AI4 Healthy Cities

**Recommendations for
Using AI to Transform Urban Health**

January 2022

AI4HealthyCities: Recommendations for Using AI to Transform Urban Health

About

AI4HealthyCities brings together city and regional authorities from across the globe to share experiences, challenges, and best practices in the use of data and AI to transform urban health and wellbeing, increase health equity, and create intelligent cities. Participants are invited to exchange proven solutions and recommendations to inform public policy proposals. AI4HealthyCities aims to create a sustainable coalition and long-term dialogue between participants.

About the Novartis Foundation

The Novartis Foundation is a non-profit organization based in Switzerland. For over 40 years, we have helped improve the health of low-income populations, initially supporting disease elimination in areas such as leprosy and malaria. Today, we tackle the burning issues of our time, cardiovascular diseases and health inequity. We take a population health approach, which means bringing together existing but disconnected data to help authorities understand the root causes of unequal health outcomes, and define the best ways and best partners to remediate those. This empowers governments to transform their health systems from being reactive to proactive, predictive and preventative, and achieve health equity among the populations they serve.

About the NewCities Foundation

NewCities is an international nonprofit organization dedicated to making cities more inclusive, connected, healthy, and vibrant. Focusing on people, places, and policies, we bring a global network of public and private sector leaders together with local communities to foster results-oriented collaboration through tailored events, editorial features, and actionable research.

Foreword

Ann Aerts, Head of the Novartis Foundation

The global health landscape is changing, with data and digital technologies playing an increasingly important role addressing the challenges our health systems face. For over 40 years, the Novartis Foundation has helped local authorities innovate the way they deliver health and care. Today, we focus on advancing data and digital-led approaches to improve population health – helping health systems transform from being reactive to proactive, predictive, and ultimately preventive. We believe that data, digital and artificial intelligence-driven solutions are powerful tools to improve population-wide health equity.

One way we are helping shepherd digital innovation is through the Broadband Commission for Sustainable Development, where the Novartis Foundation has led the health-focused working group for several years. The working group's 2020 report defined a Roadmap to AI Maturity in Health, which identified six domains that governments should invest in to advance their readiness to deploy AI solutions in health: (1) data science and digital skills among people, workforces and government leaders; (2) broadband access and interoperable data systems; (3) strong governance and regulatory systems for these new technologies; (4) needs-driven and human-centered design; (5) the right partnerships; and (6) the new business models needed to nurture innovation and allow solutions to roll out at scale.

Now, with AI4HealthyCities, we aim to create a living dialogue on these topics, with city and regional authorities from across the globe sharing best practices. We hope to create an environment of mutual learning, inspiring dialogues, and sustained collaboration.

We were excited to pioneer the AI4HealthyCities dialogue series with the State of São Paulo and the Province of Québec. Both regions have overcome complex challenges, with many learnings to share and I express my sincere appreciation to the Governments of São Paulo and Québec for their generous participation. It has been an honor and true pleasure to facilitate this dialogue on AI, which allowed us to learn about the needs of today's cities and be inspired by their visions. Lastly, I take this opportunity to invite other cities to join the conversation on improving population health through data, digital and AI-driven innovation, and participate in our AI4HealthyCities dialogues.

John Rossant, Founder of NewCities

At NewCities, urban health and wellbeing are two of our core focus areas, and we have spent the last decade convening and connecting key stakeholders of the urban ecosystem to foster meaningful and fruitful collaborations in this field. We believe that such exchanges are key to ensuring a healthy and sustainable future for all. We are also convinced that cities must embrace innovative solutions and employ all the tools at their disposal in this goal of building healthy cities, and artificial intelligence is one of them.

AI4HealthyCities convenes governments and experts from all sectors to share best practices and tackle common challenges. It is an amazing opportunity to look at how we can attract, shape and retain innovation in artificial intelligence that promotes healthy, inclusive and happy cities.

This first phase of the initiative has given us the chance to closely collaborate with the Novartis Foundation and the governments of Québec and São Paulo, two of the most dynamic and forward-looking geographies in the Western hemisphere. We are sincerely grateful for the participation and contributions of these pioneering governments to the initiative. Their insights and expertise have shaped the AI4HealthyCities activities and this report.

We hope that the key learnings outlined here help promote collaboration opportunities among cities and urban stakeholders to explore the potential of using artificial intelligence to build healthy and inclusive cities. The policy recommendations captured in this report represent what can be achieved by enabling interdisciplinary and meaningful conversations. We look forward to continuing this dialogue and involving more geographies in the future of the initiative!

Jason Naud, Director of Québec Office in São Paulo

As Director of the Québec Office in São Paulo and on behalf of the Government of Québec, I would like to thank NewCities and the Novartis Foundation for having put forward the wonderful initiative that is AI4HealthyCities.

One of the most important lessons to come out of the COVID-19 pandemic might be how interconnected our world truly is. We have learned that what happens anywhere may affect us all and that we all depend on each other. The world is now facing unprecedented challenges, especially in the health sector, to which we must respond collectively in order to move forward. It is also becoming increasingly clear that artificial intelligence can, and must, play an important role in establishing sustainable solutions to these new challenges.

Québec is proud to act as a global leader in the artificial intelligence sector with the world's largest concentration of academic researchers in deep learning, as well as cutting-edge expertise, put forward by centers of excellence such as IVADO and MILA. Québec also plays a leading role in responsible and ethical AI: we were a pioneer in the field with the Montreal Declaration and we continue to be at the forefront.

The AI4HealthyCities initiative has been a fantastic opportunity for us and the State of São Paulo to deepen our collaboration through an exchange of our expertise in artificial intelligence and Life Sciences, which are areas of excellence common to our two territories. We are convinced that this initiative will greatly benefit other states and cities and contribute to the pooling of our knowledge to better tackle, together, the health and wellbeing of urban populations.

Torquato Jardim, Executive Vice-President of InvestSP

The AI4HealthyCities initiative is closely connected to InvestSP's mission of fostering the development of the State of São Paulo through the promotion of investments, innovation and competitiveness. The State of São Paulo values innovation and entrepreneurship and is strongly committed to a sustainability-led investment strategy that also includes urban health, so as to ensure high living standards for the State's nearly 46 million inhabitants.

The State of São Paulo and the Province of Québec have a strong relationship and a long history of cooperation, both in research and business. They are members of the Regional Leaders Summit, a network of subnational governments focused on developing technologies for a cleaner and better world.

The AI4HealthyCities project developed by Novartis Foundation and NewCities has catalyzed new collaborations and the exchange of best practices. We were able to gather in the same virtual stage representatives from the public administration, the private sector, academia and non-governmental organizations to discuss how to implement artificial intelligence solutions for the benefit of citizens. The outcome of the project may assist the formulation of state-of-the-art public policies.

We need to support entrepreneurs and their businesses of the future that are addressing major health challenges. At the same time, it is crucial that governments use technology to achieve a more sustainable and healthier environment for the generations to come. InvestSP, on behalf of the State of São Paulo, is honored to have been part of this initiative, which has also pro-vided a substantial contribution to strengthening the relationship between our State and the Province of Québec.

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Executive Summary

Using Artificial Intelligence (AI) to Transform Urban Population Health

Data and digital innovations, such as AI, offer extraordinary opportunities to support evidence-based decision-making and improve access to health for all. Governments around the world are actively harnessing the power of AI to improve urban population health. They are implementing policies, partnerships, collaborations, and investment strategies to drive digital transformation towards healthy and sustainable cities. While using AI for health has great potential, it is challenging to implement, has limitations, and can pose risks. International collaboration and dialogues can help governments and policy makers embrace best practices, learn from challenges and failures, and achieve their priorities.

This is why the Novartis Foundation and NewCities launched AI4HealthyCities – a platform for governments to share their experiences of how data and AI can improve the health of urban populations, exchange best practices, and address common challenges. AI4HealthyCities fosters sustainable solutions by enabling international collaboration.

AI4HealthyCities:
A Platform for International Dialogue

AI4HealthyCities built upon existing communication channels between São Paulo and Québec. A workshop series enabled participants to dive deep into key priorities, strengthened the relationship between the regions, and identified further needs, challenges, and solutions for implementing AI for health. The workshops also provided opportunities for experts from diverse regions and sectors to share knowledge and case studies. This informed 12 new policy recommendations, which are captured in this report, and can help guide governments in harvesting the power of data and digital solutions to improve health and wellbeing of urban populations.

This report outlines the key findings of the 2021 AI4HealthyCities dialogues, highlighting case studies on the use of AI for improving urban health in addition

to the policy recommendations. The report also summarizes AI4HealthyCities' scalable and replicable engagement model as a call to action for governments around the world to join the conversation.

Policy Recommendations

The 12 recommendations emerging from the intergovernmental and expert dialogues are designed to help people, institutions, and policy makers around the world build the network of companies, researchers, advocates, and leading thinkers needed to realize the potential of AI in urban population health. They aim to respect regulatory frameworks and ensure a responsible, ethical approach to deploying AI in urban spaces.

1. Create a multistakeholder forum
2. Develop a platform to share resources and knowledge
3. Engage with civil society and non-profit organizations
4. Invest in and promote research and development
5. Foster local innovation
6. Train and retain the workforce in data science and AI
7. Improve data literacy
8. Design responsible and ethical AI assessment and acquisition tools
9. Invest and develop responsible, ethical, accountable AI solutions
10. Fund connectivity and broadband access programs
11. Sustain public, open datasets
12. Prioritize responsible and ethical virtual health services

Call to Join the Network

We invite cities and regions around the globe to join our dialogue, inspire others by sharing your achievements, and drive conversations based on your experiences and learnings.

