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Barriers and facilitators to knowledge translation in Brazilian health: insights from the Grand Challenges Brazil case study

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Abstract

Background Translating scientific evidence into improved health practices remains a challenge. Knowledge translation (KT) aims to bridge the gap between research and real-world implementation in public health. This article examines barriers and facilitators to KT on the basis of a case study from Grand Challenges Brazil, a KT-oriented strategy that adapts international models to Brazil's public health context.

Methods Semistructured interviews were conducted after approval by a research ethics committee (protocol no. 6.540.207), with 22 key informants, including researchers, health system managers and members of the initiative's governance team, from October 2024 to November 2025. Data were analysed using Bardin's content analysis through a manual, iterative coding process validated by peer review and categorized according to the Consolidated Framework for Implementation Research (CFIR).

Results The results reveal individual, institutional and contextual barriers, including distrust and scientific denialism, administrative discontinuity, political influences and funding constraints. Facilitators included collaborative strategies, sufficient resources and technical support, processes that support institutionalization, and targeted funding mechanisms. Findings indicate that KT is not merely a technical exchange but a political process in which evidence competes with institutional power and interests.

Conclusions KT efforts in Brazil continue to encounter complex and interconnected challenges across multiple levels. Strengthening KT requires institutionalizing memory to withstand political turnover and building researcher and manager capacity through structured collaboration and sustainable mechanisms that connect science and practice.

Keywords Knowledge translation, Use of scientific information in health decision-making, Knowledge management for health research, Public health

Background

Advances in scientific and technological knowledge over recent decades have generated a vast body of information across various domains, with the potential to improve practices and outcomes [1]. However, knowledge production alone does not ensure its effective application. A gap remains between available evidence and everyday practice across multiple fields, particularly in the health sector [2]. In this context, knowledge translation (KT) is

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a critical field of study for the development of evidence-based policy and practice.

The Canadian Institutes of Health Research (CIHR) defines KT as a dynamic and iterative process involving the synthesis, dissemination, exchange and ethically sound application of knowledge to improve population health, deliver more effective services and products, and strengthen health systems. This definition expands KT beyond simple knowledge transfer, incorporating interaction between knowledge producers and users to co-create actionable and sustainable solutions [2]. Although widely recognized, this definition was primarily developed within the context of high-income countries, raising questions about how its core dimensions translate to low- and middle-income countries (LMICs), where institutional, political and health system characteristics differ significantly.

Accordingly, engaging researchers and stakeholders collaboratively from the early stages of problem identification fosters meaningful interaction and yields immediate benefits for knowledge users [3–5]. Beyond the collaborative process, when research is conducted by professionals embedded within healthcare services, the likelihood of integrating findings into decision-making processes and incorporating them into routine practices increases significantly [6].

Nevertheless, the effectiveness of KT is hindered by individual, organizational, financial, political and cultural factors shaped by local implementation contexts [1, 7–9]. Studies have highlighted limited access to current evidence, insufficient time for evidence retrieval, resistance to change, constraints in technical and financial resources, inadequate communication between researchers and knowledge users, as well as cultural beliefs and unfavourable political environments [1, 7–9]. These factors do not operate uniformly across settings but are shaped by institutional arrangements, funding mechanisms and political-administrative contexts, particularly in LMICs, where KT processes are inextricably linked to the structural constraints and opportunities inherent to their public health systems. Understanding these barriers and identifying facilitators are essential steps towards developing more effective KT interventions.

In Brazil, the Ministry of Health (MS) established the Department of Science and Technology (DECIT) to coordinate research and development initiatives and align funding with public health priorities [10, 11]. In this context, national and international partnerships have been essential, such as the collaboration between the Ministry of Health/DECIT and the Gates Foundation (GF), which led to the creation of Grand Challenges Brazil (GC-Brazil). GC-Brazil is a funding strategy explicitly designed to strengthen the practical application of research findings

in addressing priority public health challenges. Beyond supporting innovation, GC-Brazil incorporates features consistent with knowledge translation principles, including problem-driven research agendas and an emphasis on ensuring that research outputs are applicable to public health decision-making.

The GF launched the Grand Challenges for Global Health, a set of initiatives designed to foster innovation in addressing key global health problems [12, 13]. Brazil joined the initiative in 2011 and launched GC-Brazil as a co-funded partnership between MS/DECIT and the GF. Research agendas are jointly defined, aligned with the National Agenda of Health Research Priorities and responsive to emerging health issues [11].

