these countries or groups of countries; the importance of national and international journals for the Croatian national interest and for the Croatian medical profession; the importance of financial support by the state government to these journals; the importance respondents personally give to publishing in these journals; and the importance which should be attributed to reviewing for or publishing in these journals as criteria for professional and academic advancement. All items in the third part of the questionnaire were 4 point Likert-type scales with the following categories: 0 – completely unimportant, 1 – not very important, 2 – important, 3 – very important.

The questionnaire was piloted on 34 attenders of a postgraduate course in family medicine, and their responses were used to increase the clarity of questions, but were not included in the final database. The study was approved by the Zagreb University School of Medicine Ethics Committee.

Statistical analysis

The McNemar test[27] was used to test the differences, both within the whole sample and within subsamples (academic and nonacademic physicians), in the frequency of reading *LV* and *CMJ*, how the journals were accessed, respondents' willingness to serve as a reviewer, and their publishing history. The Mann-Whitney U test[27] was used to compare the age distribution in the group of GPs who answered the postal questionnaire with that in the group of GPs who were surveyed at the congress or postgraduate course. The Chi square test[27] was used to test the differences in gender distribution between the two groups of GPs. The Chi square test was also used to test the differences between academic and nonacademic physicians in reading patterns, willingness to serve as a reviewer and history of publishing in *LV* and *CMJ*. Wilcoxon Signed Ranks Test[27] was used to test the differences in median score of knowledge about *LV* and *CMJ*, and the differences between *LV* and *CMJ* in the importance attributed by respondents to different categories (e.g. types of articles, geographic origin of authors and readership, reviewing for and publishing in national and international journals). The Friedman[27] test was used to test the differences in the importance attributed to different types of articles within national and international journals. Multivariate logistic regression analysis[27] was applied to determine the predictors both of knowledge about *LV* and *CMJ* and of attributing high importance to national or international journals. The level of statistical significance was set at $P<0.05$. All analyses were performed using SPSS 13 for Windows.[28]

Results

Medical faculty comprised 43.1% of the respondents, and GPs 56.9%. A quarter of respondents spent more than three hours a week reading medical journals. The majority rated the level of their English as average or better (Table 1).

More respondents said that they had read every issue of *LV* (n=176, 40.1%) in the previous year than those who reported the same for *CMJ* (n=41, 9.3%, *P*<0.001, McNemar test). More respondents did not read any issue of *CMJ* (n=158, 36.0%) than those who did not read any issue of *LV* (n=51, 11.6%, *P*<0.001, McNemar test). No significant difference was found in the number of respondents who said they had read several issues of *LV* (n=212, 48.3%) or of *CMJ* (n=240, 54.7%, *P*=0.056, McNemar test) in the previous year.

More respondents said that they accessed the printed copy of *LV* (n=353, 83.1%) than of *CMJ* (n=207, 48.7%, *P*<0.001, McNemar test), and the number of respondents who said that they did not access *LV* (n=39, 9.2%) was significantly lower than those who did not access *CMJ* (n=136, 32.0%, *P*<0.001, McNemar test). A hundred and six (32%) respondents said that they accessed *CMJ* online, whereas 32 (6.8%) respondents reported accessing *LV* online (*P*<0.001, McNemar test).

There was no significant difference in the number of respondents who were willing to serve as reviewers for *LV* (n=146, 34.0%) or for *CMJ* (n=153, 35.6%, *P*=0.337, McNemar test), in the number of respondents who had ever submitted a manuscript to *LV* (n=143, 32.8%) or to *CMJ* (n=148, 33.9%, *P*=0.644, McNemar test), or in the number who had ever published an article in *LV* (n=126, 29.1%) or in *CMJ* (n=119, 27.5%, *P*=0.500, McNemar test).

Academic physicians spent significantly more time than non-academic GPs reading medical journals (Table 2). They were more willing to serve as reviewers and more often stated that they had ever submitted an article to, or had an article published in, *LV* or *CMJ* (Table 2). Significantly more respondents, both those working in academic institutions and those in non-academic general practices, had read every issue of *LV* than of *CMJ* (Table 2).

To estimate respondents′ knowledge of *LV* and *CMJ*, we took the sum of the number of correct answers to the questions about the 1) language of the journals, 2) frequency of the journals, 3) geographic origin of the majority of authors who publish in the journals, 4) databases in which the journals are indexed, and 5) professional societies with which the journals are affiliated. The median score of the respondents' knowledge of *LV* was significantly higher than that of *CMJ* (C=3, interquartile range 1 vs. C=2, interquartile range 2, P<0.001, Wilcoxon Signed Ranks Test).

We performed a multiple linear regression analysis to explore the relationship between knowledge about *LV* or *CMJ* as a criterion and the following predictors: gender, age, having a specialty, working in academic setting, having a PhD, field of work, time spent reading medical journals, knowledge of English, means of accessing the journals, and frequency of reading *LV* or *CMJ* during the previous year. Significant predictors of knowledge of *LV* were: working in an academic setting (β=0.286, P<0.001), having read *LV* at least once during the previous year (β=0.232, P<0.001), and accessing *LV* by personal subscription (β=0.104, P=0.043, R^2=0.165). Significant predictors of knowledge of *CMJ* were: working in an academic setting (β=0.557, P<0.001) and having read *CMJ* at least once during the previous year (β=0.203, P<0.001, R^2=0.453).

We also found significant differences in the importance attributed to different types of articles within national and international journals (Friedman test, *P*<0.001) (Figure 1). In national journals, the respondents rated guidelines for clinical practice as most important, followed by original scientific articles, narrative reviews, and case reports; biographies of eminent physicians and articles about health care policy were rated least important (Figure 1). In international journals, original scientific articles were considered most important, followed by

narrative reviews, systematic reviews and meta-analyses, and guidelines for clinical practice, with biographies of eminent physicians and articles on medical terminology coming last (Figure 1).

The majority of respondents thought that Croatian journals, both national and international, should publish articles primarily by authors from Croatia. A significant number of respondents also put high importance on publishing articles by authors from developed countries, i.e. those that belong to the scientific mainstream (Figure 2). Similar opinions were expressed regarding the relative importance of readership from different countries or groups of countries (Figure 2).

