DEPARTMENT OF EPIDEMIOLOGY AND BIOSTATISTICS

RESEARCH CLUSTERS

Schulich
MEDICINE & DENTISTRY

Western

Message from our Department Chair

On behalf of my colleagues, administrative staff, and students, I wish to present you with this booklet which highlights the key initiatives of our department since my appointment in October 2016 as the new Chair of Epidemiology and Biostatistics at Western University. Our department has benefited over time from the outstanding leadership and scientific caliber of prominent scholars who have preceded me as Chairs, faculty members, and affiliates. As the oldest graduate program in Epidemiology and Biostatistics in Canada, we have a history and reputation of training our students to apply methodological rigour and to critically appraise complex clinical and public health issues.

Inspired by the challenge and privilege of leading such an exceptional group of scholars and students, my major focus and commitment over the last two and a half years has been guided by four overarching goals: (1) to provide the best possible support to my colleagues so they can continue flourishing in the current challenging and competitive research environment; (2) to explore opportunities for further growth of our department as a whole, both within the Canadian context and globally; (3) to consolidate and expand collaborative networks within the Schulich School of Medicine & Dentistry, by building strategic partnerships with clinical departments, as well as fostering links across Western University, and with other academic institutions nationally and internationally; and (4) to complement our traditional educational offerings with new programs and/or partnerships at both the undergraduate and graduate level. To achieve these goals, the department held a Strategic Retreat during my first year as Chair, followed by a year long planning exercise, including several consultations and brainstorming meetings with colleagues, students and local stakeholders, in order to generate a common way forward for Epidemiology and Biostatistics at Western University.

In this booklet, we present the main outcome of this self-reflective process, specifically the development of clusters of expertise within the department, both in terms of methodological approaches and substantive areas. These clusters bring together a number of colleagues, including our core-faculty members as well as cross-appointed clinicians and other scholars working at Western and in other research entities within the local community (i.e., ICES, CAMH). The identification of clusters of expertise should maximize our success with team grant applications, in line with current funding opportunities. This clustering scheme should also help to increase our scientific visibility and inform students' decisions regarding their research areas and potential supervisors.

In closing, I sincerely hope that our department will continue to bolster and strengthen what we know to be an already outstanding research and educational environment. My continuing commitment will be to ensure a collegial and scientifically vibrant working environment, of which my colleagues, administrative staff and students can be proud.

I would like to acknowledge all of my colleagues who have participated in this process, with a special thank you to Angela DeCandido and Kimberley McCready, who have played a crucial role in the generation of this booklet, and have supported me with the utmost dedication, professionalism and patience.

Saverio Stranges, MD, PhD, FAHA
Professor & Chair
Department of Epidemiology and Biostatistics
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Aging & Life-Course Epidemiology

Group Leader: Mark Speechley, PhD

The epidemiological study of human aging originally focused on the health of older adults, typically defined as beginning at the historical retirement age of 65 years. Research was done by gerontologists under a social/behavioural science paradigm, and by geriatricians under a biomedical/patient care paradigm. Life-course epidemiology is a more recent multidisciplinary evolution, with a broadened focus on human health, illness, and function from conception to death. Most recently, interest has broadened even further to look at the role of parental and even grand-parental health on the health of offspring. Collectively, aging and life-course epidemiologists now study how aging affects the distribution and determinants of health-related states and events, comprising mortality, diseases, illnesses, syndromes, injuries, birth outcomes, and positive and negative mental health states, across the entire human life span.

Vision
To promote healthy aging across the lifespan by conducting transdisciplinary research from individuals to health systems.

Goals
1. Foster transdisciplinary and inter-paradigmatic research and program evaluation to further understanding of determinants and trajectories of aging across the lifespan.
2. Enhance integration with other local, regional and international researchers doing human-based aging-related research.
3. Investigate how health system and healthcare system approaches could be used to answer key aging and life course questions.
4. Develop metrics that capture key research outputs (e.g. number of successful manuscripts and grants)
5. Establish working groups on the basis of:
   (a) Methods (e.g. secondary analyses of population-based age-specific samples such as the Canadian Health Survey on Children and Youth, aged 1-17 years, and the Canadian Longitudinal Study on Aging, aged 40 and older)
   (b) Age-specific topics (e.g. childhood obesity vs. malnutrition in older adults)
   (c) Age-transcendent topics (e.g. violence; injuries; poverty; depression; social isolation; discrimination; health inequities; neurodegeneration)

Members
- Gutmanis, Iris
- Heisel, Marnin
- John-Baptiste, Ava
- Meyer, Matthew
- Montero-Odasso, Manuel
- Nicholson, Kathryn
- Speechley, Mark (Leader)
- Stranges, Saverio
- Wilk, Piotr
- Zou, Guangyong

Behavioural & Environmental Risk Factors

Group Leader: Piotr Wilk, PhD

A deeper understanding of modifiable risk and protective factors is imperative for the prevention of disease and injury. Adopting socio-ecological perspectives of health encourages us to assess how multiple levels of influence, such as those related to behavioural and environmental factors, affect health and disease among populations, and how these contexts are interrelated.

Behavioural risk and protective factors refer to personality traits and lifestyle factors such as dietary habits, physical (in)activity, sleep hygiene, sensation-seeking, alcohol consumption, substance use, sexual behaviours, gambling, and coping strategies. Environmental risk and protective factors encompass a broad range of factors related to socio-economic, ethno-cultural, political, and policy conditions, as well as factors related to the natural and built environment, such as neighbourhood walkability, access to parks, and local food environments. It also includes pollution from a variety of sources.

