# Request for Compass’s Participation in Research

## Section a - Research Team Information

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| --- | --- | --- | --- | --- | --- | --- |
| Name: | Shauna Heron | Principal Investigator: |  | Yes |  | No |
| Role/Title: | Graduate Student | Affiliations: | Masters student in Psychology; Laurentian University | | | |
| Professional Qualifications: | BSc Psychology | Street Address: | 460 Spruce Street | | | |
| Email: | sheron@laurentian.ca | Postal Code: | P3C 1P2 | | | |
| Phone Number: | 705619026 | City: | Sudbury, ON | | | |
| Potential Conflicts of Interest: | Potential dual role--I work as data analyst at Compass and will be principal researcher | Province: | Ontario | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| Name: | Dr. Kaldrum Passi | Principal Investigator: |  | Yes |  | No |
| Role/Title: | Advisor | Affiliations: | Full Professor of Mathematics and Computational Science; Bharti School of Engineering & Computation | | | |
| Professional Qualifications: | Ph.D.,M.Tech,M.Sc.,B.Sc. | Street Address: | Laurentian University  FA-380 935 Ramsey Lake Road | | | |
| Email: | kpassi@laurentian.ca | Postal Code: | P3E 2C6 | | | |
| Phone Number: | 705.675.1151 | City: | Sudbury | | | |
| Potential Conflicts of Interest: | none | Province: | Ontario | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| Name: | Dr. Michael Emond | Principal Investigator: |  | Yes |  | No |
| Role/Title: | Supervisor | Affiliations: | Director of School of Social Sciences | | | |
| Professional Qualifications: | Ph.D., B.Sc. | Street Address: | Laurentian University  A-238 935 Ramsey Lake Road | | | |
| Email: | memond@laurentian.ca | Postal Code: | P3E 2C6 | | | |
| Phone Number: | 705.675.1151 ext 4246 | City: | Sudbury | | | |
| Potential Conflicts of Interest: | none | Province: | Ontario | | | |

*Please append any additional investigators’ information.*

## section b - Research Proposal

*Please clearly indicate where the requested information can be clearly found in any attached proposals, plans, or applications using page numbers. Please attach all relevant project materials including measures, interview guides/tools, and consent forms.*

1. **Title of Research Project**

# Beyond counting clients: Developing a measure of clinician workload with machine learning

1. **Research Project Timeline**

*Outline the timing of major project milestones and overall expected length*

Prospectus writing – Summer 2024

Proposal Presentation – December 2024

Ethics Approval – Late Winter 2024

Model Building and Analysis – Early Spring 2025

Thesis Writeup – Late Spring 2025

Thesis Defense – Summer 2025

1. **Research Ethics Board Approvals**

*Include the REB’s name, host institution, reference number, status, and relevant dates*

**TBD will share as soon as I have the information (will be December 2024 after proposal presentation).**

1. **Research Funding**

*Include the name of any funding sources for the project and amounts*

**TBD**

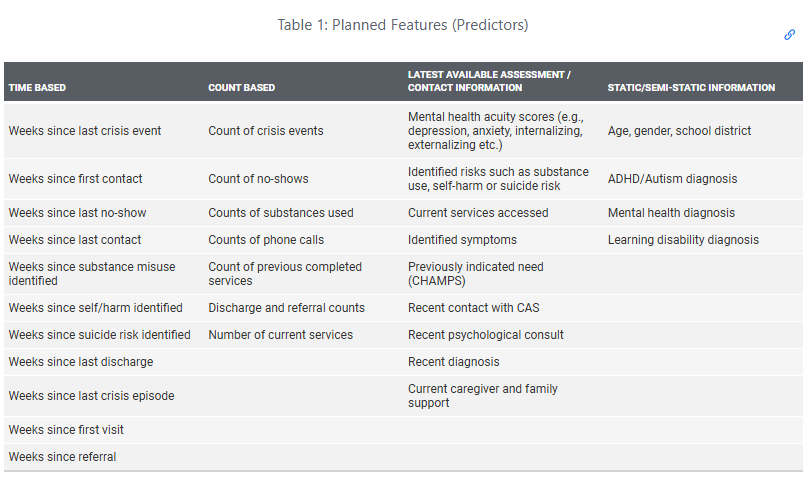
1. **Research Plan**

*Research plans involving children, youth, caregivers, families, and/or Compass clients or their data must follow the Personal Health Information Protection Act (PHIPA) Section 44 and provide a description of why this research cannot be accomplished without the use of personal health information. If express consent is not planned to be collected from individuals’ whose data will be disclosed please explain why. If requesting specific data from Compass please include a table of each data element and applicable filters (e.g., date, program, age). Ensure you’ve described any data linkages and the rationale for such linkages.*

