

Ai & Pandemic Response Sub-Working Group Report

November 2020 - GPAI Montréal Summit

Please note that this report was developed by experts of the Global Partnership on Artificial Intelligence's Working Group on the Responsible Development, Use and Governance of AI. The report reflects the personal opinions of GPAI experts and does not necessarily reflect the views of the experts' organizations, GPAI, the OECD or their respective members.



Co-Chairs' Welcome	4
Introducing AIPR	5
AIPR's Members	6
Mandate of AIPR	7
Work Process	8
Preliminary Recommendations and Outputs for the Summit	10
AIPR's Focus for the Next 3-6 Months	12
Long-Term Vision	14
Annex1	15

Co-Chair's Welcome



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The Global Partnership on AI (GPAI) was founded in 2020 to undertake and support applied AI projects and provide a mechanism for sharing multidisciplinary analysis, foresight and coordination—with the objective of facilitating international collaboration and synergies and reducing duplication in the area of AI systems governance.

We co-chair one of GPAI's five expert working groups, the AI and Pandemic Response Subgroup ([from now on, "AIPR"](#)), which reports to the Responsible AI Working Group.

AIPR's mission is to foster and support the responsible development and use of AI-enabled solutions to address COVID-19 and future pandemics. Concretely, AIPR ensures that methods, algorithms, code and validated data are shared rapidly, openly, securely, and in a rights and privacy-preserving way, in order to inform public health responses and help save lives. AIPR promotes cross-sectoral and cross-border collaboration and supports engagement with the public and healthcare professionals around the responsible use of AI to address pandemics and public health challenges.

This report presents the work that AIPR has done in the last six months as well as its short-term goals. It also discusses briefly the principles that will guide AIPR in the long-term. Please note that though we prefaced this document, it really should be considered as a deliverable produced by AIPR's 21 members, among which 8 sit on AIPR's Steering Committee. We are grateful that we were given the opportunity to co-lead a group with so much expertise and enthusiasm.

There is no doubt in our mind that AI has the potential to help our societies—whether we live in developed or developing countries—fight this pandemic and future ones. But to do that, we will need, collectively, to get rid of some of the important hurdles—technical and, also non technical ones—that prevent us from developing the AI tools we need and from implementing them efficiently. Contributing to the elimination of these obstacles with the help of strategic partners will be AIPR's focus in the next 6 to 12 months, but also in the longer term.

Introducing AIPR

As of November 30, 2020, AIPR had 21 members, 15 men and 6 women. Two people also sat on AIPR as observers.

AIPR's international experts come mostly from the technical world (e.g. computer science, engineering) and they use AI to address complex medical challenges (e.g. medical imaging, bioinformatics, clinical risk prediction, health delivery services).

Thirteen members come from the academic sector, 3 work in the private sector, 1 for a non-profit, 3 in the public sector and 1 in an international organization.

Sixteen countries or international entities designated members to AIPR: Australia, Canada, the European Commission, France, Germany, India, Italy, Japan, Korea, Mexico, New Zealand, the OECD, Singapore, Slovenia, the United Kingdom, and the USA.

We are conscious that a better membership balance will need to be achieved in the future since only diversity and the collaboration of *all* stakeholders will enable our societies to use AI as an efficient lever during pandemics. In particular, we would like more members to come from the Global South. More women should also sit on the subgroup.

Box 1, below, presents AIPR's experts.