I. An Introduction to AI4HealthyCities

AI and Health: International Challenges, Regional Solutions

Cities today are facing unprecedented health challenges, from the growing burden of cardiovascular diseases, to increasing demands on health systems due to rapid urbanization, and the acute dangers posed by the COVID-19 pandemic. These challenges require new and creative solutions to be developed, fostered, and implemented by local governments and institutions.

The growing availability of data bears the potential to transform the urban health landscape. Data analytics can shed light on health inequities and help identify high-impact intervention opportunities. Cities can use digital health technologies, including artificial intelligence (AI), to increase healthcare access, improve quality of care, reduce inequities, and empower marginalized communities. For example, AI can assist medical workers, expanding their capacity in regions where there

aren't enough workers to meet population needs. Virtual health services can provide remote access to care (Broadband Commission, 2020).

AI innovation attracts large investments (Brandusescu, 2021), and often receives great attention from the media. However, **to successfully implement AI solutions in population health, a network integrating the right partners, supporting policies, and regulatory frameworks must be established.**

When building this network, it is important to account for the risks of AI. These include concerns for digital rights, data governance, ethics, and AI accountability. The data AI learns from, and the context in which it is deployed, shapes its impact. Many challenges exist regarding collecting representative data, addressing the digital divide, and mitigating the disparate access to healthcare. Without nuance and a responsible approach, AI can reflect existing biases and inequalities in healthcare systems (Nicholson Price II, 2019).

There are increasing efforts worldwide to establish guidelines and roadmaps to AI implementation (European Commission, 2021; Broadband Commission, 2020) that aim to reduce biases and health disparities, and promise better access to healthcare for all (World Health Organization, 2021). Yet, adopting these guidelines and implementing AI solutions is challenging, due to a lack of interdisciplinary understanding between policy, technology, and health science sectors, and an unclear landscape of requirements and opportunities. To move forward, it is important to forge interdisciplinary collaborations that address and coordinate infrastructure and workforce requirements, data governance and protection, and policy and implementation processes (Zuiderwijk et al., 2021). Decision-makers need to be aware of health challenges and operational and data challenges around the implementation of AI solutions. Topic experts need to be included, the needs of end-users analyzed, and a regular exchange among all involved stakeholders must be established. This will enable cities to adopt and implement AI solutions that foster equitable and sustainable improvements in urban population health.

AI4HealthyCities Vision

Geographies across the world face different, but often related, challenges concerning creating responsible, ethical, and accountable AI ecosystems for urban population health.[1] AI4HealthyCities aims to establish an open dialogue around the opportunities and challenges of implementing AI solutions for urban

[1] This trend is reflected, for example, in the efforts to regulate AI and create strategic plans for its deployment by federal governments (Brazil, Chile) and the European Union in 2021 only.

population health and nurture sustainable applications through international collaboration. As such, it offers a platform of exchange and mutual learning where needs can be shared, challenges discussed, and local solutions designed with an interdisciplinary approach.

AI4HealthyCities is a **dialogue** between governments, policy makers, civil society, researchers, and industry. The first set of dialogues that was held in 2021 is the focus of this report, centered on the AI-maturity framework as developed by the Broadband Commission for Sustainable Development (2020) working group on AI in Health. During the dialogues, the requirements and potentials of AI in health were discussed, thereby also increasing participants' technological and legal literacy. Simultaneously, AI4HealthyCities catalyzes opportunities for **collaboration** between cities and regions, by bringing diverse stakeholders together and identifying common priorities and challenges.

The dialogues were also an opportunity to share **local and international case studies** that shed light on the digital health landscape in each of the represented cities and other cities around the world. By exploring best practices and lessons learned, participants can inspire and support each other as they implement innovative solutions. Finally, AI4HealthyCities helps develop concrete, actionable **policy recommendations** that respond to the health and wellbeing priorities identified by the participating regions, and are useful to decision-makers in their use of AI to improve urban population health.

Nurturing Collaborations

The AI4HealthyCities approach is centered around three core values:

1. **Co-creation:** Decisions on dialogue and workshop content were made together with various stakeholders and organizations. Conversations and policy recommendations were based on input from specialists and practitioners.

2. **Ethics, Responsibility and Accountability:** AI ethics, responsibility, and accountability are transversal aspects integrated into the discussions around policy making, regulation, discrimination, and sociocultural impacts of data-driven initiatives.[2] They were integrated and used to develop the policy recommendations and to promote equitable change and inclusive AI policies.

[2] "Good data science should incorporate the perspectives of people who create and work with data, people who study the interactions between science and society, and people whose lives are affected by data science."

3. **Openness:** AI4HealthyCities prioritizes access to knowledge and provides open access to resources within the initiative, including this report and the initiative website. This openness is crucial to building a common agenda and creates a space conducive to sharing and discussing ideas.

Pioneering Participants:
São Paulo and Québec

AI4HealthyCities launched in 2021 with the State of São Paulo, Brazil and the Government of Québec, Canada as pioneering partners. Public health officials, healthcare experts, and the broader environment of innovation and economic development from both regions took part in these first dialogues. Participant organizations included the Ministry of Economy and Innovation of Québec, the Secretariat of Economic Development of the State of São Paulo, InvestSP, and the Ministry and Secretariat of International Relations from both governments.

The governments of Québec and São Paulo have been funding science and innovation projects that encompass data-driven initiatives for several years.[3] They have been working to design policies, establish regulatory frameworks, and address the many socio-cultural impacts of deploying these technologies. Former collaborations and ongoing relationships between the regions set the stage and allowed the first dialogues to build upon existing interest in learning from each other. The two governments are experienced in developing unique systemic and technological solutions to ensure the health and wellbeing of their populations: both sides have a breadth of knowledge and innovative solutions that served as inspiration to the other. Both governments are also members of the Regional Leaders Summit (RLS), a forum for exchange comprising seven regional governments.

The Novartis Foundation has a strong presence in the State of São Paulo, as a longstanding partner of the city government of São Paulo for an urban population health initiative following the CARDIO approach to improve cardiovascular population health. The Novartis Foundation also worked with the University Hospital (Hospital das Clínicas da Universidade de São Paulo) to establish data and digital-driven systems in the COVID-19 response (a partnership with InovaHC, IdeiaGov and the Secretary of Economic Development of the State of São Paulo).[4] NewCities has partnered with the Government of Québec on several projects, e.g. the NewCities' Wellbeing Cities Initiative, which promotes

[3] The government of São Paulo, for example, has approved a Law promoting innovation and R & D in 2008 ("Lei Paulista de Inovação" - Lei Complementar Nº 1.049/2008). The government of Québec has invested in the video game industry since the 1980s and is now known as a relevant AI hub.

[4] Case study was published as "Pursuing AI maturity in health: How São Paulo, Brazil built an AI solution for diagnosing COVID-19" available here.

health and wellbeing in cities around the world. NewCities is deeply invested in promoting Montréal and Québec's leading role in health and wellbeing, mobility, sustainability, and more.

Within AI4HealthyCities, both governments worked together closely with the Novartis and NewCities Foundations to pioneer the dialogues and ensure local relevance. The Novartis Foundation and NewCities facilitated a series of workshops designed to map priorities and challenges and brainstorm solutions. They supported the development of a set of policy recommendations and the discussions are consolidated into this report.

Expanding the Network

AI4HealthyCities provides opportunities for collaboration and exchange between cities and regions globally. While the dialogue was launched with two regions, AI4HealthyCities aims to expand to include other governments. Onboarding of additional cities will integrate new perspectives and foster the creation of a powerful, global network of knowledge-sharing. It can lead to the development of more recommendations that respond to what we need to transform urban population health, given ever-increasing health needs and challenges.

II. Engagement Model Overview

AI4HealthyCities' engagement model leveraged the existing channels between São Paulo and Québec to connect people, identify governments' priorities for AI and urban health in a series of workshops, and jointly develop actionable recommendations. All activities were centered around four core principles.

Further detail on the engagement model is provided in Appendix I, the workshop findings are detailed in Appendix II, the collated case studies brainstormed throughout the conversations listed under Appendix III, and participants and partners listed in Appendix IV. The following section presents the final set of policy recommendations for the implementation of AI solutions for urban population health.

1. Multisectoral Dialogue: Representatives from diverse sectors and disciplines participated, such as government, academia, industry, and civil society, from the fields of health and technology, as well as policy makers.

2. Convergence: A common agenda was designed together with both regional governments.
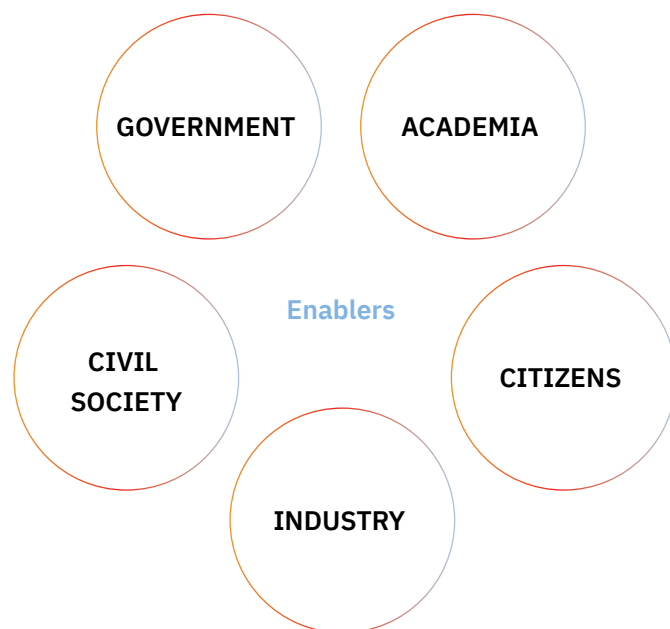
3. Collaboration: The initiative provided open spaces for dialogue and exchange through regular meetings and a workshop series featuring balanced representation from both regions.