Respondents judged the publication of national and international journals to be equally important for Croatian national interests. However, the publication of national journals was more frequently rated 'very important' for the Croatian medical profession than that of international journals. Financial support by the state government was considered more important for national than for international journals. When asked to rate how important it was for them personally to publish in one or other type of journal, more respondents attributed very high importance to publishing in international journals than in national journals (Figure 3).

We performed multiple linear regression analysis to explore the relationships between different aspects of importance attributed to national or international journals as criteria and the following predictors: gender, age, having a specialty, working in an academic setting, having a PhD, field of work, time spent reading medical journals, knowledge of English, means of accessing *CMJ* and *LV*, knowledge about *CMJ* and *LV*, and reading of *CMJ* and *LV*

during the previous year. The model explained a relatively small percentage of variance (2-28%) (Table 3).

Working in academic medicine, good knowledge about CMJ, and younger age were significant predictors of attributing high importance to international journals. Working in academic medicine was a negative predictor, and regular reading of medical journals a positive predictor for attributing high importance to national journals (Table 3).

With regard to both professional and academic advancement, reviewing for and publishing in international journals were more frequently rated as 'very important' than reviewing for or publishing in national journals (Figure 4). Multiple linear regression analysis showed a significant association between having a specialty in any field of medicine and attributing high importance to reviewing for and publishing in international journals. Also, the more respondents knew about the CMJ or read medical journals in general, the more likely was that they would attribute a higher importance to reviewing for and publishing in international journals (Table 4).

Discussion

Our study found significant differences among Croatian physicians, in reading patterns and opinions, between national and international journals. Those working in academic institutions (schools of medicine) spent more time reading medical journals than their non-academic colleagues. All physicians were better acquainted with the Croatian-language *LV* than with English-language *CMJ*, but they generally attributed high importance to both journals. The respondents thought that both national and international Croatian journals should focus primarily on Croatian authors and readers. For them personally, publishing in a Croatian international journal was seen as more important than publishing in a national journal.

Similarly, respondents thought that both reviewing for a journal and publication should be more highly valued as a criterion for professional and academic advancement when it concerned Croatian international than national journals.

The limitations of our study are related to a relatively low response rate and the mixed composition of the sample of GPs, which may have had a negative impact on the generalizability of the findings. Low response rates are not uncommon with postal surveys of physicians, and often do not exceed 50%[29]. As with any postal survey, the respondents may have been those who are more accustomed to read and respond to paper mails, and therefore perhaps more conservative than the population as a whole. Although a significant portion of the GPs in this study constituted a convenient sample, the postgraduate course and the congress, at both of which the respondents were surveyed, were attended by GPs from all over Croatia, which may increase the representativeness of the sample.

Data in the literature show that almost all health professionals regularly read medical journals and indicate that the time spent in reading has increased, from an average of 60 hours per year in the 1980s[30] to almost double that in recent years[2,3]. According to our survey, Croatian academic physicians spend an average of 192 hours per year reading medical journals, nearly twice as long as their non-academic colleagues. This is in accordance with previous studies which found that physicians outside the university read journals considerably less than do medical faculty[2,3,6].

The finding that 40% of respondents said they read every issue of *LV*, as opposed to only 9.3% who read every issue of *CMJ*, can be explained by the fact that *LV* is the official journal of a large professional society whose members all receive free print copies of *LV*. *CMJ*, on the

other hand, does not have a broad membership base, but is freely available online. However, Internet connections are not widely available in Croatian hospitals, which limits the use of the online editions of journals such as *CMJ*. In other settings, such as among UK surgeons, it has been found that readership patterns are influenced by membership journals[6]. Another possible reason for the relatively small percentage of regular readers in our study may be that both of the journals studied are general medical journals, whereas more than 80 percent of respondents were specialists (including the specialists in family medicine who work as GPs). As expected, Croatian physicians knew more about *LV* than about *CMJ.* Working in an academic setting was a significant predictor of knowledge about both journals, suggesting that academic physicians monitor both Croatian- and English-language national publications.

Our respondents rated Croatian national and international journals as equally important for national interests, but thought that financial support by the state government should be directed more towards national than international journals. On the other hand, for them personally it was more important to publish in Croatian international than in national journals. In all these ratings academic physicians scored higher than their non-academic colleagues. These findings most probably reflect a situation in which physicians are more inclined to use journals in their native language for their clinical practice, but are under pressure to publish in English-language journals indexed in prestigious bibliographic databases and visible to the global scientific community. The preference for publishing in international journals may also have to do with researchers' own interests and their perception of the importance of their field of study[31].

When asked to indicate the types of articles they would prefer to see in Croatian international journals, the respondents in our study gave priority to original research, followed by

systematic reviews and meta-analyses, which are also considered as items of original research[32]. On the other hand, guidelines for clinical practice, narrative reviews, case-reports and translations of important articles from the world literature were preferred content of Croatian national journals. This is perhaps the most important finding of our study for journal editors, owners, and policy-makers, particularly those in non-English speaking countries. International journals are perceived as having a scientific role – they should act as the 'gatekeepers' of credible science[33] and transmit it to the widest possible audience. National journals, on the other hand, are perceived as having a 'professional' role – they should be readable and easily accessible to local physicians, conveying clinically relevant information in a digest form, primarily for educational and professional purposes[34]. They can play a major role in harnessing knowledge for public policy and in translating the most recent findings of global research to practice in their local environments. We argue that it is not necessary for national journals to publish original scientific articles, and if they do so, they should very carefully follow the highest standards of editorial practices, including international peer review to ensure an independent and unbiased assessment of manuscripts. This is, however, not always possible, especially for journals published in languages with a limited number of speakers. Unfortunately, the result is that some national journals serve only as a vehicle of poor science, which is detrimental for the development of a culture of scientific inquiry based on values and integrity. It is the responsibility of national journals to foster such culture and help researchers, particularly those in early stages of their careers, to learn “the rules of the game” before they enter the world of international science.

