RtKW 1: Urgency, pace and temporality in implementation

Evolving learning health systems: integrating scientific rigour and real-world pragmatism

Robbie Foy[1], Michael Sykes[2], Bethan Copsey[1], Tracy Finch[2], Sarah Alderson[1], on behalf of the EQUIPD team.

Urgency in implementation: How temporal structures influence health-system climate change and sustainability work

Denise Thomson[1], Kristie L. Ebi[2], Lisa Hartling[1], Stephanie Montesanti[1], Amanda S. Newton[1], Elden Wiebe[3], Ken J. Caine[1]

Combining Implementation and Data Sciences to Advance the Speed of Evidence Integration Into Healthcare

Natalie Taylor[1,2], Jeffery Chan[1,2], Skye McKay[1,2], Shuang Liang[1,2], Elizabeth Kennedy[1], Carolyn Mazariego[1], Joseph Elias[1], April Morrow[1], Ely Tyedmers[1], Helen Monaghan[1,3], Guillaume Fontaine[4,5,6,7], Kathryn Leaney[8], Bridget Douglas[1,2], Helen Ke[2], Benjamin Koh[2], Mandy Ballinger[1,2,9,10], David Thomas[1,2,9,10], Kathy Tucker[1,2], Milita Zaheed[1,2,10,11], David Goldstein[1,2], Janna Hastings[12], Frank Lin[1,2,11]

Advancing the speed and science of implementation using mixed-methods process mapping – best practice recommendations

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Evolving learning health systems: integrating scientific rigour and real-world pragmatism

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Background
People with type 1 diabetes and raised blood sugars are at greater risk of multiple, serious complications. Since 2008, the National Institute for Care Excellence (NICE) has recommended continuous subcutaneous 'insulin pump' therapy for people with type 1 diabetes and HbA1c above 69 mmol/mol. Insulin pump use can improve quality of life, cut cardiovascular risk and increase treatment satisfaction. Many people meet criteria for insulin pumps but do not use one. The National Diabetes Audit (NDA) identified increasing insulin pump use as a key priority. Healthcare providers have limited capabilities to mount effective responses to feedback. With the NDA, we adapted a theoretically- and empirically-informed quality improvement collaborative (QIC) to strengthen local responses.

Research aims
The NDA planned to roll out the QIC to all specialist diabetes teams, but its cost-effectiveness was unknown. We evaluated whether the QIC improved the uptake of insulin pumps following NDA feedback.

Methods
Our efficient cluster-randomised trial, with parallel process and economic evaluations, used routine NDA data. Diabetes teams in England were randomly allocated to QIC delivered alongside NDA feedback or to standalone NDA feedback. The primary outcome comprised the proportion of people with poorly controlled type 1 diabetes who started and continued using insulin pumps, with subgroup analyses by ethnicity, sex, age and deprivation.

Results
The trial included 77 diabetes teams, and the QIC was delivered with reasonable fidelity. Trial results are expected in early 2025.

Discussion
Our evaluation findings will directly inform future programme delivery by virtue of being embedded within the NDA. Two questions will be discussed: What factors enable or hinder embedding rigorous evaluations of implementation strategies within healthcare systems? Can we become more ambitious in integrating and advancing both implementation practice and research?

RtKW 147

Urgency in implementation: How temporal structures influence health-system climate change and sustainability work

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Research aim
Climate change will profoundly affect health systems for decades to come; its impacts on human health are projected to increase over time. Our aim is to investigate how health-system staff construct and maintain a sense of forward-facing urgency in the development, implementation and sustainment of climate-health policies and programs.

Setting
This work pertains to the implementation of climate change policies within health system organizations, including ministries of health, entities responsible for organizing and delivering health care and public health services, and health facilities.

Method(s)
Data came from 1) 41 interviews with staff developing and implementing policies and programs related to climate change in health-system organisations in the Canadian provinces of British Columbia and Ontario and 2) publicly-available documents from those organisations. The interview guide included questions on factors enabling or constraining participants' implementation work and the individual capabilities they deployed to navigate those factors. For this analysis, data from the interviews and documents were coded for elements relating to temporality; the codes were then developed into themes. The topic of how urgency is constructed, individually and organizationally, came from this temporally-focused thematic analysis.

Key finding(s)
The construction of future-focused urgency fundamentally influences the development, implementation and sustainment of climate-health policies and programs. Specific climate change-related events, such as the BC heat dome of 2021, have served to accelerate organisational urgency about supporting climate change preparedness. Staff deploy personal urgency to link the temporal frames that drive policymaking and programming within health systems (e.g. reporting tied to fiscal year-end, five-year strategic plans) with their concern about the long-term intensification of impacts over the coming decades and centuries. This future awareness is a motivational force, yet the accompanying dread and anxiety can contribute to burnout.

