Advancing and Integrating Climate and Health Policies in Brazil:

INSIGHTS FROM NATIONAL POLICY STAKEHOLDERS

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Cover photos: (top left) Building of the Ministry of Health, in the Historic Center of Porto Alegre (RS), flooded during the climate tragedy of May 2024; credit: © Gideon Mendel / Greenpeace. (bottom left) Indigenous people cross spears in front of a cordon formed by MPs in front of the National Congress, in 2014; credit: Vianey Bentes. (top right) Greenpeace presents a sustainable renewable energy practice for Brazil; credit: © Greenpeace / Rodrigo Baleia. (bottom right) Forest near the Tapajós River, in the Sawré Muybu Indigenous Land region, of the Munduruku people, in Pará; credit: © Valdemir Cunha/Greenpeace.

Abstract

Recent extreme weather events, which are increasing in frequency and intensity, show that the worsening climate crisis is impacting human health in Brazil. These impacts, among others such as the Dengue epidemic, are further overloading the Unified Health System (SUS) and bringing an extra layer of challenges to a country that still deals with structural problems of social inequalities and income concentration. However, the link between climate and health is still in its infancy in the country and is limited to a few projects and initiatives. To analyze the current situation and explore the potential for national integration of climate and health public policies, we conducted 33 semi-structured interviews with representatives of the Executive Branch, federal agencies, the academic environment, the National Congress, think tanks, and advocacy organizations that work directly or indirectly on the interconnection of climate, health, and related areas. This study synthesizes these actors' perceptions of the current status, ideals for integrating policies, barriers, opportunities, and strategies for overcoming them.

The vast majority of interviewed stakeholders feel that climate and health policies are poorly – or not at all – connected in Brazil. However, they point to a movement towards greater integration in recent years. There is a consensus that policies should be more connected, maximizing mutual benefits for the areas of health and climate. In the meantime, many participants point to barriers to this integration, such as a lack of strategic planning and risk perception, a lack of data, political polarization, the defense of vested interests, silos and a lack of dialogue between government bodies and sectors of society, and limited resources and funding. This study presents recommendations from the interviewees aimed at integrating climate and health policies. They include improving communication and education; expanding the production and dissemination of research and data on the impacts of climate on health and the economy, as well as on the benefits of climate action for health and other areas; and strengthening political governance for integrated country planning.

These actions aim to overcome the identified challenges, optimize Brazil's potential for climate adaptation and justice, and raise the quality of life. The recommendations were systematized to include possible implications for policymakers in various segments, including federal and subnational governments, the National Congress, the Judiciary, academia, advocacy, and communicators. The research is part of a multi-country study coordinated by the Center for Climate Change Communication at George Mason University in the United States.

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1. Executive Summary

Climate change is causing profound and growing damage to human health in Brazil. Recent and increasingly frequent extreme events, such as the historic drought in the Amazon region and the climate tragedy in the State of Rio Grande do Sul, are concrete examples of the extent to which the climate issue puts us all at risk. In Brazil, a movement is beginning to emerge among different stakeholders, including academics, politicians, and representatives of non-governmental organizations and think tanks, who are considering how national policymaking can promote climate solutions for health protection and health solutions for climate protection. The critical question is to what extent, in what ways, and how climate and health policies should be combined in national policymaking.

We investigated the perspective of stakeholders involved directly or indirectly in Brazilian public policymaking through 33 semi-structured interviews with representatives of ministries, federal agencies, academic institutions, civil society organizations, think tanks, and the National Congress, as well as a representative of the Federal Public Prosecutor's Office and a representative of a subnational government. The research participants work in climate (and/or environmental) policies, health policies, and the connections between climate and health or related areas such as energy, economy, housing and urban development, transportation, disaster prevention, emergency response, agriculture, and education.

The interviews were conducted between April 8th, 2024, and June 17th, 2024. In addition, our analysis relied on feedback on our preliminary findings from some stakeholders involved in formulating and designing climate (and/or environmental) and health Brazilian policies.

This report is intended for a wide range of stakeholders aiming to understand and promote the development of national climate and health policies in Brazil. They include federal policymakers and federal agency officials, health and climate professionals, academic researchers, representatives of civil society organizations, and all people interested in the interconnections between climate and health.

The following conclusions represent the participants' opinions on the current national status of climate and health policies in Brazil, the ideals for advancing these policies, the barriers to achieving these ideals, the perceived opportunities, and the recommended strategies.

Current national status of climate and health policies

According to the participants, climate and health policies are currently little or not at all connected in Brazil. However, many of the interviewees pointed out that policies are becoming increasingly integrated over time, especially under President Lula da Silva’s administration, which is conducting a review of the National Policy on

Climate Change and the National Plan for Adaptation to Climate Change. Progress, however, is considered to be less than desirable, is restricted to specific projects, is far removed from the effective implementation of public policies, and is out of the agenda in the National Congress. Climate and health are seen as a little more integrated in specific contexts, such as disaster emergency response actions and issues relating to air pollution and basic sanitation. There is a general perception that the country is unprepared to face the worsening climate crisis and its impacts on health and other sectors.

Ideal for climate and health policies

Most participants believe climate and health policies should be more integrated, cross-cutting, and aligned with Brazil's strategic planning. To this end, they consider it essential to broaden dialogue and adopt participatory macro-sectoral and multi-level governance. The interviewees perceive the intrinsic interconnections between climate and health issues and believe that integrating policies can promote mutual support and strengthening for both areas, benefiting the population's well-being and helping combat Brazil's structural inequalities. Many point out that the wide coverage range of the Unified Health System is a strength of the country and a means of promoting progress in implementing the adaptation agenda involving the federal, state, and municipal spheres. They also consider that sectors such as housing, sanitation, the economy, energy, transportation, and agriculture are key to incorporating climate and health policies, reducing socio-environmental vulnerabilities, and increasing the country's resilience to the worsening climate crisis. Finally, they point to the need for more data, research, and indicators to help make the impacts of climate issues on health tangible and vice versa, broadening the perception of risks and enabling the formulation of evidence-based policies.

Barriers to integrating climate and health policies

Political issues – the historical difficulties of formulating less principled and more normative policies; the lack of intersectoral dialogue and lack of dialogue among government bodies; the limitation and poor distribution of public resources; the defense of vested interests by minority segments and groups to the detriment of the interests of the majority; the lack of integrated and systemic country planning; and the absence of a culture of risk perception – were mentioned by most of the interviewees as obstacles to achieving the ideal in integrating climate and health policies. Limited knowledge on the part of the stakeholders involved in policymaking about the links between health and climate was also considered a barrier.

Many recognize the difficulty of adapting the country to the worsening climate crisis at the same time as the nation still needs to resolve historical structural problems involving inequality, poverty, income concentration, and lack of access to housing, sanitation, education, and health, among others. However, they point out that all these issues will be aggravated by the impacts of global warming, which require strategy and governance capable of building consensus.

Political polarization, the profile of the National Congress, denialism, fake news, and a development plan that goes in the opposite direction to combat the climate crisis – with support for agribusiness and oil exploration at the mouth of the Amazon – were also mentioned as additional layers of challenges that need to be overcome.

Opportunities to advance and integrate climate and health policies

Recent extreme events – such as the historic drought in the Amazon, the tragedy in Rio Grande do Sul, and the wildfires – have contributed to increasing the perception and awareness of policymakers and society in general of the risks related to the worsening climate crisis and its impacts on human health and the economy. According to the participants, although regrettable, this is an opportunity to advance the country's integration of climate and health policies. The (ongoing) review of the National Climate Change Policy (including the National Climate Change Adaptation Plan) and the COP30 in Brazil in 2025 were also considered essential opportunities to connect the climate and health agendas with other priority agendas for the country. The Unified Health System – for its successful implementation as a public policy and for its wide coverage range and scope – was also considered strategic for advancing the integration of climate and health policies in the country.

In addition, the interviewees mention Brazil's strategic opportunities in the international context to incorporate forest restoration, biodiversity protection, and the energy transition into the country's development plan due to the enormous potential for obtaining resources and generating jobs and income with the transition to renewable energies such as wind, solar and green hydrogen, and with advances in the bioeconomy and agroecology in a regenerative economy. For the opportunities to be seized, however, a political decision is needed on the part of the government to articulate and conduct strategic planning based on the country's vocation to protect biomes such as the Amazon and the Cerrado, which are fundamental for the provision of ecosystem services such as water, air and climate regulation, avoiding the approval of projects that further aggravate the climate crisis, such as oil exploration.

Strategies to advance and integrate climate and health policies

The participants recommended various strategies for effectively communicating the links between climate and health. The proposed actions would help to make the impacts more tangible, create a sense of urgency, increase awareness and risk perception, and guide the prioritization of investments and public resources in efficient mitigation and adaptation policies to improve the country's resilience in the face of the worsening climate crisis. Communication should involve climate impacts (including economic impacts) on health and explain the costs of inaction versus the advantages of adopting preventive measures and climate solutions.

To overcome the lack of knowledge on the part of policymakers about the interconnections between climate and health, the interviewees suggest speeding up the production of data, indicators, and research that establish the links between the two. They also recommended giving science a more significant role in supporting the formulation of public policies. The participants also recommended closer ties with Indigenous, "Quilombolas" and traditional peoples and the consideration of ancestral knowledge in the search for solutions.

Expanding intersectoral dialogue, strengthening participatory policies, educating strategic audiences – such as health professionals –, including new actors in the debate, and mobilizing society are considered strategic ways to pressure policymakers for change.

To overcome political barriers, the recommendations point to centralized leadership that promotes integrated country planning and management, with the concepts of One Health and Planetary Health as the guiding principles for policy integration. The recommendation to overcome the silos and departmentalization between federal agencies, ministries, and federative entities is for top-down coordination capable of optimizing human and financial resources, programs, and actions within and between public bodies, with data platforms, expanded dialogue, and the use of technologies. Finally, they recommend looking for funding, strengthening sanctions

against polluters, stimulating the low-carbon economy, reviewing the fiscal framework, and mobilizing funds that have already been created to fund climate adaptation while combating structural inequalities.

Potential implications for strategic audiences

Members of Congress should consider strategies to find common ground for dialogue and build possible consensus on climate and health policies. This is essential, especially in the face of the worsening climate crisis, which is already affecting not only the health of the population but also several strategic sectors of the economy – agribusiness, energy, and transport sectors, among others. In this sense, it is essential to increase knowledge about the costs of inaction versus the economic advantages of integrated policies and climate mitigation and adaptation actions. One of the possible paths is to get closer to scientists and open a dialog with stakeholders committed to the country's climate and health agendas. A greater understanding could help to overcome political polarization and review positions that defend specific and short-term interests. It could also contribute to a political conciliation capable of seizing opportunities and placing the country on a level of integrated development that is sustainable from a social, environmental, and economic point of view in the long term.

The President of the Republic and his political staff have enormous potential to assume national and international climate leadership and governance capable of ensuring strategic and integrated planning for the country moving towards decarbonization. This effort must be aligned with combating structural inequalities and preparing the country to face the worsening climate crisis through preventive mitigation and adaptation measures. It is also recommended that the lead be taken in drawing up and implementing integrated health and climate policies that prioritize the protection of all forms of life. The President, in particular, has the opportunity to advance his intention to make the climate a cross-cutting issue in his government. This can be done through executive measures – such as decreeing the climate emergency and creating the Climate Authority directly linked to the presidential cabinet – and measures to build a multi-level, multi-agent, multi-thematic, and multi-sectoral political conciliation.

In the face of the worsening climate crisis**, members of the justice system** are considered essential to ensure rights related to the health, well-being, and survival of different forms of life. The increase in judicialization in cases defending intergenerational, climate, and environmental justice is seen as a trend in the country, and the Judiciary must be prepared. Faced with public policies that are considered to be “less normative” and “more principled”, the role of the Judiciary in creating case law and ensuring a firm stance on compliance with the Federal Constitution becomes even more essential in the face of the actions of the Executive and Legislative branches, especially the Federal Supreme Court. The role of members of the justice system at the state and municipal level is also vital, especially with regard to environmental policies on land use and occupation, air and water pollution, basic sanitation, and environmental licensing.

Federal agency officials still need to make great strides in establishing interconnections between inter- and intra-agency climate and health to reduce the silos of power between them and their respective departments, enable cross-cutting actions, avoid overlapping or duplicated efforts, expand cooperation, and optimize the use of public resources. To this end, in addition to centralized governance and the modernization of structures, it is recommended to train civil servants, systematize learning, build data platforms to support well-informed decisions, and increase synergies between projects, programs, and actions, including more significant interaction with academia.

Health professionals and organizations are considered essential players in strengthening climate policies, but to do so, they still need to broaden their understanding and production of data and indicators on the impacts of climate change on human health and take a more leading role in integrating, expanding dialogue and exchanging information with experts in the climate field and other sectors. The wide coverage range and scope of the Unified Health System throughout the country, in different territories, is considered a national strength. The strengthening of the climate-health nexus by health managers, professionals, and agents can empower and train them as relevant and reliable spokespeople with communities and also with representatives of the executive and legislative powers at national, state, and municipal levels to demand prevention and adaptation measures in the face of the impacts of the climate crisis on human health.

Climate and environmental professionals and organizations have a lot to benefit from more significant interaction with scientists and with the health sector and professionals since the climate-health nexus is a powerful strategy for making impacts tangible, stimulating behavior change, generating a sense of urgency, broadening risk perception and bringing the climate crisis closer to people's reality in the short term. In this sense, it is recommended that the sector play a leading role in broadening the dialog with the health sector, as this contributes to strengthening both agendas in the national context. There is also an opportunity for the climate sector to adopt a strategic, narrative, and communicative approach to establish the interconnections between the two areas in a simple and accessible way, with less technical jargon and more links to the impacts on human health, not just ecosystems and biomes. Finally, it is recommended that the economic and health benefits of mitigation and adaptation actions be identified and incorporated into the narrative once these actions are already under review through the Climate Plan.

Members of the scientific community can contribute to climate and health policies with interdisciplinary studies – stimulated by funding agencies, for example – that examine in greater depth the impacts of climate change on human health, as well as the economic costs of these impacts on health and other areas such as agriculture, infrastructure, transportation and activities in the energy generation and water management sectors. They can also advance research into the country's positive impacts – including economic impacts – of mitigation and adaptation policies. It is recommended that academics become protagonists in policy formulation, adopting a stance in line with the concepts of "responsible advocacy" and "implementation science". Academics also have the opportunity to improve their ability to communicate not only with the political class but with society as a whole. This can be done by "translating" technical terms and jargon, bringing scientific findings closer to the reality of people and voters. Finally, this study could be expanded to examine more deeply the intersection between climate and health policies at subnational, regional, state, and local levels and the role of the different social actors and stakeholders.

Advocacy organizations have the opportunity to amplify their voices and increase public pressure on governments and the National Congress if they better integrate the agendas of the environment, climate, health, and other social causes linked to the defense of rights, such as issues of gender, race, ethnicity, youth, and the peripheries (marginalized populations), for example. Doing so would increase issue salience and attention in the public sphere and increase their influence on political decision-makers. The suggestion is to bring the different agendas closer together, highlighting synergies, prioritizing evidence-based strategic communication to create messages and campaigns that explain climate impacts on human health and the public health system, and including messages that show the positive effects, including for the economy and other sectors of society, of decarbonization, prevention, mitigation and adaptation actions in the field of climate and health. Activism through social networks

is considered strategic, as is building coalitions for integrated actions (community-building), choosing reliable messengers and target audiences, and adapting messages to adhere to different stakeholders' interests and values.

Subnational governments and city halls have the opportunity to train the technical staff of city halls and state public bodies so that they have the technical capacity to develop climate mitigation and adaptation plans, improve public policies on the environment, climate, and health, obtain national and international resources and find local and regional solutions to meet the specific needs and reduce vulnerabilities in the country's different territories.

Brazilian communicators and media professionals have a fundamental role in amplifying news and providing information based on technical and scientific data to help stakeholders decide on climate and health policies. This role is even more relevant in the face of a worsening climate crisis and a context of political polarization, the defense of vested interests, structural inequalities, denialism, and fake news. To this end, communicators and journalists must be better prepared to incorporate these interconnections into their agendas in different sections, whether covering disasters or encouraging and demanding preventive, mitigation, and adaptation measures. A systemic vision in news coverage and communications by various actors in their social networks is also considered essential. They must dedicate time and space to identifying and disseminating success stories and messages of hope and confidence to avoid inaction resulting from hopelessness. Finally, public authorities' investments in public communication and data transparency were seen as extremely important for communicating the impacts of the climate on health and other sectors.

2. Background

The effects of climate change on human health in Brazil

Climate change is already having a significant impact on human health in Brazil. These impacts include the increase and/or worsening of diseases such as enteroviruses, hepatitis, and leptospirosis – while also favoring the transmission of arboviruses such as Dengue, Malaria, Zika, and Chikungunya – which have spread to regions previously considered to be at low risk, such as southern Brazil (Saldiva, 2024; Barcellos et al., 2024).

Applied health studies show that heat stress and air pollution from burning fossil fuels are linked to heart and respiratory diseases such as stroke, migraine, Alzheimer's, meningitis, epilepsy, and multiple sclerosis (Sisodiya et al., 2024). In addition to the direct impacts, specific vulnerability factors, such as physical and mental comorbidities, disabilities, and gender and age issues, amplify these adverse effects in correlation with climatic phenomena, and their consequences also affect the mental health of young Brazilians, causing what researchers have called climate anxiety (Hickman et al., 2021).

While everyone is at risk of health damage caused by climate change, discrimination based on race and gender, for example, perpetuates intergenerational cycles of poverty, limiting opportunities and increasing vulnerabilities for certain population groups. Among those most affected and who disproportionately face the impact and risks are those with pre-existing illnesses, low-income communities, children and the elderly, women and black, brown, and Indigenous people, among others (Peters et al., 2022). In the case of heavy metal exposure and contamination, for example, almost 80% of all mercury emissions in South America are concentrated in the Amazon region, causing damage to health, especially to the most vulnerable populations, such as children and Indigenous people, according to Crespo-Lopez et al. (2024). Another example is in urban centers, where the health impacts of urban heat islands (UHI) and air pollution disproportionately affect the most vulnerable populations (Lima, 2024).

Sthefane Sofia Nantal, with her cat Gigi on her lap, in Vila dos Papeleiros, in Porto Alegre (RS), during the climate tragedy that hit Rio Grande do Sul in May 2024. Credit: © Gideon Mendel / Greenpeace.

Extreme events exacerbate damage and impacts

While this study was being carried out, with the interviews already underway, the state of Rio Grande do Sul was hit by the worst climate disaster in its history following torrential rains between April and May 2024. The floods caused damage in 478 of Rio Grande do Sul's 497 municipalities, and at the height of the crisis, more than 626,000 people were forced to leave their homes. A study by the National Confederation of Trade in Goods, Services, and Tourism (CNC, 2024) showed that losses totaled R$97 billion. The crisis also resulted in the loss of 195,000 jobs in the state and 110,000 in other regions. Trade had a daily loss of R$5 billion, and the tourism sector could lose up to R$6 billion in the year. Infrastructure, especially transportation, was severely damaged, and reconstruction will require R$19 billion and support measures for jobs and credit.

Rescues mobilized hundreds of volunteers in Canoas, a city in Porto Alegre's Metropolitan Region, in Rio Grande do Sul. The municipality was one of the worst affected by the tragedy. Image credit: Carlos Macedo.

All of these repercussions have strongly affected the health of the population, directly and indirectly, whether through water contamination (e.g., leptospirosis), the collapse of the health system – even impacting the treatment of people with chronic illnesses – the spread of viral diseases in public shelters or compromised mental health through post-traumatic stress resulting from material losses and loss of life, among others (Biernath, 2024).

In recent years, other extreme events have also affected populations in the mountainous regions of Rio de Janeiro (RJ), São Sebastião (SP) and Franco da Rocha (SP), cities in the Itajaí Valley region (SC), towns in the Taquari Valley (RS), in the south of Bahia and the states of Pernambuco, Acre, Amazonas, Mato Grosso do Sul, and Espírito Santo, among others. Insufficient water supply for households, contamination of water sources, and inadequate treatment of sewage and wastewater, often the state's responsibility, threaten the security of sanitation systems.

The climate crisis intensifies the vulnerability of these systems, and for Barcellos (2024), the "precarious universalization" of these services represents a challenge for cities in adapting to extreme climate events. These floods cause not only enormous human and social losses but also a devastating economic impact, as the destruction of infrastructure and the mass displacement of the population result in significant losses for the local and national economy.

The worsening of flooding and landslides on hillsides – one of the most apparent consequences of the impact of climate change in Brazil – has affected various regions of the country, especially the most vulnerable populations. This also has an impact on mental health.

Mental health problems have also been documented due to pollution. Exposure to chemical and toxic substances resulting from fires and air pollution in large urban centers, as well as from pesticide and heavy metal

contamination, causes alterations in the endocrine system and is associated with a series of mental disorders. These include severe psychiatric disturbances, including anxiety, depression, schizophrenia, and panic disorder (Waissmann, 2002; Flores et al., 2023).

A survey with 1,552 participants assessed the mental impacts of the tragedy in Rio Grande do Sul. The study identified high rates of depressive and anxious symptoms and pointed out that more than half of the individuals had moderate to severe symptoms of mental impact, even though they had no previous history of these conditions. Also, according to the study, participants directly affected by the floods – or who were close to people affected – had higher scores for Generalized Anxiety Disorder (GAD) and Acute Stress Disorder (ASD) compared to the unaffected group. The worst mental health outcomes mainly affected younger people, females, people with lower family incomes, and also people who had taken part in rescues (Diefenthaeler et al., 2024). In May 2024, Bill 1883/2024 was presented to the Chamber of Deputies in the same month as the tragedy. The bill, which is still being processed, provides for establishing the National Policy for Psychosocial Resilience in response to environmental disasters, with guidelines on prevention, promotion, and post-intervention in mental health.

The intensification of human-caused forest fires in Brazil is increasing exposure to direct risks and the harmful effects of smoke on human health, impacting areas that can extend for thousands of kilometers and requiring mass evacuations. Air quality management in Brazil faces significant challenges despite the legal approaches established by the National Environmental Policy (Law No. 6.938/1981) and the Resolutions of the National Environmental Council (CONAMA).

Volunteer firefighters battled a wildfire in the Chapada dos Veadeiros National Park in Goiás in 2024. Image credit: André Dib.