While previous studies have mapped KT processes, there is a lack of empirical evidence on how these processes operate within large-scale, co-funded international partnerships in the Global South. This study helps address this gap by examining the barriers and facilitators that influence research use within the framework of Grand Challenges Brazil, an internationally co-funded initiative embedded in the Brazilian Public Health System (Sistema Único de Saúde [SUS]). By capturing the perspectives of key stakeholders, the study aims to contribute to enhancing evidence-based public health.

Methods

A qualitative case study design was used to explore the KT processes within the GC-Brazil initiative. Case study methodology enables the evaluation of complex social phenomena and the pathways through which lessons are learned [14, 15]. The unit of analysis in this study was the GC-Brazil initiative, examined as a national research funding strategy explicitly oriented towards knowledge translation [16]. These processes included the development and adaptation of planning, assessment and knowledge-management tools based on models produced by the Canadian Institutes of Health Research and the International Development Research Centre [16].

The case study combined semistructured interviews as the primary data source, with documentary analysis to facilitate data triangulation. Documentary materials included internal documents provided by the Ministry of Health's Department of Science and Technology (DECIT/MS), such as meeting minutes and project monitoring reports, as well as publicly available government documents pertinent to GC-Brazil.

This study is part of a broader investigation analysing research funding, knowledge translation and their impacts within GC-Brazil from 2011 to 2020. During this period, six public calls were launched, resulting in 71 funded studies in maternal and child health, child health, data science, antimicrobial resistance and malaria.

Additionally, GC-Brazil directly funded the Eliminate Dengue: Brazil Challenge project, utilizing *Wolbachia* bacteria [11].

Sample definition and characterization

Key informants included researchers, health managers and members of the GC-Brazil governance core (GC). The GC comprises representatives from MS/DECIT, the National Council for Scientific and Technological Development (CNPq), the GF and their partners, responsible for funding and monitoring research, and supporting KT-related activities.

Participants were selected using snowball sampling, a nonprobabilistic method that constructs referral networks to maximize coverage and minimize bias [17, 18]. Initial so-called seed informants nominate additional individuals belonging to the target population. Sampling continued until analytical saturation was reached, defined operationally as the point at which successive interviews no longer yielded new dimensions of the identified KT barriers and facilitators and when existing categories were sufficiently rich to account for variations in participants' accounts [19].

Seed participants met two criteria: (i). engagement in GC-Brazil at its launch (between 2011 and 2014); and (ii) continued involvement in GC-Brazil until 2020. Three seeds were identified: one from MS, one from CNPq and one from the Program Manager Unit (PMU) established by the GF to monitor projects in Brazil. These informants are primary sources of information, recognized for their extensive institutional knowledge and experience [20].

Data collection and analysis

In-depth semistructured interviews with open-ended questions were conducted virtually via Microsoft Teams® between October 2024 and July 2025. The last interview was conducted in person in November 2025. All interviews were conducted by the principal investigator, who has prior experience in qualitative research and evaluation studies. An interview guide was used to ensure consistency across interviews while allowing sufficient flexibility to explore participants' experiences and perspectives. Interviews lasted an average of approximately 40 min and focused on participants' perceptions of GC-Brazil's origins, governance and objectives; expectations, processes, partnerships and dissemination strategies; and the communication and collaborative use of research findings, and perceived impacts, including barriers and facilitators to the knowledge translation process. Of the 27 individuals invited via email, 22 participated: 10 are researchers funded by GC-Brazil, 3 MS managers (executive departments), and 9 governance core members. Participants were coded to ensure anonymity (R+number

for researchers; M+number for managers; G+number for the governance core).

Interviews were transcribed and analysed using Baridin's content analysis technique, which facilitates the identification of meaning and underlying structures, and interpretation of content [22]. Data management and coding were conducted manually through an exhaustive, iterative process of reading and coding to ensure deep immersion in the findings. To maintain scientific rigour and enhance the reliability of the analytical categories, a peer-review validation process was implemented: The primary researcher's coding was reviewed and discussed by the research team until consensus was reached on the final thematic structure. The categorization process involved identifying negative and positive factors for KT reported by the informants and organizing them into barriers and facilitators. For clarity, these were assigned to categories and then grouped into domains on the basis of the Consolidated Framework for Implementation Research (CFIR) [8, 23], designated here as individual, institutional (inner setting) and external context (outer setting) levels.

