

## Analysis of Inter-institucional Cooperation Practices for Science, Technology, and Innovation in Health

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**This study aimed to analyze practices of inter-institutional cooperation for science, technology, and innovation in health in different countries and institutions available in scientific journals. Eight articles were chosen for discussion in this study. This work also introduced a method for constructing a platform model that might guide performance improvement actions in inter-institutional cooperation activities in science, technology, and innovation in health. We observed that this subject is evolving and that there is an opportunity to perform additional studies to develop this scientific area. This work enhanced the discussion on this progressing scientific and practical area.**

**Keywords: Science, Technology, and Innovation. Health Institutions. Inter-institutional Cooperation. Practices. Platform.**

### Introduction

In recent decades, health has been a central concern of global governance, and diplomacy has played a significant role in building a global health governance system, as shown by the importance of global health diplomacy in keeping countries jointly committed to improving health for all [1,2]. Thus, diplomacy is a field evolving fast with the changing world of globalization [3].

Nevertheless, whether and how the policies developed and the integration between organizations meet the expectations to achieve practical cooperation in global health is unclear. To accomplish that, it is necessary not only political will but also a better understanding of the institutions, interests, and environments of ideas, which can ease or hinder global health diplomacy efforts [4].

If the efforts to bring about change do not persist, there is a high probability that poor outcomes and inequalities in health will worsen [5]. Thus, it is vital to consider the broader goals

of improving global health rather than focusing solely on individual issues [6]

Global Health Diplomacy acknowledges the interplay between health and foreign policy, emphasizing negotiation's significant role in achieving goals and entails negotiations among various actors, including state and non-state entities. This fact involves integrating health concepts into policy strategies for broader political, economic, or social aims [7]

Inter-institutional cooperation (IIC) is a widely studied issue, but there is still much to learn. IIC allows different organizations to work together to achieve common goals. It is a complex process that requires a variety of typical collaborative practices. Some standard practices are aggregation of sectoral actions, mutual consultation, establishing units, and confirming committees and subcommittees. These practices could make IIC more effective and efficient. A more complex understanding of the conditions that could promote and facilitate inter-institutional cooperation could stimulate collaborative behavior, and it would be easier to define a typology of tools adjusted to different contexts [8].

This study aimed to analyze practices of inter-institutional cooperation for science, technology, and innovation in health in different countries and institutions available in scientific journals.

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## Materials and Methods

Scientific journal articles (original research papers and reviews) were searched at Scielo, PubMed, Scopus, and Web of Science databases from January 2019 to August 2023 to gather the most recent contributions to the theme. The research was structured so that the records to assess might contain the descriptors for a defined search string in the Title, Abstract, and Keywords fields. The search string applied combined term variations of the main categories: "Inter-institutional cooperation,"; "health," "science, technology, innovation," "platform," and "practices."

From the spectrum of fifty-four documents, the most pertinent ones were selected. Additional ones were then identified and extracted via snowballing (consulting the first selected articles' references). Documents were included based on their contents (papers describing theories, policies, frameworks, and guidelines in the public sector, focusing on the public health sector). As a result, 8 (eight) articles were chosen and fully read for the discussion of this study.

This article also intended to introduce a method for constructing a platform model to guide performance improvement actions in inter-institutional cooperation activities in science, technology, and innovation (STI) in health. The authors conceived the mentioned method (described in the 3.1 section) and will be performed as doctoral thesis research shortly.

## Results and Discussion

In this section, we portrayed the findings from the 8 (eight) final chosen articles to address the aim of this research (Table 1). The theme seemed to be regaining attention more recently. Studies in different countries and continents showed a worldwide interest in the matter. The primary type of research verified was qualitative, and the scientific methods applied varied (interviews and focal groups).

