

# Research on Health Inequalities in Latin America and the Caribbean: Bibliometric Analysis (1971–2000) and Descriptive Content Analysis (1971–1995)

Naomar Almeida-Filho, MD, PhD, Ichiro Kawachi, MD, PhD, Alberto Pellegrini Filho, MD, PhD, and J. Norberto W. Dachs, MD, PhD

There is growing international interest in the study of social inequalities in health.<sup>1–3</sup> This interest is partly due to the accumulating evidence that health disparities are widening within and across countries.<sup>4–6</sup> Interventions designed to narrow gaps in health have become a high priority for international organizations,<sup>7,8</sup> but their implementation has been hampered by, among other conditions, lack of information on trends and causes of health inequities. This dearth of information is supposedly more acute in underdeveloped regions of the globe, as reflected in Wagstaff's assessment that "only recently . . . has the issue of socioeconomic inequalities in health started to receive attention in the developing world."<sup>8(p2)</sup>

The purpose of this article is to partly dispel that myth, at least concerning literature originating from Latin America and the Caribbean (LAC). Far from a paucity of information, knowledge, and thinking, LAC has a long-standing tradition of research on health inequalities, mostly tied to the social medicine movement. The *American Journal of Public Health* recently published a brief overview of social medicine in Latin America authored by Waitzkin et al.,<sup>9</sup> focusing mainly on its historical and political aspects as a resistance movement against military dictatorships in the region. The contributions of Latin American social medicine toward understanding the complex relationships between society and health formed the topic of a companion article by the same authors.<sup>10</sup> Consistent with their academic and political agendas, research groups in Latin American countries have tackled social inequalities in health as a central topic of empirical and theoretical inquiry. This aspect was barely sketched in the reviews just mentioned and therefore deserves further elaboration.

In this article, we report a bibliometric and descriptive content analysis of research output on health inequalities produced in LAC

We conducted a bibliometric and content analysis of research on health inequalities produced in Latin American and Caribbean countries. In our bibliometric analysis (n=576), we used indexed material published between 1971 and 2000. The content analysis (n=269) covered the period 1971 to 1995 and included unpublished material.

We found recent rapid growth in overall output. Brazil, Chile, and Mexico contributed mostly empirical research, while Ecuador and Argentina produced more conceptual studies.

We found, in the literature reviewed, a relative neglect of gender, race, and ethnicity issues. We also found remarkable diversity in research designs, however, along with strong consideration of ecological and ethnographic methods absent in other research traditions. (*Am J Public Health*. 2003;93:2037–2043)

during the period 1971 to 2000. Bibliometry is a methodological branch of the new interdisciplinary field of scientometrics, which in turn is one of the main contemporary currents in the social studies of science and technology (for a recent up-to-date review of scientometrics, see Schoepflin and Glanzel<sup>11</sup>; for bibliometric methods and theory, see Narin et al.<sup>12</sup>). Despite their wide use in the health field,<sup>13</sup> bibliometric approaches are virtually nonexistent in the literature on health inequality, with the exception of Benach's<sup>14</sup> study in Spain. We know of only 3 bibliometric analyses of health research in Latin America.<sup>15–17</sup> We also found a review of Brazilian public health research, mostly covering descriptive content analyses of academic output, conducted by Nunes.<sup>18</sup> None of these articles exhibited a special focus on health inequality research.

Our analysis was conducted as part of a Pan American Health Organization (PAHO)/World Health Organization (WHO) initiative for the promotion of research on social inequities, living conditions, and their consequences for the health status and health care of poor populations.<sup>19</sup> It is also linked to the establishment of a virtual health library (specifically aimed at providing scientific information on health inequities) in the region of the Americas.

## METHODS

### Sources and Selection Criteria

The study comprised an exhaustive compilation of papers, including those published as articles in scientific periodicals and technical journals, chapters in edited volumes, graduate theses, and dissertations. These studies were identified initially via searches of computerized bibliographical databases (Institute for Scientific Information (ISI), Medline, Literatura Técnico-Científica em Ciências de Saúde na América Latina e Caribe (LILACS), and the Documentation Centre on Socioeconomic Inequalities in Health). All member countries of PAHO were included in the search. We conducted bibliographic Internet searches of ISI and MEDLINE systems using the following standardized queries: "country name" and "inequality" or "inequity" or "social class" or "social status" or "gender." We repeated the same searches for the generic headings "Latin America" and "Caribbean."

We also included in the study unpublished papers produced in limited editions for restricted or local circulation. Papers presented at conferences, symposia, and other scientific meetings were considered only if they were included in proceedings or collections of abstracts and the full texts could be obtained. We used a snowballing process in which

bibliographies found in the collected papers also served as sources for the identification of new references. In addition, authors registered in the bibliographical databases and other researchers nominated by PAHO staff as consultants or resource persons were contacted directly by e-mail and invited to update reference lists, to provide new references, and to indicate other authors who had done research on health inequalities.

