

PUBLIC HEALTH RESEARCH WORK IN LATIN AMERICA AND THE CARIBBEAN: A BIBLIOMETRIC ANALYSIS OF THE LITERATURE (1980-2005)

Macías-Chapula C.A.; Mendoza-Guerrero J.A.; Rodea-Castro, I.P.;
Gutiérrez-Carrasco A.; Juárez-Sánchez, E.

cesarmch@liceaga.facmed.unam.mx

Hospital General de México, Research Division. Information Science Programme.
Algeciras 43 A, Col. Insurgentes Mixcoac, Delegación Benito Juárez, 03920 México D.F (México)

Abstract: Few studies have been conducted on the analysis of outcome indicators related to public health research work, as conducted in the Latin American and Caribbean (LAC) regions. These indicators can help policy decision makers, researchers and managers, among others, to improve existing research lines, design public health programmes, and allocate resources accordingly. The **purpose** of this work is to present the results of a research in progress on the patterns of scientific communication on public health research work in LAC, as found from the documents published in the field and retrieved from international bibliographic databases. **Method.** A bibliometric approach was used to identify the documents indexed under *public health* and the LAC, for the period 1980-2005, both in LILACS (Latin American and Caribbean Literature in the Health Sciences) and MEDLINE. A selection of the top eight countries with major production was identified. Data was further analysed to establish the type of documents produced, authorship, language of publication, and the subject content of the production. For the purpose of this paper only the articles published in scientific journals were analysed so as to compare the database coverage; i.e., local or mainstream visibility of the production on public health research work in LAC. Bibexcel 2001 and Refworks2005 were used to establish data rank distributions and clusters linked to a particular subject content, institutional affiliation, language of publication and authorship. **Results.** The paper presents the results of this analysis and the implications derived from the study.

1. Introduction

In the last two decades, multiple health care reforms have emerged in the LAC regions (Macías-Chapula, 2002; Gonzalez-Garcia, 2001). In these countries, new tools and managerial models have been developed and applied. Most health care researchers and managers in these countries however, are not aware of the results derived from public health research interventions, both at the national and international levels. No information exists regarding for example, public health research lines; benchmarking; visibility of research results; or impact on public health programmes. Clearly, less information exists on the relationship between public health research and interventions leading to social change and improvement of well-being (Macías-Chapula et al, 2005). Few studies have been conducted on the analysis of outcome indicators related to public health research work, as conducted in the Latin American and Caribbean (LAC) regions. These indicators can help policy decision makers, researchers and managers, among others, to improve

existing research lines, design public health programmes, and allocate resources accordingly (Macías-Chapula, 2005; Almeida-Fihlo, 2003; White, 2002; Lancet, 2004; WHO, 1999; Pellegrini, 1997; Frenk, 1986).

2. Purpose

The purpose of this work is to present the results of a research in progress on the patterns of scientific communication on public health research work in LAC, as found from the documents published in the field and retrieved from international bibliographic databases.

3. Method

A bibliometric approach was used to identify the documents indexed under *public health* and any country of the LAC regions, for the period 1980-2005. A literature search was conducted, both in LILACS (Latin American and Caribbean Literature in the Health Sciences) and MEDLINE. A selection of eight leading countries with major production was obtained. These countries were the following: Brazil, Mexico, Chile, Argentina, Colombia, Cuba, Peru and Venezuela. Data was further analysed to establish the type of documents produced, authorship, language of publication, and the subject content of the production. For the purpose of this paper only the articles published in scientific journals were analysed so as to compare the database coverage; i.e., local or mainstream visibility of the production. Bibexcell 2001 and Refworks 2005 were used to establish data rank distributions.

4. Results

4.1 Production

A total of 93, 374 journal articles were found in both databases LILACS (65, 759) and MEDLINE (27, 615). The distribution of this production is described in Table 1.

Country	MEDLINE	%	LILACS-SP*	%
Brazil	10,887	39.42	28,504	43.35
Mexico	6,988	25.31	6,055	9.21
Chile	2,596	9.40	7,536	11.46
Argentina	2,244	8.13	8,265	12.57
Colombia	1,358	4.92	3,619	5.50
Cuba	1,345	4.87	3,998	6.08
Peru	1,150	4.16	2,610	3.97
Venezuela	1,047	3.79	5,172	7.87
Total	27,615	100	65,759	100

*LILACS-SP = Latin American and Caribbean Health Sciences Literature. Public health domain.

4.2 Authorship

Collaboration was more visible in MEDLINE (85.04%) than in LILACS-SP (59.89%). This pattern may reflect the fact that public health research results are more likely to be disseminated in the international literature if they are derived from the collaboration of two or more researchers. It also illustrates the high tendency of single researchers to publish their results in local or regional sources, as found in LILACS-SP. Table 2, describes the distribution found by authorship in both databases.

