



## The language of science and the Cuban Journal of Health Technology

### *El idioma de la ciencia y la Revista Cubana de Tecnología de la Salud*

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**Received:** January 9<sup>th</sup>, 2023  
**Accepted:** January 16<sup>th</sup>, 2023

#### Cite as:

Araujo-Inastrilla CR, Solís-Solís S. The language of science and the Cuban Journal of Health Technology. Revista Cubana de Tecnología de la Salud [Internet]. 2023 [cited: ]; 14(1):4013. Available from: <http://www.revtecnologia.sld.cu/index.php/tec/article/view/4013>

#### ABSTRACT

**Introduction:** currently, most scientific publications are written in English. The Cuban Journal of Health Technology, in the Hispanic American context, must take up this challenge of current science in order to achieve its vision. **Objective:** to characterize the interest in searching for information on Health Technology worldwide in the year 2022. **Methods:** a study of global search trends on "Health Technology" was carried out using Google Trends to find out the behavior according to the different nations of the world and the language in which these searches are produced (Spanish or English). The average relative search volume was calculated for each language, and these averages were compared using Student's parametric t-test. **Results:** English searches accounted for 88.6% of the total. The average relative search volume was 77.8%, much higher than in Spanish. Significant differences were found in the averages of both languages. Searches in Spanish generated more interest in Latin America. **Conclusions:** worldwide, there is greater search interest in Health Technology in the English language. The Cuban Journal of Health Technology, given this reality, should become involved in the process of publication in English in order to achieve greater international visibility.

**Keywords:** English language, Spanish language, Search Trends, Health Technology

#### RESUMEN

**Introducción:** en la actualidad, la mayoría de las publicaciones científicas están escritas en inglés. La Revista Cubana de Tecnología de la Salud, del contexto hispanoamericano, para alcanzar la visión debe asumir este reto de la ciencia actual. **Objetivo:** caracterizar el interés de búsqueda de información sobre Tecnología de la Salud a nivel mundial en el año 2022. **Métodos:** se realizó un estudio de las tendencias de búsqueda a nivel mundial sobre

"Tecnología de la Salud", a través de *Google Trends* para conocer el comportamiento según las diferentes naciones del mundo y el idioma en que se producen estas búsquedas (español o inglés). Se calculó el promedio de volumen relativo de búsqueda para cada idioma, y se realizó la comparación de dichas medias a través de la prueba paramétrica t de *Student*. **Resultados:** las búsquedas en inglés representaron el 88,6 % del total. La media del volumen relativo de búsqueda fue del 77,8 %, muy superior al español. Se hallaron diferencias significativas en las medias de ambos idiomas. Las búsquedas en español generaron más interés en América Latina. **Conclusiones:** a nivel mundial existe mayor interés de búsqueda sobre Tecnología de la Salud en el idioma inglés. La Revista Cubana de Tecnología de la Salud ante esta realidad debe imbricarse en el proceso de publicación en idioma inglés para alcanzar mayor visibilidad internacional.

**Palabras clave:** Idioma inglés, Idioma español, Tendencias de búsqueda, Tecnología de la Salud

## INTRODUCTION

The use of a common language has been inevitable in the development of international scientific activity. It is considered to be conditioned by the interactions of the science actors best positioned in the hierarchical structures of international scientific networks. <sup>(1)</sup>

As has been noted, a particular language of science constitutes a resource in the dissemination and representation of knowledge. It proposes a solution to the problems of scientific socialization, in the context of the acceleration of transnationals. They promote competition and collaboration in science and technology, in conjunction with the speed at which the globalization of the mechanisms of communication is produced. <sup>(1)</sup>

While scientific articles proliferated among the main channels of science communication in the information society, English was positioned as the language of science, culture, and the global economy. Currently, 98% of scientific publications are written in English, with greater emphasis on the areas of natural science and basic research. <sup>(2)</sup>

Non-English speaking scientists are disadvantaged in the context of globalized science. They are forced to consume and publish scientific texts which, although they should be clear and direct, can be complex due to the level of technicality that they imply. Proficiency in English thus influences scientific and professional performance, the quality of science and access to knowledge.