**The proposed analyses would occur on a retrospective dataset that links program history (containing current and historical client-level administrative features), client contacts (containing direct and indirect service hours and other client and agency-related features) and interRAI screener+ and ChYMH assessment data (containing client-level historic and current mental health acuity features).The records extracted will be filtered to include all case records that were discharged between January 1, 2019 and April 31, 2024 and contain at least one intake assessment.**

**Names, addresses, birthdates, postal codes, clinical notes and any other potentially identifying features will be removed via an automated script at the time of data extraction (after downloading from EMHware). Client IDs will be deidentified using an encrypted hashing system.**

**Features will be aggregated weekly for each unique client.** A finalized feature list is not available at this stage as feature selection will be a step in the modeling process. During this phase, features will be iteratively identified and validated based on those that are most predictive and relevant to the research objectives, ensuring the model is both accurate and interpretable. However, some features we propose to evaluate and include:



1. **Expected Benefits of the Research for Compass, Staff, Children/Youth and Families, and Public**

As child and youth mental health (CYMH) providers face increased demand for service, the ability to anticipate and optimize staff caseloads is critical to maintaining provider well-being and delivering equitable, high-quality care. Yet so far, there are a lack of efficient and reliable tools to support this decision making in a way that is cost-effective, fair and accounts for individual client need. Manual review of client records, necessary to fairly and efficiently allocate new clients and monitor current workload is untenable in the face of the same workforce shortages. With this gap in mind, we propose to explore the feasibility of predicting the work associated with a given case (caseweight) at different points in the client timeline. The proposed work will to evaluate whether such predictions could provide added value to clinical practice. the utility of leveraging machine learning algorithms trained on electronic mental health records (EHR) to estimate the number of hours per week that individual clients contribute to a provider’s work.

1. **Risks, Burdens, and/or Potential Harm Associated with Participating in the Research for Compass, Staff, and Children/Youth and Families**

The proposed research investigates the feasibility of leveraging electronic health records (EHRs) and machine learning to address a critical challenge in child and youth mental health (CYMH) services: rising demand combined with significant workforce shortages. By exploring the use of EHRs to predict case-related workload (caseweight), Compass will contribute to a novel study—the first of its kind in the community-based CYMH domain. If successful, the research could lay the groundwork for a practical, automated tool to support clinical decision-making, offering data-driven insights to improve the efficiency and fairness of caseload management. Furthermore, it directly addresses calls from the Auditor General and Children’s Mental Health Ontario (CMHO) to develop reasonable workload guidelines that reduce wait lists, minimize staff turnover, and enhance accessibility and quality of care for children and their families. On a broader scale, the work will also advance the growing field of applied machine learning in healthcare by expanding its application to community-based mental health, with data-driven solutions meant to strengthen public health systems and improve care delivery.

1. **Risk/Harm Mitigation Strategies / Plans**

*Include a description of mechanisms to safeguard research participants from harm, abuse, exploitation, and discrimination.*

The study will utilize a retrospective, deidentified dataset in accordance with best practices for sensitive PHIPA data, ensuring that no identifiable information about cases will be accessible. Additionally, all analyses will be conducted on a secure, password-protected computer managed by Compass, with only aggregated results reported after approval. To further safeguard against harm and promote trust, we have planned our research to align with the principles of Explainable AI (XAI), which emphasizes transparency, interpretability, accountability, and ethical decision-making in machine learning models. Techniques such as SHAP (SHapley Additive exPlanations) are proposed to explain the contribution of each feature to model predictions, so that the decision-making process is understandable to clinicians and stakeholders. By prioritizing transparency and ethical safeguards, we ensure that the model serves as a decision-support tool meant to assist clinicians, rather than replace their judgment. These measures collectively aim to uphold high ethical standards, protecting participants from harm, abuse, or exploitation while promoting trust and fairness in research outcomes.

