

## New Field Proposal – Summary of Program Changes

1. Program: Graduate Program in Health
2. Degree Designation: MA and PhD
3. Type of Modification: New Graduate Field Proposal
4. Effective Date: Fall 2022

5. Summary of proposed changes (the attached New Field Proposal describes all of the following in detail).

| Topics  | Answers  |
|---|--|
| a) Description of the proposed modifications  | Modifications are proposed in the context of launching a new Field in the Graduate Program in Health   |
| b) Rationale for the proposed changes   | Proposed new field was always planned for the Graduate Program in Health. We now have the faculty resources to offer a program of study in this high demand area |
| c) Updated mapping of the program requirements to the program learning outcomes   | See Appendix A5  |
| d) Consultations undertaken with relevant academic units, and external support.   | See section 9 of the proposal for consultation details. See support statements from other units (Appendix C) and external organizations (Appendix D)             |
| e) Resource implications and how they are being addressed (e.g., through a reallocation of existing resources), including a statement from the relevant Dean(s)/Principal confirming resources will be in place to implement the changes. | No new resources are being requested.<br><br>For Dean's support letter, see Appendix B   |
| f) How students currently enrolled in the program will be accommodated.   | Students currently enrolled in the program will not be affected  |
| g) Calendar Copy (side-by-side comparison of the existing and proposed program requirements as they will appear in the Graduate Calendar).  | See Appendix A6 for side-by-side Calendar Copy   |

# Graduate Field Proposal

## Graduate Program in Health

(using QUQAP [template](#))

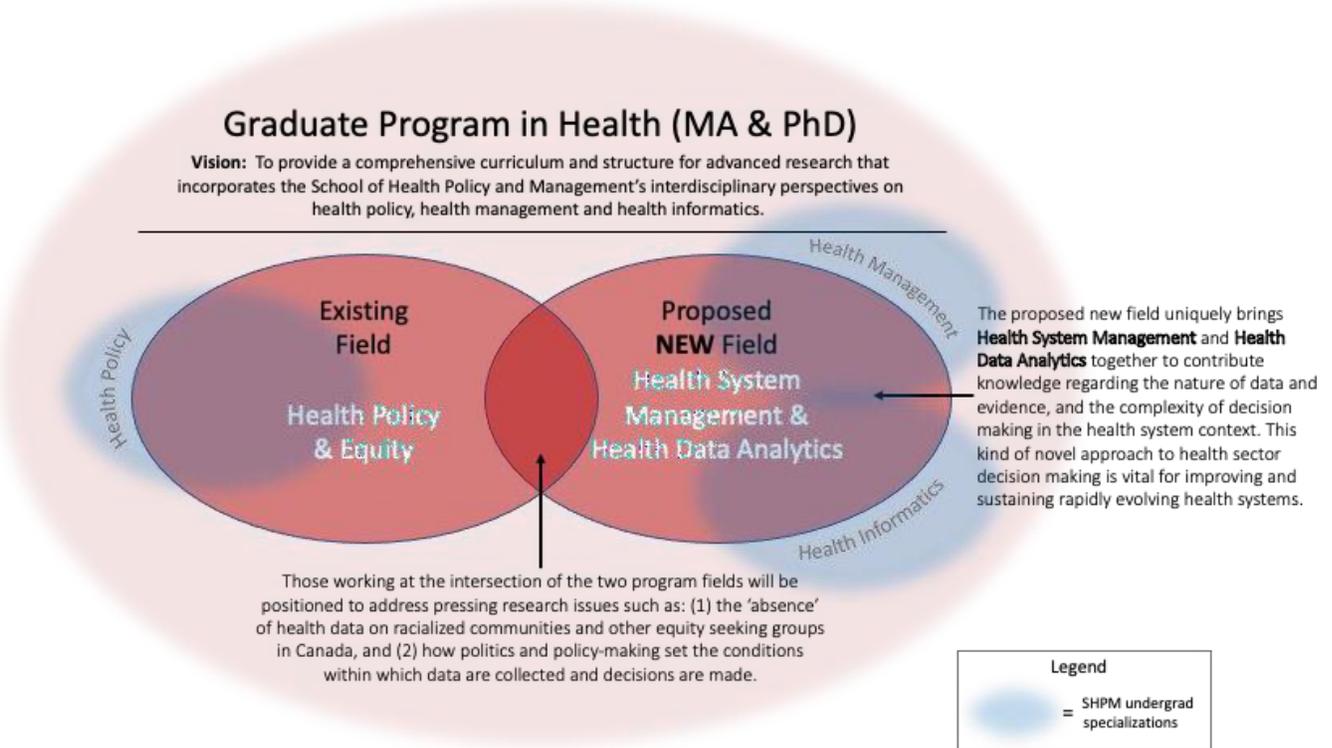
### Definition of a Field

In graduate programs, field refers to an area of specialization or concentration (in multi/interdisciplinary programs a clustered area of specialization) that is related to the demonstrable and collective strengths of the program's faculty. Institutions are not required to declare fields at either the master's or doctoral level. Institutions may wish, through an expedited approval process, to seek the endorsement of the Quality Council.

## Graduate Field Proposal

### 1. Indicate the name of the field being proposed and identify the parent program.

The new field being proposed is in “Health System Management and Health Data Analytics”. The Parent program is the Graduate Program in Health – a program envisioned in 2008 in keeping with York’s strong tradition of interdisciplinary programs. The graphic below shows the relationship between the existing field and the proposed new field is shown in red. Further details of how the new field is situated within the Graduate Program in Health are provided below (see page 3).



### 2. Provide a description of the field (its intellectual focus, etc.) including the appropriateness and consistency of the field name with current usage in the discipline or area of study.

The new field brings together two areas of intellectual focus that correspond to specializations within our school – health management and health informatics (as shown in blue in the graphic above).

These two areas are come together in a way that centers around on the use of health data analytics to support health system management decision making. Simply put, the justification for the new field has to do with the fact that data, alone, are insufficient to change practice – indeed, other fields have also emerged in response to this problem.<sup>1,2</sup> The behavioural decision literature provides further justification for the proposed new field. For example, given the sophistication of data analytic techniques and the increasingly wide availability of health data, one might expect that, as Simon (1978) predicted, we would by now have reached the point where the classic rational model would provide an increasingly accurate description of how health system decisions are made. Yet this is not the case. Instead, health system decision-making remains resistant to “rational” approaches in recognition of the role of ‘judgment’, power and ‘politics’ in determining decisions.<sup>3</sup> At an individual level / on the clinical side, variability in patient preferences highlights the role of ‘judgement’ in healthcare decision making.

**Areas of Focus in the new Field.** The WHO defines a *health system* as all activities whose primary purpose is to promote, restore or maintain health.<sup>4</sup> This includes not only the delivery of formal health services, but also public health activities such as health promotion, disease prevention, and other health interventions. *Health system management* and health management education focus on decisions pertaining to how a country's health system is organized, managed, and delivered.<sup>5</sup> *Data Analytics* refers to integration of heterogenous sources of data, drawing inferences to enable various types of decision-making.<sup>6</sup> The need to bring health system management and health data analytics together in the proposed new field is highlighted by the fact that health systems are dynamic, complex, open systems that interact with the political and social environments external to those system. As such, managerial decision making in this context is complex. The proposed new field seeks to contribute knowledge regarding both the technological *and* the socio-political aspects of how health system decisions are made and how system change occurs (or why it sometimes fails to occur). The field name, *Health System Management & Health Data Analytics*, faithfully reflects the proposed field of study, bringing the concept of analytics into the healthcare decision-making context.

From a scholarly perspective the proposed Field draws on a constellation of disciplines (including aspects of organizational behaviour and theory and organizational psychology that address micro and macro-level decision making, as well as informatics, information management and decision science, and implementation science) that come together in service to improving decision making and knowledge mobilization in the health sector.

The fields of Health Management and Health Informatics/Analytics are truly interdisciplinary in nature – something that is evident from the diverse backgrounds of our faculty members. For example, faculty with expertise in healthcare organization and management or health informatics completed most of their theoretical training in root disciplines of organizational theory and computer science, respectively. By bringing organizational decision making and informatics together in the health sector context, the proposed field promises to offer an innovative, cross-cutting program that approaches the field in a comprehensive way – incorporating the analytical, but also the social, political, economic and organizational aspects of decision making. The core faculty in the School of Health Policy & Management are unique in the training and expertise they possess and are exceedingly well positioned to

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<sup>1</sup> Madon T, Hofman KJ, Kupfer L, Glass RI. Implementation science. *Science*. 2007. 1728–9.

<sup>2</sup> Straus SE, Tetroe J, Graham I. Defining knowledge translation. *CMAJ*. 2009;165–8.

<sup>3</sup> Langley A, Mintzberg H, Pitcher P, Posada E, Saint-Macary J. Opening up Decision Making: The View from the Black Stool. *Organ Sci*. 1995; 6:260–79.

<sup>4</sup> WHO. The world health report 2000 - Health systems: improving performance. <https://www.who.int/whr/2000/en/>

<sup>5</sup> Weil TP. Health management education in Europe and in the United States: A comparative review and analysis. *Heal Serv Manag Res*. 2013; 26:76–85.

<sup>6</sup> Runkler TA. *Data analytics: Models and algorithms for intelligent data analysis*, 2nd edition. Springer: Wiesbaden, Germany. 2016

deliver training in the proposed area (see section 6). In addition, faculty from across the university complement the School's existing strengths.

**Recent Developments in the Field.** The past two decades has seen a dramatic increase in the health sector's sophistication in the use of financial, clinical and health information in order to function more effectively and help with strategic planning and decision making at the organization and system levels. Increased emphasis on accountability, performance measurement, and evidence-based decision making has led to increased demand for and reliance on various information sources. Rapidly changing technologies and interest in more integrated approaches to the delivery of care and services have also created a need for enterprise-wide programs dealing in data, information, and knowledge management/utilization and decision making.

By bringing together perspectives and individuals with an interest in health organization and management and health informatics and analytics, this field seeks to enhance the capabilities of both groups. The field of health informatics and analytics includes individuals with unique expertise in healthcare data and information management, including patient information collected in the medical record/patient care database and management data collected and housed in administrative data systems such as the Management Information Systems (Ontario Hospital Reporting System) financial data. In view of their overall responsibility for collection, management, analysis and dissemination of patient and management information, it is imperative that these individuals master the knowledge and competencies needed to respond to rapidly advancing and increasingly sophisticated healthcare industry information needs. However, it is increasingly imperative that health informatics and analytics specialists possess a clear understanding and appreciation of the context within which information is used (or more often, not used), including facilitating and limiting factors, judgement, biases, and "noise" – all of which are inherent in human decision processes.

Similarly, managers in the healthcare system are increasingly expected to incorporate the kind of health information described above, as well as various other sources of research evidence into their decision-making process. Accordingly, the landscape, skills and focus health system managers need to navigate is changing. Evidence of this change can be seen in recent initiatives in research and knowledge translation geared toward training senior-level health system managers in evidence-based decision-making (e.g. The Canadian Foundation for Healthcare Improvement's EXTRA (Executive Training for Research Application) Program which trains a small number of senior health care executives each year). By merging the disciplines of health informatics and health management decision making, the proposed field will be ideally positioned to respond to human resources needs in this area by producing graduates with the ability to understand and handle the wealth of information available within the applied context of optimizing decisions and performance outcomes within the health system. All of this will be accomplished in a program that acknowledges and addresses the social, psychological, political and change management aspects of decision making.

**Situating the proposed new field within the Graduate Program in Health.** Students enrolled in the proposed new field will also have opportunities for intra-program learning with the Health Policy and Equity field. The intentional intersecting of the two fields by having students take the same foundational courses (section 4) means students will not only think about the field of health system management & health data analytics, but will also be exposed to some of the most pressing health, and health policy and equity questions facing our health sector, such as what inequities affect access to health and health care services, or how do politics and policy-making set the conditions promote or hinder health equity. This exposure will enable students to raise cutting-edge questions and will lead to new thinking about how to design, collect, manage and analyse data to ensure that programs and services enable equitable access and better, more equitable, health outcomes. Our students will be well-positioned to take these insights forward to help inform the design, collection, and interpretation of patient and management data in ways that examine equity considerations as we pursue improvement of

health systems. As an example, those working at the intersection of the proposed new field in Health System Management & Health Data Analytics and the existing field of Health Policy & Equity will be ideally positioned to address timely research and practical questions pertaining to things such as the ‘absence’ of health data on racialized communities and other equity seeking groups in Canada.

The field of Health System Management & Health Data Analytics is intended for new graduates from a range of disciplines including health studies, social sciences, admin studies, organizational psychology, engineering, information technology, in addition to healthcare practitioners and professionals in clinical and managerial roles interested in pursuing rigorous applied research training at the graduate level. In all these cases, individuals will have a strong interest in the application and use of knowledge and information in the context of health system management. Due to the increasing connection between health system management and health sciences and technology, the program’s unique and innovative focus, and the reputation of the faculty, this field will attract international scholars, researchers and students.

From the strategic perspective of the university, the field directly addresses the growing need for digital fluency, information literacy and knowledge for the future and the new field will meet an increasingly pressing need for graduates with academic training and skills in health management and health data analysis who can exploit the wealth of data and evidence increasingly available in the health field to help optimize decision making and improve performance outcomes across the health system. **Data analytics and data science produces graduates with valuable, highly technical, skills capable of querying health data while management and health management programs impart valuable knowledge required to operate health care organizations and health systems. The proposed field uniquely brings these two areas together to contribute to knowledge and expertise regarding both the nature of data and evidence, and the complexity of decision making in the health context. This kind of novel approach to health sector decision making is vital for improving and sustaining rapidly evolving health systems.**

**3. Comment on the relationship of the admission requirements for the field to those of the parent program. If the same, describe the program admission requirements. If different, describe the field admission requirements, indicate how they are different from those of the parent program, and provide a rationale for the difference in relation to the focus and learning outcomes of the field.**

Program Admission requirements will be the same across both fields of the parent program (Program Learning Outcomes are included in Appendix A5). For both the MA and the PhD Programs, applicants must:

- have completed an honours undergraduate degree with B+ average or equivalent in the last two years of study (MA applicants) / completed a Master’s degree with B+ average or equivalent (*PhD applicants*). Prior degree must be in a field related to health policy, health management or health informatics. Related disciplines might include psychology, political science, sociology, management, or nursing.
- Provide a statement of interest demonstrating commitment to advanced research in the field. The statement should include a discussion of the applicant’s background, interests, skills and career goals, along with a proposed field of study and research interests.
- Demonstrate ability in writing and research by submitting a recent research paper or report that the applicant has written for a course or in an employment context.
- Provide three letters of reference, at least one from university faculty and preferably two. Equivalencies (letters from non-university professional colleagues) will be considered for applicants who have been out of school for more than 5 years.

**4. Comment on the relationship of the curricular requirements for the field to those of the parent program. If the same, describe the program requirements. If different, describe the field requirements, indicate how they are different from those of the parent program, and provide a rationale for the difference in relation to the focus and learning outcomes of the field.**

Both fields share the same curricular requirement structure (foundational, field-specific, and elective courses, MRP (MA students), two Comprehensive Exam Papers and Dissertation (PhD students). Both fields are designed to be interdisciplinary, incorporating the perspectives of health policy, health system management and decision making, knowledge transfer, and health equity, providing students with a strong and broad theoretical foundation. Students in both fields of the Graduate Program in Health obtain this *breadth* of knowledge through Foundational courses that are common to all students in the Graduate Program in Health (see figures 1&2 on the next page, top box). Students in the proposed new field in Health System Management and Health Data Analytics will obtain *depth* of knowledge in this area through their field-specific course requirements (see figures 1&2) and electives, and through the MRP (MA students), and comprehensive exams and Dissertation (doctoral students). Note that while doctoral students in the existing field (Health Policy & Equity) are not required to take a statistics course, doctoral students in the Health System Management and Health Data Analytics field will be required to take a graduate level statistics course as one of their electives if they have not previously completed one. Detailed curricular requirements for MA and PhD students are shown in the flow charts in Figures 1 and 2, respectively (next page). For a description of the **Program Learning Outcomes** and how curricular requirements support their achievement see Appendix A5. Old and New **Calendar Copy** is included in Appendix A6.

**5. Provide a list of courses that will be offered in support of the field. The list of courses must indicate the unit responsible for offering the course (including cross-lists and integrations, as appropriate), the course number, the credit value, the short course description, and whether or not it is an existing or new course. For existing courses, the frequency of offering should be noted. For new courses, full course proposals are required and should be included in the proposal as an appendix. (The list of courses may be organized to reflect the manner in which the courses count towards the program/field requirements, as appropriate; e.g. required versus optional; required from a list of specified courses; specific to certain concentrations, streams or fields within the program, etc.)**

A list of courses that will be offered in support of the proposed new field is provided in Appendix A1. These are organized by the manner in which they count towards program requirements for students in the new field. Offering unit, new/existing status and frequency of offering is indicated for each course in Appendix A1. As noted, courses which are listed as “Foundational” as well as the “Elective” courses service both the existing field (Health Policy & Equity) AND the proposed new field (Health System Management and Health Data Analytics). As such, many are already routinely offered. In addition, students in one field can take a field-specific course from the other field as an elective. Accordingly, only a small number of new courses will need to be consistently offered to meet the needs of students in the new field of Health System Management and Health Data Analytics. Two new course proposals for students in the proposed new Field are included in Appendix A2 (Health Data Visualization) and Appendix A3 (Machine Learning for Health). As an interdisciplinary field designed to address challenges at the intersection of *health system management* and *health data analytics*, course requirements expose students to a variety of content areas, both technical and social science oriented, as well as methodological approaches common to these areas (both quantitative and qualitative).

