Best Brains Exchange

what we heard report

A vision for the future of public health surveillance in Canada in 2030

Public Health Agency of Canada
Agence de la santé publique du Canada

Canada

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Message from Dr. Sarah Viehbeck

Chief Science Officer and Vice-President, Data, Surveillance and Foresight Branch, PHAC

I am pleased to introduce the *What We Heard Report:* Best Brains Exchange on A Vision for Public Health Surveillance in Canada in 2030, which captures discussions of the Best Brains Exchange held on November 21, 2023, co-hosted by the Public Health Agency of Canada and the Canadian Institutes of Health Research. This event brought together Canadian and international experts for open and constructive dialogue on promising opportunities for the future of public health surveillance in Canada. Their discussions highlighted the key importance of enhancing surveillance workflows with new technologies, improving data quality to support target populations, enhancing data sharing and linkage, using community and partnership approaches, building trust through public engagement and communication, aligning surveillance activities with population health priorities, and moving from vision to implementation of concrete and sustainable change.

The Public Health Agency of Canada is committed to fostering a culture of science excellence. As a national convenor and international connector, we leverage modern technologies and new data sources to drive innovation in surveillance practices, while incorporating health equity to provide timely insights and foresight for decision-making. This *What We Heard Report* will help inform public health surveillance planning and actions in Canada, and contribute to the development of a vision for the future of public health surveillance in Canada by 2030.

We thank all contributors to the Best Brains Exchange for their diverse perspectives and expertise in shaping this report.

Executive summary

The Public Health Agency of Canada (PHAC) is leading Vision 2030, an initiative to envision what public health surveillance in Canada should look like by 2030. To develop this vision, the Agency is consulting with diverse public health stakeholders and partners across Canada and internationally. As part of this process, PHAC co-hosted a virtual Best Brains Exchange (BBE) meeting in collaboration with the Canadian Institutes of Health Research (CIHR) on November 21, 2023 to bring together domestic and international senior policy makers, researchers, and other public health stakeholders to discuss the key challenges facing public health surveillance and gather ideas to create concrete and sustainable change. This *What We Heard Report* provides a summary of the key themes from these discussions, which will be used as an input into the development of the final report on Vision 2030.

Key themes of what we heard

New technologies to enhance surveillance workflows.

Emerging technologies, such as artificial intelligence (AI) and machine learning, have a role in supporting the public health workforce and facilitating the integration of new and diverse datasets into surveillance workflows. For example, AI may be used to automate routine tasks and free up public health practitioners for the more complex work of analysis, interpretation, and developing relationships. The key to achieving buy-in is working with practitioners to identify and eliminate pain points in their workflow, with one participant giving a case study of using AI to assist with discharge notes and administrative work in the healthcare setting. Another application of these emerging technologies is to expand our toolset for data analysis, from using AI to sift through "big data" for actionable insights to using large language models (like ChatGPT) to do plain language queries of complex datasets. Participants cautioned that AI tools raise a host of legal and ethical concerns, centred around their potential for facilitating misinformation and creating biased or falsely confident outputs. The public health workforce would require training to use these new tools effectively while appreciating their potential pitfalls.

High quality data to support target populations.

The flood of information during a public health crisis has created an "infodemic" where data of unknown quality and relevance are used to inform decision making. Convenient and accessible sources of data, such as "big data", have the potential to produce inaccurate and biased estimates for the parameters needed to inform population health interventions. One participant framed these circumstances as an opportunity to refocus on a classical approach to public health surveillance data collection prioritizing quality over quantity. This approach begins with identifying specific information needs for a target population, followed by tailored data collection and dissemination of the resulting analysis to those who will use it to inform public health decision making. Another participant raised a concern that population surveys, an important tool for high quality data collection, were threatened by low response rates.

Enhanced data sharing and data linkage.