1. **Data Governance and Community Engagement Plan**

*For research specifically involving Indigenous peoples a description of how the research will adhere to Chapter 9: Research Involving the First Nations, Inuit and Métis Peoples of Canada of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. For research specifically involving individuals of particular racial, ethnic, disability, religious, gender identity, or sexual orientation groups a description of the research’s community engagement and data governance plans (e.g.,* [*OCAP*](https://fnigc.ca/ocap-training/)*,* [*EGAP*](https://blackhealthequity.ca/)*).*

To minimize perpetuating marginalization, the proposed reseach will not include race-based variables. While race and gender may correlate with resource use, the correlations are often confounded by systemic marginalization factors that increase the risk for mental health concerns. In such a case, it is not the client driving need but the unfair structures that they find themselves in. For this reason, cultural and race-based variables will be omitted at the data-deidentification stage.

1. **Data Security and Privacy**

*Describe how you will ensure the security and privacy of research materials and data. Include references to, and copies of, any third party assessments or assurances with respect to information security and privacy practices, where such are available. For research involving children, youth, and/or families provide evidence that any individuals who will be involved in data collection or will have access to the data have/will pass a vulnerable sector check.*

Given the sensitivity of mental health data, ensuring data privacy and security by obtaining the necessary ethical approvals and maintaining transparency throughout the research process, will be strictly enforced. The necessary approvals from relevant ethics boards will be obtained. An exemption must be granted by both the agency (Compass) and Laurentian’s institutional review board for the use of de-identified data. De-identified clinical data will be acquired from an electronic health information system belonging to Compass. The EHR database is maintained by the institution. Data will be de-identified at extraction using the Health Insurance Portability and Accountability Act Safe Harbor Method ([OCR, 2012](file:///C:\Users\SHeron\Documents\R_Projects\Prospectus\docs\index.html#ref-rightsocr2012)). This means that names, addresses, birthdates, postal codes and any other directly identifying information will be stripped from the dataset before any analysis begins. As an added precaution, unique client identification codes will be encrypted with a hashing system that makes it near impossible to reverse engineer the code to obtain original IDs. Furthermore, the data will not leave the custody of Compass and will only be analyzed by the principal researcher within a password-protected machine belonging to Compass. The reporting of model results, summary statistics and other visualizations will only include metrics associated with the performance of predictors and the models themselves, never individual scores or any other identifying information that could be linked to clients or smaller subgroups of clients. Furthermore, the researchers will seek approval from Compass before results are shared or utilized in any report or presentation

1. **Resources Required from Compass**

*Describe all financial, time, or human resource requirements or expectations of Compass, Compass staff, and/or Compass clients. You are encourage to include a budget, if applicable.*

**TBD**

1. **Knowledge Dissemination Plan**

*Include how Compass may use the research findings, and the levels at which results will be reported (e.g., individual level, institutional, regional/geographic).*

**Unless otherwise approved and requested, findings and results will be reported internally to my thesis committee and advisors and to fellow psychology masters students during my thesis defense. Any plans to expand further than these institutions will warrant first approval from Compass.**

## SECTION C - INVESTIGATOR Signatures

*The signing parties certify that the information reported in this form and the appended documents is accurate.*

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|  |  | Shauna Heron |  | November 15, 2024 |
| Signature |  | Print Name |  | Date |

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|  |  |  |  | Click or tap to enter a date. |
| Signature |  | Print Name |  | Date |

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|  |  |  |  | Click or tap to enter a date. |
| Signature |  | Print Name |  | Date |

*If the request is approved your team will subsequently be required to also sign non-disclosure/confidentiality agreements prior to accessing participants or the data.*

## Section d - COMPASS review

**Manager of System Performance Review**

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| Date Complete Proposal Received: | | Click or tap to enter a date. | | | | |
|  | The credentials and competencies of the primary investigator to competently design and perform the research have been checked and reviewed. | | | | | |
|  | | |  |  |  | Click or tap to enter a date. | |
| Signature of Manager of System Performance | | |  | Print Name |  | Date | |

**Senior Leadership Review**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Date Proposal Reviewed: | Click or tap to enter a date. | | | | | |
| Decision: |  | Proceed with research | | | | |
|  |  | Do not proceed | | | | |
| Rationale | | | | | | |
|  | | | | | | |
|  | | |  |  |  | Click or tap to enter a date. | |
| Signature of the Executive Director | | |  | Print Name |  | Date | |