Ethical considerations

The research was approved by the Research Ethics Committee of the Faculty of Health Sciences and Technologies at the University of Brasília (protocol no. 6.540.207; CAAE 74817023.9.0000.8093). Interviews were only conducted after participants signed informed consent forms and image and sound usage forms for research purposes.

Results

Analysis of the interviews and documentary materials revealed a consistent pattern of barriers to knowledge translation operating across three interconnected levels (Table 1): individual, institutional and external context. Barriers were predominantly associated with relational dynamics, institutional instability and political conditions that constrained the use of research evidence. By contrast, facilitators were linked to structured interaction mechanisms, targeted resources and governance arrangements.

At the individual level, challenges centred on distrust, communication difficulties and uneven engagement among actors. Distrust of the GF reduced adherence to the strategy, and limited interaction between researchers and managers constrained the KT process. Although the GC-Brazil promoted spaces for interaction, informants noted that interaction by managers was inconsistent, limiting meaningful collaboration.

Leadership influence also emerged as critical: Decisions to apply or disregard evidence were often shaped by the personal interests or political alignment of

Table 1 Levels and categories of barriers to knowledge translation: synthesis and exemplifying reports

Levels	Categories	Synthesis	Exemplifying reports
Individual	Distrust	Some managers reported distrust of the Gates Foundation's intentions in promoting research in the country, which may have influenced adherence to the GC-Brazil strategy at the beginning	"... there's some distrust in the Bill and Melinda Gates Foundation. ... This had repercussions, but once the barrier was overcome, it became clear that the process was free of any intention of data interest and aimed at funding research relevant to management." M1 "During the Bolsonaro administration, our direct secretary was very wary of the foundation of 'what Bill Gates wants'. There was always a lot of suspicion." G6
	Communication and language	Researchers acknowledged difficulties in adequately communicating their results to managers. Researchers often assume that scientific articles suffice Managers reported needing "more executive-style communication" to understand the research	"I think we may lack expertise in communicating better ... I have difficulty knowing if he (the manager) actually reads the material or not. I think that most of the time he doesn't ... Researchers often do not realize that there are different audiences and different languages. They think it's all the same". R2 "... public authorities, public institutions, and researchers are way behind society in knowledge translation. Many civil society institutions manage to translate knowledge for the public, through campaigns and various other means". M1 "What is your product? Unable to identify it, he answers – It's a scientific article". G3 "We wanted knowledge to reach the target audience in language and channels appropriate to them ... not only researchers, but also managers and healthcare professionals". G7 "There are managers who hurry to understand the data, and others who hide it. They run away from the data. So they actively do everything possible to sabotage the quality of the data ... I'm convinced that it's one thing to produce knowledge, and even convince people that it's relevant, but it's something else entirely if managers are interested in translating knowledge ... So it's naive to think that managers will take action if they know it's important because if it involves conflicts of interest, they'll often remain silent and disregard all of it". R8
	Communication format	Limited effort to adapt communication formats to different audiences	
	Manager's personal influence	The use of knowledge depends directly on managers' agendas and interests. In cases where data are perceived as indigestible or uninteresting, evidence may be ignored or suppressed	

Table 1 (continued)

