Proposed Project:
Development of a methodology to predicting incidents and injuries related to consumer products and cosmetics

Background/context:
The Surveillance and Triage Unit (STU) of Health Canada provides data analysis and interpretation services to the Consumer Product Safety Program in support of health and safety activities related to consumer products and cosmetics. As such, ongoing post-marketing surveillance of potential safety hazards forms a critical part of our function. The overall objective of this project is to enhance our surveillance capacity through identifying new methodology necessary to strengthening post-market surveillance of consumer products and cosmetics.

Approach:
While input from the students is welcomed, we envision that the project will require the following steps:
1. Review of the literature on post-marketing surveillance approaches;
2. Review of the literature on signal detection and prediction modelling methodology;
3. Review and assess appropriateness of traditional data holdings (e.g, incident reports, emergency department visits, etc) as well as public data sources (e.g., social media, product reviews, user behaviours, and marketshare/sales data etc.) for post-marketing surveillance applications;
4. Develop a predictive model to identify potential hazards based on literature reviews (items #1 and 2) and available data (item #3); and,
5. Prepare presentation and manuscript for peer-review publication.

Proposed Team:
The Student team will consist of 3 t o4 students from the MSc HSTP program. Ideally the students will have some experience with conducting literature review, analyses of databases, and statistical training in public health.

Duration:
The project will require 18 months to complete, starting September 2019.

Accommodations:
The project can be conducted/implemented at Carleton University. Weekly updates will be conducted via teleconference and will convene in-person meetings as required.

Canadian Atlas of Rural Health Inequality

The objective of this project is to develop an interactive web-based mapping tool to better understand the health conditions and challenges for rural Canada. This project will build on initial work completed in Maritimes and initially broaden coverage to include Ontario within an online health atlas interface. The output will be an interactive, web-based mapping tool that describes measures of health status, health service use, and the social determinants of health across small geographic areas, enabling health care stakeholders to understand and respond to the health care challenges. There is a particular focus in this project health inequalities, where both absolute and relative measures are presented.
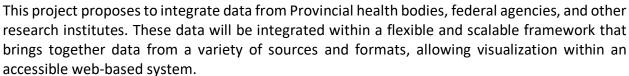
The objective of this project is to build capacity for a cross-provincial comparative perspective that provides opportunities to investigate the health impacts of different health care resource allocations, social support systems and health outcomes. This will allow rural regions and health care system decision makers to have a stronger evidence base for identifying health gaps and needs and promising directions for policy development. This information platform will improve the capacity for learning and collaboration across geographic areas to improve the health outcomes of rural Canadians and address systemic inequalities in health services delivery and in health outcomes.

Various agencies across Canada produce a wide variety of useful and informative health indicators relevant to the determinants of health. While some of these are being disseminated online, there is no publicly-accessible application where a broad range of data on health determinants and outcomes for rural communities can be visualized, compared, and accessed.

This project proposes to integrate data from Provincial health bodies, federal agencies, and other research institutes. These data will be integrated within a flexible and scalable framework that brings together data from a variety of sources and formats, allowing visualization within an accessible web-based system.

This project is seeking up to 3 individuals who have interest in understanding the determinants of health, data analytics, and health geography. The project will build upon existing web-based health atlas applications to develop a rural-specific atlas of health. Activities will include identification of available data sources, specification of indicators, calculation of measures, and development of a web-based atlas application. Throughout this process, students will consult with individuals residing in rural communities, rural health professionals, and regional health planners who utilise these data.

Supervisor: Dr. Kristin Connor, Department of Health Sciences, Carleton University
External Partners / Co-Supervisors: Dr. Tim Van Mieghem, Obstetrics and Gynaecology, Maternal Fetal Medicine, Mount Sinai Hospital, Toronto; Dr. Amanda MacFarlane, Nutrition Research Division, Health Canada.

The maternal microbiome as a target for the prevention of fetal spina bifida

PROJECT SUMMARY

Spina bifida is one of the most common birth defects. There is extensive evidence that the micronutrients folate and vitamin B12 are key players in the development of spina bifida. The gut microbiome produces these vitamins, but there are no studies investigating the link between the gut microbiome and folate or B12 levels in pregnancy, or its links with fetal spina bifida development. This project will determine how the maternal gut microbiome differs between healthy pregnancies and those complicated by fetal spina bifida, and how it is related to micronutrient status. It will provide a unique multidisciplinary training platform for 1 to 2 students, who will be exposed to clinical and lab research, engage with clinical/government experts, hone knowledge translation (KT) skills, and produce KT outputs (e.g. infographics, brief reports, scientific manuscripts for publication) for patient engagement and dissemination to the public, policymakers, researchers and health care workers.

