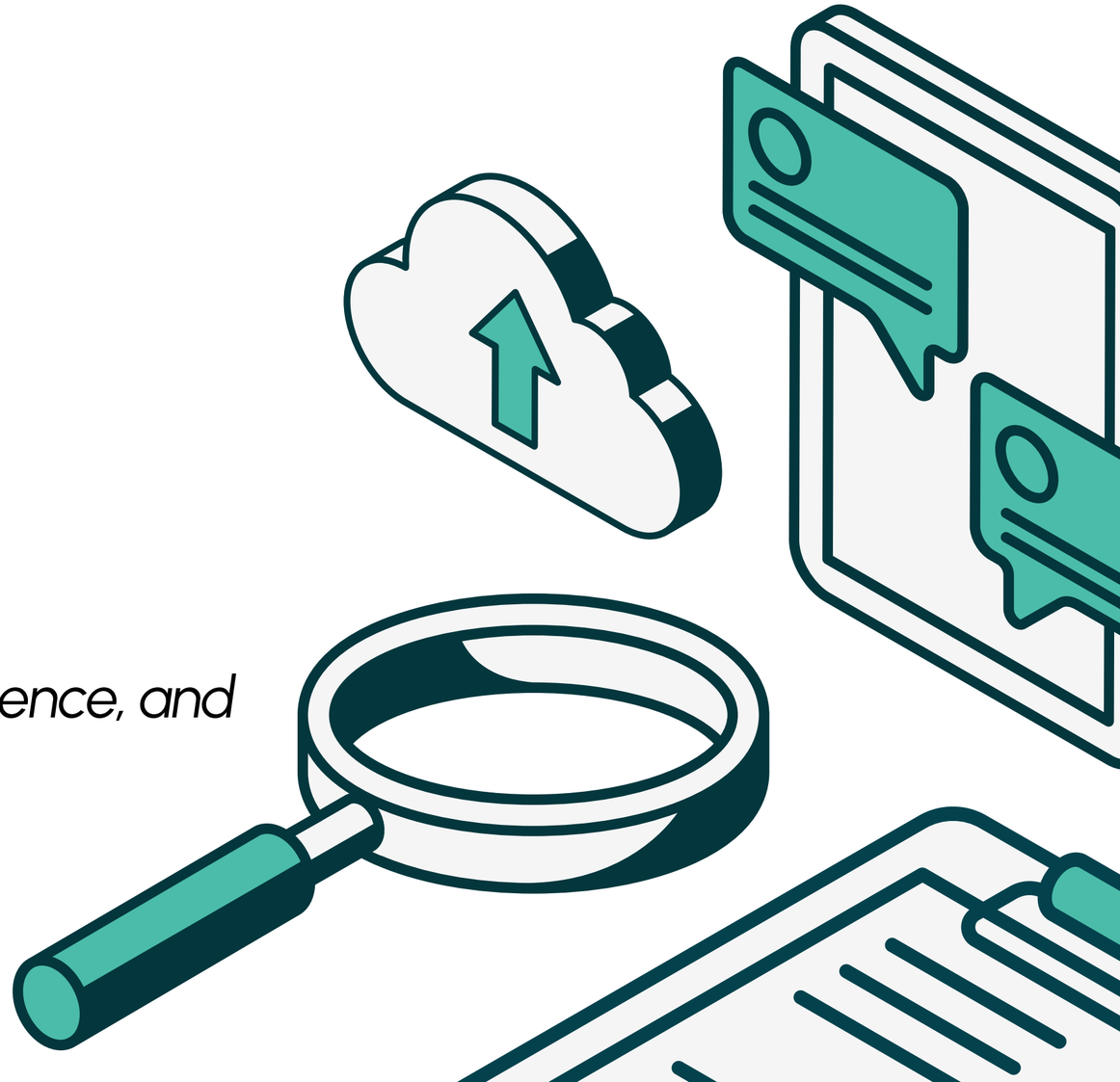
Waypoint
CENTRE for MENTAL HEALTH CARE
CENTRE de SOINS de SANTÉ MENTALE

Mobilizing evidence for mental health and substance use system decision-making



Cara Evans, Arina L. Bogdan, Meron Gidey

Supporting Transformation through Research, Evidence, and Action in Mental health (STREAM) Lab