This disadvantage results in global inequalities, in countries where most of the population receives minimal training in English and bilingualism is very low. <sup>(2)</sup> Readers with language barriers have access to a limited number of studies, considered of limited scope, impact, relevance, and breadth. This results in an information gap making it harder to carry out research with a more far-reaching basis. <sup>(3-5)</sup>

Despite the importance of local knowledge, the professional success of a scientist begins to be measured by the internationalization level. This constant pressure influences academic migration (brain drain). Learning English is one of the pressure factors for migration; it is harder to achieve English skills for scientists who remain in non-English-speaking countries. <sup>(2)</sup>

The complexity of these issues has led to the urgent need for researchers to adapt if they are not willing to perish in scientific work. A report on linguistic diversity in science indicates that more than eight out of ten Ibero-American researchers write in the Anglo-Saxon language, to the detriment of their mother tongues. <sup>(6)</sup>

In addition to researchers, the phenomenon extends to the world's biomedical journals. These publish the original version of the articles in the native language and appear simultaneously in the English language. <sup>(7)</sup>

Journals with a local or regional character represent a refuge in the communication of scientific research in languages other than English. However, they are often perceived as low quality, as the most important research work is often reserved for international journals. <sup>(3-5)</sup>

The Cuban Journal of Health Technology (RCTS, in Spanish) is included within the reduced group of Spanish-American journals, which are limited to the area of science and innovation in Health Technology. Therefore, it must assume the challenge that mastering English represents in the production of knowledge and the socialization of science, in order to achieve the internationalization of the serial publication of scientific articles.

For the RCTS to take the road to internationalization, it requires a study of the potential users of the journal's scientific output. It becomes necessary to know the interests of worldwide searches, with the aim of adapting editorial policies based on international standards and the information needs of the scientific community.

It becomes urgent in the RCTS to explore the search interests of potential users. This is possible in the information society, with the use of tools for web research professionals. Specifically, Google Trends (GT), <sup>(8,9)</sup> developed by Google, which performs an analysis of the characteristics of users' search terms. The study guides the experience in accessing information.

Studies related to information search trends have been coined with the term "infodemiology" or "infoepidemiology". Defined as an emerging set of public health information methods for analyzing search behavior, communication and publication on the Internet <sup>(10)</sup>.

To combine «infoepidemiology», information needs and formats, with the language used by the community in which the scientific production of the RCTS is to be made liveable; it can derive valuable information for decision-making in the fulfilment of the vision. The RCTS is aiming at being an international benchmark in the field of health technologies in order to become publication that is read and cited by academic communities around the world. <sup>(11,12)</sup>

In accordance with these needs, this study aims to characterize the search for information on Health Technology worldwide in the year 2022; in both the English and Spanish language.

## METHOD

A descriptive cross-sectional study was carried out on the trends in information searches in Health Technology worldwide in the year 2022; in both English and Spanish. The study was carried out using the Google Trends (GT) computer tool.

According to Salgado et al. <sup>(13)</sup> GT is an online tracking system that determines the proportion of searches for terms queried by the user. The platform normalizes search data, facilitates comparisons between terms, provides a Relative Search Volume (RSV), adjusted for a given location and period of time. The values obtained are comprised in an interval from 0 to 100 depending on the proportion, 100 represents the largest amount of the term in a time series. <sup>(13)</sup>

Exploration of search trends for the terms "Tecnología de la Salud" and "Health Technology"; compared the proportion of searches by language. The RSV shown by this tool in the year 2022, and the statistics by countries were used.