Levels	Categories	Synthesis	Exemplifying reports
Institutional (inner setting)	Structure of the Ministry of Health	High turnover of technical teams and management within the Ministry of Health disrupts the continuity of processes	"High staff turnover in the Ministry of Health definitely compromises this process, because someone who's involved this year is gone the next ... the barriers we face come from our own government structure". G4 "In my opinion, the main barrier to the circulation of knowledge is the Ministry of Health itself". M3 "... monitoring by other departments was very precarious, sending a technician who didn't know the process, had not participated in it, and had no idea what was happening". G7 "Institutional partnerships often didn't go beyond the first level of the manager who had direct contact with the product and was truly interested in its concrete application in policy; internal bureaucracy was so complex that he ultimately gave up". G1 "... you end up not having a funding line that takes you from the beginning of the research to the final development of the product". R5 "Funding is harder to come by. You know what you need to do, but you have fewer resources to do it with than you had yesterday". G9 "I pay out of my own pocket for hosting and the domain, otherwise it [the created platform] wouldn't be operational ... I think maintenance funding would be very important. ... The project ends when the funding ends. That's the frustration, that's a barrier". R7 "There was no continuity. Once the process was successful, our expectation was to build the instrument and validate it. The pilot was very successful in relation to the products we wanted to deliver, and when the time came... we wanted to expand it across Brazil, but there was no proposal to incorporate and financially support that continuity". R9 "The project ends and we keep working, and even when we have results, sometimes the article doesn't get published and we can't spend any more money, especially in the CNPq. We can't use those funds for publication and we have no way to communicate this lack of funding to cover publication costs in major journals". R6 "You can't afford to hire a specialized design firm for every call; it's just not possible every time and researchers can't do that themselves". G4
	Hierarchical coordination	Lack of coordination between management levels, and between management and academia	
	Funding for implementation	No specific funding line to support implementing research with results of interest to management or maintain/incorporate products beyond research funding	
	Post-research funding for knowledge translation and dissemination	No budget to hire KT specialists or cover publication and dissemination costs, which researchers cannot afford alone	

Table 1 (continued)

Levels	Categories	Synthesis	Exemplifying reports
External context (outer setting)	Institutional use of science	Using evidence in decision-making is a recent phenomenon in Brazil; managers and academics still operate in so-called separate worlds.	"In fact, this culture of using evidence for decision-making and actively identifying what academia is producing so that management can incorporate or use it is a much more recent phenomenon. Until then, they were two separate worlds: managers doing what they thought was best or relying on their own or their team's experience in public policy, and scientists complaining among themselves that they weren't being heard". G1
	Different timelines	Research timelines differ from decision-making timelines, compounded by the high turnover of teams and managers	"There's a lot of turnover, both among managers who order the research and technical teams who monitor it. It's terrible for using research results". G7 "The difference in timing between research and management is the main barrier". G1
	Engagement	Difficulty engaging decision-makers and securing their time and attention in acknowledging the importance of research in public health policies	"One issue I think the Ministry still faces is getting technical areas to give research the time and attention it deserves and follow these projects more closely". G7 "They [Health Ministry departments] just send anybody to the seminars, people who don't contribute or care about the research". G3
	Lack of KT technical support	Few trained KT professionals to help researchers and inability to contract specialized firms for support	"We just don't have enough qualified people around who can do that kind of work [knowledge translation support] with researchers. ... And you can't hire a specialized firm for every call, it's just not possible, and researchers can't do that themselves. ... There's no way to fund that with our regular budgets". G4
	Seminar restrictions	Seminars were useful but reached limited audiences, reducing KT potential	"I think the evaluation seminars are really valuable, but they're often very limited, you know?". M2
External context (outer setting)	Political priorities influencing research priorities	Political shifts, the reluctance of decision-makers to address sensitive topics, and misalignment between political and technical priorities means that promising projects might be abandoned	"The serious issue addressed in the study, about cesarean sections ... they [managers] never really dealt with that because generally they just don't want to: from what I see, they don't want any form of conflict ...". R4 "... the political priorities of management and the project itself weren't the same, so technical priorities weren't aligned with political ones. You need to find a balance, each manager knows what matters to keep things running, and neither of the two projects fit that specific management". R3

Table 1 (continued)

Levels	Categories	Synthesis	Exemplifying reports
	Periodic change in management	Leadership changes are a crucial factor, because important research projects may be set aside and never restarted by the next administration	"... we try to reach senior leadership. But by the time you finish the project, there's already a new director, sometimes even the second one after the first. ... The way our government is structured, and the high personnel turnover mean that the person making decisions doesn't follow the topic selection process. That affects whether results actually get used". G4 "The manager who orders the project isn't the one who receives it and that's definitely a barrier to using knowledge. It's normal for priorities to change, because health is dynamic and people are different. Everyone has their own goals, ideologies, and ways of thinking". G6 "I think the Ministry itself can bring in partners, depending on the management, obviously". M2 "There are managers who hurry to understand the data, and others who hide it. They run away from the data. So they actively do everything possible to sabotage the quality of the data. ... I'm convinced that it's one thing to produce knowledge, and even convince people that it's relevant, but it's something else entirely if managers are interested in translating knowledge. ... So it's naive to think that managers will take action if they know it's important because it involves conflicts of interest, they'll often remain silent and disregard all of it". R8 "Periods of regression and denialism can impact how research gets used. It depends a lot on whether those departments make a constant effort to maintain their agendas, and researchers themselves have to do that too". M1 "I think if the pandemic hadn't happened, and if the public health system hadn't been so dismantled, the project that [name of researched] started and I was involved in would have continued further, but it was such an overwhelming time, it just halted everything". R4
	Managerial influence	Use of knowledge influenced by managers' agendas and interests, conflicts of interest and preference to avoid so-called uncomfortable or uninteresting data	
	Denialism	Scientific denialism, the biased attitude of refusing to accept the validity of science, as expressed in the interviews, hinders evidence uptake	
	Epidemiological scenario	Crisis situations, such as the coronavirus disease 2019 (COVID-19) pandemic, can disrupt continuity and KT efforts	