In conclusion, our study demonstrated the unique position of national journals in the medical profession. In spite of the fact that they usually cannot reach a global readership, national journals are widely read in their countries and can provoke considerable interest and

discussion[35]. However, there is a gap between the needs of physicians as readers and as authors of articles in medical literature[36]. This gap could be further explored, perhaps by qualitative research designed to elucidate the habits and preferences of physicians as users and producers of medical literature. In this study we used a survey to explore the opinions of two large groups of physicians – those working in academic institutions and non-academic general practice, but there are many other physicians who belong to neither of these two categories – mostly those working in non-academic hospitals, and their opinions may be worth further investigation.

From the policy standpoint, measures should be taken to support national journals published in local languages by providing them with necessary funds. Furthermore, reviewing for[37] and publishing in national journals should be recognized as a valuable contribution to the advancement of the medical profession, and the educational role of national journals should be encouraged.

Dario Sambunjak, M.D.

Croatian Medical Journal, Zagreb University School of Medicine

Šalata 3b, 10000 Zagreb, Croatia

dsambunj@mef.hr

Mirjana Huić, M.D.

Croatian Medical Journal, Zagreb University School of Medicine

Šalata 3b, 10000 Zagreb, Croatia

mhuic@mef.hr

Darko Hren

Croatian Medical Journal, Zagreb University School of Medicine

Šalata 3b, 10000 Zagreb, Croatia

dhren@mef.hr

Prof. Milica Katić, M.D., PhD

Department of Family Medicine, Andrija Štampar School of Public Health , Zagreb University School of Medicine

Rockefellerova 4, 10000 Zagreb, Croatia

mkatic@snz.hr

Prof. Ana Marušić, M.D., PhD

Croatian Medical Journal, Zagreb University School of Medicine

Šalata 3b, 10000 Zagreb, Croatia

ana.marusic@agram.mef.hr

Prof. Matko Marušić, M.D., PhD

Croatian Medical Journal, Zagreb University School of Medicine

Šalata 3b, 10000 Zagreb, Croatia

mmarusic@mef.hr

References:

1. Evidence-Based Medicine Working Group. 1992. Evidence-based medicine: A new approach to teaching the practice of medicine. *Journal of the American Medical Association*, 268: 2420-5. http://dx.doi.org/10.1001/jama.268.17.2420.

2. Tenopir, C., King, D.W. & Bush, A. 2004. Medical faculty's use of print and electronic journals: changes over time and in comparison with scientists. *Journal of the Medical Library Association*, 92: 233-41.

3. Tenopir, C., King, D.W., Clarke, M.T., Na, K. & Zhou, X. 2007. Journal reading patterns and preferences of pediatricians. *Journal of the Medical Library Association*, 95: 56-63.

4. Burke, D.T., Judelson, A., Schneider, J.C., DeVitto, M.C.& Latta, D. 2002. Reading habits of practicing physiatrists. *American Journal of Physical Medicine & Rehabilitation,* 81: 779-87. http://dx.doi.org/10.1097/00002060-200210000-00011

5. Schein M., Paladugu, R., Sutija, V.G. & Wise, L. 2000. What American surgeons read: a survey of a thousand Fellows of the American College of Surgeons. *Current Surgery,* 57:252-8. http://dx.doi.org/10.1016/S0149-7944(00)00177-X.

6. Jones, T.H., Hanney, S. & Buxton, M.J. 2006. The journals of importance to UK clinicians: a questionnaire survey of surgeons. *BMC Medical Informatics and Decision Making,* 6, 24. http://dx.doi.org/10.1186/1472-6947-6-24.

7. Jones, T.H., Hanney, S. & Buxton, M.J. 2007. The information sources and journals consulted or read by UK paediatricians to inform their clinical practice and those which they consider important: a questionnaire survey. *BMC Pediatrics,* 7, 1. http://dx.doi.org/10.1186/1471-2431-7-1.

8. Saha, S., Saint, S. & Christakis, D.A. 2003. Impact factor: a valid measure of journal quality? *Journal of the Medical Library Association*, 91: 42-6.

9. Bollen, J., Rodriguez, M.A. & van de Sompel, H. 2006. Journal status. *Scientometrics*, 69: 669-87. http://dx.doi.org/10.1007/s11192-006-0176-z.

10. Seglen, P.O. 1997. Why the impact factor of journals should not be used for evaluating research. *British Medical Journal*, 314: 498-502.

11. Golubić, R., Rudeš, M., Kovačić, N., Marušić, M. & Marušić, A. 2008. Calculating impact factor: how bibliographical classification of journal items affects the impact factor of large and small journals. *Science and Engineering Ethics*, 14: 41-9. http://dx.doi.org/10.1007/s11948-007-9044-3

12. Gonzalez Perez-Yarza, E., Cabanas Gonzalez, F. & Moreno Galdo, A. 2003. Impact factor, a strategic goal. *Anales de pediatría (Barcelona)*, 58; 1-2 (in Spanish). http://dx.doi.org/10.1157/13042230

13. Royal Netherlands Academy of Arts and Sciences. *The Societal Impact of Applied Health Research: Towards a Quality Assessment System.* Amsterdam. Council for Medical Sciences, 2002. Available at http://www.knaw.nl/publicaties/pdf/20021098.pdf

14. Sanz, E., Aragon, I. & Mendez, A. 1995. The function of national journals in disseminating applied science. *Journal of Information Science,* 21: 319-23. http://dx.doi.org/10.1177/016555159502100408.

15. Schloegl, C. & Stock, W.G. 2004. Impact and relevance of LIS journals; a scientometric analysis of international and German-language LIS journals – citation analysis versus reader survey. *Journal of the American Society for Information Science and Technology*, 55: 1155-68. http://dx.doi.org/10.1002/asi.20070.

16. Baranyiova, E. 2004. Publishing science in Czech Republic. *European Science Editing*, 30: 87-9.

17. Melero, R. 2004. Editing in Spain: Spanish scientific journals are still alive. *European Science Editing*, 30: 45-6.

18. Towpik, E. 2003. Scientific medical journals in Poland. *European Science Editing,* 29: 72-3.

19. McCarthy, M. & Pana, A. 2005. Public health journals in own languages: an endangered species? *European Journal of Public Health*, 15: 222-3. http://dx.doi.org/10.1093/eurpub/cki149.