Data sharing and data linkage within and across different levels of government are hampered by the existence of data silos, inconsistent standards, and legal and cultural barriers to information exchange. Oftentimes, the data required for public health decision making have been captured somewhere but cannot be acquired with the necessary timeliness or granularity. Participants noted several ways of breaking down these barriers within government institutions, including legislation, co-developing standards, and shifting from a paradigm of hierarchical reporting to reciprocal exchange. For Vision 2030, participants concluded that a few key data linkages should be prioritized in the short term to demonstrate the benefits of data sharing and build a foundation for future efforts. Participants suggested that Canada should also advance these same initiatives internationally to improve data sharing with global health partners.

Community and partnership approaches for public health surveillance.

Disaggregated data related to the social determinants of health are important to addressing social inequalities as part of public health surveillance. More granular data are often held by clinical and community groups, and forming partnerships with these organizations would be beneficial for deepening insights into individual and community health. Participants emphasized the importance of ensuring that communities have a say in how their data are governed, reported, and used to inform public health actions, mentioning Indigenous data governance as a model for this process.

Public engagement and communication to build trust.

Trust in public health and government institutions more broadly has suffered in recent years. Even the term “surveillance” in public health can be problematic, as it may have different connotations for public health professionals and the public, such as Indigenous communities. Rebuilding trust in public health remains a significant challenge, exacerbated by the ubiquitous spread of misinformation. Some participants felt that public health communication during the COVID-19 pandemic had been too certain at times, and failing to properly communicate uncertainty and the limitations of our knowledge can fuel mistrust. Resource allocation for communication should be reviewed given its critical function in building credibility and cohesion around public health goals. Furthermore, PHAC’s use of mobility data during the COVID-19 pandemic, which resulted in a Parliamentary inquiry and investigation by the Office of the Privacy Commissioner of Canada, was cited as an example of why increasing public engagement at the early stages and emphasizing participatory approaches to designing surveillance systems are essential.

Align surveillance activities with population health priorities.

Canada faces mounting crises surrounding opioid use and mental health, as well as longstanding issues with access to the most basic social determinants of health: food, clean water, and shelter. While it is crucial that the lessons learned from COVID-19 are used to help prepare for the next pandemic, some participants felt it was important to reassess the focus of PHAC's surveillance activities to place a greater emphasis on chronic conditions and other public health issues not directly related to infectious diseases. Priorities for building capacity in public health surveillance should align with our understanding of the risks to population health posed by non-communicable diseases and the unequal distribution of the social determinants of health.

Moving from vision to implementation.

The session highlighted a prevalent frustration with the persistent gap between vision and implementation for improving public health surveillance in Canada. Participants noted the excellence of previous reports at diagnosing the problems with public health surveillance and the inadequate progress at converting these plans and strategies into concrete and sustainable change. One participant suggested a "Best Implementers Exchange". It was also suggested that lawyers and legislators must be more involved in the process, especially discussions related to the governance of health data. Progress requires not just technical solutions but political strategies to build relationships between various stakeholders across the public health continuum.

Acronyms

AI: Artificial intelligence

BBE: Best Brains Exchange

CIHR: Canadian Institutes of Health Research

COVID-19: Coronavirus Disease 2019

CSTE: Council of State and Territorial Epidemiologists

LLM: Large language model

PHAC: Public Health Agency of Canada

Background and objectives

Public health surveillance is the bedrock of public health practice, providing decision-makers with the data and insights they need to set priorities and carry out interventions. Developments over the past two decades, from new infectious disease threats to emerging technologies and data governance models, have continually challenged Canada's public health surveillance systems to adapt. The COVID-19 pandemic highlighted the critical importance of marshaling data across numerous domains, including epidemiological, laboratory, genomic, and vaccine safety data, along with many other types of information.

Vision 2030 is an initiative led by the Public Health Agency of Canada (PHAC) to envision what public health surveillance in Canada should look like by 2030, extending beyond the everyday challenges faced by public health practitioners today. It is an opportunity to reimagine public health surveillance so that it meets the evolving needs of people residing in Canada and to guide the incorporation of new technologies, ways of thinking, and modes of governance into this fundamental activity of public health.