Figure 1. MA in Health - Program Progression & Requirements

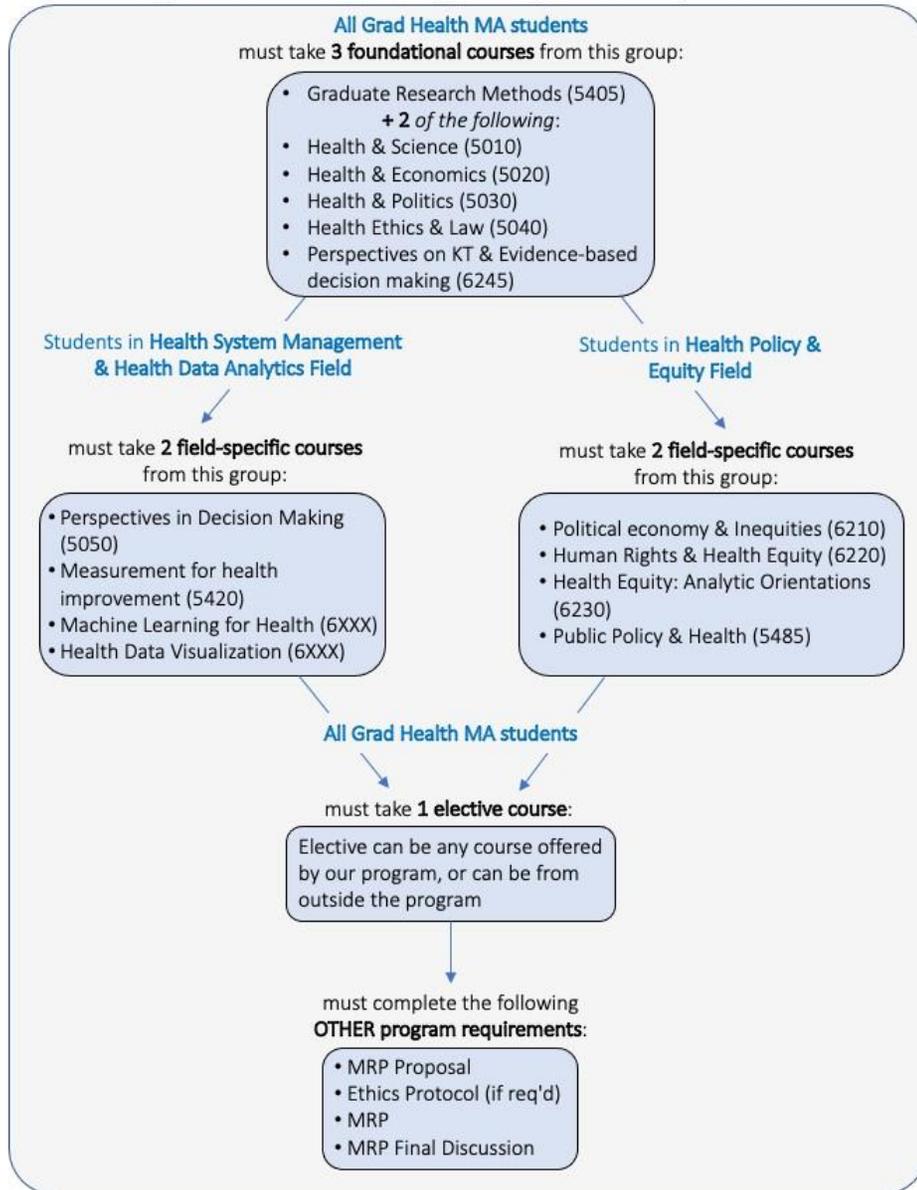
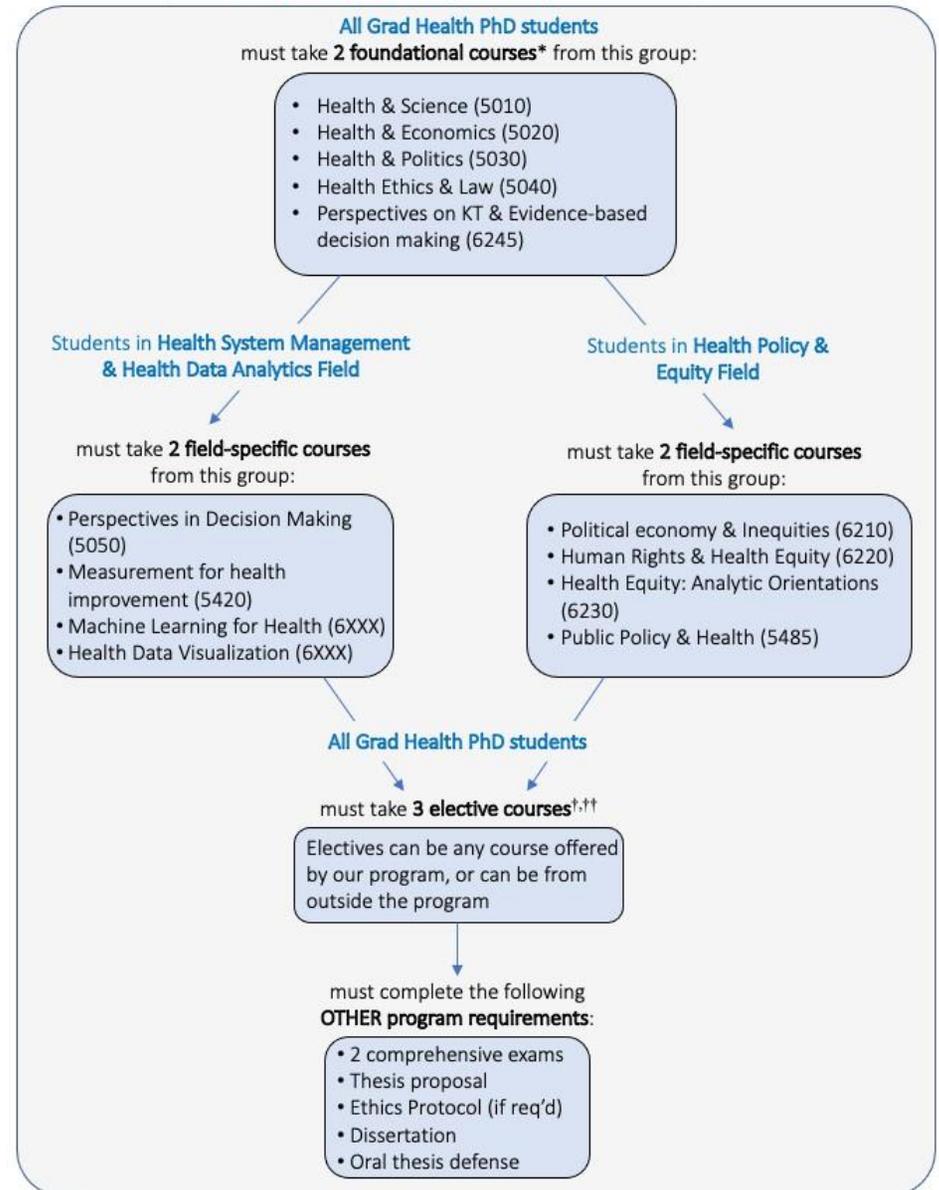


Figure 2. PhD in Health - Program Progression & Requirements



\* PhD students who have not previously taken a graduate level methodology course, must take HLTH 5405 3.0 in addition to the 2 foundational courses for a total of 3 foundational courses.

† PhD students in the HM&HDA field without a graduate level statistics course must take one as one of their electives (KINE and PSYCH have indicated they could likely accommodate our annual intake of 1-2 PhD HLTH students in one of their graduate statistics courses – see Appendix C5)

†† With the GPD's approval, students may take up to two 3.0 courses from other graduate programs at York University to fulfill their elective requirements.

**6. Comment on the expertise of the faculty who will actively support/participate the field and provide a Table of Faculty by field, as follows:**

Table 2a lists ten faculty members whose primary appointment is in the School of Health Policy & Management (plus two cross-appointed faculty), all of whom have expertise in either Health Management or Health Data Analytics (the area of the proposed new field). Our program’s capacity to provide adequate participation, support and supervision in the area of the proposed new field has increased by 25% in the last two years with the hiring of 3 new faculty members (Appel, Granek, van Dreumel). All 12 faculty members listed in table 2a have expressed interest in being actively involved with supervision and/or teaching and several have expressed interest in serving on the Graduate Program’s Executive Committee. Together, these faculty members have a broad range of expertise that spans all aspects of health management and health data analytics. Up-to-date CVs of faculty in Table 2a – those who will actively participate in delivering the graduate program – are included as Appendix E.

In addition, there are approximately 10 other faculty members with expertise in Health Policy, Equity, or Critical Disability studies, who can sometimes play supportive roles as MRP and dissertation committee members. Because of the unique interdisciplinary nature of our School and our underlying concern with equity, these ten individuals can provide an important source of ancillary expertise to the new field (See table 2b).

Finally, there are several faculty members from other units at York who, from time to time, will act as MRP or dissertation committee members and may occasionally teach in the program. These are individuals with primary appointments to other graduate programs but whose expertise overlaps with the health management and health data analytics (see table 2b).

**Table 2a – Faculty in Health System Management and Health Data Analytics Field  
Primary Field: Health System Management and Health Data Analytics**

| <b>Faculty Member &amp; Rank</b>               | <b>Home Unit</b>           | <b>Expertise</b>  | <b>Supervisory Privileges †</b> |
|--|----------------------------|---|---------------------------------|
| Farah Ahmad<br>Associate Professor             | Health Policy & Management | Primary care settings; vulnerable communities; eHealth innovations  | Full                            |
| Lora Appel<br>Assistant Professor              | Health Policy & Management | Virtual reality; Aging and dementia   | Associate                       |
| Tamara Daly<br>Professor                       | Health Policy & Management | Paid and unpaid care; gender and health; health care working conditions; health equity for older adults and those who provide care; comparative long-term care policy; health policy and equity | Full                            |
| Serban Dinca-Panaitescu<br>Associate Professor | Health Policy & Management | Medical equipment; health information systems; e-health   | Full                            |
| Christo El Morr<br>Associate Professor         | Health Policy & Management | Community-based research; health virtual communities; mobile communities; e-collaboration; chronic disease management   | Full                            |
| Liane Ginsburg<br>Professor                    | Health Policy & Management | Healthcare organization and management; patient safety culture; nursing home quality; knowledge translation, implementation science   | Full                            |

| <b>Faculty Member &amp; Rank</b>         | <b>Home Unit</b>                                    | <b>Expertise</b>   | <b>Supervisory Privileges †</b> |
|--|---|--|---------------------------------|
| Leeat Granek<br>Associate Professor      | Health Policy & Management                          | Psycho-oncology; Provider health and well-being; decision making; Psychological and social determinants of health; Qualitative methods | Full                            |
| Lillie Lum<br>Professor                  | Nursing / Health Policy & Management                | Health Human Resource Management; Promoting equitable access and participation in the health system                                    | Full                            |
| Ellen Schraa<br>Associate Professor      | Health Policy & Management                          | Financial measurement of health care organizations for funding reform and performance evaluation                                       | Full                            |
| Peter Tsisis<br>Associate Professor      | Administrative Studies / Health Policy & Management | Interface between interorganizational collaboration and patient outcomes   | Full                            |
| Lynda van Dreumel<br>Assistant Professor | Health Policy & Management                          | Health Professional Regulatory models; Healthcare leadership   | Associate                       |
| Hannah Wong<br>Associate Professor       | Health Policy & Management                          | Statistical regression and system dynamics modeling; elderly population health; diagnostic tools and therapies; systems problems       | Full                            |

† Consistent with the Graduate Program in Health Approved Appointment Criteria, Associate members may act as the principal supervisor of master's theses and as a co-supervisor of doctoral dissertations; for faculty whose primary FGS appointment is in the Graduate Program in Health, Full membership comes with tenure and promotion to Associate Professor)

**Table 2b – Faculty in Other Fields**  
**Primary Field: Health Policy & Equity / Critical Disability Studies**

| <b>Faculty Member &amp; Rank</b>                 | <b>Home Unit</b>                 | <b>Primary Field / Expertise</b>   | <b>Supervisory Privileges</b> |
|--|----------------------------------|--|-------------------------------|
| Rachel da Silveira Gorman<br>Associate Professor | Health Policy & Management / CDS | Anti-racist Disability Theory  | Associate                     |
| Nancy viva Davis Halifax,<br>Associate Professor | Health Policy & Management / CDS | Arts-based Research and Creation   | Associate                     |
| Geoffrey Reaume<br>Associate Professor           | Health Policy & Management / CDS | Mad People's History   | Associate                     |
| Jessica Vorstermans<br>Assistant Professor       | Health Policy & Management / CDS | Disability and Equity; Human Rights  | Associate                     |
| Claudia Chauhan<br>Associate Professor           | Health Policy & Management       | Political Economy of Global Health / Antiimperialist & Anticolonial theory | Full                          |
| Sean Hillier<br>Assistant Professor              | Health Policy & Management       | Indigenous Health  | Associate                     |
| Marina Morrow<br>Professor                       | Health Policy & Management       | Critical Health Policy; Mental Health and Social Inequity                  | Full                          |
| Dennis Raphael<br>Professor                      | Health Policy & Management       | Social Determinants of Health  | Full                          |
| Amrita Daftary<br>Assistant Professor            | Global Health                    | Health Services research & evaluation                                      | Associate                     |
| James Orbinski<br>Professor                      | Global Health                    | Clinical Public Health; Health Emergencies                                 | Full                          |
| Adrian Viens<br>Associate Professor              | Global Health                    | Ethics; Legal Theory and Public Policy                                     | Full                          |
| Mary Wiktorowicz<br>Professor                    | Global Health                    | Transnational and National Governance Models Developing Health Policies    | Full                          |

**Faculty with Primary Appointment in Another Program**

| <b>Faculty Member &amp; Rank</b>             | <b>Home Unit</b>                        | <b>Expertise</b>   | <b>Supervisory Privileges †</b> |
|--|---|--|---------------------------------|
| You-Ta Chuang<br>Professor                   | School of Administrative Studies (LAPS) | Knowledge transfer within organizations; performance feedback on firm behavior; social movement activities in orgs | Associate                       |
| Kelly Thompson<br>Associate Professor        | School of Administrative Studies (LAPS) | Organizing and Change; Diversity, Equality and Inclusion; Management   | Associate                       |
| Mary Fox<br>Associate Professor              | School of Nursing                       | Interprofessional interventions to improve outcomes; Qualitative and quantitative analysis; systematic reviews     | Associate                       |
| Luiz Marcio Cysneiros<br>Associate Professor | School of Information Technology (LAPS) | Requirements Engineering in the Health Care Domain; Business Modeling  | Associate                       |
| Manar Jammal<br>Assistant Professor          | School of Information Technology (LAPS) | Machine Learning, Networking, Optimization, Cloud Computing  | Associate                       |
| Enamul Hoque Prince<br>Assistant Professor   | School of Information Technology (LAPS) | Data visualization; Natural language processing  | Associate                       |

| Faculty Member & Rank  | Home Unit                              | Expertise   | Supervisory Privileges † |
|--|--|---|--------------------------|
| Amin Mawani<br>Associate Professor   | Schulich School of Business            | Economic analysis; cost-benefit analysis of illness prevention programs | Associate                |
| Joseph Mapa<br>Adjunct Professor & Executive Director (Health Industry Management MBA) | Schulich School of Business            | Leadership and Strategic Management                                     | Associate                |
| Kevin Tasa<br>Associate Professor  | Schulich School of Business            | Negotiation and decision making; team dynamics                          | Associate                |
| Jianhong Wu<br>Professor   | Department of Mathematics & Statistics | Complex disease modelling   | Associate                |

**7. Comment on the projected in-take into the field, including the anticipated implementation date (i.e. year and term of initial in-take), and indicate if the projected in-take is within or in addition to the existing enrolment targets for the parent program.**

Projected in-take into the new field will be 8 MA students and 2 PhD students. These in-take numbers are within our existing enrolment targets for the Graduate Program in Health and are based on splitting our current in-take in the Graduate Program in Health (which is approximately 20 MA and PhD students annually) between the Health Policy & Equity field and the new field in Health System Management and Health Data Analytics. The anticipated implementation date for the new field is September 2022.

**8. Comment on the impact of the field on the parent program, focusing on the extent of diversion of faculty from existing graduate courses and/or supervision, as well as the capacity of the program to absorb any anticipated additional enrolment.**

By splitting the intake between the existing and the new field, the new field will (1) alleviate the disproportionate supervision burden that currently resides with a small number of SHPM faculty with expertise in the Health Policy & Equity field, and (2) provide welcome supervision and graduate teaching opportunities for faculty in the health management and health informatics areas. In terms of teaching, with only a small net increase in the number of new graduate courses offered annually (see section 5 above), the new field will not divert faculty away from existing graduate courses. Instead, it will allow for a more equitable spread of graduate and undergraduate teaching among SHPM faculty. Zero or a negligible additional enrolment above our existing Graduate Program in Health target is anticipated.

The following consultations and approvals took place within the School of Health Policy & Management: (1) the new field was agreed upon as a priority at our School’s most recent strategic planning retreat; (2) the course structure for the Graduate Program in Health (the parent program) was discussed and agreed upon by the Graduate Health Executive Committee during the Summer and September 2020 meetings; (3) between October 2020 & January 2021, the new field proposal was developed by an ad hoc sub-group of health management and health informatics faculty; (4) the proposal was sent back to the Grad Health Executive Committee for review and approval and the motion received unanimous approval by all members of the Grad Health Exec on February 25<sup>th</sup>; (5) the new field proposal was sent to our School’s Faculty Committee for discussion and approval and received unanimous approval at our March 18<sup>th</sup> meeting (20 in favour, 0 opposed, 0 abstained).

## 9. Support statements

- from the relevant Dean(s)/Principal, with respect to the adequacy of existing resources necessary to support the new field, as well as the commitment to any plans for new/additional resources necessary to implement and/or sustain the new field
- from the relevant Faculties/units/programs confirming consultation on/support for the new program, as appropriate
- from professional associations, government agencies or policy bodies with respect to the need/demand for the proposed program, as appropriate

A support **statement from the Dean** of the Faculty of Health is included in Appendix B. **In terms of consultation with other relevant units/program**, we have consulted extensively with relevant programs on campus including The School of Information Technology in LAPS (support letter attached – see Appendix C1) and the proposed new Health Industry Management Program in Schulich (support letter attached – see Appendix C2). We have also consulted with the co-Chair of the University-wide taskforce on AI who is also a member of the Lassonde School of Engineering (support letter attached – see Appendix C3). All of these consultations suggest a high degree of complementarity between our proposed new field and their graduate programs. Indeed, as indicated in each support letter, our consultations identified avenues of collaboration and resource sharing (e.g., for advising, supervisory committee membership, and possibly opportunities for students to take courses across these programs). We also consulted with the Chair of the Mathematics and Statistics Department as they are developing an undergraduate Data Science major that is anticipated to have large enrollment and would require students to choose a domain specialization. It is possible that as many as 100-200 students could choose Health as a domain specialization which could provide a pathway to our proposed new Field in Health System Management and Health Data Analytics (support letter attached – see Appendix C4).

One question identified by Schulich during our consultation pertains to naming of the proposed new field (initially proposed as Health Management and Health Data Analytics). We discussed overlap and possible confusion in the use of the term management across their new program (in Health Industry Management) and our new field, both of which are health focused. Subsequent to receiving their support letter (Appendix C2) we had further discussion and agreed this is a naming issue rather than a substantive concern regarding program overlap (our field is a regulated, research-based graduate program; Schulich’s Health Industry Management program will be a professional unregulated program with a broader focus). Following this discussion, we changed the name of the proposed new field from “Health Management and Health Data Analytics” to “Health System Management and Health Data Analytics” and feel the program names are suitably distinguished (Schulich’s new Program will likely be in Health Industry Management). Importantly, the benefits of ongoing collaboration between the two Schools are clear and we are all committed to continue working collaboratively to make clear differences in our respective programs/fields and different pathways available to prospective students. Note that our letters of support were solicited in prior to the field name change and they therefore refer to the original program name, Health Management and Health Data Analytics.

Lastly, we include support letters from eight key organizations, associations, and individuals relevant to the proposed new field. Appendices D1-D8 includes letters of support from Choosing Wisely Canada, University Health Network's Open Lab, Alliance for Healthier Communities and other organizations operating in primary care environment, acute and complex continuing care hospital leadership, and from the past president of the College of Family Physicians and the Canadian Medical Association (S. Buchman), and from a Canada Research Chair in knowledge translation (C. Estabrooks). These letters from key stakeholders across the continuum of care all endorse the proposed new field and attest to the need/demand for the proposed program to help improve data use and decision making at the individual, group, organization, and health system levels.

## Appendices

### **Appendix A – Course Related Materials**

- A1 – Course List
- A2 – New Course Proposal – Health Data Visualization
- A3 – New Course Proposal – Machine Learning for Health
- A4 – Library Statements
- A5 – Program Learning Outcomes
- A6 – Old and New Calendar Copy

### **Appendix B – Dean's support statement**

### **Appendix C – Support Statements from other units / programs**

- C1 – Support Statements from The School of Information Technology (LAPS)
- C2 – Support Statements from The Health Industry Management Program (Schulich)
- C3 – Support Statements from The University-wide taskforce on AI
- C4 – Support Statements from The Mathematics and Statistics Department (Science)
- C5 – Support Statements from KINE and PSYCH GPDs re Statistics Courses (FoH)

### **Appendix D – Support Statements from Health Organizations**

- D1 – Industry Support Statement: Choosing Wisely Canada,
- D2 – Industry Support Statement: University Health Network's Open Lab
- D3 – Industry Support Statement: Alliance for Healthier Communities
- D4 – Industry Support Statement: Ontario Health Team
- D5 – Industry Support Statement: Past president Canadian Medical Association and College of Family Physicians of Canada
- D6 – Industry Support Statement: North York General Hospital
- D7 – Industry Support Statement: Toronto Grace Health Centre
- D8 – Industry Support Statement: CRC in Knowledge Translation

### **Appendix E – CVs (Twelve faculty in table 2a who will actively deliver the new field)**

## Appendix A1: Courses and Descriptions

### FOUNDATIONAL COURSES

MA and PhD students must take three and two courses from among this group of foundational courses, respectively. MA students must take HLTH 5405 as one of their Foundational courses.

