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The Biomedical Publishing Gap between the First World and the Emerging World – Can It Be Overcome?

Article Information Sheet

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Abstract

The Pan-American Health Organization has stated that access to scientific knowledge is key to the development and well-being of nations, but it has also pointed out that there is a strong disparity in knowledge production, which translates into poor publication indicators and low citation rates for research coming from emerging countries. This paper overviews the reality of emerging countries in terms of biomedical publications and lists the obstacles that must be overcome in order to close the gap with first-world English speaking countries. This review also describes the importance of local medical communication in order to change practice patterns based on evidence, since several studies show that local practitioners are more prone to adopt new approaches when the evidence is published in local journals that are perceived to be more pertinent.

Key Words:

Biomedical journals, citation rates, emerging countries, first-world peer-reviewed journals, local biomedical journals

Analysis

In its 2007 report "Health in the Americas", the Pan-American Health Organization pointed out the need for strengthening scientific information on health, including access and use of information to better inform decision-making in health. The report straightforwardly states that "as an activity to produce new knowledge to benefit society, research and its products are a classical example of a public good". Then it goes on to mention the call made during the two phases of the World Summit on the Information Society to "promote universal access to scientific knowledge that affects the development and well-being of peoples".¹ However, this report, as well as many other studies, denounces the marked disparity in the production of scientific knowledge between developed and emerging countries, which translates into a roster of poor indicators in scientific production including low rates of citation of research based in non-developed non English speaking countries.

The reality of emerging countries in biomedical publications

Sumathipala² refers to the ethical issues arising from the under-representation of developing countries in the research literature. The author holds that there is an

underlying inequity in how these countries are represented in five high-impact medical journals. Only 6.5% of published articles in these journals come from countries where 90% of the world population resides. Not without concern, Sumathipala also points out that articles containing original data from developing countries are actually written by first world authors and calls this phenomenon "safari research".

Falagas³ says that emerging countries hardly contribute to world scientific production even after having adjusted by GDP. Likewise, Yousefi-Nooraie⁴ also follows this idea by pointing out that in psychiatry, cardiovascular diseases, and epidemiology the representation of developing countries is low. The under-representation of emerging countries in leading high-impact medical journals is coupled with the fact that these countries' health problems are not adequately covered, especially in well-designed studies such as randomized controlled clinical trials².

Rahman⁵ studied the correlation between economic development and the number of publications normalized by million inhabitants. This author also refers to a significant imbalance that should prompt the governments

of developing countries to foster biomedical research in their respective countries.

Regardless of how development is measured, either as GDP or the Human Development Index, the countries that concentrate more wealth are also the countries that generate most medical research, which in turn biases the journals coming from the wealthier countries to contain more scientific capital since they tend to select original studies from their own countries.² Developed countries also invest more in research and development, and journals that publish the results of this research should acknowledge the fact that part of their own success – and business model – thrives on the scarcity of local publications. In other words, world biomedical literature is concentrated in countries that conduct more research, and, in turn, these are the better developed and wealthier countries. This results in a recirculation of scientific capital that does not benefit developing countries whose needs and issues are not properly addressed.

The importance of local biomedical publications

Central to this article is the importance of local biomedical science and its publication in local language because these journals contain more pertinent studies and better practical applications. Guindon⁶ concluded that locally conducted and published research correlates with a higher degree of compliance on behalf of emerging-country healthcare professionals. Since one of the objectives of biomedical publications is to reduce clinical practice variability by communicating the results of the best evidence available, it is fundamentally important that we understand the fact that local publications with local research are deemed to be more pertinent than non local ones by readership of biomedical journals, thereby translating into a greater disposition towards adopting best practices validated by evidence.

Page⁷ specifically looked into whether the origin of a publication bore an effect on the perception of readers and decision makers of the quality of the studies. Since emerging countries have few local publications, healthcare professionals are forced to resort to what is most prevalent, that is, first-world biomedical literature where they will not necessarily find needed relevant information for changing practice. In this author's study, with the exception of Egypt, all healthcare professionals from the other countries studied (China, Thailand, India and Kenya) indicated that they would be more prone to changing clinical practice if the evidence came from a locally conducted and published study.

The obstacles that emerging countries must overcome in order to increase their scientific production

There are several reasons why developing countries are scarcely represented by mainstream medical literature, among which several are worthwhile mentioning. First of all, language appears as a difficult-to-overcome barrier in many cases, which in turn affects citability of studies that may be of excellent quality and pertinence. The case of Japan is illustrative – although it produces great research

and good scientific publications, it ranks far below North American, European and Australian in terms of citation ratings.

Sumathipala² correctly summarises the main factors that explain the low representation of less advantaged countries in world biomedical publishing. Among those obstacles that hinder a greater local production, the author points out the lack of funding for local research, poor healthcare facilities, inadequate training in research methodology, overburdened professionals, lack of expertise in manuscript preparation, fear of rejection by high-impact journals and contradictory agendas between the funding agencies and the real interests of investigators. Even while many more factors that hinder developing countries' scientific production and communication could be identified, this summary is very indicative of the major effort that both researchers and editors from these countries must undertake. One could speak of a veritable "social determinant" of scientific production poverty.