Currently, less than half of Brazil's states carry out systematic air quality monitoring, and those that manage to do so often face difficulties preparing and publishing their reports. The creation of a Basic Air Quality Monitoring Network, planned since 1989 in the National Air Pollution Control Program, has never been effectively implemented, reflecting a persistent flaw in the public management and effective implementation of environmental policies in the country. The establishment of this network was included in the National Air Quality Policy (Law No. 14,850/2024), approved in 2024. In large urban centers, air pollution is strongly linked to emissions from individual motorized transport systems. However, state environmental agencies responsible for managing air quality have limited power to deal with these emissions.

In September 2024, all of Brazil's Federative Units registered outbreaks of fire and, according to data released by the National Institute for Space Research's (INPE) Burning Program, the states of Mato Grosso and Pará led the way, with more than 2,300 outbreaks each (Casemiro, 2024; INPE, 2024).

From the beginning of the year until December 3, the country had almost 268,000 fires, an increase of more than 49% from the previous year (INPE, 2024). Studies show that almost all wildfires in Brazil are caused by human activities [anthropogenic causes] (Moura, 2024; Menezes et al., 2022).

In September, Amazon recorded the highest number of fires since 2010; Cerrado, the highest since 2012; and Pantanal, 2024 was second only to 2020 regarding area burned. The smoke from the fires affected not only the North but also spread throughout the country, reaching cities such as Porto Alegre, Rio de Janeiro, São Paulo, and Brasília (Casemiro, 2024). Between January and August 2024, the country burned more than 11.3 million hectares, an increase of 116% compared to the same period in 2023. The largest area burned occurred on large rural properties. The most significant increase was in "Non-Destined Public Forests" (+176%). There was an 80% increase in fires in Indigenous Lands compared to 2023, highlighting the vulnerability of these territories (Alencar et al., 2024). The press highlighted the effect of this smoke on the air quality of a large part of the country and how this increased the resulting health problems, as verified by attendance in the health system (Gomes, 2024).

The Lancet Countdown Policy Brief for Latin America 2023 showed that despite an initially bleak scenario, there are signs in Brazil that collective action is being mobilized to turn this challenge into an opportunity to integrate health and climate policies. According to the report, this can be achieved through the implementation of intergovernmental policies that benefit society, the economy, and the environmental determinants of health (Hartinger et al., 2024).

Air pollution mainly affects children and older people.
Image credit: Freepik

The climate-health nexus is, in fact, part of a broader issue of the intricate relationships between human activities and the planet's natural systems. The impacts that humanity has caused are against it, its health and well-being, and climate change is a clear example, but it is not an isolated fact but a consequence of multiple factors. This is the Planetary Health field, a fundamental framework for understanding the current moment. Brazil is intensely engaged in this field and in this global movement through Planetary Health Brazil, which, among other results, coordinated with the Planetary Health Alliance the drafting of the São Paulo Declaration on Planetary Health (Myers, Pivor & Saraiva, 2021; PHA, 2021), the result of the 2021 Planetary Health Annual Meeting. The Declaration contains, among other vital points, messages about the role of the health system and health professionals in dealing with the current crisis.

Economic bias prioritizes mitigation over adaptation

Compared to the international context – which has an energy matrix composed mainly of non-renewable sources – Brazil's energy matrix is considered the most renewable in the world. According to the National Energy Balance (BEN, 2024), the share of renewable energies in the Total Energy Supply (TES) remained high, reaching 49.1% in 2023. This puts the country in a favorable position to meet the mitigation targets of the Paris Agreement about the energy transition by including new renewable sources in its energy matrix. Among the country's most widely

used renewable energy sources are sugarcane biomass (16.9% of renewables) and hydroelectric power (12.1%). Solar and wind energy share as renewable sources in the Brazilian energy matrix has been growing in recent years.

The proposal to modernize Brazil's energy matrix prioritizes transitioning from thermoelectric and fossil fuels to renewable sources such as wind, solar, geothermal, tidal, hydraulic, biomass, and biofuels. This approach recognizes the diversity of Brazil's natural resources. It seeks to integrate various energy sources to maximize efficiency and reduce costs by taking advantage of the country's climatic and geographical characteristics (Baitelo, 2024). For example, the Northeast has strong winds that can compensate for the low generation of hydroelectric power during periods of drought, while the sugarcane bagasse available during the harvest can supply energy demand when other sources are insufficient (Araújo and Goes, 2009).

Brazil's recent leadership of the "Energy Transition" theme at the UN High-Level Dialogue on Energy aims to transform the national energy sector and contribute to global sustainability goals. The Ministry of Mines and Energy (MME) leads the National Hydrogen Program (PNH2), an initiative within the National Energy Transition Policy, thinking of the country with great potential to become a leader in low-carbon hydrogen production.

In addition, the global decarbonization program, Energias da Amazônia (Gov Agency, 2024), aims to reduce the use of diesel oil in power generation in the region. The program aims to replace fossil fuels with renewable sources, with an investment of approximately R$5 billion, guaranteeing the quality and security of the electricity supply for more than 3.1 million people in isolated systems in the Amazon (MME, 2024).

Wind power generation has been growing in Brazil in recent years. Brazil's energy matrix is considered one of the most renewable in the world. Image credit: Pexels/Pixabay.

Because they involve advantages for the national economy, investments in mitigation measures associated with the energy transition become a priority for the government. On the other hand, adaptation and disaster prevention measures – including adapting the Unified Health System and urban infrastructure – are second on the scale of priorities and investments.

Since 2023, the Lula da Silva government has been revising the National Policy on Climate Change (Law No. 12.187/2009) and the National Plan for Adaptation to Climate Change (PNA) (Brazil, 2016a), launched in May 2016. The Climate Plan will guide Brazil's climate policy until 2035, in line with Decree 9.073/2017, which ratifies the Paris Agreement in the national context. To this end, an Interministerial Committee on Climate Change was set up (Decree 11.550/2023), involving more than 20 government bodies, including 18 ministries. This inter-ministerial work will result in 15 sectoral adaptation plans and seven sectoral mitigation plans, which have also been submitted to public consultation.

The federal government had already drawn up the 2016 NAP with an intersectoral focus. At the time, the PNA had the collaboration of civil society, the private sector, and state governments. Eleven sectors were considered,

including health. However, little progress has been made in implementing public prevention policies and effective actions to mitigate the impacts, risks, and vulnerabilities identified in the “Health Strategy” (Brazil, 2016b).

Vision of Science in Brazil

Another factor to consider is the lack of perception and understanding of climate risks and the discrediting of science by some sectors, which contributes significantly to the vulnerability of urban and peripheral communities in Brazil. This gap in understanding exacerbates the impacts of recent events, including the historic drought in the Amazon, the fires, and the climate tragedy in Rio Grande do Sul.

In parallel, Brazilians' perception of the quality of national science has shown a positive trend. In 2023, approximately half of those interviewed in a study carried out by the Center for Management and Strategic Studies (CGEE) rated Brazilian science as "intermediate" (34.9%) or "advanced" (14.6%), while 45.7% considered it to be lagging behind. Although there has been a reduction in the percentage of Brazilians who perceive national science as outdated – from 51.4% in 2019 to 45.7% in 2023 – there is still a relatively pessimistic view of the state of scientific and technological research in the country (CGEE, 2024).

These figures are at odds with Brazilian science's real position in international evaluations that measure its quality in terms of academic production, including in the areas of health and climate. This reveals the need for science to be brought closer together and better disseminated to the country's population. It also indicates that the population is poorly informed about the connections between climate and health, which weakens the ability to exert greater pressure for the formulation of integrated policies based on scientific evidence.

Extreme events and risk perception

A survey carried out in May 2024 (Petró, 2024) offers a revealing insight into Brazilians' perceptions of the floods in Rio Grande do Sul and the responsibility of governments to mitigate such tragedies. The data shows that 99% of respondents believe that the floods in Rio Grande do Sul are in some way related to climate change. Of these, 64% consider the relationship to be total, while 30% believe it to be partial, and 5% see only a minimal relationship. Only 1% see no connection at all. These results reflect a clear public awareness that extreme weather events are primarily a consequence of changes in the global climate and may indicate a growing understanding and concern about the impact of climate change on everyday life. As for the responsibility of governments in dealing with floods, the survey reveals a significant critical view.

For 68% of those interviewed, the government of the State of Rio Grande do Sul is considered highly responsible for the tragedies. In comparison, 20% believe there is less responsibility, and 12% think there is no responsibility at all. Similarly, 64% of the participants see the municipalities as highly responsible, with 20% attributing little responsibility and 16% none at all (Petró, 2024). This data indicates an apparent demand from the population for more significant action and responsibility from local and state authorities. The high percentage of respondents who consider governments to be responsible suggests a strong feeling of dissatisfaction with management and the ability to respond to crises. This scenario reflects the population's growing concern and demand for more effective and responsible action from the authorities in the face of the challenges posed by climate change, which require policies and programs to address the problem.

A survey reveals that 99% of those interviewed believe the floods in Rio Grande do Sul are related to climate change. In the image, water flooded a pharmacy in Canoas (RS). Image credit: © Gideon Mendel / Greenpeace.

Contrary to what voters expect, a survey revealed that 37% of the candidates for mayor in the 2024 elections, who had more than 5% of voting intentions in 94 Brazilian cities, ignored climate issues in their government plans. Of the 60 who mentioned climate change in their plans, only 20 did so recurrently, with more than ten mentions, but even so, their proposals were insufficient to tackle the climate crisis (Arraes and Fraga, 2024).

Research questions for this study

Faced with the need to advance climate and health policies and the lack of a clear roadmap on how to proceed, this report investigates the perspectives of policymakers at the national level and other climate and health stakeholders in Brazil on the following issues:

1 - What is the participants' perception of the current state of integration (or lack thereof) of climate and health policies in the country?
2 - What do policymakers and other stakeholders consider to be the ideal relationship between climate and health policies and with policies in areas adjacent to climate?
3 - What barriers currently stand in the way of progress towards these ideals?

4 - What opportunities have the potential to create progress towards the ideal relationship between climate and health policymaking?
5 - What strategies have been considered effective in influencing climate and health policies?

Methods

Based on 33 semi-structured interviews with stakeholders from different sectors, the research investigated to what extent and how climate and health policies can be better integrated. The interviews carried out between April 8, 2024, and June 17, 2024, were conducted with representatives from federal agencies, ministries, the National Congress, advocacy organizations, think tanks, and academic institutions, as well as a representative from the Federal Public Prosecutor's Office and another from a subnational government. These stakeholders are specialized in climate and/or environmental policy, health policy, the climate-health intersection, or other related areas (energy, transport, emergency response, disaster prevention, housing and urban development, sanitation, economy, agriculture, and education). The results were systematized based on a qualitative content analysis. The report is aimed at policymakers, health and climate professionals, researchers, and others interested in the interconnections between climate and health, offering insights for promoting integrated national policies. More details are available in "8. Methods".

Multinational research context

This research is part of a multinational study funded by the Wellcome Trust. We partnered with researchers who carried out similar studies in the United States, the Caribbean, Germany, Kenya, and the United Kingdom. The teams worked together to design the research project, including defining interview questions, sampling approaches, and analysis methods. The survey questions and analysis were also informed by stakeholder input from the Global Climate and Health Alliance. The results from all regions form part of a multinational synthesis report (link here).

3. Findings

3.1. Current status of integration of climate and health policies

To better understand interconnections in climate and health policymaking in Brazil, we invited the survey participants to reflect on how connected or separate they perceived these policies to be in the current Brazilian context, both in their experiences in their respective fields and their understanding of the national policy ecosystem.

The vast majority of participants consider that climate and health are currently little or not at all connected in the country's public policymaking. However, many point out that this scenario is changing over time, especially in the current administration of the Lula da Silva government, with the ongoing updating of the National Policy on Climate Change (Law n. 12.187/2009), called the Climate Plan. Several participants also realize that the integration between climate and health policy is advancing due to the need to respond to disaster emergencies caused by extreme events and fight against air pollution, basic sanitation issues, and vector-borne diseases such as Dengue.

3.1.1. Climate and health are perceived as little or not at all connected in national public policies

In general, the majority of participants believe that **climate and health issues are poorly or not at all connected** in the Brazilian national policies.

> "They are not directly linked. We don't have a specific climate policy linked to health issues."
>
> – Federal government representative working in health

Although some specific projects or initiatives were mentioned, the interviewees pointed out that the lack of connection between the themes occurs in the different phases of national public policymaking, from understanding the impacts through the search for solutions or alternatives to the implementation phase itself.

> "It's clear that the policies are far from being aligned. There is a lack of coordination at the government level so that the policies of the Ministry of Health are aligned with those of the Ministry of the Environment and the General Secretariat for Climate Change."
>
> – Academic expert on climate

> "When we talk about more structural public health policies, which are linked to the climate, there is an even greater gap. On the subject of air quality, there is still an environmental agenda linked to fires. But in the field of health and climate, specifically, if we're looking at policies that are really linked to public health, it's a little more distant."
>
> – Climate and health advocacy representative

> “Public policies don't talk to each other... We should be planning to prevent diseases (...) by creating healthier environments for people to live in. (...) When we analyze public policies today, we see that the paradigms are departmentalization and 'sectorization', not an integrated vision, a systemic vision, which would be the appropriate new paradigm.”
>
> – Climate think tank representative

> “The policies should be linked, but as far as I can see, they are not. In other words, the joint work we have is basically [that of] a project [not that of a structured policy] (...) This integration within a national vision is still lacking: a climate change plan that works with a health plan, an adaptation plan, or a disaster risk reduction plan.”
>
> – Federal government representative working in disaster risk management

Although the lack of cross-cutting action between federal government agencies is mentioned as one of the factors for the disconnection between policies, the need and importance of greater integration between them is already being perceived by representatives of federal agencies working on climate and health issues. However, there is still **a lack of understanding about how to connect the policies** in the face of the complexity involving the interface between the areas.

> “It's not easy, even for those who are well versed in the discussion of climate impact, to understand what health impact is, which is a little more complex.”
>
> – Ministry of Health representative

> “I think that, in general, Brazil is well behind in the adaptation agenda, and it needs to adapt in various sectors, including the health agenda.”
>
> – Ministry of the Environment and Climate Change representative

Many participants pointed to the lack of policy dialogue on the interconnections between climate and health in the National Congress, whose elected members are also responsible for drawing up, debating, and approving public policies that meet the needs of the Brazilian society they represent.

> “I don't remember seeing the Health Committee of the National Congress arguing with the Environment Committee. These thematic committees in the legislative houses say a lot about public policy. They are formulated in a totally fragmented, watertight way. You don't have two committees meeting to discuss an integrated policy. So, for example, [we don´t have] the Health Committee, a digital technology committee, a climate committee coming together to define how we create a system that is preventative in relation to health, that is in line with mitigation and adaptation policies, that we can combine with a housing and sanitation policy.”
>
> – Climate think tank representative

This perception of a lack of interconnection between climate and health issues was corroborated by the majority of the representatives of the National Congress interviewed for this study.

> "The climate issue is not on the [congressional] agenda, let alone the connection between health and climate. This is not a priority. And I can't say whether this is consolidated in Brazil today, either. (...) If we think about the necessary design, [climate and health policies] should be linked, of course. If we think about reality, no, there is no connection at all. The environmental agenda is dealt with in isolation and with little acceptance and repercussions elsewhere."
>
> – Parliamentarian of the Federal Senate - climate and health

One parliamentarian, however, recognizes that there is an effort to unite climate and health issues when they are linked to the topic of agriculture and food.

> "I would say that, in practice, climate and health policies are not very closely linked. However, there is a great effort to link these policies. In particular, I'm talking in part about the causes that are having health problems, mainly related to food."
>
> – Parliamentarian of the Chamber of Deputies - agriculture

Advocacy representatives also point out that the debate on the interconnections between climate and health is still embryonic, even among members of organized civil society organizations.

> "(...) The youth, the climate justice group, for example, don't fight for health, (...) I don't see anyone from the black movement or the gay movement associating their civil rights disputes with the issue of better health. I never have. You see how, again, you believe you have it [conditions to interconnect climate and health issues] when you don't [have it]. This is a political ghost. Brazil needs to wake up."
>
> – Climate advocacy representative

> "Almost zero ties. It's almost nothing. The climate debate on the environmental side, which has been on the agenda for a long time, doesn't have health as part of its focus of debate or narratives. There are almost no examples, it´s very little compared to the size of the impact that will occur in the area of health."
>
> – Climate advocacy representative

> "Out of ten conversations I have, the word health comes up in one of them. I'm aware that everything is intertwined and that, at the end of the day, it's the impact on people."
>
> – Climate advocacy representative

3.1.2. Connections between climate and health are changing over time

Many participants recognize that the connections between climate and health – although still discussed in the context of public policy planning rather than actual implementation – **are advancing over time**.

> "The policies are not linked, but they are being worked on. We are in a new environment in Brazil; the government is much more sensitive to climate issues, and it has to act across the board. All the ministries in Brazil today have some kind of climate agenda."
>
> – Subnational government representative working on climate

Although this view is not a consensus among the interviewees, some participants emphasize that the current administration of the Lula government and **the revision of the Climate Plan have the potential to promote greater integration** between climate and health issues.

> "I understand that the issue of climate change is now a major concern for Brazilian society. This was already the case before the disaster in Rio Grande do Sul, and now, unequivocally, it's showing up very strongly. We have a government committed to the climate agenda, which has decided to take up this agenda again."
>
> – Ministry of the Environment and Climate Change representative

> "Now the Ministry of the Environment is pushing much harder, and our studies are serving as the basis for the National Adaptation Plan. One of the things we've been insisting on lately, because it's a lack we see, is for greater sectoral integration. We are negotiating with them and asking for bilateral or multilateral meetings."
>
> – Federal agency representative - water and sanitation

However, some interviewees highlighted institutional, financing, and implementation challenges (more information in section 3.3.).

> "The 2016 NAP [National Adaptation Plan] is now being updated and should include national targets (...). The Climate Plan has the dimensions of mitigation and adaptation, it has strategies that are considered cross-cutting, involving means of implementation, financing, just transition, the issue of research, education, innovation, and it has a cross-cutting chapter that is linked to monitoring and this transparency agenda. Our climate policy will be consolidated (...) to reduce vulnerability to climate impacts. (...) The Climate Plan needs an agreement and a budget. It needs to overcome the inability to provide resources for this agenda to actually happen."
>
> – Ministry of the Environment and Climate Change representative

Some participants point out that **the connection between health and climate must happen in the territories** where the impacts of the climate crisis are most visible. For this reason, in addition to actions by the federal government, **there is a need to involve the state and municipal spheres to advance** policy integration.

> "I think we're starting to see a process of connection so that the issue of adapting health to climate change is institutionalized. (...) I notice that the further into the territory you go, the more latent this issue (of health in the foreground) becomes. It's different when we're talking about public policies at a more national level. (...) The adaptation plan is more fervent and is bringing up health nuances. But the further you get from the grassroots, the less tangible these issues become."
>
> – Climate advocacy representative

> "We have to bring in state and municipal governments that can also move towards this same goal. The federal government alone can't make any progress towards transforming this reality."
>
> – Ministry of the Environment and Climate Change representative

Some interviewees also recognize that the link between health and climate issues in policies needs to advance in Brazil, especially as extreme events such as heat waves and floods become more frequent and intense.

> "The mention of climate risks for the health system is only in the climate policy document, in the 2016 NAP, which is being updated now. (...) At that time, there was much more talk about the risk of landslides, floods, etc. Now it is known that heatwaves are the main risk factor, especially for the elderly, young children, and people with illnesses. So climate policies must also seek to help millions and millions of Brazilians adapt. (...) The issue of health has to be given much greater weight."
>
> – Academic expert on climate

3.1.3. Climate and health are seen as more integrated in some contexts than in others

Many interviewees mentioned that the integration of climate and health issues, in the perception of policymakers and public managers, is becoming **a little more visible in specific contexts, such as disaster response, air pollution, and basic sanitation**. However, these connections are still fragmented and recent, and significant challenges are faced in implementing public policies.

The connections occur more at the operational level in crisis management. A recent example was the climate tragedy in the State of Rio Grande do Sul. This extreme event recorded more than 420 mm of rainfall, resulting in flooding that affected more than 90% of the state.

> "I hope that, after all these disasters, the different national strategic plans will start to converge because when you have a disaster, everything happens. Loss of agriculture, impact on health, impact on energy, impact on the population, on the population's social cycle. In short, there are a series of very serious impacts that cannot be assessed from a single point of view. They have to be assessed on a macro level."

– Federal government representative working in disaster risk management

For the emergency response to disasters of this magnitude, "crisis rooms" are created with the involvement of various ministries and federal agencies.

> "When we have a specific crisis, whether it's a drought or a flood, we bring together a series of actors who have something to do with it in order to find solutions in a timely manner. [The crisis room] is something we activated from time to time. From 2013 to 2015, we only had one crisis room for the drought on the São Francisco River. Then came the time when we had eight or ten crisis rooms open for drought and flood simultaneously in different regions. (...) I have a lot of faith in the possibility of climate policies and policies to prepare for this different scenario being able to unite the different sectoral policies."

– Federal agency representative - water and sanitation

> "We've been putting this on a more transversal agenda, but now, with what's happened in Rio Grande do Sul, it's very evident. All the concerns that we're having over lowering the waters. How could we do things differently? It's not yet fully internalized, but it's something we've been discussing in the various events on the climate issue."

– Federal government representative - housing and urban development

Representatives from adjacent areas – such as sanitation, disaster prevention, and emergency response – agree on the **importance of the health sector's participation in crisis management** resulting from extreme events. Some point out that the role of public health bodies is improving over time.

> "The health sector has incorporated health management in disasters into its concept and philosophy, as well as disaster management, which comes from health issues. [Policies] incorporate the theme of risk management; this will happen. The disaster ends up motivating improvements to take place (...). Every disaster is a lesson for us of things that need to be done."

– Federal government representative working in emergency response

> "In the last decade, [the correlation between health issues, disasters, and climate] has improved because previously everyone worked in their own sector. For example, if I were a doctor, (...) I were to take some temperature data and start evaluating it myself, I might not know much about how the temperature in a place is changing, if it has already changed over time, but by working with meteorologists and climatologists, you can understand it better. So I would say that this institutional collaboration has helped a lot."