20. Germenis, A.E., Kokkinides, P.A. & Stavropoulos-Giokas, C. 1997. Non-indexed medical journals in the Web: new perspectives in the medical literature. *International Journal of Medical Informatics*, 47: 65-8. http://dx.doi.org/10.1016/S1386-5056(97)00076-2.

21. Pittler, M.H. & Ernst, E. 2005. The decline of non-English language journals. *Mayo Clinic Proceedings*, 80: 287.

22. Pulišelić, L. & Petrak, J. 2006. Is it enough to change the language? A case study of Croatian biomedical journals. *Learned Publishing*, 19: 299-306. http://dx.doi.org/10.1087/095315106778690733.

23. Bracho-Riquelme, R.L., Pescador-Salas, N. & Reyes-Romero, M.A. 1997. Bibliometric repercussions of adopting English as the sole language for publication. *Revista de Investigación Clínica*, 49: 369-72 (in Spanish).

24. Marušić, A. & Marušić, M. 1999. Small scientific journals from small countries: breaking from a vicious circle of inadequacy. *Croatian Medical Journal*, 40: 508-14.

25. Sambunjak, D., Ivaniš, A., Marušić, A. & Marušić, M. 2008. Representation of journals from five neighboring European countries in Journal Citation Reports. *Scientometrics*, 76 (in press).

26. Marušić, M., Sambunjak, D. & Marušić, A. 2006. Life of small medical journal – how bibliographical indexing and international visibility affected editorial work in Croatian Medical Journal. *Croatian Medical Journal*, 47: 372-5.

27. Field, A. 2005. Discovering Statistics Using SPSS (Introducing Statistical Methods). Thousand Oaks: Sage Publications.

28. SPSS Inc.; Chicago IL, USA. Available at: http://www.spss.com

29. Asch, D.A., Jedrziewski, M.K. & Christakis, N.A. 1997. The response rates to mail surveys published in medical journals. *Journal of Clinical Epidemiology*, 50: 1129-36. http://dx.doi.org/10.1016/S0895-4356(97)00126-1.

30. Stinson, E.R. & Mueller, D.A. 1980. Survey of health professionals' information habits and needs. Conducted through personal interviews. *Journal of the American Medical Association*, 243: 140-3. http://dx.doi.org/10.1001/jama.243.2.140

31. Eijkman, M.A., Willems, J.T. & Groen, J.H. 1995. Publishing in the native tongue? *Nederlands Tijdschrift voor Geneeskunde*, 102: 299-302 (in Dutch).

32. Lang, T.A. 2004. The value of systematic reviews as research activities in medical education. *Academic Medicine*, 79: 1067-72. http://dx.doi.org/10.1097/00001888-200411000-00011.

33. Hojat, M., Gonnella, J.S., Caelleigh, A.S. & Lang, T.A. 2003. Impartial judgment by the 'gatekeepers' of science: fallibility and accountability in the peer review process. *Advances in Health Sciences Education : Theory and Practice*, 8: 75-96. http://dx.doi.org/10.1023/A:1022670432373

34. Brandt-Dominicus, J.C. & van Harten, P.N. 2006. Survey among readers of the *Tijdschrift voor Psychiatrie*. *Tijdschrift voor Psychiatrie*, 48: 445-51 (in Dutch).

35. Van Maldegem, B.T., Walvoort, H.C. & Overbeke, A.J. 1999. Effects of articles published in the *Dutch Journal of Medicine*. *Nederlands Tijdschrift voor Geneeskunde,* 143: 1957-62 (in Dutch).

36. Rowlands, I. & Nicholas, D. New journal publishing models: an international survey of senior researchers. London. School of Library, Archive, and Information Studies, University College, 2005. Available at http://www.ucl.ac.uk/ciber/ciber_2005_survey_final.pdf

37. De Gregory, J. 2004. Medical journals start granting CME credit for peer review. *Science Editor,* 27: 190-1.

Table 1. Demographic data of respondents

Characteristics		No. (%)*
Gender	Male	179 (38.4)
	Female	281 (60.3)
Age	<40	60 (12.8)
	40-49	199 (42.7)
	>50	193 (41.4)
Having a specialty	Yes	276 (59.2)
	No	188 (40.3)
MSc or PhD	Yes	204 (43.7)
	No	259 (55.6)
Academic status	Teaching assistant	9 (1.9)
	Assistant professor	74 (15.8)
	Associate or full professor	115 (24.7)
	None of above	262 (56.2)
Field of work	Basic sciences	30 (6.4)
	Specialist medicine	154 (33.0)
	General practice	272 (58.4) †
	Other	10 (2.1)
Time spent reading medical journals (hours per week)	<1	95 (20.4)
	1-2	161 (34.5)
	2-3	93 (20.0)

	3-4	48 (10.3)
	>4	68 (14.6)
Self-assessed knowledge of English	None or small	55 (11.8)
	Average	195 (41.8)
	Very good or excellent	216 (46.4)

* Percentages refer to the total number of participants (n=466). All data were not available for all participants, therefore percentages do not add up to 100%.

†General practitioners working in academic institutions are included in this figure.

Table 2. Differences between academic and nonacademic physicians in reading patterns, willingness to serve as a reviewer and history of publication in *Liječnički vjesnik* (*LV*) and *Croatian Medical Journal* (*CMJ*)*

Groups of respondents		Academic physicians (No, %)	Nonacademic physicians (No, %)
Spends ≥3 hours a week in reading medical journals		88 (44.4)	30 (11.5)
In the previous year have read every issue of:	*LV*	93 (46.9)	86 (33.0)
	P‡	<0.001	<0.001
	CMJ	33 (16.7)	8 (3.1)
Willing to serve as a reviewer for:	*LV*	131 (66.2)	15 (5.7)
	P‡	0.080	0.375
	CMJ	141 (71.2)	11 (4.2)
Have ever submitted own manuscript to:	*LV*	126 (63.6)	17 (6.5)
	P‡	0.072	0.013
	CMJ	139 (70.2)	6 (2.3)
Have ever published own manuscript in:	*LV*	112 (56.6)	14 (5.4)
	P‡	>0.950	0.092
	CMJ	112 (56.6)	6 (2.3)

*All differences between academic and non-academic physicians are statistically significant ($p<0.05$, chi-square test).