4. Consolidation: Ideas, discussions, and brainstormed solutions were translated into concrete, implementable recommendations and actions.

III. Policy Recommendations

Twelve policy recommendations were consolidated based on the priorities, successes, challenges, and needs identified by the regions. They reflect what has worked well – and what has not – to help policy makers and anyone working with AI to improve urban population health.

The recommendations span seven categories, featuring required action items for success and listing enablers – stakeholders responsible for or involved with the policy recommendations, or to whom the recommendations are addressed.

GOVERNMENT

ACADEMIA

Enablers

CIVIL SOCIETY

CITIZENS

INDUSTRY

PARTNERSHIPS AND MULTISTAKEHOLDER COLLABORATIONS

1. Create a Multistakeholder Forum

- Create a permanent multistakeholder forum to strengthen the relationship between the Government of Québec and the State of São Paulo.
- Implement multiple collaboration formats, such as official long-term partnership agreements, bilateral agreements, a steering committee to oversee the deployment of AI technologies, knowledge sharing platforms, and mutual milestones.
- Develop a clear roadmap and methodology on how to create and maintain a functional multistakeholder network.

Enablers:
Government, Citizens, Civil Society, Industry, Academia

2. Develop a Platform to Share Resources and Knowledge

- Develop an AI and health platform for knowledge sharing between regions and exchange of best practices, lessons learned, failures not to be repeated, works in progress, and international perspectives.
- Prioritize openness (open licensing, access, data, codes, educational resources) in shared resources and materials to ensure equity and access to knowledge for all whenever possible.

Enablers:
Government, Citizens, Civil Society, Industry, Academia

3. Engage with Civil Society and Non-profit Organizations

- Foster learning opportunities and build a common agenda with various stakeholders to increase diversity, equity, and inclusion in the development and implementation of AI technologies to eliminate health disparities.
- Establish a regular communication channel with civil society and non-profit organizations through workshops, public hearings, public consultations, studies, grants, and online engagement.
- Include underrepresented communities to ensure AI solutions are inclusive and to avoiding potential harm (such as Indigenous peoples, Black people, people of colour, and members of the LGBTQIA+ community).

Enablers:
Government, Citizens, Civil Society, Industry

FUNDING AND POLICY

4. Invest in and Promote Research and Development (R&D)

Enablers:
Government, Civil Society, Industry, Academia

- Increase long-term sustainable R&D funding across sectors (academia, industry and civil society) independent of current political leadership.
- Promote and fund regular public conferences, symposiums and other opportunities to showcase research findings, research-action projects, and evidence-based policy-making.
- Foster interdisciplinary support for grant applications (for example, a combination of STEM, Humanities, and Social Sciences).
- Set guidelines for diversity, equity and inclusion that projects should follow to receive funding.
- Fund programs to facilitate regular exchange on evidence-driven and science-informed initiatives between experts, advocates, and policy makers, encouraging openness about successes and limitations.
- Have independent publicly funded labs dedicated to evaluating the ethical aspects of AI research projects.

5. Foster Local Innovation

Enablers:
Government, Industry

- Create incentives and opportunities for R&D groups to partner with the private sector and civil society organizations.
- Fund challenges to support local companies providing responsible and ethical AI solutions in health, and that follow diversity, equity and inclusion policies.
- Provide seed funding for actors in the local AI ecosystem committed to developing responsible and ethical AI and help integrate them into the national AI ecosystem.
- Avoid the "pilot trap" — when governments are eager to develop pilot projects but fail to commit resources to scale them — by establishing mid-term views and mechanisms for support beyond the initial stage.

CAPACITY BUILDING

6. Train and Retain the Workforce

Enablers:
Government, Civil Society, Industry, Academia

- Develop interdisciplinary, AI-focused capacity building programs and workshops for public servants that address potential challenges and

issues related to the design and implementation of AI initiatives, especially when related to health and healthcare.

- Gather support from C-suite executives and managers, ensuring workers have sufficient time and support for training.
- Foster AI knowledge in nontechnical fields (policy, legal, sociology, urban planning). This may include the development of interdisciplinary AI-focused capacity building programs and workshops for public servants. Endorsement from executives and managers should be ensured.
- Create programs and funding opportunities to recruit and retain leading global talent in the field of AI, and AI and health, and increase the number of research-focused employees.
- Design strategies to overcome language barriers and ensure diversity, equity and inclusion.
- Develop guidance and tools to help organizations engage a diverse group of citizens and patients in digital health projects.

7. Improve Data Literacy

Enablers:
Government, Citizens, Civil Society, Industry, Academia

- Partner with specialists, public libraries, cultural centers, schools and universities to offer data literacy courses free of charge and open to the public, both in-person and online.
- Include data and media literacy in school curriculums.
- Design and promote campaigns to enhance awareness of the importance of data and media literacy.

REGULATORY FRAMEWORK

8. Design Responsible AI Assessment and Acquisition Tools

Enablers:
Government, Citizens, Civil Society, Industry, Academia

- Collaborate with multistakeholder specialists to set standards, methodologies and guidelines for AI acquisition and deployment that include bias, risk, or harm assessment mechanisms.
- Develop tools to evaluate the sustainability of AI solutions in the short, mid, and long-term.
- Design clear norms and guidelines for AI procurement and public-private partnerships in a multistakeholder dialogue.
- Set up an independent multistakeholder entity (steering committee), to oversee projects and actors across the ecosystem, and to set standards and metrics for monitoring and evaluating impact.

9. Invest in and Develop Responsible, Ethical, Accountable AI Solutions

Enablers:
Government, Citizens, Civil Society, Industry, Academia

- Invest in education, training and debates addressing the ethics, responsibility, accountability, policy, and governance of AI.
- Integrate human and social sciences training in the curricula of data scientists and other technology developers.
- Hire people committed to diversity, equity, and inclusion to develop, deploy and evaluate AI solutions.
- Include civil society and non-profit organizations in the debate around ethical and responsible AI to learn together.
- Fund interdisciplinary, multistakeholder teams to develop open, accessible guidelines to assess responsibility and accountability of AI solutions and encourage the public and private sectors to adopt these guidelines when buying/selling products and services.
- Adopt data governance and protection frameworks that promote public interest and digital rights.
- Implement AI and data use registries to enhance transparency.
- Include underrepresented communities (e.g. Indigenous peoples, Black people, people of color, and members of the LGBTQIA+ community).
- Ensure funding guidelines prioritize projects committed to diversity, equity and inclusion.

INFRASTRUCTURE AND DATASETS

10. Fund Connectivity and Broadband Access Programs

Enablers:
Government, Citizens, Civil Society, Industry, Academia

- Fund programs to improve internet universalization and broadband access in public spaces and in households.
- Ensure these programs follow best practices and regulatory frameworks for data governance and protection.
- Design these programs in collaboration with stakeholders outside of government and industry to guarantee public interest connectivity and compliance with digital rights frameworks.

11. Sustain Public, Open Datasets

Enablers:
Government, Civil Society, Industry, Academia

- Build ethical, public, and open datasets that comply with regulatory frameworks of data governance and protection, digital rights, and guidelines from the openness community.
- Consult with data scientists and other specialists on priorities and expectations for open/public datasets to improve data quality and interoperability.
- Adopt robust data governance and protection frameworks.
- Create incentives for contributions to open datasets, through collaborations and partnerships between governments, industry, academia and civil society.
- Invest in data security, protection, and privacy.

SPECIAL FOCUS: VIRTUAL HEALTH SERVICES

12. Prioritize Responsible and Ethical Virtual Health Services

Enablers:
Government, Civil Society, Industry, Citizens

- Develop and integrate responsible virtual health service options to improve access to healthcare for patients and professionals that most need it.
- Design reliable follow-up processes to ensure predictive or preventative virtual health service solutions are linked to an effective clinical response when needed.
- Build and publish protocols and guidelines for the responsible and ethical deployment of virtual health services in consultation with specialists from different fields (medicine, law, public policy, data science) and practitioners (health, IT, social services, legal services).
- Follow regulatory frameworks for data governance and protection to ensure patient data collection and usage in digital devices is compliant with personal rights and avoids widening health disparities.
- Invest in interoperability and integration.
- Establish models and methodologies for monitoring and impact evaluation to ensure innovations demonstrate their value in the short, mid and long term.
- Consult with end-users to make technology user-friendly, needs-based, and accessible.

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Additionally, we would like to thank the participants of the exploratory meetings and workshops, and the workshop keynote speakers for their time and for sharing their expertise.

Appendix 1: Methodology

The 2021 AI4HealthyCities dialogues included the following steps, which are summarized below.

1. Landscape Analysis
2. Development of an Engagement Model
3. Two Exploratory Meetings

4. Survey for Additional Information
5. Workshop Series

1. Landscape Analysis

A literature analysis was conducted on AI, data-driven initiatives, machine learning, data governance and protection, privacy, data ethics, responsible data science, urban health, and the deployment of AI solutions for health-related purposes. The regulatory landscape was reviewed, including recent **international** policy frameworks and reports, such as the "Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules On Artificial Intelligence (Artificial Intelligence Act) And Amending Certain Union Legislative Acts" (European Commission, 2021); "Data for Better Lives" (World Bank Group, 2021); "Ethics and governance of artificial intelligence for health: WHO guidance" (World Health Organization, 2021); and "Reimagining Global Health through Artificial Intelligence: The Roadmap to AI Maturity" (Broadband Commission for Sustainable Development, 2020). Further, recently published **regional** policy and research frameworks were reviewed, including the report "Artificial intelligence policy and funding in Canada: Public investments, private interests" (Brandusescu, 2021); "National AI Strategies and Data Governance in the Region" (Aguerre, 2020); "Estratégia Brasileira de Inteligência Artificial" (Brasil, 2021); "Actes du Symposium international sur l'Innovation responsable en santé numérique: Occasions, obstacles et avenues" (Université de Montréal, 2020); "La Déclaration de Montréal pour un développement responsable de l'intelligence artificielle" (Université de Montréal, 2018); and "Trustworthy AI in Health" (OECD, 2020).