APPROACH

In a matched case-control study we will compare pregnant women carrying a fetus with spina bifida to women carrying a healthy fetus.

The student(s) will:
1. Analyse microbiome and clinical data from patients, and perform dietary recall analysis from detailed questionnaires, to gain a more complete insight into microbial and micronutrient physiology, and to identify new biomarkers for pregnancies at high-risk of fetal spina bifida.

2. Develop a patient engagement plan and knowledge translation activities to:
- generate awareness about the impact of spina bifida on families and society and about current prevention strategies
- generate interest in new strategies to decrease the incidence and burden of spina bifida
- impart knowledge generated form our research findings to patients and their families, health care workers, researchers, and public health and policy stakeholders

STUDENT REQUIREMENTS AND OUTPUTS

Interest in maternal-child/early life health, data analysis, and risk prediction are assets to the project. Students interested in this project *must* show evidence of a strong background biostatistics, bioinformatics, and/or epidemiology, and ideally have experience analysing genetic datasets (even better: working with microbiome data). To assess your statistical analysis experience, in your application indicate what software, packages, and methods you have used, and on what populations (these could be human or from animal models). Ideally, students will also have had some experience in wet-lab research, to understand the entire bedside-to-bench-to-data pipeline. Students must have excellent writing and communications skills. Students lacking these skills/experiences should make a case for their suitability for the project despite these gaps.

Over the course of the project (2019-2021), it is anticipated that the minimum outcomes of the project will be the production of a manuscript for publication and other KT and patient engagement outputs (e.g. infographics, brief reports) for dissemination to patients/families, the public, policymakers, and health care workers.

Student Project Proposal
Master of Science in Health: Science, Technology and Policy
Carleton University, Ottawa, Canada

Proposed Project:
Prospective cohort study examining the efficacy of arthrodistension on pain and function in shoulder adhesive capsulitis.

Objective:
The objective of this study is to determine if arthrodistension is effective in improving range of motion and function and decreasing pain in adult patients with shoulder adhesive capsulitis (frozen shoulder).

Background:
Adhesive capsulitis or frozen shoulder is a condition that causes significant decreased range of motion in the shoulder. Conservative management, including rest, physiotherapy and time is the current accepted treatment for adhesive capsulitis. Time to healing can be as long as 1-2 years. Arthrodistension – distension of the shoulder capsule with normal saline – is a proposed treatment option to accelerate the process of improving range of motion in the shoulder. This procedure is done regularly at the Carleton Sport Medicine Clinic

Research Project Components:
1. Review of literature on arthrodistension in the treatment of adhesive capsulitis
2. Protocol development for best procedure protocol (based on #1)
3. Protocol for study design evaluating the efficacy of the procedure protocol
4. Research Ethics Board application and approval for study
5. Recruit patients into study, data collection, data analysis
6. Prepare pilot study manuscript for peer-review publication

Proposed Team:
The student team will consist of 3-4 students from the MSc HTSP program. Ideally, the students will have some experience with conducting literature review, REB applications and statistical methods.

Duration:
The project will require 18-20 months to complete.

Logistics: Patient recruitment would be conducted at the Carleton Sport Medicine Clinic and possible other affiliated clinics in Ottawa

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Student Project Proposal
Master of Science in Health: Science, Technology and Policy
Carleton University, Ottawa, Canada
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Proposed Project:
Predicting post-concussive problems in adults.

Objective:
The objective of this study is to determine if prolonged post concussive symptoms can be predicted based on certain criteria and features at initial concussion assessment in adults.

Background:
Persistent post concussive symptoms (> 1 month) are present in 15% of adult patients suffering a concussion. These can include physical symptoms (e.g., headache or dizziness), cognitive symptoms (e.g., difficulty concentrating or feeling in a fog), emotional symptoms or behavioral symptoms. Consequences may include missed work, depressed mood, loss of social and physical activities, and lower quality of life. A persistent post concussion symptom risk score has been created and validated in the pediatric population to help predict risk of developing persistent symptoms when assessing a concussion within 48 hrs of the injury. The aim is to determine if similar factors are present in the adult population to allow for risk stratification.