To support development of this vision, PHAC began a process to engage key stakeholders and experts from coast to coast to coast and internationally to gather insights on public health surveillance needs and gather concrete ideas to produce sustainable improvements. This *What We Heard Report* provides a high-level summary of a Best Brains Exchange (BBE) meeting held on November 21, 2023 as a partnership between PHAC and the Canadian Institutes of Health Research (CIHR). This meeting brought together domestic and international policy makers, researchers, implementation experts, and other key stakeholders for a one-day, invitation-only virtual discussion concerning the future of public health surveillance in Canada. This included nine presenters

and facilitators (listed in **Annex A**) and approximately 50 national and international participants. The BBE objectives were to:

1. identify new and ongoing high-priority issues that will require public health surveillance;
2. characterize the type and amount of public health information needed for public health surveillance to drive public health policy and action;
3. discuss international models of governance, organizational structures, and/or policies that enable public health surveillance, including information sharing to stakeholders for public health action; and
4. identify key public health surveillance skills and competencies for the future public health workforce.

This report provides a summary of the discussion that occurred during the BBE (see the agenda in **Annex B**), providing a synthesis of the input received from the presenters and attendees. Detailed notes regarding what was said during each session were taken by five individuals and a consolidated notes document was created. From these notes, the technical writer developed a thematic summary, noting key areas of need, innovative solutions, and subjects eliciting differences of opinion. Themes were not necessarily mutually exclusive. Anonymous post-workshop evaluations completed by approximately half of participants were further used to contextualize discussions. Themes, ideas, and points of discussion are not attributed to specific individuals to protect participant confidentiality. Quotations are used occasionally to highlight key points.

The contents of this report do not necessarily reflect the views of PHAC or CIHR. The themes and discussions from this meeting will serve as one input into the development of a vision for public health surveillance in Canada by 2030, alongside stakeholder consultations, Indigenous engagement, public engagement, and expert validation. A final report on this vision will be published on Canada.ca in late 2024.

Key findings

The goal of public health surveillance is to inform health decision making, providing the information necessary to set priorities, identify opportunities for intervention, and monitor the results of these interventions [1]. A recurring theme throughout the meeting was the myriad of constraints facing public health practitioners seeking to improve surveillance systems, which include legislative, human, cultural, technological, and financial barriers. One participant suggested a question to guide efforts to achieve concrete and sustainable improvements to public health surveillance by 2030:

> "Does it help decision making?

Put another way, how will the information gleaned from the activities of public health surveillance lead to action to better the lives of people living in Canada? Participants shared their experiences with the challenges facing public health surveillance and their suggestions for steps that could be taken to make improvements. These ideas are summarized into seven themes below.

Automate as much as possible to preserve precious human resources for interpretation."

New technologies to enhance surveillance workflows

Challenges

Public health surveillance workflows contain many tedious and repetitive elements. How can we use emerging technologies like artificial intelligence (AI) to help streamline and automate these workflows, freeing up the public health workforce for the work of analysis and interpretation that is required to produce actionable information? Additionally, sources of "big data"[i], such as the "digital exhaust"[ii] from our increasingly computerized lives, offer potentially compelling avenues for public health insights. However, the exponentially growing nature of these data sources make it impossible to sort through by hand, requiring advanced tools to extract useful information.

Potential actions

Participants noted that the key to successful deployment of AI was working with public health practitioners to identify use cases for these tools to eliminate pain points in their workflows. PHAC must consult with partners in local, provincial, territorial, and federal public health to identify the best value propositions for automation in their surveillance processes. One participant gave examples of the use of AI for automation in the clinical setting, including discharge notes and administrative work. The leeway given to clinical AI tools is restricted: they are supervised and their outputs checked. Another suggestion was to focus automation on key existing systems that support multiple areas, such as the Canadian Notifiable Disease Surveillance System.