The international and regional regulatory frameworks were analyzed, with focus on selected legislation addressing data governance and protection, digital rights, AI regulation, smart cities, public procurements, and public-private partnerships.

2. Development of an Engagement Model

The AI4HealthyCities engagement model is centered around ongoing communication between stakeholders from São Paulo and Québec and aims to ensure their participation would shape the initiative and lay the foundation for future collaboration. Technical teams on both sides took part in regular meetings and liaised with their respective ecosystems of AI and health. We used several platforms to sustain these conversations: emails, collaborative communication platforms and applications, regular video calls.

3. Two Exploratory Meetings

Two exploratory meetings were held, one technical meeting (May 4, 2021) with representatives of both governments and the Novartis and NewCities core teams and one involving high-level government officials (see participants in Appendix IV). The main goals of the first meeting were to:

- Align on objectives and activities for the AI4HealthyCities initiative;
- Introduce government representatives involved in the project from both regions;
- Develop a process for involving public officials across sectors throughout the initiative;
- Scope the governments' priorities on urban health and wellbeing;
- Jointly develop a roadmap for the initiative, including a meeting with high-level government officials, a survey, and the workshop series.

The second meeting with high-level government officials aimed to:

- Introduce the AI4HealthyCities initiative to high-level government officials.
- Secure their interest in, commitment, and support for the initiative.
- Scope priorities and challenges in regards to AI and health from the governments' perspective.

4. Survey for Additional Information

An online survey, available on JotForm, was designed to collect additional information from participants on key interests and priorities in the deployment of AI solutions to improve urban health and inform needs for the workshop series. The survey was shared with partners from both governments and their networks of AI experts.

Name: [First] [Last]	Position/Title:
Organization/Department:	State/Province: [SP] [QC]

Expectations: Using the sliding scales below (Not at all important, Somewhat Important, Important and Very Important), please rate the key expectations identified during the May 4th technical call according to their importance to your organization:

✕ Opportunities for knowledge and expertise sharing among partners
✕ Interest in developing long-term partnerships in science and technology
✕ Fortify the relationship between governments (QC/SP)

Key Policy and Regulatory Themes: Using the sliding scales below (Not at all important, Somewhat Important, Important and Very Important), please rate the key policy and regulatory themes identified during the May 4th technical call according to their importance to your organization (scroll to see all topics):

✕ Capacity building: Training (on-the-job) workforce to work with AI
✕ Regulatory framework: Public procurements
✕ Regulatory framework: Data governance
✕ Regulatory framework: Data portability
✕ Infrastructure and tech: Robust standards for technological interoperability
✕ Ethics and rights: Privacy and digital rights
✕ Ethics and rights: Responsible/ethical AI
✕ Transversal themes: Digital divide, Internet connectivity and universalization
✕ Transversal themes: Misinformation/Disinformation and digital literacy
✕ Transversal themes: Smart mobility and reduction of carbon emissions

Health and Well-being: Using the sliding scales below (Not at all important, Somewhat Important, Important and Very Important), please rate the previously identified health and well-being examples identified during the May 4th technical call according to their importance to your organization:

✕ Telemedicine/virtual care and hybrid models   ✕ Chatbots
✕ Digital prescriptions   ✕ Health prevention

Are there any other interests or priorities that your organization would like to see discussed in this initiative?
Which one(s)?

Challenges and opportunities: What are the main challenges your organization faces while trying to foster an innovative artificial intelligence ecosystem? Please name up to three challenges you would like to discuss in this initiative.

Are there any specific challenges related to AI innovation and health/wellbeing? If yes, please mention at least one of these specific challenges:

Best Practices: Can you name one or two experiences and/or projects developed or adopted by your government at the intersection of AI and health/wellbeing that could be shared as a case study in this project? If yes, which one?

In your opinion, what is the main lesson learned in these experiences and/or projects that make them relevant for this initiative?

What would be the main expertise in AI and health/wellbeing that your government could share with our partners? Please provide as many details as possible:

What kind of case studies would you like to see discussed in this initiative?

Perspectives on AI and Health/Wellbeing: In your opinion, what is a healthy city?

Are there any cities in your state/province you would consider a successful healthy city? Which ones? Why do you consider it or them a healthy city?

When it comes to developing consistent AI and health/wellbeing initiatives, where/how do you see your organization five years from now?

5. Workshops Series

Three workshops were co-developed with the technical teams from São Paulo and Québec and held virtually on August 30, 31 and September 1, 2021. The objectives of the workshops were to identify priorities, share best practices, discuss real-world case studies on the use of AI in urban health and wellbeing, and advance potential for collaboration between the two governments. The findings, presented in Appendix II, helped inform the policy recommandations presented in this report. Over forty participants from government organizations, industry, academia, and civil society in São Paulo and Québec joined the sessions (see Appendix IV for the full list).

Each workshop addressed different topics but followed the same agenda:

- Welcome and Introductions (10 mins)
- Lightning Talks (10 mins)
- 2-3 experts give brief presentations on the topics of the day
- Activity 1: Priorities and Expectations (10 mins)
- Participants share their priorities and expectations for the topics of the day
- Break 1 (5 mins)
- Activity 2: Main Challenges (20 mins)
- In small groups, participants dive deeper into the challenges associated with the topics of the day
- Break 2 (5 mins)
- Sharing and Moving Forward (20 mins)
- The main outcomes of Activity 2 are shared in a joint discussion
- Activity 3: Brainstorming Solutions (25 mins)
- In small groups, participants develop potential solutions to the challenges. For this, they are invited to dive deeper into the ideas, best practices and lessons discussed by the specialists and stakeholders.
- Sharing and Closing (15 mins)
- The main outcomes from Activity 3 are shared in a joint discussion with a special focus on opportunities for bilateral collaborations

Appendix 2:
Detailed Workshop Findings

The goal of the workshop series was to dive deeper into the key priorities identified during the exploratory meetings. Additional objectives included:

Strengthen the relationship between Québec and São Paulo and foster a long-term collaboration by encouraging participants to provide contact details.

Further identify and explore needs, challenges, and solutions for implementing AI and digital solutions for urban population health.

Provide the opportunity for experts from both regions and all sectors to share knowledge and expertise.

Map relevant experiences, case studies (compiled in Appendix III) best practices, and lessons learned on the key themes.

Initiate a global discussion on implementing AI and digital solutions for urban population health in a tangible format that could inform policy recommendations.

The following pages present the topics of the day, keynote presentations, and a summary of participants' insights and comments during each of the three workshops. Participant comments have been organized into 9 thematic tables. Each table correlates to a discussion topic and presents in detail the comments shared by the workshop participants in response to the below prompts.

Some participant comments have been edited for clarity.
The four prompts that guided conversations are:

PRIORITIES AND EXPECTATIONS:

participants identified the top two priorities in AI and health and the main expectation for what they would like to see happening in the field over the next five years.

CHALLENGES AND NEEDS:

participants identified the main challenge (faced by them or their organization) when trying to achieve the priorities, and explored their needs to achieve the main expectation previously listed.

SOLUTIONS AND BEST PRACTICES:

participants identified existing solutions, best practices, or potential actions that they would like to see implemented.

PARTNERS:

participants identified stakeholders that should be involved in refining policy recommendations and implementing AI and health solutions.

The tables summarize participant comments under the topic of discussion. However, some arguments were transversal across topics. For example, participants repeatedly emphasized that AI solutions should promote public interest and common good as a priority across topics. Similarly, they identified a shared challenge in the lack of data literacy and interoperability, and the tendency for sectors to work in silos. Common best practices include mutlistakeholder collaborations and partnerships and the development of widely accepted guidelines and national strategies. Additionally, "Responsible AI and Ethics" was identified as essential in the consideration of all topics, rather than as an independent category, and participants emphasized approaches and best practices that were inclusive, such as including diverse stakeholders in decision-making processes and improving transparency.

Workshop 1: Setting the Stage

"In technology governance, trust is key. Artificial intelligence and machine learning systems are becoming increasingly complex and black-box algorithms hinder explainability to users and even data specialists. This may yield many negative consequences and build distrust in AI, especially for use cases in the public sector. Many stakeholders argue that public procurement, through the purchasing power of the state, can provide better incentives to foster development of human-centered and ethical AI, in a market shaping approach that raises awareness of ethical concerns in software development. There is huge evidence arising from innovation policy literature supporting the use of procurement to develop transversal and cross-cut technologies, such as AI. It is true that procurement can be cumbersome and time-consuming, but latest developments in Brazilian regulation – such as the New Public Procurement Law (L. nº 14.133/2021) and the recent Startup Act (LC nº 182/2021) – favor the development of problem-based acquisitions and co-creation of functional requirements alongside with private entities. This innovation-friendly framework now offers a wide array of procedures that may offer new possibilities to a wider use of AI in the health sector."