Another element that underscores the inequity in the production of scientific capital and that at the end of the day impedes increasing country competitiveness is the so-called "manuscript selection bias", which stems from the selection of manuscripts that are chosen for reasons other than methodological quality and statistical soundness. The consequence is that many authors from less advantaged countries do not submit their manuscripts to high-impact journals.^{2 4} Yousefi-Nooraie studied the correlation between the quality of the papers published in countries of different socioeconomic level and the impact factor of the journal in which the manuscripts were published. The author concluded that in effect there is a positive correlation between a lower level of development and a lower acceptance rate of papers in high-impact journals, which could be explained by a publishing bias and the inhibition suffered by third-world country authors about submitting their research to these journals.

The competitive ranking of countries has been proven to be correlated with higher levels of scientific production, which in turn is measured by the number of published manuscripts in ISI/million inhabitant journals.⁸ However, on the other hand, English is the main language for scientific publications, and no other country reaches a 2% rate.⁹ In consequence, it is imperative that a greater scientific production is induced in developing countries, based not only on funding more research from biddable sources but also on strengthening local capacities for publishing the results of these studies in local languages as well as in English. Local language increases study pertinence and replicability, and English language enhances citability by the international scientific community.

While this may be the desirable outcome, reality presents itself in a different guise. According to the PAHO report, in 2000-2005 the participation of Latin America and the Caribbean in MEDLINE was only 2% of world production. In this database in 2005 only 66 indexed journals came

from Latin America. According to our own data, there are only 26 indexed journals in Spanish in MEDLINE, most of which come from Spain. To date, there are only three Chilean journals indexed in MEDLINE, and all three are published in Spanish with only the article abstracts in English.

Chilean scientific and publishing status

In Chile there are a number of universities, many of which conduct research and require their faculty to comply with annual publication targets in high-impact journals. Academics and investigators are fully aware and value that peer review is fundamental to the process of quality validation of a manuscript. Similarly, journals indexed in the world-leading databases of biomedical literature can prove that they have well-consolidated peer-review processes. As a result, there is a growing demand for publication in peer-reviewed, indexed journals with impact factors. However, and as this aspect of academic furtherance is not exclusive to Chile, it is easily understood that there is a push to publish in the so-called ISI journals, of which there are few in Spanish as was mentioned previously. Additionally, universities that have performance agreements must also increase the publication rate of their institutions. All of this leads to pressure on the system and to a need for more high-quality publications.

Chile is well aware of the need to invest more in science and technology in order to improve its competitive ranking, among other positive externalities. Biddable funds have increased the number of investigators, and funded research is also compelled to publish its results in indexed journals. The obvious consequence of this greater investment and demand is evidenced by the 86% increase in scientific production measured as publications in a four-year period (2004-2008). The National Council on Innovation for Competitiveness has stated that Chile still ranks low in world scientific production, despite recent increases and a leading position compared with that of other Latin American countries.¹⁰

Reference was already made to the obstacles that hinder scientific production in developing countries. In our experience, it has been extremely difficult to finance independent journals, ie journals that do not skew their editorial line in favour of advertisers that generally come from the pharmaceutical industry. And even when these sponsors may restrain from using their influence to promote contents of their interest, we have noticed that the marketing departments of these companies are the ones that decide spending, and the analysis is made on strict standards of rate-of-return on investment. A case can be made for conducting a retrospective tendency study that could identify a drop in local biomedical journal investment by the industry. The empirical consequence of this reality is that journals are increasingly hard-pressed to find funding that could help them become more professional, and this reality is reflected in the very low number of Chilean journals indexed in MEDLINE – only three, as already mentioned above.

The challenges faced by Medwave in this context

This is the context in which Medwave, without significant external funding, strives to further itself as a high-quality biomedical journal. In order to achieve this, Medwave must consolidate and professionalize the currently existing double-blind peer-review process; it must finish the development of its web-based online manuscript submission and review application, which includes checklists; it must provide feedback to authors so that they can improve the standard of their publications by following the suggestions of reviewers and editors, as well as strengthening and improving the review competencies of reviewers; it must comply with all sorts of quality standards in each phase of its processes so that the main international databases will accept application, which is also correlated with the need to professionalize its editorial staff; it must regularly send out invitations to publish in Medwave, promoting this journal as a viable quality option for submitting manuscripts based on speed and the consistency of the peer-review process; investigators and reviewers alike must train in methodology and biostatistics, and Medwave must provide the platform that will facilitate e-learning access to courses validated with follow-up data indicating high-quality standards; it must publish in two languages at least, in order to facilitate citability of articles from authors based in other latitudes of the world; and it must create protocol and clinical guidelines databases so as to streamline access to the best and most recent clinical practice orientations, with a sense of local reality.

The beneficiaries of this effort are multiple players, including universities, medical and learned associations and non-academic researchers. Maybe in the future one could envisage a publishing fee for those manuscripts that are funded from biddable sources, which would help potentiate the publishing groups of our country. This is already happening in developed countries, such as the United Kingdom, where studies that are duly financed generally include this type of fee among their costs.

