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April 28, 1994

Ms. Jane M. Russell
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Dear Ms. Russell,

Thank you very much for your contribution to 47th FID '94. We are pleased to inform you that your paper entitled

A Comparative Study of Mexican Research Published in the Regional and Mainstream Scientific Literature

has been accepted for oral presentation of this conference. At this time, we are still setting up the program, and we will be able to inform you of your session and presentation schedule soon.

Please note that the final manuscript of your paper must reach us no later than June 30, 1994. (Dead line has been changed.) Delayed papers may not be included in the proceedings. Further information, such as the form to be used for your text and its length will be sent to you by May 20, 1994.

Thanking for your cooperation and looking forward to meeting you in October, we remain, with all best wishes,

Sincerely yours,

Kimio Hosono (Prof.)
Chairman of Program Committee
47th FID'94

A COMPARATIVE STUDY OF MEXICAN RESEARCH PUBLISHED IN THE REGIONAL
AND MAINSTREAM SCIENTIFIC LITERATURE

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ABSTRACT

A search carried out on two Latin American databases, BIBLAT covering studies produced by LA authors in international, mainstream journals and PERIODICA covering regional journals, revealed the extent to which Mexican scientists in different fields published preferentially as first authors in the international or national literature from 1981 to 1985. A total of 7184 studies were disseminated in national and regional journals compared to 3221 in foreign journals. In both cases the majority of studies were in the medical fields but this was less marked with respect to the international than the regional literature (30.4% and 57.4 %, respectively). More studies were published during this period in mainstream than regional journals in Chemistry (64.6% and 35.4%, respectively) and Physics (76.1% and 23.9%, respectively) while in all other scientific fields regional (particularly, national) publication was preferred. A marked trend away from regional to international publication was noted in Biology from 20% of studies published internationally in 1981 to 53.5% in 1985. The results of the present study have implications for the design of evaluation schemes for researchers and research groups from developing countries, as well as for the

development of information systems covering their scientific production.

INTRODUCTION

Developing country scientists have a choice to make as to whether to publish their research findings in a local journal or to use one of the international communication channels. Many factors come into play when making this choice, not all of which are related to purely scientific considerations. Loyalty to the national editorial endeavour and to the ideal of publication in the local language, as well as the fear of rejection by the editors of international journals, are some of the non-scientific arguments for local publication put forward by developing country scientists. On the other hand, the desire for visibility and recognition by foreign colleagues as a bona fide member of the global scientific community, are inducements for publishing in international journals.

The extent to which Latin American national scientific communities publish preferentially in the local or international literature is not known in many cases. The few studies that have been carried out generally refer to specific (often institutional or subject orientated) research communities which might not have relevance to the situation of the country as a whole (1-3). Previous studies on the publishing patterns of the Mexican scientific community have analyzed the behaviour of researchers in Medicine and Health (4,5) and in Physics (6).

One of the main difficulties in determining production in

national publications relates to a lack of accurate, reliable sources, particularly databases, for carrying out these studies. In the case of Latin America, few national or regional databases exist and the majority of these cover specific subject areas. However, the Sciences and Humanities Information Centre at the National University of Mexico (Centro de Información Científica y Humanística (CICH), Universidad Nacional Autónoma de México, (UNAM)) has been compiling in automated form the Latin American production in regional and mainstream journals since the late '70s.. Its PERIODICA database covers regional periodical literature in all fields of science and technology. Although periodical literature predominates, serials and limited circulation publications are also included. Journal selection is based on subject coverage, priority being given to highly specialized titles showing regular publication. CICH also produces the BIBLAT database which covers articles and other documents published in the international, mainstream literature by authors reporting an address in Latin American countries. The unique coverage of these two databases makes them obvious choices for the realization of studies on Latin American production.

OBJECTIVE

The object of the present study is to measure how much of Mexican scientific research is published preferentially in local and regional journals and to determine if this percentage is field-dependent. The results of the study will be useful for determining the adequacy of criteria used to evaluate the performance of scientists in different fields, as well as to

provide guidelines for the development of databases to access the production of developing country scientists.

METHODOLOGY

The PERIODICA and BIBLAT databases produced by the CICH were used in the present study. PERIODICA presently covers approximately 1,200 titles of Latin American journals in science and technology (of which around 30% are Mexican titles). Coverage has increased gradually since its formation in 1979. BIBLAT indexes documents published by Latin American authors in the set of approximately 3,300 international journals covered by Science Citation Index from 1978 onwards. Both databases are in the MINISIS format and include only first author addresses. A geographic code is assigned to each record corresponding to the country of affiliation of the first author. Other codes refer to the subjects covered by the indexed documents, each record containing up to five different codes. However, the first one reflects the principal focus of the paper. Subject codes are assigned manually by specialists after a revision of the subject matter of individual articles. Major subject codes are: Agrosociences, Biology, Chemistry, Engineering, Exact Sciences (not including Physics), Geosciences, Medicine, Multidisciplinary Sciences, Physics, and Psychology.