Advances in machine learning and AI also empower public health practitioners to extract nuggets of actionable insights from noisy "big data" sources. Several examples were offered. A longstanding use of this technology is for early disease detection through automated analysis of high volumes of free text data, such as social media and news reports [2]. For example, HealthMap analyzes streams of information posted to the Internet to identify and geolocate outbreaks corresponding to a dictionary of known pathogens and syndromes. Large language models (LLMs), such as ChatGPT, have also been used to speed up the process of querying and extracting information from large datasets. An example was presented of using an LLM to query, using plain language, an infectious disease outbreak dataset

maintained by the Global.health platform [3]. Sample queries included “show a graph of flu outbreaks by year” and “show a map of cholera outbreaks”. Regarding the deployment of AI models for sensitive health-related datasets, local data governance can be retained by having each organization deploy their own instance of these tools in a secure server environment compliant with local health data privacy laws. Another use case of AI is to support advanced analysis involving many streams of data. A case study was presented for the use of AI in capacity modelling at Boston Children’s Hospital. This system was used to forecast hospitalizations/bed demand for COVID-19, influenza, and Respiratory Syncytial Virus by incorporating several types of data including environmental factors like pollen and wildfires.

Alongside potentially useful applications of AI for public health surveillance, several participants warned that these new technologies could be used to supercharge the creation and amplification of misinformation. AI is a double-edged sword: it may present incorrect information with false confidence, is susceptible to bias, can ingest unreliable data, and raises difficult questions around privacy, including legal considerations. To take full advantage of these emerging technologies, the public health workforce must include individuals with the necessary education and experience to appreciate their complexities and potential pitfalls. Opportunities for training, along with a plan to hire and retain personnel with specialized skills, will be essential to facilitate this technological transition.

High quality data to support target populations

Challenges

Another participant offered an alternative perspective on the deluge of data collected in the digital age, citing the "Big Data Paradox", which states that the bigger the data, the surer we fool ourselves [4]. This participant noted that while big data may be useful for event-based surveillance[iii], it is much more difficult to use it for population-based problems like designing a program to prevent smoking. A supporting example was given of the Delphi–Facebook survey platform that greatly overestimated first dose coverage of the COVID-19 vaccine in the United States during the first half of 2021 compared to later benchmarks by the US Centers for Disease Control and Prevention [5]. The survey platform provided easy access to timely estimates with huge sample sizes and tiny margins of error; in other words, the "big data" estimates were precise but inaccurate. The problem arose from the fact that those responding to the surveys were very different from the population at large, and these biases were not sufficiently accounted for by statistical adjustments after the fact.

Potential actions

A participant introduced the "slow data public health" paradigm to challenge the notion that public health problems could be solved by simply acquiring more data [6]. The term "infodemic"[iv] was used to describe the countless streams of data that are filtered through numerous actors, creating a flood of information of unknown quality used to inform decision making during a public health crisis [7, 8].

By contrast, the classical process in public health surveillance is to identify a problem in a target population, select a tool to collect a finite amount of data from that population, and finally use this tailored dataset to address the problem. The problem with big data, a participant argued, is that it is usually collected for an objective unrelated to the question at hand, the target population is often fluid and vaguely defined, and the data collected are of poor quality and lack standardization. The solution offered was to embrace an approach beginning with identifying the information required to assess and improve the health of a target population within the system of systems for health decision making. Following this, high quality data should be collected from a well-defined target population and be used to create a reproducible analysis. Finally, the resulting information should be efficiently disseminated, according to pre-defined information requirements, to those who can use it to inform decision making. The point of this "slow data public health" is not to make the acquisition of surveillance data less timely, but rather to be focused, deliberate, and efficient about the collection of data that can actually be used to inform public health action in a specific target population.

Participants agreed that big data and AI had significant limitations and that their proper application depended on the specific question at hand. Later, during general discussion, a participant raised an important threat to participative data collection for public health:

> "Not discussed is the need to incorporate alternatives to population surveys whose response rates are becoming alarmingly low."