decision-makers. This finding demonstrates that the individual level can either facilitate or hinder evidence use, depending on the attitude and commitment of key actors.

At the institutional level, high turnover among MS technical staff and frequent changes in senior management weakened institutional memory and disrupted ongoing KT processes. The lack of hierarchical coordination across management levels and an institutional culture that does not consistently prioritize evidence use reinforce institutional fragility. Barriers also included the absence of dedicated funding for KT activities, limited technical support in Brazil for KT and dissemination, and lack of resources after project completion to support evidence uptake. As a result, managers and researchers often continue to operate in so-called separate worlds. While initiatives such as evaluation seminars were valued as rich interaction spaces, informants reported that their reach remained limited, reducing opportunities for evidence sharing and adoption.

At the external context level, political instability and shifting government priorities were prominent barriers, directly affecting project continuity and the incorporation of results. Misalignment between technical and political agendas further impeded evidence use, even when findings were considered relevant. Changes in leadership frequently resulted in discontinued projects or reduced support for ongoing initiatives. Informants also described the adverse effects of scientific denialism, which undermined trust in science and reduced the legitimacy of research evidence. Finally, the epidemiological scenario, particularly the COVID-19 pandemic, altered priorities, disrupted research continuity and compromised ongoing KT projects.

Key informants also identified facilitators of KT within GC-Brazil. Drawing on their experiences, they highlighted four main opportunity areas for improving KT processes (Table 2).

The first, interaction and collaboration strategies, reflects GC-Brazil's role in the creation of structured spaces for engagement between researchers and potential knowledge users, building networks and communities, and promoting international collaboration. These efforts helped cultivate relationships and provide mechanisms for sustaining engagement after project completion.

The second area, resources and technical support, emphasized access to KT and communication specialists, as well as early planning for dissemination and audience engagement, requirements embedded in GC-Brazil's funding calls.

The third area, institutionalization for KT improvement, underscored the value of continuous project monitoring in supporting knowledge use by managers. Informants also emphasized the institutionalization of

initiatives that promote knowledge exchange, particularly those that incorporate KT from the initial stages. Mechanisms were established to ensure continuity of research until findings are implemented.

The fourth area involved targeted funding for KT as a crucial issue. This included allocating resources to applied research with greater potential for managerial use, as well as flexibility in using these funds, a characteristic of GC-Brazil that supported overcoming research-related obstacles and enhanced the communication of results.

Discussion

Knowledge translation (KT) is recognized as a critical mechanism for applying scientific research to policy formulation and practice [9, 24–28]. However, the findings of this study demonstrate that the incorporation of evidence into decision-making is neither linear nor purely technical.

Specifically, the analysis identified multilevel barriers (individual, institutional and contextual), suggesting that limited evidence use within GC-Brazil cannot be explained solely by deficits in communication or technical capacity. Informants reported distrust, selective engagement and instances of managers avoiding or suppressing data, suggesting that evidence use is mediated by perceived political risks, organizational incentives and the potential costs of acting on certain findings. These outcomes are consistent with literature describing KT as a complex, multidimensional process highly sensitive to the internal (institutional) and external environments [7, 8, 25–29].

The KT process must be distinguished from related fields such as implementation science and advocacy. While the former focuses on the scientific study of methods to promote the systematic uptake of research findings into routine practice [23, 26], and the latter involves organized efforts to influence public policy and resource allocation [28, 29], KT serves as a broader umbrella, facilitating the exchange and ethical application of knowledge [2, 27]. Consequently, KT processes are embedded in policy ecosystems in which actors may gain or lose authority, legitimacy or resources depending on how evidence is mobilized.