For the purpose of the present study only the principal subject code was taken into consideration. The few studies identified in Multidisciplinary Sciences and Psychology were eliminated from the present analysis as they were not considered

representative. Also eliminated were those studies not assigned subject codes and those containing subject codes in the Humanities and Social Sciences fields.

In order to identify documents published regionally and internationally by Mexican authors, records from both databases which included Mexico as the geographic code in documents published between 1981 and 1985 were downloaded online from the two databases and stored in separate MICROISIS files.

At the time the present study was initiated (early 1993), 1985 was considered as the latest year for which comprehensive data was available in PERIODICA due to the long delays in the publication and distribution of many Latin American journals and allowing for the time required to index all journal titles from a particular year.

RESULTS

A total of 7184 records of Mexican studies produced in the national and regional journal literature were identified for 1981 to 1985. A corresponding 3221 records were found in the mainstream literature indicating that during this period a total of 10,405 Mexican studies were published, 31% of which were disseminated outside the region.

Approximately half of all Mexican research was in the medical field (n=5104), with a higher percentage with respect to regional dissemination compared to international (57.4% and 30.4%, respectively) [Figure 1]. Biology in second place (n=1285) in total number of publications was followed by Chemistry (n=870), Engineering (809) and Physics (n=765). Biology was also

the second most represented field in regional journals representing 11.4% of studies followed by Engineering with 8.3% and Agrosociences with 7.9%. On the international front, studies in Physics accounted for 18.1%, Chemistry for 17.4% and Biology, 14.4%. Only in Physics and Chemistry were more studies published at international than regional level.

With respect to the annual production in regional journals in different fields during the five years studied, an overall downward trend was apparent in Medicine, Biology, Geosciences and in the Exact Sciences (Figure 2). Engineering was the only field to show an upward trend towards the end of this period.

The trends in international publication show a different picture (Figure 3). In all fields, with the exception of Geosciences, Engineering and Exact Sciences, there was a trend towards increased production which was particularly apparent in Biology, Chemistry and Physics.

The field of Biology showed a definite move away from local to international publication from 80% disseminated regionally in 1980 to 46.5% in 1985 (Figure 4). A similar trend was found in Medicine (Figure 4) and in Geosciences, Exact Sciences and in Physics (Figure 5).

The titles of journals from the region publishing more than 200 Mexican studies in our five year period are listed in Table 1. All are Mexican journals in the health sciences field. In all 196 regional journals published at least one Mexican study. Mainstream journals publishing more than ²⁵~~50~~ Mexican contributions were in a variety of fields, particularly in Chemistry and

Physics (Table 2). Seven of these nine journals are edited in the USA. Overall Mexican scientists used ¹¹¹¹~~119~~ different mainstream journal titles to disseminate their research during the period of study.

DISCUSSION

It is generally considered that the results of more applied studies, such as those in the fields of Clinical Medicine and Engineering, will be submitted locally while studies in areas of basic research, such as Biomedicine, Physics and Mathematics, where results contribute to the universal body of scientific knowledge, will be sent to international, mainstream journals. In the present study much more use was made of Latin American journals than those in the mainstream in the field of Medicine and Biology while in Physics and Chemistry the trend was reversed. In other Exact Sciences slightly more local publication was found than international, probably due to the fact that the Mexican Journal of Astronomy and Astrophysics (*Revista Mexicana de Astrofísica y Astronomía*), a mainstream journal in the sense that it is indexed in Science Citation Index, is included as a local journal. Our results confirm previous findings that preference is given by Mexican researchers in the medical field to local publication (4,5) and in the physical sciences to international dissemination (6).

An important argument in favour of dissemination at international level is the value given to articles published in the international scientific press by evaluating committees in the developing world. The high quality assigned to

internationally published articles is based on the premise that these are subject to rigorous peer review before acceptance for publication. At the same time authors from developing countries compete for publication in these prestigious titles with scientists from many different countries, including those at the forefront of scientific research. With the implementation in recent years in certain Latin American countries, such as Venezuela and Mexico, of government incentive schemes to supplement researchers' institutional salary (7), the value assigned to international publication translates directly into additional income for the researchers.