Potential solutions to this problem would be a fruitful subject of discussion for experts in survey design and implementation.

> **People think of a reporting hierarchy; think instead about who is best suited to collect, share, and report data."**

Enhanced data sharing and data linkage

Challenges

Another prevalent perspective around data acquisition for public health surveillance was that in many cases, the data required already exist. The problem is getting the relevant data to the people who need it for decision making. This core problem arises from the fact that public health surveillance is not one system but a system of systems. While participants mentioned hurdles related to technology and resources, cultural, human, and legal barriers were also a strong focus of discussion. The existence of "data silos"—across levels of government as well as within different teams at the same level—was an oft-repeated criticism. The reliance by many organizations on unofficial datasets during the pandemic, such as the ones provided by the Johns Hopkins Center for Systems Science and Engineering and the COVID-19 Canada Open Data Working Group, are symptomatic of the issues that exist with data governance in public health surveillance. Together, these barriers make it difficult for public health decision-makers to access the information they need and enhance the data they already have through linkage to other, related datasets.

Potential actions

One participant provided a useful starting point for this theme: reframing public health surveillance not as a reporting hierarchy with information flowing up from the local, to the provincial, and finally to the federal level, but rather as a network. Data sharing should be bi-directional, flowing down as well as up.

Participants suggested that federal organizations like Statistics Canada and PHAC should coordinate to carry out national, population-based surveys whose results would be of use to local and provincial public health bodies. An example was given of the "Real-time Assessment of Community Transmission" (REACT) study in the United Kingdom. This study, carried out on behalf of the UK government, produced rigorous, longitudinal prevalence estimates for COVID-19 across the United Kingdom throughout the pandemic [9].

Another participant noted that actors at the local level are resentful of surveillance systems imposed from above if these systems don't help them get the information they need. A further consideration regarding public health surveillance is the viability of methods and data sources across different geographic contexts, such as rural areas or Northern territories ("North of the 60th parallel"). Point-of-care

> **At the national level, legislative barriers are put into place. We cannot share data because laws don't allow sharing across Canada. Multi-year discussions for MLISA [multi-lateral information sharing agreements] didn't give us the data we need at the provincial level."**

testing and wastewater analysis were called out as two methodologies that empowered COVID-19 surveillance in the North during the pandemic. Wastewater surveillance, in addition to being easy for territories and municipalities to set up independently to get information they needed to make decisions locally, was held up as a success for national and international data sharing and collaboration during the pandemic.

A pervasive technical problem with data sharing and linkage is the lack of standardization, which makes data interoperability difficult even if the goal of sharing is agreed upon. Common standards are a key component of the Pan-Canadian Health Data Charter [10]. These would enable common analytical methods to be used to produce comparable results from provincially federated data sources and enhance collaboration between public health authorities across the country. One participant mentioned the Canadian Primary Care Sentinel Surveillance Network as an example of an effort to standardize electronic medical record data (EMR) data to a common schema to support research, surveillance, and quality improvement [11]. Having access to a greater breadth of data helps both population surveillance and medical research, but one participant cautioned that inferences can be misleading if the underlying data are not truly comparable, mentioning the example of some European surveillance databases. The Council of State and Territorial Epidemiologists (CSTE) in the United States was brought up as an instance of a group helpful for enabling interoperability, such as the development of common case definitions. The CSTE was noted as having no Canadian equivalent, and some participants suggested bringing back provincial/territorial epidemiologist roles alongside national coordinating committees.

Legislation can be a key enabler of data sharing and data linkage, as issues regarding privacy and data security often cannot be overcome solely by changes to organizational culture around data sharing. Integrated biosurveillance during the COVID-19 pandemic in South Korea was used as a case study, leading to several observations [12]. First, legislation was noted as providing the foundation for authority, responsibility, and accountability for data sharing efforts. Second, legislation should be specific, defining not just the availability of the data but the timeliness of sharing as well. Finally, there must be clear and concrete goals regarding what to do with the resulting data. This includes an agreed-upon division of work for processing and analyzing the resulting fusion of data to produce useful insights and well-defined indicators.