Documents included in the database were classified under the following categories:

- Epistemological and conceptual studies addressing the issues of equity in health and health care, including their possible definitions and explanatory models as well as papers dealing with concepts such as inequality, inequity, disparity, difference and diversity
- Research designed to generate empirical evidence on the relations between the health status of population groups and their historical and socioeconomic determinants, including categories such as gender, ethnic group, social class, generation, and living conditions
- Investigations of social responses to health problems (in the form of models of health care and health practices, including professional and community sectors and individual and collective health care services) and their relations with social differences, inequalities, equity, and inequity

The collected papers are housed at the Library of the Instituto de Saúde Coletiva at the University of Bahia and form the embryo of PAHO's virtual health library on LAC health inequalities. Efforts to add fresh references and obtain offprints, originals, and photocopies are continuing. As of December 2001, the database comprised a total of 631 bibliographical entries spanning the years 1962 to 2001.

### Content Analysis

All documents that had been published or distributed between 1971 and 1995 and were available in the database in their full-text form as of December 1999 were considered for the content analysis. This time restriction was imposed to ensure broad representativeness of documents that circulate through informal networks (or "gray literature") and bibliographic material that requires a longer latency time for reaching its audience (e.g., books). All compiled

papers (n=269) were classified, evaluated, and analyzed by the first author, who has formal training in epidemiological as well as ethnographic methods. Individual summaries of the collected articles, reports, and documents were then generated in relation to 2 basic elements:

- Methodological aspects of the studies reviewed—the papers were categorized according to the research strategy employed. As a working definition for the present analysis, "research strategy" consists of a general research plan that includes stages, decisionmaking rules, field movements and procedures, and data collection and analysis techniques. The methodology of each study was scrutinized to identify data sources, data generation procedures, and data analysis techniques.
- Principal trends, gaps, new issues raised, and models explaining the determinants and consequences of health inequities—the leading trends in the general findings of the studies were ascertained on the basis of the analysis of the compiled research reports. Special attention was given to the nature of the hypotheses tested, their articulation with theoretical frames of reference, and, in particular, the avenues opened up for future research.

The list of references used for the content analysis, with abstracts and annotations, can be accessed at <http://www.paho.org/English/HDP/HDR/series19.pdf>.

### Bibliometric Analysis

We conducted the bibliometric analysis using the entire database available as of November 2001, including 576 papers published between January 1971 and December 2000. We catalogued and classified all entries by geographic origin, date of publication, author, complete references, keywords, published form, and other identifiers. We used Endnote Plus 2.3.1 software (Berkeley, Calif: Thomson Scientific) for indexing, cross referencing, and bibliographical classification of the information of interest considered here. We used Minitab (version 1.3) software (State Collage, Pa: Minitab Inc) for data processing and statistical analysis, primarily cross tabulation and time-trend graph analysis.

In assessing publication type, we used a simplified classification scheme (conceptual or

position paper vs empirical research report) derived from the descriptive content analysis. We analyzed research output, both overall and according to country of origin, by fitting univariate regression trend models (linear, polynomial, exponential, and logarithmic). Analyses of residuals and corresponding  $R^2$  statistics were used to ascertain the best degree of fit for the time-trend series. These procedures followed criteria developed for modeling growth in scientific communication in specific areas of research.<sup>20</sup>

## RESULTS

### Content Analysis

In the corpus of literature examined, the following types of publications were identified, corresponding roughly to the data collection strategies employed in each study.

1. *Institutional documents or position papers*: studies produced or sponsored by a governmental or nongovernmental organization to set forth a policy position or recommendation, or documents written by individuals stating a proposition, commentary, viewpoint, or argument.
2. *Conceptual research*: studies done to propose conceptual principles, organize a body of knowledge, establish a terminology, develop a theoretical model, and the like.
3. *Macrocontext research*: analyses of current settings or junctures, overall trends, or contexts, generally for the comparison of countries or regions, or studies based on historical records and documents, resulting in divisions into periods and analyses of past situations or contexts.
4. *Case studies*: research on social or institutional collectivities (communities, neighborhoods, agencies, bureaucracies) or individuals (representative subjects) with methodological approaches designed for comprehensiveness and depth (ethnographies).
5. *Aggregate studies*: "ecological" and "trend" studies with epidemiological designs that take social or institutional aggregates as the units of observation and analysis, especially those involving simplified indicators generated by health information systems.
6. *Cross-sectional studies*: cross-sectional epidemiological prevalence studies, with special attention to those based on proportional samples drawn according to parameters of social inequality.