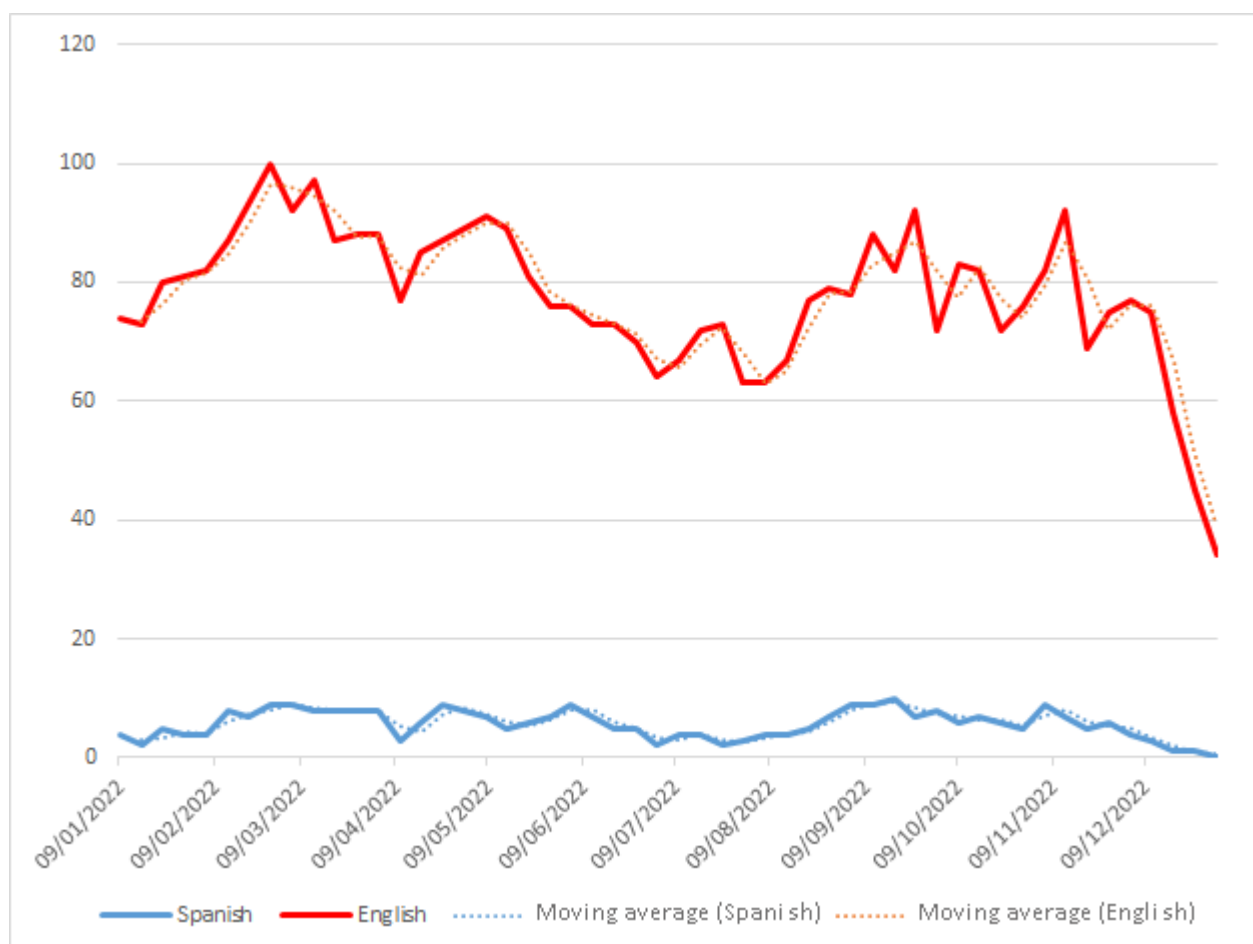
All searches for both languages (N=1,638,091) were included in the study population. Sampling was not required. The variables studied were: language and country of the search terms. Descriptive statistics were used.

The data was stored in a database prepared in Microsoft Excel and processed in the statistical software IBM SPSS Statistic 23. The RSV average was calculated for each language. In the present study, ethics in research was maintained. The information obtained is anonymous and cannot be traced back to identifiable individuals.