The poor quality and visibility of national journals has been used as an argument against local publication and in favour of international dissemination. Recommendations to this effect, which question the role of national and regional journals, are commonly heard throughout Latin America (8). The assignment of articles published by Latin American scientists into two categories: those of poor standard published in applied, local journals and those of high quality appearing in foreign journals is too simplistic to be generally acceptable. There are many examples of good quality, Latin American journals able to compete in the international market, as there are of poor quality, foreign titles. The fact that production of most Latin American journals is heavily subsidized by institutional, international or other funding should imply constant monitoring of their quality by the sponsoring bodies. Perhaps, however, absence of the need to be commercially viable explains the continued existence of

many titles of dubious worth.

Use of the CICH databases to carry out bibliometric studies is open to criticism. The absence of well-defined criteria for the selection of journals, the unknown increase in the number of journals covered annually, the problems associated with the timely publication and distribution of many Latin American journals, the short life of many of these, are all factors which could have affected our results. Nonetheless, this is the case to a greater or lesser extent with all bibliometrical studies based on commercially-available bibliographic databases designed for purposes other than scientometric analysis. As Blickenstaff and Moravcsik point out in their article on the scientific output of the Third World, information based on the best available sources is always valuable, even if these are in some respect deficient (9). We are of the opinion that the CICH databases provide valuable information on the production of Latin America which is not available using other sources.

In the present study we have presented evidence to suggest a trend towards increased international publication and away from local publication by Mexican scientists in many fields during the first half of the last decade. With the increasing globalization of science in recent years, as well as increasing importance being given to the need for wider dissemination of research results from Latin American countries, we could expect this trend to have continued throughout the '80s and into the '90s.

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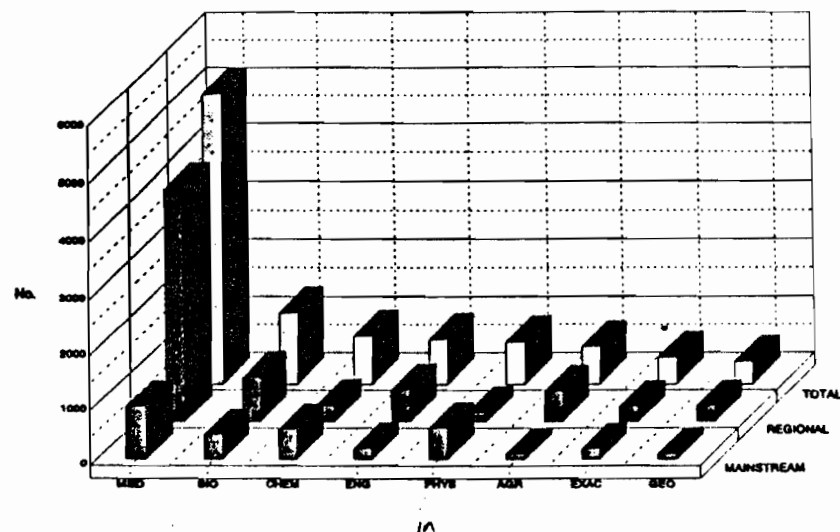


Figure 1. Distribution of Mexican studies regional and mainstream literature according to subject field

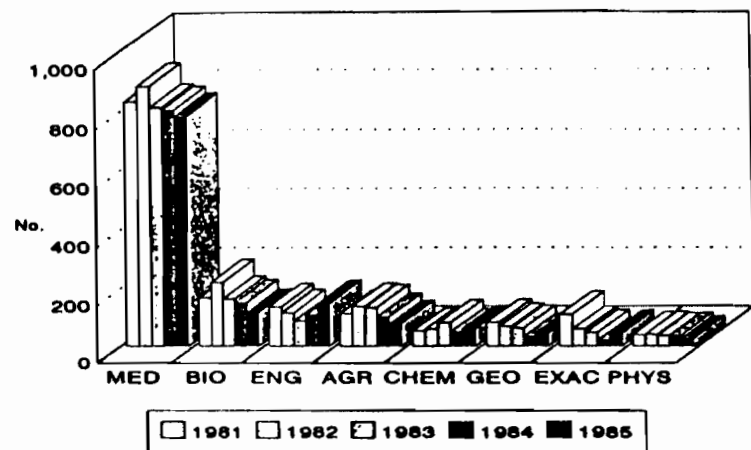


Figure 2. Annual distribution of Mexican studies published regionally according to subject field