**TABLE 1—Health Inequality Research, by Country and Type of Publication: Latin America and the Caribbean (LAC), 1971–1995**

Country	Type of Study							Total, No. (%)
	Conceptual Study or Position Paper, No. (%)	Macro-Context Analysis, No. (%)	Case Study, No. (%)	Aggregate Study (Ecological), No. (%)	Cross Sectional (Prevalence), No. (%)	Case-Control, Cohort, No. (%)	Methodological Research, No. (%)	
Brazil	16 (16.3)	16 (16.3)	6 (6.1)	23 (23.5)	12 (12.2)	15 (15.3)	10 (10.2)	98 (100)
Mexico	4 (17.4)	10 (43.5)	2 (8.7)	3 (13.0)	2 (8.7)	0	2 (8.7)	23 (100)
Chile	4 (20.0)	2 (10.0)	1 (5.0)	9 (45.0)	1 (5.0)	0	3 (15.0)	20 (100)
Argentina	8 (61.5)	2 (15.4)	1 (7.7)	1 (7.7)	0	0	1 (7.7)	13 (100)
Ecuador	6 (54.5)	3 (27.3)	1 (9.1)	1 (9.1)	0	0	0	11 (100)
LAC <sup>a</sup>	19 (54.3)	9 (25.7)	2 (5.7)	3 (8.6)	0	0	2 (5.7)	35 (100)
All other LAC	55 (79.7)	1 (1.4)	1 (1.4)	4 (5.7)	5 (7.2)	2 (2.9)	1 (1.4)	69 (100)
Total	112 (41.6)	43 (16.9)	14 (5.4)	44 (16.3)	20 (7.4)	17 (6.3)	19 (7.1)	269 (100)

<sup>a</sup>Comprising the LAC region taken as a whole.

7. *Cohort and case-control studies*: primarily studies with an expanded area/population as their frame of reference, including studies of interventions (clinical trials) in which the individual is the unit of observation and analysis.

8. *Methodological research*: evaluations of development or performance of techniques or instruments for the production of data on health inequities, including mainly studies of the validity and reliability of standardized instruments.

Table 1 presents the relative distribution of the types of study according to selected countries of the region. The overall figures make immediately apparent the sizable volume of personal and institutional position papers, conceptual studies, and analyses of macrocontexts, which account for more than half of the papers. In contrast, papers based on more conventional epidemiological approaches represented approximately 30% of the total. Analysis of the profile of distribution among countries revealed 2 distinct patterns: empirical studies accounted for more than half of the production of countries with the largest volumes of papers (Brazil, Mexico, and Chile), while in the remaining countries more than 70% of papers were conceptual or theoretical in nature. It was found that Brazil contributed almost all “analytic” epidemiological studies (15 of 17). Brazil also accounted for approximately half of the aggregate studies performed in the region.

The compiled documents were also scrutinized with regard to their links to the prevail-

ing theoretical models in the research field. The content analysis of the bibliographic material allowed us to identify several approaches to inequity.

1. *Poverty*: access to economic resources or consumer goods, with a definition of inequality on the basis of differential exclusion from essential public or private services such as health services.
2. *Socioeconomic stratification*: health inequalities resulting from the relative position of individuals on scales of social status determined chiefly by the variables of education, income, and occupation.
3. *Economic development*: a perspective on health inequity as the outcome of evolving macroeconomic processes (e.g., development, modernization) that has as its corollary in the health field the so-called “theory of epidemiological transition” but is often used without reference to theoretical models of the social distribution of pathology.
4. *Living conditions*: health inequalities linked to social reproduction models of the effects of daily life on health conditions, viewed as the material equivalent of the notion of lifestyle; primacy is given to area/population units defined as the ecological basis of observation and analysis.
5. *Historical/structural*: inequities in health as an effect of the social relations of production and the class structure of society, directly linked to a Marxist perspective on the social determination of health and disease.

6. *Gender/ethnic affiliation*: inequities in health interpreted with consideration of gender relations and of different forms of ethnocultural discrimination as causes or consequences of social differentiation, oppression, and exclusion.

Table 2 evaluates the distribution of these conceptual frames in the region and by individual countries according to the foregoing definitions. Generally, we found that most of the papers took approaches apparently more neutral in terms of inequality, with 48% of them using definitions of health inequity based on the living conditions approach (area/population units) or on unequal access to health services. In addition, these papers chiefly used a frame of reference identifying inequity with poverty, which was defined as scarcity of resources and low income. Two approaches have also been strongly applied, each of them accounting for about 20% of the papers: the living conditions approach and the historical/structural framework based on Marxist social theory. Finally, 10% of the studies focused on gender or ethnic affiliation, while studies focusing on social stratification and epidemiological transition each accounted for less than 5% of the studies. This pattern held in all countries of the region with the exception of Ecuador, in which more than 60% of the papers considered were influenced by the historical/structural approach.

