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Building a Strategy for Artificial Intelligence in Public Health: Centering Partnership, Equity, and Interdisciplinarity

Public Summary
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Executive Summary

Background

For over a decade, research has highlighted that artificial intelligence (AI) and data-driven methodologies more generally, hold enormous potential for population and public health, as they can serve not only to contextualize and enrich one's understanding of a particular public health issue, but also as tools to assist decision-making. Conversations on the application of these types of technologies to public health practice have been occurring for the past few years, creating a baseline for this dialogue. Around the globe, many local, regional, national, and supra-national jurisdictions have adopted certain data-intensive/AI tools to enhance their traditional public health practices. Canada is among the world leaders in the AI sector and has seen a growing yet limited adoption of such technologies at various levels of public health governance.

The development of AI coincides with the need to strengthen public health capabilities and reduce health inequities. This points to significant opportunities and challenges for the responsible adoption of AI and data-driven tools by public health actors. For this reason, PHAC's Office of the Chief Science Officer and CIHR's Institute for Population and Public Health are seeking to hold discussions on the effective, equitable, and ethically informed application of AI and emerging digital technologies into public health policy and practice, schematized around a potential future strategy. Dialogue with local, national and international experts from a range of fields is necessary in order for PHAC and CIHR-IPPH to gain rich, interdisciplinary perspectives on the challenges at hand and lessons learned. The need for a national strategy targeting AI for health has been highlighted through CIFAR's AI4H Task Force (2020) report, which includes an urgent call for "federal/provincial plans to advance digital health" to be tied to "an explicit AI4H strategy with the relevant policies, investments, partnerships, and regulatory frameworks." In light of these calls, there is currently work to define a Pan-Canadian Health Data strategy, led by PHAC. This data-focused work aligns with the development of discussions and work on AI and public health, as both could serve to inform each other in a bi-directional manner. The focus of this Best Brain Exchange (BBE) on AI and public health practice aligns with this priority and intends to integrate and build upon learnings from these reports.

Presentations by government staff at various levels (provincially, federally, and other countries) and researchers as well as a First Nations-led organization focused on the challenges and opportunities in using AI in public health, and examples of its use. Presentations outlined that AI is not neutral. AI is a tool and public health values and principles (including equity and ethics) should guide how and when AI is used. Many challenges were highlighted, including data (e.g. lack of data interoperability, data ownership questions), environmental impacts, and the need for increased capacity building and infrastructure. The need for innovation, evaluating interventions, and ongoing learning were noted. Provocateurs identified many questions and considerations for adopting AI in public health.

Summary of Themes from Discussion

Guiding principles for adopting AI in public health:

Transparency in a meaningful way**,** including on the tools, what is needed to use them, what has gone into using them, and how they will be used.

Co-creation with communities, bringing communities to the table from the start for meaningful engagement. This will also lead to increased trust and improved data quality if people are actively engaged.

Multi-disciplinary and agile teams including from public health, AI, the humanities and social sciences.

Accountability to people and populations, including ensuring people have agency over their own data.

Equity and inclusion, including addressing inequities, identifying power structures, decolonizing, Indigenizing, and rebalancing power. Co-creation with communities will help to address this.

AI in public health should be **intentional and of value for public health**, so that needs and priorities of public health drive the use of AI.

Building capacity, knowledge, and comfort for AI in public health, including investment to build this capacity in public health and at the community level.

Assessing risks and costs, including human and hidden costs (e.g. environment, human rights) and ethics being applied from the identification of questions and priority setting.

Continuous learning, to ensure changes are made iteratively as we learn.

Elements needed for successful adoption of AI in public health:

- **Workforce building:** There are continued challenges in working and bridging across disciplines. Relationship building is needed across sectors, and communities of practice should be developed to encourage this work.
- **Infrastructure:** Infrastructure needs to be re-conceptualized beyond technology to include a broader socio-technical lens that includes resource and environmental sustainability and policy that is grounded in social realities. Lack of skills and understanding of technologies is a challenge. Policymakers need to have practical and functional understandings of technologies and infrastructure need to enable the use of AI. New methods of collaboration between the public and private sector are needed, and more discussions are needed on the importance of building collaborative relationships with communities.
- **Governance:** An important starting point is to look at what instruments are already in place (e.g. Canadian Constitution – Article 15 on stewardship principles, protecting rights/lands of Indigenous Peoples), and ensuring we are staying true to these and building on them particularly with respect to equity. Governance needs to build on communication with the community. The Pan-Canadian Health Data Strategy could have an AI table as one mechanism for a national space to discuss these issues.
- **Best Practices for Evaluating the Outcomes/Impacts of AI:**
    - **Equity -** evaluating how different models perform across disproportionately disadvantaged and structurally marginalized sub-groups as a best practice. Mandatory equity impact assessments as a potential best practice.
    - **Transparency -** has to be in place across the lifecycle, including outlining how the algorithm was developed, in reporting of data, and publications. Reporting needs to be digestible and understandable to people. Pre-registration, like what is done for clinical trials, could help to ensure a publicly accessible catalogue of projects. Transparency is also critical when the private sector is involved to ensure there is not a negative impact on the public's trust.
    - **Engagement -** authentic partnerships are important. Frameworks and best practices for global health research can be adapted for AI and public health. It is also important to understand "best practices for whom", including considering the end user.

- **Partnerships:** Trans-disciplinary and multi-disciplinary teams are needed. Partnerships with academia, start-up companies, public health agencies, and the private sector need to be struck from the beginning to ensure a common understanding of public health goals and objectives, and expectations. The government should be considered a key enabler of partnerships.

Conclusion

AI needs to serve the needs of public health, including addressing inequities. Sustained investments are needed to support AI work in public health, though there a number of existing assets to build on. A strong public health voice is needed.