#### HLTH 5405 3.0 Research Methods Seminar

| Offering Unit: | New or Existing Course: | Frequency of offering: |
|----------------|-------------------------|------------------------|
| SHPM           | Existing                | Annually               |

**Short course description:** This is an advanced course in research methodology. Particular emphasis will be placed on research design (experimental, quasi-experimental), methods, and paradigms of understanding that incorporates the philosophical orientations of positivism, constructivism and critical social science. The implications of such understandings for carrying out and assessing research in the social sciences including public policy, management and informatics will be examined and the appropriate methods for each paradigm presented and applied.

#### HLTH 5010 3.0 Health and Science

| Offering Unit: | New or Existing Course: | Frequency of offering: |
|----------------|-------------------------|------------------------|
| SHPM           | Existing                | Every 3-5 years        |

**Short course description:** Health and Science considers how science contributes to various aspects of human health. Studies in a number of areas of science, but primarily life sciences, have had huge impacts on the human condition. This course will explore the nature of certain advancements in human health and provide students with an in-depth understanding of key areas of research. The *biomedical research paradigm* will explore various advancements in our understanding of human biology including, but not limited to, studies on stem cells (what is consciousness, how should we treat neurological diseases), common molecular, cellular, physiological and behavioural mechanisms that underlie many diseases. *Health and Environment* will explore the importance of a healthy environment in determining human health (i.e. a cure for cancer isn't much good if we don't have a planet to live on). The *behavioural health research paradigm* will explore various bio-psychosocial determinants of health and the relationship between behaviour and biology.

#### HLTH 5020 3.0 Health and Economics

| Offering Unit: | New or Existing Course: | Frequency of offering: |
|----------------|-------------------------|------------------------|
| SHPM           | Existing                | Every 3-5 years        |

**Short course description:** Economic analysis deals with both inputs and outputs, or costs and consequences, in a world where resources – people, time, facilities, equipment and knowledge – are scarce. Economic analysis therefore concerns itself with choices, since our ability to produce all desired output (efficacious therapies) is constrained. These choices are made on the basis of explicit and implicit criteria. Economic analysis seeks to identify criteria that may be useful in deciding among alternative uses of scarce resources.

#### HLTH 5030 3.0 Health and Politics

| Offering Unit: | New or Existing Course: | Frequency of offering: |
|----------------|-------------------------|------------------------|
| SHPM           | Existing                | Bi-annually (approx.)  |

**Short course description:** Health and Politics considers how politics – the social relations that involve authority or power -- influence the domain of health studies. Three key areas are considered. *Paradigms of Health* examines the various ways that health issues are defined and activities related to such definitions are implemented. The *Determinants Of Population Health* consider how political decisions by governments and other policymakers shape the patterns of health and disease within a society. *The Organization and Delivery of Health Care* examines how health care systems are shaped by dominant political ideologies and the economic and social forces that influence policy decisions.

### **HLTH 5040 3.0 Health, Law and Ethics**

| <b>Offering Unit:</b> | <b>New or Existing Course:</b> | <b>Frequency of offering:</b> |
|-----------------------|--------------------------------|-------------------------------|
| SHPM                  | Existing                       | Bi-annually (approx.)         |

**Short course description:** This course explores the relationship between health, ethics and the law. It focuses on the following key areas of study: bioethical principles and approaches, selected case and statute law and health-related issues which illustrate the intersection between legal and ethical analysis. These issues have implications for both individual and public policy decision-making. All of them impact on the social, political and economic institutions which support the health care system. Ethical theory and medical practice will be scrutinized with a focus on the following key areas: foundations of healthcare ethics and practice, concepts of illness and disease, medical decision-making, resource allocation, autonomy, paternalism and justice. There has been a number of challenges to the assumption that everyone is treated the same in our current health care system. Consequently, equity-based, feminist, social constructionist and disability rights perspectives will inform the legal and ethical analyses. These perspectives reveal complex interconnections with other power systems that can have a negative influence on equitable access to health care, such as race, ethnicity, sexual orientation, class, age and disability. An interdisciplinary approach that employs these perspectives will expand our understanding of the determinants of health in ways that exclusive reliance on a biomedical perspective will not. It can also enable us to address key questions about developing and accessing responsive health care systems.

### **HLTH 6245 Perspectives on Knowledge Transfer, Evidence and Decision Making in Organizations**

| <b>Offering Unit:</b> | <b>New or Existing Course:</b> | <b>Frequency of offering:</b> |
|-----------------------|--------------------------------|-------------------------------|
| SHPM                  | Existing                       | Bi-annually (approx.)         |

**Short course description:** The study of the use of information, knowledge, and evidence in decision-making has long been an important part of organizational theory. Organizational scholars have focused on studies of decision-making for decades. In healthcare, the growing focus on the development and application of evidence-based decision making has stimulated interest in adopting similar guidelines for decision-making in managerial practice in healthcare. This course will explore perspectives on decision making in the organizational literature and the move to evidence-based Decision making in healthcare. Perspectives from other related disciplines will also be explored. This course will also explore models of knowledge transfer and exchange involving interactions between decision makers and researchers. More and better transfer of knowledge embedded in research is urgently needed to support improved performance in multiple areas of the health system. The conceptual and methodological dimensions of knowledge exchange will be discussed.

### **FIELD SPECIFIC COURSES (HEALTH MANAGEMENT AND HEALTH DATA ANALYTICS FIELD)**

*MA and PhD students must choose two courses from among this group of field-specific courses.*

### **HLTH 5050 3.0 Perspectives in Decision Making & Information Systems**

| <b>Offering Unit:</b> | <b>New or Existing Course:</b> | <b>Frequency of offering:</b> |
|-----------------------|--------------------------------|-------------------------------|
| SHPM                  | Existing                       | Bi-annually (approx.)         |

**Short course description:** Decision Making and Information Systems aims to help health professionals understand the decision-making aspects (rational and non-rational) in health care. This course reviews decision making theories and information systems used for supporting decision making in health care, the opportunities they offer and the challenges they face.

### HLTH 5420 3.0 Measuring and Improving Quality and Safety in Healthcare

|                               |  |  |
|-------------------------------|--|--|
| <b>Offering Unit:</b><br>SHPM | <b>New or Existing Course:</b><br>Existing | <b>Frequency of offering:</b><br>Bi-annually (approx.) |
|-------------------------------|--|--|

**Short course description:** This course addresses both the measurement and improvement of quality and patient safety in healthcare organizations. Students will learn the principles and processes of quality improvement (QI) and patient safety including QI theory and tools, the importance of system level factors in understanding patient safety failure, and the role that measurement, leadership, culture, and inter-professional teams play in QI and safety. The principles and practices of quality management will be critically assessed including consideration of current methods used to measure and track quality and safety, the state of empirical support for process improvement techniques, and data quality challenges that are central to the measurement of patient outcome in healthcare. Legal and regulatory issues in healthcare quality and safety will also be explored.

### HLTH 5XXX 3.0 Machine Learning for Health

|                               |                                       |  |
|-------------------------------|---------------------------------------|--|
| <b>Offering Unit:</b><br>SHPM | <b>New or Existing Course:</b><br>New | <b>Frequency of offering:</b><br>Bi-annually (approx.) |
|-------------------------------|---------------------------------------|--|

**Short course description:** This course will introduce the fundamental concepts and principles of machine learning and its application in healthcare. We will explore machine learning approaches, health cases in relation to machine learning, and best practices for designing, building, and evaluating machine learning applications in healthcare. Opportunities and challenges that machine learning present for health and society will be covered.

### HLTH 5XXX 3.0 Health Data Visualization

|                               |                                       |  |
|-------------------------------|---------------------------------------|--|
| <b>Offering Unit:</b><br>SHPM | <b>New or Existing Course:</b><br>New | <b>Frequency of offering:</b><br>Bi-annually (approx.) |
|-------------------------------|---------------------------------------|--|

**Short course description:** This course will introduce the fundamental concepts and principles of data visualization and its application in healthcare. We will explore the history of data visualization and its current uses in healthcare: from infographics informing patients and consumers, to EHR dashboards aiding providers in decision-making, to detailed epidemiology maps driving policymaking aimed at protecting population-health. Students will learn best practices for designing and evaluating health data visualizations, and learn to think critically about literacy, ethics, and the future of the field. By the end of this course, students will be able to use online tools to create powerful visuals that tell a story and inform diverse stakeholders.

## **FIELD SPECIFIC COURSES (HEALTH POLICY & EQUITY FIELD)**

*MA and PhD students must choose two courses from among this group of field-specific courses.*

### HLTH 6210 3.0 Political Economy of Health Inequities

|                               |  |  |
|-------------------------------|--|--|
| <b>Offering Unit:</b><br>SHPM | <b>New or Existing Course:</b><br>Existing | <b>Frequency of offering:</b><br>Bi-annually (approx.) |
|-------------------------------|--|--|

**Short course description:** The Political Economy of Health Inequities examines how health inequities result from public policy decisions that skew the distribution of economic and social resources among the population. These public policies are shaped by the form that the economic and political systems take in modern capitalist economies such as Canada. Canada is firmly entrenched in the “liberal” political economy camp which is associated with minimal government intervention in the operation of the marketplace. The forces that could challenge marketplace domination of societal distribution of resources are examined as a means of moving towards more equitable distribution of resources and power, thereby reducing health inequities and improving population health.

### **HLTH 6220 3.0 Human Rights and Health Equity**

| <b>Offering Unit:</b> | <b>New or Existing Course:</b> | <b>Frequency of offering:</b> |
|-----------------------|--------------------------------|-------------------------------|
| SHPM                  | Existing                       | Bi-annually (approx.)         |

**Short course description:** The intersection between human rights and disability is an area of health that is expanding as globalization progresses. The purpose of this course is to view health in a human rights context from both domestic and international perspectives. It begins with an exploratory look at the basic concepts of human rights and social justice in the global setting. It will then cover the following topics: institutional mechanisms for connecting health and human rights, health as an equity issue, globalization and health, health, human rights and law, health and disability, reproductive technology, HIV/AIDS, Gender and health equity. The course incorporates the work of High Commissioner on Human Rights in health, the UN Special Rapporteur on Health and World Health Organization and raises concerns related to both developed and developing economies. The course will survey the relationships between human rights law and health law, as well as between law and the actual practice.

### **HLTH 6230 3.0 Health Equity Analytic Orientations**

| <b>Offering Unit:</b> | <b>New or Existing Course:</b> | <b>Frequency of offering:</b> |
|-----------------------|--------------------------------|-------------------------------|
| SHPM                  | Existing                       | Bi-annually (approx.)         |

**Short course description:** Exposes students to and grounds them in a comprehensive range of analytic orientations drawn from political science including public choice, class structure, neo-institutionalism, political economy and political philosophy, to guide their approach to policy analysis as it pertains to health equity issues. Different analytic lenses used to study political behavior and public policy will be addressed and compared. These will allow students to develop rich and in-depth knowledge in public policy analysis that they can apply to studying health equity issues.

### **HLTH 5485 3.0 Public Policy and Health**

| <b>Offering Unit:</b> | <b>New or Existing Course:</b> | <b>Frequency of offering:</b> |
|-----------------------|--------------------------------|-------------------------------|
| SHPM                  | Existing                       | Bi-annually (approx.)         |

**Short course description:** Introduces students to the history and process of public policy making and ways to evaluate them with a focus on health. Course topics include the origins of public-policy making; the concept of the welfare state, its history and evolution; key concepts, modes and instruments in the process of public policy making; and constraints on public policy analysis along with critical analyses of relevant cases from the field of health.

## **ELECTIVE COURSES**

Students in the HM&HDA field without a graduate level statistics course must take one as one of their electives (at this time it would be taken outside of our School). The following elective courses are existing courses but only a small number can be offered in any given year, depending on faculty availability.

### **HLTH 5060 3.0 Qualitative Methods for the Health Sciences**

This course will strike a balance between theory and application with respect to qualitative research in the health sciences. We will examine a number of core issues surrounding qualitative research as well as four of the most common methods for analyzing qualitative data.

Opportunities for experiential learning and 'hands on' practice will be interwoven with the course material. These exercises/ demonstrations are intended to concretize, enhance, and enliven class discussions as well as teach analytic skills, synthesizing skills, group work and presentation skills.

### **HLTH 5410 3.0 Survey Design in Healthcare**

This course examines various aspects of survey design and survey data collection that are relevant in different health related environments. The course focuses on both questionnaire design and implementation issues, with a focus on achieving strong response through good design and procedures. Issues of validity

and reliability of measurement are explored to the extent that they are important in survey design and measurement. Procedures and challenges associated with actual survey implementation and data collection are explored. Timely issues and challenges arising out of the confluence of research ethics and new privacy legislation along with other issues are also explored.

### **HLTH 5415 3.0** Drugs and Decisions: Decision Making and Pharmaceutical Policy

As Canada continues to spend an increasing percent of our health care budget on prescription drugs, it becomes more and more important to understand decision making in the pharmaceutical policy arena. This course will take a political science approach to exploring the interplay between private and public interests in making decisions around topics such as the research agenda, how drugs are priced and the system for approving new drugs and monitoring the safety and effectiveness of those on the market.

### **HLTH 5425 3.0** Managing E-Health

The objective is to provide the health and industry sectors with people skilled to understand the design, selection, procurement, installation, management, maintenance, and evaluation of telemedicine and eHealth systems appropriate to present and future needs.

More specific, the course objectives are:

- a) to critically evaluate the role of current and emerging telemedicine and eHealth technology;
- b) to critically appraise relevant information and communication technologies and network technology from a system level perspective;
- c) to critically investigate the legal, regulatory, ethical and clinical aspects of telemedicine and eHealth.

### **HLTH 5430 3.0** Evaluation in Research

Evaluation differs from research in that it involves making practical decisions about real-life policies, programs, and practices. This course focuses on the theory and practice of evaluation as it applies to policy and equity studies in health. It considers both the similarities as well as differences of evaluation with research and reviews various paradigms and methodologies associated with the evaluation of policies in support of equity.

### **HLTH 5440 3.0** Globalization, Pharmaceuticals & Health Equity

Globalization in the pharmaceutical area has sparked debate about a series of issues that impact on health equity. These issues centre around two central themes: access to pharmaceuticals and ethics. The move towards a single standard for intellectual property rights world-wide has led to significant problems in accessing pharmaceuticals in developing countries due to the lack of generic products which generate price competition. At the same time, drug companies have been unwilling to undertake research into problems largely specific to developing countries because of a lack of a market for any resulting medications. The first part of the course will explore the history of intellectual property rights (IPRs) and how and why the industry and its political supporters have been successful in strengthening IPRs. The course will then look at new initiatives to stimulate R&D in neglected diseases]. The recent effort to revise the Declaration of Helsinki and the CIOMS Guidelines on research involving human subjects are but some of the ethical controversies about how to conduct biomedical research with human subjects in developing countries. These controversies subsume the following issues: culturally appropriate practices of informed consent and subject recruitment, post-trial therapeutic commitments, models for research ethics review and questions about who should control the review process. This part of the course will address the need to conceive of and then relate ethical research practices to the different socio-cultural contexts in which they will be pursued.

### **HLTH 5450 3.0** Health Equity & Mental Health Policy

Involves an analysis of mental health policy from a political perspective, starting with early conceptualizations and approaches to mental health care in the 20<sup>th</sup> century. It will then explore more recent societal approaches, government initiatives and legislation in the Canadian context and draw on examples in other international contexts. Topics to be explored include: history of psychiatric care, definitions of mental health and mental illness, the meaning of therapy, legislation concerning community treatment orders and involuntary treatment, deinstitutionalization and the shift to community care, "trans-institutionalization," mental health policy development, competence in an emergency situation, consent to treatment issues, representation issues and the interests of clients and family members, and mental health policy in international jurisdictions.

### **HLTH 5455 3.0 Health Equity Human Resources – Working in Care**

Almost one in five Canadians have paid work in health and social services and at least an equivalent number provide unpaid care. As this labour force ages and as conditions made work in care less attractive, there is growing concern about whether there will be enough doctors and nurses to provide the care we need. At the same time, more and more care work is being relocated to the household and to unpaid, often untrained providers. Moreover, infections such as SARS have made the contributions of the non-professional staff increasingly visible, especially as more of the care work is done by non-clinical providers. These processes are profoundly gendered, with women providing over 80 per cent of the paid care and an equivalent amount of the unpaid personal care. Racialization also plays a significant role, as do factors linked to other social locations. This course will explore the conceptualization, nature, conditions and relations of care work along with planning for care, paying particular attention to multiple social locations and structural forces.

### **HLTH 5460 3.0 Ideological Conflicts in Health Care: Money Versus Care, Profit Versus the Public Good**

The shape that a health care system takes is a reflection of various forces. One of the most defining characteristics of a system is the degree to which it is an expression of individual free enterprise versus social cohesion. These distinctions are driven by the dominant ideology of the country as expressed through its government, the union movement and the strength of private enterprise. These ideological distinctions can be expressed in features of a system such as private versus public insurance for health care, for-profit versus not-for-profit delivery of health care services, whether selling organs is allowed and the uptake of public-private initiatives. This course will use a political science model to examine these and other ideological divisions in health care both in Canada and internationally. Students will be exposed to a range of literature that looks at both sides of these issues both from a theoretical and a practical, case-based point of view.

### **HLTH 5465 3.0 Women & Health**

Women are not only the majority of the population; they are also the majority of those who need and provide care. While there are significant differences among women in terms of their health, there are also important similarities that result not only from their bodies but also from the ways those bodies are shaped by and interpreted within social, economic and physical environments. Women have also been active in constructing both their own possibilities for health and care and the health care system. This course will explore the research on differences and their consequences for the health of both women and men. Feminist political economy focused on Canada will guide this exploration, but other perspectives and other countries will also be considered.

### **HLTH 5470 3.0 Intra-Hospital Information Systems**

This course is designed to allow students to have an in-depth knowledge of intra-hospital health related information systems, to understand the complexity of their design, the impact they have on health care information management, as well as their integration challenges. The course investigates the challenges related to streamlining information communication inside a hospital as well as the integration of intra-hospital information systems. Students will learn how to analyze new opportunities that intra-hospital information systems provide to hospitals as well as to analyze the integration requirements of these systems.

### **HLTH 5475 3.0 Telemedicine Systems**

The objective of this course is to provide the students with skills that will enable them to be active players in health-related organizations where they can analyze the technological and the functional requirements of a telemedicine application. In addition, students will be able to design a telemedicine system, and draw a performance evaluation plan. The course will give the students the chance to carry out a critical analysis and assessment of existing research papers in the telemedicine field; it will also convey to the students the knowledge and the necessary skills to understand the complexity of telemedicine applications.

### **HLST 6250 3.0 Strategic Planning in Healthcare Organizations**

This course provides an objective basis for decision making. The goal of this course is to familiarize students with conceptual frameworks, debates, and developments in contemporary strategic thinking. Emphasis will be placed on the exploration of various theoretical perspectives, ideas, issues and on the sharing of knowledge through classroom discussion. Learning Objectives are (1) to provide students with useful conceptual tools to guide analysis and decision making, (2) to enhance awareness and increased

understanding of critical strategic issues facing various types of healthcare organizations, (3) to develop critical thinking skills via the application of concepts and theories to case studies (4) to stimulate students to explore and evaluate new and developing areas of strategic management theory.

