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Mental Health and Addiction Data Use Cases: Macro Perspectives in Ontario

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Abstract. The opioid crisis in Ontario has led to a surge in preventable overdose deaths. Challenges in the mental health and addiction system, along with various contributing factors, have amplified this crisis. Underutilization of data exacerbates service gaps and hinders innovative solutions. Through stakeholder engagement, interrelated problems emerged, emphasizing the pervasive data underutilization. This research explores data usage in mental health and addictions, focusing on the opioid epidemic in Ontario and comparative jurisdictions. To improve service quality, Ontario should implement a comprehensive data management strategy. Two key recommendations include increased investment in exploring additional data use cases and evaluating policy initiatives using dynamic models throughout a patient's journey.

Keywords. Data usage, mental health, opioid crisis, underutilization, service gaps, data management

1. Background

In March 2020, Ontario unveiled its long-awaited strategic plan, "Roadmap to Wellness: A Plan to Build Ontario's Mental Health and Addiction System," to address the growing challenges in mental health and addiction. The plan envisions an integrated and connected ecosystem, emphasizing investments in data assets for system improvement. Ontario has proposed a $3.8 billion investment over the next decade, including targeted federal funds, to implement the strategic plan. This financial commitment aims to bridge the funding gap and position Ontario and Canada competitively in mental health and addiction spending compared to their OECD counterparts [1].

The COVID-19 pandemic placed a considerable strain on the limited healthcare resources available in recent years, as health officials struggled to contain the disease's numerous manifestations. Furthermore, the pandemic worsened the opioid overdose epidemic leading to an unprecedented increase in overdose-related mortality [2]. This report focuses on the macro health system level, exploring applications of mental health and addiction data, with a specific emphasis on addressing the opioid crisis.

2. Methods

The methodology comprised 14 stakeholder interviews spanning mental health, addiction services, and data management. Interviews explored data utilization in

Ontario's opioid crisis. Qualitative content analysis revealed themes and was validated by stakeholders. Comparative analysis with other crisis-prone regions was conducted. Ethical considerations were observed, and limitations included a small sample size and qualitative data focus.

3. Results and Discussion

This compilation of mental health and addiction data use cases in Ontario is not exhaustive; instead, it specifically emphasizes macro-level perspectives.

3.1. Current State: Macro Level Applications of Mental Health and Addiction Data

3.1.1. Mental Health and Addiction Data and Digital Initiatives (MHA DDI)

The mental health and addiction (MHA) data and digital initiatives align with the Ontario Ministry of Health's Digital First for Health strategy and have a prominent place in the "Roadmap to Wellness Plan". At a high level, the MHA Data and Digital Initiatives include the Provincial Data Set (PDS), Measurement-Based Care Solution for Ontario Structured Psychotherapy, MHA EHR Data Set and Data Analytics. Together, these four use cases support the goal of advancing real-time access and linking of patient and provider information across the mental health and addiction care continuum [1].

3.1.2. Institute for Clinical Evaluative Sciences (ICES) Research and Analytics

The ICES mental health dashboard is a public reporting tool that monitors and evaluates Ontario's mental health and addiction system. Established in 2013 as part of the Ontario Mental Health System Reporting, the dashboard provides quarterly updates on trends and performance indicators. Drawing from multiple sources, such as the Discharge Abstract Database (DAD) etc., ICES dashboard offers a succinct summary of key data, influencing factors, and access to care [3].

Recent legal designation empowers ICES to receive Coroner data under PHIPA and the Coroners Act. This allows secure integration with Ontario's Narcotics Monitoring System data, enabling the analysis of opioid-overdose-related mortality and its correlation with opioid prescribing practices province-wide.

3.1.3. Ontario Mental Health Reporting System (OMHRS)

The Ontario Mental Health Reporting System (OMHRS), overseen by the Canadian Institute for Health Information (CIHI), captures clinical, administrative, and demographic data for individuals receiving in-hospital mental health and addiction services in Ontario. This system, utilizing the Resident Assessment Instrument for Mental Health (RAI-MH), provides comprehensive insights, including mental health assessments, service usage, care planning, and case-mix funding applications [4]. Developed collaboratively by interRAI, the Ontario Ministry of Health, and the Ontario Health Association, the RAI-MH instrument covers key data sets, quality indicators,

and clinical evaluation methods for in-patient psychiatry. Published quarterly, OMHRS offers a valuable snapshot of mental health and addiction services in the province [4].

3.1.4. Public Health Ontario (PHO) Interactive Opioid Tool

The Interactive Opioid Tool, a collaboration between Public Health Ontario and the Ontario Ministry of Health, provides users with recent aggregate-level data on opioid-related mortality and morbidity in Ontario. This surveillance tool allows the display of figures for public health units based on factors such as age, gender, and Local Health Integration Network. Data sources include emergency department visits, hospitalizations, opioid-related deaths, and population estimates [5].