Rafael Carvalho de Fassio
State Attorney and Government Fellow at the Centre for the Fourth Industrial Revolution (World Economic Forum)

TOPICS OF THE DAY:

1. **Design and Process:** How to approach the implementation of AI solutions in healthcare (Table 1)
2. **Public Procurement:** Innovation laws, regulatory bottlenecks, opportunities for cooperation between stakeholders (Table 2)
3. **Data Governance and Protection:** Privacy, portability, and infrastructure (Table 3)

WELCOME REMARKS:

The series was introduced with opening words by:

- **Ann Aerts,** Head of the Novartis Foundation
- **Torquato Jardim,** Executive Vice President, Invest SP
- **Jason Naud,** Director, Québec Office in São Paulo

KEYNOTE PRESENTATIONS:

- **Carole Jabet** (Scientific Director of the Québec Health Research Fund) on the role of AI and digital solutions in the healthcare system, the role of cities, and international collaborations
- **Rafael Fassio** (Government Fellow at the Center for the 4th Industrial Revolution and State Attorney for São Paulo) on procurement and innovation in AI

During the conversations at the first workshop, participants spoke to the importance of inter-disciplinary dialogue, support for local start ups, improved capacity-building, the alignment of AI strategies and regulation at different government levels, and innovative approaches to data literacy, security, and protection.

Table 1. Findings on the topic **"Designing Policies for AI and Urban Health"**

PRIORITIES AND EXPECTATIONS	- Identify the current **"maturity level"** of procurement, application, capacity, etc. - Create an **AI strategy** that defines clear priorities and aims for using AI in the public sector. - Establish context-based **risk assessments for AI.** - Give **incentives for Research and Development (R&D)** groups to partner with the private sector. - Develop and implement **public-interest centered policies.**	- Create an **interdisciplinary dialogue** between people and organizations. - Support **evidence-driven and science-informed initiatives.** - Build **ethical and open-source datasets.**
CHALLENGES	- There is a lack of data and AI literacy across the public sector. - There is a "pilot trap:" governments are eager to develop pilots, but fail to scale them. - Policy makers and AI developers work in silos, failing to communicate.	There is a lack of understanding of the potential and the limitations of technology (AI).
NEEDS	Adapt investment promotion agencies' (IPA) activities to support companies, as usually IPAs are better prepared to advise companies from the manufacturing sector.	
SOLUTIONS AND BEST PRACTICES	**Facilitate regular exchange** (e.g. research conferences) **between technology and AI experts and policy makers** that encourage openness on the limitations of AI. - Create **accountable organizational entities** that facilitate conferences and in turn help avoid the pilot trap.	- Invest in a **promotion agency** that can help connect companies with public and private organizations. - Develop **capacity building programs**, such as AI workshops for the public.
PARTNERS	Trade associations; agencies that support research and development (FAPESP, FRQ, etc.); and government departments (education, science and technology, etc.).	

Table 2. Findings on the topic **"Fostering Public Procurements for Innovation"**

PRIORITIES AND EXPECTATIONS	
• Develop **accountability** and **transparency structures** for AI. • Understand and **address systematic underrepresentation of communities** in AI and health tech discussions. • Reference Québec's civil law data trust to **govern data and engage stakeholders.** • Devise **capacity-building programs for public servants** on the protection of personal information (PPI) legislation and applications. • Set **standards for AI acquisition** that include risk assessments.	• Create **competitions as a way to select companies** using AI for health. • Foster dialogues to share **best practices for purchasing AI.** • **Promote enterprises of all sizes**, not just large multinational companies.

CHALLENGES	
• The role of governments in promoting innovation is often unclear. • AI is not a government priority. • It is difficult to identify risks, and to portray those risks in procurement processes. • The AI landscape is opaque, obscuring the needs of public servants and how AI can help.	• Startups and small and medium-sized enterprises (SMEs) are rarely included in the supply chain of AI solutions. • Many business models prioritize public-private partnerships.

NEEDS	
• Build national AI strategies that are aligned with regulatory frameworks and support business models that can be contracted by state actors.	• Invest in a workforce that is conscious about the role innovation plays in fostering economic development.

SOLUTIONS AND BEST PRACTICES	
• Create **national AI strategies that are evidence-based** and promote HR training in these fields. • Offer **exchange programs** for employees from private and public sectors. • **Make norms for AI procurement from the government clear.** • **Showcase** the procurement process for pilot projects. • **Build intra-government collaboration** to identify needs and provide procurement solutions.	• Build **multi-partnership structures** to foster an innovative environment. • Build a pipeline: establish **government-driven innovation** and acceleration mechanisms. • Work with **diverse teams** in software development.

PARTNERS	
• Health experts (e.g. doctors, nurses); auditors; ministry of Information and Communications Technology (ICT); AI companies; organizations focused on capacity building for government officials and public servants (schools of government); suppliers; Human Resources.	

Table 3. Findings on the topic **"Enhancing Data Governance and Protection"**

PRIORITIES AND EXPECTATIONS	• Improve **data literacy.** • Build an **ethical data and AI governance framework** that considers digital rights. • Have a better understanding of **the role of municipal governments** in data governance. • Follow the **FAIR Guiding Principles** for scientific data management and stewardship. • Build a **standardized process to assure transparency, traceability, and secure sharing** in data use.	• **Empower underrepresented communities** to weigh in the discussions. • Create **interoperable systems** to exchange health data between levels of care.
CHALLENGES	• There is a lack of interoperability. • There is not a common understanding of data, hindering error-free use. • There is a need for more public datasets and improving the quality of datasets.	• Since technologies are evolving, we cannot futureproof anonymization processes. • Accountability and ownership structures are non-existent or opaque.
NEEDS	• Advance responsible data science. • Build datasets for AI design, considering inherent bias, data privacy, and anonymization. • Collaborate with a variety of stakeholders with interdisciplinary perspectives, especially underrepresented communities.	• Share more examples of current uses of AI and health data. • Create AI and data-use registries (for transparency).
SOLUTIONS AND BEST PRACTICES	• Create **incentives for more open datasets** with collaborative efforts of governments and industry. • Prepare to manage the **reproducibility of large repositories of open datasets.** • A **data curator** can take care of data, especially data requiring pre-processing for issues (such as privacy). • Foster **data partnerships** with defined criteria and standards.	• Develop **unbiased, open datasets** with high quality data. • Establish a **basic conception of AI.** • Establish a clear purpose and **robust data governance framework** that may help access more granular and sensitive data (ex. to advance research) elaborated around these.
PARTNERS	• Municipalities; citizens; academia; industry; civil society and non-profit organizations; AI experts.	

Workshop 2: Implementing AI Solutions

"Public investments reveal how the government builds the innovation economy with AI. AI policy and funding provide insight into government relationships with various stakeholders in the ecosystem through financial commitments. There are over 710 entities that work, research, fund, procure AI and operate in Canada. The public-private connection is key for financial support, as government funding for AI goes mainly to industry ($800 million CAD) and academia adjacent to industry ($140 million CAD). The top four awards go to Innovation Supercluster for-profits, notably Scale AI, AbCellera Biologics Inc, Digital Technology Supercluster, CAE Inc; startups like Mindbridge Analytics and Element AI; and public institutions: University of Toronto, Université de Montréal, University of British Columbia. A private sector culture is reflected in public engagements with policy or research efforts, where Non-Disclosure Agreements (NDAs) are found in public consultations and when conducting public research. A closer look at Canada's policies for AI reveals a focus on algorithmic impact and bias, not accountability or harm. The Directive on Automated Decision-Making is only legally binding at the federal level for departments and agencies that develop or implement AI products created in-house or outsourced to private suppliers. The Algorithmic Impact Assessment is only a voluntary commitment and relies on self-regulation. Moving forward, a collective approach is needed to question, change and improve public policy and regulation for AI technologies. Clear definitions and enforcement of accountability is needed through access, public scrutiny and independent oversight. AI crosses many jurisdictions and must be developed, procured and deployed in accountable ways."

Ana Brandusescu
2019-2021 McConnell Professor of Practice, CIRM, McGill University

TOPICS OF THE DAY:

1. **Responsible AI and Ethics** (Table 4)
2. **Capacity Building:** Training the workforce (Table 5)
3. **Onboarding a Sustainable Ecosystem of the Right Partners** (Table 6)

KEYNOTE PRESENTATIONS:

- **Rafael Zanatta** (Director of Data Privacy BR) on ethics, inclusion and representation, and dignity in AI
- **Ana Brandusescu** (2019-2021 McConnell Professor of Practice at the Center for Interdisciplinary Research of Montréal) on funding the AI ecosystem in Canada
- **Marc-Antoine Dilhac** (CIFAR Chair in AI Ethics, MILA, and Associate Prof. at Université de Montréal) on co-designing as implementation of AI ethics principles

During the conversations at the second workshop, participants spoke to the importance of establishing standardized methods and frameworks to assess AI impact, promoting multistakeholderism and partnerships, the need for accountability structures, and funding multidisciplinary approaches to AI. They also discussed the need to openly share shortcomings of failed projects so as to save resources on future projects. They emphasized that ethics and responsibility should be at the center of AI and data initiatives.