The dynamic interplay among behavioural and environmental factors adds to the complexity of addressing public health problems, requiring interdisciplinary collaborations to develop innovative, multi-pronged solutions. Smoke-free legislation is a good example of how environments can impact health behaviour. Smoking bans protect non-smokers from the dangers of passive smoking and encourage smokers to quit or to reduce consumption.

Vision
To promote population health by conducting transformative and policy-relevant research on behavioural and environmental risk factors.

Goals
1. Conduct transformative and policy-relevant epidemiological research in the area of behavioural and environmental risk factors, with a focus on the distribution of these factors across different sub-populations and geographic areas.

Members
- Elton-Marshall, Tara
- Gilliland, Jason
- Heisel, Marnin
- Koval, John
- Sarma, Sisira
- Seabrook, Jamie
- Speechley, Mark
- Stranges, Saverio
- Vingilis, Evelyn
- Wells, Samantha
- Wilk, Piotr (Leader)

Biostatistics

Group Leader: Guangyong Zou, PhD

Biostatistics is the branch of statistics, which is concerned with the proper collection, analysis and interpretation of scientific data generated in a wide range of research areas, including biomedicine, epidemiology, genomics, public health and other health sciences. Biostatistics is integral to the advancement of knowledge in these disciplines. At Western University, our biostatistical faculty has a long history of developing innovative biostatistics methodology in areas such as cluster randomization trials, assessment of reliability and agreement, regression models, and genetic epidemiology. The areas of research interest of the group members include randomized clinical trials methodology, bioinformatics, cost-effectiveness analysis, health system evaluation, machine learning, sampling, hierarchical modeling, prognostic modeling, longitudinal data analysis, meta-analysis, causal inference, statistical methods for observational studies, statistical genetics, epidemiological studies, survival analysis, and Bayesian statistics.

Vision
To improve human health by turning data into knowledge and addressing important biomedical and public health issues.

Goals
1. Develop novel statistical methods that are directly applicable to medical and health research.

2. Assist biomedical and epidemiological researchers formulate questions that can be answered by data and make decisions on how to best collect and analyze the data.

3. Educate students and researchers for proper application of statistics to address their research questions and carry out high-quality biomedical and population health research.

Members
- Ali, Shehzad
- Bauer, Greta
- Choi, Uni
- Cipriano, Lauren
- Dixon, Stephanie
- John-Baptiste, Ava
- Jones, Philip
- Karp, Igor
- Klar, Neil
- Koval, John
- Lizotte, Daniel
- Sarma, Sisira
- Zhu, Yayuan
- Zou, Guangyong (Leader)

Biostatistical & Computational Methods

Group Leader: Daniel Lizotte, PhD

Biostatistical and computational methods underpin our quantitative understanding of health. Members of our cluster develop and apply methodology for the design and analysis of trial and cohort studies to answer a wide variety of questions in challenging settings where data are difficult to obtain, complex in structure, very noisy, and very large. Our members also develop simulation techniques to help better understand the mechanisms and outcomes that impact health. The methods we develop advance knowledge in subject areas including primary care, public health, addictions and mental health, neurology, LGBTQ2+ health, and many more, by translating raw data into actionable decision support for all levels of the health care system from the clinic to public health to policy.

Vision

To develop and apply biostatistical and computational methods for cutting-edge health problems, thereby generating new knowledge and improving the health of people in Canada and globally.

Goals

1. Promote the strengths and expertise of our group both within Western and abroad.
2. Create a core team with members of the Epidemiological & Observational Studies cluster to look at problems of causality within electronic health record (EHR) data.

Members

- Bauer, Greta
- Choi, Yun-Hee
- Cipriano, Lauren
- Klar, Neil
- Lizotte, Daniel (Leader)
- Rogan, Peter
- Steven, David
- Wells, Samantha
- Zhu, Yayuan
- Zou, Guangyong

Chronic Disease & Multimorbidity

Group Leaders: Dr. Saverio Stranges and Kathryn Nicholson, PhD

The occurrence of both single and multiple chronic diseases within individuals, and more broadly in populations, have become prevalent as we move into the fourth phase of the epidemiologic transition, which is characterized by a decline in mortality rates combined with an aging population. Not only do single chronic diseases represent a threat to well-being and healthy aging for societies, but the task of preventing or managing the presence of multiple chronic diseases presents an elevated challenge.

Research must shift from a focus on single and distinct chronic diseases to examine the intersection and interplay that exists between common chronic diseases. The use of a multimorbidity framework has been present in traditionally single-disease oriented disciplines, most notably in the study of cardiovascular disease and the long-acknowledged complexity of the metabolic syndrome; however, the multimorbidity framework goes far beyond cardiovascular disease and our research is at the forefront of this expansion. To design effective public health strategies and health care systems that will prevent multimorbidity and respond to the needs of individuals living with multiple chronic diseases, more transdisciplinary research and systems science approaches are needed to tackle this complex issue.

Vision

To promote the transdisciplinary investigation on the interplay of chronic diseases and the underlying common pathways to multiple chronic diseases (that is, multimorbidity), utilizing the full spectrum from basic science to health care delivery to tackle the increasing burden of multimorbidity in aging societies.

Goals

1. Foster opportunities for transdisciplinary discussion of conceptual challenges for chronic disease and multimorbidity research, particularly in the context of non-communicable diseases and communicable diseases that now have a chronic natural history as well as the underlying factors that increase or decrease the shift from single to multiple chronic diseases, particularly within subgroups of individuals and settings.
2. Create a platform and methodology for transdisciplinary investigation into the intersection or interplay between co-occurring chronic diseases, spanning from the pathophysiology of cells, to common clinical pathways, to the impact of health care delivery and societal structure on living with chronic disease and multimorbidity, to the role of public health strategies in primary, secondary and tertiary prevention.
3. Implement state-of-the-art methodological approaches that will address the increasing amount of health survey, administrative and clinical data that are available for transdisciplinary research, particularly by maximizing these secondary data through approaches like machine learning or data linkage.
4. Articulate the outcomes and consequences of multimorbidity that are important and relevant for individuals and societies, in order to create more informed targets for intervention and improvement.