#### **HLTH 6260 Health Information Management and Systems**

One of the major aims of Health Information Management is to help health professionals make better decisions. To this end, diverse models and methods of decision making and decision support have been developed and implemented in health care settings. This course reviews theories, methods, and technologies for aiding the process of making decisions in health care. This course represents a comprehensive approach of information management, record management, policy and planning. Provides students with the knowledge and skills to manage health information services in health organizations, to use computer technologies to collect, manage analyze and technically evaluate health information and work with confidential health records. This course examines also the forces outside healthcare facilities that directly affect the collection, maintenance and dissemination of health information. Topics include international trends in healthcare, federal and state government regulations, national trends in healthcare delivery and technology.

#### **HLTH 6290 Genetics and Public Policy, Ethics, and Law**

Explores the political, societal, ethical and philosophical issues concerning society's emerging understanding of genetics, its biotechnologic applications and the implications for health policy, regulation and legislation, covering a range of areas. These include the history of biotechnology, reproductive issues (prenatal and pre-implantation genetic testing) and their ethical, societal and economic implications. Other areas of exploration include gene therapy, epigenetics, cloning, genetically modified foods, biotechnology and patents (e.g. the Myriad patent on cancer gene testing), and societal legislative and policy responses. The implications of new technologies for the environment and public health care will be considered, including coverage decisions, the federal/provincial government regulatory role, and private insurance.

#### **HLTH 6300 3.0 Political Economy of Global Health**

Analyzes the process through which global health policy is developed drawing from political economy, historical and comparative perspectives. Problematizes the concept of globalization and considers how the dynamics of the modern world system emerging from the European colonial project influences health policy and drives health inequities at national and global levels. Explores the integration of scholarship, practice, and citizen activism.

## New Course Proposal Form

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**1. Program: Graduate Program in Health – Health Management and Health Data Analytics**

**2. Course Number:** HLTH 6XXX

**3. Credit Value:** 3.0

**4. Long Course Title:** Health Data Visualization

**5. Short Course Title:** Health Data Viz

**6. Effective Session:** Fall 2022

**7. Calendar (Short) Course Description:**

This course will introduce the fundamental concepts and principles of data visualization and its application in healthcare. We will explore the history of data visualization and its current uses in healthcare: from infographics informing patients and consumers, to EHR dashboards aiding providers in decision-making, to detailed epidemiology maps driving policymaking aimed at protecting population-health. Students will learn best practices for designing and evaluating health data visualizations, and learn to think critically about literacy, ethics, and the future of the field. By the end of this course, students will be able to use online tools to create powerful visuals that tell a story and inform diverse stakeholders.

**8. Expanded Course Description:**

The following describes the (A) course topics (B) course learning objectives, and a (C) description of experiential education (EE) and/or technology-enhanced learning activities.

**A) course topics/theories**

1. Importance of visuals for human understanding
2. History of (health) data visualization
3. Current uses of health data visualization
  - i. When/ how and by whom are visualizations used (stakeholders)?
4. Visualization literacy (how to properly interpret visualizations)
5. Ethics of/ Bias in visualization (what are the limitations and considerations of visualizations)
6. Design principles
7. How to combine and clean data for visualizations
8. How to use Tableau to create health visualizations
9. Identify and understand the needs of various user-groups.
  - i. Patients and consumers
  - ii. Health care providers and Hospital mgmt.
  - iii. Policy and decision makers
10. Future trends in health data visualization (AI, Big Data)

## **B) Course learning objectives**

### 1) Depth and breadth of knowledge

- Demonstrate understanding of the key concepts underlying Health Data Visualization
- Engage with Visualization tools and techniques

### 2) Knowledge of methodologies

- Demonstrate understanding of health data visualization (e.g. which graphs are best suited for what data)
- Grasp the fundamentals of design data visualization (colours, font, layout)

### 3) Application of knowledge

- Employ critical analytics skills
  - when appraising real-life health visualizations
  - when analyzing health data
  - when making decisions about how to visually represent the data in order to tell a story and/or aid in decision making
- Conduct research of print, electronic, and visual resources
- Learn to use visualization technologies

### 4) Communications skills

- Work collaboratively and ethically with others
- Effectively research, develop, and present data visualizations
- Write rigorous, critical and convincing reports
- Constructively give peer feedback

### 5) Awareness of limitations of knowledge

- Understand the ethical limitations of data visualizations and specific implications for Healthcare contexts
- Understand the benefit of interprofessional collaboration (working together with designers and researchers to best convey data)

### 6) Autonomy and professional capacity

- Develop a disciplined and rigorous practice
- Learn to present visualizations confidently, accepting and applying constructive criticism

## **C) Description of experiential education (EE) and/or technology-enhanced learning activities.**

The course will contain classroom-focused EE that exposes students to concrete data visualization activities in the form of “in the news” class discussions (contributing to participation grade), weekly reflection assignments, and lab exercises.

Every class will begin with some time dedicated to “in the news” where students will have a few minutes to look through recent media posts/publications and identify a recent visualization that we will dissect collectively as a class. Individually, students will be required to find real-world examples and apply concepts and theories covered each week, summarizing their thoughts in 5 brief “reflection assignments” that will be submitted online. Lab exercises will be completed collaboratively in teams, a real dataset will be provided and teams will be encouraged to create appropriate visualization for their target audience using online tools and techniques learned in class, and present the following week. Students are expected to respectfully provide feedback to their peers and submit their work online for correction and feedback.

Note that special computer labs will not be required for this course. Online software (Tableau) will be used which is free to students. Use of online software can sustain capacity in data visualization that students build during the course.

Lab exercises will allow student to achieve the following learning outcomes

- 1- Engage with multiple data visualization techniques (infographics, graphs, dashboards, maps)
- 2- Grasp the fundamentals of design related to data visualization
- 3- Provide students with “real” messy data to learn to clean and analyze
- 4- Work collaboratively and ethically with others
- 5- Effectively research, develop, present, and give peer feedback on visualizations in healthcare
- 6- Meet deadlines and develop a rigorous discipline

In addition, guest lecturers will be invited to the class when possible, to review and interact with the students about concrete health data visualization applications and (un)successful cases (E.g., invite UX designers of EHR dashboards, and patient reports on smartphone apps).

## 9. Course Learning Outcomes

After completion of the course students will be able to:

- **Apply theoretical and practical knowledge** of Data Visualization in Healthcare
- **Evaluate Data Visualizations** in Healthcare (e.g. in research papers, government infographics) according to their expressiveness and effectiveness
- Be able to **understand (literacy) and identify bias (ethics etc.)** in health visualizations
- **Choose appropriate visualization tools** and methods for a given data set and presentation problem
- **Inspect Accuracy**, Discriminability, Saliency, and Separability, and their implications for design.
- Examine, navigate, and **learn to use the various features of Tableau** (or other online tools)
- Combine the data to and follow the **best practices to present your story**
- **Create and design visualizations and dashboards** for diverse audiences using Tableau (or other online tools)

## 10. Rationale:

"The purpose of computing is insight, not numbers."

Health care is becoming more data driven than ever before. The collection, organization, and interpretation of increasingly large volumes and types of data from multiple sources is integral to nearly every aspect of healthcare.

From replacing a patient's medical chart with a lifelong electronic medical record, to wearable devices that capture quantified self, alongside an expanding trove of digital data captured through social media, geographic information systems (GIS) and advancements in research (e.g., DNA sequencing of data), and technologies (such as biomedical imaging and Machine learning for health), data is growing in volume and diversity making analysis and interpretation increasingly complex. Healthcare professionals, researchers, patients, families, caregivers, and consumers need information to be presented in an accessible, useful, and usable manner.

Data visualization is the graphical representation of information and data. By using visual elements like icons, charts, graphs, and maps, data visualization tools provide an accessible and engaging way to see and understand trends, outliers, and patterns in data. Data visualization helps to tell stories by curating data into a form easier to understand, helping diverse stakeholders make more informed decisions. Today every hospital uses data visualization solutions to manage their in-house process ranging from maintaining the patient record, to capacity planning, every smartphone health app uses data visualizations to push “personalized goals” to their consumers in the hope that they will change their

behaviours, and local and national governments employ interactive maps to try and educate citizens and manage the spread of disease across entire countries and the world, as was the case with the COVID-19 pandemic.

This course aligns with the faculty educational objectives, providing up-to-date content using cutting edge technologies, and preparing students with hands-on skills that are highly marketable in the workplace. Students will further their critical thinking, data literacy, visualization, and presentation skills, as well as gain experience using novel technologies, and EE experience; all of which are core to the SHPM objectives and will prepare students to fill a need for data analytics skills in the healthcare system. There are no other graduate courses on offer that focus on health data visualization.

This course, along with another new course on Machine Learning in Health constitute two of the new field-specific courses in the new field in health management and health data analytics in the Graduate Program in Health. These two analytics-oriented courses are unique to the program and complement existing health management and knowledge utilization courses already approved in the program.

The Graduate Program in Health's learning outcomes are included in Appendix X.

## 11. Evaluation:

| Assignment   | Percentage Value |
|--|------------------|
| The Good, the Bad, and the Ugly of Data Visualization                              | 20%              |
| 5 weekly reflections, 6% each  | 30%              |
| 3 Tableau visualization assignments - > different stakeholder groups, 5% each      | 15%              |
| 1. data for patients & consumers   | 5%               |
| 2. data for healthcare providers & healthcare/ hospital mgmt                       | 5%               |
| 3. data for policy & decision makers   | 5%               |
| Final project: Pick data set (your capstone?), make visualization, explain choices | 30%              |
| 1. Final Paper   | 20%              |
| 2. Final presentation  | 10%              |
| Participation (attendance, "In the news", class conversations/ contributions)      | 5%               |
| <b>TOTAL</b>   | <b>100</b>       |

## 12. Integrated Courses:

N.A.

## 13. Cross listed Courses:

N.A.

## 14. Faculty Resources:

Faculty members qualified to teach this course: Lora Appel; Liane Ginsburg; Hannah Wong  
Frequency with which you expect this course to be offered: Approximately every other year.

We have several health informatics and health management faculty members with the School equipped to teach at the graduate and undergraduate levels. Offering this course in alternate years will not detract from the School's ability to continue to have full-time faculty deliver undergraduate health studies courses. The addition of this area to our graduate program will also help alleviate currently high supervision loads experienced by SHPM faculty members in the health policy and equity area and allow us to share faculty supervision resources more equitably across the School.

## 15. Physical Resources:

No additional physical resources are needed.

## 16. Bibliography and Library Statement:

| Session | Topic  | Assignment                     |
|---------|--|--------------------------------|
| 1       | "A picture is worth 1000 words"                                    | none                           |
| 2       | History and current uses of (Health) Data Visualization            | weekly reflection 1            |
| 3       | From Data to Viz   | weekly reflection 2            |
| 4       | Data visualization literacy and ethics                             | weekly reflection 3            |
| 5       | Design Principles  | good bad ugly                  |
| 6       | Introduction to tools (e.g., Tableau) + Lab work                   | weekly reflection 4            |
| 7       | Visualizations for Patients & Consumers + Lab work                 | Tableau assignment i           |
| 8       | Visualization for Providers & Healthcare/Hospital mgmt. + Lab work | Tableau assignment ii          |
| 9       | Visualization for Policy & Decision Makers + Lab work              | Tableau assignment iii         |
| 10      | Future of data visualization                                       | weekly reflection 5            |
| 11      | Final Project Prep/ Bonus show and tell                            | none                           |
| 12      | Final Presentations  | Final Projects & Presentations |

### Books (or chapters in books) under consideration:

Wexler, S., Shaffer, J., & Cotgreave, A. (2017). *The big book of dashboards: visualizing your data using real-world business scenarios*. John Wiley & Sons.

Steele, J., & Iliinsky, N. (2010). *Beautiful visualization: looking at data through the eyes of experts*. " O'Reilly Media, Inc."

### Session 1: "A picture is worth 1000 words"

Evergreen, S., & Metzner, C. (2013). Design principles for data visualization in evaluation. *New directions for evaluation*, 2013(140), 5-20. Accessed from: [Link to the article](#)

Ottino, J. M. (2003). Is a picture worth 1,000 words?. *Nature*, 421(6922), 474-476. Accessed from: [Link to the article](#)

Shneiderman, B., Plaisant, C., & Hesse, B. W. (2013). Improving healthcare with interactive visualization. *Computer*, 46(5), 58-66. doi: 10.1109/MC.2013.38. URL: [Link to the article](#)

Martin, L. J., Turnquist, A., Groot, B., Huang, S. Y., Kok, E., Thoma, B., & van Merriënboer, J. J. (2019). Exploring the role of infographics for summarizing medical literature. *Health Professions Education*, 5(1), 48-57. URL: [Link to the article](#)

### Session 2: History and current uses of (Health) Data Visualization

Friendly, M. (2008). A brief history of data visualization. In *Handbook of data visualization* (pp. 15-56). Springer, Berlin, Heidelberg.

Tableau. (n.d.) The 5 Most Influential Vizzes of All Time [White paper].  
([Link to the article](#))

Comello MLG, Qian X, Deal AM, Ribisl KM, Linnan LA, Tate DF (2016). Impact of Game-Inspired Infographics on User Engagement and Information Processing in an eHealth Program J Med Internet Res 2016;18(9):e237 URL: [Link to the article](#) DOI: 10.2196/jmir.5976 PMID: 27658469 PMCID: 5054233

Strecker, J. (2012). Data visualization in review: summary; evaluating IDRC results-communicating research for influence. Accessed from: [Link to the article](#)

### Session 3: From Data to Viz

Nevo, D. (2014). *Making sense of data through statistics - An introduction*: Legerity Digital Press.  
Dunlap, J. C., & Lowenthal, P. R. (2016). Getting graphic about infographics: design lessons learned from popular infographics. *Journal of Visual Literacy*, 35(1), 42-59.  
URL: [Link to the article](#)

Pettiross, J. Tableau. (n.d.) How to Build Dashboards that Persuade, Inform, and Engage. [White paper]. ([Link to the article](#))

Healy, Y. (2018). Find the graphic you need. Retrieved January 31, 2021, from [Link to the article](#)  
Ferdio. (n.d.). Collection of data visualizations to get inspired and finding the right type. Retrieved January 31, 2021, from [Link to the article](#)

### Session 4: Data visualization literacy and ethics

McCrorie, A. D., Donnelly, C., & McGlade, K. J. (2016). Infographics: healthcare communication for the digital age. *The Ulster medical journal*, 85(2), 71. URL: [Link to the article](#)

Arcia, A., Suero-Tejeda, N., Bales, M. E., Merrill, J. A., Yoon, S., Woollen, J., & Bakken, S. (2016). Sometimes more is more: iterative participatory design of infographics for engagement of community members with varying levels of health literacy. *Journal of the American Medical Informatics Association : JAMIA*, 23(1), 174–183. [Link to the article](#)

Neuhaus, F., & Webmoor, T. (2012). Agile ethics for massified research and visualization. *Information, Communication & Society*, 15(1), 43-65.  
URL: [Link to the article](#)

Hepworth, K., & Church, C. (2018). Racism in the Machine: Visualization Ethics in Digital Humanities Projects. *DHQ: Digital Humanities Quarterly*, 12(4).

Dasgupta, A., Maguire, E., Abdul-Rahman, A., & Chen, M. (2014, November). Opportunities and challenges for privacy-preserving visualization of electronic health record data. In *Proc. of IEEE VIS 2014 Workshop on Visualization of Electronic Health Records* (Vol. 13). URL:

### Session 5: Design Principles

Few, S., & Edge, P. (2008). Practical rules for using color in charts. *Visual Business Intelligence Newsletter*, 11. Accessed from: [Link to the article](#)

Senay, H., & Ignatius, E. (1990). *Rules and principles of scientific data visualization*. Institute for Information Science and Technology, Department of Electrical Engineering and Computer Science, School of Engineering and Applied Science, George Washington University.

Tableau. (n.d.) Good Enough to Great: A Quick Guide for Better Data Visualizations. [White paper]. ([Link to the article](#))

## Session 6: Introduction to tools (e.g. Tableau)

Tableau. (n.d.). Welcome to Tableau Desktop. Retrieved January 31, 2021, from [Link to the article](#)  
Tableau. (n.d.). Next steps. Retrieved January 31, 2021, from [Link to the article](#)

## Session 7: Viz for Patients & Consumers

Browne S, Behzadi Y, Littlewort G. Let Visuals Tell the Story: Medication Adherence in Patients with Type II Diabetes Captured by a Novel Ingestion Sensor Platform JMIR Mhealth Uhealth 2015;3(4):e108 URL: [Link to the article](#) DOI: 10.2196/mhealth.4292  
Theis S, Rasche P, Bröhl C, Wille M, Mertens A Task-Data Taxonomy for Health Data Visualizations: Web-Based Survey With Experts and Older Adults. JMIR Med Inform 2018;6(3):e39 URL: [Link to the article](#) DOI: 10.2196/medinform.9394  
Faisal S, Blandford A, Potts HW. Making sense of personal health information: Challenges for information visualization. *Health Informatics Journal*. September 2013:198-217. doi:[10.1177/1460458212465213](#)  
Pack, A. P., Golin, C. E., Hill, L. M., Carda-Auten, J., Wallace, D. D., Cherkur, S., ... & Kashuba, A. D. (2019). Patient and clinician perspectives on optimizing graphical displays of longitudinal medication adherence data. *Patient education and counseling*, 102(6), 1090-1097. URL: [Link to the article](#)

## Session 8: Viz for Providers & Healthcare mgmt/ Hospitals

Stadler, J. G., Donlon, K., Siewert, J. D., Franken, T., & Lewis, N. E. (2016). Improving the efficiency and ease of healthcare analysis through use of data visualization dashboards. *Big Data*, 4(2), 129-135.  
Kopanitsa, G., Hildebrand, C., Stausberg, J., & Englmeier, K. H. (2013). Visualization of medical data based on EHR standards. *Methods of information in medicine*, 52(01), 43-50. Accessed from: [Link to the article](#)  
Lamy, JB., Duclos, C., Bar-Hen, A. *et al.* An iconic language for the graphical representation of medical concepts. *BMC Med Inform Decis Mak* 8, 16 (2008). [Link to the article](#)  
Rind, A., Wang, T. D., Aigner, W., Miksch, S., Wongsuphasawat, K., Plaisant, C., & Shneiderman, B. (2013). Interactive information visualization to explore and query electronic health records. *Foundations and Trends in Human-Computer Interaction*, 5(3), 207-298. URL: [Link to the article](#)  
West, V. L., Borland, D., & Hammond, W. E. (2015). Innovative information visualization of electronic health record data: a systematic review. *Journal of the American Medical Informatics Association*, 22(2), 330-339. URL: [Link to the article](#)

## Session 9: Viz for Policy & Decision Makers

Concannon, D., Herbst, K., & Manley, E. (2019). Developing a data dashboard framework for population health surveillance: widening access to clinical trial findings. *JMIR formative research*, 3(2), e11342. Accessed from: [Link to the article](#)

Chishtie JA, Marchand JS, Turcotte LA, Bielska IA, Babineau J, Cepoiu-Martin M, Irvine M, Munce S, Abudiab S, Bjelica M, Hossain S, Imran M, Jeji T, Jaglal S  
Visual Analytic Tools and Techniques in Population Health and Health Services Research: Scoping Review. *J Med Internet Res* 2020;22(12):e17892 URL: [Link to the article](#)  
DOI: 10.2196/17892 PMID: 33270029 PMCID:7716797

Sopan, A., Noh, A. S. I., Karol, S., Rosenfeld, P., Lee, G., & Shneiderman, B. (2012). Community Health Map: A geospatial and multivariate data visualization tool for public health datasets. *Government Information Quarterly*, 29(2), 223-234. URL: [Link to the article](#)

### Session 10: Future of data visualization

Saket, B., Moritz, D., Lin, H., Dibia, V., Demiralp, C., & Heer, J. (2018). Beyond heuristics: Learning visualization design. *arXiv preprint arXiv:1807.06641*. URL: [Link to the article](#)

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Please submit completed forms and required supporting documentation by email to the Coordinator, Faculty Governance – [fgsgovrn@yorku.ca](mailto:fgsgovrn@yorku.ca)

## New Course Proposal Form

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*The following information is required for all new course proposals. To facilitate the review/approval process, please use the headings below (and omit the italicized explanations below each heading).*

**1. Program: Graduate Program in Health – Health Management and Health Data Analytics**

**2. Course Number:** HLTH 6XXX

**3. Credit Value:** 3.0

**4. Long Course Title:** Machine Learning for Health

**5. Short Course Title:** Machine Learning for Health

**6. Effective Session:** Fall 2022

**7. Calendar (Short) Course Description:**

This course will introduce the fundamental concepts and principles of machine learning and its application in healthcare. We will explore machine learning approaches, health cases in relation to machine learning, and best practices for designing, building, and evaluating machine learning applications in healthcare. Opportunities and challenges that machine learning present for health and society will be covered.