AIPR's Members

Members

[Alice Oh](#), Korea Advanced Institute of Science and Technology
[Paul Suetens](#), KU Leuven
[Anurag Agrawal](#), Council of Scientific and Industrial Research
[Amrutur Bharadwaj](#), Indian Institute of Science
[Nozha Boujema](#)a, Median Technologies
[Dirk Brockmann](#), Humboldt University of Berlin
[Howie Choset](#), Carnegie Mellon University
[Enrico Coiera](#), Macquarie University
[Marzyeh Ghassemi](#), University of Toronto
[Hiroaki Kitano](#), Sony Computer Science Laboratories Inc
[Seán Ó hÉigearthaigh](#), Centre for the Study of Existential Risk
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[Alan Paic](#), OECD
[Michael Plank](#), University of Canterbury
[Mario Poljak](#), University of Ljubljana
[Daniele Pucci](#), Istituto Italiano di Tecnologia Research Labs Genova
[Joanna Shields](#), BenevolentAI
[Margarita Sordo-Sánchez](#), Brigham and Women's Hospital at Harvard Medical School
[Leong Tze Yun](#), National University of Singapore
[Gaël Varoquaux](#), INRIA
[Blaž Zupan](#), University of Ljubljana

Observers

[Cyrus Hodes](#), AI Initiative
[Kim McGrail](#), UBC

Mandate of AIPR

As mentioned in the foreword, AIPR's role is to foster and support the responsible development and use of AI-enabled solutions to fight COVID-19 and other future pandemics.

Concretely, AIPR must work to ensure that methods, algorithms, code and validated data are shared rapidly, openly, securely, and in a rights and privacy-preserving way, in order to inform public health responses and help save lives. AIPR must promote cross-sectoral and cross-border collaboration as well as support engagement with the responsible use of AI among the general public and healthcare professionals in the global response to pandemics and to public health challenges.

AIPR's mandate aligns closely with the mandate of GPAI's Responsible AI Working Group (RAI), whose role is to foster and contribute to the responsible development, use, and governance of human-centered AI systems, in congruence with UN Sustainable Development Goals. AIPR's mandate particularly aligns with RAI's short term action plan which contemplates the creation of an internal committee on Drug Discovery and Open Science that will examine how to create a favorable context for AI to contribute to drug discovery in an open and equitable manner. Not surprisingly, 5 members of AIPR have accepted to sit on RAI's committee on Drug Discovery and Open Science.

AIPR is also eager to collaborate with other GPAI working groups. Since data bias and data scarcity have been identified by members and by [the OECD](#) as major barriers to the development of AI, members of AIPR are especially eager to work with GPAI's Data Governance Working Group in the coming months. For example, both groups could issue recommendations on better balancing privacy considerations with the potential of data to save lives. By insisting on privacy, the current approach entails missed opportunities. A better balance could open a door to improving data management in healthcare more broadly, which would in turn better leverage the potential of AI. Kim McGrail, from UBC, acts as a link between the Data Governance Working Group and AIPR, which will facilitate cooperation in the future.

Work Process

AIPR was created less than six months ago, during a highly difficult period, to work precisely on solutions that could help us get back to more normal lives.

AIPR has held 4 meetings since it began its activities. These meetings were used to discuss the work that the group should undertake and the work that it had initiated.

On August 20 of 2020, members of AIPR met to discuss what AIPR's mandate should be and to brainstorm about what this new body should try to accomplish in the short term. Members also framed the first project they intended to undertake as a group.

AIPR members decided their first project would consist in cataloguing, analyzing and making recommendations on AI tools addressing the pandemic. This project had three components:

- **Catalogue existing AI tools developed and used in the context of the COVID-19** pandemic to accelerate research, detection, prevention, response and recovery. The catalogue will list initiatives from academia, governments, the private sector, civil society, and international organizations, among others;
- **Assess selected AI tools.** AI tools of particular interest will be selected from the above catalogue for further assessment. The assessment will analyse how these tools implement notions of responsible research and development, and why they are beneficial applications of AI systems. The analysis will identify best practices, lessons learned and the main socio-economic, technical, and scientific challenges to implementing responsible AI principles;
- **Make recommendations on future projects. Based** on the analysis, make recommendations on best practices to overcome the challenges identified above, and suggest specific projects to fill gaps and overcome problems detected during the assessment.