Members

- Ali, Shehzad
- Burneo, Jorge
- Campbell, M. Karen
- Cipriano, Lauren
- Clemens, Kristin
- Elton-Marshall, Tara
- Garg, Amit
- Hackam, Dan
- Harris, Stewart
- Hosseini, Seyed
- Jones, Philip
- Karp, Igor
- Lazo-Langner, Alejandro
- Lizotte, Daniel
- Louie, Alexander
- Malvankar, Monali
- Meyer, Matthew
- Moist, Louise
- Montero-Odasso, Manuel
- Mrkobrada, Marko
- Nicholson, Kathryn (Leader)
- Povitz, Marcus
- Ryan, Bridget
- Sarma, Sisira
- Sontrop, Jessica
- Speechley, Kathy
- Speechley, Mark
- Stranges, Saverio (Leader)
- Suskin, Neville
- Terry, Amanda
- Weijer, Charles
- Welk, Blayne
- Wilk, Piotr
- Zou, Guangyong
- Zwarenstein, Merrick

Clinical Epidemiology

Group Leader: Janet Martin, PharmD

Clinical epidemiology is the application of epidemiology principles and methods to the clinical setting. In short, clinical epidemiology is generally focused on applied decision-making, for the purpose of improving patient-level outcomes. Classical epidemiology is generally focused on the distribution and determinants of disease (population level), while clinical epidemiology is the application of the principles and methods of epidemiology to conduct, appraise, or apply clinical research for the purpose of improving prevention, diagnosis, prognosis, and treatment of diseases in patients. The movement toward evidence-based medicine and evidence-informed decision-making in the clinical setting and in healthcare more generally is a direct derivative of the field of clinical epidemiology.

Vision
To support advances in evidence-based medicine, evidence-informed decision making, and applied clinical research for the purpose of improving patient outcomes in real world settings.

Goals
1. Build skills and capacity in defining clinical questions, identifying relevant evidence, critically appraising evidence, applying evidence to support improved clinical decision-making and patient outcomes.
2. Develop and explore innovative methods to improve efficiency of identifying evidence, filtering evidence, assessing risk of bias, extracting information, and applying results in the clinical setting.
3. Develop and explore innovative approaches to prioritizing clinical research questions and performing meaningful clinical trials.
4. Develop approaches to minimize wasteful clinical research.
5. Develop methods to improve the timely translation of clinical evidence into real-world impact.

Members
- Bagur, Rodrigo
- Blanchette, Phillip
- Campbell, Craig
- Clemens, Kristin
- Dubois, Luc
- Garg, Amit
- Gula, Lorne
- Hachinski, Vladimir
- Harris, Stewart
- Heisel, Marnin
- Hosseini, Seyed
- Jairath, Vipul
- Jones, Philip
- Karp, Igor
- Klar, Neil
- Lazo-Langner, Alejandro
- Louie, Alexander
- MacDougall, Arlene
- Martin, Janet (Leader)
- Moist, Louise
- Montero-Odasso, Manuel
- Nicholson, Kathryn
- Qu, Melody
- Schemitsch, Emil
- Silverman, Michael
- Speechley, Mark
- Sposato, Luciano
- Stranges, Saverio
- Suskin, Neville
- Tang, Anthony
- Weir, Matthew
- Welk, Blayne

Epidemiological Observational Studies

Group Leader: Samantha Wells, PhD

The epidemiological observational studies cluster consists of a large number of investigators who study a variety of health topics using observational approaches, including cohort, case-control, cross-sectional, and repeated measures designs, to observe health determinants, health behaviours and health outcomes in clinical and general population samples. Unlike experimental research in controlled laboratory settings, observational studies involve the collection of data in natural contexts. Researchers in this cluster use administrative databases (e.g., ICES), existing health survey databases as well as investigator-led populations, community health and clinical studies to understand population health and the health determinants, including demographic, socio-economic, psychological, behavioural, environmental, and biological risk and protective factors.

Many biostatistical techniques are used by this group, including survival analyses, propensity score matching or adjustment, linear regression, logistic regression, multi-level analyses, instrumental variable analysis (e.g., Mendelian randomization studies), difference-in-differences, time series analyses as well as descriptive analyses, as appropriate depending on the sample and study design. Transdisciplinary work is also conducted in this cluster, where biological, behavioural, social, epidemiological, and biopsychosocial approaches are combined to advance knowledge and develop synergies across disciplines.

Vision
To develop and apply current and innovative observational approaches for cutting-edge health problems, thereby generating new knowledge and improving the health of people in Canada and globally.

Goals
1. Advance knowledge regarding patient and population health to improve clinical practice and public health policy.
2. Enhance methodological and biostatistical expertise to further advance scientific enquiry and enhance the impact of observational research.
3. Cultivate collaboration among established and emerging researchers to improve knowledge and expertise regarding patient and population health.
4. Use a determinants-of-health perspective, considering individual, community and societal factors affecting health.