Medwave must continue to be an open-access journal, especially with respect to original studies. However, once it achieves indexation and gains an impact factor in the future, Medwave could consider charging for some of the content. We believe that our readers would be willing to pay a small fee of around 50 dollars a year as a payment for pertinent, quality-checked and local language articles, protocols and clinical guidelines, all of which could influence the clinical decision-making process.

The editors of Medwave imagine in the not-so-distant future many learned societies and teaching centres setting up their own editorial committees, using Medwave as a publishing platform and taking full advantage of its editorial policies and processes, as well as its proprietary applications. With time, more journals could be established by interest or by specialty, thereby spawning a fully fledged publishing group with a growing catalogue of high-quality e-learning courses for the healthcare professionals of Latin America, in line with continuing

medical education programs at the service of medical and allied-professionals accreditation.

Conclusions

- Biomedical research and its products are a clear example of a public good, and universal access to scientific knowledge will affect people's development and well-being. There is a marked difference between developed and developing countries in the number of scientific publications they produce.
- Developing countries' under-representation in high-impact first-world journals is a problem of equity, and the health issues of these countries are not duly covered by these journals.
- This inequity also results from the fact that developed countries invest more in research and development and that the results from this research are published in first-world journals, thereby establishing the recirculation of scientific capital that tends to marginalize countries with poorer indicators of scientific production.
- However, locally conducted and published research correlates with higher levels of compliance by healthcare professionals in emerging economies, which explains why it is so important to strengthen local scientific publishing capacities that also respect the local language.
- The factors that explain the under-representation of less-advantaged countries in world biomedical journals are many (including language barriers, lack of research funding, weak training in methodology and scientific communication), thereby thus installing the concept of social determinant of scientific production poverty.
- Selection manuscript bias also prevents emerging countries from having a greater presence in impact biomedical literature.
- Chile also holds true to this world trend in research and publishing inequities and its standing in the more important databases is minimal.
- Both first-world countries as well as emerging economies should endeavour to invest more in projects and funds that will strengthen local research and publishing capacities. This imperative must be heeded by governments and by the international pharmaceutical industry, which finances the large therapeutic trials. All stakeholders should assume responsibility for this inequity and contribute to closing the gap that perpetuates the disadvantaged lot of the poorer countries.

Notes

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References

1. Organización Panamericana de la Salud. Salud en las Américas: 2007. Washington, D.C.: OPS, © 2007—2v. (OPS, Publicación Científica y Técnica No. 622) ISBN 978 92 75 31626 0 (Volumen I—Regional) ISBN 978 92 75 31622 8 (Obra completa, 2 volúmenes). ↑
2. Sumathipala A, Siribaddana S, Patel V. Under-representation of developing countries in the research literature: ethical issues arising from a survey of five leading medical journals. *BMC Med Ethics*. 2004 Oct 4;5:E5. ↑ | [PubMed](#) |
3. Falagas M, Michalopoulos A, Bliziotis I, Soteriades E. A bibliometric analysis by geographic area of published research in several biomedical fields, 1995–2003. *CMAJ* 2006;175(11). ↑ | [CrossRef](#) | [PubMed](#) | [PubMed Central](#) |
4. Yousefi-Nooraie R, Shakiba B, Mortaz-Hejri S. Country development and manuscript selection bias: a review of published studies. *BMC Med Res Methodol* 2006;6:37. ↑ | [CrossRef](#) | [PubMed](#) | [PubMed Central](#) |
5. Rahman M, Fukui T. Biomedical publication--global profile and trend. *Public Health* 2003 Jul;117(4):274–80. ↑ | [CrossRef](#) |
6. Guindon GE, Lavis JN, Becerra-Posada F, Malek-Afzali H, Shi G, Yesudian A, et al. Bridging the gaps between research, policy and practice in low- and middle-income countries: a survey of health care providers. *CMAJ* 2010;182(9). ↑ | [CrossRef](#) | [PubMed](#) | [PubMed Central](#) |
7. Page J, Heller RF, Kinlay S, Lim LL, Qian W, Suping Z, et al. Attitudes of developing world physicians to where medical research is performed and reported. *BMC Public Health* 2003;3:6. ↑ | [CrossRef](#) | [PubMed](#) | [PubMed Central](#) |
8. Cáceres C, Katz J. Análisis y Recomendaciones para Mejorar los Procesos de Construcción de las Agendas de Investigación de las Universidades Chilenas. Universidad de Chile. ↑ | [Link](#) |
9. Monge-Nájera J, Nielsen V. The countries and languages that dominate biological research at the beginning of the 21st century. *Rev Biol Trop*. 2005 Mar-Jun;53(1-2):283–94. ↑ | [PubMed](#) |
10. CNIC. Generación y Sistematización de la base para la evaluación de la Estrategia Nacional de Innovación en las áreas de Ciencias y capital Humano (Background Report). Subsecretaría de Economía, 2010. ↑ | [Link](#) |



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