## RESULTS

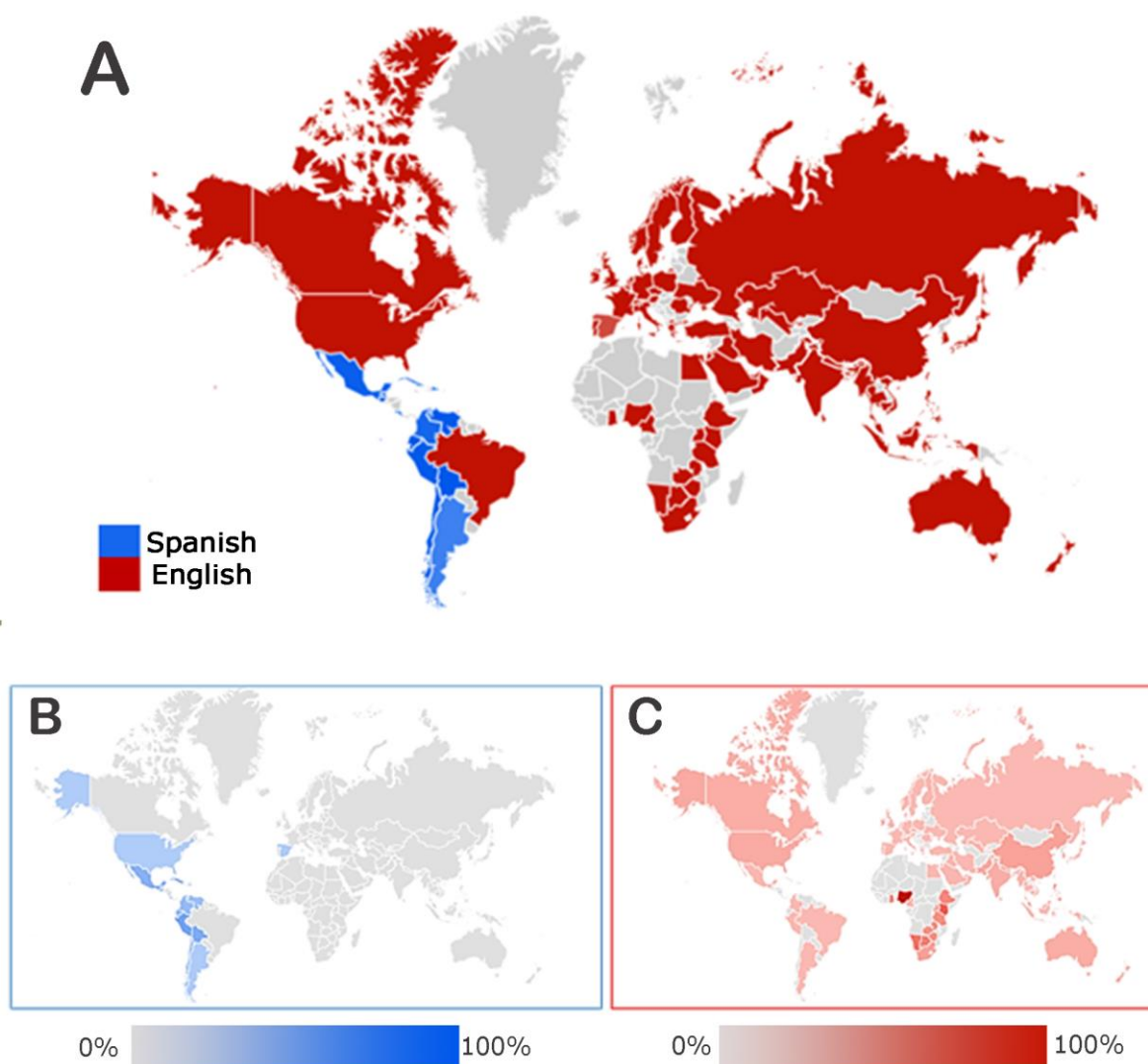
In 2022, a total of 1,638,091 searches related to Health Technology were carried out, in Spanish and English. The search in Spanish covered 11.4% of the total (186,878), with a mean of  $3,593.8 \pm 209.02$  weekly searches. Searches in English represented 88.6% of the total (1,451,213), with a mean of  $27,907.9 \pm 577.04$ .

The mean of the RSV in English (77.8%) was much higher than the RSV in Spanish (5.6%). It was verified that there were significant differences according to the Student's t test ( $p=0.000$ ) between the RSV means of both languages. Figure 1 shows the RSV in English, it remains very distant from the RSV in Spanish in the year 2022. Both tend to decrease at the end of the period.



**Figure 1** – RSV in Google on Health Technology according to the language of the search

Searches for the terms "Tecnología de la Salud" generated search interest in 5.6% (14) of the world's countries. On the other hand, the terms "Health Technology" reached 30.5% (76) nations. Figure 2 shows the geographical distribution of the countries where search interest was observed for these terms.



**Figure 2 - A:** Geographical distribution of searches on Health Technology according to the language of the search. **B:** RSV in Spanish according to country. **C:** RSV in English by country

In the countries with the greatest interest according to the order in which they appear in GT, a high RSV prevailed in Spanish only in the Spanish-speaking ones. It should be noted that, in Spain and Argentina, despite being Spanish-speaking, a RSV in English of 68% and 35%, respectively, was observed. Of the countries where Spanish is not the official language, only the United States had 1% of RSV in Spanish. Figure 3.