In September 2020, AIPR launched a public [call for proposals](#) to identify a consultant who could help AIPR to complete that study before the end of November, in time for the December Summit. It also set up a Steering Committee comprising 8 volunteers from AIPR (see Annex 1) to evaluate the proposals received by AIPR and supervise the work done by the winning firm or group.

Five proposals were received by AIPR before the September 29 deadline. On October 5, after one evaluation round, the Steering Committee selected The Future Society (TFS) as the firm that would lead AIPR's first project under the Steering Committee's supervision.

TFS met with members of the Steering Committee during a kick-off meeting that took place on October 7. That meeting served to develop a common and more refined understanding of the objectives of this project, define the final work plan for the project and plan future meetings.

Other meetings were held by the Steering Committee and TFS on October 14 and 21 and on November 2 and 13 to discuss TFS's methodology, findings and preliminary versions of its report and of its different components, especially its recommendations, and to plan the intervention of TFS during meetings of the larger group.

On October 20 of 2020, TFS presented the project's scope, timeline and initial results to members of AIPR, who had the opportunity to make suggestions during virtual breakout sessions, and subsequently, by email or through one-to-one meetings with TFS employees.

On November 18 of 2020, TFS presented the latest draft version of its report to AIPR. Members were given the opportunity to propose changes that TFS could integrate in the final version of the report before it was submitted on November 23.

TFS submitted its final report to AIPR on November 23. During the following 48 hours, members of AIPR were asked to assess the importance of TFS's 4 main recommendations and different sub-recommendations using an online survey and a 1-5 scale, where "5" meant AIPR experts "strongly approved" a recommendation and "1", "strongly disapproved". Twelve of AIPR's 21 members submitted an answer and made comments regarding the future direction the group should take.

Working Group Timeline

AUGUST

Co-Chairs are introduced

[First meeting of the Working Group](#) (20th) – discussion around the first deliverable that AIPR should produce; participants are invited to fill a form to start cataloguing existing AI tools

SEPTEMBER

[Introductory blog on AIPR](#) is published on the [OECD website](#), including a call for proposals and terms of reference

[Second meeting of the Working Group](#) (17th) – discussion around, especially, the main obstacles to the development and use of AI to fight pandemics

OCTOBER

[Round 1 of the evaluation of the proposals](#) received by AIPR (5th)

Project kickoff meeting with TFS and Steering Committee (7th)

[Meeting of the Steering Committee](#) and TFS (14th)

[Meeting between all Co-Chairs](#) to compare progress and discuss potential synergies (October 16th)

[Third meeting of the Working Group](#) (20th) – presentation of TFS and discussion around TFS's mandate and work plan, and around the project's scope

[Meeting of the Steering Committee](#) and TFS (21st)

NOVEMBER

[Meeting of the Steering Committee](#) and TFS (2nd)

[Meeting of the Steering Committee](#) and TFS (13th)

[Fourth meeting of the Working Group](#) (18th) - presentation of the last draft of TFS's report; discussion around the findings and recommendations

[TFS's report is submitted](#) to AIPR (23rd)

[Survey](#) is launched to collect the level of support of members for the report's recommendations

[Meeting between all Co-Chairs](#) prior to the Summit (27th)

DECEMBER

Presentation of finalized outputs and open workshop on next projects at the Summit.

Preliminary Recommendations and Outputs for the Summit

The review of national and international initiatives conducted by TFS is the first deliverable commissioned by AIPR. That review contains valuable insights and recommendations that will guide the work the subgroup will undertake in the future.