**8. Expanded Course Description:**

The following describes the (1) course topics (2) course learning objectives, and a description of experiential education (EE) and/or technology-enhanced learning activities.

**a) Course topics/theories**

1. Healthcare and Decision Making
2. Analytics Building Blocks: Descriptive, Predictive and Prescriptive Analytics
3. Statistical Analysis and Machine Learning
4. Linear and Logistic Regression
5. Integrated development Environments for Machine Learning
6. Neural Networks
7. Support Vector Machine
8. Unsupervised Learning
9. Dimensionality Reduction
10. Evaluations of Machine Learning Applications in Healthcare
11. AI deployment

**b) Course learning objectives**

1) Depth and breadth of knowledge

- 1- Demonstrate understanding of the key concepts underlying Machine Learning
- 2- Engage with multiple Machine Learning techniques

2) Knowledge of methodologies

- 1- Demonstrate critical understanding of the technological advancements in Machine Learning in Healthcare
- 2- Grasp the fundamentals of the algorithms related to Machine Learning

### 3 Application of knowledge

- 1- Employ critical analytics skills
- 2- Conduct research of print, electronic, and visual resource texts

### 4) Communications skills

- 1- Work collaboratively and ethically with others
- 2- Effectively research, develop, present, and give peer feedback on Machine Learning projects in Healthcare
- 3- Write rigorous reports

### 5) Awareness of limitations of knowledge

- 1- Understand the limits of Machine Learning in Healthcare
- 2- Understand the ethical limitations of Machine Learning in Healthcare

### 6) Autonomy and professional capacity

- 1- Develop a disciplined and rigorous practice

### **c) Description of experiential education (EE) and/or technology-enhanced learning activities.**

The course will contain classroom-focused EE that exposes students to concrete machine learning activities in the form of lab exercises and case studies. Students will be required to reflect on both and will be asked to submit at the end of each session a writeup to answer specific questions related to the concepts and theories being covered in the course. In addition, guest lecturers will be invited to the class to interact with the students about concrete Machine Learning applications in Healthcare. Lab exercises will allow student to achieve the following learning outcomes:

- 1- Engage with multiple Machine Learning techniques
- 2- Grasp the fundamentals of the algorithms related to Machine Learning
- 3- Employ critical Machine Learning skills
- 4- Analyze, discuss, and communicate clearly in a range of Machine Learning problems and solutions in healthcare
- 5- Work collaboratively and ethically with others
- 6- Effectively research, develop, present, and give peer feedback on Machine Learning applications in healthcare
- 7- Meet deadlines and develop a rigorous discipline

Case studies consist of real-life situation that demands Machine Learning based solutions, students need to work in group to find the different Machine Learning approaches that can be used to address the problem, and to choose one approach based on a clear rationale.

In both case studies and lab exercises, student will work collaboratively in groups; they will be able to present their findings in class and submit the results for correction and feedback.

Special computer labs will not be required for this course. Free self-install software will be used to enable students to continuously have access to machine learning capacity at home and work independently. Weka, Anaconda, and Jupyter are examples of such integrated development environments. The first lab would be dedicated to installation and use of the software.

## **9. Course Learning Outcomes**

After completion of the course students will be able to:

- 1- Apply theoretical and practical knowledge of Machine Learning in Healthcare
- 2- Apply practical knowledge of available Machine Learning software
- 3- Assess Health outcomes using Machine Learning techniques
- 4- Choose appropriate Data Visualization tools
- 5- Evaluate Machine Learning Applications in Healthcare
- 6- Analyze, discuss, and communicate clearly in a range of Machine Learning related problems and solutions in healthcare

## 10. Rationale

With Machine Learning and Artificial Intelligence applications thriving in the healthcare domain, professionals working in the healthcare industry are faced with both opportunities and challenges. This course introduces the principles of Machine Learning and their applications in healthcare.

This course equips students with in-depth understanding on the data use and Machine Learning techniques as well as with skills needed in the domain. It contributes to furthering the students critical thinking, data skills, Machine Learning skills, technological innovation, presentation skills, group work, EE experience; all of which are core to the program objectives and prepare students to fill a need for data analytics skills in the healthcare system.

The course aligns with the faculty educational objectives to provide students with excellent educational experience via up-to-date content using cutting edge technologies, as well as providing students with marketable skills.

This course, along with another new course on Data Visualization constitute two of the new field-specific courses in the new field in health management and health data analytics in the Graduate Program in Health. These two analytics-oriented courses are unique to the program and complement existing health management and knowledge utilization courses already approved in the program.

The Graduate Program in Health's learning outcomes are included in Appendix X.

## 11. Evaluation:

*Please supply a detailed breakdown of course requirements, including the type and percentage value of each assignment. The expectation is that course assignments can normally be accomplished within the course period. If applicable, details regarding expectations and corresponding grading requirements with respect to attendance and participation should be provided.*

| Assignment                                      | Percentage value |
|---|------------------|
| Reflection (e-Class Discussion forum / Journal) | 10%              |
| Lab exercises (Lab assignments)                 | 25%              |
| Term paper (research paper)                     | 25%              |
| Project (report 30% and presentation 10%)       | 40%              |

## 12. Integrated Courses:

N.A.

## 13. Cross listed Courses:

N.A.

## 14. Faculty Resources:

Faculty members qualified to teach this course: Christo El Morr and Serban Dinca

Frequency with which you expect this course to be offered: Approximately every second year.

We have several health informatics faculty members with the School equipped to teach at the graduate and undergraduate levels. Offering this course in alternate years will not detract from the School's ability to continue to have full-time faculty deliver undergraduate health informatics courses. The addition of this area to our graduate program will also help alleviate currently high supervision loads

experienced by SHPM faculty members in the health policy and equity area and allow us to share faculty supervision resources more equitably across the School.

### 15. Physical Resources:

The lab already in place in HNE B02 is adequate to run the labs related to this course. No additional physical resources are needed.

### 16. Bibliography and Library Statement:

*Please provide an appropriate and up-to-date bibliography in standard format. A statement from the University librarian responsible for the subject area certifying that adequate library resources are available for the new course must be provided.*

1. Healthcare and Decision Making
2. Analytics Building Blocks: Descriptive, Predictive and Prescriptive Analytics
3. Statistical Analysis and Machine Learning
4. Linear and Logistic Regression
5. Integrate development Environments for Machine Learning
6. Neural Networks
7. Support Vector Machine
8. Unsupervised Learning
9. Dimensionality Reduction
10. Evaluations of Machine Learning Applications in Healthcare
11. AI deployment

#### Session 1: Healthcare and Decision Making

El Morr, C., Ginsburg, L., Nam, S., & Woollard, S. (2017). Assessing the Performance of a Modified LACE Index (LACE-rt) to Predict Unplanned Readmission After Discharge in a Community Teaching Hospital. *Interact J Med Res*, 6(1), e2. doi: [DOI URL to the article](#)

Khalifa, M., & Zabani, I. (2016). Utilizing health analytics in improving the performance of healthcare services: A case study on a tertiary care hospital. *Journal of Infection and Public Health*, 9(6), 757-765. doi: [DOI URL to the article](#)

Al Hamouche, V. (2014). Making Quality Control Decisions in Radiology Department: A Decision Support System for Radiographers' Performance Appraisal Using PACS. In M. Christo El (Ed.), *Research Perspectives on the Role of Informatics in Health Policy and Management* (pp. 48-61). Hershey, PA, USA: IGI Global.

#### Session 2: Building Blocks

Witten, I. H., Frank, E., Hall, M. A., & Pal, C. J. (2016). *Data Mining: Practical Machine Learning Tools and Techniques*: Elsevier Science.

Santos, R. S., Malheiros, S. M., Cavalheiro, S., & de Oliveira, J. M. (2013). A data mining system for providing analytical information on brain tumors to public health decision makers. *Comput Methods Programs Biomed*, 109(3), 269-282. doi: [DOI URL to the article](#)

Rose Business Technologies. (2013, February 7, 2013). Descriptive Diagnostic Predictive Prescriptive Analytics Retrieved from the [Link to the article](#)

Khalifa, M. (2015). Developing an Emergency Physician Productivity Index Using Descriptive Health Analytics. *Stud Health Technol Inform*, 213, 167-170.

Wagenen, J. V. (2017). 3 Big Data Trends in Healthcare Using Predictive Analytics.  
[Link to the article](#)

Safaei, M. M., Scheer, J. K., Ailon, T., Smith, J. S., Hart, R. A., Burton, D. C., . . . Ames, C. P. (2018). Predictive modeling of length of hospital stay following adult spinal deformity correction: Analysis of 653 patients with an accuracy of 75% within 2 days. *World Neurosurg*. doi:10.1016/j.wneu.2018.04.064

Chalmers, E., Hill, D., Zhao, V., & Lou, E. (2015). Prescriptive analytics applied to brace treatment for AIS: a pilot demonstration. *Scoliosis*, 10(Suppl 2), S13.  
doi: [DOI URL to the article](#)

Rose Business Technologies. (2013, February 7, 2013). Descriptive Diagnostic Predictive Prescriptive Analytics Retrieved from [Link to the article](#)

### Session 3: Statistical Analysis and Machine Learning

Nevo, D. (2014). *Making sense of data through statistics - An introduction*: Legerity Digital Press.

Badillo, S., Banfai, B., Birzele, F., Davydov, I., Hutchinson, L., Kam-Thong, T., . . . Zhang, J. D. (2020). An Introduction to Machine Learning. *Clin Pharmacol Ther*, 107(4), 871-885.  
doi:10.1002/cpt.1796

Jamthikar, A., Gupta, D., Saba, L., Khanna, N. N., Araki, T., Viskovic, K., . . . Suri, J. S. (2020). Cardiovascular/stroke risk predictive calculators: a comparison between statistical and machine learning models. *Cardiovasc Diagn Ther*, 10(4), 919-938.  
doi: [DOI URL to the article](#)

### Session 4: Linear Regression and Logistic Regression

Misra, D. P., Zimba, O., & Gasparyan, A. Y. (2021). Statistical data presentation: a primer for rheumatology researchers. *Rheumatology International*, 41(1), 43-55.  
doi: [DOI URL to the article](#)

Monahan, J. F. (2008). *A Primer on Linear Models*: CRC Press.

### Session 5: Integrate development Environments for Machine Learning

Grolemund, G., & Wickham, H. (2016). *R for Data Science* (1 ed.): O'Reilly Media, Inc.

Ohri, A. (2017). *Python for R Users* (1 ed.): Wiley.

### Session 6: Neural Networks

*Neural networks in healthcare : potential and challenges*. (2006). Hershey, PA: Idea Group Pub.

Xie, X., Li, X., Wan, S., & Gong, Y. (2006). Mining X-Ray Images of SARS Patients. In G. J. Williams & S. J. Simoff (Eds.), *Data Mining: Theory, Methodology, Techniques, and Applications* (pp. 282-294). Berlin, Heidelberg: Springer Berlin Heidelberg.

Raeisi Shahraki, H., Bemani, P., & Jalali, M. (2017). Classification of Bladder Cancer Patients via Penalized Linear Discriminant Analysis. *Asian Pac J Cancer Prev*, 18(5), 1453-1457.  
doi: [DOI URL to the article](#)

### Session 7: Support Vector Machine

Sun, X., Su, S., Zuo, Z., Guo, X., & Tan, X. (2020). Modulation Classification Using Compressed Sensing and Decision Tree-Support Vector Machine in Cognitive Radio System. *Sensors (Basel)*, 20(5). doi:10.3390/s20051438

Farhadian, M., Shokouhi, P., & Torkzaban, P. (2020). A decision support system based on support vector machine for diagnosis of periodontal disease. *BMC Res Notes*, 13(1), 337. doi:10.1186/s13104-020-05180-5

### Session 8: Unsupervised Learning

Jain, V., & Chatterjee, J. M. (2020). *Machine Learning with Health Care Perspective: Machine Learning and Healthcare*: Springer International Publishing.

Cleophas, T. J. M., & Zwinderman, A. H. (2020). *Machine Learning in Medicine -- a Complete Overview*: Springer.

### Session 9: Dimensionality Reduction

Jain, V., & Chatterjee, J. M. (2020). *Machine Learning with Health Care Perspective: Machine Learning and Healthcare*: Springer International Publishing.

Cleophas, T. J. M., & Zwinderman, A. H. (2020). *Machine Learning in Medicine -- a Complete Overview*: Springer.

### Session 10: Evaluations of Machine Learning Applications in Healthcare

Kelly, C. J., Karthikesalingam, A., Suleyman, M., Corrado, G., & King, D. (2019). Key challenges for delivering clinical impact with artificial intelligence. *BMC Medicine*, 17(1), 195. doi:10.1186/s12916-019-1426-2

Sidey-Gibbons, J. A. M., & Sidey-Gibbons, C. J. (2019). Machine learning in medicine: a practical introduction. *BMC Med Res Methodol*, 19(1), 64. doi:10.1186/s12874-019-0681-4

Tohka, J., & Gils, M. (2020). Evaluation of machine learning algorithms for Health and Wellness applications: a tutorial. *ArXiv, abs/2008.13690*.

### Session 11: AI deployment

Carlile, M., Hurt, B., Hsiao, A., Hogarth, M., Longhurst, C. A., & Dameff, C. (2020). Deployment of artificial intelligence for radiographic diagnosis of COVID-19 pneumonia in the emergency department. *Journal of the American College of Emergency Physicians Open*, 1(6), 1459-1464. doi:https://doi.org/10.1002/emp2.12297

Campion, A., Hernandez, M. G., Jankin, S. M., & Esteve, M. (2020). Managing Artificial Intelligence Deployment in the Public Sector. *Computer*, 53(10), 28-37. doi:10.1109/MC.2020.2995644

He, M., Li, Z., Liu, C., Shi, D., & Tan, Z. (2020). Deployment of Artificial Intelligence in Real-World Practice: Opportunity and Challenge. *The Asia-Pacific Journal of Ophthalmology*, 9(4). Retrieved from [Link to the article](#)

## Session 12: Presentations

Students' in-class project presentations.

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Please submit completed forms and required supporting documentation by email to the Coordinator, Faculty Governance – [fgsgovrn@yorku.ca](mailto:fgsgovrn@yorku.ca)

## Memo

To: Professor Liane Ginsburg, Chair, School of Health Policy and  
Management

From: Thumeka Mgwigwi, Teaching and Learning Librarian, Scott Library

Date: 19 February 2021

Subject: Library Statement for Health Data Visualization

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I have reviewed the course proposal material for *Health Data Visualization*. I am happy to report that York University Libraries will be able to support this course. A majority of the titles in the bibliography are already held at York in both print and electronic format. Titles not held at York have been ordered. A quick search of the York Libraries resources revealed more sources related to health data visualization and that includes both journals and monographs in print and electronic format.

For further research, students can use the online catalogue, periodical indexes and resources like Scholars GeoPortal. More resources can be found in the Geospatial Data and Health Studies and Global Health research guides found here:

[Link to the article](#)

York University Libraries is equipped with subject librarians specializing in a wide array of subject areas like Health, Nursing, Research Data Management, Data and Statistics. These librarians are always available to support students' research needs.

Students also have access to the Resource Sharing Department to request materials not held at York Libraries.



## Memo

To: Professor Liane Ginsburg, Chair, School of Health Policy and Management

From: Thumeka Mgwigwi, Teaching and Learning Librarian, Scott Library

Date: 19 February 2021

Subject: Library Statement for Machine Learning for Health

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I have reviewed the course proposal material for *Machine Learning for Health*. I am happy to report that York University Libraries will be able to support this course. A majority of the titles in the bibliography are already held at York in both print and electronic format. Titles not held at York have been ordered. A quick search of the York Libraries resources revealed more sources related to machine learning and healthcare and that includes both journals and monographs in print and electronic format.

For further research, students can use the online catalogue and periodical indexes like Medline, Scopus, Web of Science, General Science Abstracts, to name a few. More resources can be found in the Health Studies and Global Health and Computer Science research guides found here:

[Link to the article](#)

York University Libraries is equipped with subject librarians specializing in a wide array of subject areas like Health, Nursing, Computer Science, Data and Statistics. These librarians are always available to support students' research needs.

Students also have access to the Resource Sharing Department to request materials not held at York Libraries.