– Federal government representative working in disaster risk management

Brazil is also facing a Dengue epidemic in 2024. Studies (Barcellos, 2024; Barcellos et. al, 2024) show that changes in the country's temperature and humidity patterns are climatic factors that lead to the proliferation of the Aedes aegypti mosquito, which transmits this and other diseases that can lead to death. Several participants in the survey pointed out the **correlation between the increase in Dengue cases and climate change** but emphasized that this relationship **is not yet being worked on in an integrated manner** by public managers. Some also point out that the federal connection is more between the areas of sanitation and health than between climate and health.

> "(...) For example, on the issue of the spread of infectious vectors, which is clearly increased by climate change, and basically the Ministry of Health doesn't link the fight against these disease-transmitting vehicles with the issue of climate change. They make the link with the issue of basic sanitation, quite rightly, they make it [the link] with the issue of health care and the family, but they leave many aspects out."
>
> – Academic expert on climate

> "I think it's a topic that could be worked on much better than it has been. We're living in a strong moment of the pandemic, and this issue of vaccination has become very latent. The environmental issue is linked to Dengue and other issues. We see a lot of correlation in this sense, but I see few initiatives to bring this together. The two ministries don't talk to each other, and it's understandable with all the emergencies we've had lately. (...) Few institutions have been working hard on this."
>
> – Climate think tank representative

Some interviewees, mainly academic and think tank researchers, mention that the **correlations between climate and health still need to be clarified to most representatives of federal public bodies**. One example involved the construction of the recently launched National Air Quality Policy (Law 14.850/2024). Although public managers already had some perception of the direct impacts of pollution on human health, there was little understanding of the correlations between the indirect impacts on health caused by global warming generated by greenhouse gas emissions from burning fossil fuels.

> "What we did, at many points, was really have to state the obvious. When we talked about combating air pollution, we were talking about solving two problems: the climate issue and the environmental issue in general, and the health issue. That was a load of hooey [because climate and environment are inherently connected], but for many, we had to bring this link even to public authorities. (...) In general, it's a link that we don't see happening so much between [government] bodies in this sense. There is a distance."
>
> – Climate and health advocacy representative

> "I think that when it comes to climate change, the discussion is much more environmental than health-related. With air quality, there is very strong work on air pollution and its toxic effects on health, and this is very well established. Climate change, on the other

> hand, encompasses all of this but doesn't focus on just one sector or one issue. But together, they gain strength, and there are many more health impacts to be worked on and justified in this sense."
>
> – Climate and health think tank representative

Despite the participation of the Ministry of Health in the debates, the data on the health impacts of air pollution was compiled and produced by think tanks and academic researchers. On the other hand, this policy was mentioned as a positive example in **that academics, experts, and civil society organizations were directly involved in the construction of the policy**.

> "Today, science clearly shows that pollution in cities – and also due to fires in the Amazon, Cerrado, and Pantanal – is posing a huge risk. So science is already providing a lot of data."
>
> – Academic expert on climate

> "The National Environment Council (CONAMA) didn't even want to write in Resolution 491/2018 that Brazil would base itself on the guidelines of the World Health Organization [on air quality], (...) but we insisted because the WHO compiles all the epidemiological studies carried out around the world into a guide, which suggests health safety levels for air. (...) This was even the subject of discussion and, in the end, we managed to keep it in the Resolution, but [the information] was removed from the National Air Quality Policy."
>
> – Climate and health think tank representative

3.2 Views of optimal integration

We asked the participants if they believed that climate and health policies should be more connected or separate and how and why. The interviewees said that health issues should be integrated with climate policies and vice versa. They also pointed out the need to develop and implement public policies that incorporate climate and health in a cross-cutting way and in line with the country's strategic and integrated planning.

They believe that factors such as housing, sanitation, the economy, transportation, agriculture, and environmental conditions are essential for reducing socio-environmental vulnerabilities, increasing resilience, and advancing mitigation and adaptation strategies. To this end, they believe **it is crucial to adopt participatory, multi-sectoral, and multi-level governance**, i.e., involving multiple sectors and levels of government – federal, state, and municipal – as well as engaging civil society and other relevant actors. They also mention the need to produce data, research, and indicators that help make the impacts of climate issues on health tangible and vice versa, helping to increase awareness of the country's risks and vulnerabilities.

Orientation towards the concepts of One Health and Planetary Health – recognizing the interconnections between human, animal, and environmental health – is pointed out as a guiding path for governance and the creation of public policies to prevent, mitigate, and adapt to the impacts of climate change. In addition, the interviewees stress the urgency of prioritizing budgetary resources, focusing on climate justice, and combating Brazil's structural inequalities.

3.2.1. The vast majority of stakeholders believe that climate and health policies should be more integrated

Almost all participants believe climate and health should be better integrated into national policymaking. The common reason is that **climate and health issues are intrinsically interrelated** and should, therefore, be dealt with jointly to tackle the impacts of the climate crisis better.

> "If we don't deal with these two connected things, we are putting our planet at risk, our humanity, because we are generating conditions that will favor epidemics, will favor diseases, will favor the degeneration of health as a whole. (...) The benefits [of linking climate and health policies] are obvious if we understand that our health and our future as humanity depend on the climate and the environment."
>
> – Climate and health advocacy representative

> "The World Health Organization has listed climate change as the greatest global health threat in the world. (...) Among the ten emergency health priorities, air pollution and climate change are the first priority. Why? Because 95% of people in the world are exposed to toxic air (...), the environmental leader in illness and death (...). It's not just the human species; it's every species on the planet that is threatened by climate change, but the human species is undoubtedly the most threatened."
>
> – Climate and health think tank representative

> "Systematic studies of global and national networks (...) show that the impact of climate on health is influenced by factors such as the built environment, vegetation cover, and people's vulnerability, such as the ability to manage chronic diseases. (...) Climate-dependent diseases, such as those transmitted by vectors, are expanding geographically. The issue is complex."
>
> – Academic expert on health

> "I don't see how we can do politics from now on without adding health. If all public policies had the health dimension incorporated from the outset, (...) we would certainly have healthier cities today, we would have a more balanced way of life, and we would have urban planning that is very different from what we have today."
>
> – Climate think tank representative

The **climate emergency overlaps with and exacerbates historical inequalities** in Brazil.

> "The climate is a machine for generating poverty and social inequality. If you solve the whole climate problem, if you turn off all the taps, and if you don't emit another gram of carbon from today. If you do that [zero emissions], you won't take anyone out of the hunger queue; you won't take anyone out of the health clinic queue. Now, if you don't solve the problem [and continue to increase emissions and worsen the climate crisis], you're going to throw a lot of people into the hunger queue and the health clinic queue. That's the circumstance. So we're going to aggravate what is already bad. The inability to serve the population is going to be aggravated."
>
> – Climate advocacy representative

Linking policies contributes to prioritizing the fight against the climate crisis on the social agenda. For this reason, the participants pointed to the **need to develop and implement integrated public policies on climate and health that are aligned with the country's planning** and move in the same direction.

3.2.2. Integrated planning and management should involve other areas such as agriculture, transport, energy, housing, and urban development

According to many participants, **integrated intersectoral planning** – both in the policies themselves and in the policymaking process – **avoids duplicating efforts or making decisions in opposite directions**. This allows policies from different areas to complement and strengthen each other instead of competing.

> "The integration of these public policies is essential because we are dealing with multidisciplinary, transdisciplinary, cross-cutting issues, and this is, in fact, necessary."
>
> – Parliamentarian of the Chamber of Deputies - agriculture

> "The formulation of public policies needs to be done with all the stakeholders, with all those impacted, and with all those who, in a certain way, have responsibilities in that integrated chain of that process. (...) A fundamental point of these references is to work with academia, companies, governments, non-governmental organizations, communities, and innovators in this formation of policies. Often, innovation is not about inventing sophisticated technology; often, innovation is about simplifying and getting closer to nature's cycles."
>
> – Climate think tank representative

> "I think they have to be linked in planning. If we consider health issues, from the impact of disasters to a particular disease, such as Dengue (...) I think we have to have better planning. We have a system that is spectacular, which is the SUS, which has enormous

> scope, but it has to be prepared. (...) In a disaster (...), you have peaks in demand, so we have to prepare (...) in the health system. And this has to do with climate change."
>
> – Federal government representative working on climate

Some interviewees indicated that **integrated management represents a paradigm shift in public administration**. This new paradigm seeks to break with the sectorized and hierarchical logic that has historically prevailed in favor of a more holistic, systemic, and collaborative approach. Some participants believe this **requires reviewing the economic model and transitioning to a new, more inclusive, and regenerative economy** to replace the current model, which they view as degrading and exclusionary.

> "It is the economy that is creating all these problems, and it is the economy that has to be transformed to become a solution. Instead of the paradigm of destruction, it should be the paradigm of reconstruction; instead of exclusion, it should be inclusion; instead of inequality, it should be equality, a new economy with these parameters. (...) A fundamental point of these references is to work with academia, companies, governments, non-governmental organizations, communities, and innovators in the formation of policies."
>
> – Climate think tank representative

Some interviewees mentioned the need to create governance capable of supporting the strategic planning of the country and integrated management. Some noted that **the concepts of One Health and/or Planetary Health should be the guiding principles of this governance**, capable of saving lives and reducing vulnerabilities in the face of the challenges posed by the climate crisis. Participants mentioned the need to establish climate criteria for the approval of any bill and the perception of health issues in the broadest sense.

> "Obviously, the issue of health cannot be seen in the strict sense of the word as a medical service. I think that this integrated health, this One Health, understanding that housing issues, environmental issues, and issues related to access to sanitation, in short, have a set of public policies that are necessarily articulated with a health agenda and with the reduction of socio-environmental vulnerabilities. They need to happen in an integrated way."
>
> – Ministry of the Environment and Climate Change representative

> "We have to look at this vision of Planetary Health, integral health, which is the voice of climate health, it has to prevail in this sense. I think this could be strengthened as governance. Power of decision, power of instruments that guarantee (...) climate criteria for the approval of any type of bill. (...) I think it would start there, with this vision and this stronger governance of climate and health."
>
> – Climate and health advocacy representative

Most interviewees believe that cross-cutting themes such as health and climate are extremely important in national planning and policies. However, some consider climate more cross-cutting, while others believe health should be the main guiding axis.

> "If health plays a leading role in the climate issue, perhaps the agenda will change, and it needs to change."
>
> – Climate advocacy representative

> "So considering health in all the other policies of relevance to the intervention of other areas would be (...) fundamental, and this really doesn't happen."
>
> – Ministry of Health representative

> "As it [climate] is a cross-cutting issue, if I have an adequate impact on areas such as health, education, and agriculture, I would naturally have a more positive result in terms of preserving the environment and policies to combat climate change. And that's what we want, although I don't have any expectations in the short or medium term."
>
> – Parliamentarian of the Federal Senate - climate and health

> "Climate has to be transversal in everything. (...) We have to stop treating the climate issue as if it were a Ministry of the Environment issue. We need (...) to work with (...) a new type of governance that is much more transversal. (...) Climate will need to be within all the secretariats, within all the ministries."
>
> – Climate think tank representative

One of the arguments most often cited as a positive consequence of this ideal integrated planning is the **increased capacity to prioritize and allocate resources efficiently and appropriately**, both public and private and/or from international sources. For many participants, this is fundamental for policies to prevent, mitigate, and adapt to the impacts of climate change on health and other sectors, **taking into account climate justice and the fight against inequalities**.

> "If you don't put health into the equation, investments become a bit meaningless. What are you doing to protect people and protect people's health? What are you protecting the economy for? (...) Protecting the economy so that people have food, water, and a decent life, then it's fundamental. (...) The focus is on protecting citizens and people. Climate justice is the basis."
>
> – Ministry of Health representative

3.2.3. The wide coverage range of the SUS is seen as a means of implementing the adaptation agenda at the federal, state, and municipal levels

Among the ideas put forward by some interviewees is **to take advantage of the Unified Health System (SUS) wide coverage range to implement the climate and adaptation agenda in an integrated manner**, from the federal level through the state level and up to the municipalities. The justification is that the presence of the SUS throughout the national territory allows this climate adaptation agenda to reach the territories, taking into account the specificities of each region in order to adequately meet the different demands and local realities that exist in this country of continental dimensions. To this end, they consider **it essential to train health professionals as knowledge disseminators and adopt a more preventive climate and health approach** rather than focusing on treating diseases.

> "Brazil's health system is exemplary; it already has a very consolidated strength and a structured network throughout the country. Connecting this structure to promote climate policy would be extremely intelligent, right? It would be extremely effective. Optimizing resources. We end up putting things in boxes: "How much of the Ministry of the Environment's budget is going to be used for air quality policy?", which ends up limiting a lot. When we extend this to health, which is the largest budget we have in Brazil, it becomes much stronger. And I think there's also an efficiency in the way we think about intelligence, in fact, when the health system is totally decentralized in all the cities and territories. There is a structure for this. If we put climate policy at the service of or to contribute to and support this health system, I think that would be a huge efficiency."
>
> – Climate and health advocacy representative

> "The wide coverage range of the SUS is spectacular. It's a wealth. It certainly helps because (...) no other sector has this wide coverage range, not even the education sector. It doesn´t have a unified education system. This [wide coverage range of the SUS] is undoubtedly a resource. What could be made easier? In order to make the best use of this wide coverage range [what can be facilitated] is information. What else? What can be used in a richer and more expressive way than today are online technologies and telemedicine. This is growing."
>
> – Ministry of Health representative

> "When, for example, we take a broader look at what health can do to reduce vulnerability, this tends to be reflected in the improvement of basic sanitation, housing, and mental health indices. I think that health plays an important role, not least because of its wide coverage range, because of the way the Unified Health System is built."
>
> – Ministry of the Environment and Climate Change representative

3.3. Barriers to optimal integration

We asked participants to describe any barriers that prevent progress towards what they consider ideal in integrating climate and health policies in Brazil. They identified several obstacles, such as the influence of vested interests, the lack of country planning so that all sectors move in the same direction, the poor distribution of resources, and the lack of a risk perception culture in the country.

The interviewees also mentioned fake news and denialism, political polarization, the urgency to attend to other structural and urgent issues on the national agenda, and the limited understanding of the correlations between climate and health as barriers. They also pointed to historical difficulties in the formulation and implementation of policies in the country, the gap between science and policy formulation, the existence of government and professional silos, and the overload in the Unified Health System, among others.

3.3.1. Limited understanding of the links between climate and health and lack of risk perception are pointed out among both policymakers and the public

Most participants mentioned the lack of a culture of risk awareness in Brazil, associated with a limited understanding of the interfaces between climate and health, as an obstacle to progress in integrating policies. This **lack of perception of risks related to climate impacts on human health and other areas**, such as agriculture, **makes it challenging to prioritize more effective adaptation actions**.

> “People will experience trauma. This is not minor, on the contrary, because it even impacts new generations. Living under risk, living under vulnerability in a country that doesn't know what that is, in a country that doesn't deal with risk. Because Brazil doesn't have a risk culture! (...) There isn't a hotel in Brazil that does fire training. (...) If you arrive in a favela, in a more vulnerable place, and say: "This building here could fall down," the guy turns around and says: "For God's sake." The first thing he does is call on God and complain that you're bringing bad omens.”
>
> – Climate advocacy representative

> “The first challenge we have is the disconnect between environmental issues and health, poverty, energy, industry, and the economy, in short, this is the big challenge. People still don't understand that a healthy environment is a preserved environment and that climate problems and global warming will bring a series of diseases, as is happening in Brazil. Today, Dengue fever has exploded in Brazil precisely because there are more conditions for mosquitoes to reproduce. So I think this lack of perception is the first challenge.”
>
> – Climate think tank representative

Although the interviewees mentioned that recent extreme events in the country are beginning to change this perception of risks, **there is still no sense of urgency capable of increasing pressure from society for changes** in how policies are formulated.

> “Our society, in general, has a low sense of risk perception that the disaster is present, but this has been changing recently; we see that people are increasingly involved and concerned about this. (...) It has improved a lot, but there is still this low sense of risk perception. And often, when the disaster passes and leaves the media, people end up forgetting.”
>
> – Federal government representative working in emergency response

> “Do you remember when there was that fire in the Amazon that polluted the whole of São Paulo? People seem to look at the signs and aren't interested. (...) There's a denial of the urgency of this change and the influence it has on their individual lives. The person is in São Paulo, they don't think it's their business, but they're the ones suffering from it. (...) It's something that sounds like it's just a scientist's thing, right? We are all part of the same planet, and each person's attitude will have an impact on the health of the planet as a whole. (...) If we don't take care of our health, sanitation, pesticides, and air pollution, we're going to have new pandemics as a human race. (...) Doesn't anyone notice? (...) It's so obvious that we just have to bring the obvious to the decision-makers.”
>
> – Climate and health advocacy representative

> “Many actors are involved in what is happening. We know how delicate it is to open the curtain, to reveal from one moment to the next the reasons for the things that are affecting health and killing thousands of people at the [vulnerable] end. The policies are not clear and direct about this; they are too loose.”
>
> – Climate advocacy representative

The lack of risk perception, the absence of a sense of urgency, and uncertainties in the face of the complexity of the climate crisis are also mentioned among decision-makers in both the executive and legislative branches as obstacles to prioritizing public policies and integrated climate and health management.

> “We're talking about the difficulty of understanding more complex issues on the part of interlocutors who occupy highly qualified positions. And the consequences of having this lack of preparation, let's call it that. Until we overcome this barrier, the issue will never be discussed seriously. I'll never be able to discuss an economic slowdown that, for example, can guarantee that the goal of reducing [GHG emissions], sustaining and reducing global warming is met.”
>
> – Parliamentarian of the Federal Senate - climate and health

> “It's [climate scenario] a new thing that's already happening, and it's bound to get worse. Even if we make a great adaptation plan, it's bound to get worse. And then it's ignorance. It's the difficulty of thinking about the future in the face of the difficulties that will come

> with climate change. This is a major difficulty, isn't it? We have to think about the structure of health services, health programs in general, and endemic disease control in the face of a present scenario, not a future one. And this is a major challenge. Thinking about the future is very difficult."
>
> – Ministry of Health representative

> "It's a big challenge for us to think about (...) any environmental issue, (...) this more macro view that everything is interconnected. But we don't really understand how. So we do a license, and we're looking at an impact. But we can't understand all the complexity of a larger ecosystem. So, we pretend we know what the impacts of a particular action are. But in reality, we don't know because we don't have an in-depth understanding of the complexity of all these relationships that exist in nature. And it's a bit the same with us, with our health. (...) So, if you know about it, you say: 'Well, we're really going to do badly over the next few decades.' Then we see that people's lack of awareness means that this is often a minor issue in public discussion."
>
> – Representative of the Federal Public Prosecutor's Office

3.3.2. Difficulties formulating and implementing policies and governance

Several participants mentioned that **the very way in which public policies are formulated in Brazil makes it challenging to integrate climate and health issues effectively**. They mention the country's historical difficulty in formulating state policies and structuring significant agreements between the Executive, Legislative, and Judiciary branches impacts policy integration. Although they recognize that the country has an excellent legal framework, both in the 1988 Federal Constitution and environmental policies, for example, the policies are more principled (conceptual) and not very normative. In the perception of some interviewees, this leads to gaps and loopholes in the rules and procedures for regulation and inspection.

> "Public policies have little binding force. They are not very normative from the point of view of saying what the guy has to do, in how many months, and the consequences if he doesn't do this or that. They are very principled [conceptual]. They provide for instruments, but without establishing obligations or deadlines for implementation."
>
> – Representative of the Federal Public Prosecutor's Office

Interviewees also pointed out the **low effectiveness of implementing most approved public policies**. To corroborate the perception that Brazilian legislation has robust but ineffective laws and legal instruments, some interviewees mentioned Vehicle Inspection and Brazil's Ecological Economic Zoning (ZEE). The latter is a fundamental legal instrument for the National Environmental Policy. It establishes criteria for organizing land use in plans, programs, policies, and projects. However, to be successful, it depends on the ability of public authorities and the private sector to internalize these initiatives and implement them effectively. For many reasons, including lack of political will, it does not happen in most of the country.

> "Here in Brazil, we have good provisions in the law, but things that end up not being put into practice. We have a lot of legal instruments (...) provided for in our legislation, (...) which end up not becoming a reality. Ecological and Economic Zoning is one of them."
>
> – Representative of the Federal Public Prosecutor's Office

> "The main thing in Brazil, in order to improve the policy, is the involvement of public managers [civil servants and politicians]. There's no way forward if they don't want to. (...) The vehicle inspection law has existed for twenty years. (...) The states have to comply. Nobody complies, and nothing happens. There's no inspection, there's no sanction. (...) The political discussion, courage, and will of the managers to actually do it. I think this is Brazil's biggest problem."
>
> – Climate and health think tank representative

Among the obstacles mentioned by many participants were the length of time it takes to set up policies and the **low technical capacity of public policymakers associated with the lack of dialogue with specialists**.

> "From the point of view of public policy design, perhaps the Brazilian state still doesn't have the necessary structure to institutionalize these public policies. So, a certain ministry that wasn't working on a topic is suddenly working on that topic, but it has the same structure as in the past. Most of the directorates and secretariats of the different ministries are still very much based on the previous model."
>
> – Federal agency representative - environment

> "Today, the National Congress doesn't have representation from all these sectors [NGOs, academia, companies, governments], and when it does, it's superficial, it's not from an expert on the subject (...). Public policy is made by representatives and not by people who know the subject intensely."
>
> – Climate think tank representative

Some also cited the lack of dialog and coordination between policymakers from the different federal entities – the Union, states, and municipalities – that are associated with the other priorities on the agenda of politicians on occasion. Linked to the low standardization of policies, bureaucracy, and corruption, this jeopardizes the implementation and effectiveness of long-term public policies in the face of constantly changing priorities on the agenda.

> "The main barrier is the inability of governments as a whole in Brazil to structure state policies because a policy of this kind, of a government for just two or four years, has very little effectiveness. Brazil has to implement long-term policies agreed upon by the judiciary, legislative, and executive branches if it is to have any chance of success. The

> country has a historical difficulty in structuring state policies or, at least, in structuring major agreements between Congress and the Executive and Judicial branches, unfortunately."
>
> – Academic expert on climate

> "Most of the barriers are subjective, as incredible as it may seem. They're questions of knowledge, perception, ideology, political issues, and egos, which there are a lot of in politics because these are processes that nobody builds alone. You have to do it with a lot of multisectoral knowledge and multilevel action. It can't just be the federal government. It has to integrate municipalities and states. So we're a long way behind. Our democracy is still far removed from science. So discussions are very subjective."
>
> – Climate think tank representative

Some interviewees questioned the conduct of climate governance by the Ministry of the Environment and Climate Change. The justification is that this federal body does not have the necessary political strength to lead the interdepartmental collaboration on such a strategic issue for national development. The Ministry, in their opinion, has difficulties in articulating the different actors and interests around a strategic plan for the country.