[†]Percentages refer to the total number of academic (n=198) and non-academic physicians (n=261). For seven respondents it was not possible to identify whether they were academic physicians or non-academic GPs, so their answers were not included in these analyses.

[‡]McNemar test.

Table 3. Multiple linear regression analysis of relationships between importance attributed to national or international journals as criteria and the following predictors: gender, age, having a specialty, working in academic medicine, having a PhD, field of work, time spent reading medical journals, knowledge of English, means of accessing *Croatian Medical Journal* (*CMJ*) and *Liječnički vjesnik* (*LV*), knowledge of *CMJ* and *LV*, and reading of *CMJ* and *LV* during the previous year. Only significant predictors are presented.

Criterion	National journals				International journals			
	Predictors	Odds ratio	95% Confidence Interval	R^{2*}	Predictors	Odds ratio	95% Confidence Interval	R^2
Importance of journals for the national interest	Knowledge of English	1.660	1.082-2.548	0.02	Younger age Working in academic medicine Knowledge of	1.046 4.995 1.476	1.013-1.081 2.526-9.878 1.178-1.849	0.28

					CMJ			
Importance of journals for national medical profession	Working in academic medicine	0.576	0.354-0.939	0.04	Younger age	0.596	0.373-0.951	0.07
	Reading *LV* at least occasionally	2.074	1.026-4.190		Knowledge of English	1.665	1.033-2.684	
					Knowledge of *CMJ*	1.270	1.067-1.511	
Importance of publishing in journals for the respondent personally	Reading medical journals > 2 hours a week	1.920	1.196-3.082	0.03	Younger age	1.040	1.006-1.075	0.24
					Having a specialty	2.445	1.397-4.281	
					Working in	2.628	1.375-5.023	

					academic medicine			
Importance of governmental financial support to journals	Reading medical journals > 2 hours a week	1.825	1.188-2.804	0.03	Working in academic medicine	3.030	1.950-4.707	0.10

*R^2 represents the strength of the obtained relationship. It can range from 0 to 1, higher values representing stronger relationship.

Table 4. Multiple linear regression analysis of relationships between the opinion about the importance of reviewing for or publishing in national or international journals as criteria and the following predictors: gender, age, having a specialty, working in academic medicine, having a PhD, field of work, time spent reading medical journals, knowledge of English, means of accessing *Croatian Medical Journal* (*CMJ*) and *Liječnički vjesnik* (*LV*), knowledge of *CMJ* and *LV*, and reading of *CMJ* and *LV* during the previous year. Only significant predictors are presented.

Criterion	National journals				International journals			
	Predictors	Odds ratio	95% Confidence Interval	R^{2*}	Predictors	Odds ratio	95% Confidence Interval	R^2
Opinion that reviewing for the journal should be counted for professional advancement.					Younger age Having a specialty Reading medical journals >2 hours a week	1.039 2.406 2.022	1.008-1.070 1.421-4.074 1.240-3.102	0.10

Opinion that reviewing for the journal should be counted for academic and scientific advancement.	Male gender Reading medical journals > 2 hours a week	0.540 1.791	0.334-0.871 1.124-2.852	0.05	Accessing *CMJ* in printed form Knowledge of *CMJ*	0.573 1.451	0.355-0.926 1.229-1.713	0.08
Opinion that publishing for in journal should be counted for professional advancement.	Working in academic medicine Reading medical journals > 2 hours a week	0.504 2.245	0.306-0.831 1.367-3.686	0.05	Younger age Having a specialty Knowledge of *CMJ*	1.041 2.611 1.322	1.009-1.073 1.510-4.515 1.103-1.584	0.10

					Reading *CMJ* at least occasionally	0.560	0.325-0.962	
Opinion that publishing in the journal should be counted for academic and scientific advancement.	Younger age Having a specialty Working in academic medicine	1.031 2.077 0.574	1.000-1.064 1.223-3.526 0.341-0.967	0.05	Having a specialty Knowledge about *CMJ*	1.687 1.258	1.077-2.643 1.065-1.487	0.08

*R^2 represents the strength of the obtained relationship. It can range from 0 to 1, higher values representing stronger relationship.

Figure 1. Importance attributed to different types of articles in Croatian national and international journals. All differences between international and national journals were statistically significant ($p<0.05$, Wilcoxon Signed Ranks Test).

Figure 2. Importance attributed to publishing articles by **authors** from different countries or groups of countries in Croatian national and international journals, and importance of focusing of these journals on **readers** from different countries or groups of countries. All differences between international and national journals are statistically significant ($p<0.05$, Wilcoxon Signed Ranks Test).

Figure 3. Importance attributed to Croatian national and international journals, to publishing in these journals and to governmental financial support to them. Except for the rating of their importance for Croatian national interests ($P=0.458$), all differences between international and national journals are statistically significant ($p<0.05$, Wilcoxon Signed Ranks Test).

Figure 4. Respondents' assessment of how much importance should be attributed to reviewing for or publishing in Croatian national and international journals as criteria for professional and academic advancement. All differences between international and national journals are statistically significant ($p<0.05$, Wilcoxon Signed Ranks Test).

Figure 1.