In addition, we analyzed methodological approaches across the different studies. About half of the studies involving use of the living conditions frame of reference were performed

**TABLE 2—Health Inequality Research, by Country and Frame of Reference: Latin America and the Caribbean (LAC), 1971–1995**

Country	Ecosocial (Space–Population), No. (%)	Poverty/ Access to Health Services, No. (%)	Living Conditions, No. (%)	Socioeconomic Stratification, No. (%)	Economic Development (Epidemiological Transition), No. (%)	Historical/ Structural, No. (%)	Ethnicity/ Gender, No. (%)	Total, No. (%)
Brazil	26 (26.5)	25 (25.4)	17 (17.3)	9 (9.2)	2 (2.0)	23 (23.5)	12 (12.2)	98 (100)
Mexico	4 (17.4)	11 (47.8)	5 (21.7)	0	2 (8.7)	4 (17.4)	0	23 (100)
Chile	6 (30.0)	9 (45.0)	5 (25.0)	2 (10.0)	0	0	1 (5.0)	20 (100)
Argentina	3 (23.1)	2 (15.4)	4 (30.8)	0	1 (7.7)	0	0	13 (100)
Ecuador	3 (27.3)	2 (18.2)	0	0	0	7 (63.6)	2 (18.2)	11 (100)
LAC <sup>a</sup>	5 (14.3)	14 (40.0)	8 (22.0)	1 (2.9)	2 (5.7)	7 (20.0)	2 (5.7)	35 (100)
All other LAC countries	3 (14.3)	17 (24.6)	13 (18.8)	2 (2.9)	3 (4.3)	10 (14.5)	9 (13.0)	69 (100)
Total	49 (18.2)	80 (29.7)	52 (19.3)	14 (5.2)	10 (3.7)	51 (19.0)	26 (9.7)	269 (100)

Note. Horizontal totals may not correspond to the sum of the respective cell values because studies could be classified in more than 1 frame of reference or in none of them.  
<sup>a</sup>Comprising the LAC region taken as a whole.

on the basis of aggregate designs (ecological and trend studies). Papers that took poverty as the frame of reference for inequity were based predominantly (58%) on studies of limited empirical reach. Curiously, poverty was also the focus of a large number of analytic designs, which, as noted earlier, represent a more empiricist segment of health research. A similar pattern was found in the group of studies focused on socioeconomic status. At the other—more ideological—end of the spectrum, we found a predominance of theoretical and position papers and macro-contextual analyses. A similar pattern was observed in the studies of relations between living conditions and health, in which reviews of literature and position papers accounted for the largest proportion.

The great majority (84%) of the empirical studies involved the exclusive use of first-level indicators, mainly direct parameter measurements such as education or income averages. All of the studies that relied on a composite measurement as an indicator used social class as a key independent variable. A few aggregate studies employed trend indicators and second-level indicators of inequity, such as Gini coefficients and relative proportions of income distribution, mainly studies of mortality gaps.

**Bibliometric Analysis**

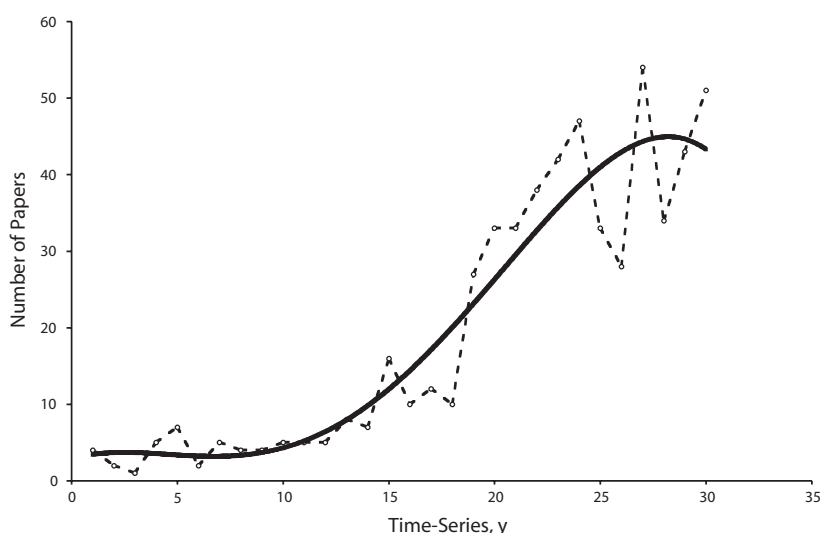
There was a clear upward trend in the output of health inequality research in LAC over the interval 1971 to 2000. Research output reached a new threshold during the past dec-

ade; in fact, the production of the most recent 7 years of the study period was larger than that of the preceding 23 years. This trend, however, is best fit by a polynomial model that yields a reduction in the slope of the growth curve ( $R^2=0.89$ ) relative to exponential ( $R^2=0.86$ ) and linear ( $R^2=0.80$ ) models.