> "The climate governance model in Brazil is wrong. The Ministry of the Environment doesn't have the economic and political clout to guide the debate, which has to do with other actors beyond the environmental issue. The climate issue is a development and geopolitical issue. That's not to say that the Ministry of the Environment isn't in the equation. But I'm honestly radically opposed to the model that has been adopted, and that's where all the difficulties lie. (...) I think Brazil is losing a very important moment."
>
> – Climate advocacy representative

> "The continuity of policies that work is the ideal, but this is not always possible in a democratic environment. The change of managers, whether in municipalities, states, managers from different areas of education, or the environment, sometimes causes discontinuity, but this, on the other hand, is the price of the democratic system. It can happen. Discontinuity of policies that are working, and then (...) we take a step back."
>
> – Ministry of Health representative

3.3.3. The lack of integrated country planning divides the agenda and the political class

The lack of integrated planning in the country, in the perception of the survey participants, fragments the agenda of priorities and the political class. They point out that sectors such as mining, oil exploration, agribusiness, and transportation – the main mode of which is road – compete for attention and resources, often going in the opposite direction to the needs for climate adaptation and greater resilience in the health sector.

The current economic policy – coupled with the pressure of international competition in commodities – in the view of the interviewees, makes it challenging to define a unified agenda that connects climate and health issues and incorporates climate justice and the reduction of inequalities as a priority in the national context. This results in **disjointed policies and conflicts between integrated development agendas, hindering the country's efficiency and sustainable development**. Many decisions are still motivated by profit and the influence of sectors that don't respect the climate.

> "You take the issue of agricultural policy. You take the issue of pesticide use. The agricultural sector is one of the sectors that will be most affected by climate change. So, if you look at the issue of health and climate in isolation, without looking at the country's development macro-policies as a whole, you're also going to be limited. It is essential that this is integrated into a development strategy for the country, taking into account all the other sectors. We can't leave the other sectors out."
>
> – Academic expert on climate

> "We've just had the approval of the bill that releases agrochemicals in Brazil for unrestricted use. This is something that, as well as accelerating global warming (...), emits particulate [matter]. You have an associated problem because the unrestricted use of pesticides makes monoculture cheaper, and monoculture is what, on a large scale, deforests the Amazon, for example. So you have a link. Obviously, this causes health problems for the general population."
>
> – Climate advocacy representative

> "Climate issues are always sidelined, above all because of the economic development model in Brazil, which is very much based on extractive and agribusiness, generally without respect for climate and environmental impact issues. Brazilian policy is not geared towards considering the climate issue. On the contrary, Brazil grows and maintains its GDP against the climate perspective."
>
> – Parliamentarian of the Chamber of Deputies - education

> "We're [Brazil] replanting. We're reforesting. Then comes Brazil itself [the Brazilian challenges and economic interests] and the [carbon-intensive emitters] countries. They don't change. The oil issue doesn't change. Then comes a drought, a fire that burns down the whole forest, and everything that has been recovered. So it's a struggle we often find inglorious, but it [the fight] won't stop."
>
> – Climate and health advocacy representative

3.3.4. Limited or poorly distributed resources to meet urgent demands

In the view of many interviewees, **the need to resolve urgent demands arising from complex and situational issues in the country**, such as social inequalities and lack of access to basic services, **competes with prioritizing progress in integrating the health and climate agendas**.

> "In Brazil, marked by inequalities throughout history – but also by the characteristic of its composition of regional, income, racial, and gender inequality – this is a mark of our constitution [as a country]. So, undoubtedly, every policy, whether formulated or not, impacts people differently. (...) The figure of main people impacted by any public policy are single mothers, black, living on the outskirts who are unemployed and lives on underemployment. Because that's where all of Brazil's historical and situational issues lie, and that's where any Brazilian tragedy is most explicit, whether from the point of view of health, the environment, or everything else connected to public policy. I think this is the portrait of Brazil itself."
>
> – Parliamentarian of the Chamber of Deputies - education

> "In a way, when you have very immediate needs in society, issues of greater complexity are difficult to understand. In people's daily lives, there will be the price of gas, there will be a lack of food, there will be a hole in the street, and there will be sanitation, but [people] don't even connect with the issue of health, with health infections. So climate change is a long way off."
>
> – Parliamentarian of the Federal Senate - climate and health

> "A survey shows that 80% of the Brazilian population thinks that climate change is an important issue (...), but it's not at the top of the agenda. Here in Brazil, you have a population survival agenda for the overwhelming majority of people, which is what occupies their time and thoughts. The person has nowhere to live and nothing to eat. (....) So, we barely have the money and capacity to provide the care that is lacking today. It's difficult to plan this system for something that will be lacking in a few years' time because it's a very big problem."
>
> – Climate advocacy representative

> "I think one of the fundamental aspects at the heart (...) of the issue of health and climate change is that our health gap is much deeper than the impact of climate change, extreme weather events, and so on. I mean, when you have a health center that takes six months to schedule a mammogram or nine months to start cancer treatment, talking about the impact of climate change is a bit weird, isn't it?"
>
> – Academic expert on climate

The **concentration of income** was also pointed out as one of the country's structural obstacles.

> "Our country has two circumstances: it's a developing country (...) and highly unequal. So sometimes you have a country that doesn't have the same money as Brazil, but it's less unequal. The population suffers less. There's no point in having a GDP of R$400 trillion when R$399 trillion is in the hands of two people (...). Too much money circulates in the hands of too few people; too little money in the hands of too many people. (...) The money that should go to the state is concentrated in the hands of half a dozen people who have 50% of the national GDP. So you distribute little in the form of health care, in the form of schools."
>
> – Climate advocacy representative

Another obstacle mentioned by the participants refers to the **poor distribution and management of existing resources**, associated with problems of corruption and inefficiency in public policies and management, as well as the waste of public money.

> "You have a budget problem. Brazil is a country that, at the same time as having a lot of wealth, (...) has a lot to do. So, public budgets are always very short. There's a problem with the efficiency of public policies. At the same time as there is a lack of money, we see that a lot of money is also used badly, without planning, without scope, sometimes with the involvement of corruption, and sometimes with a waste of public money. So the efficiency of public spending and the efficiency of public policy also ends up being another obstacle we have. So, a low budget and, at the same time, low efficiency in public spending."
>
> – Federal agency representative - environment

> "The environment budget is something to sit and cry about. Then, when you have to spend, you have to spend on the run. It has to be spent within that financial year. Then, often, the little money there is spent in the wrong way. So there's this huge set of situations."
>
> – Federal agency representative - environment

When mentioning barriers related to budget issues and the distribution of resources, some interviewees emphasized that resources are prioritized to mitigate the impacts of climate disasters after they occur, but **little is invested in prevention**.

> "The budgets of the centers and institutes or operation and research centers of the federal government are getting smaller and smaller when the trend should be to increase the budget. (...) This disaster policy is, let's say, much more included in the risk management part. Civil Defense and all that. But what's missing, or at least what needs to be clearer and more detailed, is prevention. This part of prevention already involves,

for example, monitoring conditions that can trigger disasters and issuing disaster risk alerts, but it also involves building hydraulic infrastructure to protect cities or nature-based adaptation measures (...) It seems that more is spent on reconstruction than on prevention. And this is something that should be reversed."

– Federal government representative working in disaster risk management

"There is criticism of the lack of measures and investments linked to prevention. Even if prevention measures are cheaper [than investment in post-tragedy reconstruction], they don't get votes. (...) On the other hand, a guy who hasn't invested [in prevention] but is the manager of a place that suffers a tragedy, if he does relatively well during the post-tragedy period, sometimes spending a lot more public resources and achieving a lot less, he gets a wonderful image as 'the savior' [the hero] of that place. And that means a lot more votes in the next election."

– Representative of the Federal Public Prosecutor's Office

3.3.5. Lack of access to relevant information to support the development of integrated climate and health policies hinders decision-making

Many interviewees pointed out that although research and studies on the links between climate and health are emerging, they are not yet used by decision-makers to draw up public policies that integrate the two areas, indicating a **gap between science and policymakers**.

"Science is distant [from policymaking]. You´re [the country] making policy as if politicians were the ones who were self-sufficient in these formulations [of policies, without listening to the public and experts], and we know they're not [they cannot be], especially when it comes to climate change and health. We've seen now, with the pandemic itself, that if it weren't for science, politics would never solve it."

– Climate think tank representative

"Where the failure exists is in the effectiveness of bringing this science to the political class, showing risk, showing the tremendous risks that this could have for human health, even for human survival. This science, which is now very well known, has not yet become a public policy for adapting to these climatic extremes, and I don't think this is anything new in Brazil in the sense that it's not just in the area of health and climate. Brazil is a country that has made great strides in its scientific community. It has greatly improved university education, but we have great difficulty communicating science to the political class."

– Academic expert on climate

> "The scientific community discusses and issues scientific bases for this, but the state and federal governments are those who implement environmental public policies in practice and invest money. And that is where the current fragility lies."
>
> – Federal government representative working in disaster risk management

> "We're trying to bring out the best in science. Brazil today produces a lot of content, a lot of information, and a lot of good things. The health service today has research, science, and innovation, and the university produces a lot of good things. But, at the same time, we're suffering a reverse because not everyone understands this. I mean, this process we're living through today is challenging. Brazil is experiencing a time of opportunity, but it is also a time of risk."
>
> – Ministry of the Environment and Climate Change representative

> "Public policies need to be ahead of what has been happening, which scientists have been pointing out for decades, at least the last twenty years. What could happen in the future? So we have to be prepared for the floods, the extremes of drought, the excessive heat, and a whole range of other changes that we've been experiencing in Brazil and around the world."
>
> – Ministry of Health representative

Some participants pointed to the **need for more in-depth research and studies on the connections between the impacts of the climate crisis on human health and other sectors**, including financial costs.

> "Honestly, I think there's a lack of research, a lack of information, a lack of forecasts of what could actually happen. We have very little research on the impact on health and climate change, although it has gained a bit of momentum with Dengue."
>
> – Climate advocacy representative

> "In scientific findings, [we need to] look at trends, to [have an] understanding of the statistical models of the areas involved. Not everything has an estimate of what might happen. So, we need more analysis, more projections, and more prediction models. There is a lack of studies. We need to study all of this more. We have limited databases. (...) We also need to study our databases."
>
> – Ministry of Health representative

One of the shortcomings pointed out by some interviewees involves the **underreporting in the Unified Health System (DATASUS) database of correlations between illnesses and deaths resulting from climate issues**. There is still no specific International Classification of Diseases (ICD) for climate change, and diseases and deaths caused

by drowning or polytrauma [multiple injuries in a patient] following a climatic tragedy or health problems resulting from heatwaves are not recorded as climate-related illnesses/fatalities.

> "Unfortunately, it's still not happening [the notification of illnesses and deaths directly related to climate issues]. This has to be done, and this part has to be worked on better."
>
> – Ministry of Health representative

> "We know [from DATASUS], for example, whether cardiovascular diseases are increasing or decreasing in which regions of the country. Now, we still have no way of saying that we have a database, that is, that we have statistics showing that we have had a 2% or 5% increase in diseases, whether respiratory or cardiovascular, directly linked to climate change. We don't have that."
>
> – Federal government representative working on health

> "This is also another fight. Public policies, for this [climate impacts on health] to be notified, to have its own ICD [International Classification of Diseases]. (...) There was the case of the teenager who died because of a heatwave [in Rio de Janeiro, in November 2023]. (...) She was dehydrated, as were many, but she died. (...) I even think that there was (...) incorrect clinical conduct [for treatment in the event of heatwaves]. (...) This was due to a lack of knowledge of Planetary Health in terms of coping and adapting [to problems caused by heat stress], which should be taught from the time we [doctors] graduate since climate change is now a health emergency, a public health problem."
>
> – Health advocacy representative

3.3.6. Political polarization, conservative profile of the Legislative, denialism, and fake news are obstacles to progress on the agenda

Most interviewees mentioned **various political barriers as obstacles to integrating climate and health policies**. Among the points highlighted were the lack of political will and the party-political issue, which, in certain situations, overrides the technical nature of the choice of leaders for public administration positions. Representatives from advocacy, think tanks, and academics were the most critical.

> "The barrier is political. When we begin to understand that ministries are basically instruments for party political negotiation, it's very challenging to have a more integrated vision of public policies, right? (...) That, for me, is the main barrier. And this extends to state and municipal bodies."
>
> – Climate and health advocacy representative

> "The first [barrier] really is politics. I work with the government, and I'm there, in the discussion. I get to a meeting and want to cry when I leave because I can't understand

> how they don't take ownership. They don't want to take ownership of the problem. I really think this is irresponsible."
>
> – Climate and health think tank representative

Another obstacle mentioned was **the worsening of political polarization, which has intensified in recent years**. The polarized scenario even contributes to reducing the capacity for coordination and dialogue between representatives of the executive and legislative branches.

> "It's not a lack of money. It's a lack of articulation capacity. We currently have a scenario where Congress pulls society to one side, and the Executive pulls society to the opposite side. We're seeing that this ends up tearing the country apart. This wasn't the case ten years ago. At the time, we had the capacity to structure policies. In the area of education this was done, in the area of health, with the very construction of the SUS, [which] lasted four or five governments of different presidents and was one of the greatest successes Brazil has had. I see that implementing these state policies is much more difficult today."
>
> – Academic expert on climate

Some interviewees mentioned the current profile of the National Congress – which is even more conservative – and the setbacks in the social, environmental, and climate agendas, especially under former president Jair Bolsonaro, as relevant political barriers. In the current context, the **defense and maintenance of vested interests by sectors considered privileged** in the national context have been intensified, with the **approval of projects that negatively impact human health and the environment** and delays in advancing climate agendas.

> "We are very active movements in the fight against water pollution, pesticide pollution, vaccines, and so on. The issue is that there are political interests that don't care about this. They don't care about climate policy or health policy. So it's a struggle! A lot of pesticides are being approved in Congress today. There's a huge movement to stop it, but it is not succeeding."
>
> – Climate and health advocacy representative

> "The 2016 National Adaptation Plan was already due to enter a third cycle. It actually provides for monitoring and updating every four years. Unfortunately, this agenda was left aside. It was sidelined in the Bolsonaro government, although the Unified Health System proved to be quite resilient [during the period of the far-right government]."
>
> – Climate advocacy representative

For some interviewees, this defense of interests and maintaining the status quo is supported by an 'ideological barrier,' making dialogue and consensus-building on public climate and health policies even more difficult.

> “Unfortunately, it's an ideological barrier. There is a negationist logic in Brazilian politics that thinks that the direct impact that man has on the environment is silly and unimportant, as if events were inevitable. And this is present in many places, many administrations. I see a denialist ideology.”
>
> – Parliamentarian of the Chamber of Deputies - education

> “There are ideological and budgetary disputes going on, which also affect any serious public policy.”
>
> – Parliamentarian of the Federal Senate - climate and health

In the dispute over narratives, the **wave of scientific denialism and fake news is mentioned as an additional layer of challenges** for policy progress.

> “I don't know what else we have to do to make people realize what's happening. But as long as there is political interest, corrupt interest, economic interest above all and fake news, it won't work, right? (...) Amazon has already reached its non-reversal limit. (...) We are fighting. We're all working towards the same goal. It's just that it's often inglorious in this Congress that we have now, with this global right-wing movement.”
>
> – Climate and health advocacy representative

> “Today, with social media, you have the denialist movement. A movement totally anchored in anti-science, which is doing great damage to humanity. (...) In this first moment, the big challenge is to deal with fake news on social media. We now see a billionaire entering this discussion, this manipulation. (...) This shows how critical it really is from a communication point of view, and I think it's a fundamental point to deal with.”
>
> – Climate think tank representative

> “Society needs to believe in someone. It doesn't believe in politics, it doesn't believe in justice, it has trouble believing in religions that aren't strictly those of its profession. They have totally abandoned respect for academic knowledge, and universities are often demonized by various circles. And this challenge will have to be overcome gradually.”
>
> – Parliamentarian of the Federal Senate - climate and health

3.3.7. Silos between public bodies and a lack of dialog among policymakers inhibit climate-health integration

Among the barriers to integrating public policies, many interviewees highlighted the **departmentalization of federal public bodies and compartmentalized power structures**. These, in the perception of the participants – including those who represent public bodies and who were interviewed for this study – **hinder cross-cutting issues in the constitution and implementation of public policies**.

In their view, these structures end up being reproduced and working on a back feed loop by decision-makers and civil servants within the same federal agency. The same occurs in the interrelationship among government agencies and between federal entities – the Union, States, and Municipalities.

> "Sometimes the interaction and integration between ministries does not happen as it should, perhaps due to political differences, and it also happens that one encroaches on the other's attributions, generating friction. (...) When we talk about disasters, they are democratic. They affect everyone, regardless of political party, religion, social status, or money. We have to think that the main objective is to protect the population. (...) This division into fiefdoms shouldn't exist, but unfortunately, it is happening."
>
> – Federal Government representative working in disaster risk management

> "People and institutions are very fond of their competencies and very keen to keep their place. So, it's not always easy to do this integration. If a particular sector has done its planning, it's difficult for it to want to change its planning because of the influence of another sector. It's like a Mafalda comic strip where she said that each ministry had its own 'mini-hysteria', and that's more or less what it is. That's the biggest problem."
>
> – Federal agency representative - water and sanitation

> "We always treat national policy as a Security box, a Health box, an Environment box. As much as the ministers, secretaries of state, and municipal secretaries talk to each other, they have the challenge of making their agenda, the one you are responsible for, happen on a day-to-day basis."
>
> – Subnational government representative working on climate

> "We make an effort. We try to bring this about [interconnection between policies], but the discussion structures, the government planning tools, all the legislation, the way Congress works, politics, everyone looks after their own little box. There no one wants anyone to interfere in their project, their activity, or their ministry. So this ends up creating great difficulty and maintaining this totally unproductive, inefficient, ineffective vision, which is that you try to solve things that are complex and integrated in a simplified and fragmented way."
>
> – Climate think tank representative

The lack of integration of the climate and health agendas perceived among public policymakers and government bodies is also noted among organizations that support and lobby for one or the other.

> "People in the climate field, whether in the third sector or in the climate field, don't talk to the health and children's groups. In this respect, human rights and vice versa. And I

> would translate that to the health field. The organizations that are looking at the health field are far removed from the climate. There is a lack of joint work, [lack of] coalitions, and networks that work to connect these two visions. (...) The two fields need to be more interconnected."
>
> – Climate and health advocacy representative

3.3.8. Overload, complexity, and urgent demands of the Unified Health System (SUS) make it difficult to prioritize health adaptation and prevention policies

Although the capillarity and scope of the Unified Health System for the implementation of the climate agenda was mentioned as an ideal, many interviewees recognize that the fact that the SUS is overloaded is a barrier to the integration of climate and health policies, even more so in the face of worsening climate impacts. Some interviewees point out that **climate issues represent an overlapping crisis in public health**. Recent episodes, such as the COVID-19 pandemic and the extreme drought in the Amazon, were mentioned to exemplify how the already overburdened SUS is still unprepared to face the climate crisis.

> "We experienced this in the drought-stricken Amazon (...), where the rivers were very low because of the drought, and since all the basic river health units there depend on the river [for transport], the vaccine, the medicine, and the health professionals themselves often didn't reach the Indigenous and 'Quilombolas' riverside communities in these regions. (...) These are different impacts you have on the health system. This is all due to climate change."
>
> – Federal Government representative working on health

> "The pandemic clearly shown us that if it weren't for the SUS, we wouldn't be able to react. But how much does this SUS have to improve to provide public health security in a climate era in vulnerable territories, not only in the Amazon but also in the Northeast? We are now experiencing the situation of Rio Grande do Sul, in a disruptive process of adaptation, which clearly has no organized response capacity."
>
> – Climate advocacy representative

Often, when people talk about the connections between climate and health in relation to the SUS, the focus ends up being more on adapting the care infrastructure to face climate threats rather than incorporating a strategic policy of prevention, education, and collective health. **With urgent demands on the population, the public health system still focuses on treating diseases**.

> "Many health organizations look more at traditional health, investing in hospitals and post-illness infrastructure, rather than prevention, which is totally related to the climate. The two fields need to be more interconnected."
>
> – Climate and health advocacy representative

Some interviewees mentioned that the health budget has reduced investment in prevention policies. In addition, they say that the situation is likely to worsen with the environmental crisis due to the competition for resources between health and different sectors as the effects of the climate issue intensify.

> "This disconnection of perception, this lack of perception, is consolidated in the formulation of policies, in this separation, in the fragmented vision, and above all, in the budgetary vision. We have a lot of resources to treat disease and very little to prevent it, which is a big mistake. It shows that the strategy is totally wrong. Instead of attacking the cause and preventing the health problem, you think you have to build more hospitals, more emergency rooms, etc."
>
> – Climate think tank representative

> "Everything we've seen in the Covid pandemic, which is the insufficiency, the inability to care for people, is going to double in size. There will be competition with the health sector because the money will remain the same, won't it? Brazil isn't going to get rich because the planet has warmed up. Brazil will have a lot of money. However, the other sectors that compete for public money – housing, education, and other sectors – will also increase their demand. There will be more competition for money, which is already scarce today."
>
> – Climate advocacy representative

> "SUS is systemically attacked by part of the political spectrum, so to speak, as a public system, right? Imagine when things get heavier. The images are there. We're seeing what's happening with Dengue this year. Imagine that Dengue fever will be much worse in five or ten years' time. There will be new diseases. SUS is going to come under a lot more attack. It's going to need a lot more money. If we don't understand that this has to be part of a discussion and that climate has to be one of the vectors that mobilize and motivate this discussion, the negative impact this will have is immense."
>
> – Climate think tank representative

In addition, the health sector is a greenhouse gas emitter, and one health advocacy participant mentioned it needs to review its "carbon footprint".

> "[We have to] think about waste management in health units, the use of materials, the choice of these materials, these resources, the production of these medical inputs, health service inputs. Where do they go? They are burned, they are incinerated. They also have a very high carbon footprint. So I think it would be the best policy, really, to think about adapted services and reducing the carbon footprint of health services. There's a study [showing] that if the health service were a country in the world, for example, it would be the fifth largest emitter of greenhouse gases. We're polluting a lot."