Country	1 Author		2-5 Authors		6-10 Authors		11 + Authors	
	MEDLINE	LILACS-SP	MEDLINE	LILACS-SP	MEDLINE	LILACS-SP	MEDLINE	LILACS-SP
Brazil	12,68	36,22	59,72	57,00	25,31	6,17	2,29	0,61
Mexico	16,41	39,17	53,71	51,80	26,01	8,24	3,86	0,79
Chile	12,89	46,95	57,46	44,21	27,76	7,83	1,89	1,01
Argentina	3,39	52,06	40,92	41,68	45,71	5,88	9,98	0,38
Colombia	23,36	29,06	50,97	35,01	21,42	17,51	4,25	18,42
Cuba	23,01	25,61	57,70	67,67	17,59	6,61	1,70	0,10
Peru	19,46	59,51	45,58	36,72	30,49	3,43	4,47	0,34
Venezuela	12,95	35,43	54,38	53,10	30,28	10,45	2,39	1,02
Total	14,96	40,11	56,07	52,46	25,93	6,66	3,03	0,77

*LILACS-SP = Latin American and Caribbean Health Sciences Literature. Public health domain.

4.3 Language

English was the main language used in MEDLINE (62.64%); and Spanish in LILACS-SP (55.58%). While Portuguese was the second language used in LILACS-SP (38.21%); this language however was less visible (13.05%) than Spanish (23.15%), in MEDLINE. Other languages like French, German and Russian were less significant in MEDLINE (1.16%).

4.4 Subject content

Due to the high proportion of productivity of Brazil (39.42%) as compared with the other LAC countries, the subject content of Brazil was analysed separately. In this country, public health research outcome was mainly related to papers discussing aspects of *Prevalence*; *Socioeconomic Factors* and *Risk Factors* in MEDLINE. In LILACS-SP, the subject content was highly related to *Health Policy*. Tables 3 and 4, provide a rank distribution of the main Medical Subject Headings found in each database, accordingly.

Table 3. Public health research work in Latin America and the Caribbean. Subject content distribution of the literature, according to the frequency found of Medical Subject Headings in Brazil (MEDLINE, 1980-2005).

r*	MeSH	Frequency
1	Prevalence	1.678
2	Socioeconomic Factors	1,501
3	Risk Factors	1.391
4	Cross-Sectional Studies	861
5	Sex Factors	793
6	South America	767
7	Urban Population	754
8	Questionnaires	726
9	Incidence	697
10	Retrospective Studies	678
11	Developing Countries	580
12	Time Factors	515
13	Age Distribution	474
14	Demography	467
15	Prospective Studies	427
16	Latin America	411
17	Americas	399
18	Sex Distribution	395
19	Follow-Up Studies	386
20	Seasons	381
*rank	1-189	
Total	109.916	

MeSH = Medical Subject Headings

Table 4. Public Health research work in Latin America and the Caribbean. Subject content distribution of the literature, according to the frequency found of Medical Subject Headings in Brazil (LILACS-SP, 1980-2005).

r*	MeSH	Frequency
1	Health Policy	1,125
2	Health Education	834
3	Risk Factors	820
4	Socioeconomic Factors	820
5	Nursing	713
6	Public Health	667
7	Health Services	615
8	Nursing Care	613
9	Mental Health	572
10	Health System	567
11	Questionnaires	522
12	National Health System	496
13	Consumer Participation	494
14	Epidemiologic Surveillance	494
15	Occupational Health	492
16	Public Policy	491
17	Breast Feeding	487
18	Research	465
19	Congress	463
20	Retrospective Studies	434
*rank	1-246	
Total	180.659	

MeSH = Medical Subject Headings

The remaining countries, Mexico, Chile, Argentina, Colombia, Cuba, Peru and Venezuela, were analysed according to the rank distribution of the Medical Subject Headings, as found in Mexico. The reason being the leading role of Mexico in the amount of papers published. The analysis of these data illustrates both similarities and discrepancies in the varying fields of interest of each country. This pattern applied for both databases MEDLINE and LILACS-SP. The main areas of interest for example of Mexico, Chile, Argentina and Venezuela, were related to *Risk Factors* and *Prevalence* in MEDLINE; while Colombia, Cuba and Peru interest was in *Developing Countries* and *United States*. Table 5, describes the rank distribution of descriptors in MEDLINE.

Table 5. Public health research work in Latin America and the Caribbean. Rank distribution of Medical Subject Headings, according to the production of Mexico (MEDLINE, 1980-2005).							
MeSH/r*	Mexico	Chile	Argentina	Colombia	Cuba	Peru	Venezuela
Risk Factors	1	2	2	6	5	5	2
Prevalence	2	1	1	10	6	2	1
Socioeconomic Factors	3	4	14	8	11	6	7
Developing Countries	4	8	8	1	3	1	4
Age Factors	5	3	5	9	4	8	3
Demography	6	12	6	5	7	7	5
Latin America	7	11	13	2	6	3	6
North America	8	59	69	43	9	44	45
Americas	9	15	15	4	10	4	10
Cross-Sectional Studies	10	13	20	12	30	11	11
United States	11	44	47	37	1	43	40
Questionnaires	12	22	23	13	23	16	30
Population	13	19	16	7	11	9	13
Sex Factors	14	5	15	18	12	25	11
Population Dynamics	15	6	7	11	11	13	12
Retrospective Studies	16	7	3	26	18	16	14
Hispanic Americans	17	78	83	65	15	4	53
Incidence	18	9	4	20	14	10	9
Emigration and Immigration	19	44	22	25	8	31	22
Urban Population	20	21	19	16	34	16	16
*rank	1-155	1-78	1-83	1-69	1-62	1-62	1-53
Total MeSH	72.307	25.219	24.386	15.624	13.000	13.290	10.741
MeSH = Medical Subject Headings							