## Appendix A5

### Graduate Program in Health – Program Learning Outcomes

The Degree level expectations in the left-hand column of this table adhere to the structure specified by the [Ontario Universities Council on Quality Assurance](#). The Program learning outcomes below are taken from the Graduate Program in Health Self-study completed in the Fall of 2020 as part of our School’s Cyclical Program Review. Yellow highlighted text reflects minor edits required to ensure the PLOs align with the proposed new field in health management and health data analytics.

| Degree Level Expectations (DLE)      | MA in Health<br>Health Policy and Equity Field<br>Program Learning Outcomes<br>This degree is awarded to students who have demonstrated the following skills and abilities:  | PhD in Health<br>Health Policy and Equity Field<br>Program Learning Outcomes<br>This degree extends the skills associated with acquiring a Master of Arts degree and is awarded to students who have demonstrated the following skills and abilities:  |
|--------------------------------------|--|--|
| 1. Depth & breadth of knowledge      | <u>PLO MA 1:</u> Articulate a systematic understanding of leading-edge multi-disciplinary concepts, approaches and issues in the study of health policy and equity <b>OR health system decision making / data analytics problems.</b>  | <u>PLO PhD 1:</u> Articulate a thorough understanding of a substantial body of multi-disciplinary concepts, approaches and issues at the leading edge of the field to inform the study of health policy and equity <b>OR health system decision making / data analytics problems.</b>  |
| 2. Research & scholarship            | <u>PLO MA 2:</u> Assess and analyze scholarly literature and information related to health issues, policies, norms, laws, organizations, services, <b>health system decisionmaking</b> and the social determinants of health using analytical frameworks associated with various research methods.   | <u>PLO PhD 2:</u> Select from and apply multi-disciplinary concepts and approaches that inform the research process in a way that confirms, refines or extends knowledge in the field of health policy and equity <b>OR health system decision making / data analytics.</b>  |
| 3. Level of application of knowledge | <u>PLO MA 3:</u> Employ appropriate methodology and analytical frameworks to carry out research that demonstrates originality in the application of knowledge and the ability to develop and support a sustained argument  | <u>PLO PhD 3:</u> Navigate theoretical, practical, and ethical challenges while conceptualizing and conducting original scholarly investigation to generate new knowledge of suitable quality for peer review and that merits presentation / publication.  |
| 4. Professional capacity / autonomy  | <u>PLO MA 4:</u> Demonstrate initiative, personal responsibility and accountability, the capacity for complex decision-making, and intellectual independence necessary for employment.<br><br><u>PLO MA 5:</u> Exhibit ethical behaviour consistent with academic integrity and the use of appropriate guidelines and procedures for responsible conduct of research;<br><br><u>PLO MA 6:</u> Recognize the broader implications of sharing and applying knowledge to particular contexts and receiving feedback in a constructive manner. | <u>PLO PhD 4:</u> Demonstrate autonomous initiative in complex situations, intellectual independence and engagement with the field, ethical behaviour and academic integrity necessary for employment.<br><br><u>PLO PhD 5:</u> Provide, receive and act on constructive peer review to enhance the quality of one’s peer’s and one’s own academic work.<br><br><u>PLO PhD 6:</u> Evaluate the broader implications of sharing and applying knowledge in and to particular contexts. |

| <b>Degree Level Expectations (DLE)</b> | <b>MA in Health Health Policy and Equity Field Program Learning Outcomes</b><br>This degree is awarded to students who have demonstrated the following skills and abilities:                            | <b>PhD in Health Health Policy and Equity Field Program Learning Outcomes</b><br>This degree extends the skills associated with acquiring a Master of Arts degree and is awarded to students who have demonstrated the following skills and abilities: |
|--|---|--|
| 5. Level of communications skills      | <u>PLO MA 7:</u> Clearly, accurately and concisely communicate ideas, issues and research findings and justify conclusions about health research questions in oral, written, chart and diagram formats. | <u>PLO PhD 7:</u> Clearly, accurately and concisely communicate complex ideas, arguments, and research findings and justify conclusions about health research questions in oral, written, chart and diagram formats.                                   |
| 6. Awareness of limits of knowledge    | <u>PLO MA 8:</u> Articulate awareness of the complexity of knowledge and of the potential contributions of other interpretations, methods, and disciplines/perspectives.                                | <u>PLO PhD 8:</u> Recognize the limitations of one's own work, training, and discipline, as well as the complexity of knowledge, and of the potential contributions of other interpretations, methods, and disciplines/perspectives.                   |

## **How the program curriculum and structure support the achievement of the program learning outcomes**

Course work requirements primarily enable students to achieve PLOs associated with obtaining *Depth and breadth of knowledge*, *Application of knowledge* (e.g., through writing a policy brief, critically appraising a study, and *Communication skills*).

Students in the **MA program** are required to complete an MRP proposal, ethics review (if required) and a Major Research Paper that will provide an original contribution to health research. Graduation with an MA degree requires that students have a final discussion to their supervisory committee. For **PhD students**, The first comprehensive paper reviews the major literature in the field while the second comprehensive paper reviews the literature with a focus on the content area of their dissertation research and includes a 5 to 10-page methodological appendix oriented towards the methodologies to be applied in the PhD thesis. The dissertation research involves a significant and original contribution to the specific area identified in the thesis proposal. These contributions are in the form of both collection and analysis of new or existing data and the organization of the research with an interdisciplinary approach that distinguishes the field from other existing graduate programs in the area of health. The dissertation can be a traditional one or involve the preparation of three or four manuscripts of publishable quality. The MRP proposal and comprehensive papers as well as the MRP and Dissertation ensure students achieve PLOs associated with all degree level expectations, but uniquely promote the *Application of knowledge*, *Autonomy*, and *Awareness of limits of knowledge*.

Lastly, specific training workshops (e.g., how to successfully prepare and defend your MRP, comprehensive exam, or PhD thesis) integrated into the Professional Development Series facilitates achievement of PLOs associated with both *Professional capacity* and *Communication*.

**MAP.** To illustrate how the proposed requirements will support the achievement of program learning objectives a map of the program requirements to the program learning outcomes is included on the next two pages.





| Existing Program/Graduate Diploma Information<br>(change from)   | Proposed Program/Graduate Diploma Information<br>(change to)   |
|--|--|
| <p><b>HEALTH</b></p> <p>The Graduate Program in Health offers MA and PhD degrees in the <b>Health Policy &amp; Equity</b> area, emphasizing equity in health through policies that are directed at the social causes of inequality in health and the organization and delivery of health care. Health equity is explored through a range of theoretical, empirical, interdisciplinary, and experiential orientations, supported by York’s thematic strength in social justice.</p> <p>Health equity issues are dealt with at the local, national and international levels incorporating developing nations. The program is interdisciplinary, incorporating perspectives from political science, law, economics, sociology, history and ethics.</p> <p>Students develop a strong theoretical foundation to critically analyze the political and economic forces that shape the quality of various determinants of health and undertake research in the social and economic dynamics that underlie health inequities at global and local levels, including those of human rights.</p> <p>Moreover, students master the principles of qualitative and quantitative social science research designed to address health policy and equity issues. In pursuing their interests, students have the opportunity to link into existing and ongoing faculty research.</p> | <p><b>HEALTH</b></p> <p>The Graduate Program in Health is a cross- disciplinary program, providing students with a broad range of perspectives that cross health policy, health equity, health system management and health informatics. MA and PhD students choose from one of two different fields of study:</p> <p><b>Health Policy &amp; Equity</b><br/> <b>Health System Management &amp; Health Data Analytics.</b></p> <p>The Health Policy &amp; Equity field emphasizes equity in health through policies that are directed at the social, political and economic causes of inequality, unequal access to health as well as inequities resulting from the administration, organization, funding and delivery of health care services. Health equity is explored through a range of theoretical, empirical, interdisciplinary, and experiential orientations, supported by York’s thematic strength in social justice.</p> <p>The Health System Management &amp; Health Data Analytics field combines two areas of intellectual focus that correspond to specialization within our school – health system management and health informatics. They are combined in a way that centers around on the use of health data analytics to improve health system management decision making, incorporating not only the technical, but also the social, political, economic and organizational aspects of decision making. A range of perspectives are employed towards improving knowledge utilization and knowledge mobilization in the health sector.</p> <p>The program is interdisciplinary, incorporating perspectives from political science, political economy, law, economics, sociology, health services research, organization and management studies, health informatics, history and ethics. There is an intentional intersecting of the two fields by having students take the same foundational courses. Overall, the Program provides a comprehensive curriculum that incorporates the School of Health Policy and Management’s interdisciplinary perspectives on health policy and equity, health management and health informatics. In pursuing their interests, students have the opportunity to link into existing and ongoing faculty research.</p> |

## MASTER OF ARTS PROGRAM ADMISSION REQUIREMENTS

Students with an honours degree who wish to be considered for admission to the MA in Health must:

- have completed an honours undergraduate degree with a B+ average or equivalent in the last two years of study, in a field related to health policy, health management or health informatics. Related disciplines might include psychology, political science, management, or nursing;
- provide a statement of interest demonstrating commitment to advanced research in the field. The statement should include a discussion of the applicant's background, interests, skills and career goals, along with a proposed field of study and research interests; demonstrate ability in writing and research by submitting a recent research paper or report that the applicant has written for a course or in an employment context; and,
- provide three letters of reference, from at least one university faculty member and preferably from two university faculty members. Equivalencies (letters from non-university professional colleagues) are considered for applicants who have been out of school for more than five years.

## DEGREE REQUIREMENTS

### MA Degree by Major Research Paper

Students must successfully complete the following requirements:

#### 1. Courses

Master's students are required to take **six 3.0 credit courses** in the first two terms of study. ~~Two of these are core courses in the Graduate Program in Health:~~

~~Health 5405 3.0: Graduate Research Methods  
Health 5485 3.0: Public Policy and Health~~

## MASTER OF ARTS PROGRAM ADMISSION REQUIREMENTS

Students with an honours degree who wish to be considered for admission to the MA in Health must:

- have completed an honours undergraduate degree with a B+ average or equivalent in the last two years of study, usually in a social science field related to health policy, health management or health informatics. Related disciplines might include psychology, political science, sociology, women's studies, management, or nursing;
- provide a statement of interest demonstrating commitment to advanced research in the field. The statement should include a discussion of the applicant's background, interests, skills and career goals, along with a proposed field of study and research interests; demonstrate ability in writing and research by submitting a recent research paper or report that the applicant has written for a course or in an employment context; and,
- provide three letters of reference, from at least one university faculty member and preferably from two university faculty members. Equivalencies (letters from non-university professional colleagues) are considered for applicants who have been out of school for more than five years.

## DEGREE REQUIREMENTS

### MA Degree by Major Research Paper

Students must successfully complete the following requirements:

#### 1. Courses

Master's students are required to take **six 3.0 credit courses** in the first two terms of study. **Three of these are 'foundational' courses in the Graduate Program in Health including the following foundational graduate research methods course which is required:**

#### **Health 5405 3.0: Graduate Research Methods**

Students must complete two additional foundational courses from the following (a selection of which will be offered each year):

Health 5010 3.0: Health and Science

Health 5020 3.0: Health and Economics

Health 5030 3.0: Health and Politics

Health 5040 3.0: Health Ethics & Law

Health 6245 3.0: Perspectives on Knowledge Translation and Evidence-based decision making

In addition, master's students must complete **two** field-specific courses from the following:

**Health 6210 3.0: The Political Economy of Health Inequities**

**Health 6220 3.0: Human Rights and Health Equity**

**Health 6230 3.0: Health Equity: Analytic Orientations**

**Health 6300 3.0: Political Economy of Global Health**

Finally, students must complete **two elective courses** from the remaining Health course roster, ~~with a maximum of one course from~~ another graduate program upon Graduate Program Director approval. The course requirements outlined are designed to ensure that students benefit from the interdisciplinary nature of the program.

## 2. Major Research Paper

The major research paper tests students against the educational objectives of being able to form an original researchable question, and to address it through an appropriate theoretical framework, review and synthesis of the literature, analysis of primary or secondary data sources and formation of a set of conclusions. It trains students in the formulation and writing of a specific project, and give them the experience of working independently on a project under faculty supervision. Students develop a research topic given ~~their interests in specific areas~~ and are supervised by faculty members with related expertise.

The major research paper is evaluated by the student's major research paper supervisor and advisor through the written work, and an oral presentation at which the student's ability to answer questions related to the major research paper is assessed. The major research paper is evaluated on the extent to which the student proposes an original researchable question, and their ability to address it through an appropriate theoretical framework, review and synthesis of the literature, analysis of primary or secondary data sources and formation of a set of conclusions. The length of the

Master's students **in the Health Policy & Equity Field** must complete **two field-specific courses** from the following:

**Health 6210 3.0: The Political Economy of Health Inequities**

**Health 6220 3.0: Human Rights and Health Equity**

**Health 6230 3.0: Health Equity: Analytic Orientations**

**Health 5485 3.0: Public Policy and Health**

Master's students **in the Health System Management and Health Data Analytics Field** must complete **two field-specific courses** from the following:

**Health 5050 3.0: Perspectives in Decision Making**

**Health 5420 3.0: Measurement for Health Improvement**

**Health 6XX 3.0: Machine Learning for Health**

**Health 6XX 3.0: Health Data Visualization**

Finally, **all MA** students must complete **one elective course** from the remaining Health course roster, or from another graduate program upon Graduate Program Director approval. The course requirements outlined are designed to ensure that students benefit from the interdisciplinary nature of the program.

## 2. Major Research Paper

The major research paper tests students against the educational objectives of being able to form an original researchable question, and to address it through an appropriate theoretical framework, review and synthesis of the literature, analysis of primary or secondary data sources and formation of a set of conclusions. It trains students in the formulation and writing of a specific project, and gives them the experience of working independently on a project under faculty supervision. Students develop a research topic given their **specific interests** and are supervised by faculty members with related expertise.

The major research paper is evaluated by the student's major research paper supervisor and advisor through the written work, and an oral presentation at which the student's ability to answer questions related to the major research paper is assessed. The major research paper is evaluated on the extent to which the student proposes an original researchable question, and their ability to address it through an appropriate theoretical framework, review and synthesis of the literature, analysis of primary or secondary data sources and formation of a set of conclusions. The length of the

major research paper is 50 pages with an upper limit of no more than 65 pages, excluding references.

#### PROGRAM LENGTH

The expected degree completion time for full-time master's students is 3 terms. For those students who complete degree requirements earlier than 3 terms, they must register and pay fees for a minimum of the equivalent of 3 terms of full-time study. All requirements for a master's degree must be fulfilled within 12 terms (4 years) of registration as a full-time or part-time master's student in accordance with Faculty of Graduate Studies' registration policies.

### DOCTOR OF PHILOSOPHY PROGRAM

#### ADMISSION REQUIREMENTS

Students with a master's degree who wish to be considered for admission to the PhD Program in Health must:

- have completed a master's degree with a B+ average or equivalent in a field of study related to health policy, health management or health informatics. Related disciplines might include ~~psychology, life sciences~~, political science, management or nursing
- provide a statement of interest demonstrating commitment to advanced research in the field. The statement should include a discussion of the applicant's background, interests, skills and career goals, ~~along with a proposed field of study and research interests~~;
- demonstrate ability in writing and research by submitting a recent research paper or report that the applicant has written for a course or in an employment context; and,
- provide three letters of reference, from at least ~~one~~ university faculty member and preferably ~~two~~ from university faculty members. Equivalencies (letters from non-university professional colleagues) will be considered for applicants who have been out of school for more than five years.

Applicants are assessed based on academic achievement and/or demonstrated capacity or potential for advanced work in an applied area. The statement of interest and submitted research paper or report provide a basis for evaluating that potential.

Candidates with backgrounds in varying disciplines are assessed by the admissions committee on a case-by-case basis. The most important factors remain research excellence and research potential as demonstrated

major research paper is 50 pages with an upper limit of no more than 65 pages, excluding references.

#### PROGRAM LENGTH

The expected degree completion time for full-time master's students is 3 terms. For those students who complete degree requirements earlier than 3 terms, they must register and pay fees for a minimum of the equivalent of 3 terms of full-time study. All requirements for a master's degree must be fulfilled within 12 terms (4 years) of registration as a full-time or part-time master's student in accordance with Faculty of Graduate Studies' registration policies.

### DOCTOR OF PHILOSOPHY PROGRAM

#### ADMISSION REQUIREMENTS

Students with a master's degree who wish to be considered for admission to the PhD Program in Health must:

- have completed a master's degree with a B+ average or equivalent in a field of study related to health policy, health management or health informatics. Related disciplines might include psychology, sociology, women's studies, political science, management or nursing
- provide a statement of interest demonstrating commitment to advanced research in the field. The statement should include a discussion of the applicant's background, interests, skills and career goals, and research interests along with selection of one of the fields of study;
- demonstrate ability in writing and research by submitting a recent research paper or report that the applicant has written for a course or in an employment context; and,
- provide three letters of reference, from at least two university faculty member and preferably three from university faculty members. Equivalencies (letters from non-university professional colleagues) will be considered for applicants who have been out of school for more than five years.

Applicants are assessed based on academic achievement and/or demonstrated capacity or potential for advanced work in an applied area. The statement of interest and submitted research paper or report provide a basis for evaluating that potential.

Candidates with backgrounds in varying disciplines are assessed by the admissions committee on a case-by-case basis. The most important factors remain research

through competitive grade standing, favourable reference letters and publications.

## DEGREE REQUIREMENTS

Candidates for the PhD degree must successfully complete the following requirements:

### 1. Courses

PhD students in Health entering with a master's degree are required to take **seven 3.0 credit courses** in the first 1-2 years of study (as specified below).

Students entering with a ~~master's degree in Health Policy & Equity~~ from York's Graduate Program in Health must take **four 3.0 graduate courses** or equivalent within the first year of study (upon discussion with the supervisor and Graduate Program Director, with at least **two 3.0 courses** from the Graduate Program in Health).

'Non-standard' ~~applicants, i.e.,~~ with qualifications other than a master's degree, ~~may be considered. These students~~ must take **ten 3.0 credit courses** within the first two years of study (as specified below).

Generally, students entering with a master's degree are required to take the following courses:

#### ~~Two core courses:~~

~~Health 5485 3.0: Public Policy and Health~~

~~Health 5405 3.0: Graduate Research Methods (can be replaced by an equivalent number of credits upon supervisor and Graduate Program Director approval, if the student has taken an equivalent graduate course in research methods)~~

#### Two field-specific courses from the following:

Health 6210 3.0: Political Economy of Health Inequities

Health 6220 3.0: Human Rights and Health Equity

Health 6230 3.0: Health Equity: Analytic Orientations

Health 6300 3.0: Political Economy of Global Health

excellence and research potential as demonstrated through competitive grade standing, favourable reference letters and publications.

## DEGREE REQUIREMENTS

Candidates for the PhD degree must successfully complete the following requirements:

### 1. Courses

PhD students in Health entering with a master's degree are required to take **seven 3.0 credit courses** in the first 1-2 years of study (as specified below).

**PhD** Students entering with **an MA** from York's Graduate Program in Health must take **four 3.0 graduate courses** or equivalent within the first year of study (upon discussion with the supervisor and Graduate Program Director, with at least **two 3.0 courses** from the Graduate Program in Health).

'Non-standard' **entrants to the PhD program, i.e.,** with qualifications other than a master's degree, must take **ten 3.0 credit courses** within the first two years of study (as specified below).

Generally, students entering with a master's degree are required to take the following courses:

#### Two foundational courses from the following:

**Health 5010 3.0: Health and Science**

**Health 5020 3.0: Health and Economics**

**Health 5030 3.0: Health and Politics**

**Health 5040 3.0: Health Ethics & Law**

**Health 6245 3.0: Perspectives on Knowledge Translation and Evidence-based decision making**

\* PhD students who have not previously completed an equivalent graduate level methodology course must take **Health 5405 3.0: Graduate Research Methods**, in addition to the 2 foundational courses for a total of 3 foundational courses.

Students **in the Health Policy & Equity Field** must complete **two field-specific courses** from the following:

**Health 6210 3.0: Political Economy of Health Inequities**

**Health 6220 3.0: Human Rights and Health Equity**

**Health 6230 3.0: Health Equity: Analytic Orientations**

**Health 6300 3.0: Political Economy of Global Health**

**Health 5485 3.0: Public Policy and Health**

Students **in the Health System Management and Health Data Analytics Field** must complete **two**

Finally, all students must complete the credit requirements corresponding to their admission category drawing from courses from the Health roster, with a ~~maximum of one 3.0 credit course from another graduate program (or two 3.0 credit courses, for students with a master's degree in Health Policy and Equity from York) upon Graduate Program Director approval.~~

The course requirements outlined are designed to ensure that students benefit from the interdisciplinary nature of the specialization.

## 2. Comprehensive Examinations

The comprehensive examination consists of two written papers (about 25 double-spaced pages each, excluding references) and an oral examination.

Each paper must be comprised of a concise literature review and demonstrate command of the literature.

The first paper addresses theoretical tensions and debates in health policy and equity. The second paper addresses a dissertation specific area of study and includes an overview of methods (additional 5 to 10 double-spaced pages) under consideration for the dissertation.

Generally, the two papers are completed over **8 months** under the supervision of two faculty members of the Graduate Program in Health. Affiliated faculty members may supervise one paper upon Graduate Program Director approval. The supervisor of the first paper will be the advisor of the second paper. Conversely, the supervisor of the second paper will be the advisor of the first paper. In all cases, students should have an assigned dissertation supervisor no later than their fifth term of study. The Graduate Program Director ~~will~~ assist in students finding and confirming a supervisor.

For students entering with a master's degree, the comprehensive examination will normally take place

field-specific courses from the following:

**Health 5050 3.0: Perspectives in Decision Making**  
**Health 5420 3.0: Measurement for Health Improvement**  
**Health 6XX 3.0: Machine Learning for Health**  
**Health 6XX 3.0: Health Data Visualization**

Finally, all students must complete the credit requirements corresponding to their admission category drawing from courses from the Health roster, with **up to two 3.0 credit elective courses** from another graduate program, upon Graduate Program Director approval.