– Health advocacy representative

3.4. Opportunities to advance integration

We asked participants to describe possible opportunities for advancing climate and health policies. Their responses covered advantageous situational factors, such as the revision of the National Policy on Climate Change, the increased awareness of climate impacts from recent extreme events, the country's competitive advantages in the face of the energy transition challenge, financial and technological resources, and the COP30 to be held in Brazil in 2025.

Many also highlighted the value of implementing previously approved policies, especially the National Air Quality Policy and the implementation of the Unified Health System (SUS), which is also considered a strength for disseminating the climate agenda. Some also mentioned the tripartite system and the primary care network of SUS as an opportunity to disseminate climate-health interconnections in the country.

3.4.1. The Climate Plan and extreme events are opportunities to advance the climate-health connections

Many interviewees mentioned that revising the Climate Plan and the National Adaptation Plan represents an opportunity to integrate public policies in the country, including health policies, around climate issues. They highlight that the creation of sectoral and cross-cutting adaptation and mitigation plans could contribute to the more effective implementation of integrated policies. Among the plans' strengths were the establishment of targets, deadlines, and actions and the openness to public consultation before their finalization.

> "The Climate Plan itself could be an opportunity, (...) there's the Health sector. (...) The expectation is that there will be a more holistic view of all these sectoral plans in order to draw up the national strategy. The resumption of the SDG [Sustainable Development Goals] agenda, I would say, is another opportunity (...) with a more transversal agenda."
>
> – Federal government representative - housing and urban development

> "You now have the construction of targets that will then be rolled out to the states and municipalities in very clear public policies, with targets that are even linked to targets, agreements, and international treaties."
>
> – Climate think tank representative

> "When it comes to adapting to climate change, cross-cutting is mandatory, not least to avoid maladaptation. I think these are the opportunities because everyone has their own sectoral policy and follows that, and we try to integrate."

– Federal agency representative - water and sanitation

> "In this process, we identify the integration of this climate lens into the agenda of the Ministry of Health. (...) We are racing to ensure that this Climate Plan is ready soon so that we can, by the end of half of the Lula administration, move on to the implementation of a climate agenda that is bold, robust, integrated, articulated with federal entities, with subnational entities, with civil society, with the business sector."

– Ministry of the Environment and Climate Change representative

Still on the subject of the Climate Plan, some interviewees highlighted as an opportunity the fact that the review was based on technical and scientific data, with the participation of researchers from the Brazilian Forum on Climate Change and Rede Clima in the Interministerial Committee on Climate Change.

> "The [Brazilian Climate Change] Forum has a seat on the Interministerial Council on Climate Change, (...) and the Climate Network and the Academy are also represented there. (...) The moment we create processes that take these aspects into account, calling those who understand the subject the most in the academic sector, the business sector, the public sector, communities, etc., to discuss a solution, we are creating a condition that even reduces polemics and reduces these polarizations when you bring in people with a lot of knowledge."

– Climate think tank representative

Many interviewees also realize that the various recent extreme events in Brazil, including the historic drought in the Amazon and the torrential rains that devastated Rio Grande do Sul in 2024 – both widely reported in the media – have also contributed to raising awareness about climate impacts on health and other areas, both among policymakers and the public.

> "And then the opportunity, from the tragedy, unfortunately, which is the episodes that are happening now in the Rio Grande do Sul, and that has been happening everywhere. There is a need for a more integrated policy to look at the health system and climate adaptation in response to these disasters. And risk and disaster reduction management."

– Climate and health advocacy representative

> "Public policies that integrate the risk management issue will happen, and the disaster ends up being a motivator for improvements to take place. We don't want a disaster to happen. It's a tragic thing that brings damage, loss of life, economic loss, and the deterioration of people's social status. They lose their dignity. (...) The disaster has to be used to learn from it. We see that every disaster is also a lesson for us of things that must be done. (...) I'm talking about the federal government, which is my niche, but this also happens in states and municipalities."

– Federal government representative working in emergency response

"The impacts of climate change are already affecting important production chains, especially agribusiness, with the change in rainfall, prolonged droughts and floods. Many are already losing productivity and money as a result of these climatic events. On the other hand, the impact on the public budget to be able to deal with the emergency of these climatic events has also mobilized the public sector and society itself in terms of awareness, (...) mainly because of the painful experience. The national outpouring of support for Rio Grande do Sul is an example of this."

– Parliamentarian of the Chamber of Deputies - agriculture

"This crisis, with all its tragedy, is going to be the driving force for us to start putting things right."

– Academic expert on health

3.4.2. Election periods are cited as an opportunity to change political representation and broaden the debate on climate and health through popular pressure

Several interviewees highlighted the elections when asked about opportunities to expand the interconnections between climate and health policies. The justification is that recent extreme events and the Dengue pandemic – which make explicit the risks of climate impacts on human health – offer arguments for voters, through the power of the vote and popular pressure, to opt for candidates committed to climate adaptation agendas connected to risk reduction and health prevention at the federal, state and municipal levels.

"One opportunity is to vote right, or rather, [to vote] less wrong. I think that's another important element."

– Federal government climate representative

"We have opportunities every four years. Effective opportunities for federal impact, every four years. The last at least four or five times the right to vote has been exercised, the profile of Congress has gotten worse from the point of view of environmental protection, understanding impacts, and even institutional respect. It's been getting worse."

– Parliamentarian of the Federal Senate - climate and health

"Now, if the population has a perception of the risk of disasters, they will think: 'We have been affected by an environmental disaster. What is the environmental agenda of the next mayoral and city council candidates to deal with future disasters?'. So the population can really choose someone who has this political, ecological nuance, we could say. [People can choose someone] who thinks climate change is a serious problem. There is no place

for skeptics, deniers, or inaction. (...) We have been impacted for some time, but now it is getting worse and worse."

– Federal Government representative working in disaster risk management

"Those in power need to understand that the era of politics where you finish four years and leave a statue of yourself in the square is long over. Now, it's a question of continuity because we're talking about human existence on Earth. How can we maintain and recover a quality of life so as not to be decimated? Covid has already come here to show this. It's a trailer for a movie that has already begun. Now, we have an outbreak of Dengue fever. It'll be something else soon."

– Climate advocacy representative

"So we need to raise awareness when I talk about the area. Often, the work that people can do is to look for a politician, at election time, who is concerned about the issue of risk if they live in an area of risk; in other words, a simple action. (...) Choose someone who, if you live in an area of risk, considers that your governor and your councilor are people who are concerned about this aspect."

– Federal government representative working in emergency response

"We need to ensure that the adaptation and integration of the climate lens takes place in the various public policies and in the various entities of the Federation. (...) We need to take broader steps so that municipal managers and state managers also understand the urgency and relevance of making professionals, and civil society also have this as a demand. (...) We need governments that are really committed to this agenda and parliamentarians who can, as far as the legislative branch is concerned, do their bit to guarantee a budget for both the federal government and state and municipal governments."

– Ministry of the Environment and Climate Change representative

3.4.3. Brazil's strategic strengths in the energy transition, bioeconomy, and agroecology are viable opportunities for climate and health

Several of the country's strategic differentials were mentioned as viable opportunities for integrating climate and health in Brazil, as listed by the interviewees. For many participants, investments in segments aligned with decarbonization, in addition to bringing benefits from reducing greenhouse gas emissions, contribute to reducing social inequalities, improving the economy and investment capacity in health, and increasing the population's quality of life. One example involves **the transformation of the Brazilian agricultural model, focusing on preserving biomes, forest restoration, and agroecology**.

> "The Executive should also take more incisive measures from an agroecological perspective to face these major challenges, as well as changing the model of agriculture."
>
> – Parliamentarian of the Chamber of Deputies - agriculture

> "There are solutions, such as agroforestry in the middle of a large pasture [already degraded, but with potential for restoration], such as encouraging the economy of the standing forest and the sustainable economy (...). They must counter ignorance and political decisions regarding an environmentally destructive model. The açaí, if I'm not mistaken, gives twenty times more income per hectare than the cattle that are destroying the forest today."
>
> – Climate and health advocacy representative

> "I see, for example, some carbon market mechanisms. All of this will stimulate a change in behavior on the part of those who deforest and those who pollute. There are states, such as Espírito Santo, which have payment programs for environmental services for those who conserve and for those who recover their forests. They reforest. (...) Although a lot is missing, we have been moving in a very strategic direction."
>
> – Subnational government representative working on climate

The bioeconomy was considered another promising area for the country's sustainable development.

> "The bioeconomy is a great solution to our economic crisis (...) Giving people an opportunity to leave mining and stop cutting down trees, giving people a decent option, a decent and qualified job. There is a huge expectation from our bioeconomy, including the whole issue of producing medicines [based on Brazilian biodiversity]."
>
> – Climate think tank representative

> "The discussion [of bioeconomics and the production of pharmaceuticals] is also [a discussion about] how Brazil can be healthier. (...) This brings in discussions about food production territories, food and nutritional security, regulation of bioindicators, less toxic agrochemicals, and the National Agroecology Program. (...) All of those issues look at small farmers and increasing income. How to eat better from healthier food production and externalize this to that environment as a gain in life, quality of life and, therefore, being able to monitor or subsidize the SUS and other health mechanisms, (...) monitor the quality of life of that population."
>
> – Climate advocacy representative

Other opportunities highlighted by the interviewees are related to the energy transition because **Brazil's energy matrix is primarily renewable, which places the country in an internationally prominent position**.

> "One of the main reasons for emissions is the burning of fossil fuels, oil, and coal. Most countries don't have as many alternatives to make this transition as Brazil does, and I see this as a great opportunity for Brazil, in that it has sun all year round, it has wind, it has hydroelectric potential, and, above all, the potential to produce bioenergy, with great potential to be a major exporter of green hydrogen, sustainable energy, clean energy."
>
> – Parliamentarian of the Chamber of Deputies - agriculture

> "Brazil is in a favorable position because it is a country that can benefit from green investment. More than other countries, which don't have Brazil's competitive advantages in relation to the Sun, the wind, the arable area, for tropical products that involve biofuel production, green hydrogen production, and so on. So I believe that Brazil has advantages in this transition (...). We can be a vector for transformation."
>
> – Ministry of Finance representative

> "We have several programs in this direction, but we have to understand that our situation is different from other countries, from European countries, from the most emitting countries. (...) When we're talking about the energy matrix, we have about 46% of our matrix renewable. I'm talking about the energy matrix as a whole, whether it's fuel or electricity. Other countries are around 14% or lower. (...) If you only consider electricity generation, around 86% of our matrix is renewable. In other words, it's a matrix (...) with renewable sources."
>
> – Ministry of Mines and Energy representative

Some interviewees also mentioned the **transport sector as a vector for transformation**, for example, through the **electrification of the vehicle fleet** – helping to reduce emissions and pollution and improve quality of life.

> "The expansion of the electric bus fleet, which in addition to improving the quality of the service itself and reducing global pollutants in terms of climate change and the greenhouse effect, has a significant impact on the emission of local pollutants in large urban centers. (...) I think that decarbonization has a direct impact on people's quality of life. This will probably involve strengthening collective modes of transportation, whether it's the metro or the electric bus, and so on."
>
> – Ministry of Finance representative

3.4.4. Brazil hosts COP30: an opportunity to expand the interconnections between climate, health, and other areas for the climate agenda

The COP30 to be held in Brazil in 2025 has been highlighted as a strategic opportunity for the country. The event, which will be held in the Amazon, is called the "Forest COP". Participants highlighted that the **period leading up**

to the Climate Conference in the country fosters internal debates and mobilizes different segments of society, creating an environment conducive to producing data and strengthening the climate and health agenda.

> "We have the obvious opportunity of the milestones taking place in Brazil in terms of international policies, such as the G20 and COP30, a very important moment to look at health. There was a great mobilization in terms of health actors at COPs 26, 27, and 28 to establish a framework on health and climate, and an alliance of countries looking at climate and health emerged. This network can be strengthened for COP30."
>
> – Climate and health advocacy representative

> "[Representatives of] family farming are preparing a lot for the debate [at COP30]. The sector will prove with figures how it can emit less and produce more. (...) The COP in Belém is a good time for this [producing data connecting climate and health issues] because you will have press mobilization in [journalistic] coverage, another space, within Congress, within city halls, within the state government, and everything else. The COP is one of those opportunities, let's say, to broaden the debate."
>
> – Climate advocacy representative

> "The debates around the COP (...) will necessarily move Brazil. We will be open to the whole world as the host of this issue, which is fundamental and impacts all future generations. It is a window of opportunity, less because of the event itself but more because of its preparation, construction, and presentation [of the climate issue] to Brazil, businesspeople, and the political class."
>
> – Parliamentarian of the Chamber of Deputies - education

The choice of location for the COP, in the opinion of some interviewees, is also seen as an opportunity to broaden the debate around solutions to structural problems in the Amazon region.

> "COP30 is going to rub the Brazilian reality in the world's face, that something has to be done because Belém is the capital with the worst rates of access to basic sanitation, it has a garbage problem, it has an open sewage problem, and we're taking COP30 there at a time when the Amazon was dry, and now it's starting to flood in some places. (...) The COP is a good opportunity to deal with this integration not only of health with water management but also with other policies."
>
> – Federal agency representative - water and sanitation

> "The COP in the Amazon, the drought in the Amazon, the pandemic, the Dengue epidemic are all opportunities and warnings that we have to try to bring the issue of health closer together. At the last COP in Dubai [COP28], health appeared for the first time there. (...)

> The COP is not about the Amazon, but it will be in the Amazon. Having said that, Amazon is a medicine, a Paracetamol for the world; it will be a good opportunity to correlate environmental issues and health."
>
> – Climate and health advocacy representative

3.4.5. The Unified Health System (SUS) is considered essential for expanding the correlations between climate and health throughout the country

Some interviewees highlighted as opportunities the recognition of the importance and use of the wide coverage range, scope, and equity of the Unified Health System (SUS) in promoting health in the face of climate change. Considered essential for expanding the correlations between climate and health in the country, the SUS has a tripartite system and a primary care network distributed throughout the country.

> "The SUS itself is this success story that came from a grassroots construction, from many visions, but which were consolidated in a collective vision of the public good, which is health as a right and not as a commodity. (...) It was a process of collective construction. (...) We have well-established mechanisms of tripartite negotiation. (...) The Councils, CONASS [National Council of Health Secretaries], CONASEMS [National Council of Municipal Health Secretaries], are fundamental in mobilizing this force of transformation."
>
> – Ministry of Health representative

> "There has to be a change in behavior, (...) and I think health is one of the most essential channels for this, where you go, from the point of view of educating doctors, political education, citizen education, residents' associations, etc. (...) So, the opportunity to talk to society and generate hope to say: "Look, we have a tremendous system that provides coverage for all Brazilians". And that's what we're seeing in Rio Grande do Sul. Poor, rich, black, white, Indian, everyone has assistance from the public service, and therefore the public service will have to be prepared for this [climate era]. I don't see anything like that."
>
> – Climate advocacy representative

> "When the pandemic came, we saw how important it was to have a Unified Health System to deal with a problem of that size. So, this debate is not over. We still have part of society that defends this idea of a minimal state. We need to make a social and political impact to guarantee a budget and investment that contributes to reducing vulnerabilities in the country, that actually fights poverty, that reduces food insecurity, that improves living conditions, housing and access to water."
>
> – Ministry of the Environment and Climate Change representative

Regarding the SUS's wide coverage range, some participants indicated that it was an **opportunity to promote the training and education of health professionals with a "climate lens"** – to improve their ability to disseminate

information and knowledge on the climate-health interconnections. They also highlighted the importance of community health workers and close contact with the population in the territories.

> "Undoubtedly, thinking about the presence of health posts – even if some regions need more – they are present in the most remote territories, and it is often where the figure of 'community health agents' is organized in many communities (…). So, without a doubt, I think that this wide coverage range, the presence, and incorporation into the real life of the Brazilian population that the SUS has, through its primary care network, is fundamental [for interconnecting climate and health in the territories]."
>
> – Parliamentarian of the Chamber of Deputies - education

3.4.6. Air quality and sanitation policies are mentioned as relevant lessons for advancing the integration of climate and health

Several interviewees pointed out that the experiences gained with the approval of the National Air Quality Policy (Law No. 14.850/2024) and Law No. 14.026/2020, which revises the legal framework for sanitation, as well as with the amendment to Law No. 9.984/2000, which assigns regulatory action in the sanitation sector to the National Water Agency, can serve as inspiration for moving forward with the integration of climate and health policies in Brazil.

> "In the Cantareira water crisis, we built a solution and inserted risk. (...) We produced quality information. (...) We occupied a space of technical reference and neutrality, identifying different actors. (...) We have the task of transforming these good experiences into manuals, guides, and good practice guidelines so that everyone has contingency plans (...) that take different aspects. And a city's water contingency plan has to include health."
>
> – Federal agency representative - water and sanitation

Some participants expressed that the correlation between environmental and health issues, in the case of air pollution, is more tangible and direct, although the link has yet to be made explicit based on data presented to decision-makers by academics and organizations involved.

> "The arguments [data on the health impacts of air pollution] are very strong and difficult to refute. When it comes to putting it on the table, it's almost administrative impropriety to say you're not going to follow it."
>
> – Climate and health think tank representative

> "This connection with health (...) serves the climate narrative, (...) in this sense, we haven't explored this as much as we should. (...) The discussion about the approval of the National Air Quality Policy, to a large extent, opens up space for this, as well as the discussion about

> adaptation. I think we have new spaces to explore with other partners. (...) There's still a lot we can do, and it's exciting to think about doing it."
>
> – Climate think tank representative

> "In the transport sector, accelerating the electrification of the urban vehicle fleet will bring huge health benefits, including the state no longer spending billions and billions of reais on treating cardiovascular diseases associated with urban pollution, since this is a problem in all major Brazilian centers."
>
> – Academic expert on climate

Another positive point highlighted in the formulation and approval of the air quality policy, which is yet to be implemented, was its participatory and articulated nature, with the inclusion of different players in society, including doctors and industry representatives, in building consensus.

> "We have been involved in building and leading civil society in relation to the National Air Quality Policy. (...) We were involved in the Respirar Coalition (...), which has more than 20 institutions that defend air quality in the country. We accompanied and led this discussion, both in the Chamber of Deputies and in the Senate, (...) and now we have completed this stage. It was approved (...), so I think this was an important achievement (...) in the construction of this policy and this support of civil society. (...) We met with industry for almost a year and a half to find common ground so that when it came to final approval in the Senate, they wouldn't obstruct it because they had already talked about it, and we had already tried to find a solution."
>
> – Climate and health think tank representative

> "What we did with the national air quality policy is going to be a good example, (...), a very good case for us to take and move forward. (...) To understand how this came from an articulation of technical actors, communication actors, and actions within Congress and the Supreme Court, (...) This is a good case."
>
> – Climate think tank representative

> "I think that looking at this whole air quality management system that is now going to be created in the National Air Quality Policy is a super opportunity that includes air quality standards, the revision of Pronar [National Air Quality Control Program], all the instruments in this. I think it's a very strong thematic opportunity."
>
> – Climate and health advocacy representative

Concerning revising the legal framework for sanitation and the fact that the water regulatory agency is taking on a new role, being renamed the National Agency for Water and Basic Sanitation, some interviewees mentioned

that the **correlation between sanitation and health issues could be strengthened**. Also, **it could contribute to advancing the correlations between health and climate**.

> "Until 2020, the water resources management area and the health area didn't even talk about sanitation. That was a Brazilian peculiarity. (...) That changed in 2020. We're still integrating, and it's a process. (...) Countries where the two policies – sanitation and water resources – were born together are more efficient in seeing the health issue linked."
>
> – Federal agency representative - water and sanitation

> "I think the issue most closely linked to health is sanitation. (...) The basic sanitation agenda is very related, and I think the Climate Plan is an opportunity to review and rediscuss this. (...). In impact assessment research, a lot is said, for example, about sanitation, [where] one Real invested in sanitation saves four Reals in health."
>
> – Federal government representative - housing and urban development

> "All climate policies, considering health, they're going to incorporate sanitation, they're going to incorporate access to water, they're going to incorporate vaccines, they're going to incorporate environmental monitoring, the new emerging diseases, they're going to incorporate all of that."
>
> – Climate and health advocacy representative

3.4.7. New resources in the forms of financing, information, and technologies are emerging

The interviewees highlighted the opportunity represented by new resources in funding, information, and technologies, primarily through algorithms and digital modeling. They emphasized the role of young people in exploiting these resources, which are essential for improving infrastructure, quality of life, and the formulation of public policies, enabling the efficient organization of data and implementing concrete and practical actions.

In financing, some interviewees mentioned international resources, such as the Amazon Fund, which in Brazil is managed by the National Development Bank (BNDES), as well as resources to finance climate adaptation plans in the states.

> "Today, we have a very strong focus on climate finance, energy transition, and governance. (...) In the Green Brazil Consortium, we provide intelligence support to fifteen states, fifteen governors, (...) to structure adaptation plans and mitigation plans and be able to bring good projects for international financing and BNDES financing."
>
> – Climate think tank representative

Concerning financing from Brazil's financial resources, the Climate Fund, new lines of credit from the BNDES, and the Safra Plan revision were mentioned as opportunities. In these cases, socio-environmental and climate criteria

are beginning to be incorporated as premises for releasing funds, which are then released upon approval of socio-environmental impact assessments.

> "The Safra Plan has already undergone changes based on ecological transformation. The lines of financing for more sustainable agriculture are cheaper. So, a series of measures are gradually being adapted to achieve the greater objective. The BNDES Climate Fund and so on."
>
> – Ministry of Finance representative

Concerning resources in the form of technologies, the use of artificial intelligence, blockchain, and digital systems enabling the cross-checking of data and information were mentioned. One of the opportunities mentioned by a participant was to use the technology already implemented for income tax for climate and health issues. This would make it possible to track the current climate/health effects.