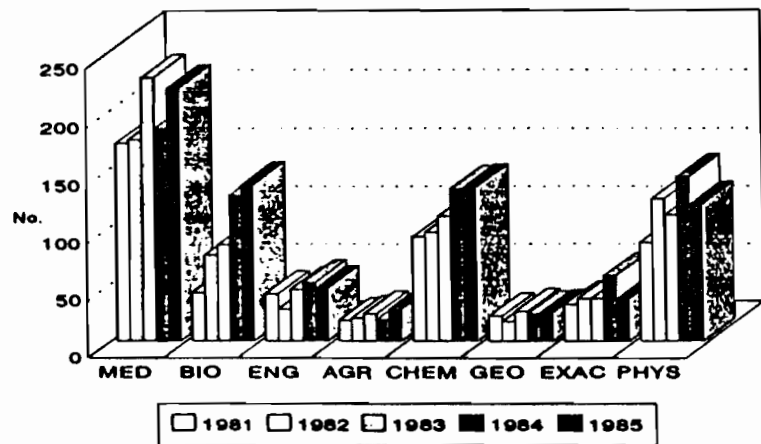


Figure 3. Annual distribution of Mexican studies in the mainstream literature according to subject field

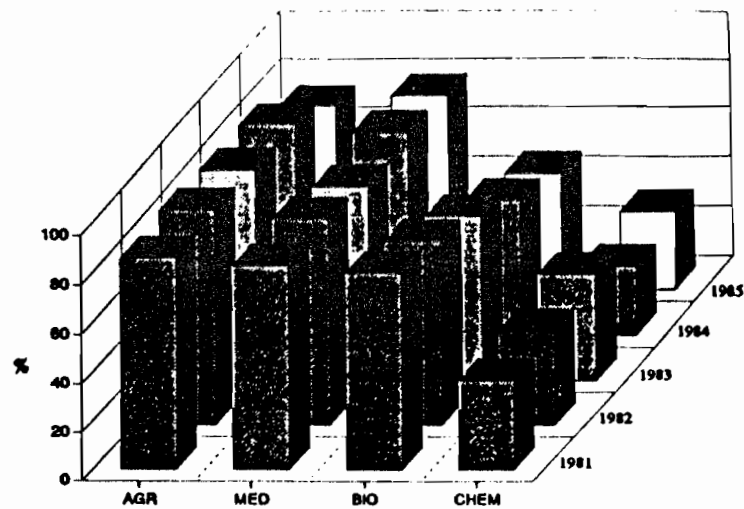


Figure 4. Annual percentages of Mexican studies published regionally (Agriculture, Life Sciences and Chemistry)

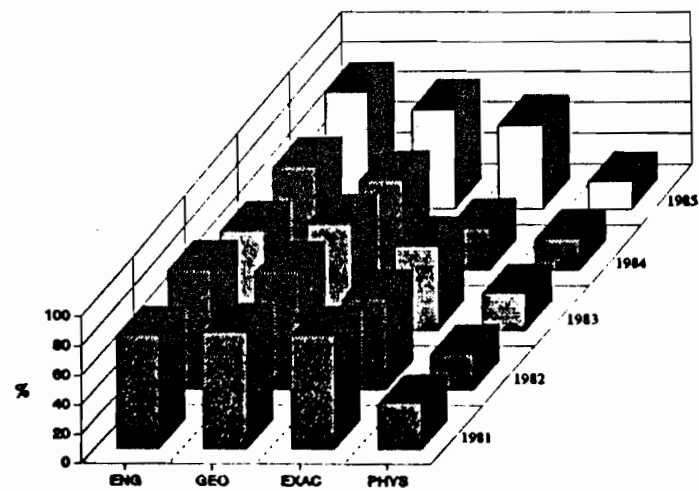


Figure 5. Annual percentages of Mexican studies published regionally (Engineering, Geosciences and Exact Sciences)

Table 1. Regional journals publishing more than 200 Mexican articles

	Country	No.
Revista Médica-Instituto Mexicano del Seguro Social	MEX	458
Boletín Médico-Hospital Infantil de México	MEX	372
Archivos-Instituto de Cardiología	MEX	286
Revista de Investigación Clínica	MEX	279
Gaceta Médica de México	MEX	275
Archivos de Investigación México	MEX	240
Salud Pública de México	MEX	214

Table 2. Mainstream journals publishing more than 50 Mexican articles

	Country	No.
Phytochemistry	USA	122 61
Physical Review B-Condensed Matter	USA	110 55
Journal of Mathematical Physics	USA	102 46
Journal of Chemical Physics	USA	100 40
Physical Review D-Particles and Fields	USA	76 38
Proceedings of the Western Pharmacology Society	USA	70 35
Annales de Genetique	FRA	64 32
Journal of Rheumatology	CAN	60 30
Bulletin of the Seismological Society of America	USA	54 27