In general, the findings and results of the selected papers pointed out the positive potential of inter-institutional cooperation approaches and the need to deepen the knowledge of this emerging subject. Those encompassed a range of inter-institutional collaboration models, capacity-building strategies, and policy analyses in public health and research. The results highlighted the need for trust, communication, and coordination to overcome collaboration challenges (such as the need for shared vision, resources, and commitment) and realize its benefits (increased efficiency, effectiveness, and sustainability). The review of the articles provided a comprehensive overview of the models, challenges, importance, and benefits of inter-institutional collaboration for public health. They also called for further research on the most effective collaboration models and the obstacles that must be addressed. However, they did not approach any optimal models, specific promotion strategies, or factors that influence inter-institutional collaboration's success and performance. The possible reasons for that might be because the articles were published in different years and journals, they focused on different aspects, and might reflect diverse perspectives on inter-institutional collaboration. They might report issues based on different times, data, and methods; their findings might not be directly comparable, but they showed trends and clues for future research paths.

### The Proposed Method

The findings of the eight articles have highlighted essential implications for public health practice. They suggested that inter-institutional collaboration is essential for addressing complex public health problems. As the findings also emphasized the need to develop and implement effective models of inter-institutional collaboration that tackle the challenges of trust, communication, and coordination, it corroborated the proposition of building a model of the platform that may guide

**Table 1.** Papers' findings/results.

#	Title/ Reference	Year	Findings/results, from the Papers' authors
1	Models of inter-institutional collaboration to build research capacity for reducing health disparities. [9]	2008	"Three collaboration models – traditional, consultant, and mentoring – have arisen from the Yale-Howard Partnership Center. While the focus here is on these models, ongoing assessment of their effectiveness is acknowledged. Each model presents distinct attributes, advantages, and limitations. Notably, the traditional and mentoring models have demonstrated optimal efficacy within the Yale-Howard Partnership Center. However, the consultant model necessitated discerning selection to ensure project completion. These models collectively fostered augmented competencies and research environments in both institutions, notably in the realm of health disparities elimination."
2	The Guatemala-Penn partners: An innovative inter-institutional model for scientific capacity-building, healthcare education, and public health. [10]	2017	"The Guatemala-Penn Partners represents a collaboration between Guatemalan public and private universities and Penn that is founded on the principles of university-to-university connections, dual autonomies with locally led capacity building, and mutually beneficial exchange. Its ongoing initiatives in the domains of science, health-care education, and public health strive to fulfill the World Health Organization's Global Health Workforce Alliance strategies of partnerships and education. The goal of both describing and analyzing the success and limitations of these initiatives is to supply insight into strategies that can be adapted to other contexts to promote and strengthen similarly oriented global partnerships."
3	Inter-sectorial and inter-institutional cooperation and coordination in public health within the market model of the Colombian Health Care System, 2012- 2016. [11]	2018	"Inter-institutional cooperation and articulation are recognized as essential for the development of the public health. Some specific and short-term experiences have been reported. The market and competition model of the Colombian Health Care System does not allow for strengthening the values required to achieve sustainable development in public health. Given the wide range of actors involved in public health actions, inter-institutional and intersectoral coordination and articulation is imperative to rationalize resources, improve efficiency and effectiveness, and build values and social fabric as a scaffolding for the development of public health."
4	The institutional building of science and innovation diplomacy in Latin America: toward a comprehensive analytical typology. [12]	2021	"We understand Science and Innovation Diplomacy (S&ID) in Latin America (LA) as a tentative re-organization of different states and subnational actors around the study and institutionalization of the governance of contemporary transformations on the systems of Science, Technology, and Innovation (ST&I). The main contribution here is to supply a simple typology regarding the varieties of S&ID initiatives and how its institutional building is being influenced by state and non-state actors, regionally and globally. The main finding is the necessity for better articulation between S&ID initiatives in and among LA countries, as well as a wider understanding of the dynamics of ST&I in Global South countries, which brings challenges but also possibilities of open agendas."
5	The interface of multisectoral and multilateral dimensions of public health policy: what is new in the 21 <sup>st</sup> century? [13]	2022	"As the developments prove, the interface between multisectoral and multilateral dimensions of health policy has substantially diversified and enriched in the 21st century. The two dimensions tend to, increasingly, interact, inform, and reinforce each other. Such interaction would, alongside the profound intersectoral potential embedded in Health in All Policies and the SDGs, be one of important drivers of 21st century intersectoral policy—and international cooperation—for health."
6	R&D and innovation efforts during the COVID-19 pandemic: The role of universities. [14]	2022	"One of the main contributions of this study is the understanding of the Research and Development and Innovation (RDI) potential of the region and the relevance of setting up inter-institutional and business cooperation networks at national and international levels. The study shows that during the pandemic universities showed high RDI potential to quickly react to critical needs, offered open innovations, open licensing, showed collaborative abilities and effective use of their academic and student resources."
7	Brazil's foreign policy and health (1995-2010): A policy analysis of the Brazilian health diplomacy – from AIDS to 'Zero Hunger'. [15]	2023	"The main argument of this study is that national and international policies are intertwined in this process and that domestic dynamics and societal engagement are essential, but more is needed: governmental choices are also determinant. Institutional arrangements and policies shift in different conjunctures and are constantly prone to conflicts and change. Therefore, we emphasized the importance of more systematic and rigorous studies on the possibilities and limits of the links between health and international relations, as on the so-called health diplomacy."
8	Strengthening national public health institutes: a systematic review on institution building in the public sector. [16]	2023	"The overriding result is the identification and definition of six domains of institution building in the health sector: "governance," "knowledge and innovation," "inter-institutional cooperation," "monitoring and control," "participation," and "sustainability and context-specific adaptability." Our results show that the described domains are highly relevant to the public health sector, and that managers and the scientific community recognize their importance. Still, they are often not applied consistently when creating or developing National Public Health Institutes (NPHIs). We conclude that organizations engaged in institution building of NPHIs, including International Association of National Public Health Institutes, may benefit from state-of-the-art research on institution building as presented in this study."