> "The income tax return, you have information on everything there, including health, (...) because it crosses the data, the CPFs, and the information. So, it's an intelligent public government system (...), an internationally recognized model. (...) It's all totally within transparent privacy procedures, the law that governs it all, the connection with the banking system, with a series of things that provide very good security. This is going to be more advanced now with Drex [a digital version of the Brazilian Real], which comes from the Central Bank, with tokenization and Blockchain. In other words, the world is advancing in these digital technologies to make public policies and the control of things very secure. (...) We need to bring these technologies to climate policies. You can't manage a forest, like the Amazon rainforest, without having a set of digital systems with IoT [Internet of Things], artificial intelligence, and satellite networks, with a set of interconnected things that give you real-time information about what's going on that allow you to carry out intelligent monitoring. (...) Brazil already has these technologies, and we can apply them to the climate and health areas."
>
> – Climate think tank representative

> "The opportunity I see is for young people because of the possibilities for working with algorithms. So, modeling is a tool that has the power to make prognostic scenarios with benefits. How can we solve [for example] an infrastructure issue? It can be solved [using modeling data]. Let's focus on that. This would bring so many benefits and improve the quality of life, not just in terms of health, but in schools, technical schools focused on the problems, not just the problems in urban areas, [but also] in remote areas."
>
> – Federal government health representative

Finally, the AdaptaBrasil Platform[1], which is still under development, is considered an opportunity to produce data, indicators, and information connecting climate with health and seven other areas. It can also contribute to modeling impacts and future solutions.

The platform already has data on the relationship between climate and diseases such as Malaria and two types of Leishmaniasis and is incorporating data on Dengue, Zika, and Chikungunya in 2024. AdaptaBrasil is already being used to support the revision of the Climate Plan. Among the strengths highlighted is using the platform as a tool for municipal, state, and federal policymakers. In this way, it can contribute to modeling impacts and future solutions.

> "The MCTI placed the AdaptaBrasil platform as an initiative within the Brazilian NDC. (...) The platform was included within the national commitment to the [UNFCCC] Convention as an adaptation strategy for the country. So, yes, it is in dialogue with the exercise of public policy. (...) In terms of adaptation, the platform has been considered one of the important tools for the different sectors to take action. It has great spatial permeability. It is made for all the municipalities in the country, individually. In other words, you can consult the factors influencing potential measures in each municipality."
>
> – Federal government climate representative

> "AdaptaBrasil is a tool that can work by showing the priority areas for managers of problems that may arise. For example, vector-borne diseases like Malaria, Zika, Chikungunya, and all of that. But it's not just health. AdaptaBrasil brings up issues of ports and water resources, where we're going to have droughts and possibly water shortages in the country, the Amazon region (...) Climate change is still a major challenge, but it's also an opportunity for various areas, for all economic sectors."
>
> – Federal government climate representative

3.5. Strategies to advance integration

We asked the participants what strategies they recommend to integrate and advance climate and health policies. The suggestions were expressed considering the barriers and opportunities they identified. The recommendations and strategies pointed out by the participants highlight the need for an integrated, multisectoral approach, the role of

[1] The AdaptaBrasil Platform is the name given to the Information and Analysis System on the Impacts of Climate Change. It is being developed at the MCTI and includes correlations between climate change and the following areas: water resources, food security, energy security, health, port, rail and road infrastructures, and geo-hydrological disasters — more information at: https://adaptabrasil.mcti.gov.br/.

science, social empowerment, and effective communication to address the challenges at the intersection of climate and health.

The interviewees highlighted the importance of integrating these policies, using a Planetary Health concept, with interagency collaboration and centralized leadership. Expanding intersectoral dialogue and strengthening science in policymaking were emphasized as essential. They also expressed the need to mobilize society and include new actors to push for cultural changes, improve public and scientific communication of data on climate risks, and train health professionals to get involved in the climate agenda. Some participants also pointed to the systematization of data, the generation of indicators, and the prioritization of interdisciplinary research on climate and health as strategies. Finally, they suggested a fiscal and tax review, increased funding, mobilizing funds, and establishing sanctions for polluters, as well as increasing representation in decision-making spaces, building networks, and persisting in actions to integrate policies.

3.5.1. Improved communication

Most of the participants in the survey consider **improvements in communication to be essential to advance the integration of climate and health in Brazil and combat denialism and fake news**. Many respondents suggested communication for decision-makers in the public sphere and for the public. These include improving public and scientific communication to broaden the dialogue, adapting messages to specific and previously defined target audiences, and framing messages by connecting climate, health, and other areas. They also recommended training communicators, both from the media and other stakeholders, in order to prepare them to establish correlations between climate and health on social networks, in already **institutionalized spaces for dialogue** – such as participatory councils – in traditional communication vehicles and on digital platforms.

> "Communication is essential. Registering all of this. You have platforms and portals. You have initiatives from a government that seeks this integration. Listening to society. In this respect, developing some mechanism for consulting society is important. In the past, there were conferences. Somehow [it's important] you consult society too, the different elements of the Federation. A plan should mainly involve the agencies that deal with these issues. [To seek] convergence."
>
> – Federal government representative working in emergency response

> "Having knowledge of communication, even how we approach Planetary Health in caring for people's health, in social care for people, is already the first way to face what we are experiencing today. (...) Knowing how to communicate through television and social networks, which are now the major media, and how to communicate through digital platforms. All of this is very important so that this reaches people, not as a situation of radicalism or denialism, which is what we have in excess today."
>
> – Health advocacy representative

> "I think that, in the communication approach, training is an important issue. The involvement of bodies that are perhaps not so easily perceived, [such as] the water resources councils and the health councils, the regional development councils, the municipalities as well. (...) The entry of municipalities into this system and this integration is also important. But I think it's communication, training, and, unfortunately, taking advantage of disasters, lessons learned."
>
> – Federal agency representative - water and sanitation

One interviewee emphasized the importance of training press professionals to **broaden the focus of communication on prevention, not just post-disaster news coverage**.

> "The press only put the spotlight on response actions [to disasters]. Today, the press is already talking about prevention (...) We manage to save a lot of lives in silence, without anyone seeing that it's with preventive actions. That's why we need to shine a light on it. And when the press gives us the opportunity to talk about preventive action, that's very important."
>
> – Federal government representative working in emergency response

3.5.1.1. Communicating the links between climate and health is a powerful tool for making impacts tangible and promoting change

The participants recommend **reframing messages about the climate crisis with a focus on health for policymakers and the general public**. The rationale is that climate issues seem distant and long-term, while health issues are current, urgent, and a priority for virtually all audiences.

> "The first benefit [of linking climate and health] is narrative. It's showing people how the climate, which is this super invisible thing, and which even promotes this denialism in the world, is in people's daily lives and has an impact on their health."
>
> – Climate and health advocacy representative

> "If health is at the top of people's priorities, of their lives, of their day-to-day survival, and you bring this alert to something that is already naturally of interest to the person, you broaden the capacity for dialogue. That's what the climate agenda is all about: we need more people. And for the health agenda, I think it's about alerting managers, those who plan in the area, to say: 'Look, the situation is already bad, but it's going to get worse. We just don't know how bad it's going to get. For now, we know it's going to get that much worse. Let's get ready!'."
>
> – Climate advocacy representative

Some participants also mentioned **tailoring the message for more conservative audiences**, such as most parliamentarians in Congress today.

> "It [adapting the message] would strengthen the budget and the narrative, even in the understanding of people who are against environmental policy in some way or who don't see it [climate-health connection] as a priority."
>
> – Climate and health advocacy representative

Several interviewees pointed out the importance of making the impacts of the climate crisis on human health, ecosystems, and different sectors more tangible and explicit through communication based on scientific research and data. They argue that this contributes to making the message powerful, making vulnerabilities explicit, and awakening a sense of urgency. With this, it is possible to **broaden the perception of risks necessary for immediate action by different sectors and stakeholders**.

> "In the area of health, having more information, more research, more data, is a more powerful lever. (...) To say: 'The climate has changed. The temperature has risen by two degrees. So many people are going to die.' We need to have a type of communication with this level of wisdom and the ability to really upset people. (...) How this is going to impact the local population (...). This is extremely important and has a double effect: for our side [the climate area], which will be able to have a better dialog, it will make it easier, and it will give more consistency to what we are already doing. And for the health area, because it opens a door for this climate agenda to enter (...) with data and awareness."
>
> – Climate advocacy representative

Many interviewees stressed the importance of making this connection locally, in the territory where climate impacts occur. This approach brings the message closer to the perceptible reality of people's daily lives. They point out that communication helps make the impacts directly tangible in the present and future.

> "We have to improve our communication. We need to do a lot of work on communicating the [climate] risks and the types of intervention. Even for those suffering the consequences, it is not easy to think in the long term. We have to know how to deal with [the issue], both by giving immediate responses that alleviate it and by thinking about long-term interventions."
>
> – Ministry of Health representative

> "People need to understand that climate is a reality, and we need to be able to communicate climate in a much more tangible way to people. Nothing is more tangible than health itself. It's very positive for us to build these bridges and explain under these conditions, (...) [saying that] 'We need to protect the Amazon because of your health'. The message is this: 'If you don't take care of the Amazon; if you don't understand that

> there's a profound discussion going on here and that it's going to affect your quality of life, the health of your children, your mother, your grandmother and that this is going to have an immense impact on our lives…'. We need to do this math and get support for climate discussions so that the climate comes out of isolation."
>
> – Climate think tank representative

> "It's creating this storytelling of getting to the top and saying: 'Look, we're going to have this heat wave, so how do we prevent it? (...) Climate change is happening, and you will need to drink a bit more water or avoid being in the sun for some hours. These are very simple and basic things that sometimes don't get through to [the population] because [climate] policy isn't linked to health. I don't know to what extent everyone gets the signal that that region is going to be toast for the next two weeks. As [the local population] is not yet connected to this climate change radar, they end up being taken by surprise."
>
> – Climate advocacy representative

The communication of the links between climate and health, in the perception of many interviewees, contributes to a well-informed population, putting pressure on policymakers to act.

> "To the extent that society starts to make this demand, to the extent that it starts to become aware of it, this debate comes to an end, and politicians and government officials feel pressured to give answers. The reality tends to impose itself."
>
> – Ministry of the Environment and Climate Change representative

> "We need to understand that [the climate crisis] is reality. (...) The tendency from now on is to have more situations of this kind [the Rio Grande do Sul tragedy] so that changes can be made and elaborated by these authorities, and [these changes] in attitude are provoked and stimulated by the collective, by society."
>
> – Health advocacy representative

Several interviewees highlighted scientific communication as essential for progressing in cultural change and integrating the climate and health agendas. However, it must be carried out in such a way as to **"translate" academic language into the reality of other stakeholders**.

> "The more we can make a clear connection to the population, the better we can advance the climate agenda. The climate discussion has become very elitist. It's become a discussion with difficult terms and very much in the world of science. (...) I think the discourse needs to be increasingly clearer, [about] what are the points that really impact people's day-to-day health."
>
> – Climate think tank representative

> “When science manages to communicate all the risks to the population, the population follows the best sector and forces the government to do so. It's important that science also manages to improve this communication a lot. 'Ah, but the heatwave kills a few people, and COVID kills millions'. No! The heatwave, if it continues, in the worst case scenario of a 4 degree Celsius rise in temperature by 2100, a large part of the planet becomes uninhabitable.”
>
> – Academic expert on climate

> “Today you have, with social networks, the denialist movement, a movement totally anchored in anti-science, which is doing great damage to humanity. (...) So communication, professional journalism, and science have a great role today in countering this obscurantism. (...) The great challenge is dealing with fake news and social networks. (...) I think it's a fundamental point to deal with.”
>
> – Climate think tank representative

The communication carried out during the pandemic period was cited as an example of how to make progress on the correlations between climate and health.

> “We learned a lot from the pandemic. [We learned] that we, in the scientific-academic field, needed to communicate better with society. (...) This was not just because of this fake news movement but also because scientific knowledge, the form of communication, was difficult to understand. So, if we communicate well, this relationship between climate and health will undoubtedly strengthen this thinking that you can't work separately. That water scarcity – which is related to the increase in diarrheal diseases and infant mortality – will increase with climate change.”
>
> – Ministry of Health representative

> “At the beginning of the pandemic, all the television channels interviewed great scientists from all over Brazil, (...) and everyone put forward the risk that Covid brought. So there was politics. The whole federal government was in denial, the Minister of Health was in denial at the time, and the president was in denial, but that turned into politics. The Supreme Court authorized state governors to put in place the lockdown policy, the mask, after the vaccine. It was all fast and effective through scientific communication. In those early days of 2020, (...) we saw the news every night, showing all that, the number of deaths, and then all the scientists, (...). That was fundamental; it's a good example.”
>
> – Academic expert on climate

3.5.1.2. Communicating the damage of impacts – and the benefits of climate solutions – in health and economics is important

Several interviewees stressed the importance of a systemic approach, highlighting the economic – and health – costs of inaction in the face of the climate crisis, including impacts on GDP and public spending on health and other sectors, outweighing the costs of preventative actions. To this end, more research is needed to help establish these connections (more information in 3.5.3). **Pricing the impacts and cost-benefit of mitigation and adaptation actions and communicating this adequately to different audiences**, in the opinion of many participants, can contribute to advocacy actions and popular pressure and also can instrumentalize public policymakers in decision-making.

> "When you start saying: 'There's going to be a trillion shortfall. Either you have that one trillion, or so many more people are going to die every year…', then you get into the thick of the political debate. (...) We need to be aggressive because climate change is going to be very aggressive with the scenario."
>
> – Climate advocacy representative

> "All the extra medicine that was sent there [the Rio Grande do Sul tragedy], all the money that was spent on restoring and revitalizing the health units, what was spent on building the field hospitals (...), all this should go into a box called climate emergency or climate catastrophe, but that could be notified like this: 'Boy, that cost our pockets a lot!' Look, how much does it cost for public health? How much did it cost people's lives? How many people lost everything? How much aid will the government now have to give each person who manages to get back on their feet?"
>
> – Health advocacy representative

> "When we do a study that demonstrates the economic issue (...) of the impact on GDP, on public spending on health, (…) this will help to understand [climate impacts]. You need a very systemic approach. (...) I have no doubt that the discourse always ends up going through the economic side, alongside the costs [of inaction] that this has for society. (...) Knowing what the cost of inaction is – which is much higher than the cost of these actions."
>
> – Climate think tank representative

Some interviewees emphasized the importance of **communicating the avoided health costs from climate solutions**.

> "The cost, the cost avoided, the cost of hospitalizations, the cost of rebuilding, the cost of lost productivity due to premature death or permanent disability, has to be priced. (...) How many years of productive life does event X cause in population Y due to this factor? This pricing thing is a guideline for public policies. It won't work if there's no price."
>
> – Academic expert on health

The interviewees suggest communication approaches **highlighting innovative solutions** to make it tangible how tackling climate challenges and adopting a sustainable economy are advantageous for different segments of society, including generating jobs and business opportunities.

> "I think communication is fundamental. (...) To show that reforestation and renewable energy generate jobs, income, and business. [Make known] that the most efficient digital solutions are better for companies, in other words, showing concrete proposals [indicating] that the company will improve its performance, (...) will have a long life because it is restoring the environment. (...) It's time for us to show that the economy can be regenerative, inclusive, and, at the same time, remunerate capital."
>
> – Climate think tank representative

3.5.1.3. Strategic mobilization and efficient communication to influence policies, broaden the debate, include new actors, and increase social pressure

Unbelieving that the political class, especially in the National Congress, will, on its own, promote the changes needed to integrate climate and health policies better, many interviewees point to the **need to strengthen strategic mobilization, communication, and engagement with target audiences capable of reinforcing the social "pressure cooker"** so that climate mitigation and adaptation measures gain weight in the formulation of integrated public policies. Many advocate greater synergy between climate and health advocacy representatives on the integration of agendas. Others advocate mobilizing and building relationships with actors involved in related agendas, such as health professionals, family farmers, and members of social movements such as youth and peripheral movements, among others.

The interviewees highlighted the importance of **strategically selecting these target audiences and building relationships with and between them**, emphasizing the importance of effective and engaging communication to strengthen social participation and drive integrated policies.

> "It needs a lot of unity and a process of convincing professionals, public managers, society and the press. We have to quickly structure the country in various sectors, including health, to deal with a reality that is absolutely new but has already arrived. It's not a future issue. I think the fact that we are already seeing the climate impacts helps us along this path, but that alone is not enough."
>
> – Ministry of the Environment and Climate Change representative

> "I think the revolution is going to be made by those who are outside the debate today and are going to enter the discussion. When family farmers enter the debate, they revolutionize the agenda. When the areas of health, medicine, and medical research join the conversation, they are the ones who raise the level of the debate and the ownership of the debate for the area of health. It's about bringing them onto the [environmental] agenda or bringing the [environmental] agenda to them. Of course, this alone won't

> resolve the issue. But if you create the urgency, the pressure, the narrative, it will pave the way."
>
> – Climate advocacy representative

Some interviewees stressed that social pressure from a mobilized and well-informed society is an essential and effective tool for **pressuring governments and parliamentarians to make changes in the community's interests**. The forms of pressure can change according to those in power's commitment to change.

> "Engagement can be pressure. It can be collaboration. There are several ways to engage. When the government is more responsive, you collaborate. When the government is less responsive, you apply pressure. It will depend on moods and this sense, this awareness that this is an urgent issue."
>
> – Ministry of Finance representative

> "Society has to be involved. It's the driving force, whether it's the sectoral areas or the legislature. (...) It's motivated by demands, by experiences, by perception, but also by information. (...) The pressure cooker does work, and we are experiencing the pressure of tragedies. One after the other (...)."
>
> – Ministry of Health representative

> "Online pressure has a big impact, whether it's through petitions, direct pressure tools on parliamentarians, the way it reverberates on the networks, because sometimes it ends up in the press, reaching families, it has a big weight. And nothing replaces the old street pressure, mobilization, and protests. (...) It's the main tool that society has."
>
> – Parliamentarian of the Chamber of Deputies - education

Some participants also highlighted the **role of the press as relevant in amplifying messages** that connect climate and health issues and contribute to increasing pressure for change.

> "What can move forward more quickly? We have to help bring the legislature and the budget into this agreement. (...) We've seen the mainstream media demanding this agenda of transformation, demanding this agenda of adaptation to climate change. I mean, at least part of the mainstream media, right? Because there is one [part of the media] that is still based on a very conservative view, but to a large extent, we have managed to make progress."
>
> – Ministry of the Environment and Climate Change representative

3.5.1.4. Trusted spokespeople, such as scientists, health professionals, and voters, are considered essential in communication

Many participants pointed out that **some spokespeople tend to be more persuasive** in influencing political decision-makers. These include **voters, health professionals, scientists, representatives of youth movements, and people directly affected by climate disasters**. In this sense, equipping these audiences with information and communication tools so that they can be influential messengers and communicate the impacts of climate risks on health more strategically is essential in the face of the worsening climate crisis.

> "The population needs to equip itself with the conditions, resources, and sanctions to be able to do something like this [take legal action against air pollution, as happened in England]. Physicians and health professionals must have the courage (...) to start this movement. That's why I think the health sector not only has the importance of knowing how to defend the policy, but it also has the importance of being the protagonist of this change."
>
> – Climate and health think tank representative

> "Human health is at enormous risk from climate extremes. We, scientists, must learn how to communicate much more with voters because they increasingly have to elect politicians who are very concerned about these climate risks, and then a majority of politicians in the State Legislative Assembly, in the City Council, in the National Congress, in Brasilia, will eventually implement [policies to address the climate crisis and its human health impacts]. (...) Voters should also demand that politicians respond to the global warming and climate emergencies."
>
> – Academic expert on climate

The electoral context was considered a strategic period for these spokespeople to make a difference and strengthen community building in defense of integrated health and climate solutions.

> "Thinking about the electoral context, there needs to be greater pressure from civil society for the climate issue to be more centralized in the debates so that the candidates are at least forced to think about it, even if it's to deny it completely, and then expose themselves in their entirety."
>
> – Parliamentarian of the Chamber of Deputies - education

> "We need health professionals who know about Planetary Health (...). [We need] A knowledgeable person saying [in a newspaper]: 'You have Dengue fever in the South, which you didn't have before, and that is related to climate change'. That person who has Dengue today will understand this relationship. And when they start to understand, it's the micro-actions that become macro because it's going to affect their vote. (...) Having our [the physicians'] power of speech is very important for these transformations that we hope will impact on the production of these climate policies."

– Health advocacy representative

> "We must increase informed social pressure (...). That means we need the participation of the whole of society. So that scientists can also talk to the public, and the big issues become topics of political discussion. (...) It's this ability to communicate with the general public and not be something so distant and complicated that you can't see a way out."

– Ministry of Health representative

The preparatory events for the Climate Conference (COP30) in Brazil were also considered strategic moments for integrating the climate and health agendas.

> "We are organizing the Brazilian symposium on health and the environment (...) By preparing it, we are connecting with all the other COP networks, bringing this health issue, and trying to implement it in any event that will take place. We are the health warriors for the COP."

– Climate and health advocacy representative

3.5.2. Educate stakeholders about the climate-health nexus and reduce silos between the areas to qualify the dialogue and advance the integration of agendas

In addition to the communication strategies already presented, the interviewees consider **education about the connections between health and climate to be fundamental for promoting cultural change in Brazilian society in the short, medium, and long term**. They point to the need to reduce silos between professionals and specialists in the areas of health and climate in order to facilitate integration and improve education with a systemic vision. Education on the climate-health nexus should be aimed at different audiences, such as press and health professionals, advocacy and social movement representatives, public service managers and technicians, and policymakers, among others.

Promoting dialogue between health and climate experts in workshops, structured spaces, or collaborative networks – to **exchange experiences and learn from each other** – was also mentioned as necessary. These meetings facilitate the systematization of integrated knowledge between the areas, generating content to be then disseminated through education strategies. They also help to create networks and reduce silos between areas.

> "In the long term, major structural changes need insistence and persistence. The best way to do this is for us to create an ecosystem of institutions, whether civil society organizations and/or academia, that are thinking and acting in this direction, producing knowledge and producing campaigns. (...) Many people need to be in this conversation. Many actors need to be involved. Let's join forces and cooperate in this process. It's absolutely fundamental."

– Climate think tank representative

The education – and broadening of the dialogue to improve the quality of the debate – of climate advocacy representatives on health and vice versa was also mentioned as essential by several participants.

> "What the climate can perhaps give to the health area is an extra urgency on the agenda, so that the health area itself has new allies, (...) gains an associated narrative that is still weak in Brazil, which is this issue of public health. (...) When I say that Dengue and Chikungunya cases are going to increase or that more houses are going to collapse and people are going to die, (...) this correlation is direct. (...) This helps you to enter the dialog, the list of importance of the people who make decisions in Brazil."
>
> – Climate advocacy representative

Some point to the concept of Planetary Health as an essential umbrella for establishing these interconnections in different educational contexts, whether in schools, universities, the business environment, or advocacy. They also emphasize the importance of talking about environmental racism and climate justice as guiding axes for change, intending to incorporate the fight against inequalities into the debate.

