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## Conducting and Disseminating Epidemiological Systematic Reviews in Latin America and the Caribbean: Pitfalls and Lessons Learned

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### ABSTRACT

**Objectives:** To describe the experience, pitfalls, and lessons learned in conducting and disseminating epidemiological systematic reviews (SRs) in Latin America and the Caribbean between 2007 and 2016. **Methods:** We used a mixed-methods approach, including a descriptive cross-sectional study and a qualitative study of pitfalls and lessons learned. The following end points were analyzed: number of primary research studies included, country of origin, study design, risk of bias, citations in social media, number of researchers and experts involved, and time devoted by them to conduct SRs. Data for the qualitative study were collected through sessions with multi-professional focus groups of the reviewers' core team held from February to March 2016. We performed a thematic analysis of the following domains: sources of information, evidence quantity and quality, statistical analysis, and dissemination of findings in both academic and social media. **Results:** A total of 19 SRs were produced, including 1016 primary research studies. Brazil (35%) and Argentina

(19%) contributed the largest number of studies. The most frequent design was cross-sectional (35%). Only 27% of the studies included in the SRs were judged as having a low risk of bias. We identified key challenges at different stages of the process. We found substantial difficulties in all domains derived from the thematic analysis and proposed potential solutions for each of them. **Conclusions:** There are large gaps in epidemiological evidence from primary research, particularly from population-based studies. Special approaches are needed to identify, assess, synthesize, interpret, and disseminate epidemiological evidence from Latin America and the Caribbean.

**Keywords:** epidemiology, Latin America and the Caribbean, systematic reviews.

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### Introduction

Latin America and the Caribbean (LAC) is a large and cultural diverse region with 46 countries. The most commonly spoken languages are Spanish and Portuguese, but there are some English- and French-speaking countries as well. The population is estimated to be 642 million, which is projected to reach 673 million by 2020 [1].

Despite the progress made during the last several decades, LAC remains the most unequal region in the world [2]. The report published by the Economic Commission for Latin America and the Caribbean [2] in 2014 indicates that poverty remained stable, affecting 28% of the population, which corresponds to 167 million people living in poverty. Meanwhile, extreme poverty or indigence was 12% (2014).

During the last few decades, the region has experienced rapid and complex epidemiological changes. The rates of

noncommunicable diseases and injuries have increased and there are many existing and emerging endemic diseases that are not completely controlled [3]. Most countries depend largely on external funding to sustain long-term research initiatives. This has limited the production of qualitative and quantitative research and has affected research priorities, which sometimes are not aligned with the region's most pressing social and health needs [4]. In spite of their limited resources, LAC researchers have made significant scientific contributions worthy of being analyzed and summarized through systematic reviews (SRs) to inform health and research decisions and to avoid future duplicate efforts.

There are many groups of researchers in the region that conduct SRs. A search of the Latin American and Caribbean Health Sciences Literature (LILACS database), performed in March 2011, identified 2241 studies potentially suitable to be classified as SRs, but only 15% fully met the criteria to be regarded as such and

Conflicts of interest: The authors have indicated that they have no conflicts of interest with regard to the content of this article.

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2212-1099/\$36.00 – see front matter © 2017 Published by Elsevier Inc. on behalf of International Society for Pharmacoeconomics and Outcomes Research (ISPOR).

<http://dx.doi.org/10.1016/j.vhri.2017.07.011>

a small percentage addressed epidemiological issues [5,6]. The Institute for Clinical Effectiveness and Health Policy (IECS) is a nongovernmental organization, affiliated with the University of Buenos Aires, founded by professionals from the medical and social sciences devoted to research, education, and technical cooperation with the goal of improving the efficiency, equity, quality, and sustainability of health care systems and policies in Argentina and Latin America. The institution has conducted many SRs focusing on evidence derived from LAC. The objective of this article was to describe our experience in conducting and disseminating epidemiological SRs of different diseases prevalent in LAC, focusing on the difficulties faced and the lessons learned.

## Methods

We used a mixed-methods approach, including a descriptive cross-sectional study of completed SRs and a qualitative study focusing on pitfalls and lessons learned. The cross-sectional study described the epidemiological SRs conducted by the IECS between 2007 and 2016. The following end points were analyzed: number of studies included in the reviews; countries most represented; risk of bias; epidemiological design of studies; citations in literature and social media; number of participating researchers, experts, and librarians; and time devoted to conduct the SRs. In all cases, the risk of bias of the studies included in our SRs was assessed by an original tool containing the most important domains identified in methodological studies, including selection of participants, control of confounders, ascertainment of exposure and outcomes, and potential conflicts of interest [7–11].