The epidemiological context also influenced knowledge use. While crises are frequently described as “windows of opportunity” for evidence use, the COVID-19 pandemic also intensified political polarization and scientific denialism, creating conditions in which research evidence was actively contested or delegitimized, undermining knowledge appropriation [8, 26, 27]. These findings underscore the need to conceptualize context not merely as a backdrop for KT. Instead, context must be considered

Table 2 Facilitators identified by key informants: synthesis and illustrative excerpts

Facilitators by opportunity area	Illustrative excerpts
Strategies for interaction and collaboration	
Engagement of stakeholders: Interaction between researchers and technical teams from the outset, and continuous participation of the same individuals in seminars, were considered highly positive for knowledge flow	"Always having a manager present was truly unique and something I had never seen in other projects. ... We were definitely put in contact with people; that philosophy was very well executed. We really did establish relationships and contacts". R1
Creation of structured interaction spaces: Seminars, direct meetings and events with high interactivity and participation from different audiences (managers, researchers and technical teams) were considered innovative opportunities	"... both in joint seminars across projects and in direct individual meetings, there was always a focus on project activities. I think this helped foster that closeness". R2 "We saw the Grand Challenges as a great opportunity to dive into our own data and understand it at a more scientific level". (Manager referring to service data used by the researcher) M3 "I think there was another aspect that was very interesting, this cross-fertilization among the projects. ... My perception is that this dialogue throughout the project, aimed at refining and testing hypotheses, also helps amplify its external relevance, because the same problem is being viewed from different perspectives". G2
Network and community building: GC-Brazil fostered the formation of a community of researchers who communicated and shared ideas, despite not collaborating directly	"There was that Knowledge Integration group, the Ki ...". R1 "We've had experience with the Gates Foundation, which fostered those [Ki] communities ... Everyone working in that area was there, and we saw first-hand what was evolving and what wasn't". G4 "The call for proposals encouraged us to develop the project, and the creation of the community was largely based on mutual support. There was a lot of collaboration". R8 "I think it's a really collaborative process, not major collaboration process, but rather a small network, they knew each other and ended up connecting. There was a WhatsApp group where everyone communicated and shared things, you know? So, it became a kind of community for sharing ideas, even without direct collaboration. This was thanks to the GC". G3
Post-research relationships: Continued interaction between management and researchers after project completion supported new projects or technical collaboration in the use of knowledge	"In 2019 [after the end of the research], we created a specific technical area for the surveillance of congenital anomalies, and CIDACS also contributed substantially... using all the know-how they [CIDACS] had developed over time Today, they serve as a reference for us". M2 "Much of this originated with the Grand Challenges experience. I believe that envisioning the possibilities for new studies and research that could make a difference in our approach to policy implementation was important". M3
Universal health system (SUS): Developing research for the SUS (Brazil's national health system) was recognized as strategically facilitating knowledge translation (KT) because the system's constitutionally guaranteed infrastructure provides opportunities for KT	"... It's a basic human right, not a privilege. ... It allows you to not only translate knowledge into policies but implement them. Because you have the data, you can reach the patients. It's health infrastructure of the government by the government". G9
International exchange: Being part of the GC community promotes the exchange of experiences, and being selected for GC-Brazil opened doors and facilitated exchanges with international institutions and researchers, enabling new partnerships and attracting global interest	"We have partnerships in South Africa, with the University of Cape Town, working on data interoperability. ... pathways are opening up, not only regarding the data center itself and the use of data, but also in the field of research". R7 "I actually think that we've got an amazing community of, you know, different people with different skill sets and resources, all coming together around this main idea ...". G9 "I think one of the strengths of the call was the exchange among researchers in these international meetings". R9
Resources and technical support for KT	
Professional support: Specialized KT and communication professionals contributed to research design and dissemination. Hiring professionals for social communication contributed to institutionalizing the process and provided researchers with greater assurance	"ODD [design company] was more intrinsically involved (...) helping with the design ... which was valuable input turned out very well". R1 "When the term 'knowledge translation' was mentioned here, I think that truly reflects what we experienced. We brought together all these actors to provide support. I increasingly believe that everything revolves around connections and mutual support". G6
Communication planning: Calls required communication plans and allowed the allocation of project resources for dissemination	"The call brought a greater focus on communication. We even had an additional communication page in the proposal". R3 "We used [created the website] with project funds; it was included. ... So it was created using Gates' funding—actually, CNPq resources". R6