> "To use Planetary Health as an integrative subject in the curriculum, to take people who are [today] eight years old and in ten years' time, when they are entering the job market, they can opt or opt again [for professional choices] according to new values."
>
> – Academic expert on health

> "All our conversations today cross Planetary Health. We're talking about health here, but also about social issues when we talk about environmental racism, climate justice, climate refugees, and climate-affected people in the South [of Brazil]. (...) We, as family and community doctors, (...) [have] our race to put this [Planetary Health] training, even if it's for residents, into the undergraduate program, as another objective. There are already some courses."
>
> – Health advocacy representative

> "Education [on climate-health links] is an important basis for transformation. (...) It's important to change our training base for those who are just starting out in life. (...) School training and strategies in education are fundamental (...) for us to change certain misconceptions that we've had for decades about certain issues. (...) This has to do with structural environmental racism. (...) Most of the major tragedies affect the most vulnerable populations."
>
> – Federal government representative working on health

Many also pointed out that recent extreme events have an educational character. Some advocate incorporating risks and related issues into school curricula.

> "The facts are imposing themselves independently of our will. (...) The government has to sponsor the involvement of society, open channels for this participation to take place, and mobilize universities and schools to train citizens who are aware of the climate threat. It's a job that can be done from the classroom to the most elite spheres of debate."
>
> – Ministry of Finance representative

> "Changing the curriculum, for example, by incorporating risks, (...) I think is essential because people have to learn to think about it systematically."
>
> – Ministry of Health representative

> "It's important to invest in environmental education projects because it's a way of changing a cultural and generational view. Young people are growing up with a different perspective."
>
> – Parliamentarian of the Chamber of Deputies - education

Finally, interviewees highlighted the **importance of learning from the ancestral knowledge of the native peoples**, recognized for their worldview and the deep connection they have maintained for millennia as individuals whose existence is inseparable from the nature of which we are all part.

> "Working with Indigenous people is a way of getting to know what the [climate] impacts are in advance and what adaptations they seek about climate change."
>
> – Federal Government representative working in health

> "From our experience with Indigenous communities, (...) we hear a lot of this wisdom about not separating things into compartmentalized boxes. The health of the territory where they live is also the health of the community."
>
> – Representative of the Federal Public Prosecutor's Office

3.5.3. Systematizing data, generating indicators, and prioritizing interdisciplinary research on climate and health

Many interviewees mentioned as a strategy the production of more research, data, and indicators that connect climate and health issues in a multi- and interdisciplinary way, with the aim of **equipping public policymakers to make science-based adaptation and risk management decisions**.

> "Depending on the quality and the robustness of that study, it leads us to make a decision. This is an important aspect for us to be able to strengthen and guarantee the survival of public policies. Conditioning them on a good scientific basis is empowering institutions so that they can help design or implement policies efficiently."

– Federal agency representative - environment

Participants also recommend an effort to ensure that existing research and databases are better developed and connected to quantify climate impacts on health and other sectors, considering the specificities of different Brazilian regions, biomes, and realities.

> "The first thing [to improve policies] is information. We need disaggregated information and a database that can provide accurate information. (...) Another thing is to disaggregate these databases by population group so that we can see which groups are more exposed and which are more vulnerable. We don't have differentiation of everything by women, by race, by where they live, [with information on] whether they live on the outskirts [slums], whether they live in a [low-income] community. (...) If we improve the information, we can improve public policies aimed at the most vulnerable population."

– Federal agency representative - water and sanitation

To move forward, interviewees recommend increasing resources for research and mechanisms for making the results available and communicating them. They also recommend the measurement of risks, vulnerabilities, and impacts and the use of digital technologies and artificial intelligence. Additionally, they propose structuring scientific databases and information systems that are accessible – to society, advocacy representatives, technical teams from public bodies, and decision-makers – that are capable of ensuring the cross-referencing of data and information for the construction of regionalized indicators and the subsequent monitoring of the efficiency of the actions implemented.

> "We must unite research and science with the public service agenda."

– Ministry of the Environment and Climate Change representative

> "To formulate public policy, you have to have knowledge, you have to have indicators, you have to have science, and you have to have digital tools today because there is no human being who can organize all this objectively. And you have to turn this into practical, concrete information in order to formulate actions."

– Climate think tank representative

> "When you have the data, you increase your ability to talk to decision-makers and society in general. Without the data, you'll be left speculating. There's no point in just saying that the scenario is going to get worse without the concrete data."

– Climate advocacy representative

Some interviewees mentioned strategies such as more significant investment, improvements, and advances in data management and the production of indicators in existing systems, such as DATASUS and the AdaptaBrasil platform, to make climate impacts on health and different sectors more tangible.

The AdaptaBrasil platform (see more in topic 3.4.7) is considered by some participants to be a strategy for integrating vulnerability metrics and calculations related to climate change mitigation and adaptation. Using data facilitates the promotion of coordinated actions at national and local levels involving financial institutions, municipalities, companies, and universities.

> "Financial institutions are using [the AdaptaBrasil platform] for risk issues. The Central Bank has sought it out (...). Some municipalities are looking for [AdaptaBrasil], and some are already drawing up Adaptation Plans based on the platform (...). Some universities are looking for it, even for undergraduate courses, to show people how you calculate vulnerability."
>
> – Federal government representative working on climate

Some interviewees also pointed to the training of professionals who feed the databases, such as health professionals. The suggestion is to create robust tools and systems capable of cross-referencing databases, facilitating the analysis of connections, and transforming data into relevant information to inform decision-making and communication.

> "Science needs to advance much more in research and in adaptation and improvement. (...) How can we train the health system to know the cause of death or the cause of the risk of disease, saying that it was the heat wave that started it? The entire Brazilian health system needs to be trained in this direction. This is a climate change adaptation policy which, if it doesn't grow within the health system, will remain a letter written in a government policy, but it won't be effective because it won't really know what's going on. This is an example of policies that need to make a lot of progress, both in health and in the climate field."
>
> – Academic expert on climate

3.5.3.1. Science must play a greater role in formulating policies

Another point highlighted, including by the academic participants, refers to increasing the role of science in policy formulation. This also involves the need for Brazilian research institutions to mature. Among the proposals, in addition to the practice of interdisciplinarity, is the adoption of the concept of "implementation science", which, based on a partnership between science and politics, can bring practical solutions adapted to the reality of cities. Today, municipalities account for 86% of the population in Latin America, consume 78% of energy demand, and are at the scene of profound inequalities.

> "The [research] question has to come from the public service. It's not advisory. There has to be a creative process, co-ideation, and co-production with execution, and you have to have two outputs: 1) policy, the political part has to generate policies or practices. It can be redesigned, it can be the creation of policies that can be implemented; and 2) science, which has to generate [scientific] articles."

– Academic expert on health

Another proposal to increase the role of scientists in formulating public policies involves the **implementation of "responsible advocacy" by scientists**.

> “We have to play a responsible advocacy role. What does that mean? It's not advocacy linked to private interests, personal interests, or the political interests of political parties. It's responsible advocacy to save the planet and even save human life. (...) It's showing the risk, for example, of epidemics and pandemics that climate change itself can greatly accelerate on the planet.”
>
> – Academic expert on climate

3.5.4. Integrating climate and health more effectively in the federal government through an integrated approach involving different levels, agents, and sectors, with centralized leadership

To move towards the ideal of integrated country planning and management (economic, social, and environmental), with the incorporation of interconnected climate and health policies, the interviewees recommend various strategies. These include 1) the development of mechanisms to expand intersectoral dialogue, with increased capacity for articulation, cooperation, and collaboration between and within agencies and ministries, with bi- and multilateral meetings; and 2) the articulation between federal, state, regional, and municipal governments, with **centralized leadership to promote a country pact that moves in the same direction as building greater resilience to the climate emergency**.

> “It has to look at the country's development macro-policies as a whole, integrated into a development strategy for the country. (...) For this, the Ministry of Planning should really play a much more important role. What is its role? Its job is to take a harmonious look at the country's development policies, which will have an impact on climate change, health, and so on. (...) If we look at sub-sets, whether it's health or climate change, without looking at the bigger picture, we end up taking a short view.”
>
> – Academic expert on climate

> “We are a country with profound social inequalities, real environmental and economic asymmetries, and we have to fight in the short term to accelerate the well-being of the Brazilian population. (...) This achievement of well-being involves nature, access to natural resources, the development process, access to education, public health, and feeling safe in prevention and safe when you have to react and deal with the climate emergency. So you'll have to sort this out. [Define] the governance model and the national model, not just the federal government. It's [defining] what agreement will be made with the governors of this country and their representatives. How will you discuss this in Congress and refute it in the [state legislative] assemblies?”
>
> – Climate advocacy representative

Many interviewees pointed to the **need for a systemic and transversal vision on the part of the federal government to advance policies**. One interviewee suggests incorporating Planetary Health into the legal framework of the National Climate Change Policy as a strategy for greater integration between health and climate.

> "Adapting all of these policies to fit within the legal framework. This could be a strategic path that establishes decision-making and priority governance by the ministries. I think that for me health and the environment are the most important aspects of the governance of this Planetary Health policy. I see an agenda for Planetary Health that is very effective and has robust governance."
>
> – Climate and health advocacy representative

Some participants stressed the **importance of drawing up public policies in a participatory way**. They suggest engaging organized civil society organizations – including vulnerable social groups – through structured mechanisms and channels for public consultation and dialogue. They also recommend strengthening deliberative and parity council representation. This includes national, state, and municipal councils created since the late 1980s and the resumption of sectoral plans and major national conferences such as those on Health, the Environment, Social Assistance, and Education. In the opinion of some interviewees, public policies will be more solid and adherent if they incorporate the real demands of society.

> "The communities need to be heard, the population. Politicians need to express what this population is saying because they are the ones suffering the impact of climate change. They are struggling to access the health system. The lack of access is a central issue (...) Often politicians don't listen."
>
> – Federal government representative working in health

The participation of experts in the councils was also highlighted as an opportunity to qualify policies.

> "Experts create much more solid public policies that (...) will look at these demands from society, such as wanting a healthier environment, clean water, healthy food, climate comfort, climate security, and air that people can breathe. This integration of public policies, which are also built in a participatory way, has an enormous capacity for transformation."
>
> – Federal agency representative - environment

The **systematization of successful experiences, initiatives, and policies, in which integration, collaboration, and cooperation between the different areas of government worked**, was another recommendation from some interviewees. One example, at the federal level, was the case of crisis rooms to deal with emergencies resulting from extreme events. **Successful initiatives at the state and local level, which can be scaled up and adapted to other realities**, were also mentioned as a strategy for the federal government. Finally, given the complexity of Brazil – a country of continental dimensions and different realities – some participants recommended **promoting territorialized policies**.

Among the examples of local success stories mentioned is that of the river hospital boats in the Amazon, whose initiative started with one boat, from the articulation initiated by a local civil society organization, with international resources, and today has become a public policy of the Unified Health System, with a hundred boats in operation.

> "I'm very much in favor of starting by choosing a territory and directing the action so that an effective policy is made in that single territory. From there, [the suggestion is] to advocate for all the other territories, starting in a metropolitan region, encompassing other cities, moving across the state, and, in this way, we expand. (...) Start locally, and this policy, once implemented, and, above all, metricizing the improvement of health in the surroundings. [Then] expand to become a national guideline perhaps."
>
> – Climate advocacy representative

> "What works are practical, low-cost, high-impact results, adapted to the local context and replicable on a large scale."
>
> – Climate and health advocacy representative

3.5.5. Fiscal and tax revision, increased funding, mobilization of funds, and sanctions for polluters

In addition to mobilizing and strengthening existing funds, such as those mentioned in section 3.4.7, the participants recommend reviewing fiscal policy, tax, and revenue rules, and the federal budget to prioritize investments in health and adaptation to climate change at the national, state, and municipal levels. This also involves **more effective oversight of the use of public resources, improvements in the distribution of existing resources, and the fight against corruption**. It also involves the mobilization of society to press for funds earmarked for parliamentary amendments to be directed, for example, toward equipping and professionalizing state and municipal civil defenses, training public managers, and increasing the resilience of the health system in the face of the climate emergency. At the federal level, many mention the need for greater public health, research, and disaster monitoring and prevention investment.

> "The first thing we have to do is calculate how much this whole mess is going to cost the country in terms of climate. (...) 'For us to deal with this problem, it costs so much, and what are we going to do? Where are we going to get this money? What are we going to stop investing in? How are we going to deal with this situation?' When you throw it into the real world of public management, the size of the problem is [still] on the side of the debate."
>
> – Climate advocacy representative

Another strategy mentioned by some interviewees was to increase revenue through mechanisms already provided for in Brazilian environmental legislation for **compensation for damage caused to the environment, based on the 'polluter-pays' principle**. Some of the participants recommend the development of pricing actions

and the creation of taxes, fees, and sanctions – including increased legalization, if necessary – for those responsible for greenhouse gas emissions and their effects.

> "Oil companies should pay into a fund to take care of the people who are being affected [by the impacts that] their pollution is causing. So there are a series of tax rules that can be imposed."
>
> – Climate advocacy Representative

> "One of the things that could help would be the pricing of air pollution and sanctions based on pricing. (...) Another issue would be to bring economic benefit to everything that is produced by reducing greenhouse gas emissions and toxic pollutants. (...) An electric car should be much cheaper than a car powered by diesel or gasoline or alcohol, for example, and it's not. Today it's more expensive."
>
> – Climate and health think tank representative

> "The problem is not the lack of data, but interpretation. The use and valuation [of natural resources and ecosystem services, including air quality] is not just by money but by principles. (...) If you don't straighten it out, he [the polluter] will suffer the consequences. (...) I think there may be hope there. You [a company] can't do something absurd environmentally without someone going there, denouncing it, and [the company] having to explain itself and losing money, going to jail on the New York Stock Exchange and losing, I don't know how many billions of dollars in shares."
>
> – Academic expert on health

> "Some economists say that there's only one thing that would change everything: it's a tax on the environmental and social footprint. If you change the ratio of this tax, instead of encouraging and subsidizing the mass production of unsustainable products, you say, 'No, the product that has a social or environmental footprint will be taxed more.'"
>
> – Climate and health advocacy representative

3.5.6. Persistence, collaboration, diversity, and courage are the keys to overcoming barriers

Even with a critical view of the current unpreparedness of the country and the world in the face of the magnitude of the challenges of dealing with the climate emergency, most of the interviewees believe that it is **possible to find common points of dialog and minimum consensus in the country** to promote a cultural change, broaden the perception of risks, create a sense of urgency, and formulate and implement efficient, integrated and participatory policies. They emphasize the importance of biodiversity in the Amazon, the Cerrado, and other Brazilian biomes and the capacity to reduce Brazilian emissions with strategic political decisions.

There is a general perception that 'throwing in the towel' is out of the question and that it is still possible to find alternatives to **set and achieve ambitious adaptation and mitigation goals**. To this end, they consider the interconnection between climate and health powerful. They recommend strategy, persistence, resistance, determination, and courage to overcome the barriers. They also advocate **building networks to strengthen collaboration and dialog between different stakeholders and social groups** that are acting in the search for solutions in various territories (community building).

Some participants also stressed the importance of increasing representation in decision-making spaces.

> "I translate the [necessary] change into a photo. The day that the official photo of the COP events, the climate finance events, the senators and deputies are diverse, the day that these photos represent as much as possible the diversity that we have, from then on, we will change the structures. I have no doubt that the next day, the political decisions will be different and that many of the challenges will be much easier to solve because they will become a priority for many people. So, we need to work on changing this official photo. (...) Together, everyone can really make this systemic change. (...) We cannot underestimate our power and our influence."
>
> – Climate advocacy representative

> "If we want to sit down calmly, stop playing games, and start an agenda where health does play a role in climate security, then we will start getting other actors in the room. You will also start to give populations and various societies a chance to see the climate crisis with its alternatives, to have the need to be resilient and to adapt, but also to have the need to be able to have alternatives to plant better, eat better, etc. And therefore dealing with trauma in a different way. I think this will be a society less exposed to risk, and I hope a less traumatized society."
>
> – Climate advocacy representative

4. Summary and potential implications

The vast majority of participants feel that health and climate are very little connected in the formulation of public policies in Brazil and should be much more connected in the national context. They note opportunities and trends to increase policy integration and raise awareness about the links between climate and health and the associated risks. These include: taking advantage of Brazil's strategic strengths for a regenerative economy and decarbonization, as well as new forms of financing, information, and technologies that are emerging; expanding intersectoral dialogue; benefiting from COP30 being held in Brazil; taking advantage of the lessons learned and knowledge acquired from the extreme weather events that have recently hit the country to plan future prevention and adaptation actions; and taking advantage of the wide coverage range of the Unified Health System to expand the interconnections between climate and health throughout the national territory.

However, the participants listed a series of barriers that prevent the integration of climate and health, such as political issues; lack of information, knowledge, funding, dialogue, and technical capacity; silos between public bodies; limited and/or poor distribution of resources; political polarization and defense of vested interests by privileged groups for economic reasons; and lack of integrated country planning.

To overcome these obstacles, they suggest a variety of strategies and recommendations, such as innovative financing mechanisms and educating different stakeholders about the climate-health nexus – which also helps to increase social pressure from activists and policy advocates on governments and parliamentarians. They also suggest bringing health, climate, and other human rights advocacy agendas closer together, speeding up the production of research and cross-referencing of data on the impacts and solutions of climate on health and vice versa, and expanding dialogue and optimizing the efforts of and between federal agencies and ministries. Several communication strategies were mentioned, including a narrative based on data capable of showing that climate is a public health problem, choosing credible spokespeople, such as scientists and health professionals, and broadening communication between academics, policymakers, and society, in general, to advance policies, among other tactics.

Potential implications for presidential leadership and staff

Participants expressed the need for integrated country planning and robust governance capable of promoting efficient political coordination and ensuring that all sectors and ministries move in the same direction, considering the fight against the climate crisis as a priority. Some pointed to the climate issue as geopolitical and economic and emphasized the country's aptitude in protecting its biodiversity and its ability to reduce emissions while at

the same time promoting the country's development with social inclusion and combating inequalities through the energy transition and the restoration of biomes.

Many have mentioned that the Ministry of the Environment and Climate Change, which is currently leading the work to revise the Climate Plan and the National Adaptation Plan, does not have the necessary strength to ensure that climate issues are mainstreamed across all spheres of government.

To overcome this limitation, they recommend that the Presidency of the Republic adopt the necessary measures to ensure the reduction of greenhouse gas emissions, the fulfillment of its commitment under the Paris Agreement, and the creation of a preventive adaptation plan in defense of life in its different forms and the well-being of the population.

They consider it essential, in this direction, to provide leadership for multi-agency, multi-sector, and multi-level coordination involving states, municipalities, and the legislative and judicial branches, as well as a firm hand to combat the defense of vested interests by a minority in favor of short-term profit, to the detriment of the interests of the majority of the population and the medium and long term.

Among the suggestions is the establishment of measures capable of combating the climate crisis, with the concepts of Planetary Health and One Health as the guiding principles, and promoting the reduction of inequalities, the fight against deforestation, the strengthening of command-and-control measures, and the fiscal and budgetary review, prioritizing prevention measures, disaster risk management and the protection of life.

Measures such as strengthening social participation in decision-making and systematizing lessons learned from successful experiences in inter-ministerial integration should be considered in planning. They also commented that the Presidency of the Republic should help coordinate climate and health initiatives between federal agencies, overcoming the challenge of historically established power silos.

Opportunities such as the COP30 in Brazil should be seized to put Brazil on another leadership level in the international climate debate. The interviewees also pointed out that lessons learned from the loss of life and economic damage caused by extreme events such as the floods in Rio Grande do Sul and the historic drought in the Amazon should be taken into account to guide integrated planning.

Potential implications for the National Congress

Barriers to progress on climate and health policy identified by the participants included opposition among most conservative members of the National Congress and political polarization. They also mentioned corruption and the actions of members of Congress who legislate in defense of the vested interests of a privileged minority in certain sectors – mainly on the part of the so-called “ruralist caucus” and oil exploration advocates – to the detriment of the general interests of Brazilian society. Many interviewees also mentioned the persistent attempts by most members of Congress to weaken, dismantle, and roll back environmental policies already established in the Brazilian legal framework, especially in recent years. In addition, they point to the lack of preparation, lack of knowledge, unwillingness to engage in dialogue, and the defense of interests that run counter to disaster prevention, mitigation, and climate change adaptation policies.

The three parliamentarians interviewed – out of the 20 who were contacted for this study – admit that the connections between climate and health issues are not on the agenda or priorities in the National Congress. To reverse this situation, most participants suggest reducing the gap between science and policymaking by expanding research and providing data, information, and evidence that demonstrates, in practice, the impacts of climate change and environmental degradation. These impacts to be measured occur not only in the health sector but also in the economy, agricultural production, infrastructure, and other strategic sectors such as energy, transportation, and basic sanitation.

Finally, they recommend expanding intersectoral dialog and multilevel political consultation (Union, States, and Municipalities), as well as between the Executive, Legislative, and Judicial branches.

We invited several conservative politicians to participate in this study, but none agreed to be interviewed. This refusal in the Senate and the Chamber of Deputies reflects what many participants pointed out as denialism and the consequent lack of willingness to engage in dialogue on environmental, climate, and health issues in the National Congress. More details are available in topics 3.3 (Barriers) and 5 (Limitations).

Potential implications for federal agencies

The participants stressed the need to expand intersectoral, inter-, and intra-federal agency dialog to integrate climate and health issues better. They pointed out that there are silos of power and attributions that need to be dissolved to enable cross-cutting actions. This helps to avoid overlapping or duplicated efforts, expand cooperation, and optimize the use of public resources.

Another proposal involves holding bi- and multilateral meetings as an alternative to increase synergies between existing programs, plans, and actions and to set up new mechanisms that may be needed.

In the interviews conducted before September 2024, when the federal government announced the creation of the Climate Authority, participants already pointed to the need for centralized governance capable of fostering this connection between federal agencies working in the environment, climate, health, sanitation, or related areas.

The production of studies by agencies to support decision-making and the training of career civil servants on the interconnections between climate and health were also suggested. There is also a recommendation to share data between the various actors and to build common consultation platforms with better integration of data and the provision of information capable of supporting decision-making.