Waypoint Talks, October 2025

Agenda

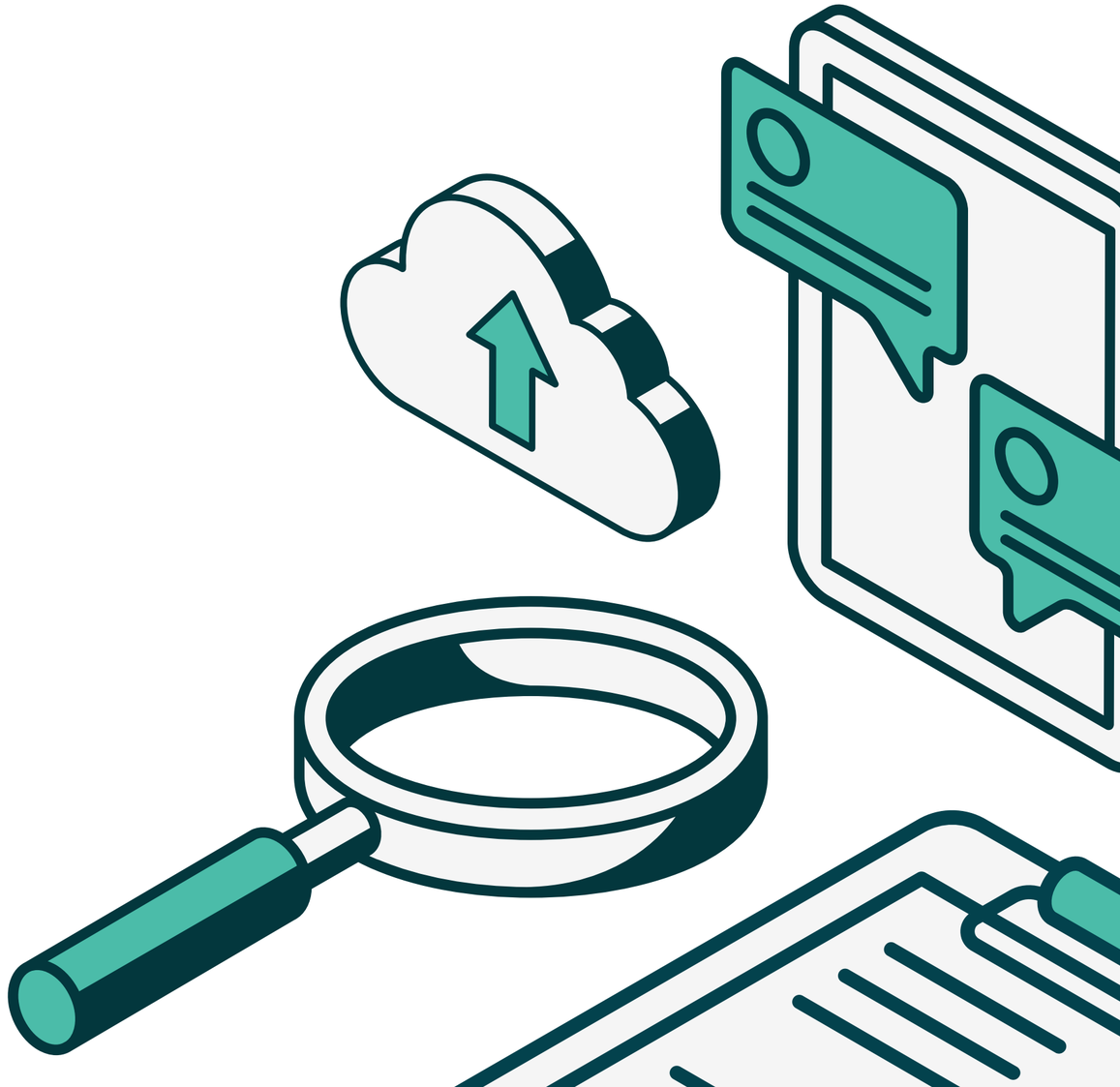
Background

About STREAM

Case study

Lessons learned

Background



Background

STREAM (*Supporting Transformation through Research, Evidence, and Action in Mental health*) Lab is based at the *Waypoint Centre for Mental Health Care*.

We conduct rapid reviews of research and other types of evidence to address decision-makers' questions about **health systems**.

Health systems

- Patients, and patient-provider interactions, take place in the context of…
    - policies,
    - resources and funding,
    - inter-organizational relationships,
    - implementation processes, etc.

- A good health system creates space for good interactions and good healthcare

(Lavis, 2017; World Health Organization, 2010)

Evidence-informed policymaking (EIP)

> *"a process whereby **multiple sources of information**, including statistics, data and the best available research evidence and evaluations, **are consulted before making a decision** to plan, implement, and (where relevant) alter public policies and programmes"* (OECD, 2020)

EIP: Challenges

- Policy is never just about evidence
  - Social values
  - Political parties
  - Interest groups
  - Existing policies and programs

- Evidence can be used in various ways—some more productive than others…
  - To solve a policy problem
  - To change discourse around a topic
  - To delay a decision
  - To justify an already-made decision ("decision-based evidence-making")

(Bowers & Testa, 2019; Weiss, 1979)

EIP: Opportunities

- Bringing research into conversations
- Promoting good resource stewardship by investing in what works
- Achieving aims aligned with social values

(Chalmers, 2005; Gough et al., 2020)

Getting evidence into policymakers' hands

- **Knowledge translation**: bringing research evidence into real world applications

"We [researchers] will bring evidence to you [users] in a form that you can use"

- **Integrated knowledge translation**: working with knowledge users throughout the research process

"We [researchers] will work with you [users] to figure out what questions to ask, how to find the answers, and how to describe findings in a usable way"

(Gagliardi et al., 2015)

Evidence synthesis units

- A "demand-driven" model to address policy-makers' evidence needs, in a **structured**, **transparent**, and **timely** way

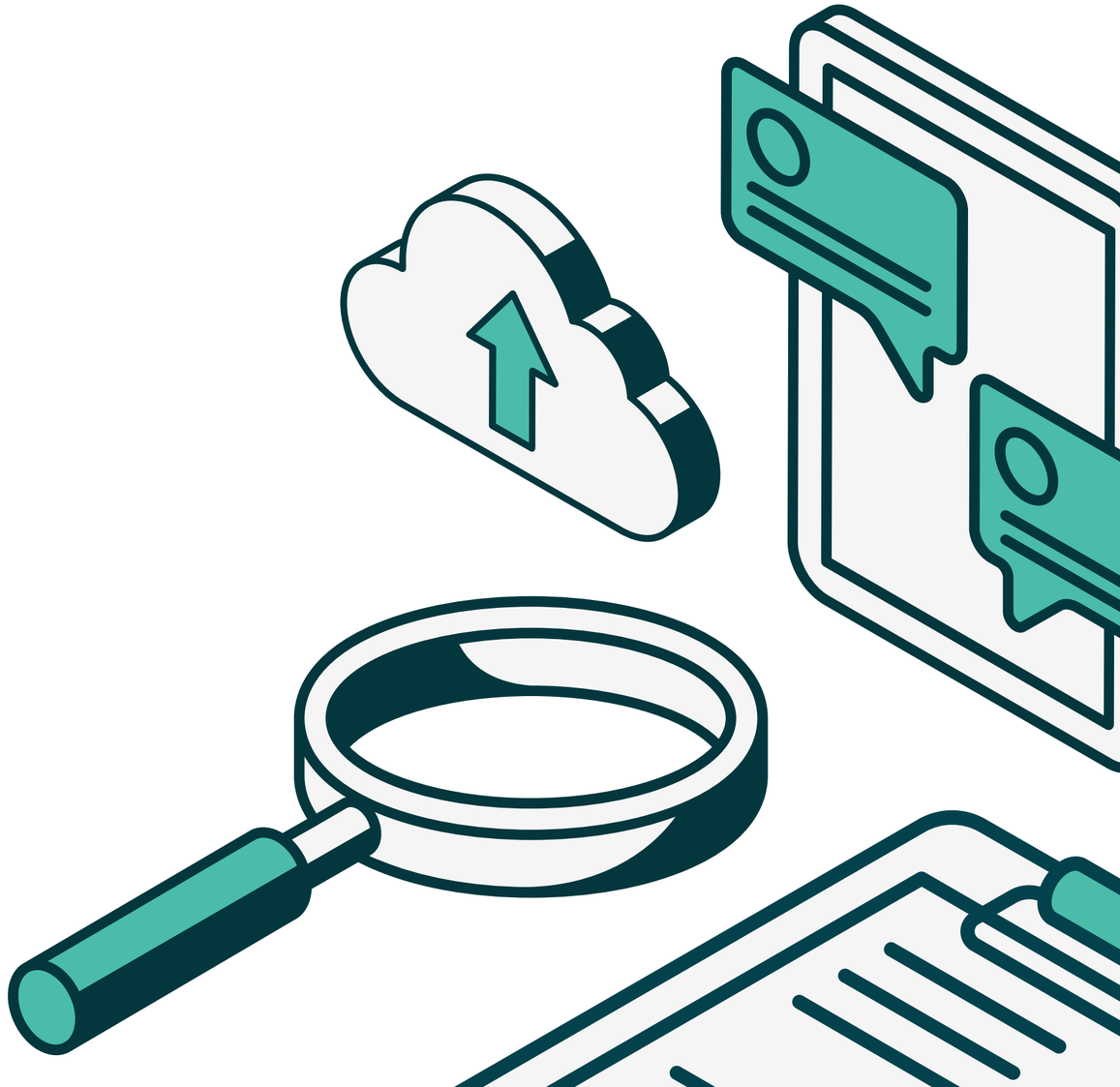
"We [policy-makers] need you [evidence synthesizers] to tell us what the science says about this issue, by next Tuesday."