3.1.5. Ontario's Narcotics Monitoring System (NMS)

The Narcotics Monitoring System (NMS) in Ontario is a centralized database for real-time reviews of controlled substance prescribing and dispensing at the point of care. Pharmacies upload data, and the NMS conducts audits, identifying issues like polypharmacy. Pharmacies receive immediate notifications for necessary actions. The system, operational since April 16, 2012, utilizes dispensing data from all pharmacies regardless of payment method. Notably, physicians are barred from patient-level data access, integrated into the province's upgraded medication management system [6].

3.1.6. Drug and Alcohol Treatment Information System (DATIS)

The Drug and Alcohol Treatment Information System is a client-based information system that provides reports on Ontario's publicly funded addiction treatment services. It is intended that agencies involved in the delivery of healthcare for individuals with substance use disorders will upload demographic information about individuals who utilize their services. DATIS provides information regarding trends in substance use and how they are affected by treatment program enrollment. The database is useful for tracking patients throughout their healthcare journey and identifying the most effective treatment services. Approximately 180 partner organizations in Ontario use Catalyst (an electronic client management system) to pull information into DATIS [7].

3.2. Future State: Macro Level Applications of Mental Health and Addiction Data

3.2.1. Cascade of Care Model

Comparable to the cascade of care model that was developed and proved effective for managing HIV and AIDS in 2017, stakeholders observing the pattern of the opioid crisis are requesting a similar framework to combat the opioid epidemic. In many circumstances, the need for services is detected by a system that is not equipped to provide adequate care. The result is that persons with opioid use disorder struggle to find the help they need while navigating a confusing system. Such persons frequently gravitate to emergency departments when more appropriate and efficient care options are available in community-based settings [8].

3.2.2. System Dynamic Modeling

Researchers in Portland, Oregon, addressed the concern of non-medical opioid usage and accidental poisoning by developing a dynamic model. The model aimed to understand the behavioral factors contributing to patients abusing pharmaceutical opioids for non-medical purposes. Utilizing data from sources including the National Survey on Drug Use and Health (NSDUH), Treatment Episode Data Set (TEDS), Monitoring the Future (MTF) Public-Use Cross-Sectional Datasets, Automated Reports and Consolidated Ordering System (ARCOS), the model successfully predicted behavior patterns in patient populations prone to pharmaceutical opioid abuse [9].

3.2.3. Integrated Data Warehouse

The Ontario Health Data Platform (OHDP) is an integrated data warehouse that is facilitating groundbreaking COVID-19 research. Similarly, developing an information management architecture that connects siloed data sources held separately to enable research on the opioid overdose epidemic has become critical. In response to the opioid crisis, Massachusetts established an integrated public health warehouse that connects patient-level administrative data from over twenty different sources. By investigating big data solutions for the opioid overdose epidemic, Massachusetts hopes to gain a better understanding of the clinically significant relationships that are fueling the opioid epidemic, as well as the added benefit of being able to model a patient's journey across the health system, among other things [10]. Figure 1 demonstrates the current state mental health and addiction data use cases in Ontario and potential future state scenarios.

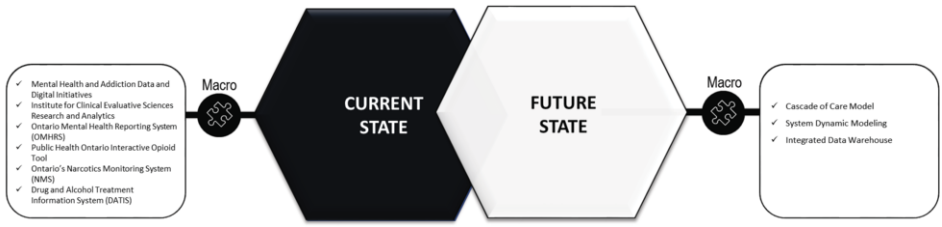

Figure 1. Visual representation of current state mental health and addiction data use cases in Ontario and potential future state scenarios.

4. Conclusion

In practice, leveraging data is crucial for providing high-quality care and enhancing accountability within the mental health and addiction system. It is imperative to establish transparent accountability guidelines for Ontario's mental health and addiction data resources [1]. The recommendations in this study emanate from a thorough research process that integrates systematic analysis and active engagement with stakeholders. Informed by a literature review, extensive data collection, and insightful stakeholder interactions, these recommendations are designed to be both actionable and

firmly grounded in empirical evidence. Specifically, the study advocates for increased resource allocation in Ontario to expand the exploration of additional data use cases at both micro and meso levels. Furthermore, it suggests that health system planners should adopt dynamic models to comprehensively assess policy initiatives throughout all stages of a patient's healthcare journey.

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