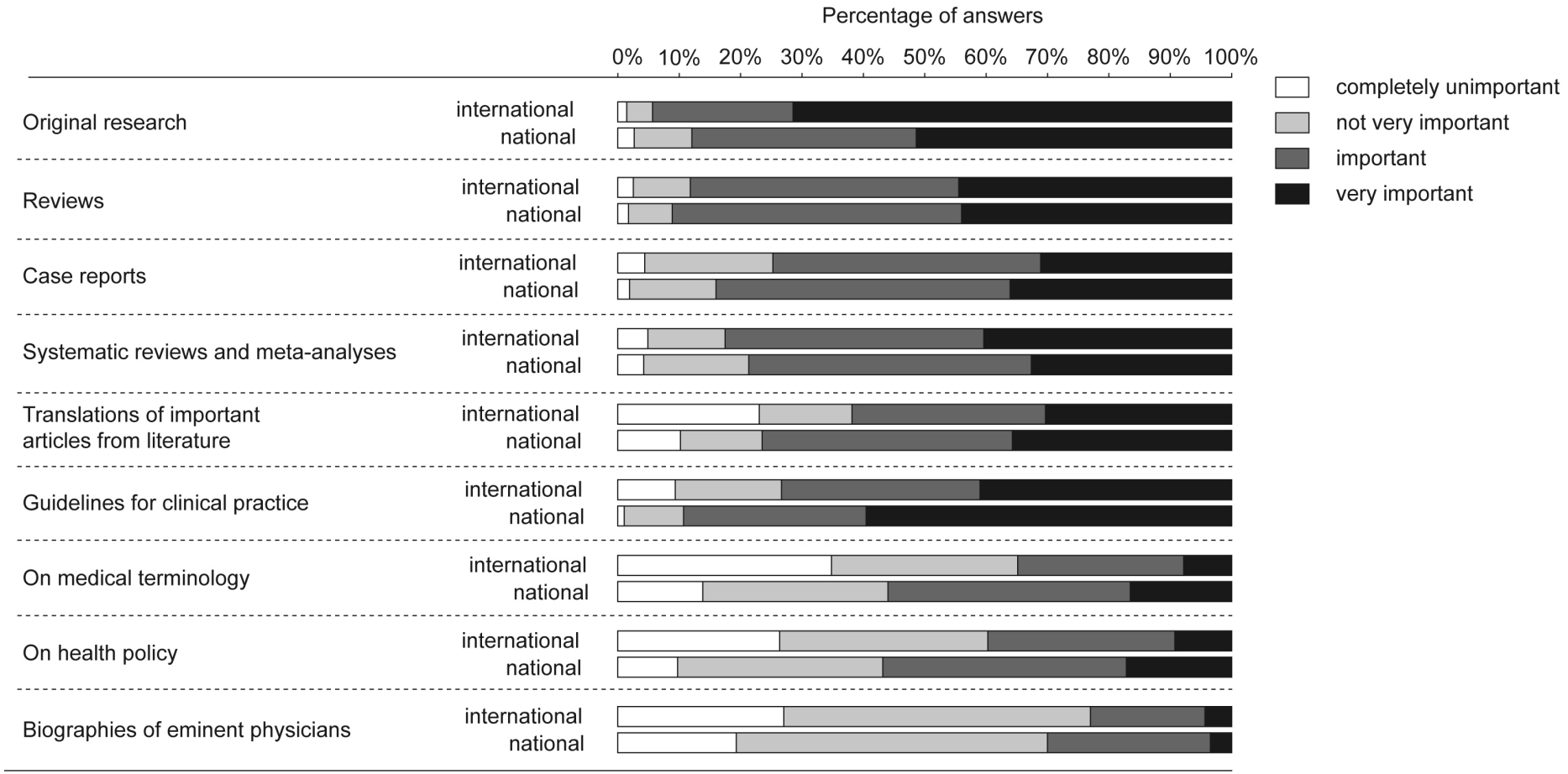

Percentage of answers
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
completely unimportant
not very important
important
very important
Original research
international
national
Reviews
international
national
Case reports
international
national
Systematic reviews and meta-analyses
international
national
Translations of important articles from literature
international
national
Guidelines for clinical practice
international
national
On medical terminology
international
national
On health policy
international
national
Biographies of eminent physicians
international
national

Figure 2.

