

Artificial Intelligence for Enhanced Public Health Outcomes

To: Chair and Members of the Board of Health

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Recommendations

It is recommended that the Board of Health approve the resolution, in Appendix A, to be submitted to alPHA.

Key Points

- Submission of this resolution to the Association of Local Public Health Agencies (alPHA) to promote the normalization and broader understanding of AI and emerging technologies within the public and private sectors.
- Encouraging other health units to recognize and adopt these technologies, understanding their profound impact on efficiency and operational methodologies.
- Highlighting the potential for AI to revolutionize public health practices through improved disease surveillance, health promotion, and service delivery, while addressing ethical concerns such as data privacy, bias, and transparency.

Background

This resolution arises from a collaborative effort between Wellington-Dufferin-Guelph Public Health (WDGPH) and Simcoe Muskoka District Health Unit (SMDHU). If approved, it will be presented to aPHa by Dr. Kyle Wilson (WDGPH) and Dr. Steven Rebellato (SMDHU) at the annual aPHa meeting this June.

aPHa serves as a vital platform for Ontario's Local Public Health Agencies, advocating for public health policy and practice improvements. This presentation aims to catalyze a province-wide discussion on the critical role of AI and emerging technologies in public health.

A full copy of the resolution is available in Appendix A for detailed review.

Discussion

The integration of AI and related technologies promises to transform public health by enhancing disease prediction, health service delivery, and operational efficiency.

Utilizing these technologies can lead to significant advancements in:

- **Predictive Analytics:** AI's ability to analyze large datasets can forecast health trends and potential outbreaks, enabling more effective resource allocation.
- **Health Equity:** AI tools can identify health disparities, guiding targeted interventions to improve outcomes across diverse populations.
- **Digital Health Innovations:** The adoption of digital health services, powered by AI, can improve accessibility, diagnostic accuracy, and patient care customization.

Investing in AI and technological capabilities necessitates upskilling the workforce and upgrading digital infrastructure to ensure public health units are equipped for future challenges.

A prime example of a collaborative project that underscores the potential of technology in public health is the AI chatbot initiative initiated by Wellington-Dufferin-Guelph Public Health (WDGPH) in 2023. Upon recognizing its potential, Simcoe Muskoka District Health Unit (SMDHU) was eager to connect and begin collaborating on the project. This venture has since attracted attention from other health units throughout Ontario, signaling a move towards widespread adoption. The chatbot stands to significantly

improve service efficiency and financial stewardship in public health operations, while also capturing real-time community feedback. This effort highlights the transformative impact of collaborative technological innovation in enhancing public health services province-wide.

Conclusion

Approval from the Board of Health is sought to proceed with this resolution, underscoring the commitment of WDGPH and SMDHU to leverage AI for public health enhancement. This initiative includes the ongoing collaboration on an AI chatbot project, demonstrating the tangible benefits of AI adoption. Approval will enable the formal presentation of these insights to aPHa, advocating for broader adoption and understanding of AI technologies across Ontario's public health sector.

Ontario Public Health Standards

Foundational Standards

- Population Health Assessment
- Health Equity
- Effective Public Health Practice
- Emergency Management

Program Standards

- Chronic Disease Prevention and Well-Being
- Food Safety
- Healthy Environments
- Healthy Growth and Development
- Immunization
- Infectious and Communicable Diseases Prevention and Control
- Safe Water
- School Health
- Substance Use and Injury Prevention

2024-2028 WDGPH Strategic Goals

More details about these strategic goals can be found in [WDGPH's 2024-2028 Strategic Plan](#).

- Improve health outcomes
- Focus on children's health
- Build strong partnerships
- Innovate our programs and services
- Lead the way toward a sustainable Public Health system

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Appendices

APPENDIX A

TITLE: Artificial Intelligence for Enhanced Public Health Outcomes

SPONSOR: SMDHU, WDGHU

WHEREAS artificial intelligence (AI) has the potential to revolutionize public health by improving disease surveillance, health promotion, health protection, and service delivery; and

WHEREAS AI-driven technologies can significantly aid in the analysis of large datasets, leading to more accurate and/or rapid identification of public health trends and outbreaks; and

WHEREAS the integration of AI in public health can enhance health promotion and health protection interventions; and

WHEREAS ethical considerations, including data privacy, bias, and transparency, are paramount in the deployment of AI technologies in public health; and

WHEREAS there is a growing need for public health professionals to be equipped with knowledge and skills in AI to effectively utilize these technologies; and

WHEREAS collaboration between local public health agencies, technology experts, and policymakers is essential for the responsible and effective implementation of AI in public health; and

WHEREAS there is an opportunity to leverage AI for addressing health disparities and promoting health equity across different populations;

WHEREAS a proactive approach would position public health agencies as beneficiaries of the technological evolution and as contributors to the ethical and impactful use of AI in improving public health and wellbeing.