- McMaster Health Forum
- National Collaborating Centre for Methods and Tools
- Ottawa Hospital Research Institute

- 3iE (Lebanon)
- Africa Centre for Evidence (South Africa)
- What Works Network (United Kingdom)

(Lavis et al., 2024)

STREAM Lab



About STREAM

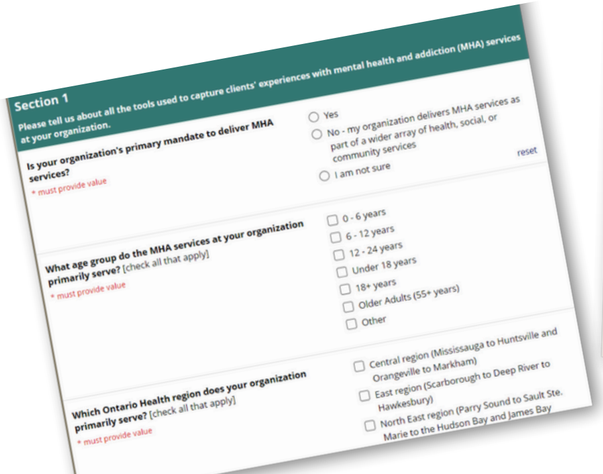
- Initiated by former VP of Systems and Partnerships, Dr. Heather Bullock
    - Dr. Bullock identified a need for evidence synthesis to support mental health policy implementation in Ontario

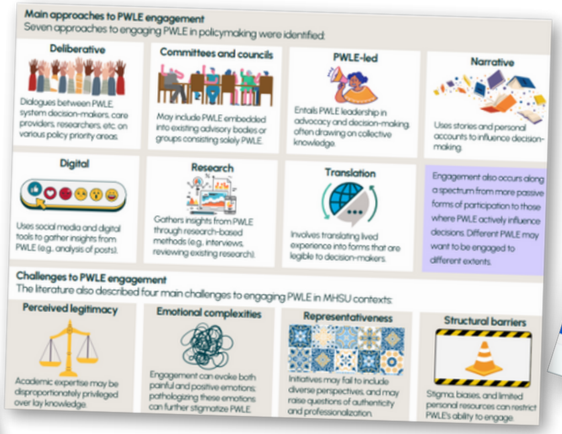
- STREAM is funded by the *Mental Health and Addictions Centre of Excellence* (the CoE) and was launched in Summer 2023

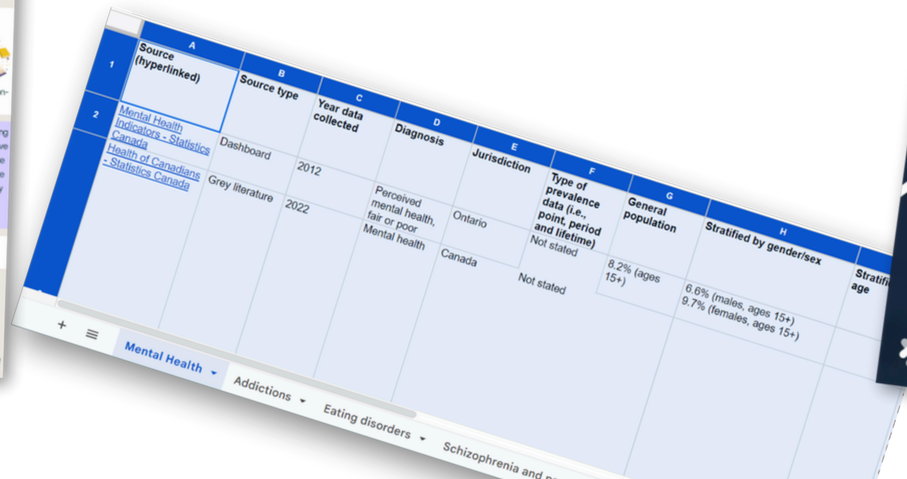
Our small but mighty team!

What we do

- We develop products for partners, including the CoE, within 3 days to 8 weeks
- Focus on mental health systems (rather than clinical research)
- Often formatted as reports, sometimes tables, infographics, dialogue events, etc.
- May include research evidence, expert opinion, grey literature, etc.