Discussion
- Scholars in fields such as organisational change and policy studies have considered time and temporality in their work, yet these concepts are under-studied in implementation science (IS). How can time-related considerations be incorporated into IS constructs such as the inner and outer setting, the characteristics of individuals, etc.?
- What is the role of implementation science in promoting a system-wide, policy-focused and equity-driven approach to climate change response within health systems?

Challenges
Temporalities of climate-health policy generally are not articulated and/or taken for granted in implementation. Surfacing them and their interactions is challenging. The health systems in the provinces chosen for this study are highly engaged with climate change response; other systems, less engaged, likely construct urgency differently, thereby influencing implementation.

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Combining Implementation and Data Sciences to Advance the Speed of Evidence Integration Into Healthcare

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Background
Implementation science suffers from significant knowledge underutilisation and inefficient data extraction processes, while healthcare systems lack dedicated infrastructure to support systematic implementation of evidence-based practices. The development of AI-enabled platforms that can automate knowledge extraction and enhance implementation capacity represents a critical advancement needed to bridge the research-to-practice gap and accelerate evidence translation into routine care.

Method(s)
A scalable, AI-enabled implementation science platform, ImpleMATE, comprises a Learning Implementation System (LIS) with an interactive web interface that employs advanced natural language processing and BERT-based deep learning models. The system enables comprehensive implementation science concept extraction and validation against established frameworks such as CFIR 2.0, BCTs and ERIC. A pilot validation study was conducted by comparing extracted implementation concepts against expert-appraised findings to determine computational framework accuracy and reliability.

Finding(s)
Initial validation demonstrates ImpleMATE's capacity to distil implementation science knowledge through its AI-driven architecture, achieving 71% and 79% accuracy in extracting implementation barriers and strategies, respectively, from an initial dataset of 14 validation studies. The platform's LIS successfully automates traditionally manual coding processes while maintaining high concordance with expert review, significantly reducing analysis time and enhancing research efficiency. Currently integrating data from 28 active implementation projects, the dual-component infrastructure combines automated knowledge extraction with a user-friendly interface, enabling systematic knowledge capture and analysis across diverse healthcare domains. Initial validation confirms ImpleMATE's capacity to accelerate evidence curation and automate concept extractions. The platform's dual-component scalable infrastructure enables systematic knowledge capture and organisation, providing real-time evidence-based support for implementation researchers.

Discussion
- There are synergies with Prof Michie's data science and health behaviour change work – where do the ontology overlaps begin and end?
- We are establishing an ethics and governance framework to incorporate live project data into this system. What challenges do you think we will face? Would anyone like to collaborate?

RtKW 261

Advancing the speed and science of implementation using mixed-methods process mapping – best practice recommendations

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Research aim
To realise the potential of process mapping as an implementation tool, we aimed to develop and formalise the methodological steps and provide guidance for contemporary best practice approaches to using mixed-methods process mapping for optimising implementation practice and research.

Setting
Several case studies demonstrate the application of these methods across various healthcare and service settings.

Method(s)
We developed a guiding framework on mixed-methods process mapping to improve the consistency, quality, and utility of its use among implementation researchers and practitioners. Drawing on existing evidence and professional expertise, core phases of implementation were identified where mixed-methods process mapping can be applied. For each core phase, we crafted: a) rationale on how mixed-methods process mapping can inform and contribute to each phase; b) practical guidance for combining process mapping with implementation practice and research, and c) existing examples from the literature and emerging approaches.

Key finding(s)
Ten best practice recommendations were developed across three core implementation phases: 1) engaging interest holders, 2) understanding what needs to change, 3) identifying barriers/enablers to change and develop solutions. Implementation science principles and expertise were synthesised and consolidated into a mixed-methods process mapping framework. Evidence from six case studies representing childhood and adult cancer, medication adherence, infectious diseases, genetics and genomics was used to demonstrate application. Practical tools (process map template, practical resources toolkit, detailed guidance) are provided. These can be adapted by implementation researchers and practitioners internationally to standardise and streamline process-map informed implementation efforts.

Discussion
This work illustrated how mixed-methods process mapping can be systematically incorporated into three core implementation phases. The two key questions for discussion are:

- What novel approaches can be used to integrate data from diverse sources during the process mapping?
- How do we formally test the impact of mixed-methods process mapping independently or combined with other implementation strategies to achieve desired implementation outcomes?

Challenges

Our proposed best practice recommendations for mixed-methods process mapping are a starting point. We envisage iterative refinement based on learning what does and does not work across different healthcare settings.