performance improvement actions in Inter-institutional cooperation activities in STI in health.

Table 2 shows the technical procedures designed for the proposed method for constructing the platform conceived by the authors. The proposed method, supported by this literature review, will be the basis for constructing the inter-institutional cooperation platform, which is the object of the first author's thesis. This review will also sustain future deepening studies by the author's research group on the subject.

## Conclusion

The studied subject is evolving; therefore, there is an opportunity to perform studies to improve this scientific field. The research suggested that inter-institutional collaboration can be a valuable tool for improving public health. However, it is

crucial to be aware of the challenges and take steps to mitigate them. This study had some limitations associated with its method and defined scope. The limitations were related to using only four different databases and needing to apply strict systematic review protocols and checklists such as Preferred Reporting Items for Systematic Reviews and Meta-Analyses - PRISMA. Further and complimentary research agenda may include the development of scoping and/or systematic literature reviews that could be beneficial to deepen the main concepts involved in the proposed method. The evidence collected pointed out that the proposed method for constructing a platform model to guide performance improvement actions in inter-institutional cooperation activities in STI in health might fill an existing gap. This work also enhanced the discussion on this progressing scientific and practical area.

**Table 2.** Proposed method technical procedures.

#	Technical Procedures	Detailed Description
1	Critical factors prioritization	Prioritize, based on the scientific literature and through a survey with national and international experts, the critical success factors for the implementation of inter-institutional cooperation and the challenges faced in the process.
2	Challenges identification	Identify the challenges faced by specific cases in a Brazilian health science, technology, and innovation institution (HSTII), through documentary research and statements collected from managers, researchers and operators involved in HSTII cooperation activities.
3	Focal groups holding	Hold representative focus groups to validate the critical success factors raised from the literature and with experts.
4	Platform model proposition	Propose a model of an inter-institutional cooperation platform for science, technology, and innovation in health.
5	Platform model validation	Validate the proposed model through an expanded survey research with HSTII managers from Brazil and abroad.

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