Members
- Ali, Shehzad
- Anderson, Kelly
- Bagur, Rodrigo
- Bauer, Greta
- Blanchette, Phillip
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- Clemens, Kristin
- Dubois, Luc
- Elton-Marshall, Tara
- Garg, Amit
- Gilliland, Jason
- Gula, Lorne
- Hackam, Dan
- Harris, Stewart
- Heisel, Marnin
- Jones, Philip
- Karp, Igor
- Klar, Neil
- Lazo-Langner, Alejandro
- Montero-Odasso, Manuel
- Lizotte, Daniel
- Louie, Alexander
- Mathews, Maria
- Nicholson, Kathryn
- Prodger, Jessica
- Qu, Melody
- Rodrigues, George
- Sarma, Sisira
- Schemitsch, Emil
- Seabrook, Jamie
- Silverman, Michael
- Sontrop, Jessica
- Speechley, Kathy
- Speechley, Mark
- Sposato, Luciano
- Steven, David
- Stranges, Saverio
- Suskin, Neville
- Vingilis, Evelyn
- Weir, Matthew
- Welk, Blayne
- Wells, Samantha (Leader)
- Wilk, Piotr
- Zaric, Greg
- Zou, Guangyong

Evidence Synthesis & Health Technology Assessment

Group Leader: Janet Martin, PharmD

Research growth and the related exponential rate of accumulation of publications have escalated the need for effective and efficient methods to synthesize the evidence base. The ultimate goal of evidence synthesis should be to produce timely and transparent knowledge that meets the needs of decision-makers in health and healthcare. Decision-makers include patients, providers (ie, healthcare providers who recommend drugs and other technologies for prevention, diagnosis, prognosis, treatment, and monitoring of disease), policymakers (governments and health administrators who decide which drugs, technologies, and health programs will be funded), and researchers (who need to understand the evidence base, and its gaps, in order to design research to address remaining gaps).

Systematic review and meta-analysis (SR/MA) are recognized methodologies for synthesizing the evidence base. Accepted methodologies for synthesizing evidence for patient-level or population-level benefits and risks have been significantly expanded to include additional considerations such as assessment of economic impacts, equity considerations, socio-legal-ethical implications, and other contextual issues through a combination of qualitative and quantitative methods.

Health technology assessment (HTA) is a closely related field that combines evidence synthesis with policy and contextual implications for 'technologies' broadly defined as drugs, devices, medical/surgical procedures, and programs of care, or any combination of these. HTA has been formally defined as "systematic evaluation of the properties and effects of a health technology addressing the direct and intended effects of this technology, as well as its indirect and unintended consequences, ad aimed mainly at informing decision making regarding health technologies. HTA is conducted by interdisciplinary groups that use explicit analytical frameworks drawing on a variety of methods." (www.inahta.org)

A number of innovative methodologies have been proposed to address statistical and other non-statistical quandaries of evidence synthesis and HTA. For example, pairwise meta-analysis has expanded to include indirect comparisons and network meta-analysis; estimation and interpretation of heterogeneity and meta-regression have expanded to include issues of contextual analysis; improvements in conveying results through data visualizations and decision-friendly summaries. Furthermore, a number of innovations have been proposed to improve the efficiency of systematic review, meta-analysis, and HTA through artificial intelligence and machine learning to expedite the time-intensive steps of identifying and filtering relevant evidence, assessing risk of bias, and extracting data.

Vision
To support advances in evidence synthesis and health technology assessment for the purpose of improving health and health care outcomes both locally and globally.

Goals
1. Build skills and capacity to support effective and efficient systematic reviews, meta-analyses, and HTAs to inform clinically-relevant and policy-relevant questions for local or global contexts.
2. Develop and explore innovative methods to improve efficiency of identifying evidence, filtering evidence, assessing risk of bias, extracting information, and synthesizing results.
3. Develop and explore innovative approaches to contextualizing the evidence and communicating the implications of the results of evidence synthesis and HTA's
4. Develop methods to improve decision-maker relevance and real-world impact.

Members
- Ali, Shehzad
- Anderson, Kelly
- Bagur, Rodrigo
- Cipriano, Lauren
- Dubois, Luc
- Garg, Amit
- Guaiana, Giuseppe
- Gula, Lorne
- Hackam, Dan
- Heisel, Marnin
- Hodge, William
- Jairath, Vipul
- Jones, Philip
- Kothari, Anita
- Lazo-Langner, Alejandro
- Louie, Alexander
- Malvankar, Monali
- Martin, Janet (Leader)
- Meyer, Matthew
- Montero-Odasso, Manuel
- Qu, Melody
- Rodrigues, George
- Schemitsch, Emil
- Stranges, Saverio
- Tang, Anthony

Global Health

Group Leader: Tara Elton-Marshall, PhD

Global health has been defined as the study of health issues across transnational boundaries with the ultimate goal of improving health and well-being and achieving health equity for all populations. Global health is interdisciplinary and uses both population and individual level approaches.

Vision
To foster transdisciplinary research to tackle health inequalities, from individuals and local communities to health systems and global settings.

Goals
1. Improve lives for all individuals, with a specific focus on more disadvantaged and marginalized population subgroups.
2. Address systematic factors that impact health globally, and addressing transnational health risks. This includes examining heterogeneity in health risks for disadvantaged, at-risk, and vulnerable groups globally and locally (including refugees, migrants, and low socioeconomic status).
3. Incorporate successful evidence-based strategies from low and middle-income countries that can be adopted in Canada and other developed countries.

Members
- Ali, Shehzad
- Burneo, Jorge
- Elton-Marshall, Tara (Leader)
- Heisel, Marnin
- MacDougall, Arlene
- Martin, Janet
- Meyer, Matthew
- Prodger, Jessica
- Stranges, Saverio
- Thind, Amardeep
- Weijer, Charles
- Zwarenstein, Merrick

Health Economics

Group Leader: Sisira Sarma, PhD

Health Economics addresses how individuals and societies choose to allocate scarce productive resources among alternative uses for health promotion, disease prevention, health maintenance and health improvement, as well as the considerations of equity in the distribution of access to health care services and equity in the distribution of health outcomes. Members of this cluster are engaged in studying the role of incentives, behaviours of health care providers and patients, health system characteristics, health services institutions, and evaluation of health technology and policies that influence health of the individuals and populations, including marginalized populations. Using a variety of mathematical and statistical techniques, members of this cluster research on theoretical models, empirical evaluation of theoretical insights, cost-effectiveness analyses, value of information analyses, and comparative effectiveness analyses to inform policy decisions from a variety of perspectives.