How we do it

01 Request

02 Proposal

03 Search and screen

04 Data extraction

05 Synthesis

06 Submission

07 Follow-up

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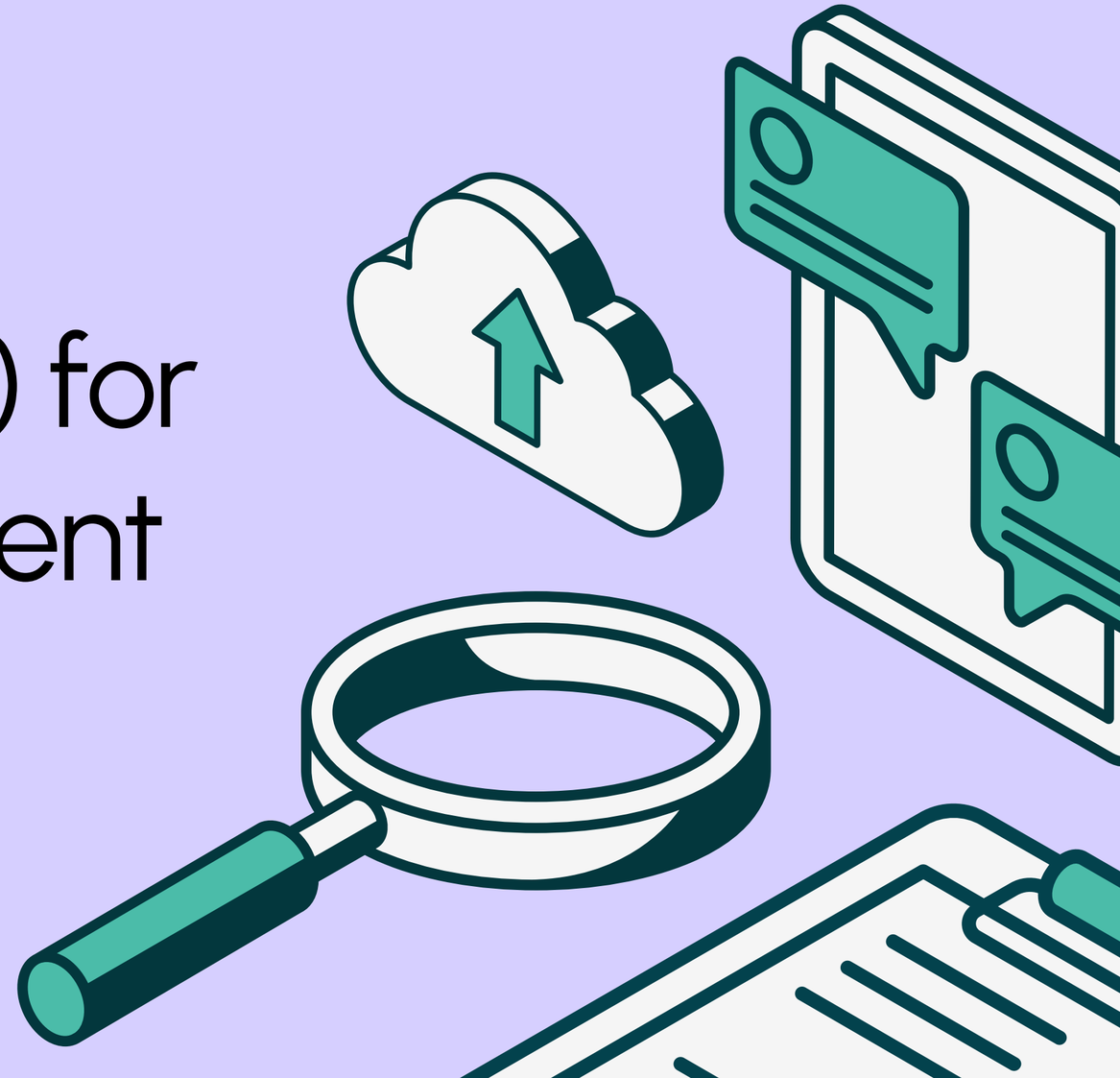
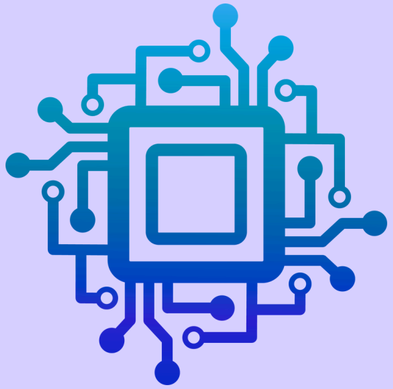
Case study: Artificial intelligence (AI) for mental health assessment



Artificial intelligence (AI) at Waypoint

- Ongoing efforts exploring AI-driven solutions to optimize Waypoint processes
  - AI-focused research
  - AI adoption roadmap and governance planning
  - AI-related education, skills-building opportunities, and tools
  - AI community of practice, led by Data Analytics



- And we were able to support one piece of the puzzle!

Step 1: The request

- We connected with a Waypoint team exploring AI within mental health settings
- Some areas of interest included:

- AI for summarizing electronic health record documentation
- AI for decision support
- AI for direct patient interaction
- AI for resource navigation
- AI for improving communication between care providers

SPEED BUMP!

- Do you foresee any challenges?

SPEED BUMP!

- Do you foresee any challenges?
  - Too many questions
  - The questions are broad

- What are some mitigation strategies?

Mitigation strategies

- To resolve this challenge, we...
  - clarified partners' needs
  - conducted preliminary searches
  - narrowed our scope

Using AI to summarize documentation in the EHR

- Artificial Intelligence (AI) – Powered Documentation Systems in Healthcare: A Systematic Review | Journal of Medical Systems
- Improving Clinical Documentation with Artificial Intelligence: A Systematic Review - PMC
- Automatic documentation of professional health interactions: A systematic review - ScienceDirect

Using AI to support decision support (in general and specifically for psychiatry)

- Artificial intelligence (AI) and machine learning (ML) based decision support systems in mental health: An integrative review - Higgins - 2023 - International Journal of Mental Health Nursing - Wiley Online Library
- Journal of Medical Internet Research - The Use of AI in Mental Health Services to Support Decision-Making: Scoping Review
- AI-enabled clinical decision support tools for mental healthcare: A product review - ScienceDirect

Step 1: Review

What could you do if partners come to you with several different topics or research questions for one rapid review? (select all that apply)

a. Conduct preliminary searches to see what type of literature is available
b. Choose one topic and ignore the rest
c. Help partners narrow their ideas into one clear question
d. Address all topics in one review

Type your answer in the chat and submit on the count of three!

Step 1: Review

What could you do if partners come to you with several different topics or research questions for one rapid review?

a. **Conduct preliminary searches to see what type of literature is available**
b. Choose one topic and ignore the rest
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d. Address all topics in one review

Any questions?

Step 2: The proposal

- After narrowing our focus in collaboration with our partners, we landed on the following research question:

What is known about the use of AI to support identification of patients' mental health and substance use service needs?

Step 2: The proposal

- We then developed a project proposal outlining…

TOPIC

Health systems across and beyond Ontario are interested in exploring the potential of artificial intelligence (AI) to enhance mental health and substance use (MHSU) care. At Waypoint, there is interest in understanding AI-enabled supports for MHSU intake, screening, triage, and stepped care, including within Ontario Structured Psychotherapy. This presents an opportunity to learn from and build on existing and emerging efforts to leverage AI for MHSU service entry and navigation.