Table 2 (continued)

Facilitators by opportunity area	Illustrative excerpts
Institutionalization to improve KT	
Continuous monitoring: Ongoing monitoring by the Program Manager Unit (PMU) and DECIT was recognized as a key factor for KT and can be institutionalized	"The PMU's coordination role was extremely important. The monitoring meetings allowed us to learn a lot". R8 "Technical support was crucial for the Wolbachia project, and both DECIT's and PMU's involvement were essential for promoting knowledge translation. Without their support, the researchers would not move beyond publishing their papers". G6
Mobilization for use: Emphasis on KT from project inception supported dissemination for target audiences	"Closer monitoring with a KT focus and providing researchers with the tools to develop their own knowledge translation plans are important. The value of this approach was recognized from the very beginning of the process, and it was very interesting". R9
Mechanisms for continuity: Developing mechanisms to sustain projects relevant to management needs	"We work with science ... but then it's left up to us to spread the word, you know? So it would be great if the Ministry or DECIT had structured ways to promote knowledge beyond publication. ... There are local and research-based initiatives, but no well-defined public policy to move things forward". R5 "... If you generate something requiring continuity, there should be maintenance tools, you know?". R7
Funding for KT	
Funding allocation: Alignment of research funding with management needs was seen as an opportunity that facilitates knowledge use	"Funding should be much more aligned with technical needs and demands". M3 "A targeted study, funded for that purpose, implies a mutual commitment, and researchers must provide the evidence for a more technical and in-depth discussion that actually leads to improvements". M2
Financial flexibility: Flexible funding provided by the Gates Foundation (GF) and managed by the PMU allowed addressing project bottlenecks during implementation, as well as expenditures on specialized communication firms and dissemination materials	"The PMU is very skilled in its role as the GC's administrator and truly believes in the potential of knowledge translation. So we managed the Gates Foundation funds for the project and allocated it to knowledge translation, travel, producing folders. So there has to be a minimum budget". G2 "The PMU had more flexible funding than the Ministry; it would often say, 'You don't have funding for that? Here, have some more.' And that helps to solve bottlenecks that a researcher with standard CNPq funding would not be able to address". G2

CIDACS Center for Data and Knowledge Integration for Health, KI knowledge integration, PMU Program Manager Unit

comprehensively, incorporating political, organizational and cultural dimensions that directly shape KT outcomes [24].

Technical support for producing appropriate information was evident within GC-Brazil; however, informants reported that shortages of specialized professionals in this domain, as well as challenges in translating and applying knowledge, remain weaknesses at the interface between knowledge production and use. Capacity-building initiatives therefore need to be accompanied by organizational and political support. This difficulty in tailoring communication to diverse audiences reflects gaps in translational competence [27] and underscores the need for training researchers to communicate findings accessibly and supporting decision-makers in interpreting and applying new technologies [28, 31, 32].

At the institutional level, high turnover among technical teams and managers within the MS emerged as a significant barrier. Rather than a peripheral organizational concern, turnover functions as a key causal mechanism: Without institutional memory and continuity structures,

KT becomes highly personalistic, dependent on individual champions, and therefore fragile. The literature emphasizes that unstable leadership contributes to the failure of evidence-based initiatives, since turnover disrupts the formation of lasting collaborative networks required to internalize knowledge [27, 29, 31, 32].

Although GC-Brazil promoted interaction between researchers and managers through seminars and follow-up meetings, informants noted that participation was often restricted to a limited group of actors, constraining effective knowledge dissemination. From a KT perspective, this finding suggests that translation may involve not only deliberating on means – how to implement evidence – but also on ends, including which problems are prioritized and whose values inform decision-making. Approaches that promote collaboration and co-production from the outset, as recommended by CIHR [2], are essential to foster the practical use of research findings.

Time-scale misalignment between scientific production and decision-making cycles is an additional challenge [26, 27], also observed in the present study.

Furthermore, the political context at the time findings are delivered directly influences evidence adoption, reinforcing that KT is not neutral but intersects with ideological disputes and institutional priorities [1, 8].