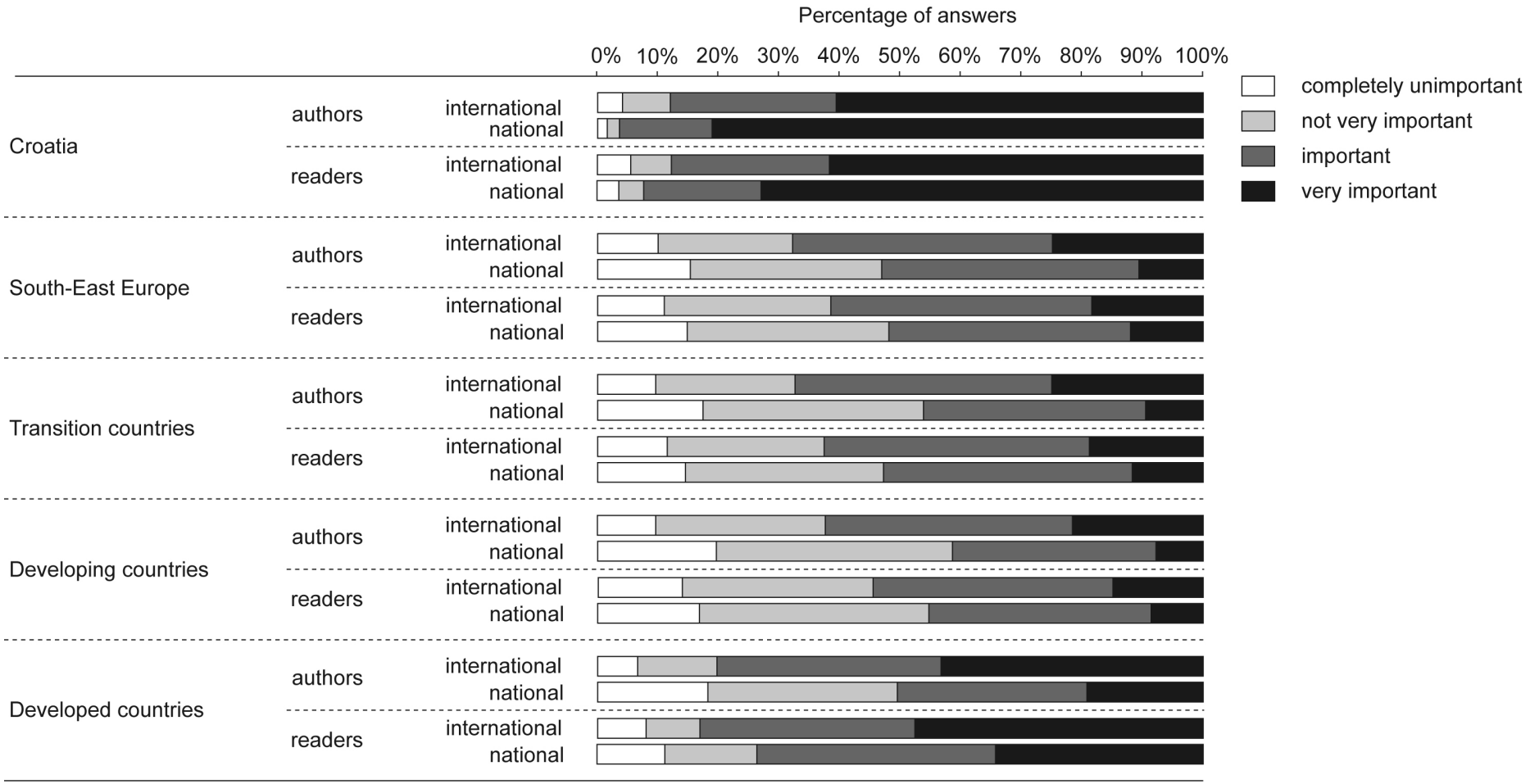

Percentage of answers
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
completely unimportant
not very important
important
very important
Croatia
authors
international
national
readers
international
national
South-East Europe
authors
international
national
readers
international
national
Transition countries
authors
international
national
readers
international
national
Developing countries
authors
international
national
readers
international
national
Developed countries
authors
international
national
readers
international
national

Figure 3.

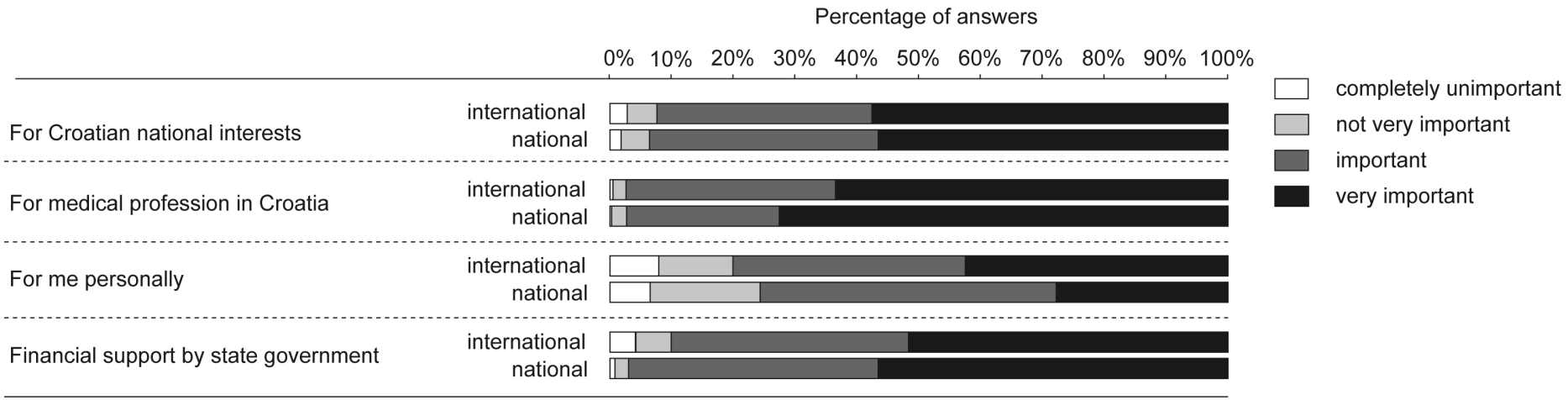
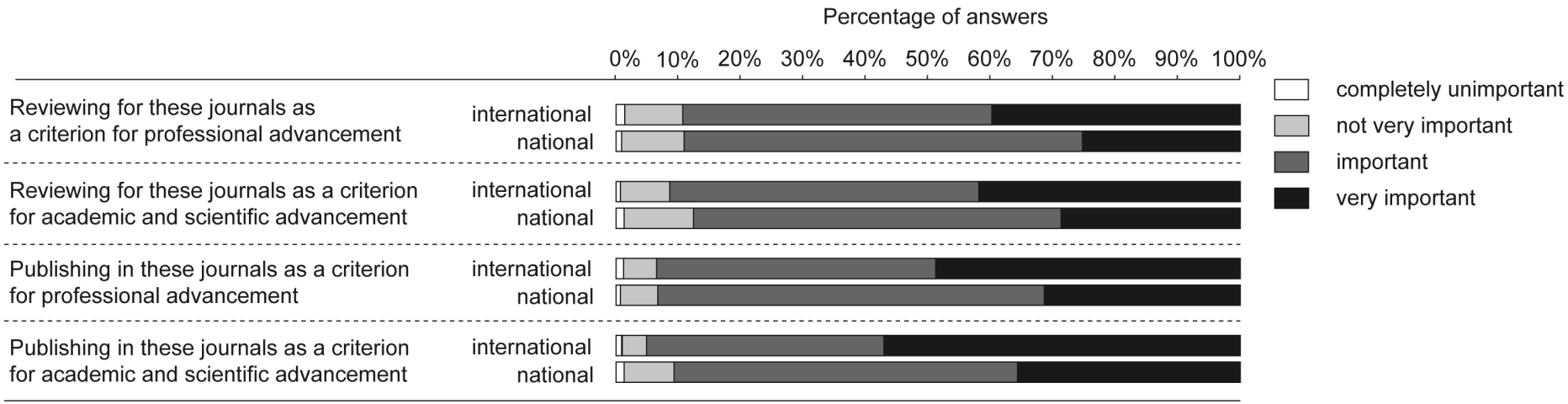

Percentage of answers
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
For Croatian national interests
international
national
For medical profession in Croatia
international
national
For me personally
international
national
Financial support by state government
international
national
completely unimportant
not very important
important
very important

Figure 4.


Percentage of answers
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Reviewing for these journals as a criterion for professional advancement
international
national
Reviewing for these journals as a criterion for academic and scientific advancement
international
national
Publishing in these journals as a criterion for professional advancement
international
national
Publishing in these journals as a criterion for academic and scientific advancement
international
national
completely unimportant
not very important
important
very important

Appendix.