RESEARCH QUESTIONS

What is known about the use of AI to support identification of MHSU service needs, including at intake, screening, triage, or in the context of stepped care?

- What is known about technical technological performance, including predictive validity?
- What is known about implementation considerations?
- What is known about outcomes?

SEARCH STRATEGY

We will conduct a search in PubMed and PsycInfo for English-language structured reviews published in the last 2 years, using the following terms:

MENTAL HEALTH-RELATED: ((exp Mental Health/ OR Psychiatry/ OR Substance-Related Disorders/) OR (mental OR psych* OR substance OR addict* OR "behavioral health" OR "behavioural health") ti,ab)
AI-RELATED: (exp Artificial Intelligence/ OR ("artificial intelligence" OR AI OR "machine learning" OR "natural language process*" OR "large language model*" OR "deep learning" OR "neural network" OR "predictive model") ti,ab)
CARE PATHWAY-RELATED: (intake OR screening OR triage OR "stepped care" OR assess* OR "measurement based care" OR "measurement-based care" OR "referral" OR "care pathway" OR "decision support" OR "decision making") ti,ab

Inclusion/exclusion criteria

Inclusion	Exclusion
Population	
Individuals of all ages experiencing MHSU challenges (diagnosed or otherwise)	Focused solely on physical health conditions without a MHSU component Focused on dementia and/or delirium
Concept	
Use of AI or machine learning tools to support MHSU intake, screening, triage, and/or stepped care; includes human-involved AI and/or fully automated AI	AI tools focused solely on treatment delivery (e.g., chatbots for CBT) without relevance to intake/screening/triage for service Focused on predicting outcomes/events (e.g., aggression, suicide) without relevance to intake/screening/triage for service
Context	
Any healthcare setting providing MHSU care (e.g., primary care, emergency department, e-mental health platform)	Use of AI used solely for administrative tasks, education and training, and/or research Based in LMICs
Study characteristics	
• Structured reviews (i.e., systematic, scoping, meta-analyses) • Published 2023-present • Available in English	• Unstructured reviews (i.e., narrative reviews)

EXAMPLES OF PAPERS THAT MAY BE INCLUDED:

- Using machine learning methods to predict the outcome of psychological therapies for post-traumatic stress disorder: A systematic review
- The Use of AI in Mental Health Services to Support Decision-Making: Scoping Review

EXPECTED OUTPUT

We will produce a 10-15 page narrative report, with appendices. The anticipated structure of this review is as follows:

- Key points
- Introduction and background
- Methods
- Findings
  - Uses of AI to support MHSU intake, screening, triage, and stepped care
  - Technical feasibility (e.g., accuracy of current technologies)
  - Implementation considerations
  - Reported outcomes
  - Equity, ethics, and safety considerations
- Limitations
- Considerations for decision-makers in Ontario
- Conclusions

TIMELINES

We will share interim findings by late August, and a draft report by September 12, 2025.

SPEED BUMP!

- Part of developing a proposal includes trying out different search strategies

- Do you foresee any challenges?

SPEED BUMP!

- Part of developing a proposal includes trying out different search strategies

- Do you foresee any challenges?
  - Too few relevant articles
  - Too many articles!

- What are some mitigation strategies?

Mitigation strategies

Too few articles	Too many articles
• Add search terms • Include single studies • Expand date range • Consider other forms of evidence (e.g., expert knowledge, grey literature) • Report on what is known and be transparent about limitations	• Remove broad search terms • Include structured reviews only • Narrow date range • Narrow scope

Mitigation strategies

- In our case we had too many articles, so we...

- Removed broad search terms (e.g., evaluation)
- Included structured reviews only
- Narrowed the date range (i.e., past 2 years)
- Narrow scope
  - Focus on applications for mental health assessment in clinical settings only
  - Excluding papers where the AI was trained solely on biomarker, neuroimaging, or social media data

Step 2: Review

If you conduct a search that yields very few relevant studies, what might you do to address the evidence gap?

a. Stop the review and report that there is not enough evidence
b. Expand the search to include grey literature (e.g., evaluation reports, government documents) and/or expert input
c. Repeat the same search in the same databases to try to find more results
d. Extend the search timeframe indefinitely until more studies on the topic are published

Type your answer in the chat and submit on the count of three!

Step 2: Review

If you conduct a search that yields very few relevant studies, what might you do to address the evidence gap?

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Any questions?

Step 3: Screening

- After receiving feedback and adjusting our proposal accordingly, we began the screening process

- Two reviewers independently apply the inclusion and exclusion criteria to each paper and vote on whether to include or exclude the paper in our review

SPEED BUMP!

- After we completed screening, we still had 55 papers left to extract!

- Do you foresee any challenges?

SPEED BUMP!

- After we completed screening, we still had 55 papers left to extract!

- Do you foresee any challenges?
  - Feasibility concerns
  - May capture data that is less directly relevant to our partners' needs and questions

- What are some mitigation strategies?

Mitigation strategies

- We conducted a mapping/"mini extraction" of the 55 papers to identify groupings of papers that may be less relevant

Article characteristics (i.e., title, author, year)	Population characteristics and use cases	Type of data inputted into the AI model	Findings, including major limitations (from abstract only)
Wearable Artificial Intelligence for Anxiety and Depression: Scoping Review Abd-alrazaq et al., 2023a	Diagnosing anxiety, depression Primarily adults <65	Wearable data - physical activity, sleep, and heart rate data from open source wearable device data sets	Wearable AI-supported prescreening assessment for anxiety and depression as promising. More research is needed re: statistical performance and effectiveness.
Wearable Artificial Intelligence for Detecting Anxiety: Systematic Review and Meta-Analysis Abd-alrazaq et al., 2023b	Early detection of anxiety Primarily adults <65	Wearable data - heart rate, physical activity, electrodermal, and sleep data from open and closed wearable device data sets.	Wearable AI as having the potential to detect anxiety, however, "it is not advanced enough for clinical use".

Step 3: Review

When screening literature for a rapid review, which of the following actions is appropriate to consider?

a. Use clear inclusion and exclusion criteria to guide screening decisions
b. Exclude studies that have negative or inconclusive results
c. Stop screening once you find 50 relevant papers
d. Have only one person screen all articles, to streamline the process

Type your answer in the chat and submit on the count of three!