Since Argentina was the leading country in the amount of papers published, as found in LILACS-SP, the same approach was used to identify the rank distribution of descriptors by country, as mapped against the rank distribution of this country. The analysis of data provided the following results: *Risk Factors* was the leading descriptor (r1) in all countries with the exception

of Venezuela and Peru, where this descriptor ranked 7 and 2, respectively. Table 6, describes the subject content found, according to the countries analysed in LILACS-SP.

Table 6. Public health research work in Latin America and the Caribbean. Rank distribution of Medical Subject Headings, according to the production of Argentina (LILACS-SP, 1980-2005).							
MeSH/r*	Argentina	Chile	Mexico	Venezuela	Cuba	Colombia	Peru
Risk Factors	1	1	1	7	1	1	2
Pediatrics	2	27	52	3	46	28	31
Prospective Studies	3	5	37	48	6	31	5
Congress	4	9	47	35	49	17	50
Primary Health Care	5	7	63	33	2	15	18
Dentists	6	76	72	60	54	16	51
Physicians	7	60	39	37	48	28	12
Socioeconomic Factors	8	2	12	5	22	3	22
Research	9	14	5	20	55	4	15
Ethics, Medical	10	5	23	50	43	12	48
Quality Control	11	59	32	25	54	23	34
Treatment Outcome	11	34	19	42	55	32	52
Quality of Life	12	11	41	31	19	18	28
Prospective Studies	13	8	24	61	53	29	16
Infant Mortality	14	19	26	39	8	17	7
Physician-Patient Relations	15	16	28	56	29	27	53
Follow-Up Studies	16	20	67	58	39	26	46
Neoplasms	17	72	52	48	35	28	21
Quality of Health Care	18	74	22	62	38	20	23
Liability, Legal	19	51	56	62	54	32	52
Health Policy	20	24	11	48	46	18	48
*rank	1-215	1-84	1-75	1-64	1-55	1-34	1-53
Total MeSH	45.031	40.696	28.041	21.140	14.228	12.301	12.130
MeSH = Medical Subject Headings							

Data analysis of check-tags used in all eight countries did not show any significant findings. Both databases provided an even distribution of check-tags. Results indicated that most of the research was related to *Human, Female, Male, Adult, and Adolescent*. Less frequently the studies were related to *Infant, Newborn and Pregnancy*. Table 7, provides this distribution.

**Table 7. Public Health research work in Latin America and the Caribbean.
Subject content distribution by Check-Tags and databases
(MEDLINE and LILACS-SP; 1980-2005).**

Check-Tags/ r*	Brazil		Argentina		Chile		Mexico		Venezuela		Cuba		Colombia		Peru	
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L
Human	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Female	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Male	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Adult	4	4	5	4	4	4	4	4	4	6	4	4	4	5	4	4
Adolescent	5	6	7	7	5	5	6	6	6	7	5	5	5	6	5	6
Middle Age	6	7	6	6	6	7	5	5	7	9	6	6	6	13	6	5
Child	7	5	8	5	7	6	8	8	8	5	7	7	7	4	7	8
Animal	8	8	4	12	12	13	10	13	5	11	8	13	8	15	8	14
Child, Preschool	9	9	11	9	11	11	11	9	9	8	11	10	10	7	9	10
Age	10	10	9	8	8	9	9	7	10	13	10	8	11	14	12	7
Infant	11	10	12	11	10	8	12	11	12	10	12	9	12	9	10	12
Comparative Study	12	12	10	13	9	14	7	10	11	4	9	14	9	10	11	9
Infant, Newborn	13	11	13	10	13	10	13	12	13	14	13	11	13	11	13	11
Pregnancy	14	13	15	14	14	12	14	14	15	12	14	12	14	8	14	13
* rank	1-34		1-32		1-32		1-26		1-31		1-24		1-23		1-23	
LILACS-SP = Latin American and Caribbean Health Sciences Literature. Public health domain.																
M= Medline								L=LILACS-SP								

5. Conclusion and discussion

The outcome of public health research work in the LAC regions is significant. Nearly half of the production corresponds to publications disseminated in the mainstream literature, as indexed in MEDLINE. Collaboration seems to have an impact in the visibility of papers, as found in MEDLINE. On the other hand, there remains a visible pattern to work and publish as a single author in local and regional papers, as found in LILACS-SP. English, Spanish and Portuguese were the main languages used in the LAC regions when publishing their results. This was found in both databases. These preliminary results provided data to continue this line of research so as to analyse for example, the subject content distribution of the literature over time and to identify clusters of emergence in the field.

6. References

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