A review of the initiatives identified by TFS revealed that the key enabling factors that were common among promising pandemic response projects include:

1. **Operationalization of open science:** Initiatives that tend to demonstrate promise are those that operationalize open science by making use of open-access data and by making their metadata, algorithms workflows, models, and software (including code), available to different levels of inquiry;
2. **Fast-tracking of traditional research or funding processes:** Another key enabling factor is the use of AI to isolate and fast-track traditional processes that face exceptional strain or congestion during pandemics, such as scientific literature review, online content curation, resource allocation, and disease diagnosis. These processes become particularly burdensome during a pandemic because of the overwhelming amount of published literature regarding the pathology of concern, and because of the large number of medical images requiring review;
3. **Cross-sectoral and interdisciplinary collaboration:** Another factor denoting present and likely future success is the degree to which an initiative incorporates interdisciplinary and cross-sectoral collaboration. These initiatives demonstrate promise because they are more likely to possess expertise and capacity to design, develop, and scale an initiative. High-level partnerships also confer a degree of authoritativeness, enhancing the likelihood of an initiative to be received well;
4. **Transferability of an initiative for future pandemics:** Initiatives that are likely to be the most successful in the long term are those that demonstrate transferability —the clear potential for the underlying techniques to be adapted to the prediction, prevention or response to future potential pandemics, or to improve the delivery of healthcare in general (e.g., making it more efficient and agile beyond pandemics).

The report also identifies obstacles to the development and use of AI in the public health field.

The main obstacles are:

1. **Ethical and legal obstacles:** Several initiatives reviewed in TFS's mapping highlighted time-consuming procedures to be compliant with existing data protection and privacy regulations. AI-enhanced CT scans, for example, expressed the burden of having to report to the Food and Drug Administration (FDA) each time they wanted to retrain their Deep Learning algorithms with new datasets. Another burden is the lack of a global health data governance framework, especially applied for medical devices developed during public health crises. Most initiatives are confronted with different data privacy regulations around the world, and it is not always clear what level of data pseudonymization is sufficient to be compliant across jurisdictions;
2. **Difficulty to access reliable data:** In the context of COVID-19, available datasets are often characterized as insufficient, incomplete, context-dependent and quickly evolving. In particular, initiatives building AI-enhanced CT scans, computational protein prediction models, and epidemiological forecasting are limited by insufficient datasets. For example, AI-powered CT scanning tools tend to be very US- and Europe-centric, with limited chest X-rays from patients across different geographies. Reviewed initiatives also have limited access to clinical expertise to supervise the development of their models. This is partly due to the increasing pressure posed on front-line healthcare workers;



- 3. Lack of public adoption and credibility:** The current pandemic heightened public concern and scrutiny around the use and collection of sensitive healthcare data. Several promising initiatives were impacted by such preoccupations. For example, COVI, a contact-tracing app powered by AI and collecting more sensitive data than most traditional contact tracing apps, faced a major confidence problem in Canada. Another relevant example is Quick Diagnosis of COVID-19 Using Medical Image, a CT scanning tool developed in Mexico by the National Institute of Astrophysics, Optics and Electronics. The initiatives' founders were confronted with the lack of practitioners' digital and AI literacy, and were unable to convince local hospitals that their tool would alleviate clinicians' workload.

This analysis led TFS to make 4 main recommendations to which 17 sub-recommendations were attached. The 4 main recommendations are:

- 1. With partners, like the Data Governance Working Group, the OECD or the World Health Organization, AIPR should help co-shape a Global Health Data Governance Framework to overcome ethical and legal barriers.** Such a framework would enable innovators to develop tools in an accelerated and sufficiently responsible manner and support regulators in holding innovators accountable for handling data responsibly. It would also support public health institutions as they evaluate and commission the tools available to them. This would be particularly beneficial in regions where there is insufficient regulatory infrastructure;
- 2. AIPR should support a central portal to fasttrack cross-sectoral and interdisciplinary research.** A common comment from interviews with project leads is that there is still no single entry point to pandemic related information. GPAI would have the authoritative standing and expertise to support an AI and Pandemic Response Portal, which could be developed in collaboration with key stakeholders. The Portal could lead to existing sites with curated COVID-19 related literature review; existing databases across clinical, biological and societal domains; relevant AI models, including NLP tools and software to annotate datasets; lists of promising initiatives and associated domain experts to encourage cross-sectoral collaboration and a well-balanced feedback loop between computational scientists, virologists, biologists but also policymakers and business leaders; a catalogue of available funding and grant applications; and a forum interface to allow experts and entrepreneurs from different domains to explain, discuss and diffuse their findings and initiatives;
- 3. AIPR should address current gaps such as social acceptability of AI initiatives and drug treatments.** TFS's mapping of AI initiatives to respond to pandemics highlighted a gap concerning the social acceptability and public adoption of vaccines and AI tools. The AI and Pandemic Response Subgroup could address this gap by encouraging the development of anti-vaccine sentiment analysis tools to monitor and understand populations' evolving perceptions towards COVID-19 vaccination. Similarly, the AI and Pandemic Response Subgroup could encourage further social acceptability of AI tools and applications such as contact tracing applications. GPAI could contribute to these applications' adoption by raising public awareness and pedagogy over the applications technical settings and data governance framework;
- 4. AIPR could set up Task Forces to address immediate challenges.** In order to implement all three recommendations mentioned above, the AI and Pandemic Response Subgroup could create a Task Force (or numerous Task Forces), collaborating with members of the Data Governance, Future of Work, and Innovation and Commercialization working groups. A Task Force with about 3-4 members from each working group would allow for further alignment, synergy and impact.



AIPR's Focus for the Next 3-6 Months

The work conducted by TFS for AIPR was extremely useful and helped AIPR determine what its priorities for the short term should be.

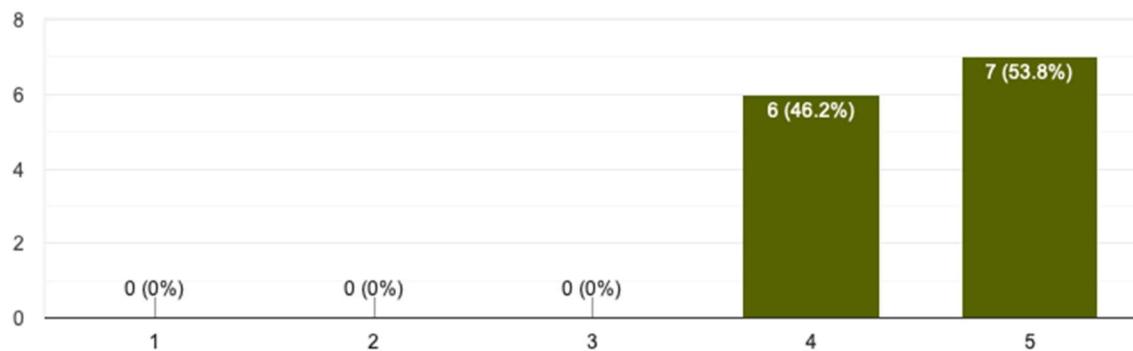
As was mentioned above, the recommendations made by TFS were put up to a vote in order to determine how much support they received from members of AIPR. In total, 13 of the subgroup's 21 members submitted an answer to the survey¹. Their answers have led AIPR to prioritize three sub-recommendations which appear particularly well supported (see Figure 1).

1. To help overcome ethical and legal barriers, AIPR will collaborate with other GPAI Working Groups to facilitate the development of a Global Health Data Governance Framework that will help foster the development of tools that utilize medical data and AI for drug discovery and clinical treatment;
2. AIPR will contribute to the adoption of applications powered by AI (like contact tracing apps) by raising public awareness and supporting pedagogical efforts about these applications's technical settings and the data governance frameworks they rely on;
3. AIPR will consider methods for providing direct support to initiatives that could bring more immediate pandemic relief.

Figure 1 — Level of support for the 3 initiatives prioritized

GPAI should facilitate the development of a Global Health Data Governance Framework that would help foster the development of tools that utilize medical data and AI for drug discovery and clinical treatment.