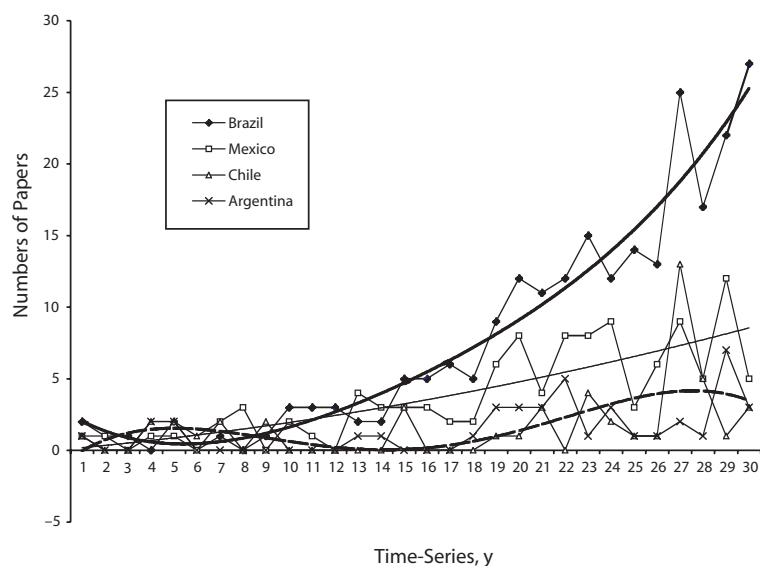
Figure 1 analyzes the historical evolution of LAC scientific output on health inequalities in terms of a gross classification of study type. Three distinct periods can be identified in this temporal evolution: a first period, from 1971

to 1989, characterized by small numbers overall and an average ratio of empirical to conceptual research of 5:1; a second period, from 1990 to 1997, with booming overall productivity and a reduced ratio of empirical to conceptual, (3:1) work; and a third period, from 1998 to 2000, still showing higher levels of scientific productivity but with an enlarged empirical-to-conceptual ratio above 7:1.

The same trends, broken out by country of origin of the research report, are presented in Figure 2. Overall, the output was concen-



**FIGURE 1—Historical trends in health inequality research, by type of study: Latin America and the Caribbean, 1971–2000.**



**FIGURE 2—Historical trends in health inequality research, by country: Latin America and the Caribbean, 1971–2000.**

trated mainly in 4 countries (Argentina, Brazil, Chile, and Mexico), which together accounted for more than 75% of the papers compiled. The data also indicate that Brazil was the origin of an annual average of 40% of this published literature. This percentage has increased recently, reaching almost 52% for the last interval (1998–2000) considered.

Figure 2 also shows separate trend analyses for each country. The output of Argentina was scattered and varied along the interval; none of its regression models reached statistical significance. The best fitting model for Chile was a polynomial nonlinear model that pointed to a downward trend by the end of the period considered, although not strongly ( $R^2=0.304$ ). Mexico's output can be best described as a linear curve of moderate slope ( $R^2=0.633$ ), and Brazil's output appears as a geometric growth curve with steep slope and excellent goodness of fit ( $R^2=0.935$ ).

**DISCUSSION**

This assessment of research output from a particular geocultural region—Latin America and the Caribbean—provides just a glimpse of a rich and dynamic scientific literature tradition that has consistently responded to social contexts. Indeed, the health inequality re-

search described here has been produced in the region of the world with the highest degree of social inequity.<sup>21</sup>

The bibliometric analysis pointed to rapid growth in overall output. Nevertheless, trend assessment indicated that the speed of scientific production in research on inequalities in health has slowed down recently in some countries. In addition, there are recent indications of more of a balance between empirical research reports and conceptual development essays.

The time-trend analysis may also be viewed as a gross evaluation of focal investment policies aimed at health research and development on the subcontinent. The PAHO-sponsored initiative for the study of living conditions and health situation analysis that was implemented in the period 1989 to 1992<sup>22</sup> clearly preceded the increase in volume of health inequity research observed in the 1990s. However, such trends may also be determined by the internal dynamics of the scientific and professional communities involved. The 3 peaks in 1994, 1997, and 2000 coincided with the years of the international meetings of ALAMES (Asociación Latino Americana de Medicina Social) or the national conferences of ABRASCO (Associação Brasileira de Saúde Coletiva). Other peaks that occurred—for example, in 1997 in Chile and

Brazil—were probably due to edited volumes or special journal issues on health inequities published in the countries in question.<sup>23–25</sup>

The relative leadership of a few countries in this research area might, of course, simply reflect relative population sizes: Brazil, Mexico, Argentina, and Chile represent roughly 70% of the population of the Latin American region. However, this concentration might also be due to the presence of institutional support; the countries just mentioned have some form of official organization aimed at funding research in general. The present results are consistent with findings based on more extended databases covering health research in general.<sup>26</sup>

Even so, the relative rankings of the countries in terms of research production, with Brazil and Mexico considerably ahead of the others, may represent a selection bias involved with the data collection process. This issue must be viewed in light of 2 factors. First, the primary sources of our literature search were indexed journals, a study feature that favored Mexico in that this country, for geographical reasons, engages in relatively more scientific exchange with North American universities. Second, our study was conducted at a university in Brazil, which facilitated access to papers generated in that country. The first factor was bound to skew the findings of the bibliometric analysis in favor of Mexico. The second factor might represent a major bias in favor of Brazil, mostly in regard to the content analysis. As a result of these issues, we sought to compare internal country profiles rather than compare overall figures among different countries.