The qualitative study summarized the main difficulties found and lessons learned during the completion and dissemination of the epidemiological SRs. Through a process of iterative group discussions held with all co-authors, we formulated a preliminary list of difficulties faced and lessons learned that was used to develop a semistructured questionnaire. Formal data collection was conducted through sessions with three multiprofessional focus groups held from February to March 2016, following standard methods [12]. During these three sessions involving SR researchers of the core IECS team, we included a total of seven physicians, a statistician, a librarian, and a journalist. The main domains discussed were sources and management of information, evidence quantity and quality, statistical analysis, and dissemination of findings in both academic and social media. One researcher led the discussion and an observer took notes. We performed a thematic analysis of the notes and the findings were organized in a matrix of domains, difficulties, and potential solutions to conduct and disseminate epidemiological SRs.

## Results

### Description of Analyzed SRs

We analyzed 19 SRs conducted by the institute to assess the field of epidemiology in LAC. These reviews included 1016 primary studies (median 34 studies, with a maximum of 168 and a minimum of 18). Fourteen of the SRs were already published [13–26].

Infectious diseases ( $n = 12$ ) were the most frequent topics of study. The epidemiology of each condition was evaluated over the previous 10- to 15-year period, before the date of the search. Analyzed aspects included incidence, prevalence, fatality rate, morbidity, rate of hospitalization, and attributable direct and indirect costs. Five SRs focused on pediatric populations. The

countries that contributed the most studies were Brazil (35%), Argentina (19%), and Mexico (9%) (see Table 1).

The most frequent epidemiological designs were cross-sectional studies (35%), surveillance reports (12%), and cohort studies (10%). Risk of bias was considered low only in 27% of the studies, and was moderate in 28% and high in 45%. Every SR searched MEDLINE, Embase, LILACS, and CENTRAL (Cochrane Library) with no language restrictions. To identify gray literature, we performed a generic and academic search on the Internet. Reports of the ministries of health of LAC countries, databases containing regional proceedings, annals of related specialties, books, and theses were searched. Authors of included studies were contacted for missing or additional information when necessary. In almost all SRs with meta-analysis we found  $I^2$  to be greater than 90% for one or more outcomes.

All SRs concluded that further research was needed to fill the evidence gaps identified.

The mean impact factor of publications was  $3.04 \pm 1.51$ . In general terms, the number of references found in social media was very low, although we have to consider that some publications were very recent and had received more coverage in academic networks such as the Science Citation Index and ResearchGate (see Table 2).

On average, each SR required six researchers working for at least 5 hours per week over 8 months. The number of months required to complete each SR, however, varied significantly according to the number of hits that needed to be screened, the number of researchers allocated to the SR, and other context-related factors. The aggregate number of hours devoted to the SR process by researchers, experts, and librarians was 1049, 100, and 94 hours, respectively (see Table 3).

## Qualitative Findings

The main qualitative findings are described in a matrix regarding difficulties and potential solutions to conduct epidemiological SRs in LAC for sources and management of information, evidence quantity and quality, statistical analysis, and dissemination of findings (see Table 4).

## Discussion

The difficulties faced during the completion of SRs were caused by many factors. One is the information sources used. Health science research in LAC is not as developed as in the United States or Europe. Nevertheless, there is a considerable body of evidence that should be examined when conducting SRs [4]. Identifying LAC data in large databases such as MEDLINE, Embase, or Cochrane is very laborious and may be prone to bibliographic errors. Therefore, we had to design highly accurate filters to identify this information (see Annex 1 in Supplemental Materials found at <http://dx.doi.org/10.1016/j.vhri.2017.07.011>).

LILACS is the most important database of scientific literature in the region. As of April 14, 2016, LILACS indexed 909 journals with 615,893 articles and 335,104 full texts, in addition to monographs and theses [1]. Checking this database to obtain data from LAC is essential. Nevertheless, using the LILACS database poses some obstacles. To perform an exhaustive search, the search must be conducted in the database's three languages—English, Spanish, and Portuguese. Even though the database has tutorials and descriptors for each language, developing a strategy to conduct an SR is very difficult without special training, especially for researchers from other regions [27–29].

In addition to the limitations of LILACS and other databases, the biggest challenge is finding the so-called gray literature, also

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