Integration of data of any sort will not help; it leads to a giant heavy system that is often slow, if it works."

Any efforts at large-scale linkages will take time and may bear fruit later than the 2030 horizon. One participant suggested that in the short term a few key linkages should be prioritized, to acquire just enough detailed and comparable data to inform key public health decisions. This strategy would also build up scaffolding for future linkage work and hopefully inspire interest by demonstrating the benefits of data sharing. Participants also felt that strengthening PHAC's stance on sharing information between levels of government would help Canada become a better partner on the world stage. Canada can and should be an international leader in cross-border information exchange to inform global health priorities such as pandemic preparedness and the development of evidence-informed approaches to public health interventions like border restrictions.

People are looking for more disaggregated data related to social determinants of health. We don't do a good job at collecting the information at the individual level."

Community and partnership approaches for public health surveillance

Challenges

Social inequalities in mortality and health are a pervasive and entrenched problem in Canada. In the past few years, data have shown the unequal burden of COVID-19 mortality on different communities during the pandemic [13]. One participant argued that public health surveillance in Canada could do a better job of supporting the task of quantifying and addressing the root causes of these disparate health outcomes. However, many of the detailed datasets that could illuminate these issues are not held directly by governmental organizations, but rather by clinical and community groups.

Potential actions

In many instances, those with the closest connections with and deepest knowledge of individuals within the community are clinical, non-governmental, and other local organizations. The quality and granularity of public health surveillance could be enhanced by public health authorities forming partnerships to link individual and household data across clinical and community systems. An example offered during discussion was the Clinical & Community Data Initiative, implemented in Colorado and South Carolina to support research and interventions for obesity and chronic health conditions [14]. In this model, longitudinal health data from a variety of clinical and community sources are securely encoded and shared with a trusted third party to allow for anonymous linkage and analysis of the resulting enhanced datasets.

It is vital to consider how the individuals and communities represented in the disaggregated and individual-level data shared as part of these partnerships will be given a say in how it will be governed, reported, and used to inform public health action. This must be done to ensure that the information from surveillance systems will benefit the populations under observation while avoiding stigmatization or other potential harms. Indigenous data governance was mentioned as a model for this process [15].

> **I think participatory approaches to surveillance (and in general, ecosystem approaches to health) hold a lot of promise to improve the relevance and utility of surveillance systems. This would by definition involve community engagement and transdisciplinary approaches."**

Public engagement and communication to build trust

Challenges

Trust in public health and government institutions more broadly has suffered in recent years. Communication regarding public health topics has become increasingly difficult in the face of an onslaught of misinformation. For public health surveillance specifically, even the term "surveillance" itself can be problematic as it can mean something very different to a public health professional than to a member of the public. Alternate terms such as "public health assessment and response" are used in some discussions [15, 16]. In the same way, public health practitioners do not want the actual activities of public health surveillance to be perceived as intrusive government overreach. The adoption of new techniques in public health surveillance has not always been smooth: PHAC's use of mobility data during the COVID-19 pandemic led to a Parliamentary inquiry and an investigation by the Office of the Privacy Commissioner of Canada [17].

Potential actions

Public buy-in is crucial to the successful operation of public health surveillance. Participants stated that more public engagement is required in the early phases, at the very least so the public is not surprised by the use of information to address a given public health issue. Public engagement should also be foundational to the process of identifying priority issues and defining the kinds of questions surveillance systems are designed to answer. Otherwise, public health authorities risk wasting their efforts on inquiries and interventions of limited relevance to the populations they are intended to serve.

One participant conceded that communication during the COVID-19 pandemic had been at times too confident, creating mistrust when information was retracted. Not communicating the uncertainty and the limitations of our knowledge can also lead to mistrust. Another participant cited data literacy among decision-makers as a barrier to good communication from public health.