The present study raises 2 methodological problems. The first involves the treatment of “gray literature” in scientometric studies. The task of compiling this literature was, no doubt, an onerous one for our research team, yet the team proceeded under the assumption that all “informal networks” were being accessed by our snowball method. A more detailed description of the acquisition and circulation of particular sorts of “gray literature” would be informative. One could, for example, consider the possibility that the same processes involved in the creation of these informal networks are, in fact, helping to shape the perception that there is a lack of research in this area in Latin America. Nevertheless, the magnitude of the research output covered by our bibliometric analysis,

identified through database searches from standard sources, represents a strong argument against this “self-containment” hypothesis.

Second, our classification of models has to be considered in relative terms vis-à-vis the complexity of health inequality as a theoretical concept. For instance, studies that privilege poverty as a category of analysis can belong to different theoretical chains and, therefore, offer quite diverse propositions. Some authors are strongly influenced by economic approaches in which poverty is synonymous with absolute deprivation of goods and services, analyzed exclusively on the basis of the utilitarian concept of income threshold. Other authors adopt the functional concept of the “vicious circle of poverty.” We classified such functionalist approaches as “theories of poverty.” Those that treated poverty as resulting from a series of fundamental processes associated with individuals’ level of social inclusion (dialectic conception) were classified in the historical/structural perspective.

The same diversity of approaches can be observed in studies of lifestyle, ethnicity, and gender, including terms and theories from within the social reproduction category. Even in the historical/structural framework, there were differences in selection of variables or in the choice of units of analysis (e.g., social formation, social class), although the theoretical conception continued to be the same. Providing readers a more in-depth view of these different, rich perspectives clearly exceeds the scope of our limited descriptive approach.

The descriptive content analysis also pointed to what is missing in this research tradition that could benefit from cross fertilization with English-language literature. First, we found a relative neglect of gender, race, and ethnicity issues in health inequality research in the LAC literature. Second, empirical data are still relatively sparse and are concentrated in a few countries.

Regarding the first issue, gender, race, and ethnicity have been widely explored in the social theory of the United States and the United Kingdom.<sup>27</sup> In particular, North American social epidemiologists have studied health inequality along a variety of dimensions distinct from (although related to) social class and social structure. For instance, higher morbidity rates among women and individuals of African or Latino descent have been hypothesized as

resulting from discrimination through sexism and racism.<sup>28</sup> This issue represents an important distinction between health inequality research conducted in Latin America and research conducted in other parts of the world; however, the invisibility of gender issues in the LAC health inequality literature might simply reflect the fact that feminist theories have not yet become influential in the collective health field in Latin American countries.

Two factors can explain the relative neglect of race as a research topic in the LAC health inequality literature. First, in many countries of the region, there are high levels of social inequality and variations in education and income across race/ethnicity gradients in populations with varying degrees of racial admixture and ethnic and social integration.<sup>29</sup> This context has produced a myth of “racial democracy” that pervades even the progressive scientific arena in a number of these countries.<sup>30</sup> Second, desegregation and affirmative action movements only recently have begun to exert pressure for more knowledge on the racial/ethnic contexts of Latin American countries, particularly Brazil.<sup>31</sup>

In regard to lack of empirical data, a common feature of this body of research literature has indeed been the small number of field studies, apparently in contrast to a major concern with theoretical construction. An ethnocentric interpretation could attribute this observation to the Iberian rhetorical tradition of Spanish and Portuguese ex-colonies. However, a more straightforward explanation may be applicable. In settings where inequities in socioeconomic resources, health status, and health care are so crude, visible, and pervasive, the bulk of the intellectual energy available must be devoted to pursuing the most urgent and efficient ways to overcome the deleterious effects of these inequities. To this end, organized research investments have been directed toward providing a deeper and better understanding of the roots and determinants of health inequities.

Our content analysis also outlined what is unique about the Latin American literature on social inequalities in health. First, on historical grounds, as described in the Waitzkin et al. article mentioned earlier,<sup>9</sup> resistance against colonialism and military regimes was a major reason for tackling health inequality research as a radical priority. Second, in theoretical terms,

we encountered a rich and varied repertoire of explanatory models, in spite of the dominance of a strong theory of health determinants based on conflict and contradiction. An original contribution in this tradition is represented by the theories of living conditions and health praxis,<sup>32–34</sup> which may be considered post-Marxist theoretical frameworks.

Finally, at the methodological level, we observed a remarkable diversity of epidemiological research designs and a refined ecological tradition, with consideration of aggregate and ethnographical methods not evident in other research traditions. An example is the current upsurge in the use of multilevel analyses and ecological studies for the study of inequities in health. In Latin America, critiques of the concept of “ecological fallacy” date back to the 1970s,<sup>35,36</sup> and the Victora et al.<sup>37</sup> study was one of the first to involve the empirical use of multilevel approaches (then referred to as “hierarchical analyses”) in epidemiological research on health inequalities.