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a. **Use clear inclusion and exclusion criteria to guide screening decisions**
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Any questions?

Step 4: Data extraction

- Upon further discussion, we decided to exclude all papers that included any data that was not of relevance (i.e., neuroimaging, biomarker, social media)

- This left us with 13 reviews to extract in full

Article title (hyperlinked)	Article information (i.e., author(s), year)	Population characteristics	Data inputs	Model approaches and supporting techniques/applications	Notes about model type (e.g., specific type of sub-model named most frequently)	Technological performance and predictive validity, based on author conclusions	Other findings	Limitations and methodological concerns
AI-supported diagnosis, classification, detection/screening								
Neurocognitive								
Performance of machine and deep learning models for predicting delirium in adult ICU patients: A systematic review (10.1016/j.ijmedinf.2025.106008)	Al-Jabri et al., 2025	Delirium among ICU patients under 65 years of age	Data from various validated and diagnostic tools (e.g., DSM-5, Confusion Assessment Method for the ICU, Intensive Care Delirium Screening Checklist)	Majority used traditional machine learning; a smaller subset used deep learning or ensemble models	"the majority of studies (n = 9, 81.8 %) used random forest and/or logistic regression as their primary modeling approach"	"The AUROC, used as the primary metric for discrimination, ranged from 0.785 to 0.931 across the studies." "These models demonstrate significant potential for the early identification of delirium; however, notable methodological and practical limitations must be addressed before they can be widely adopted in clinical practice."	"advanced methodologies, such as Gated recurrent units, XGBoost, CatBoost, and Bidirectional Long Short-Term Memory (BiLSTM) networks, exhibited superior performance in handling time-series data" relative to traditional ML	"the predominance of retrospective study designs limited external validation, and inconsistent handling of missing data reveal significant methodological limitations that restrict the generalizability and clinical applicability of these models. To translate the potential of these predictive tools into practice, future research should prioritize prospective study designs, rigorous external validation, and diverse datasets that capture the complexity of ICU populations."

SPEED BUMP!

- None of the STREAM team members are experts in AI
- Do you foresee any challenges?

SPEED BUMP!

- None of the STREAM team members are experts in AI

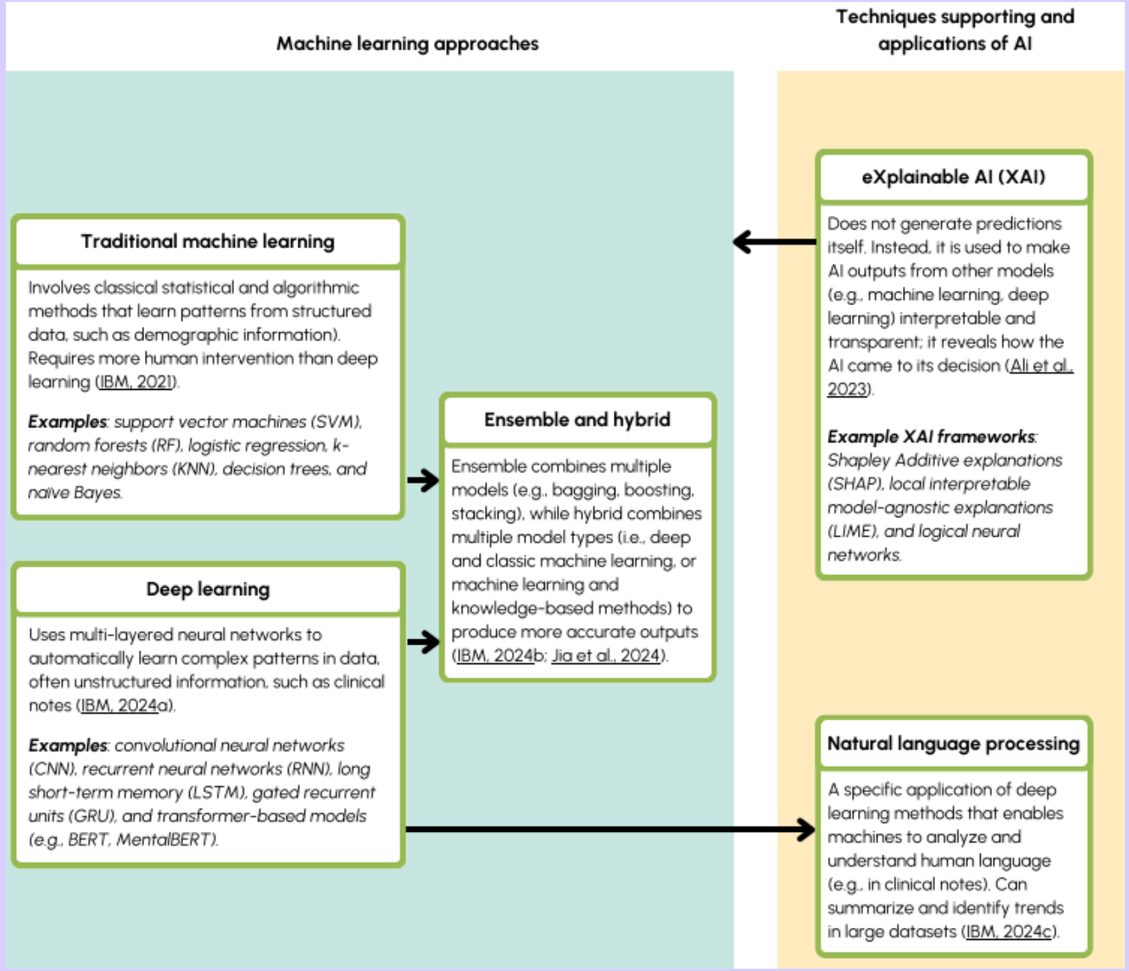
- Do you foresee any challenges?
  - Confusion among team members
  - Inconsistencies in extraction
  - Extraction of the wrong data

- What are some mitigation strategies?

Mitigation strategies

- Piloted extraction

- Developed a typology, in consultation with our partners, to support a shared understanding of machine learning approaches



Step 4: Review

Which of the following are appropriate actions when it comes to data extraction? (select all that apply)

a. Ask experienced team members or partners for guidance before starting, if you are not an expert in the field
b. Extract every detail from each study to be safe
c. Only extract data from studies that support your assumptions
d. Conduct a pilot extraction and discuss as a team

Type your answer in the chat and submit on the count of three!