One participant wondered if our public health surveillance systems were really built to communicate with individuals in the way expected from social media (e.g., timeliness, accessibility, succinctness, and visual appeal). The participant wondered if public health should enter this space, and if so, how? One suggestion was to carefully consider resource allocation for communication in public health surveillance budgets, since communication is so important for building credibility and cohesion around the goals of public health. Another stated that public health should err on the side of sharing data with the public and decision-makers, as a step in building trust, while being as transparent as possible about the reliability and certainty associated with the datasets.

Another important step involves developing a communication plan for sharing information about potential public health issues identified through surveillance. This plan should define the criteria to trigger a public communication, considering both the level of danger to the public as well as the certainty of the information. Both false positives and false negatives could undermine public trust, so these criteria should be carefully considered and developed with community input.

Align surveillance activities with population health priorities

Much of the discussion during this BBE focused on infectious disease surveillance, particularly the COVID-19 pandemic. This is understandable, given how intensely the pandemic amplified many long-standing issues in public health. The potential for a future pandemic on the scale of COVID-19 is also a significant concern. Near the end of the session, a participant shared a report from the Center for Global Development which predicted that the likelihood of such an event over the next 25 years as "roughly equivalent to a coin toss" [18].

However, some participants also emphasized the need to reassess the focus of our surveillance activities to place a greater emphasis on chronic conditions and other public health issues not directly related to infectious disease. Canada faces mounting crises surrounding opioid use and mental health, as well as longstanding issues with access to the most basic social determinants of health: food, clean water, and shelter. Our growing knowledge regarding the importance to population health of non-communicable diseases and the unequal distribution of the social determinants of health should be accompanied by increased attention and resources for building up public health surveillance capabilities in these areas.

If you had a hundred dollars and you could spend it on implementation or innovation, where would you spend it? […] We have hundreds of reports, but we can't implement them. We have the best brains but we need the best implementers. How much should we fix our current systems?"

Moving from vision to implementation

Throughout the session, several participants echoed a frustration with the process of trying to improve public health surveillance in Canada.

One specific example given was regarding the Canadian census, "the most important database." Public health models could be made to be representative if census data were better integrated and if it were possible to bring together the data required to do the adjustments, but this is often not possible. An opportunity for action that follows from this observation could be to create a portal making existing data held by the federal government more accessible to support surveillance efforts across the country.

While the BBE meeting included many participants with technical expertise, one participant suggested that a "Best Implementers Exchange" would also be of value. Another participant noted the lack of legislators at the meeting, especially given the importance placed on legislation as an enabler of data sharing during the discussion. Privacy and legal considerations were brought up as a barrier to sharing data with federal colleagues and working more closely with community partners such as Indigenous groups. Lawyers and legal experts must also be brought on board for these partnerships to be successful and to design data sharing agreements that are satisfactory for all involved parties. Participants underscored that we must focus not just on technical solutions from people concerned with the data requirements, but also on political strategies for building relationships between stakeholders.

Conclusion

The public health system in Canada has been stressed by a series of critical challenges including the COVID-19 pandemic and the ongoing Opioid crisis. A renewal of the country's public health surveillance system is required to detect and diagnose problems, design and evaluate interventions to address them, and to make progress on addressing health inequalities.

Through this discussion with key stakeholders, many important challenges and ideas for action were identified. PHAC is grateful to the participants of this BBE meeting for the time they took to share their thoughts and experiences on improving Canada's public health surveillance system. The key themes and examples raised during the discussion and synthesized in this report will be analyzed and considered alongside the findings from PHAC's consultations with internal and external public health stakeholders, Indigenous peoples and communities, and members of the public. Collectively, these results will guide the creation of a grounded and focused vision for public health surveillance in Canada by 2030. The final report on Vision 2030 will be published in late 2024.