In GC-Brazil, flexible and dedicated funding was allocated for KT, including hiring specialized professionals who assisted researchers in communicating results more effectively, thereby mitigating barriers and strengthening KT activities in complex contexts. However, the absence of specific funding for post-project implementation of research results constitutes a significant barrier. The lack of resources to sustain research products, such as big data tools for management and online observatories, is a common frustration among researchers, who often lack pathways for incorporating results. Sustainable funding across all KT stages is essential, as is careful attention to communication strategies [7, 31, 34].

The results also identify actionable strategies for addressing KT barriers. Creating structured spaces for interaction and collaborative networks between researchers and knowledge users was essential to build trust and align expectations. Wolfenden et al. [25] empirically demonstrated that more intensive use of KT strategies enhances the impact of public health research.

Institutionalizing KT practices was crucial for long-term sustainability. Strategies aimed at engaging researchers and managers early, facilitating knowledge exchange and providing mechanisms for sustaining innovative research relevant to the Brazilian national health system (SUS) were viewed as particularly important. Strengthening KT in public health requires integrated and context-sensitive strategies.

Finally, our findings indicate that KT is neither a neutral nor merely technical flow of information. As perspectives from political philosophy underscore [35], evidence frequently confronts entrenched interests, political agendas and ideology. What may appear as a communication failure or managers hiding from data may instead reflect a rational strategy to mitigate political risk. Therefore, KT must explicitly address the power relations and institutional incentives that shape which evidence is prioritized and why.

Despite a high response rate (81.5% of invited individuals), this study has limitations. The limitations identified include being a single case study and possible recall bias. Another key limitation is the use of snowball sampling, with seed informants closely involved in GC-Brazil governance. This approach may have introduced selection bias, potentially overrepresenting perspectives aligned with the program's core objectives. Power dynamics arising from participants' professional relationships with DECIT/MS and the Gates Foundation

may also have influenced their accounts. Although the study relied primarily on participants' perceptions, credibility was strengthened through triangulation of interview data with documentary analysis.

Conclusions

This case study of Grand Challenges Brazil demonstrates that KT faces complex barriers even within strategies explicitly designed to support it; however, these can be overcome. The findings suggest that the effective application of evidence depends not only on technical facilitators but also on the ability to navigate political and institutional power dynamics within the health system. Structured interaction spaces, targeted technical and financial resources, institutional mechanisms for research monitoring, and integrated communication planning are crucial. However, this study also indicates that for KT to be sustainable in Brazil, progress depends on fostering dialogue across knowledge domains and consolidating mechanisms that consistently bridge science and practice.

Abbreviations

CFIR	Consolidated Framework for Implementation Research
CIHR	Canadian Institutes of Health Research
CNPq	National Council for Scientific and Technological Development
DECIT	Department of Science and Technology
GC-Brazil	Grand Challenges Brazil
GF	Gates Foundation
KT	Knowledge translation
MS	Ministry of health
PMU	Program manager unit

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Author contributions

P.C.C. conceived the study and contributed to data acquisition, analysis and interpretation of the results, as well as drafting of the manuscript. G.B.T.M. contributed to validation, data interpretation and drafting of the manuscript. M.T.O. and A.A.T. contributed to validation, supervision and critical revision of the text. All authors contributed to critically reviewed manuscript drafts and approved the final version of the manuscript.

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Data availability

The datasets generated and/or analysed during the current study are not publicly available owing to the inclusion of sensitive qualitative interview data that could compromise the confidentiality and anonymity of the study participants. However, the data may be available from the corresponding author upon reasonable request and with permission from the relevant ethics committee.

Declarations

Ethics approval and consent to participate

The study protocol was reviewed and approved by the Research Ethics Committee (CEP) of the Faculty of Health Sciences and Technologies at the University of Brasília (protocol no. 6.540.207; CAAE 74817023.9.0000.8093). All methods were performed in accordance with the Brazilian regulations. The requirement for informed consent was obtained from all informants for data collection, in accordance with Brazilian guidelines. Participants were assured of confidentiality and the right to withdraw from the study at any time without penalty. All informant data were kept confidential.

Consent for publication

Not applicable. This manuscript contains no individual person's identifiable data in any form.

Competing interests

The authors declare no competing interests.

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