Step 4: Review

Which of the following are appropriate actions when it comes to data extraction? (select all that apply)

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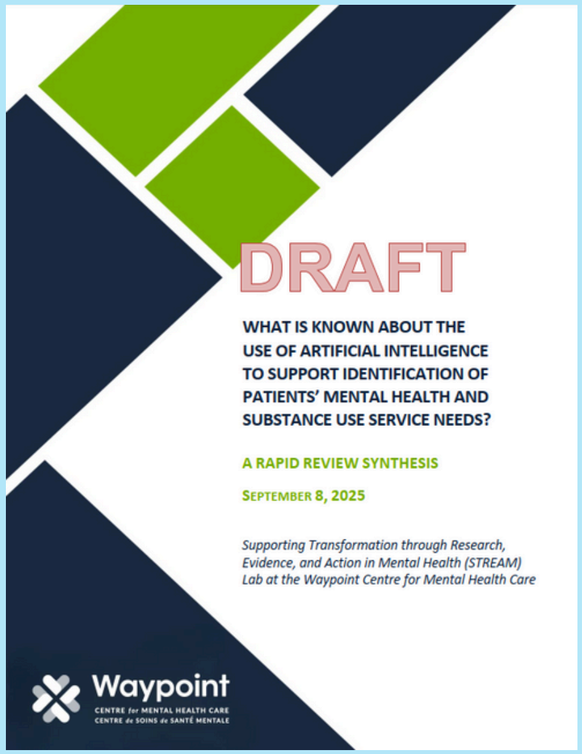
Any questions?

Step 5: Synthesis

- We then synthesized the data into a 22 page report



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  Appendix 4: Data extraction
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Key points

Why did we do this?

- Decision-makers at Waypoint Centre for Mental Health Care are interested in exploring how AI can support mental health and substance use (MHSU) assessment, to alleviate system pressures

What did we do?

- We conducted a structured literature search to identify recent reviews addressing AI-supported MHSU assessment at different junctures of MHSU care

What did we find?

- We identified a total of 13 reviews
  - 12 address AI-supported prediction, diagnosis, and classification of MHSU concerns
  - One addresses clinical decision support
- AI trained on clinical data inputs (n=6) and on data from wearables such as smartphones (n=7) appear to be promising in terms of accuracy, sensitivity, and specificity for prediction, diagnosis, and classification of MHSU concerns in research contexts
- Across reviews, few or no studies address the real-world application of AI-supported assessment, and some authors cautioned that the technology may not yet be mature enough for implementation in practice settings
- Authors highlighted concerns around methodological limitations, health equity, generalizability, and interpretability

What does this mean for Ontario?

- Decision-makers may consider identifying criteria for technological readiness, including:
  - Thresholds for acceptable performance of AI tools;
- Performance tradeoffs relating to different types of errors; and
  - Equity concerns, including the representativeness of the data sets AI are trained on, and the potential to amplify health inequities
- Decision-makers may also need to identify criteria for organizational readiness, such as:
  - Patient, family, community, and staff perspectives on AI
  - Safety, privacy, ethics, and governance concerns and regulations
  - Consistency of access to relevant data sources, such as health records and data external to the organization (e.g., referral data)
- Piloting and prospectively-developed evaluation and implementation frameworks

Step 5: Review

When you reach the synthesis stage, what is the most appropriate way to handle the information you've extracted?

a. Report every finding exactly as written in each study
b. Exclude studies that do not agree with the majority of findings
c. Summarize and organize findings according to key themes
d. Write in narrative format only; avoid using bullet points

Type your answer in the chat and submit on the count of three!

Step 5: Review

When you reach the synthesis stage, what is the most appropriate way to handle the information you've extracted?

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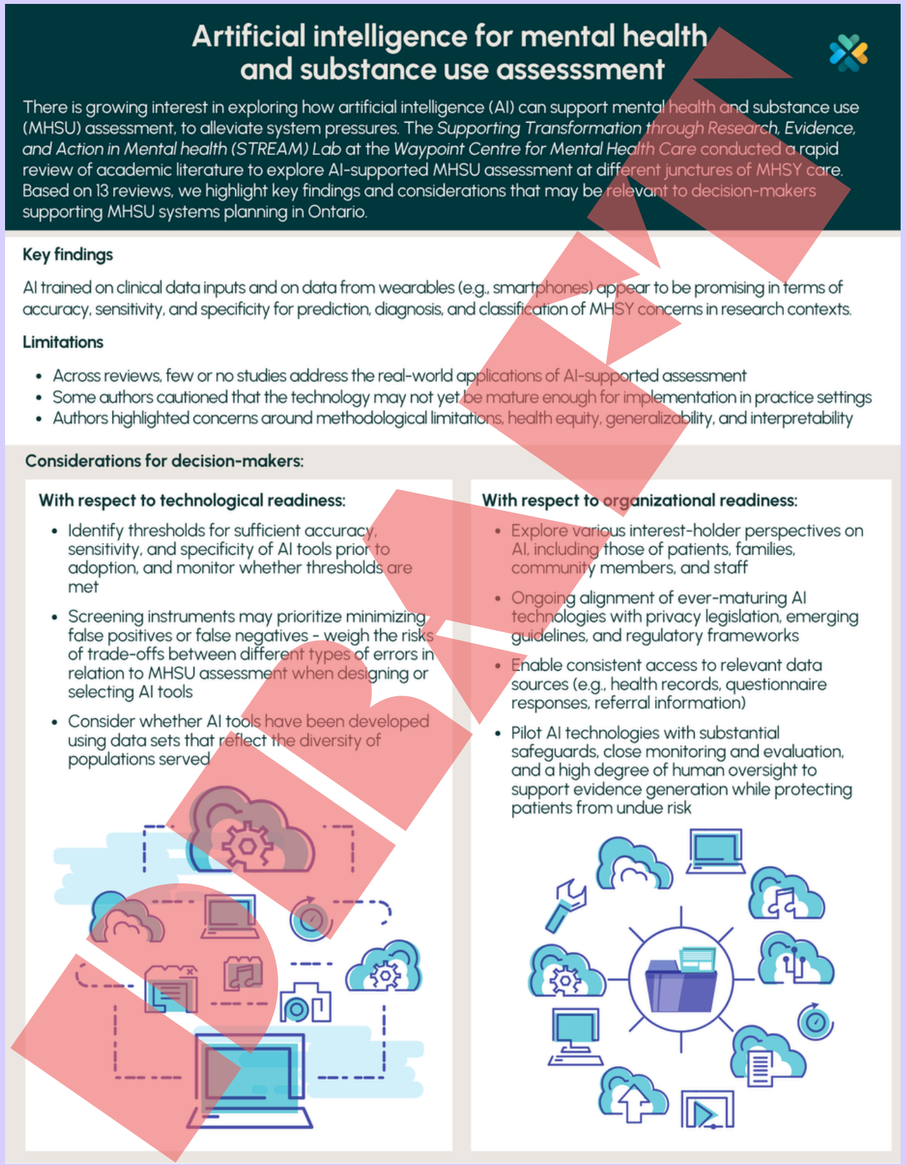
d. Write in narrative format only; avoid using bullet points

Any questions?