Our aims in this article were quite modest: to establish that research on health inequality is being done in LAC and to determine its distribution and trends. The evidence presented here does, indeed, support our original contention. These data, however, also indicate that research is focused in epicenters (e.g., Brazil, Mexico, Chile), that the literature output of Argentina is scattered and unstable, that Chile has produced a steady increase in research, that Mexico’s growth is linear, and that Brazil’s curve is “geometric” in shape. Of course, to explain why these trends are being observed, our findings need to be contextualized in regard to particular historical, cultural, and economic circumstances. A deeper investigation of countries not producing research would be equally important, in that it would provide hints about specific structural causes leading to differences in research output.

Further explorations of the social history of LAC research on health inequalities should pursue a better contextualization of bibliometric data. In so doing, researchers will be able to fully acknowledge the connections between the particular social, political, and economic contexts and social medicine movements<sup>9</sup> that allowed this type of research to proliferate in specific countries. A discussion of these historical and political contexts can help to explain

unequal gaps and trends and thus explain why research is not conducted in certain parts of Latin America in the same manner as in the developed world.

Some of these issues, of course, are addressed in more detail in several of the studies that composed our database. However, only a small fraction of this body of research, which is normally reported in Spanish or Portuguese (the languages most spoken in Latin America) and published in journals, books, or papers often circulated only on an intranational basis, reaches the English-speaking scientific audience. In an age of multilateral global exchange of knowledge, the time is ripe for sharing the invaluable assets cultivated by local scientific communities engaged in the common goal of promoting equity in health everywhere. ■

### About the Authors

Naomar Almeida-Filho is with the Instituto de Saúde Coletiva, Federal University of Bahia, Bahia, Brazil, and the Center for Society and Health, Harvard School of Public Health, Boston, Mass. Ichiro Kawachi is with the Center for Society and Health and the Department of Health and Social Behavior, Harvard School of Public Health. Alberto Pellegrini Filho is with the Program on Health Research Coordination, Division of Health and Human Development, Pan American Health Organization, Washington, DC. J. Norberto W. Dachs is with the Program on Public Policy and Health, Division of Health and Human Development, Pan American Health Organization.

Requests for reprints should be sent to Naomar Almeida-Filho, MD, PhD, Instituto de Saúde Coletiva, Universidade Federal da Bahia, Palácio da Reitoria, Rua Augusto Viana 1, Canela, Salvador, Bahia, Brazil 40210-060 (e-mail: naomar@ufba.br).

This article was accepted March 17, 2003.

### Contributors

N. Almeida-Filho, A. Pellegrini Filho, and J. N. W. Dachs contributed to the planning of the study. I. Kawachi and N. Almeida-Filho contributed to the analysis and interpretation of the data. All authors contributed to the writing of the article.

### Acknowledgments

This research was sponsored by the PAHO Program on Health Research Coordination, Division of Health and Human Development, and by the Center for Society and Health at the Harvard School of Public Health. Naomar Almeida-Filho was supported in part by a health equity research fellowship from PAHO/WHO and the Harvard Center for Society and Health and by a fellowship from the CAPES Foundation of the Brazil Ministry of Education.

We wish to thank Reinaldo Guimarães, Vilma Sousa Santana, and Maurício Barreto for comments and suggestions on earlier versions of this article. Thanks are

also due to the anonymous reviewers for revisions included in the final version.

### Human Participant Protection

No protocol approval was needed for this study.