Table 4. Findings on the topic **"Responsible AI and Ethics"**

PRIORITIES AND EXPECTATIONS	• **Include underrepresented populations** in the debates. • Establish clear norms for implementing ethical principles. • **Identify biases** in data. • Shift from addressing only bias in data to also **addressing harm.** • Promote **ethics by design.** • Advance the usage of **health data to inform decision-making.** • Map, understand, and address the **impacts of AI in emerging countries.**	• Develop **methods and frameworks for impact assessment** of AI systems that are based on AI principles. • **Advance responsible and ethical data science** by incorporating issues of governance, regulation, policy. • Focus on **public-interest technology** and the common good. • Create and **implement an ethics certification process.**
CHALLENGES	• There is a lack of certification of ethical AI. • Ethics is often not part of the value evaluation of an AI research project. • AI practitioners often have no education on (or awareness of) ethical AI.	• Increase AI maturity, creating an understanding of the importance of the topic of ethics. • There is a lack of accountability structures for all actors in the AI ecosystem.
NEEDS	• Define and promote common understanding of "responsible AI." • Develop assessment tools and methods to make AI principles actionable. • Detect and address biases in data. • Develop more international research and analysis on how to make ethical AI principles actionable (in healthcare).	• Foster public-interest technology and good common approaches to AI. • Fund interdisciplinary research. • Integrate social sciences and ethics training in the curricula of data scientists and other technology developers. • Governments should lead the framework on responsible AI and data use.
SOLUTIONS AND BEST PRACTICES	• Guarantee AI developers **obtain AI ethics approvals** before putting AI solutions in production. • Create **independent, publicly funded labs** dedicated to evaluating the ethical aspects of AI research projects. • **Develop AI literacy initiatives** (e.g. online courses to educate people and train the workforce). • **Build a platform to identify and share difficulties and failures** in the use of AI with the goal to avoid causing harm.	• **Share negative experiences** & identify failures in a system to prevent them from happening again. • Work closely with **policy makers in the Global South.** • Develop **methodologies** for impact assessment, translating documents, and participating in public hearings. • Foster **partnerships with other institutions** to improve research capacity. • **Improve diversity, inclusion, and multiculturalism** in the AI ecosystem.
PARTNERS	• Universities; research agencies; government (federal, regional, local); civil society and academia (Science, Technology, Engineering and Mathematics - STEM; Social Sciences and Humanities); citizens, patients, and communities; Institutions providing education on AI ethics.	

Table 5. Findings on the topic **"Capacity Building: Training the Workforce"**

PRIORITIES AND EXPECTATIONS	• Expand **research talent pipelines.** • Increase the number of **research-focused employees.** • **Recruit and retain** leading global talent. • **Expand AI knowledge in nontechnical fields:** policy, legal, sociology, etc. • **Fund civil society organizations** beyond academia. • Develop a **framework for access to building digital skills** and digital literacy. • Promote wide acceptance that **AI training is a long process** and training should start early in education. • Take inspiration from **international initiatives** when training present and future health professionals.	• Manage workers' schedules to **allow time for continued training.** • Receive **support from C-executives.** • Develop **independent evaluation and rating** of online courses.
CHALLENGES	• The pre-PhD talent pipeline lacks diversity. • There is a lack of diversity in individuals involved in AI projects. • In Brazil, there is a "brain drain:" highly trained individuals leave the country. • Cultural issues: in the past, people in the health field have shared negative perspectives on technology.	• There is a lack of opportunities for AI employment in the public sector and non-governmental organizations (compared to the private sector). • The subject matter and ecosystem is very complex, many people, including those in social movements, often see the topic and field of AI as "too technical."
NEEDS	• Learn about successful local solutions. • Create an open library of AI resources (e.g. impact assessment tools, training provided by other cities, etc.). • Fund more research featuring multistakeholder involvement.	• Consolidate South-South collaboration and resources. • Provide clear incentives for the private sector, such as financial conditionalities for responsible AI.
SOLUTIONS AND BEST PRACTICES	• Start **training as soon as possible** (ex: during school and not university). • Design and implement **capacity-building programs for AI implementation** in the public sector. • Develop **AI informed by Indigenous and non-Western values.** • Fund **state-sponsored programs for coding education** in low-income communities. • Promote digital culture based on **sharing knowledge.** • **Map existing training initiatives** and establish a roadmap	adapted to different workforce profiles. • Build **safe spaces for learning and cooperative culture.** • Fund **centers of excellence** to develop AI technologies. • Provide **access to datasets** as part of training. • Create **mentorship programs.** • Develop and implement **Diversity, Equity and Inclusion (DEI) policies**, practices, and accountability mechanisms. • Foster **interactions between the public and private sectors** to promote understanding of the demand for skills that may be in short supply.
PARTNERS	• Government; universities; high schools; hospitals; non-profit organizations; Public policy schools (e.g., ENAP); civil society educational groups; research agencies	

Table 6. Findings on the topic **"Onboarding a Sustainable Ecosystem of the Right Partners"**

PRIORITIES AND EXPECTATIONS

- Prioritize **civil society led decision-making.**
- Work with **diverse and inclusive partners.**
- Address **language barriers.**
- Support organizations with **guidance and tools to engage citizens and patients** in digital projects (both innovation and research).
- Promote **multistakeholderism**.
- Prioritize **technology for public-interest** and the common good.
- Create mechanisms for **information and practice sharing.**

- **Include underrepresented groups** and minorities in discussions.
- Set up an **independent entity** in charge of coordinating projects and actors across the ecosystem, to set standards and metrics to evaluate and document impacts in a uniform way.
- **Document successful initiatives** of public-private partnership in the co-creation and implementation of AI solutions.

CHALLENGES

- There is a lack of funding (short term and long term) for civil society organizations and community-based organizations working at the intersection of technology and society.
- The landscape of potential partners is opaque.

NEEDS

- Identify ethics-related shortcomings of AI and encourage transparency on these shortcomings.
- Identify all the users (e.g. patients, physicians, etc.).
- Develop a clear methodology on how to create a

functional, inclusive multi-partner network that engages civil society.
- Offer support to identify all the right stakeholders and user populations.

SOLUTIONS AND BEST PRACTICES

- Donors and funders set **formal requirements on partner diversity.**
- Build **workshops to present AI solutions to civil society** and hear back from them.
- Provide **ethics training to AI experts** and high-level decision-makers.
- Ensure **AI solutions are built for the wider population** and not just privileged groups.
- Establish **ethics frameworks for AI developers** and technical experts

- Develop a **public, searchable database** on AI in health including solution providers, experts from industry and academia, policy makers, and public organizations.
- Facilitate **interdisciplinary training** by opening up technical courses for non-technical people; ethics courses for technical specialists. This reduces barriers for training.

PARTNERS

- Civil society organizations (CSOs) and community-based organizations (CBOs); ethics specialists; user representatives.

Workshop 3: Overcoming Obstacles

"When we think and talk about sustaining Health Impact, it is relevant to share some general information about Brazil. We are 213 million habitants, distributed in about 5.6K cities, but concentrated in high- density urban areas: 49 cities hold 1/3 of the entire population. All regional, cultural, and economic characteristics and discrepancies must also be considered. It is a complex environment to work in. The investment in healthcare in the country is around 9.5% of our GDP, which is very much in line with the OECD average in relative terms. And SUS, which is the National Public Health Service, serves 80% of the population, one of the largest Public Health Systems in terms of citizens on a worldwide basis. As for a sustainable Public Health Impact, I would like to highlight a few areas in which we are working at ABIMED: With C4IR with focus on: 1- IOT Predictive Maintenance: it may generate a new business, speeding up processes and potentially reducing costs and incidents with equipment; 2- Data policy: Data Governance: An important aspect here is the introduction of the General Data Protection Act last year, and the National Data Protection Authority which is responsible for the enforcement of the new legislation from the end of August. and Remote health monitoring – for Post-COVID and Chronic Diseases, a Project with São Paulo city and other health institutions. 3- Tracking of AI Procurement related to the public sector, which represents 45% of health care expenditure in Brazil. To conclude my message, I would like to emphasize the discussions on telemedicine in Brazil. Abimed supports the full implementation in the country not only in internal medical processes (which is already granted), but also regarding remote access for the population, which now has a temporary approval due to the pandemic. In this sense, we are working with different stakeholders to achieve the full implementation in our country."

Fernando Silveira
President of ABIMED

TOPICS OF THE DAY:

1. **Ensuring broad access to and acceptability of HealthTech and AI Solutions** (Table 7)
2. **Special Focus on Virtual Health Services:** Integration of virtual appointments and care, chatbots, digital prescriptions (Table 8)
3. **Integration of Data and Digital Solutions into Decision-making:** COVID-19 and beyond (Table 9)

KEYNOTE PRESENTATIONS:

- **Fernando Silveira** (President of ABIMED) on data governance and the complexity of the Brazilian environment
- **Marie-Pierre Faure** (Deputy Director at Living Lab, Transmedtech Institute) on the development and implementation of virtual health services

During the conversations at the third workshop, participants spoke to the importance of investing in data and AI literacy, improving purchasing processes, improving access to broadband and internet connectivity, strengthening data protection, funding training and capacity-building for hospital teams, and ensuring data interoperability so that the data is understood by all parties involved.

Table 7. Findings on the topic **"Ensuring Broad Access to and Acceptability of HealthTech and AI Solutions"**

PRIORITIES AND EXPECTATIONS	
• **Improve healthcare services** and positively impact patient outcomes through technology. • Invest in the promotion of the **social acceptability of AI.** • Raise **awareness of** the benefits of health data access by **sharing the voices of patients and citizens**. • Build trust through **continuous multistakeholder engagement** in AI design and implementation. • **Empower underrepresented communities** to join discussions on AI and health. • Invest in **data literacy.**	• Invest not only in AI development but also in **AI implementation and evaluation.** • Provide **AI interpretability** to healthcare teams. • Maintain **low-tech alternatives.** • Direct **investments from healthtech companies** towards goals for broad access and acceptability of AI solutions.

CHALLENGES	
• There is a lack of digital competency and digital literacy. • Even if AI algorithms perform better than standard care, health care providers may not understand where unexpected or surprising results (e.g., identification of high-risk patients) come from, reducing their trust in these technologies. • The general understanding of social acceptability does not include all stakeholders that would be accepting these solutions.	• There is a lack of funding for health organizations to invest in training and management. The integration of data is complicated due to lack of interoperability. • There is not sufficient infrastructure for collecting and analyzing data regarding AI use and impacts for care, practice, and management; challenges in digital infrastructure and integration.