Research Project Components:
1. Reviews of literature on post concussion syndrome & comparable study done in pediatric population
2. Protocol development (work on this already started)
3. Research Ethics Board application and approval for study
4. Recruit patients into study, data collection, data analysis
5. Prepare pilot study manuscript for peer-review publication

Proposed Team:
The student team will consist of 3-4 students from the MSc HTSP program. Ideally, the students will have some experience with conducting literature review, REB applications and statistical methods.

Duration:
The project will require 18-20 months to start data collection.

Logistics: Patient recruitment would be conducted at the Carleton Sport Medicine Clinic and possible other affiliated clinics in Ottawa

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Student Project Proposal
Master of Science in Health: Science, Technology and Policy
Carleton University, Ottawa, Canada

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Proposed Project:
Randomized, double-blind, placebo-controlled, multi-center study of the efficacy of low intensity pulsed ultrasound on stress fracture healing

Objective:
The objective of this study is to determine if low intensity pulsed ultrasound is effective in decreasing time to clinical healing of adult tibial and metatarsal stress fractures versus placebo.

Background:
Stress fractures are partial or complete fractures of bone caused by the bone's inability to adapt to repetitive, rhythmic stress applied at subfracture threshold force. Up to 10% of injuries seen in sports medicine clinics are classified as stress fractures. Conservative management, including rest, cessation of repetitive activity that caused the injury and alternative exercise and cross training to maintain fitness, is the current accepted treatment for stress fractures. Time to fracture healing is usually around 8-12 weeks but can take up to as long as 6 months for some anatomic locations. There is currently no proven treatment that accelerates the repair of stress fractures. Low-intensity pulsed ultrasound therapy (LIPUS) has been proposed as a possible treatment to enhance stress fracture healing and bone remodeling. Despite the limited research on LIPUS efficacy in stress fracture healing, there have been many positive results of ultrasound therapy on fresh, complete fractures and non-unions.

Research Project Components:
1. Review of literature on LIPUS in acute, non union and stress fractures (some work in this area has already been completed)
2. Protocol development for study design (some work in this area has already been completed)
3. Research Ethics Board application and approval for study
4. Liase with device companies for equipment
5. Prepare grant application(s) for additional funding
6. Recruit patients into study, data collection, data analysis
7. Prepare pilot study manuscript for peer-review publication

Proposed Team:
The student team will consist of 3-4 students from the MSc HTSP program. Ideally, the students will have some experience with conducting literature review, REB applications and statistical methods.

Duration:
The project will require 18-20 months to complete pilot study data.

Logistics: Patient recruitment would be conducted at the Carleton Sport Medicine Clinic and possible other affiliated clinics in Ottawa

Trauma-informed Physical Activity for Pregnant and Parenting Women

Attention to physical activity is often a low priority within health promotion and illness prevention efforts with highly marginalized populations. Yet, we know that physical activity can be an extremely cost-effective intervention and have profound effects on health and healing. Physical activity may be especially important for pregnant and parenting women who are highly marginalized, who are known to be a greater risk of negative health outcomes.

Through community based participatory action research, this project aims to leverage physical activity to improve the quality of life and community social cohesion for pregnant and/or parenting women who experience multiple forms of marginalization. Community partners will be Ottawa based organizations that serve pregnant and parenting women.

This proposed project will assess perceived barriers and benefits of physical activity for women, and co-establish strategies/directions to support the community in a culturally safe and trauma-informed manner. If community partners identify a need, we will create programming and work to improve access to, and use of, resources to support women in being physically active. The aim is to concurrently address community identified barriers to physical activity and develop practical tools for organizations to enhance programs and experiences for women. Addressing individual and systemic challenges may support women in being physically active, create greater social cohesion, and improve health and overall quality of life for pregnant and parenting women and their children in Ottawa.

Up to 4 HSTP students will be involved in all aspects of the research and will garner skills to collaborate with community members, learn to respond to community identified needs, contribute to an environmental scan, conduct focus groups and interviews, and support the development of programming and resources. This work will focus on knowledge translation through the adaptation and creation of trauma informed resources.

Background Requirements: This project focuses on physical activity, thus additional consideration given to individuals with human kinetics education or personal training experience (but not required).