Annex A

Best Brains Exchange presenter and facilitator list

Keynote speaker

Theresa Tam

Chief Public Health Officer of Canada, Public Health Agency of Canada

Presenters

Steven Hoffman

Vice-President, Data, Surveillance and Foresight Branch, Public Health Agency of Canada and Dahdaleh Distinguished Chair in Global Governance & Legal Epidemiology/Professor of Global Health, Law, and Political Science, York University

David Buckeridge

Executive Scientific Director, Data, Surveillance and Foresight Branch, Public Health Agency of Canada, McGill University

Sangwoo Tak

Director for Risk Assessment, Bureau of Public Health Emergency Response and Preparedness of the Korea Disease Control and Prevention Agency

Arnaud Chiolero

Public Health Physician and Epidemiologist, Head of the Population Health Laboratory, University of Fribourg

John Brownstein

Chief Innovation Officer, Boston Children's Hospital and Professor, Harvard Medical School

Samuel Groseclose

Public Health Consultant, Decatur, GA, USA

Kelley Lee

Professor and Tier 1 Canada Research Chair in Global Health Governance, Faculty of Health Sciences, Simon Fraser University

Facilitator

Cory Neudorf

Senior Medical Expert, Public Health Agency of Canada and Professor in the Department of Community Health and Epidemiology, College of Medicine, University of Saskatchewan

Annex B

Best Brains Exchange agenda

Best Brains Exchange: A Vision for the Future of Public Health Surveillance in Canada in 2030 agenda

Tuesday, November 21, 2023 / 10:00AM - 2:30PM EST

Meeting purpose and objectives

This Best Brains Exchange (BBE) aims to bring domestic and international experts in applied public health surveillance together with senior policy makers to contribute to a renewed, evidence-informed, public-facing vision for public health surveillance in Canada. This will be achieved by addressing the following objectives:

1. Identify new and ongoing high-priority issues that will require public health surveillance;
2. Characterize the type and amount of public health information needed for public health surveillance to drive public health policy and action;
3. Discuss international models of governance, organizational structures, and/or policies that enable public health surveillance, including information sharing to stakeholders for public health action; and
4. Identify key public health surveillance skills and competencies for the future public health workforce.

Schedule

Registration (9:45AM - 10:00AM)

Opening remarks (10:00AM - 10:20AM)
- Welcome from the BBE Facilitator and hosts
- Land acknowledgement
- Format/technical guidance (housekeeping)
- Roundtable of introductions
- Overview of the BBE objectives
- Speaker: Cory Neudorf

Keynote: The Policy Context (10:20AM - 10:30AM)
Speaker: Theresa Tam

Scene-setting presentation:
Why are we here? (10:30AM - 10:40AM)
Speakers: Steven Hoffman, David Buckeridge

Panel: International models and stakeholder engagement for public health surveillance (10:40AM - 11:40AM)
Speakers: Sangwoo Tak, Arnaud Chiolero, John Brownstein

Lunch break (11:40AM - 12:30PM)

Panel: Innovative approaches and partnerships to advance public health surveillance (12:30PM - 1:30PM)
Speakers: Samuel Groseclose, Kelley Lee

Discussion Period: Priority issues and short- and long-term actions for public health surveillance in Canada by 2030 (1:30PM - 2:15PM)

BBE Evaluation (2:15PM - 2:20PM)

Closing remarks & adjournment (2:20PM - 2:30PM)
Speaker: Cory Neudorf

References

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Endnotes

[i]Big data: Very large datasets characterized by their volume (size), velocity (speed at which data are created and collected), and variety (huge variety of sources and formats, many unstructured or semi-structured, examples include social media posts, clinical notes, and satellite images)

[ii]Digital exhaust: The large amount and variety of data created through interactions with online or computerized systems

[iii]Event based-surveillance: The detection of events potentially posing a risk to public health, usually through the analysis of unstructured, ad-hoc sources of information such as news media and social media

[iv]Infodemic: An “information epidemic”, particularly during a health crisis, defined by an overabundance of information, including misinformation, available in real time from numerous sources