NEEDS	
• Establish clear guidelines on top priorities, since time and resources will always be a constraint. • Foster alignment between different government entities and include them in the decision-making process. • Establish best practices used to define needs for	technology and AI, to procure AI, and to source AI. • Facilitate investment from healthtech companies in projects. • Encourage co-development of AI solutions. • Shift hospital culture from being reactive to proactive.

SOLUTIONS AND BEST PRACTICES	
• Invest time and resources in **assessing the needs and expectations of end-users.** • Ensure Independent Physician Associations (IPAs) **adapt their services to advise startups** and technology companies. • **Create guidelines for AI implementation** and engagement for the first stages of implementation. • Learn from **examples from other countries.** • **Foster community engagement** through education events that make AI an approachable topic.	• Build a **co-creation process with the beneficiary** (patients, population, public servants etc.). • Establish **data interoperability standards** and share best practices collectively. • **Work together** with the hospital's technical teams. • **Create a multidisciplinary team** trained in machine learning operations (MLOps).

PARTNERS	
• Governments; hospitals; industry; patient associations; health care professionals; civil society; academia; underrepresented communities; entrepreneurs and tech companies; end-users	

Table 8. Findings on the topic **"Special Focus – Virtual Health Services"**

PRIORITIES AND EXPECTATIONS	• Ensure that **purchasing processes** are flexible and dynamic. • Guarantee that virtual health services and connected health services can be **reimbursed**. • Ensure that innovations can clearly demonstrate their **value in the short and long term.** • Analyze the **relevance and impact of virtual health services** (as a substitute for in-person intervention) for specific cases or diseases. • **Improve connectivity and broadband access.** • **Make virtual health services accessible** to those patients and professionals that most need it (geographical distance, lack of local expertise or resources for diagnosis, for instance).	• **Make technology easy to use** for older patients or patients with low levels of health or digital literacy. • Encounter the perfect **balance in care** between distant and in-person consultation and follow-up to best attend to patient needs. • **Guarantee that data from virtual health services appointments will not be reused/sold** to private insurances for target increased cost. • **Build regulation on virtual health services,** forwarding patients and improving follow-up flow. • Deal with **lack of interoperability** (a multitude of systems within and across hospitals), different solutions that are not integrated.
CHALLENGES	• There is a lack of interoperability. • Hospitals often do not have the technological readiness to integrate virtual health services or connected health solutions. • Purchasing processes are complex in hospitals.	• There are many different solutions that are not integrated. • There are inconsistent decisions on data made by a few stakeholders, hindering data privacy protection, data quality, interoperability, etc.
NEEDS	• Improve regulation of virtual health services. • Create frameworks for oversight that are reviewed by medical professionals. • Establish robust and agile validation techniques. • Regulate usage of patient data collection from digital devices and what data can be integrated into a	government data lake. • Have a consistent government-led digital strategy in place that spans across changes in political agendas. • Ensure that predictive or preventative virtual health services solutions can be linked with an effective clinical response in the event of abnormal signals.
SOLUTIONS AND BEST PRACTICES	• Ensure grants and subsidies are **funding solutions for real challenges,** and that they can be directed towards all relevant stakeholders (non-profit, civil society, industry, local governments, academia, health practitioners). • Develop **initiatives in which the government acts as a sponsor for locally developed innovation,** facilitating their early adoption with clear metrics. • Develop **regulatory sandboxes for experimentation** and validation.	• Ensure the **patient journey** is seamless. • Create **risk-sharing agreements** for innovations in virtual health services that allow monitoring of outcomes and pathways to reimbursement. • Focus on **piloting or sandboxing solutions** before scaling them. • **Connect patient monitoring to patient outcome** and continued management.
PARTNERS	• Health care professionals; patients; group purchasing organizations; governments; digital health clinics; health service providers; internet service providers and telecommunication companies; underrepresented communities; policy makers; end-users.	

Table 9. Findings on the topic **"Integration of Data and Digital Solutions into Decision-Making"**

PRIORITIES AND EXPECTATIONS	
• Build a minimal set of **key indicators** that can be continuously collected and analyzed.	• Foster **transparency in the decision-making process** and allow all stakeholders to voice concerns.
• Ensure **data protection and digital rights.**	• Improve **data quality.**
• Determine **legal and ethical frameworks** for AI accountability.	• Build **awareness for the usage of data for public policy** and decision-making.
• Develop **robust data governance.**	• Collect and **store only necessary data.**
• Work directly with medical teams to ensure **data curation.**	• Establish **multistakeholder partnerships.**
• Invest in **data security, privacy and integration.**	• **Invest in telecommunications infrastructure.**
• Address **data strategy** together with government partners.	• Develop **guidance documents and easy tools to support managers and teams** on how best to implement digital tech and evaluate their impacts depending on the context of use.
• **Invest in training** and management that support practitioners.	
• **Invest in interoperability** and open health.	

CHALLENGES	
• There are legal issues around the confidentiality of data, based on consent, that are different from those in Europe.	• There is a lack of knowledge, training, and capacity-building.
• There is not a detailed understanding of infrastructure issues.	• It is difficult to assess the decision-making path of some algorithms and in turn to explain decisions made in deep learning.

NEEDS	
• Invest in telecommunication infrastructure.	
• Ensure data and information is easily usable for end-users.	
• Foster co-development processes between developers and end-users.	

SOLUTIONS AND BEST PRACTICES	
• Develop **clinical decision support** that improves healthcare workflow.	• Establish a **team responsible for building integration** with hospitals/databases and data privacy/policy terms.
• Have conversations with **people from different sectors.**	• **Improve user interfaces.**
• **Fund multidisciplinary research** with co-advisors for students.	• Fund **training, capacity building, and the development of technical skills.**
• Design **workshops to showcase the benefits** of data-based decision-making.	• Facilitate **investments from healthtech** companies.
• Create **robust data infrastructure.**	

PARTNERS	
• Agencies supporting public-private partnerships in digital innovation; interoperability startups	

Appendix 3: Case Studies

This list features case studies and examples collected and brainstormed throughout the initiative.

Examples from Canada and Brazil

AI Futures Policy Lab Toolkit

The AI Futures Policy Lab is a full-day workshop for policy innovators to explore the intersection between public policy and artificial intelligence.

AI4Good Lab

The AI4Good Lab is an introductory program to AI for those with some programming background and intermediate to no experience in machine learning.

AIA - Algorithmic Impact Assessment

The Canadian AIA is a mandatory risk assessment tool intended to support the Treasury Board's Directive on Automated Decision-Making. It is organized according to Government of Canada's policy, ethical, and administrative law considerations of automated decision system risk areas as established through the Treasury Board of Canada Secretariat's consultations with academia, civil society, and other public institutions.

C4AI

Center for AI, a joint initiative held by University of São Paulo, IBM and FAPESP (Research Agency of the State of São Paulo).

C4IR Brazil

Centre for the 4th Industrial Revolution

CITADEL at CHUM

The CHUM Center for the Integration and Analysis of Medical Data (CITADEL) is one of the initiatives adopted by the University of Montreal Health Centre (CHUM). The project was born to structure (and validate) data sources (clinical, administrative, financial, management, research) in order to use them for research and improvement of health interventions.

Clinical decision support study in Porto Alegre

Santa Casa de Misericórdia de Porto Alegre (SCMPA) used Laura, an artificial intelligence platform, to alert care team professionals of patients at risk of clinical deterioration to reduce the mortality rate and improve the provider's operational processes.

Digital Inclusion Week

The Toronto Public Library promotes workshops with the public to improve data literacy and skills.

e-saudeSP

Public health online platform that allows São Paulo citizens to access telemedicine by APP, phone call, or chat bot (virtual assistant). It is an example of data integration and telemedicine at the municipal level.

FAPESP COVID-19 DataSharing/BR

COVID-19 Data Sharing/BR is Brazil's first repository of anonymized demographic, clinical and laboratory data regarding patients tested for COVID-19 in the state of São Paulo. The purpose of the platform is to enable sharing of patient data to support scientific research on the disease in various knowledge areas. The repository will initially hold open-access anonymized data.

First Nations Data Centre - First Nations Information Governance Centre

The First Nations Data Centre is a Knowledge Translation resource from FNIGC that provides access to published, unpublished, and record-level data from our respected national survey work.

Health Innovation Initiative

Canada's platform for action across academia, industry, clinical practice, government, and community.

Hospital Command Centre

The Command Centre is a highly advanced, data-driven 'mission control' situated at the very heart of Humber River Hospital. The 4,500 square foot facility enables us to monitor and manage the flow of our patients at every stage of their care journey with us.

IdeiaGov

The innovation hub of the São Paulo government.

In Fieri, University of Montreal

It is a research program that focuses on Responsible Innovation in Health (RIH) and conducts research in Canada (Quebec, Ontario) and in Brazil (state of São Paulo). The program offers assessment tools and user guides.

Indigenous Futures Research Centre

Based at Concordia University in Tiohtià:ke (Montreal), the Indigenous Futures Research Centre (IFRC) explores how Indigenous people are imagining the future of their communities.

Innovation Procurement Toolkit

A tool kit that visually represents the alternatives to procure innovation under Brazilian Law.

Innovation Québec

An online platform to buy and sell innovations or find innovation business opportunities.

Mila

Québec AI Institute and their global consultation on the ethics of AI.

Montréal Declaration for a Responsible Development of Artificial Intelligence

A collective endeavour that aims to steer the development of AI to support the common good, and guide social change by making recommendations with a strong democratic legitimacy.

PULSAR

Université Laval's research project on health data sets and consent.

OBVIA

International Observatory on the Societal Impacts of AI and Digital Technology.