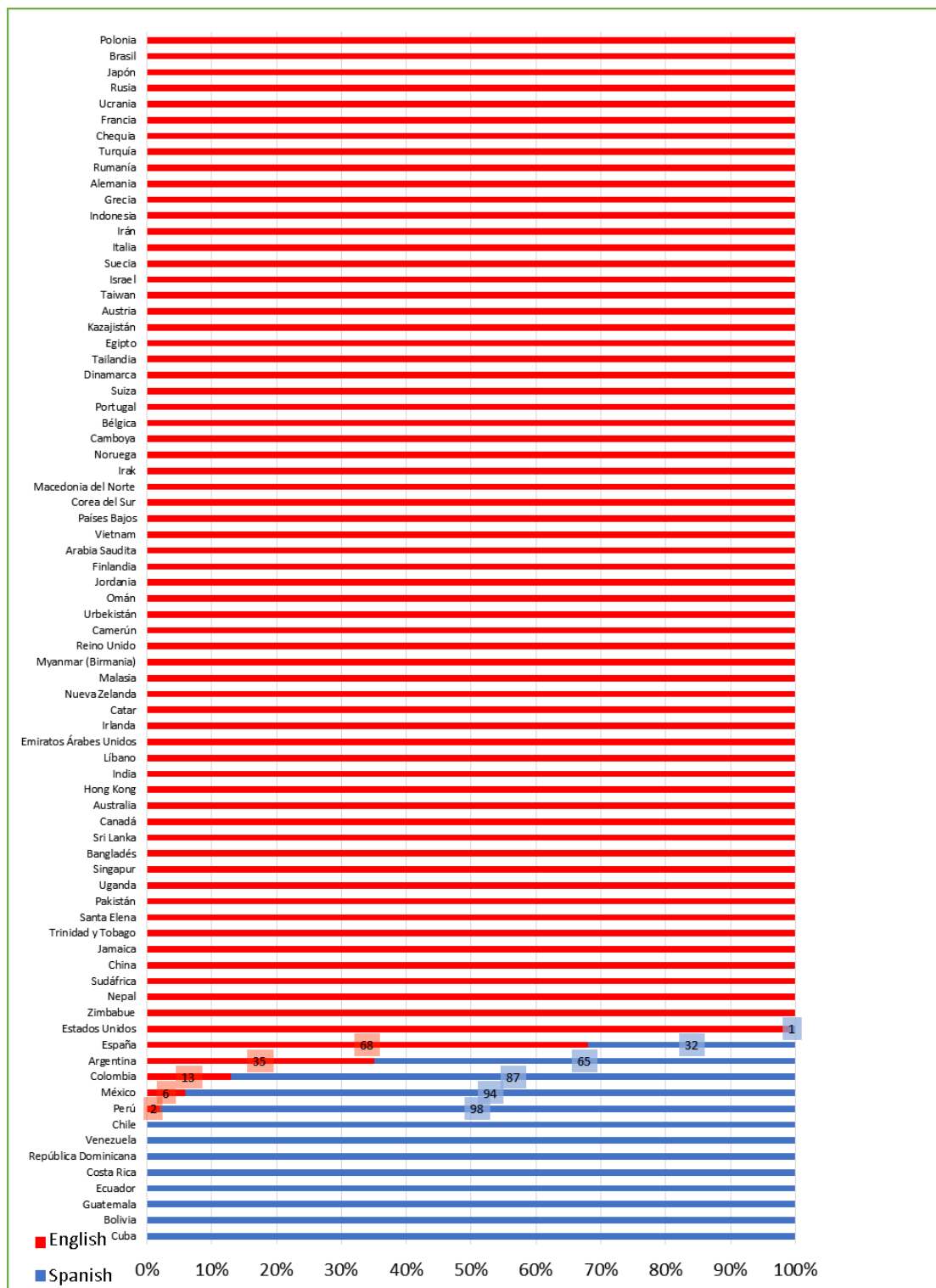


Figure 3 - RSV on Health Technology by country according to language

## DISCUSSION

The use of English in the academic world has been identified as a source of inequality and segregation in science. <sup>(14)</sup> 95% of the total articles published in scientific journals in 2020 were written in English and only 1% in Spanish or Portuguese. <sup>(6)</sup>



Researchers from the Elcano Royal Institute, <sup>(6)</sup> in the reports on linguistic diversity in science in Spain, Portugal and Latin America, summarized three fundamental reasons that have led to the predominance of English, the language of science:

- Inertia of Anglophonization: after the Second World War, German ceased to be the language of science. Before it had been French and much before Latin. It is mistakenly believed that the best science is done and published in English, and that science that is not written in that language is not of the same quality.
- System of incentives: the quality of a publication is measured (according to conventional bibliometric indicators) by the number of citations of the journal in which it is published, not by the relevance or novelty of the content. The journals with the most citations are in English.

