Innovative Public Health with AI and Automation

To:	Chair and Members of the Board of Health
Meeting Date:	May 7, 2025
Report No.	**BH.01.MAY0725.R12**, Pages: 7
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Recommendations

It is recommended that the Board of Health receive this report for information.

Key Points

- WDGPH continues to explore and implement artificial intelligence (AI) and automation to improve public health efficiency, accuracy, and responsiveness.
- Five AI-related initiatives are highlighted in this year's update. While some are in active use (e.g. automated ISPA notices), others are in development or pilot testing (e.g. AI for vaccine record processing, voicemail triage, and disease reporting).
- These innovations aim to reduce manual workload, improve service delivery during peak periods, and support timely public health responses.
- WDGPH's ISPA notification system demonstrated adaptability during a recent measles risk response, generating over 5,000 personalized letters to families of children in the area that were at highest risk—underscoring the potential of automation for both routine and emergent needs.

Background

Since 2021, Wellington-Dufferin-Guelph Public Health (WDGPH) has released annual updates on how it is using artificial intelligence (AI), automation, and modern data practices to improve public health delivery. These reports help demonstrate how the organization adapts to new technologies and continuously looks for better ways to serve the community.

This year's report highlights five major innovations. These innovations focus on automating manual tasks, improving data quality, reducing delays in service, and enabling faster public health action. These projects are feasible from a technical standpoint through close collaboration between Data & Analytics and Information Technology. From an application perspective, they have required collaboration and engagement with every other program area in the agency to identify the highest impact opportunities for automation and AI.

WDGPH is continuously reimagining public health workflows using emerging technology. At the same time, the agency prides itself in providing leadership in AI and automation for the Ontario public health system as a whole

Discussion

AI-Powered Vaccine Record Processing System

WDGPH receives hundreds of vaccine record submissions every week. These data submissions come in the many forms - voicemails, emails, faxes, and photos of varying degrees of quality of official documents or handwritten forms. Submission volume of immunization documents has marked peaks during school immunization campaigns – approximately a two-month period in the second half of each school year.

WDGPH is building a new AI-based system to process incoming data regardless of format. This system extracts key details, standardizes content for more efficient data entry into the legacy provincial immunization system, and prioritizes requests appropriately (e.g. a data submission that would keep a student from being suspended for not being compliant with ISPA would be a high priority). With this technology, the agency can now see workload trends in real time and adjust resources accordingly to meet target service levels (e.g. approving extra time, casual staffing, or redeployment of staff from other program areas to maintain 3 business day turnaround). WDGPH's automated system will also archive the records submitted in a secure, searchable format using standardized naming –under the legacy process this is an entirely manual archival process for compliance with health information documentation requirements.

As WDGPH builds AI solutions, staff are being consulted for their subject matter expertise, and trained on how to effectively provide oversight to these solutions such that any enhancements WDGPH makes to the efficiency of its operations are not at the expense of data quality or client service.