13 responses



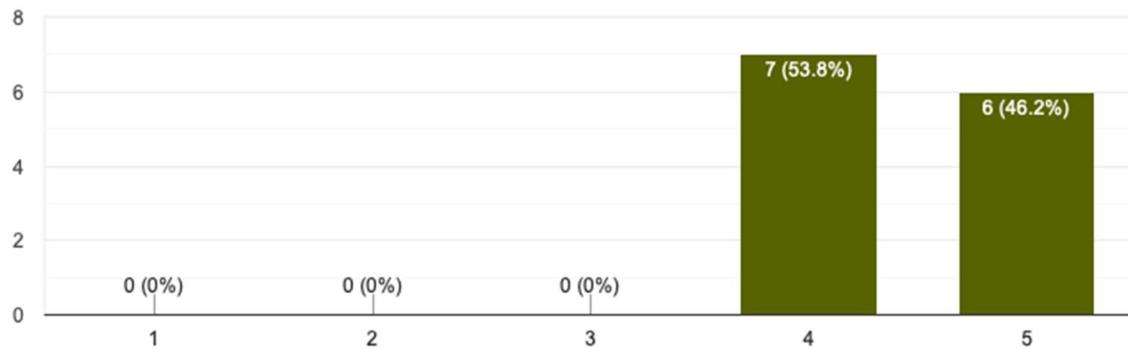
¹ Number valid as of November 27, 9 am, Montréal time.



The Subgroup should contribute to the adoption of applications powered by AI (like contact tracing apps) by raising public awareness and pedagogy over the applications's technical settings and data governance framework.



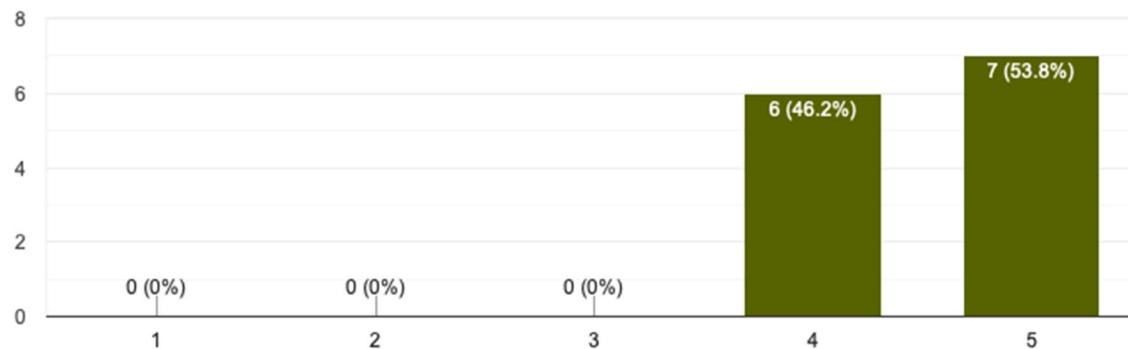
13 responses



As the Subgroup considers implementing these recommendations, it should also consider methods in which it could aid more immediate pandemic relief by providing direct support to initiatives.



13 responses



Long Term Vision

AIPR will use the Summit and the exchanges that will take place during the Summit as an opportunity for holding discussions on the longer term vision AIPR should adopt. That said, AIPR's long-term vision will rest on two pillars:

1. AIPR plans to keep following a user-driven approach instead of a technology-driven one, that is focus on the most urgent issues met by diverse stakeholders on the ground (e.g., patients, clinicians, policymakers) and on how AI could help tackling them;
2. AIPR will keep paying attention to undertaking applied projects that will help get rid of the main hurdles that impede the development or adoption of AI tools in the field. These hurdles, as mentioned before, are ethical and legal barriers, difficult access to reliable data and lack of public adoption and credibility of AI.



Annex1

Project Steering Committee Membership

Howie Choset
Alice Oh
Seán Ó hÉigearaigh.
Alan Paic
Daniele Pucci
Margarita Sordo-Sanchez
Paul Suetens
Blaž Zupan