Vision
To improve clinical and population health outcomes in a cost-effective manner.

Goals
1. Undertake innovative and policy-relevant health economics research that will generate publications in the world's leading Health Economics, Health Policy, Health Care Management, and Epidemiological and Clinical journals.
2. Train the new generation of undergraduate, graduate and post-doctoral trainees interested in cutting-edge health economics and economic evaluation research.
3. Advance methodological research in the field of health economics by drawing new insights from Economic Theory, Econometrics, Statistics, Epidemiology, Biostatistics, Management Science, Computer Science, and Life Sciences.
4. Contribute to national and international policy decision making through knowledge translation and exchange activities.

Members
- Ali, Shehzad
- Cipriano, Lauren
- Louie, Alexander
- Malvankar, Monali
- Martin, Janet
- Meyer, Matthew
- Qu, Melody
- Sarma, Sisira (Leader)
- Zaric, Greg

Health Services Research

Group Leader: Amanda Terry, PhD

The Canadian Institutes of Health Research defines health services research in the following way:

"...a multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviours affect access to health care, the quality and cost of health care, and, ultimately, Canadians' health and well-being." (www.cihr-irsc.gc.ca/e/48809.html)

The members of the Health Services Research Cluster in the Department of Epidemiology and Biostatistics at Western University are committed to achieving the goal of improving the health and well-being of Canadians through their research efforts. Together, the cluster members have a wide breadth of experience in research approaches including: randomized trials (particularly pragmatic and cluster trials); qualitative research; social network analysis; mixed methods research; systematic reviews; population-based cohort studies; analysis of health administrative data; time series analysis; computer modeling; and decision analytic modeling.

The cluster is characterized by its work in:
- Supporting learning health system approaches which integrate research into care delivery
- Promoting collaboration in research among laypersons (including patients), practitioners, researchers and policy-makers
- Achieving excellence in the development and application of methodologic approaches to health services research
- Fostering interdisciplinary and inter-professional approaches in conducting research
- Harnessing the diverse expertise and methodologic knowledge of our cluster members, across areas of focus, interests, and disciplines.

Vision
To advance informative health services research to promote health care and health system improvement nationally and internationally.

Goals
1. Facilitate the sharing of expertise, resources, and data relevant to health services research.
2. Develop a critical mass of researchers focused on health services research.
3. Become a leader in selected approaches to conducting health services research, e.g. cluster trials using routinely collected data.
4. Enhance collaborative research relationships amongst health services researchers within the Department of Epidemiology and Biostatistics, and to further establish collaborations with researchers outside of the Department.

Members
- Ali, Shehzad
- Anderson, Kelly
- Bagur, Rodrigo
- Bauer, Greta
- Blanchette, Phillip
- Cipriano, Lauren
- Clemens, Kristin
- Garg, Amit
- Gilliland, Jason
- Gula, Lorne
- Hackam, Dan
- Harris, Stewart
- Heisel, Marnin
- Jairath, Vipul
- Jones, Philip
- Kothari, Anita
- Lazo-Langner, Alejandro
- Louie, Alexander
- MacDougall, Arlene
- Malvankar, Monali
- Martin, Janet
- Mathews, Maria
- Meyer, Matthew
- Moist, Louise
- Nicholson, Kathryn
- Qu, Melody
- Rodrigues, George
- Sarma, Sisira
- Schemitsch, Emil
- Speechley, Mark
- Suskin, Neville
- Tang, Anthony
- Terry, Amanda (Leader)
- Vingilis, Evelyn
- Welk, Blayne
- Wells, Samantha
- Wilk, Piotr
- Zaric, Greg
- Zwarenstein, Merrick

Knowledge Translation

Group Leader: Matthew Meyer, PhD

Knowledge Translation (KT) in health research has been defined in a variety of ways and is often used synonymously with terms such as "Knowledge to Action" or the diffusion, dissemination, uptake, transfer, implementation, mobilization, translation, and/or exchange of knowledge. In general, these terms describe a process where individuals obtain knowledge and then use it in their health-related activities and practices. With this in mind, our department recognizes the definition adopted by the Canadian Institutes of Health Research:

"A dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of Canadians, provide more effective health services and products, and strengthen the health care system." (Graham, Straus, Tetroe. CIHR 2013)

We also recognize that knowledge is not an objective construct that can be separated from those who produce and apply it. Effective Knowledge Translation activities engage relevant stakeholder groups (patients/families, clinicians, policymakers, researchers, private healthcare organizations etc.) in all stages of knowledge creation and dissemination. We feel that to be successful, Knowledge Translation strategies in health research must be inclusive, participatory and collaborative, with the goal of positively influencing patient outcomes, health system performance, population health, and/or societal outcomes.

Vision

To promote a department that **values and enacts the process of knowledge translation** through the development of local KT expertise, collaboration with and engagement of relevant stakeholder groups, and creation of infrastructure and networks to support KT activities locally and around the globe.

Goals

1. Build a community of practice among faculty and students interested in the science of knowledge translation.
2. Foster partnerships with KT experts from other departments across Western University.
3. Develop strength in the area of integrated knowledge translation (co-produced research) to generate and apply practice-based research.
4. Build capacity among faculty to carry out effective knowledge translation strategies.
5. Ensure students have a strong foundation in knowledge translation theory and practice.
6. Partner with stakeholders wherever possible to understand their knowledge needs and ensure information is shared appropriately.
7. Build infrastructure for Knowledge Translation work, including support for developing the necessary resources (e.g. web site development, report writing, user-friendly infographics).