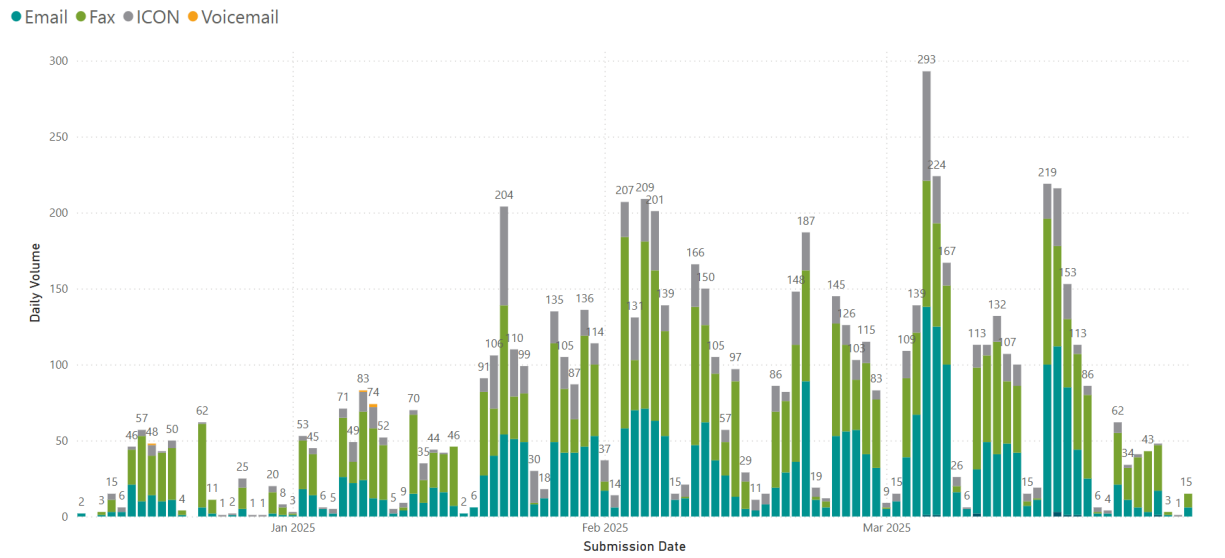

Figure 1: *Visual of vaccine record data submission volume by channel. From mid-December to the end of March, WDGPH received approximately 8000 of such submissions. Note that some data submissions may contain records for multiple clients.*

GitHub Copilot for Code Development

WDGPH has integrated GitHub Copilot into its development environments to streamline coding processes and enhance the developer experience. GitHub Copilot is an AI-powered tool that provides real-time coding suggestions and can be used to converse with a project's codebase. Tools like GitHub Copilot can significantly boost productivity. A study conducted by GitHub and Accenture found that developers using Copilot completed tasks up to 55% faster and reported higher job satisfaction.[1]

Both novice and experienced developers benefit from integration of GitHub Copilot. For those new to programming, Copilot serves as an educational aid, offering suggestions that help users translate their existing data and logic skills to learn new programming languages and software frameworks more effectively. With Copilot, someone new to a project can highlight a function or a file, and have it explained to them in plain language, while retaining the overall context of a project's codebase. Those more experienced in development on the other hand may find it most productive to provide detailed instructions of how to implement changes to a project and supervise AI agents in their edits and additions to the codebase.

To ensure the secure and effective use of AI-generated code, WDGPH has established a robust framework that includes human peer reviews and adherence to the agency's Developer's Guide.[2] This process ensures that all code meets the Agency's privacy, security, and quality standards before operationalization. WDGPH also provides continuous mentorship to staff, promoting responsible and proficient use of AI tools in development.

It is estimated now that nearly 90% of all code is being written by AI.[3] This trend is expected to continue, with nearly 100% of all code being written by AI in the future. This has already disrupted the technology sector, with a focus away from hiring of traditional junior and mid-level engineers for throughput, to a focus on those who have the skills and knowledge to effectively deploy and monitor a team of AI agents.[4] WDGPH has positioned itself to take full advantage of these AI advancements to enhance its technical capabilities and reinforce its position as an innovation leader in public health.

AI Voicemail Processing for Client and Community Support

Client and Community Support (CCS) at WDGPH is a trusted community resource for navigating public health concerns. On any given day, they receive hundreds of inquiries on a wide variety of topics. When CCS is contacted by phone during peak times, or after hours, clients leave voicemails detailing their issues and providing call back details. Traditionally voicemails are listened to one at a time, categorized, triaged, and queued for call back by a public health nurse. They are then listened to again by the public health nurse who is returning the call.

WDGPH has been piloting technology from Azure AI Services – specifically its Content Understanding service, which allows us to deploy state of the art speech transcription AI models.[5] These models are highly accurate, even in the presence of background noise or varied accents. Voicemail transcriptions can then be further processed with AI to extract key information (e.g. call back number, and client name), and classify voicemails by topic area (e.g., appointment booking, measles information).