There is also an indication of the need to systematize lessons learned in the last times when there has been greater integration between different agencies and public bodies to resolve emergencies resulting from extreme events. One successful example mentioned was the crisis rooms set up during extreme events in the country, such as the Rio Grande do Sul flood in 2024 and the São Francisco River drought between 2013 and 2015. In these two cases, multisectoral and multilevel meetings took place periodically, and each agency and public body contributed collaboratively with joint and integrated solutions. The participants recommend this integration becoming routine among public bodies and promoting unity between different sectoral policies in the face of the worsening climate crisis. To this end, the suggestions are to create protocols and response manuals with defined attributions and responsibilities for integrated prevention and planning measures.

There is also a recommendation for an internal review and modernization of the agencies' structures and organization chart to promote more systematic planning within federal public bodies, as well as a recommendation to strengthen councils to draw up policies in a participatory manner.

Potential implications for subnational governments and municipalities

Although this report focused on national-level policies, the findings still revealed important considerations for regional policymaking. The impacts of climate change occur in territories and affect people and ecosystems in different ways, depending on the region of the country and demographic issues such as income, gender, social class, housing conditions, ethnicity, and race, among others.

In this sense, decisions made at the regional, subnational, state, and municipal levels are critical to exacerbate the climate crisis and adaptation measures. Many interviewees mentioned the low technical capacity of municipal and state managers as an obstacle. They recommended that these public agents be qualified to take the lead in the search for local and regional solutions.

Potential implications for the health sector

For the health sector, the participants recommend greater integration, dialogue expansion, and information exchange with experts in the climate field and other related segments, such as sanitation. They also suggest deepening knowledge and systematizing data on the harmful effects of climate change on human health – in terms of loss of life, for example – as well as the health benefits of combating the climate crisis, including economic benefits.

The participants recognize the enormous potential of the Unified Health System (SUS) due to its wide coverage range and scope as a system capable of integrating climate and health issues and multiplying information throughout the national territory, considering the differences and cultural and regional specificities of this country of continental dimensions. To this end, they recommend improvements in the notification of climate-related diseases, which are currently underreported in the SUS. In this sense, they consider it essential to continuously train health professionals, including in training courses that incorporate concepts of Planetary Health and One Health, so that they can act as reliable spokespeople, multipliers of information, and effective notifiers. This improvement in the reporting process will allow for a better understanding of the relationship between climate variables and the health of the population, facilitating the adoption of preventive measures, as well as the creation of policies adapted to local realities.

In addition, they point to the need to strengthen integration between environmental surveillance and other sectors and departments within the Ministry of Health. Coordination between different areas can provide a more agile and comprehensive response, with a focus on prevention rather than treating diseases, which includes the early identification of risks and the implementation of strategies aimed at reducing exposure to adverse environmental factors.

They also recommend facilitating the cross-referencing of data in DATASUS and amplifying epidemiological information networks to ensure that correlations showing health problems related to climate issues such as heat

waves, floods, droughts, forest fires, and an increase in vector-borne diseases are accurate, better explained, and helpful in supporting the formulation, implementation, and adaptation of policies.

Finally, there is also the suggestion of a greater focus on adapting the SUS infrastructure to deal with the implications of climate change, as well as improved monitoring of the impacts of the Unified Health System itself (and the health sector as a whole) on greenhouse gas (GHG) emissions, with a view to more effective mitigation measures.

Potential implications for the environment and climate sectors

Stakeholders in the climate and environment sector were advised to increase their understanding of the impacts of climate change on health and to increase their engagement with stakeholders in the health sector. The participants advocate that broadening the dialogue between the climate and health areas contributes to strengthening both agendas in the national context and recommend as imperative that the climate sector adopt a strategic, narrative, and communicative approach to establish the interconnections between the two areas in a simple and accessible way, with less technical jargon.

Firstly, they believe that clearly communicating the links between climate and health is a powerful strategy for making the impacts tangible, stimulating behavior change, generating a sense of urgency, broadening the perception of risks, and bringing the climate crisis closer to people's reality. With this, it is possible to overcome the limited view that the climate crisis is a 'distant' problem, physically and temporally, demystifying the idea that it only affects polar bears, trees, or the golden lion tamarin. They emphasize that this communication must go beyond academic language and be translated into contexts understandable by the various stakeholders, ensuring that the general population and decision-makers can understand the importance and urgency of these interactions and effectively engage in promoting solutions.

The participants also recommend that communicating the economic damage caused by climate impacts as well as the benefits, including economic benefits, of climate solutions for health and other sectors should be a priority and that presenting this data in a concrete and impact-oriented way can help build a solid basis for social and political mobilization. Selecting strategic target audiences and including new actors in the debate are desirable steps to increase social pressure as a device capable of influencing governments and parliamentarians in favor of changes that serve collective interests.

Recommendations also include educating stakeholders about the link between climate and health, making it possible to qualify the dialogue and advance the integration of agendas. The systematization of data, the generation of precise indicators, and the prioritization of interdisciplinary research are fundamental to a more in-depth understanding of impacts and solutions. In this context, they emphasize that science must play a more proactive role in policymaking, supported by fiscal and tax revisions that guarantee increased funding, mobilization of funds, and effective sanctions for polluters.

Many of the recommendations for the health sector also apply to the environment and climate sectors. Many of the recommendations for the health sector also apply to the environment and climate sectors. Finally, there is the recommendation to advance intersectoral dialog, taking advantage of spaces that have already been created, such as the one set up to review the Climate Plan. However, this dialog must be supported by robust governance capable of overcoming the current limitations of the Ministry of the Environment and Climate Change in driving

the climate issue across the board to the point of influencing the agendas of other ministries. These include the Ministry of Mines and Energy (including the expansion of oil and mining exploration), the Ministry of Health, the Ministry of Infrastructure, and the Ministry of Transportation, among others.

Potential implications for the advocacy sector

Structurally, the findings show that the main strategic objectives include changing the political representation in the National Congress – by electing leaders who support climate and health policies – and denouncing the lack of alignment in Brazil's planning to move toward reducing emissions and the energy transition. The objectives also include defending the reduction of inequalities and effective risk prevention and adaptation policies to build a country more resilient to the climate emergency, as well as combating the hegemony of those who want to maintain the status quo and vested interests.

Our findings indicate that public pressure from social and grassroots movements and the development of campaigns promoted by non-governmental organizations influence public policymakers' decision-making at the national, state, and municipal levels, especially when they gain attention from the Brazilian press.

However, in general, there is still a mismatch between the agendas of the environment, climate, health, and other social causes and those linked to the defense of rights, such as gender, race, ethnicity, youth, and the slums (people living in deprived conditions).

The recommendations to overcome this barrier call for greater understanding, articulation, and rapprochement between environmental, climate, and health advocacy representatives, with the building of dialogue, a sense of community, and coalitions capable of promoting the mutual strengthening of agendas and the expansion of popular pressure. As a result, competition for attention in the public sphere of debate reduces, and the ability to influence political decision-makers increases. It is also recommended that people vote consciously to increase representation and elect politicians who are committed to life and to environmental, climate, and health issues.

Another suggestion is to prioritize strategic, evidence-based communication to create messages and campaigns that explain climate impacts on human health and the public health system and to include messages that show the positive effects, including for the economy and other sectors of society, of prevention, mitigation and adaptation actions in the field of climate and health. Among the most impactful tactics mentioned were activism on social networks to increase pressure and stop agendas for environmental and climate setbacks and the defense of equal rights in the National Congress.

Choosing reliable messengers, such as scientists, health professionals, and voters, to convey messages about climate and health to political decision-makers, choosing strategic target audiences, and adapting messages to adhere to stakeholders' different interests and values are also recommendations for the advocacy sector.

Potential implications for researchers and academics

The participants point to the need for more research that quantifies the impacts of climate change on human health, as well as the economic costs related to climate impacts on health and other areas such as agriculture, infrastructure, transport, energy generation, and water management, for example. They also recommend measuring the benefits and cost savings resulting from climate solutions. They believe that making the impacts

and risks tangible, in terms of data and information, is essential to support the formulation of public policies and encourage public debate.

The interviewees also point to a growing interest in interdisciplinary research connecting climate and health issues, especially at renowned research institutions in the country. They suggest encouraging this research through funding from government agencies or the private sector. They also pointed to the need for Brazilian research institutions to mature and embrace interdisciplinarity.

Scientists are also recommended to play a more significant role in formulating public policies. To this end, participants suggest that academic researchers adopt a stance in line with what one interviewee called "responsible advocacy". Another participant recommended the adoption of the concept of "implementation science" to work in partnership between science and politics to provide practical solutions for adapting cities to the worsening climate crisis. There was also a recommendation that research should encompass the lenses of Planetary Health and One Health in order to advance the interconnections between climate, human health, and the protection of all forms of life.

In addition, there is a recommendation that academic researchers also improve their ability to communicate not only with the political class but with society as a whole by "translating" technical terms and jargon, bringing academic findings closer to the reality of people and voters.

Finally, to move forward with the developments of this qualitative study carried out through in-depth interviews, we suggest other more in-depth, comprehensive, and quali-quantitative investigations to examine the opportunities for climate and health policies at the subnational, regional, state, and local levels, as well as research into the role of different social actors – such as representatives of Indigenous groups, young people, health professionals, educators, and the press, to name but a few – and other representatives of the Three Branches of Government: the Executive, Legislative, and Judiciary. With this, it would be possible to advance, for example, analyses of the growing demand for action by the Judiciary in processes to defend the rights to climate justice and intergenerational justice.

Potential implications for communicators and the press

Communication on the interconnections between climate and health issues is considered strategic for Brazil, especially in a context of political polarization, the defense of vested interests, structural inequalities, denialism, fake news, and the worsening climate crisis. The interviewees mentioned that, in this direction, it is essential to amplify news and provide information based on technical and scientific data to help different stakeholders make decisions.

They also stressed that the press has a fundamental role to play in this direction and that journalists need to be prepared to incorporate these interconnections into their agendas in different sections, whether covering disasters or encouraging and demanding preventive and adaptation measures.

In addition to official data, scientists, representatives of think tanks, civil society organizations, and people affected by disasters must also be heard and have their voices and messages amplified. A systemic vision in journalistic coverage and communications by different actors in their social networks is also considered essential. Finally, investments in public communication and data transparency on the part of public authorities were pointed out as

extremely important for communicating the impacts of climate on health and other sectors, as well as the benefits of mitigation and adaptation actions for the economy and for preserving life and promoting well-being.

Potential implications for members of the justice system

With the worsening climate crisis and in the face of public policies considered "not very normative", several interviewees pointed to the importance of the role of members of the justice system in ensuring rights related to the health, well-being, and survival of different forms of life, including humans. The increase in the judicialization of cases defending intergenerational, climate, and environmental justice was pointed out as a trend in the country. This is happening especially due to attempts by the National Congress to make Brazilian environmental legislation more flexible and projects to expand oil exploration in the country – which contributes to increasing greenhouse gas emissions that aggravate global warming and generate a great deal of urban pollution due to the use of fossil fuels. It is also due to the advance of deforestation and burning in already threatened biomes that are fundamental for regulating the climate, protecting biodiversity, and sustaining life.

The role of the Federal Supreme Court was highlighted as extremely important in ensuring constitutional rights related to health and the environment. One example considered successful was the STF's role in 2022 in the so-called "Green Agenda" or "Green Package". In this judgment, four of seven lawsuits involving problems relating to Brazilian environmental management were decided to favor nature conservation, increased monitoring and prevention of environmental crimes, measures to mitigate greenhouse gas emissions, and combating the climate crisis. Some interviewees also stressed the importance of members of the justice system at the state and municipal levels, including the Public Prosecutor's Office, in defending rights relating, for example, to flawed environmental licensing processes and the attribution of responsibilities.

5. Limitations

This study involved significant efforts to contact various stakeholders in climate and health policies. Extensive recruitment was carried out, covering seven different sectors, resulting in 82 invitations being sent to potential interviewees. The largest number of invitations went to the Federal Government (21), followed by the National Congress (20). Nine invitations were also sent to the Advocacy sector, seven to representatives of Think Tanks, and five to academic experts. Federal Agencies received five invitations, and the Subnational Government received one invitation. 33 of the 82 invitations agreed to participate in the study.

A notable limitation of the study is the low participation of parliamentarians, especially from the conservative wing. The refusal of many parliamentarians, who play vital roles in formulating public policies, may indicate a lack of interest or a solid unwillingness to discuss climate and health issues, which are of great relevance and urgency for the national political agenda. This bias may have led to the exclusion of essential perspectives, given that the participants who accepted the invitation may have a more favorable view of climate and health policies than those who chose not to participate.

6. Conclusion

A vast majority of stakeholders in climate, health, and climate-health policies consider that climate and health are still poorly or not at all integrated into Brazil's national policies. They believe that the country has a lot to gain from this integration, including maximizing the health benefits of climate policies as well as the climate benefits of health policies. They also highlight the direct influence of the climate crisis – and also of climate solutions – on the health of the entire Brazilian population, as well as on other strategic sectors of the country.

Although the participants in this research identified a number of relevant barriers to policy integration, they also identified many opportunities and strategies to overcome these barriers and move toward the integration they considered ideal. We believe these findings have relevant implications for diverse communities interested in advancing climate and health policies in Brazil – including federal policymakers, researchers, and representatives from the climate, health, and advocacy fields. We hope that all those involved in these sectors will carefully consider the findings of this study.

7. Methods

The methods used in this research were defined together with the partners in the other countries, adapting them to local specificities.

7.1. Selection

In order to create a relevant sample of participants in this research who would be central to the health and climate policymaking ecosystem, we recruited individuals who met the following main criteria:

- Currently works or has recently worked in the formulation or implementation of climate policies, health policies, or climate and health policies at the federal level in Brazil.
- You currently work or have recently worked in academia, or as a policy advocate or for the federal government of Brazil, or as a legislator in the Brazilian National Congress, or in a think tank.

We also recruited individuals who work on policies that are strongly relevant to climate and health, such as the economy, transportation, the environment, agriculture, energy, housing/urban development, and disaster prevention and response. Additionally, we included representatives from the Federal Prosecutor's Office and subnational government.

We recruited potential participants by sending e-mail invitations to personal contacts of our research team, followed by follow-up telephone contacts; also through the snowball technique (i.e., asking participants for recommendations of other individuals who could potentially be interviewed) and by identifying individuals with relevant expertise through searches on Google and LinkedIn.

Figure 1 shows the distribution of interviewees by sector of activity, and Table 1 shows the distribution of interviewees by sector and area of activity.

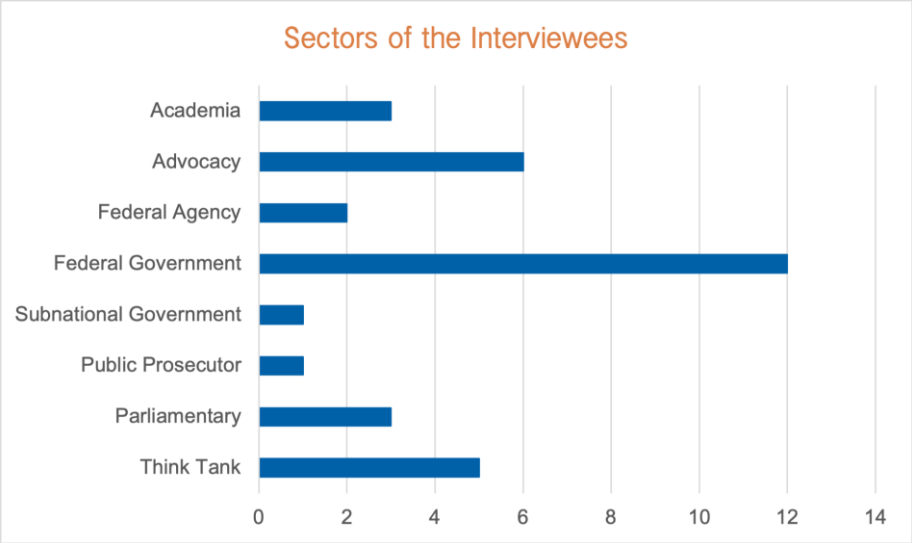

Figure 1: Sectors in which the interviewees work

Sector	Total number of interviewees	Climate	Health	Climate and Health	Others
Academia	3	2	1	0	
Advocacy	6	3	1	2	
Federal Agency	2	0	0	0	Water and Sanitation; Environment
Federal Government	12	2	4	0	Economy; Energy; Disaster Risk Management; Housing; Emergency Response; Transport
Parliamentary	3	0	0	1	Education; Agriculture
Public Prosecutor	1	0	0	0	Justice
Subnational Government	1	1	0	0	
Think Tank	5	4	0	1	

Table 1: Distribution of interviewees by sector and area of activity

7.2. Interviews

A total of 33 semi-structured interviews were conducted between April 8, 2024, and June 17, 2024. Most of the interviews were conducted virtually using the Zoom platform, except in two cases where they were conducted face-to-face at the request of the interviewees. In all cases, the interviews were recorded to allow for later transcription and analysis.

The interviews were semi-structured in that we created a pre-established list of questions for the interview but retained the flexibility to ask additional questions and ask the participants to elaborate on their answers. The list of prepared questions is available in the appendix. The questions were divided into categories based on our research questions. They sought to elicit participants' opinions and experiences related to the current national situation of climate and health policies, ideals for the relationship between climate and health policies, barriers to advancing and integrating climate and health, and opportunities and strategies for overcoming barriers.

The interviews totaled 1,739 minutes (28.9 hours) of recordings, with the shortest lasting 25 minutes and the longest an hour and 15 minutes, with an average time of 52 and a half minutes. They were conducted via the Zoom platform by one or two members of the research team. The interviews were recorded and transcribed automatically using the Zoom platform, with subsequent manual cleaning of the transcripts to correct any transcription errors, organize the text into a more readable format, and anonymize identifiable information. The two face-to-face interviews were recorded using a Zoom H4nPro portable recorder or cell phone.

In order to obtain informed consent, the participants were given a participant information sheet when the appointment was confirmed and before the interviews. They were asked to verbally approve the consent form at the beginning of the recording and before starting the interview. They were given the option of recording video and audio or just audio, depending on their preference. They were also asked to provide their preferred anonymous identifier for the report (e.g., "Federal agency representative - environment").

The study was approved by both the George Mason University Institutional Review Board (FP00001847) and Plataforma Brasil via the Ethics Committee of the School of Arts, Sciences and Humanities of the University of São Paulo (EACH-USP), under process number CAEE 77422424.0.0000.5390.

7.3. Analysis

The transcripts were coded using ATLAS.ti software based on mixed inductive and deductive manual qualitative content analysis (Fereday & Muir-Cochrane, 2006). The six deductive codes were created based on the interview questions before starting the coding process:

1. Experiences of formulating climate/health policies [the participant describes how climate and/or health appear in their work, either on a daily basis or over a longer period].
2. National status of climate/health policymaking [the participant describes the current relationship of climate and health policymaking at the national level in their country].
3. Ideals for formulating climate/health policies [the participant describes how the relationship between climate and health policies should be, in their opinion].
4. Barriers to formulating climate/health policies [the participant describes the challenges to advancing climate and health policies].
5. Opportunities for climate/health policymaking [participant describes promising ways to promote climate and health policies].
6. Strategies for formulating climate/health policies [the participant describes methods for promoting climate and health policies, such as communication strategies, political strategies, and any other approaches].

During the coding process, inductive codes were created within these deductive categories.

Two members of the research team carried out the coding. There was alignment on the standardization of coding in a joint analysis of four transcripts, with a discussion of inductive codes. We then coded the complete corpus of transcripts separately, with regular meetings to discuss and interactively update the codebook.

Once the transcripts had been fully coded, we used a list of pre-established analysis queries to guide the analysis of the coded data.

7.4. Engagement with stakeholders of the Global Climate and Health Alliance

We solicited feedback on our research questions through a survey sent to stakeholders on the Global Climate and Health Alliance mailing list in November 2023 (n=264). We invited these stakeholders, along with research participants in Brazil, to a briefing on our preliminary results in July 2024. We specifically asked them the following questions for discussion:

1. How do these discoveries align or conflict with your experiences?
2. Are we missing some crucial insight or perspective?
3. Is there one main conclusion that you consider most important? What is it and why?

We have integrated the feedback received into the section on possible implications. We then asked for your comments on the draft report via an online form in October 2024.

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10. Declaration of competing interests

The authors have no competing interests to declare.

Appendix

Interview questions

The following list shows the interview questions asked to participants working in climate policy. The questions have been adapted for participants working in health policy, climate policy, health policy, and adjacent areas.

1. How much do human health impacts or benefits feature in your work?
    a. Could you briefly give me an example of a recent time when health issues came up in your work on climate policies?
    b. Can you think of a time in the past when health issues came up in your work on climate policies?
        i. What kinds of people or organizations were involved, and what positions were they advocating?
        ii. What were the outcomes?
        iii. How typical was this example of how health issues generally come up in your work?
        iv. What about it was typical or atypical?
2. To what extent are health and climate policies linked, or not, in [their country/region]?
    a. (If links are mentioned) In what ways are they linked?
3. Should they be more closely linked than they currently are in [their country/region], or more separated?
    a. (If they think climate and health policy should be linked in any way) What are the benefits of linking climate and health policy?
    b. Do you think incorporating health considerations can build support for climate policies?
        i. Why or why not?
4. How could climate policy or policymaking procedures be improved in [their country/region] to more fully incorporate health considerations?
    a. (If they don't mention specific policies or policymaking procedures) Are there specific climate policies or policymaking procedures that could be created, improved, or removed to more fully incorporate health considerations?
5. Do any specific success stories come to mind?
6. Are there models from other countries that you have used, or are considering using, in your work?
7. What do you think is the biggest barrier to achieving the types of policy changes that you described?
    a. What would it take to overcome this barrier? (such as communication approaches, resources, and other strategies)
    b. Are there any other important barriers? (If so, ask how to overcome them)
8. What opportunities do you see to achieve the types of policy changes that you described earlier in our conversation?
    a. Are there any other opportunities you see?
    b. What would it take to move forward with these opportunities?
9. (If relevant to participant's background) In your experience, what (if anything) has worked to influence policymakers to support climate policies?
10. (If relevant to participant's background) How, if at all, have health considerations influenced your country's positions in international climate negotiations? (such as COP28, for example)
11. Is there anything else that didn't come up in our conversation that you want to share before we end?

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