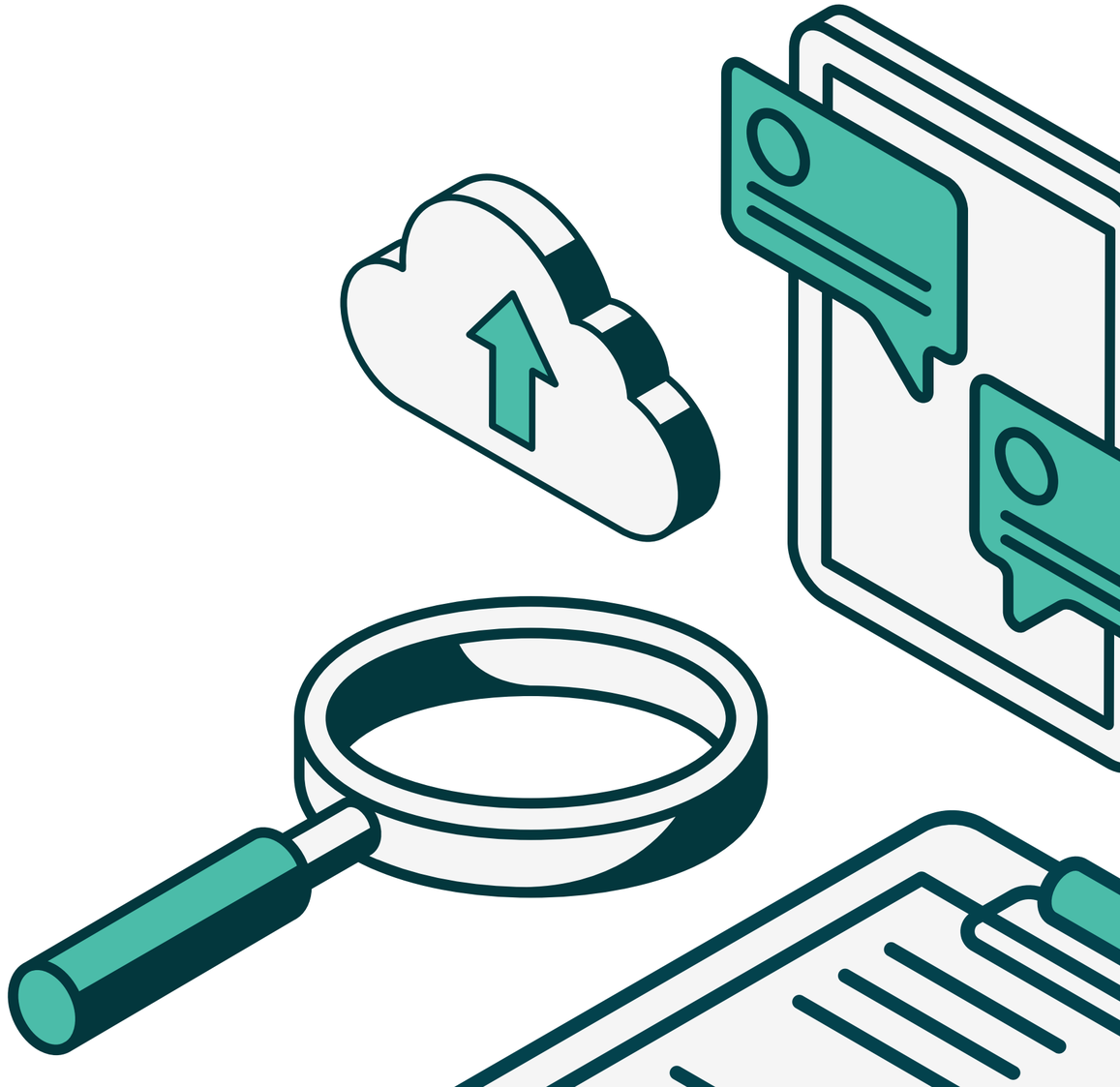
Step 6/7: Submission/follow-up

- We shared our draft with our partners, received some feedback, and made changes accordingly

- We are now working on a two-page summary graphic, which will be posted on our website later this year!



Wrapping up!



Topics to date

- Examples of topics we've covered in the past include...
  - Reducing mental health and substance use-related emergency department and inpatient **care utilization**
  - **Engaging people with lived/living expertise** in mental health and substance use decision-making
  - Enhancing substance use service delivery in **rural and remote Ontario**
  - **Client experience measurement** in Ontario mental health and substance use services
  - Components of a comprehensive mental health and substance use **crisis care system**

Scan to view summaries on our website!

Lessons learned

- Policymakers and researchers ask different questions
- The literature is full of uncertainties and gaps—especially relating to health equity
- Multiple forms of evidence matter
- Flexibility and transparency are necessary
- A team effort is essential to pulling this off!

Next steps

- Integrating STREAM within Waypoint and the broader mental health system

- Connecting to the broader evidence synthesis ecosystem
  - Bringing a mental health systems lens to the Evidence Synthesis Network for Canada to Support Pandemic Planning and Response

- Sharing our findings more broadly (check out our website!)

- Identifying opportunities to expand the types of evidence we access and the products we create

Key points

- STREAM takes a demand-driven, integrated knowledge translation approach to support evidence-informed health systems policymaking

- We use collaborative, transparent problem-solving approaches to enable rapid, relevant responses

- We continue to learn and grow, and look forward to establishing new partnerships and processes

Thank you for your time!

STREAM@waypointcentre.ca

waypointcentre.ca/services/streamlab