Successful integration of this technology will enable upwards of one full time equivalent public health nurse to be redeployed from voicemail categorization and triage to answer live calls, assist with the call back queue, or another community needs.

AI Processing of Reportable Disease Lab Results

WDGPH receives lab results for many reportable diseases by fax from Public Health Ontario Laboratories (PHOL). These faxes are not labeled in a way that allows them to be automatically directed to the appropriate team. The content in the lab results ranges from that which is not typically transcribed into another system (e.g. COVID-19 PCR test results), to those which must be responded to as soon as possible, no matter what day, or time of day they come through

(e.g. positive Rabies in an animal that has had human contact). If the data is being entered into the provincial information system for reportable disease (iPHIS), or WDGPH's electronic health record platform, (Collaborative Health Record), it must also be manually transcribed. WDGPH is leveraging technologies explored as part of its AI system vaccine records processing, to also support reportable disease processes. Even basic AI capabilities are expected to improve analytics on this important function at public health, reduce manual transcription, and vastly improve the on-call experience for WDGPH management staff.

ISPA Notification and Measles Risk Letters

WDGPH's automated overdue immunization notice system continues to evolve, which was first detailed in last year's Innovation Report, *Data & Analytics innovation in public health*.[6] This system now sends customized letters in French and English and, based on a child's immunization status and ISPA requirements, can generate upwards of 50,000 personalized ISPA notices per hour.

This spring, the system was quickly adapted to address a rising risk of measles. WDGPH generated over 5,000 personalized letters to be sent to parents of children who were due, overdue, or had philosophical exemptions for measles vaccination. Each letter was tailored to the child's situation and explained the current risk clearly. The letter generation required minutes; a fraction of the initiative's overall production and delivery timeline (which also included deciding on the language of the letter, extracting data from Panorama, printing the generated PDFs, folding and stuffing letters into envelopes, and delivery to schools for distribution to students or distribution by Canada Post). Without WDGPH's experience with generating custom immunization notices, creation of these letters would not be possible relying on Panorama alone.

This flexible system is proving to be impactful for both routine enforcement activities and emergency response scenarios. It has also become one of WDGPH's innovations of greatest interest by other public health units, with a half dozen adaptations in discussion.

Health Equity Implications

The use of AI and automation in public health holds promise for reducing service delays and improving access.

Some initiatives described in this report—such as automated ISPA notices—have direct benefits for equity-deserving populations, including newcomers, low-income families, and individuals with limited English proficiency. The ability to tailor messages based on language and immunization status helps ensure that critical health communications are accessible and actionable for more families, regardless of background or digital literacy.

In the future the project may be able to accommodate preferred languages beyond French and English, even further improving accessibility to the information in the letters.

WDGPH is committed to using AI tools in a way that promotes fairness for everyone. New AI tools are evaluated on their ability to perform well for all – for instance, using a speech understanding service that can handle varied accents and call quality. WDGPH incorporates use of confidence scores to ensure that when an AI system can not entirely decern content in a document, or a voicemail, that it is quickly routed to an appropriate staff member for manual review and follow up. Working well alongside AI systems has become essential not only for the efficiency of the organization, but also to maintain or even enhance the equitability of public health services.

Conclusion

WDGPH's continued investment in AI and automation reflects a thoughtful and forward-looking approach to modernizing public health services. While many public health units are still building the foundations for this kind of innovation, WDGPH has already established the technical and organizational groundwork needed to support AI—secure data systems, structured workflows, strong governance, and a collaborative development culture. These foundations are enabling us to implement practical solutions that improve responsiveness, reduce manual burden, and enhance service delivery. As the broader public health system moves toward greater digital transformation, WDGPH is well positioned—not just to adapt, but to contribute meaningfully to how technology can strengthen public health across Ontario.

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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