Members

- Bauer, Greta
- Dubois, Luc
- Garg, Amit
- Gilliland, Jason
- Hachinski, Vladimir
- Harris, Stewart
- Heisel, Marnin
- Kothari, Anita
- Louie, Alexander
- Martin, Janet
- Meyer, Matthew (Leader)
- Montero-Odasso, Manuel
- Rodrigues, George
- Schemitsch, Emil
- Speechley, Mark
- Stranges, Saverio
- Suskin, Neville
- Tang, Anthony
- Vingilis, Evelyn
- Wells, Samantha
- Zwarenstein, Merrick

Marginalized Populations & Social Determinants of Health

Group Leader: Greta Bauer, PhD

Social determinants of health include individual and contextual factors regarding one's place in society that influence the health of both individuals and populations. They include determinants that represent social status or position, such as gender, ethnoracial background, immigration history, and disability, as well as determinants that represent access to income and other resources such as employment and housing. In a context of inequality related to individual and structural discrimination, social marginalization, and colonialism, some groups experience exclusion from full and meaningful participation in public life and access to the resources needed to maintain health.

At Western University, we study social and economic marginalization and health inequalities between and within populations locally, nationally, and globally, in order to guide improvements in equity for health or health services. We also develop, adapt, and apply methods to better study both specific social determinants and the processes that generate inequity. Areas of research interest for group members include the health of populations that experience marginalization, including immigrants and refugees, sexual and gender minorities, Indigenous peoples, people living in poverty, and those living with mental illnesses, chronic diseases, or disabilities. In conjunction with our academic and community partners, we study a wide range of outcomes, such as access to medical and mental health services, gambling behaviour, substance use, preterm birth, cardiovascular health, and mental health and well-being.

Vision

To enhance our understanding of the role of social determinants of health and the processes underlying health inequalities in the general population and among subgroups experiencing marginalization.

Goals

1. Study social marginalization and health inequalities between and within populations, in order to guide improvements in equity for health or health services.
2. Support the development and application of epidemiological and biostatistical methods to health and social equity problems.
3. Build networks for collaboration and knowledge translation across academic, government and community sectors.

Members

- Ali, Shehzad
- Anderson, Kelly
- Bauer, Greta (Leader)
- Cipriano, Lauren
- Elton-Marshall, Tara
- Gilliland, Jason
- Harris, Stewart
- Heisel, Marnin
- Kothari, Anita
- MacDougall, Arlene
- Meyer, Matthew
- Sarma, Sisira
- Seabrook, Jamie
- Speechley, Kathy
- Stranges, Saverio
- Thind, Amardeep
- Weijer, Charles
- Wells, Samantha
- Wilk, Piotr

Mental Health & Addictions

Group Leader: Kelly Anderson, PhD

Mental and substance use disorders have been ranked in the top five leading contributors to the global burden of disease. More locally, the burden of mental and substance-use disorders in Ontario is greater than that of all cancers and infectious diseases combined. Researchers in the mental health and addictions cluster are committed to the investigation of a broad spectrum of mental health and addiction. Our research includes population and public health, clinical, and health services perspectives. From a population and public health perspective, we study the distribution of, and risk and protective factors for mental and addiction disorders to inform mental health promotion and prevention.

From a clinical perspective, we study physical and psychiatric outcomes of people with mental disorders, and develop interventions aimed at improving treatment and recovery from mental illness. From a health services perspective, we study issues related to access, organization, and delivery of mental health and addiction services, as well as the cross-sectoral intersection of mental and substance use disorders, such as with the education or criminal justice system.

Research in this cluster is focused on mental disorders and mental well-being across the life course, from childhood to old age, as well as high-risk and marginalized populations, such as migrant and ethnic minority groups, Indigenous Peoples, individuals with low socio-economic status, and LGTBQ2 groups. We study these issues from local, national, and international perspectives.

Vision
To promote the transdisciplinary and cross-sectoral investigation of mental and substance use disorders and positive mental health – including population and public health, clinical outcomes, and health services research – to tackle the high burden of mental disorders globally.

Goals
1. Create a platform that fosters transdisciplinary and cross-sectoral collaboration in mental health research, engaging community, service-provider, and academic partners, as well as people with lived experience of mental illness and their family members.
2. Generate research that identifies disparities in risk and protective factors, access to care, and long term outcomes among people with mental illness, as well as determinants of mental well-being, with an aim of increasing health equity.
3. Develop and test innovative screening, prevention, treatment, and recovery-oriented interventions for mental disorders.
4. Engage in community outreach and knowledge translation initiatives surrounding our work to improve community stakeholder and knowledge user uptake of research and build community capacity for improving mental health services.
5. Foster discussion around the creation and enhancement of epidemiological and biostatistical methods that advance the study of mental health and addictions.

Members
- Ali, Shehzad
- Anderson, Kelly (Leader)
- Bauer, Greta
- Elton-Marshall, Tara
- Guaiana, Giuseppe
- Gutmanis, Iris
- Heisel, Marnin
- MacDougall, Arlene
- Meyer, Matthew
- Speechley, Kathy
- Stranges, Saverio
- Vingilis, Evelyn
- Wells, Samantha
- Zou, Guangyong

Program & Policy Evaluation

Group Leader: Evelyn Vingilis, PhD

Evaluation is the systematic assessment of an operation and/or the outcomes of a program, service, policy, treatment, or activity, applying scientific procedures to accumulate reliable and valid evidence on the manner and extent to which specified activities produce particular effects or outcomes. There are different epistemological paradigms, theories of evaluation and different approaches within these theories. Members of this cluster have used post-positivist and constructivist paradigms and counterfactual and generative causal inference paradigms. Members of this cluster have used different approaches, such as Utilization-focussed, Experimental/quasi-experimental, Participatory and Theory-driven approaches, both in the conduct of actual evaluations and in the development of evaluation theory and methods.