Several European countries talk about implementing national evaluation systems, which collect the real production of the countries with indicators not imposed by Anglo-Saxon companies. In Latin America it is still a pending task. <sup>(6)</sup> However, other systems of indicators (altmetrics) that measure scientific production in other dimensions, beyond citations, are expanding.

- Monolingualism of US scientists: large international companies have privatized the systems for evaluating the quality of science. They produce the international impact factor indices of journals that have been in English for decades.

Many American universities abandon the teaching of languages. <sup>(6)</sup> If the close link between universities and companies (private and for-profit) is taken into account, which determines the predominance of the English language. Badillo <sup>(6)</sup> comments that it is mandatory to write in English for an author to be cited in US institutions.

The predominance of scientific production in English means that researchers need to search more information in that language. Therefore, the current search trends within the scientific community are outlined towards English, even when the researcher does not speak English.

Search engine trends are a tool that can integrate health information needs with strategies to make information visible. The VBR data obtained with GT recognized public interest in health surveillance issues. <sup>(10)</sup>

In the case of the present study, a very low RSV was observed in the Spanish language, which is worrying for the RCTS, as it is a publication in that language. This means that the audience for which the current content of the journal generates interest is limited.

However, the journal publishes articles on topics related to the area of Health Technology. The COVID-19 pandemic generated a high number of publications, during the year 2022. In previous studies, this topic produced a high RSV, in the national and international territory. <sup>(9,13)</sup> In this way, the visibility of the journal benefits despite publishing in Spanish.

The countries where "Health Technology" reached the greatest interest adhered to the framework of Latin America. In general, these are countries that are still in the process of economic development, which is why they are subject to all the difficulties implied by the information gap, resulting from the prevailing sociopolitical context in each one of them.

There is a strong correlation between English proficiency, economic development, and technological innovation in terms of number of articles, number of researchers, research and development spending. Therefore, the prevalence of the English language in the sciences deepens the inequality in the production of knowledge between countries with high and low proficiency in English. <sup>(2)</sup>

This correlation referred by Ramírez <sup>(2)</sup> reinforces the gap in scientific production and access to information between the countries of the global south or peripheral countries and those of the

global north (including the former G8 countries and Australia). It leads to a decrease in scientific contributions and their visibility in those who assume English as a foreign language.

Bibliometric studies in the context of Latin America show a predominance of literature in the English language. <sup>(15,16)</sup> In this way it is demonstrated that researchers from the South have adapted the indisputable norms imposed in the scientific community.

Based on this scenario, the RCTS, like the rest of the scientific community, must become involved in this process of adopting the English language. It is not about replacing the native language, but it is indisputable that publishing articles in more than one language helps them to be seen by a larger and more diverse audience.

Publishing in English is part of the internationalization strategy of the journal. This reflects the strategic planning outlined for the development of the RCTS, with the purpose of having a publication up to international standards. <sup>(11)</sup>. Therefore, the systematic and updated timely analysis of search trends in the world is necessary.

At present, information must be understood as a valuable resource, and in the context of neoliberal globalization considered a product on which economic value is generated. In this line, a positioning of the scientific production of the RCTS is elaborated from from a scientifically based analysis.

## CONCLUSIONS

Worldwide, there is greater search interest in Health Technology in the English language. Given this reality, the Cuban Journal of Health Technology must become involved in the process of publication in English in order to achieve greater international visibility.

## AUTHORSHIP CONTRIBUTION

**Carlos Rafael Araujo Inastrilla:** Conceptualization, Research, Methodology, Data curation, Visualization, Writing - original draft, Writing - review and editing.

**Susana Solís Solís:** Visualization, Writing - revision and edition.

## FUNDING

The authors did not receive funding for this study.

## CONFLICT OF INTERESTS

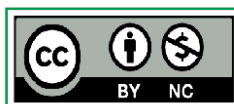
The authors declare no conflict of interests.

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