NOW THEREFORE BE IT RESOLVED that aIPHa write to the Ontario Minister of Health to provide background information on the transformational possibilities of AI tools in the future delivery of Public Health programs and services.

AND FURTHER that aIPHa call for increased academic investment in data stewardship, AI research, training, and development focused on public health applications and post-

secondary educational programs through the Ontario Minister of Colleges and Universities;

AND FURTHER that alPHa acknowledge the transformative potential of Artificial Intelligence (AI) and other emerging technologies as pivotal tools for the future across all sectors of industry and society, and support public health agencies carefully leveraging these tools to enhance health outcomes, improve service delivery, and increase operational efficiency.

AND FURTHER that a copy of this resolution be sent to the President and Chief Executive Officer of Public Health Ontario and to the Chief Medical Officer of Health of Ontario.

BACKGROUND:

Introduction

The integration of Artificial Intelligence (AI) and emerging technologies marks a transformative shift in the landscape of public health. These innovations offer new methods for tackling complex health challenges, enhancing patient care, and improving the delivery of health services. For Ontario's Local Public Health Agencies (LPHAs), adopting AI and related technologies is crucial to meet the evolving needs of public health effectively.

Defining AI and Emerging Technologies

Artificial Intelligence (AI) refers to the use of technology to perform tasks that otherwise require human-level intelligence to complete^{1,2}. AI has shown effectiveness at an increasingly broad range of tasks, including pattern recognition, decision-making³, and language understanding¹. Emerging technologies encompass a broad range of innovative tools and systems, including blockchain, the Internet of Things (IoT), and advanced computing, which are on the cusp of becoming mainstream. These technologies offer new capabilities that can significantly impact various sectors, including public health, by enhancing data analysis, connectivity, and operational efficiency.

AI and Emerging Technologies: Revolutionizing Public Health

AI and emerging technologies are transforming public health through applications in predictive analytics, health equity enhancement⁴, and the development of digital health

services⁵. These tools offer unprecedented opportunities for disease surveillance⁶, optimizing health interventions⁷, and providing more personalized care^{3,8,9,10}.

Predictive Analytics

AI-driven models can sift through vast datasets to predict health trends and potential outbreaks, enabling LPHAs to allocate resources more effectively and prepare for public health emergencies¹¹. This predictive capability is critical for planning and emergency response, enhancing the public health system's ability to mitigate threats.

Health Equity

AI can play a pivotal role in identifying and addressing health disparities by analyzing patterns in health outcomes and access to care. By leveraging AI, LPHAs can design targeted interventions to meet the unique needs of underserved populations, thereby promoting equity across different communities¹².

Digital Health Innovations

Advancements in technology have accelerated the adoption of telehealth and digital health platforms, offering new modes of healthcare delivery. AI enhances these services by improving diagnostic accuracy, enabling real-time patient monitoring, and tailoring treatment plans³, thus making healthcare more accessible and efficient⁸.

Building Capacity for Technological Adoption

To fully benefit from AI and emerging technologies, LPHAs need to invest in digital infrastructure and upskill their workforce. This involves adopting digital tools and training healthcare professionals to use these technologies effectively, ensuring public health units are well-equipped to face future challenges^{6, 13, 14, 15}.

Ethical Considerations in AI Deployment

Deploying AI in healthcare and public health must adhere to stringent ethical standards, focusing on transparency, fairness, and accountability^{10, 13, 16}. It's crucial to protect privacy and ensure that health outcomes are equitable⁷. Developing comprehensive ethical guidelines and governance frameworks is vital for maintaining public trust in public health practices^{8, 10, 17, 18}.

Overcoming Challenges: Towards a Strategic Approach

Adopting AI and emerging technologies in public health comes with its set of challenges, including data privacy concerns, potential algorithmic bias, future regulatory frameworks¹⁹ and the digital divide^{7, 16, 20}. Addressing these issues requires a strategic approach that includes policy development, stakeholder engagement, data stewardship, and continuous evaluation to ensure responsible and effective use of these technologies^{7, 16, 17, 21}.

Conclusion

Strategically utilizing AI and emerging technologies presents a significant opportunity for Ontario's LPHAs to enhance public health services and outcomes. Embracing these innovations allows public health units to improve efficiency, responsiveness, and their ability to serve the community. Moving forward, a balanced approach that tackles technological, ethical, and operational challenges will be essential for leveraging the full potential of these technologies in enhancing public health.