TIESS - Fiducie d'utilité sociale de données

Open North exploration of Québec civil law data trust (control without ownership, purpose first). It includes a "Definition and Implementation of Data Trusts in Québec Civil Law" and workshop takeaways.

WIFI Livre SP

Free public WIFI program coordinated by the Municipal Department of Innovation and Technology (SMIT) in São Paulo, designed in collaboration with other stakeholders.

International examples

AI Procurement in a Box

A set of actionable procurement guidelines to enable decision-making that can also be evaluated, this World Economic Forum project provides a guidebook designed to unlock public-sector adoption of AI through government procurement and a set of complementary tools to demonstrate the global consensus on the responsible deployment of AI technologies.

DiGA - DigitalHealth Applications (Germany)

Fast track process to assess digital health applications (DiGA) that can be prescribed to patients. The Fast Track-procedure defines a full set of requirements for DiGA. It is based on the assumption that digital applications must be safe and easy to use to be successfully established in healthcare, aiming for a successful link between privacy and information security on the one hand and user friendliness and high performance on the other hand.

Digital Health Center of Excellence (USA)
An initiative that aims to empower stakeholders to advance health care by fostering responsible and high-quality digital health innovation.

Elements of AI (Finland)
AI literacy online course designed by the University of Helsinki.

European AI Fund
Funding to support civil society organizations, including a Policy and Advocacy Core Grant

Guidelines for AI procurement (UK)
A summary and guidelines, published in 2020 by the United Kingdom government, of best practices addressing specific challenges of acquiring Artificial Intelligence technologies in government.

Guidelines for AI Procurement (WEF)
Guidelines developed by the World Economic Forum Centre for the Fourth Industrial Revolution, in consultation with a multistakeholder community in 2019.

Health Data Hub
The Health Data Hub includes an international benchmark in 11 countries, multiple case studies, and a report about data access platforms.

Laboratorio de Gobierno (Chile)
Pioneering Government Laboratory in Latin America focusing on public innovation.

NHS Capacity building (UK)
Report "Preparing the healthcare workforce to deliver the digital future" and what has been developed in terms of training following the publication of the Topol Review in the UK NHS.

Prudence AI
Multidisciplinary firm that brings together experts in Data protection law, Cybersecurity, AI Ethics and Technology to work on AI assessment.

OECD AI Policy Observatory & Framework for the Classification of AI Systems
Framework for the Classification of AI Systems, which is divided into four parts (context, data and input, AI model, task and output) and has been designed to give policy makers clarity.

Roadmap for AI and insurance
OPTIC's roadmap and report on "Artificial intelligence, solidarity and insurance in Europe and Canada" featuring examples and case studies

The AI Lab Skunkworks (UK)
The NHS AI Lab Skunkworks programme aims to find new ways to use AI for driving forward the early adoption of technology to support health, in both clinical and business contexts.

Topol Digital Fellowships (NHS/UK)
The Topol Programme for Digital Fellowships in Healthcare provides health professionals with time, support and training to lead digital health transformations and innovations in their organizations.

WHO Hub for Pandemic and Epidemic Intelligence
Based in Berlin, the Hub will benefit from WHO's presence in more than 150 countries. By linking local and global initiatives together, the WHO Hub aims to foster a collaborative environment for innovators from across a spectrum of disciplines, allowing it to leverage the best technology and anchoring its work in the needs of stakeholders around the world.

Appendix 4: Participants and Partners

First Meeting

QUÉBEC

Jason Naud
Director, Québec office in São Paulo

Thais Aun
Economic Affairs Director, Québec office in São Paulo

Stéphanie Yared
Advisor in International Affairs, Ministry of Economy and Innovation

Damien Pereira
Advisor in International Affairs, Ministry of Economy and Innovation

Rosemary De Lair-Blais
South America Advisor, Ministry of International Relations

SÃO PAULO

Andrey Pereira Brito
Undersecretary of International Affairs, Secretariat of International Affairs

Sylvia Amaral Romanelli
Innovation Advisor, InvestSP

Mayra Silvestre Izar
Technical Director, Secretariat of Economic Development

Layla Palis Pinheiro
Advisor, Secretariat of International Affairs

Marcos Teixeira
Coordinator of Science, Technology and Innovation, Secretariat of Government

Gabriela Papaleo
Digital Innovation Coordinator, Secretariat of Health

Second Meeting
Government Officials and Organization Leaders:

QUÉBEC

Marco Blouin
Director General, Science and Partnerships, Ministry of Economy and Innovation

SÃO PAULO

Andrey Pereira Brito
Eduardo Adriano
Executive Secretary of Health, São Paulo State Government

NOVARTIS & NEWCITIES

Ann Aerts
Head, Novartis Foundation

John Rossant
Chairman, NewCities

Éric Marquis
Assistant Deputy Minister for Bilateral Relations, Ministry of International Relations

Jason Naud
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Affonso Massot
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Paula Helena Ortiz Lima
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Inji Yaghmour
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Stéphanie Yared
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Mayra Silvestre Izar
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Marcos Teixeira
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NOVARTIS & NEWCITIES

Yara Baxter
Executive Coordinator, Novartis Foundation São Paulo

Johannes Boch
Director of Access and Urban Health, Novartis Foundation

Stéphanie Grandperret
Chief Operating Officer, NewCities

Hannah McCasland
Events and Partnership Manager, NewCities

Jess Reia
Fellow, NewCities

Theresa Reiker
Associate Director of Population Health, Novartis Foundation

Jason Shellaby
Director of Global Health Policy, Novartis Foundation

Workshop series
Workshop 1: Setting the Stage

NAME	POSITION	ORGANIZATION	REGION
Rafael Fassio	Government Fellow; State Attorney	Center for the 4th Industrial Revolution; Attorney General of the State of São Paulo	São Paulo
Marie-Pierre Faure	Directrice Adjointe, Living LAB- Partenariats-Projets spéciaux	Institut Transmedtech	Québec
Lauriane Gorce	Governance and AI specialist	Open North	Québec
Carole Jabet	Scientific Director	Québec Health Research Fund	Québec
Madeleine Jean	Deputy Director	Prompt	Québec
Clara Langevin	Project Manager	Center for the 4th Industrial Revolution	São Paulo
Roberto Lotufo	Chief Technology Officer; Professor	NeuralMind ; University of Campinas	São Paulo
Rafael Murgi	FDI Analyst – Business Development and Institutional Relations	Invest SP	São Paulo
Gabriela Papaleo	Digital Innovation Coordinator	São Paulo State Secretariat of Health	São Paulo
André Carlos Ponce Carvalho	Professor	University of São Paulo	São Paulo
João Arthur Reis	Project Manager	Center for the 4th Industrial Revolution	São Paulo
Karine Saboui	Senior Research Analyst, GIS and AI	Open North	Québec

Workshop 2: Implementing AI Solutions

NAME	POSITION	ORGANIZATION	REGION
Ana Brandusescu	2019-2021 McConnell Professor of Practice at CIRM	McGill University	Québec
João Paulo Cândia Veiga	Professor; Researcher	University of São Paulo; Center for the 4th Industrial Revolution	São Paulo

Barbara Decelle	Health Research Advisor	IVADO	Québec
Marc-Antoine Dilhac	CIFAR Chair in AI Ethics	MILA	Québec
Rafael Fassio	Government Fellow; State Attorney	Center for the 4th Industrial Revolution; Attorney General of the State of São Paulo	São Paulo
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Joumana Ghosn	Senior Director - Applied Machine Learning Research	MILA	Québec
Cristina Godoy Bernardo de Oliveira	Professor; Founder	University of São Paulo; Advanced Institute of Data Protection	São Paulo
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Karine Saboui	Senior Research Analyst, GIS and AI	Open North	Québec
Camille Tremblay	Principal Coordinator	Digital Health Consortium	Québec
Rafael Zanatta	Director	Data Privacy BR	São Paulo

Workshop 3: Overcoming Obstacles and Ensuring Sustainable Public Health Impact

NAME	POSITION	ORGANIZATION	REGION
Farah Bendahman	Director, Enterprise Development	Invivo	Québec

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Lauriane Gorce	Governance and AI specialist	Open North	Québec
Clara Langevin	Project Manager	Center for the 4th Industrial Revolution	São Paulo
Rafael Murgi	FDI Analyst – Business Development and Institutional Relations	Invest SP	São Paulo
Gabriela Papaleo	Digital Innovation Coordinator	São Paulo State Secretariat of Health	São Paulo
Cécile Petitgand	Data Access Advisor	Québec Health Research Fund	Québec
Cristian Rocha	CEO	Startup Laura	São Paulo
Fernando Silveira	President	ABIMED	São Paulo
Marcelo Takano	Initiative Coordinator	Avança Saúde	São Paulo
Jorge Valverde-Rebaza	Executive Director of Operations	Visibilia	São Paulo
Liang Zhao	Lead of Health-related projects	C4AI (Center for Artificial Intelligence)	São Paulo

Organizers: State of São Paulo and Government of Québec

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Sylvia A. Romanelli	Innovation Advisor	Invest SP	São Paulo
Stephanie Yared	Advisor in International Affairs	Ministry of Economy and innovation	Québec

Novartis Foundation and NewCities

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Eve Gesbert	Communications Director	NewCities
Salomé Gueidon	Project Coordinator	NewCities
Hannah McCasland	Events and Partnerships Manager	NewCities
Jess Reia	AI4HealthyCities Fellow	NewCities
Theresa Reiker	Associate Director of Population Health	Novartis Foundation

Additional Facilitators

NAME	POSITION	ORGANIZATION
Brent Barron	Director, Strategic Projects, Knowledge Mobilization	CIFAR
Gaga Boskovic	Advisor, Government and Public Policy	CIFAR

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