Questionnaire used in the study.

Dear colleague,

The aim of this questionnaire is to find out how well informed physicians are about two Croatian medical journals, and to explore their opinions about the role of national and international scientific journals that are published in Croatia.

We would be grateful if you would answer this questionnaire. Enclosed please find a return envelope.

Thank you very much

Prof Nada Čikeš, M.D., PhD
Former Editor-in-Chief of *Liječničkog vjesnika*
Dean of the Zagreb University School of Medicine

Prof Matko Marušić, M.D., PhD
Editor-in-Chief of *Croatian Medical Journal*

A) General information about you:

1. **Gender**: Female Male

2. **Year of birth: _____**

3. **Do you have a specialty?**

a) yes

b) no

4. **Your academic degree:**

a) M.Sc.

b) PhD

c) neither

5. **Your academic rank:**

a) teaching assistant

b) assistant professor

c) associate or full professor

d) none

6. **Your field of work:**

a) basic sciences

b) specialty medicine

c) general medicine

d) public health

e) other

7**. How many hours a week do you spend reading scientific journals?**

a) less than an hour

b) one to two hours

c) two to three hours

d) three to four hours

e) more than four hours

8. **Your knowledge of English is:**

a) none

b) weak

c) average

d) very good

e) excellent

B) Please answer the following questions by circling one or more answers for each of the two journals (*Liječnički vjesnik* and *Croatian Medical Journal*).

	Liječnički vjesnik	*Croatian Medical Journal*
1. Journal publishes articles (*circle one answer*):	a) in English b) in Croatian c) Bilingually d) I do not know	a) in English b) in Croatian c) Bilingually d) I do not know
2. Journal is published (*circle one answer*):	a) weekly b) monthly c) bimonthly d) semiannually e) yearly f) I do not know	a) weekly b) monthly c) bimonthly d) semiannually e) yearly f) I do not know
3. Journal publishes articles by (*circle one answer*):	a) Croatian authors only b) authors from South East Europe c) authors from all around the world d) I do not know	a) Croatian authors only b) authors from South East Europe c) authors from all around the world d) I do not know
4. Journal is indexed in bibliographic databases (*circle one or more answers*):	a) MEDLINE b) Current Contents/Clinical Medicine c) Science Citation Index-Expanded d) EMBASE/Excerpta Medica e) none of the above f) I do not know	a) MEDLINE b) Current Contents/Clinical Medicine c) Science Citation Index-Expanded d) EMBASE/Excerpta Medica e) none of the above f) I do not know
5. Journal is an official	a) Croatian Medical Chamber	a) Croatian Medical Chamber

publication of (*circle one or more answers*):	b) Croatian Medical Association c) World Association of Croatian Physicians d) Croatian Academy of Medical Sciences e) I do not know	b) Croatian Medical Association c) World Association of Croatian Physicians d) Croatian Academy of Medical Sciences e) I do not know
6. In the previous year you have read (*circle one answer*):	a) no issue b) one or more issues c) every issue	a) no issue b) one or more issues c) every issue
7. You access the journal (*circle one or more answers*):	a) in printed form (personal subscription) b) in printed form (institutional subscription) c) in printed form (in the library) d) online (at home) e) online (at workplace) f) other (specify) _____ g) I do not read the journal	a) in printed form (personal subscription) b) in printed form (institutional subscription) c) in printed form (in the library) d) online (at home) e) online (at workplace) f) other (specify) _____ g) I do not read the journal
8. Would you be willing to serve as a reviewer for this journal? (*circle one answer*):	a) yes b) no	a) yes b) no
9. Have you ever submitted a manuscript to this journal (*circle one answer*):	a) yes b) no	a) yes b) no
10. Have you ever published an article in this journal (*circle one answer*):	a) yes b) no	a) yes b) no

C) In the following questions, '**national journals**' refers to all Croatian scientific journals published in Croatian, and '**international journals**' refers to all Croatian scientific journals published in a foreign language. Please, answer according to the following scale of importance: **0 – completely unimportant, 1 – not very important, 2 – important, 3 – very important**

	National journals (in Croatian)	**International journals (in foreign language)**
1. Journals should publish the following types of **articles:** (*on each line write 0 for 'completely unimportant', 1 for 'not very important', 2 for 'important' or 3 for 'very important')*	Original scientific articles __	Original scientific articles __
	Reviews __	Reviews __
	Case studies __	Case studies __
	Systematic reviews and meta-analyses __	Systematic reviews and meta-analyses __
	Translations of important articles from the world literature __	Translations of important articles from the world literature __
	Guidelines for clinical practice __	Guidelines for clinical practice __
	Articles on Croatian medical terminology __	Articles on Croatian medical terminology __
	Articles on health policy __	Articles on health policy __
	Biographies of eminent physicians __	Biographies of eminent physicians __
2. Journals should publish articles by **authors** from: (*on each line write 0 for 'completely unimportant', 1 for 'not very important', 2 for 'important' or 3 for 'very important')*	Croatia __	Croatia __
	South East Europe __	South East Europe __
	Transition countries __	Transition countries __
	Developing countries __	Developing countries __
	Developed countries __	Developed countries __

3. Journals should focus on **readers** from: (*on each line write 0 for 'completely unimportant', 1 for 'not very important', 2 for 'important' or 3 for 'very important')*	Croatia __ South East Europe __ Transition countries __ Developing countries __ Developed countries __	Croatia __ South East Europe __ Transition countries __ Developing countries __ Developed countries __
4. For the Croatian national interest, ublication of these journals is (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important
5. For the **medical profession**, publication of these journals is (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important
6. To you **personally**, publishing in these journals is (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important
7. For these journals, **financial support** by the state government is (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important

8. As a credit for continuing medical education, **reviewing** for these journals should be considered (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important
9. As a credit for academic advancement, **reviewing** for these journals should be considered (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important
10. As a credit for continuing medical education, **publishing** in these journals should be considered (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important
11. As a credit for academic advancement, **publishing** in these journals should be considered (*circle one answer*):	National journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important	International journals 0 – completely unimportant 1 – not very important 2 – important 3 – very important