Students in the Health System Management & Health Data Analytics field without a graduate level statistics course must take one as an elective.

The course requirements outlined are designed to ensure that students benefit from the interdisciplinary nature of the specialization.

## 2. Comprehensive Examinations

The comprehensive examination consists of two written papers (about 25 double-spaced pages each, excluding references) and an oral examination.

Each paper must be comprised of a concise literature review and demonstrate command of the literature.

The first paper addresses theoretical tensions / debates in **the field of study (e.g. health policy and equity or health systems management and data analytics)**. The second paper addresses a dissertation specific area of study and includes an overview of methods (additional 5-10 double-spaced pages) that the student is considering for the dissertation.

Generally, the two papers are completed over **8 months** under the supervision of two faculty members of the Graduate Program in Health. Affiliated faculty members may supervise one paper upon Graduate Program Director approval. The supervisor of the first paper will be the advisor of the second paper. Conversely, the supervisor of the second paper will be the advisor of the first paper. In all cases, students should have selected a dissertation supervisor no later than their fifth term of study. The Graduate Program Director **may** assist students **who need help** in finding and confirming a supervisor.

For students entering with a master's degree, the comprehensive examination will normally take place

in the second term of the second year (fifth term in the program). For students entering with a master's degree in Health from the Graduate Program in Health from York, the comprehensive examination will normally take place in the first term of the second year (fourth term in the program). For nonstandard entrants, the comprehensive examination will normally take place during the 3rd term of the 2nd year (6th term in the program). Under exceptional circumstances the comprehensive examination will take place later. A maximum of two substantive revisions are allowed for each paper in advance of the oral examination.

During the oral examination, students must demonstrate a comprehensive knowledge of scholarly theoretical and empirical work in the areas that were the foci of the written papers. Students will pass, pass with revisions or not pass. Students who do not pass will be permitted to retake the examination once. The reexamination will take place within three months of the date of the first examination. A second failure will result in withdrawal of the student from the program.

### 3. Dissertation

After successful completion of the comprehensive examination students will focus on the dissertation process. The dissertation must make an original contribution to scholarship in the student's specified topic. The dissertation process includes:

- The establishment of a supervisory committee. This committee will be comprised of three faculty members (generally, albeit not necessarily, members of the comprehensive examination committee), at least two of whom must be members of the Graduate Program in Health. The supervisor must be a full-time faculty member from the Graduate Program in Health. The third member may be appointed to a graduate program other than Health. In all cases a supervisory committee should be established no later than the seventh term in the program. The Graduate Program Director will assist in students forming a supervisory committee.
- The preparation of a dissertation proposal. A dissertation proposal should normally be completed within one term following the comprehensive examination. ~~Students will be expected to present their proposal at the Graduate Colloquium in Health or similar forum intended as sites to exchange ideas and present research.~~ The proposal must be approved by

in the second term of the second year (fifth term in the program). For students entering with a master's degree in Health from the Graduate Program in Health from York, the comprehensive examination will normally take place in the first term of the second year (fourth term in the program). For nonstandard entrants, the comprehensive examination will normally take place during the 3rd term of the 2nd year (6th term in the program). Under exceptional circumstances the comprehensive examination will take place later. A maximum of two substantive revisions are allowed for each paper in advance of the oral examination.

During the oral examination, students must demonstrate a comprehensive knowledge of scholarly theoretical and empirical work in the areas that were the foci of the written papers. Students will pass, pass with revisions or not pass. Students who do not pass will be permitted to retake the examination once. The re-examination will take place within three months of the date of the first examination. A second failure will result in withdrawal of the student from the program.

### 3. Dissertation

After successful completion of the comprehensive examination students will focus on the dissertation process. The dissertation must make an original contribution to scholarship in the student's specified topic. The dissertation process includes:

- The establishment of a supervisory committee. This committee will be comprised of three faculty members (generally, albeit not necessarily, members of the comprehensive examination committee), at least two of whom must be members of the Graduate Program in Health. The supervisor must be a full-time faculty member from the Graduate Program in Health. The third member may be appointed to a graduate program other than Health. In all cases a supervisory committee should be established no later than the 7th term in the program. The GPD will assist students who require help with forming a supervisory committee.
- The preparation of a dissertation proposal. A dissertation proposal should normally be completed within one term following the comprehensive examination. The proposal must be approved by the supervisory committee and all ethics approvals must be completed and approved prior to the initiation of the

the supervisory committee, the Graduate Program Director, and the Faculty of Graduate Studies prior to the initiation of the research project.

- The conduct and write up of an original research project. This will include conducting the proposed doctoral research and writing up its rationale, methodology, findings and policy and equity implications in a dissertation format acceptable to the supervisory committee and formally approved as examinable by the members of that committee.
- The oral defence. The oral defence consists of the successful completion of an oral examination addressing the dissertation research and related matters and presided over by an examining committee recommended by the Graduate Program Director for approval and appointment by the Faculty of Graduate Studies

#### PROGRAM LENGTH

The length of time required to complete the PhD is normally four years (12 terms). ~~Doctor of Philosophy~~ students must register and pay fees for a minimum of the equivalent of six terms of full-time registration. All requirements for a doctoral degree must be fulfilled within 18 terms (6 years) of registration as a full-time or part-time doctoral student in accordance with Faculty of Graduate Studies' registration policies.

research project.

- The conduct and write up of an original research project will include conducting the proposed doctoral research and writing up its rationale, methodology, findings and implications in a dissertation format (traditional or manuscript-based) acceptable to the supervisory committee and formally approved as examinable by the members of that committee.
- The oral defence. The oral defence consists of the successful completion of an oral examination addressing the dissertation research and related matters and presided over by an examining committee.

#### PROGRAM LENGTH

The length of time required to complete the PhD is normally four years (12 terms). **PhD** students must register and pay fees for a minimum of the equivalent of six terms of full-time registration. All requirements for a doctoral degree must be fulfilled within 18 terms (6 years) of registration as a full-time or part-time doctoral student in accordance with Faculty of Graduate Studies' registration policies.

March 12, 2021

Professor Liane Ginsburg,  
Interim Chair  
School of Health Policy & Management

Dear colleagues,

I am pleased to support the proposal by the School of Health Policy and Management to develop a new field in their Master of Health degree dedicated to health system management and health data analytics. It is specifically designed to appeal to those who wish to develop advanced research skills and undertake a thesis.

As noted in the Notice of Intent, the original approved proposal creating the Master of Health degree was developed with the intention of creating inter-related fields. A field in Health Policy and Equity was created and approved at the onset of the degree. The current stream appeals to individuals with interests in health policy and the use of policy as an instrument to improve health equity. Over the last 15 years, there has been an increased need to improve management practices, not only within individual healthcare provider agencies, but particularly to improve the integration and management of what is generically regarded as the “healthcare system”. A growing body of evidence now indicates that the collection of health providers and agencies thought to be part of this “system” are poorly integrated and connected. The “system” is also fundamentally ill-equipped to prevent or manage chronic conditions (e.g., heart disease, stroke, COPD including asthma, various mental health conditions, dementia, diabetes, musculoskeletal and motor control diseases) which are the greatest causes of death and disability in Canada and around the world, and the most costly to deal with. The “system” was not designed to address the broader determinants of health, morbidity, or mortality. This is problematic because research indicates less than 25% of health or illness are determined by the provision of healthcare. The recent development of advanced analytic techniques and the emergence of “systems theory” within the health sector are examples of important tools that future health system managers and researchers must be aware of and able to use.

The proposal to create a new field in Health System Management and Health Data Analytics is designed to meet an unmet demand for researchers and professionals with advanced knowledge and skills to improve the management, effectiveness, integration, and efficiency of healthcare systems. Previous structures such as regional health authorities and local health integration networks have had only modest impact because they have difficulty hiring individuals with the advanced perspectives and tools required to create and sustain systemic change. Managers within individual agencies have difficulty understanding how their organization should contribute to a larger system. The COVID pandemic and the vaccination rollout provide illustrations of these shortcomings. It also provides an illustration of why we require more researchers with specific experience in an understanding of the highly complex factors specific to health, illness, and the organization and implementation of the current healthcare system. Generic skills in management or analytics are not sufficient, particularly given that failure can quickly result in thousands of deaths, hundreds of thousands of disability life years, and billions of wasted tax dollars. Likewise, current common research models and methods employed in academia, think tanks, and health agencies involved in research have not kept pace with innovations which, in turn, inhibits our ability to fully understand the complex interaction factors, conditions and elements necessary to improve health outcomes, system integration and overall management.



Adding the current stream will assist the School of Health Policy and Management, and its graduate programs to more fully achieve their original vision and purpose. Adding the proposed field is consistent with the UAP priorities to enhance 21<sup>st</sup> Century learning, generate and apply knowledge for the future, and contribute directly to the UN SDG for good health and wellbeing. The new field will contribute to the Faculty of Health's mission to enhance human health, health equity, health care and wellbeing through world leading research, education, and strategic partnerships for the public good. Enhancing graduate programming in health system management, analytics and informatics is part of our current IRP.

The addition of a new field in health system management and data analytics will not require any additional resources. The School of Health Policy and Management was designed specifically for the purpose of improving the management of health and healthcare services. To that end, the School already has a number of highly regarded faculty members with expertise in health management and data analytics. Indeed, creation of a new field will improve our ability to recruit more students and equitably distribute graduate supervision and teaching within the School. The majority of current applicants to the program are attracted by the ability to concentrate their work in health policy and equity. Few applicants or perspective applicants are aware that current course offerings and faculty expertise are already available to provide students with skills in health management and data analytics. Conversely, our initial market analysis indicates there is a significant unmet demand for such expertise. The net effect is that the current masters program is under-subscribed relative to its potential and capacity. The creation of this new field will help highlight our existing expertise and strengths.

In short, I enthusiastically support the proposal to create a new field, with a thesis requirement, in Health System Management and Health Data Analytics aimed at enhancing human resource and agency capacity in research and evidence-generated practice.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Paul McDonald'.

Paul McDonald, PhD, FRSPH, FCAHS  
Professor and Dean

January 29<sup>th</sup>, 2021



## **New Field in Health Management and Health Data Analytics – Consultation Letter**

**FACULTY OF LIBERAL  
ARTS AND  
PROFESSIONAL  
STUDIES**

**School of Information  
Technology (SIT)**

3068 Technology Enhanced  
Learning Bldg. (Tel)  
4700 Keele St.  
Toronto ON  
Canada M3J 1P3

Fax: 416-736-5287

The School of Information Technology had a constructive and informative consultation meeting with the proponents of the *Graduate Field in Health Management and Health Data Analytics* within the Graduate Program in Health. Liane Ginsburg, Chair of the School of Health Policy & Management, and Serban Dinca Panaitescu, Associate Professor of Health Informatics presented the idea, context, rationale of the proposed field and offered us a sketch of its curricular structure.

Our graduate program, the Master of Arts in Information Systems & Technology (MAIST) is a research-based degree with a thesis option and a focus on technical, business/organizational and application aspects of Information Technology, including Data Analytics and Machine Learning. The proposed new field in the Graduate Program in Health will focus on the intersection between health data analytics and health system decision making (e.g. decisions by health care leaders, managers, and policy makers). Given the focus of the proposed program on the health domain and its strong application orientation, rather than technical orientation that MAIST takes, we see the proposed program not only as complimentary but also as a great opportunity for collaboration and mutual support in various forms.

For example:

- Our graduate students are allowed to take up to two courses from outside of our School and the courses in the proposed field provide some good options, especially for students who wish to do thesis work in the health domain. Likewise, students in the new Health Management and Health Data Analytics field who want to deepen their understanding of technical aspects of data analytics can also take one or two of their elective courses from within MAIST. Examples of such courses are *Data Visualization*, *Machine Learning*, *Advanced Web Mining*, *Advanced Information Retrieval Systems*. MAIST also has a course *Health Information Systems* that may be of interest to students of the proposed field or the program in general. These opportunities to host each other's students would service both programs, increase the interdisciplinarity of both programs, and expand the breadth of course options available to students.
- As several MAIST professors have research projects within the Health domain, there is strong potential for sharing faculty expertise on advisory / supervisory committees of graduate students in one another's graduate programs.
- When available, reciprocal teaching could be arranged between our programs.

Overall, the School of Information Technology is in support of the proposed stream and is enthusiastic with the possibilities it opens for collaboration.

Sincerely Yours,



**Sotirios Liaskos**

Associate Professor, Director  
School of Information Technology  
York University

Email: [liaskos@yorku.ca](mailto:liaskos@yorku.ca)

Tel: 416-736-2100 (x33862)



**Subject:** Masters in Health Management & Health Data Analytics  
**Date:** Monday, February 1, 2021 at 11:42:39 AM Eastern Standard Time  
**From:** Amin Mawani  
**To:** Liane R Ginsburg  
**CC:** Joseph Mapa

Dear Liane,

Joe and I support your new proposed degree program (Masters in Health Management & Health Data Analytics) and believe it is sufficiently different from our proposed new degree program.

However, we do wish to register a concern about your use of the term "management" in your degree name since many prospective students may confuse it as being a degree from Schulich.

Currently, Schulich offers eight different Master's degree programs with the term "Management" in their titles, and we are concerned that your offering of a Master's degree in Management will confuse our students.

Your description of Faculty of Health's proposed Master in Health Management & Health Data Analytics seems to indicate that we likely have a different focus, different target markets and different pedagogical approaches.

Subject to the concern about the similar names of our degree programs, we whole-heartedly welcome the cooperative interchange of faculty expertise, cross-listing of courses and the ability of students from both faculties to take a limited number of courses from the other faculty. We share common objectives of broadening students' experiences and increasing the interdisciplinarity of both programs. There is no point in reinventing the wheel if it has already been well-developed by another York faculty. Therefore, please be assured that we will mutually cooperate with your faculty colleagues and your students to ensure that both faculties have solid and sustainable degree programs for the benefit of all our respective students and faculty colleagues.

Regards,

Joseph Mapa and Amin Mawani

January 22, 2021

Liane Ginsburg  
Professor & Interim Chair  
School of Health Policy & Management  
Faculty of Health

RE: Support Statement for the proposed new field in Health Management and Health Data Analytics in the Graduate Program in Health

Dear Liane:

Thank you for connecting with me to discuss possible synergies and potential overlap between your Graduate Program in Health proposal for a new field in Health Management and Health Data Analytics and programs/initiatives I am involved with. Based on our conversation, I am happy to provide this letter of support for your proposal.

Overall, I see several complementarities as well as possible opportunities for collaboration. In terms of potential overlap with existing graduate programs offered through Lassonde, the MSc in Computer Science with a Specialization in AI is a professional Master's degree with a technical focus on AI across a variety of sectors. Based on our conversation, I understand our Program to be quite different from the proposed new field in the Graduate Program in Health, which will focus on the health system and, in particular, the intersection between health data analytics and health system decision making. Given these differences, the programs may be complimentary, but significant duplication is highly unlikely.

More relevant may be our discussion of my work co-chairing the cross-faculty Task Force on AI & Society. The Task Force defines AI broadly and considers both the technical side of AI and also the social, ethical, legal sides of AI. While the Task Force report has yet to be released, it sounds like there may be synergistic opportunities between some of the task force recommendations and your initiative in the health sector. I am thinking particularly that undergraduate degree programs in AI recommended by the Task Force may serve as pathways to your program. Also, there may be the possibility of creating joint micro-credential and certificate programs, such as a graduate certificate in AI for Health.

I look forward to continuing conversations about how Lassonde and the Task Force work on AI may align with new graduate student opportunities in Health Data Analytics spearheaded by the School of Health Policy & Management.

Best of luck with the proposal.

Sincerely,

James Elder  
Professor & York Research Chair in Human and Computer Vision  
Co-Chair, York Task Force on AI & Society  
Department of Electrical Engineering and Computer Science,  
Department of Psychology &  
Centre for Vision Research  
York University



**FACULTY OF  
SCIENCE**

**Department of  
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Statistics**

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mathstat@yorku.ca  
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10 February 2021

I met with Liane Ginsburg, Interim Chair, School of Health Policy & Management regarding the new field they are proposing in Health Management and Health Data Analytics in their Graduate Program in Health.

The conversation provided a valuable consultation and I am supportive of the new Field they are proposing to add to their Graduate Program.

In our conversation, we identified several opportunities for future collaboration:

Mathematics and Statistics is proposing a new undergraduate Major in Data Science. Many Data Science graduates will apply their knowledge through graduate work in fields other than Statistics where Data Science is applied. So this new graduate program in Health will be of great interest to those of our Data Science graduates who are interested in Health.

We also discussed opportunities for members of our departments to serve on each other's Masters and Doctoral committees from time to time – we often have students working on problems in the health sector and SHPM graduate students could benefit from the unique expertise we have on campus in areas such as Big Data.

While not related to their proposed new Graduate Program in Health, we also discussed other collaborative opportunities between our undergraduate programs – perhaps co-developing a course on data science in health or creating opportunities for minors in one another's programs. Initiatives such as these would benefit students in both programs who have a secondary interest in the other program.

We look forward to ongoing collaboration!

*Stephen Watson*

Professor Stephen Watson (he/him)  
Chair  
Department of Mathematics and Statistics  
York University

Friday, March 26, 2021 at 18:19:06 Eastern Daylight Time

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**Subject:** Confirming Space in KINE 6010 for HM PhD students

**Date:** Friday, March 26, 2021 at 11:45:57 AM Eastern Daylight Time

**From:** Chris I Ardern

**To:** Liane R Ginsburg

**CC:** Angelo Belcastro, Michael Rotondi, Stephanie Marston

Dear Liane,

Thank you for inquiring about whether it would be possible to secure one to two seats for doctoral students in your new proposed field (and health system management and health data analyTcs) in our introductory staTsTcs course (KINE 6010 – Univariate StaTsTcs). I have consulted with the course instructor and we both agree that our program should be able to accommodate this request. The content and applied components of the course (labs, examples, etc.) will, however, conTnue as currently taught as geared towards KINE students. If you let us know when the new field has been approved, we can inform the RO to hold the seats for your students.

Regards,  
Chris

Chris Ardern  
Graduate Program Director (AcTng)  
School of Kinesiology and Health Science  
York University, Toronto, ON  
[cardern@yorku.ca](mailto:cardern@yorku.ca)

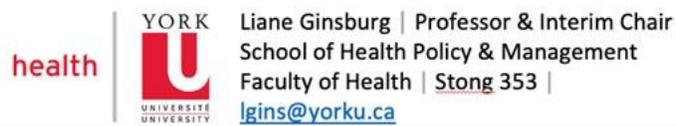
**Subject:** RE: Graduate sta-s-cs course  
**Date:** Thursday, March 18, 2021 at 12:51:04 PM Eastern Daylight Time  
**From:** David B. Flora  
**To:** Liane R Ginsburg, Suzanne E MacDonald  
**Attachments:** image001.png, image002.png

Hi Liane,  
Yes I think that's feasible.  
Cheers  
Dave

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**From:** Liane R Ginsburg <lgins@yorku.ca>  
**Sent:** March 18, 2021 11:50 AM  
**To:** David B. Flora <dflora@yorku.ca>; Suzanne E MacDonald <suzmac@yorku.ca>  
**Subject:** Re: Graduate sta-s-cs course

Thanks for this David.  
Sounds like 6131 would be really useful for our doctoral students (and interested MA students)  
Do you think it would be feasible to get a seat for 1 student (or maybe 2) in this course most years?