Program evaluations are conducted at several stages during a program's lifetime (Rossi, Lipsey & Freeman 2004). Members of this cluster have conducted evaluations within all stages: needs assessment; assessment of program design and logic/theory; process (implementation) evaluation; assessment of the program's outcome or impact and assessment of the program's cost and efficiency.

Vision
To develop, advance and apply appropriate research approaches and techniques to the evaluation of health-related interventions in order to garner new knowledge and improve the health and well-being of people in Canada and abroad.

Goals
1. Use appropriate approaches to ask relevant questions to understand the value and worth of health-related programs, services, policies, treatments, or activities.
2. Follow ethical principles while carrying out evaluation research and work.
3. Advance scholarship in program evaluation theory and methodology.
4. Generate scholarship that has impact, leading to improved health-related programs, services and policies and ultimately health gains.

Members
- Ali, Shehzad
- Cipriano, Lauren
- Elton-Marshall, Tara
- Garg, Amit
- Gilliland, Jason
- Harris, Stewart
- Heisel, Marnin
- Kothari, Anita
- MacDougall, Arlene
- Martin, Janet
- Meyer, Matthew
- Sarma, Sisira
- Schemitsch, Emil
- Speechley, Kathy
- Stranges, Saverio
- Suskin, Neville
- Vingilis, Evelyn (Leader)
- Wells, Samantha
- Zaric, Greg

Randomized Controlled Trials

Group Leader: Merrick Zwarenstein, PhD

Since the first randomized controlled trial (RCT) was published in the BMJ in 1948 about half a million RCTs have been published globally, and it has become the preeminent method in the health sciences for deciding whether a treatment or other health intervention works better than alternative treatments. Its use has spread across all health professions, and it is now common that guidelines in surgery, medicine, primary care, public health, nursing, physiotherapy and many other professions are based on evidence obtained from RCTs, and especially systematic reviews of RCTs. The use of RCTs has spread widely, such as into the field of economic development, where many anti-poverty strategies in low and middle income countries are tested using RCTs.

The reason that RCTs have taken such a front row place in evaluation is simple: this is the only evaluation design which minimizes threats to internal validity (bias) through the design itself. This is because the act of randomization tends to allocate the participants in each arm of the trial so that all arms have a similar distribution of factors that may influence outcome aside from the intervention itself. Some of these factors, such as severity of illness, or age, or other accompanying illnesses are well understood, and could conceivably be balanced even in a non-randomized study. But many factors that influence the outcome of illness are not known, and the astonishing thing about RCTs is that these unknown confounders also tend to be balanced by randomization, and thus their threat to validity of the conclusion tends to be minimized.

Western has a proud history and continuing record of contributing to the development of the RCT design, with many thousands of citations of our seminal papers and foundational book on Cluster Randomization (randomization of groups) and our papers on Pragmatic Trials (RCTs aiming at making a direct inference of the preferred intervention). We are also working on new approaches to integrating cluster randomized trials of policy into the delivery of care and individually randomized RCTs of clinical treatment options into usual health care.

Vision
To promote transdisciplinary collaboration on the design and conduct of RCTs, in order to strengthen the method and increase our understanding of how and when to use it; to increase the capacity of researchers to conduct randomized trials and to widen the use of RCT designs at Western, in Canada and globally.

Goals
1. Create a platform that fosters transdisciplinary collaboration in RCT design within our department and beyond, engaging researchers, service-provider, students and other partners, as well as people with lived experience as participation in RCTs.
2. Generate epidemiological and biostatistical research that identifies strengths and weaknesses of different design choices for RCTs.
3. Develop and test innovative approaches to design and conduct of RCTs.
4. Engage in teaching, community outreach and knowledge translation initiatives to promote student, clinician, policy maker, community, researcher and funder uptake of RCT designs for evaluation of interventions - e.g. promote new designs for RCTs with CIHR to improve their Innovative Clinical Trials (ICT) funding system.

Members
- Blanchette, Phillip
- Campbell, Craig
- Dixon, Stephanie
- Garg, Amit
- Gula, Lorne
- Hachinski, Vladimir
- Harris, Stewart
- Heisel, Marnin
- Jairath, Vipul
- Jones, Philip
- Karp, Igor
- Klar, Neil
- Lazo-Langner, Alejandro
- Louie, Alexander
- Martin, Janet
- Montero-Odasso, Manuel
- Qu, Melody
- Rodrigues, George
- Schemitsch, Emil
- Silverman, Michael
- Sontrop, Jessica
- Sposato, Luciano
- Stranges, Saverio
- Suskin, Neville
- Tang, Anthony
- Weijer, Charles
- Weir, Matthew
- Zou, Guangyong
- Zwarenstein, Merrick (Leader)