### References

- Marmot M. Inequalities in health. *N Engl J Med*. 2001;345:134–136.
- [Special issue on inequalities in health.] *Bull World Health Organ*. 2000;78(1).
- Adler NE, Ostrove JM. Socioeconomic status and health: what we know and what we don't. *Ann N Y Acad Sci*. 1999;896:3–15.
- Kawachi I, Kennedy B, Wilkinson R, eds. *The Society and Population Health Reader: Income Inequality and Health*. New York, NY: New Press; 1999.
- Leon D, Walt G, Gilson L, eds. *Poverty, Inequality and Health: An International Perspective*. Oxford, England: Oxford University Press Inc; 2000.
- Lynch J, Davey-Smith G, Hillemeier M, Shaw M, Raghunathan T, Kaplan G. Income inequality, the psychosocial environment, and health: comparisons of wealthy nations. *Lancet*. 2001;358:194–200.
- Evans T, Whitehead M, Diderichsen F, Bhuiya A, Wirth M, eds. *Challenging Inequities in Health: From Ethics to Action*. New York, NY: Oxford University Press Inc; 2001.
- Wagstaff A. *Inequalities in Health in Developing Countries: Swimming Against the Tide?* Washington, DC: World Bank; 2001. Working paper.
- Waitzkin H, Iriart C, Estrada A, Lamadrid S. Social medicine then and now: lessons from Latin America. *Am J Public Health*. 2001;91:1592–1601.
- Waitzkin H, Iriart C, Estrada A, Lamadrid S. Social medicine in Latin America: productivity and dangers facing the major national groups. *Lancet*. 2001;358:315–323.
- Schoepflin U, Glanzel W. Two decades of "scientometrics"—an interdisciplinary field. *Scientometrics*. 2001;50:301–312.
- Narin F, Olivastro D, Stevens K. Bibliometrics theory, practice and problems. *Eval Rev*. 1994;18:65–76.
- Schubert A. Scientometrics in medicine-related fields (1990–1999). *Scientometrics*. 2000;48:251–284.
- Benach J. Analisis bibliométrico de inequidades en salud en España [Bibliometric analysis of health inequities in Spain] (1980–1994). *Gac Sanit*. 1995;9:251–264.
- Rumjanek VM, Leta J. An evaluation of immunology in Brazil (1981–1993). *Braz J Med Biol Res*. 1996;29:923–931.
- Leta J, Jacques R, Figueira I, de Meis L. Central international visibility of Brazilian psychiatric publications from 1981 to 1999. *Scientometrics*. 2001;50:241–254.
- de Arenas JL, Castanos-Lomnitz H, Arenas-Licea J. Significant Mexican research in the health sciences: a bibliometric analysis. *Scientometrics*. 2002;53:39–48.
- Nunes ED. A review of research studies conducted on scientific production in collective health in Brazil. *Scientometrics*. 1999;44:157–167.
- Multicenter Study—Inequities in Health Status, Access and Expenditure: Using Secondary Data to Inform Policy-Making*. Washington, DC: Pan American Health Organization; 2000.
- Gupta B, Karisiddappa C. Modelling the growth of literature in the area of theoretical population genetics. *Scientometrics*. 2001;49:321–355.
- Londoño J, Székely M. Persistent poverty and excess inequality: Latin America 1970–1995. *J Appl Economics*. 2000;3:93–134.
- Castellanos PL. *Sistemas Nacionales de Vigilancia de la Situación de Salud Según Condiciones de Vida y el Impacto de las Acciones de Salud y Bienestar [National surveillance systems of health situation according to living conditions and impact of actions for health and wellbeing]*. Washington, DC: Pan American Health Organization; 1991.
- Número Especial Sobre Desigualdades en Salud. [Special issue on health inequalities.] *Cuadernos Médico-Sociales*. 1997;38(1).
- Barata R, Almeida Filho N, Barreto M, Veras R, eds. *Equidade e Saúde—Contribuições da Epidemiologia [Equity and Health—Contributions of Epidemiology]*. Rio de Janeiro, Brazil: Editora Fiocruz/Abrasco; 1997.
- Barata R, ed. *Condições de Vida e Situação de Saúde [Living Conditions and Health Situation]*. Rio de Janeiro, Brazil: Abrasco; 1997.
- Pellegrini Filho, A. *Ciência em Pro de la Salud: Notas Sobre la Organización de la Actividad Científica Para el Desarrollo de la Salud en América Latina y el Caribe [Science for Health. Notes on the organization of scientific activities for health development in Latin America]*. Washington, DC: Pan American Health Organization; 2000.
- Anthias F. The material and the symbolic in theorising social stratification: issues of gender, ethnicity and class. *Br J Sociol*. 2001;52:367–390.
- Krieger N. Refiguring "race": epidemiology, racialized biology, and biological expressions of race relations. *Int J Health Serv*. 2000;30:211–216.
- Kraay H, Levine RM. *Afro-Brazilian Culture and Politics: Bahia, 1790s to 1990s*. Durham, NC: Duke University Press; 1998.
- Reichmann R. *Race in Contemporary Brazil: From Indifference to Inequality*. New York, NY: Cambridge University Press; 1999.
- Nobles M. History counts: a comparative analysis of racial/color categorization in US and Brazilian censuses. *Am J Public Health*. 2000;90:1738–1745.
- Possas C. *Epidemiologia e Sociedade: Heterogeneidade Estrutural e Saúde no Brasil [Epidemiology and Society. Structural Heterogeneity and Health in Brazil]*. São Paulo, Brazil: Hucitec; 1989.
- Castellanos P. Epidemiologia, salud pública, situación de salud y condiciones de vida. In: Barata R, ed. *Condições de Vida e Situação de Saúde [Epidemiology, Public Health, Health Situation and Living Conditions]*. Rio de Janeiro, Brazil: Abrasco; 1997:24–32.
- Testa M. *Saber en Salud—La Construcción del Conocimiento [The Construction of Knowledge in Health]*. Buenos Aires, Argentina: Lugar Editorial; 1997.
- Laurell AC. Algunos problemas teóricos y conceptuales de la epidemiología social [Some theoretical and conceptual problems of social epidemiology]. *Rev Centro Americana Cien Salud*. 1977;3(5):79–97.
- Breilh J. *Epidemiología: Economía, Medicina y Política [Epidemiology: Economy, Medicine, Politics]*. Quito, Ecuador: Ediciones de la Universidad Central de Ecuador; 1979.
- Victoria C, Fuchs S, Flores J, Fonseca W, Kirkwood B. Pneumonia among Brazilian children: a hierarchical analysis. *Pediatrics*. 1994;93:977–985.