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**From:** "David B. Flora" <dflora@yorku.ca>  
**Date:** Tuesday, March 16, 2021 at 9:41 AM  
**To:** Suzanne E MacDonald <suzmac@yorku.ca>, Liane Ginsburg <lgins@yorku.ca>  
**Subject:** RE: Graduate sta-s-cs course

Hi Liane,  
We teach a broad range of sta-s-cs courses to grad students in psychology, but of course they focus on the methods that are most commonly used in psychological research and all of the examples, exercises, etc are based on psychology applications. That being said, of course the basic principles of applied sta-s-cs generalize across fields, although my guess is that certain topics like data mining and machine learning that we do not teach in psych may be more relevant to your program.  
Anyway, a list of our quantitative methods courses is here:  
<https://qm.info.yorku.ca/program/courses/>  
6131 and 6132 are required of all MA students in psychology, and so those are taught every year. They do tend to be full, but it might be possible to include a couple of your students. Only a small subset of the other courses are taught each year, but there's always something.  
I hope that helps!  
Dave Flora

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**From:** Suzanne E MacDonald <suzmac@yorku.ca>

**Sent:** March 15, 2021 6:05 PM

**To:** Liane R Ginsburg <[lgins@yorku.ca](mailto:lgins@yorku.ca)>; David B. Flora <[dflora@yorku.ca](mailto:dflora@yorku.ca)>

**Subject:** Fwd: Graduate sta-s-cs course

Hi Liane,

I'm not sure exactly what content you are looking for, so I have copied our Quan-ta-ve Methods area coordinator, David Flora, on this email. Dave will be able to tell you which of our courses might be appropriate for your students (thanks, Dave!).

Hope we will be able to help! All the best,

Suzanne

Dr. Suzanne MacDonald (she/her)

University Professor and Graduate Program Director

Department of Psychology

York University

4700 Keele Street

Toronto, ON M3J 1P3

Phone: 416.736.2100 x33970 or x66226

Email: [suzmac@yorku.ca](mailto:suzmac@yorku.ca)

Twiter: @YorkPsync

Website: [suzannemacdonald@mac.com](http://suzannemacdonald@mac.com)

Chair, Royal Canadian Ins-tute for Science (RCIScience.ca)

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**From:** Liane R Ginsburg <[lgins@yorku.ca](mailto:lgins@yorku.ca)>

**Sent:** March 15, 2021 4:02 PM

**To:** Jennifer A Connolly <[connolly@yorku.ca](mailto:connolly@yorku.ca)>; Angelo Belcastro <[anbelcas@yorku.ca](mailto:anbelcas@yorku.ca)>

**Subject:** Graduate sta-s-cs course

Dear Jennifer and Angelo,

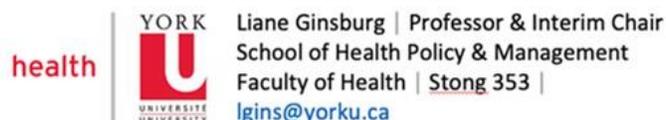
We are 95% of the way towards submiong a proposal for our new field in "Health System Management and Health Data Analy-cs" in our Graduate Program in Health.

We will have 1-2 doctoral students a year who may need to take a graduate level applied sta-s-cs course. I am guessing you have one or more stats offerings for your grad students and am wondering how I would explore whether one might be right for us and, if so, how easy or difficult it would be to secure 1-2 seats a year in such a course.

Thanks for any sugges-ons or advice you can provide.

Thanks

Liane



30 Bond Street  
250Y, 6<sup>th</sup> floor, room 648  
Toronto, ON M5B 1W8  
416-864-6060 x 77548

[info@choosingwiselycanada.org](mailto:info@choosingwiselycanada.org)  
[ChoosingWiselyCanada.org](http://ChoosingWiselyCanada.org)

Dr. Liane Ginsburg  
School of Health Policy & Management  
York University  
Toronto, Canada

February 16, 2021

Dear Dr. Ginsburg,

**Re: Graduate Program in Health – New field in Health Management and Health Data Analytics**

It is with much enthusiasm that I write this letter in support of the new field within the Graduate Program in Health in the area of Health Management and Health Data Analytics.

Choosing Wisely Canada is the national voice for reducing unnecessary tests and treatments in health care. Since 2014, Choosing Wisely Canada has worked to bridge the sizeable chasm between scientific knowledge and everyday action that drives overuse. This includes our work with professional societies to call out over 400 specific practices that should be stopped, and with provider organizations and policymakers to re-engineer systems that tend to make overuse the default.

A big part of this shift in behaviour has to be driven by data. For instance, supplying organizations and individual clinicians with analytics showing their practice patterns compared to peers has been shown in the international literature to be effective in reducing overuse. However, such innovative uses of data in decision-making have been hampered by the lack of skilled practitioners and researchers able to combine data science with behavioural and implementation science to compel desired action.

Your proposal is timely and exciting to me because of its inter-disciplinary emphasis as well as its potential bridge the chasm between data and action. I offer this proposal my strongest support.

Yours Sincerely,



Tai Huynh, MDes, MBA  
Campaign Director and Co-founder  
Choosing Wisely Canada



UNIVERSITY  
OF  
TORONTO



**Howard B. Abrams, MD, FRCPC  
Associate Professor of Medicine  
Division of General Internal Medicine**

**Director**



February 18, 2021

Graduate Program in Health

**RE: Proposed New Field in Health Management and Health Data Analytics**

As the former Division Head of General Internal Medicine, and one of the founding Directors of OpenLab at the University Health Network (UHN), it is my pleasure to write a letter of support for the Graduate Program in Health – New Field in Health Management and Data Analytics.

University Health Network is the largest academic research hospital in Canada, and rated among the top 5 hospitals in the world. Openlab is an interprofessional design and innovation group based at UHN that looks for creative solutions to important health system issues.

Health care is one of the most complex systems; it requires interprofessional collaboration to both manage and adapt to a rapidly changing environment. Acquiring accurate data and the ability to interpret it are the essential basics for evidence-based decision making.

However, understanding complex adaptive systems, organizational behaviour, and implementation science are among the other essential steps in navigating the health care space. Knowledge from organizational psychology where internal culture is impacted by professional, social and political pressures are other key elements that effect the performance of health care systems.

OpenLab not only provides solutions, but is a fertile training ground for students entering this exciting and challenging area of interprofessional study. At OpenLab, we have taken health system issues starting from idea generation, data acquisition and analysis, and moving through user experience, prototyping, story-telling, and implementation.

TORONTO GENERAL HOSPITAL, 200 ELIZABETH ST, EN 14-218, TORONTO,  
ONTARIO, M5G 2C4

TEL: (416) 340-4195 FAX: (416) 595-5826 E-MAIL:  
Howard.Abrams@uhn.on.ca

One example of this would be our PODS project (Patient Oriented Discharge Summary), now used across Ontario. It began with the problem of poor adherence to hospital discharge instructions based. Using ethnographic, data analytic, and design methods, we created a simple set of discharge instructions based on what patients told us they want to know at discharge rather than what doctors think they should know. Understanding organizational dynamics and implementation science, we developed a “community of practice” to spread this across Ontario.

Another example would be our NORC project (Naturally Occurring Retirement Community). This began with the recognition that most seniors would rather “age-in-place” rather than go to a Long Term Care Institution. There has been especially relevant during the current COVID pandemic. Using data from the City of Toronto, we mapped out areas of the GTA with high concentrations of seniors, where community development for mutual support and services could be most efficiently located. Using design methods we have developed integrated systems for mutual self-support, connected care, and social activation which are currently in the process of being implemented. Working across the sectors of private citizens, government funded services, real estate companies, and health care and home care institutions has required a deep knowledge of organizational behaviour and implementation science.

In both these examples, data analytics identified needs and opportunities. Using our other skill sets in design, organizational behaviour, and implementation science, we have been able to work creatively in the health care space while engaging with more traditional health care institutions.

UHN and OpenLab have worked with faculty members and students in the School of Health Policy & Management over the last few years on several different projects, e.g. Lifeguard, an mHealth app for creating a supportive self-care network for patients with multiple co-morbidities. In addition, as a post-doc with OpenLab, and now as Assistant Professor at York University, Dr. Appel has created a series of funded investigations studying the uses of VR (Virtual Reality) in people with cognitive impairment.

The proposed program in Health Management and Health Data Analytics is an important and innovative step in creating graduates with the type of “trans-professional” skill sets and collaborative mindsets essential for managing modern, complex health systems. We look forward to continuing to provide opportunities for collaboration, including for new graduate student research projects.

Sincerely,



Howard Abrams MD FRCPC  
Director, OpenLab  
Division of General Internal Medicine, University Health Network  
Associate Professor, Department of Medicine, University of Toronto

TORONTO GENERAL HOSPITAL, 200 ELIZABETH ST, EN 14-218, TORONTO,  
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TEL: (416) 340-4195 FAX: (416) 595-5826 E-MAIL:  
Howard.Abrams@uhn.on.ca



York University  
School of Health Policy and Management

February, 16, 2021

Dear Review Committee;

**Re: Graduate Program in Health – New field in Health Management and Health Data Analytics**

We are writing to provide our support for a new field within the School of Health Policy and Management at York University. The Alliance is a leading voice for the promotion of non-profit, community-governed, inter-professional primary health care and includes 107 community-governed primary health care organizations. These organizations are committed to health equity and supporting those facing higher social and medical complexities to good health. Alliance members are also committed to openly sharing information, tools and resources to ensure the highest quality care. All of this requires a strong understanding of data, improvement and analytics to inform decision making, consistently improve care and ensure evidence based service delivery. We exist to improve the health and wellbeing of people and communities facing barriers and feel that the training being proposed in this new field would prepare our leaders.

Within our network, we have recently endorsed a learning health system framework. Our leaders understood the importance of this pivot and believe it will have significant impact on our own work within our walls but also the health system integration work we are all involved with. In a rapidly changing health landscape, we rely on our executive leaders to understand and make decisions using data and analytics and have an understanding of implementation science to do so. Our health organizations would benefit from graduates from the proposed program because they would be equipped to maximize health analytics to support decision making and understand the power of implementation science. They would have the tools and knowledge that includes organizational behaviour, psychology combined with informatics, information management and decision science which is ideal in our environment and that we see are necessary skills for health care leaders.

Sincerely,

Jennifer Rayner, PhD  
Director, Research and Evaluation  
Alliance for Healthier Communities

750 Dundas Street W, Suite 312, Toronto, ON M6J 3S3  
Tel: (416) 603-5800 x 4015

Pauline Pariser MASc MD CCFP FCFP LM  
Co-Chair, Mid-West Toronto Ontario Health Team  
Associate Medical Director, Primary Care Lead, UHN  
Associate Professor, Department of Family and Community Medicine,  
University of Toronto.

Feb 19, 2021

Dr. Liane Ginsburg  
School of Health Policy and Management  
York University  
Toronto, Canada

**RE: Health Management and Health Data Analytics Field (Graduate Program in Health)**

I am pleased to write a letter of support for the Graduate Program in Health - New Field in Health Management and Data Analytics at York University.

To tell you a little about myself, I have practiced family medicine for over 35 years and am the founder of the Taddle Creek Family Health Team, that was recognized as Family Practice of the Year for Ontario in 2011, by the Ontario College of Family Physicians. In 2012, I was appointed Associate Medical Director at University Health Network and Primary Care Lead for SCOPE (Seamless Care Optimizing the Patient Experience), an initiative in support of solo family physicians gaining better access and integration with community and hospital services. I have held numerous leadership positions at the regional level, most recently appointed Co-chair of the Mid-West Toronto Ontario Health Team (OHT) for downtown Toronto.

In these two current roles, Primary Care Lead for SCOPE and Co-Chair for the Mid-West OHT, I cannot overemphasize the crucial role of data to guide program focus, aid in clinical decision-making and help iterate program improvements to guide effective implementation and sustainability. It has been challenging to recruit health sector human resources who can combine data analytics with health management design. The proposed Graduate Program in Health has finally recognized that it is the

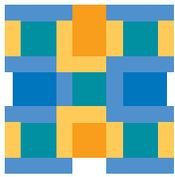
interface of informatics and organizational decision-making that is so sorely needed as we transition to virtual technology and innovative methods of patient and provider co-design to construct equitable and accessible health delivery systems. Developing this skill set with an interdisciplinary focus recognizes the current gaps that have separated information technology from implementation science.

I look forward to watching this program mature and to potentially finding positions within the organizations I steward for these leading edge practitioners.

Sincerely,  
r, ) •"

/Q.NI.,J.

Pauline Pariser MAsc MD CCFP FCFP LM



February 14, 2021

Dr. Liane Ginsburg & Dr. Leeat Granek  
School of Health Policy & Management  
Faculty of Health, Stong 353  
York University  
Toronto, ON

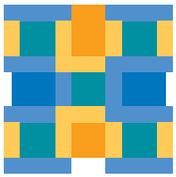
Dear Drs. Ginsburg and Granek,

Please allow this letter to serve as a statement of support for your department for the development of a new graduate program in Health Management and Health Data Analytics.

To a medical clinician leader, academic and administrator like me, the importance of having colleagues solidly grounded in the science of healthcare decision making for the development of policy and guidance for the critical decisions we make every day cannot be overstated.

Over my career, I have served as a comprehensive family physician, palliative care physician, clinical and academic lead in my field as well as having administrative responsibilities both at the hospital and community level, regional and provincial level in cancer care and palliative care, and provincial and national leadership (president) positions with our national educational College (College of Family Physicians of Canada) and most recently the Canadian Medical Association (CMA), where I have served as president and am currently immediate past-president. For example, the CMA is the Canadian medical profession's most consulted organization in Canada with regard to health policy in all areas from medical assistance in dying to Pharmacare to tobacco policies to gun control and universal health care. I have personally witnessed and experienced the sophisticated contribution of an interprofessional team of lawyers, ethicists, data analytic experts, economists, researchers, psychologists, physicians and other healthcare providers, with solid backgrounds in health management and policy development, who have provided the scientific and evidence base foundations for health clinicians and decision makers like me to have the robust discussion leading to optimal policy development for our institutions and organizations. I can unequivocally state that without this contribution, our ability to develop necessary and effective policies in so many areas would be sorely lacking.

From a medical teaching and academic point of view, the importance of understanding patient healthcare decision making is crucial to the effective, respectful, ethical, and legal management of patient care. As an Associate Professor at the University of Toronto Medical program in my field of palliative care, I regularly teach about healthcare decision making especially as our patients and families must confront crucial end of life decisions about their care. Another current example during the COVID-19 pandemic is critical care triage if our hospitals and ICUs become overwhelmed and are unable to care for all patients who require that care. This is real for me as Chair and Medical Director of a large hospital and community-based palliative care program, and I cannot imagine not having the requisite



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YORK  
GENERAL**

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[nygh.on.ca](http://nygh.on.ca)

health management consultants to guide clinician leader and administrators in these literally life and death decisions.

The bottom line here is that the development of these new graduate programs in health management and health data analytics are crucial to medical policy and clinical decision making and the teaching of the decision making processes to new clinicians. As a clinician leader I fully support the efforts of the leadership of the School of Health Policy and Management at York University to create these programs. The contribution of professionals in this field has significant and measurable impact on our ability to develop health policy and the programs we run to care for our patients and thus has a direct impact on the health of Canadians.

Yours truly,

Sandy Buchman MD CCFP (PC) FCFP  
Freeman Family Chair & Medical Director  
Freeman Centre for the Advancement of Palliative Care  
North York General Hospital, Toronto

February 11, 2021

RE: *Health Management and Health Data Analytics Field (Graduate Program in Health)*

Dear Comminee.

It is my pleasure to write a letter of support for the Graduate Program in Health - New Field in Health Management and Data Analytics. North York General has a strong and excellent relationship with York University and this program will also bring great opportunities to our organizations.

As a hospital and health care system we rely on data to make many decisions to guide patient care, hospital functions, system integration and beyond. This has been especially notable during this pandemic. Data guides these highly important discussions, decisions and outcomes. The synergy for this work is based on both health management and health informatics which aligns so well for this newly proposed program.

As a specific example and as it relates to the current pandemic, Incident Management Structures at a local hospital level, systems integration such as Critical care and overarching government decisions require the knowledge from organizational psychology and behavior along with information management to determine a course of action that has significant outcomes. The lessons learned during the course of the pandemic will be critical to future health care and system policies thus a very timely submission for this new program.

North York has successfully worked with several faculty members in the School of Health Policy & Management (e.g. Professors Ahmad, El Morr, Ginsburg) over the last few years to help us harness certain clinical and administrative to make decisions (e.g. in the context of delivering care across the continuum for heart failure patients). The proposed program can hopefully provide ongoing opportunities for collaboration, including for new graduate student research projects.

Please feel free to contact me for any further information. Wishing you success with this submission.

Stay well.

Sincerely,



Susan Woollard  
Vice President Clinical Services, Seniors Health Centre  
Chief Nursing Executive



February 7, 2021

Liane Ginsburg  
Professor and Chair  
School of Health Policy & Management  
Faculty of Health, York University  
4700 Keele Street  
Toronto, ON. M3J 1P3

**Re: Support letter for the proposed new field in Health Management & Health Data Analytics in the Graduate Program in Health at York University**

Dear Dr. Ginsburg,

Health Management and Health Data Analytics are key drivers in healthcare transformation. Moreover, Health Data is fueling the engine that allow leaders in healthcare the ability to make strategic decisions in order to ensure our health system operates efficiently. I am in full support of the proposed new area of graduate study that brings together healthcare management and health data analytics. Simply collecting data is not enough – healthcare organizations would benefit from appropriate data analytics and management in order to strategically implement actionable insights across the health system to improve quality of patient care, ensure compliance, personalize user experiences and bring about innovation. The proposed new academic area of study will ensure modern data platforms can enable critical analytics. The need for graduates at the masters and doctoral level with this kind of innovative training is required in the health sector

I am in full support of the academic vision.

Sincerely,

Jake Tran, RRT., AHLP., MSc.-CH., Ph.Dc  
President & CEO



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William and Catherine Booth  
*Founders*

Brian Peddle  
*General*

Floyd Tidd  
*Territorial Commander*

22 February 2021

Liane Ginsburg  
Professor & Interim Chair  
School of Health Policy & Management  
Faculty of Health, York University  
Toronto, Ontario

Dear Liane,

I am writing to offer support for the field of *Health Management & Data Analytics*. As you know within my longitudinal, pan Canadian, applied health services *Translating Research in Elder Care* program, we have worked for over a decade to build a robust system of measurement and data feedback in LTC. What we have discovered is that having relevant, high quality data is necessary, but woefully inadequate for change. The data and findings must be relevant to end users, i.e., about *modifiable* things they can and need to change, it must be in a useable, digestible, accessible format, it must be fed back in an appropriate systematic approach. However, even if all of those elements are in place – the managers in the system, let alone clinicians and front-line workers have no preparation in how to use it for change. They can set goals but it falls apart at action planning and implementation. These are critical skills. They also need practical, accessible ways to evaluate change. Most analytics departments are far from the point of care and do not work within a framework that values the essential importance of *clinical microsystems* as *the* place where quality is made. Hence do not attend to the people in those microsystems and their need for actionable data and an action system that supports them to use it for change.

A graduate program such as you have described to me would contribute importantly to health system improvement. It would develop knowledge and systems, prepare a generation of knowledgeable individuals equipped to work in the system for change and, over time, would have an important influence on health system improvement. Of course, the more research findings and outputs get out, the better. I certainly know that if virtual courses and perhaps physically present internships were available, my graduate students and those of others would be keen to participate. From my own experience, I am acutely aware as well, that infusing organizational behavior theory and multi-level decision making is much needed among our young scholars. The health professions do not bring this to the table generally speaking.

It is an exciting undertaking; I wish you and your department/faculty well in achieving the vision.

Sincerely yours,



Carole A Estabrooks CM, PhD, RN, FRSC, FCAHS, FAAN, FCAN  
Professor & Canada Research Chair (Tier 1)  
In Knowledge Translation  
Faculty of Nursing