Faculty Listing

Base Complement

Alcock, Danielle	Assistant Professor	Epidemiology and Biostatistics
Ali, Shehzad	Associate Professor	Epidemiology and Biostatistics
Anderson, Kelly	Assistant Professor	Epidemiology and Biostatistics
Bauer, Greta	Professor	Epidemiology and Biostatistics
Campbell, M. Karen	Professor	Epidemiology and Biostatistics
Choi, Yun-Hee	Associate Professor	Epidemiology and Biostatistics
Karp, Igor	Associate Professor	Epidemiology and Biostatistics
Klar, Neil	Associate Professor	Epidemiology and Biostatistics
Lizotte, Daniel	Assistant Professor	Computer Science/Epidemiology and Biostatistics
Sarma, Sisira	Associate Professor	Epidemiology and Biostatistics
Speechley, Mark	Professor	Epidemiology and Biostatistics
Stranges, Saverio	Professor & Chair	Epidemiology and Biostatistics
Thind, Amardeep	Professor	Epidemiology and Biostatistics/Family Medicine
Wilk, Piotr	Associate Professor	Epidemiology and Biostatistics
Zhu, Yayuan	Assistant Professor	Epidemiology and Biostatistics
Zou, Guangyong	Professor	Epidemiology and Biostatistics

Basic Scientists in a Clinical Department

Heisel, Marnin	Associate Professor	Psychiatry
John-Baptiste, Ava	Assistant Professor	Anesthesia & Perioperative Medicine
Malvankar, Monali	Assistant Professor	Ophthalmology
Martin, Janet	Associate Professor	Anesthesia & Perioperative Medicine
Mathews, Maria	Professor	Family Medicine
Ryan, Bridget	Assistant Professor	Family Medicine
Speechley, Kathy	Professor	Paediatrics
Terry, Amanda	Assistant Professor	Family Medicine
Vingilis, Evelyn	Professor	Family Medicine
Zwarenstein, Merrick	Professor	Family Medicine

Professors Emeritus

Donner, Allan	Professor Emeritus	Epidemiology and Biostatistics
Koval, John	Professor Emeritus	Epidemiology and Biostatistics

Faculty Listing

Cross Appointed Faculty

Azarpazhooh, Reza	Associate Professor	Clinical Neurological Sciences
Bagur, Rodrigo	Assistant Professor	Medicine
Begen, Mehmet	Assistant Professor	Richard Ivey School of Business
Blanchette, Phillip	Assistant Professor	Oncology
Burneo, Jorge	Professor	Clinical Neurological Sciences
Campbell, Craig	Associate Professor	Paediatrics
Cipriano, Lauren	Assistant Professor	Richard Ivey School of Business
Clemens, Kristin	Assistant Professor	Medicine
Daley, Mark	Associate Professor	Computer Science
daSilva, Orlando	Professor	Paediatrics
Dubois, Luc	Assistant Professor	Surgery
Feagan, Brian	Professor	Medicine
Frisbee, Stephanie	Assistant Professor	Pathology and Laboratory Medicine
Garcia-Bournissen, Facundo	Associate Professor	Paediatrics
Garg, Amit	Professor	Medicine
Garg, Pallav	Assistant Professor	Medicine
Gilliland, Jason	Professor	Geography
Guaiana, Giuseppe	Associate Professor	Psychiatry
Gula, Lorne	Professor	Medicine
Hachinski, Vladimir	Professor	Clinical Neurological Sciences
Hackam, Daniel	Associate Professor	Medicine
Harris, Stewart	Professor	Family Medicine
Hodge, William	Professor	Ophthalmology
Hunter, Susan	Associate Professor	Health Sciences
Jain, Arsh	Assistant Professor	Medicine
Jairath, Vipul	Assistant Professor	Medicine
Jones, Philip	Associate Professor	Anesthesia & Perioperative Medicine
Kothari, Anita	Associate Professor	Health Sciences
Lazo-Langner, Alejandro	Assistant Professor	Medicine
Louzada, Martha	Associate Professor	Medicine
MacDougall, Arlene	Assistant Professor	Psychiatry
Moist, Louise	Professor	Medicine
Montero-Odasso, Manuel	Professor	Medicine
Mrkobrada, Marko	Assistant Professor	Medicine

Poonai, Naveen	Associate Professor	Paediatrics
Pope, Janet	Professor	Medicine
Prodger, Jessica	Assistant Professor	Microbiology & Immunology
Qu, Melody	Assistant Professor	Oncology
Rodrigues, George	Associate Professor	Oncology
Schemitsch, Emil	Professor	Surgery
Silverman, Michael	Associate Professor	Medicine
Sposato, Luciano	Associate Professor	Clinical Neurological Sciences
Steven, David	Associate Professor	Clinical Neurological Sciences
Suskin, Neville	Associate Professor	Medicine
Tang, Anthony	Professor	Medicine
Weijer, Charles	Professor	Philosophy
Welk, Blayne	Associate Professor	Surgery
Zaric, Gregory	Associate Professor	Richard Ivey School of Business

Adjunct Faculty

Berg, Selinda	Assistant Professor	University of Windsor
Coleman, Brenda	Adjunct Associate Professor	University of Toronto
Dixon, Stephanie	Assistant Research Professor	London Kidney Clinical Research Unit
El-Masri, Maher	Research Professor	University of Windsor
Elton-Marshall, Tara	Assistant Professor	Centre for Addiction and Mental Health
Gutmanis, Iris	Assistant Professor	St. Joseph's Health Care London
Louie, Alexander	Assistant Professor	Sunnybrook Hospital
Macnab, Jennifer	Assistant Professor	JNR Consulting Inc.
Meyer, Matthew	Assistant Research Professor	London Health Sciences Centre
Nicholson, Kathryn	Assistant Research Professor	McMaster University
Seabrook, Jamie	Associate Professor	Brescia University College
Shoukri, Mohamed	Professor	Department of Epidemiology and Biostatistics
Some, Nibene	Adjunct Assistant Professor	Centre for Addiction and Mental Health
Sontrop, Jessica	Assistant Professor	London Kidney Clinical Research Unit
Warshawsky, Bryna	Professor	Public Health Ontario
Wells, Samantha	Associate Professor	Centre for Addiction and Mental Health