Summer 2017 Practicum Abstracts

MPH Epidemiology students conduct placements at a variety of organizations and on a variety of topics. Below you will find a selection of practicum abstracts from summer 2017 practica. Students have provided their consent to share these abstracts, which were submitted to the DLSPH as a part of their final practicum package. The structure of the abstract varies depending on the amount of information that could be shared by the student and the student's preferences in format.

S.A.
Epidemiology and Surveillance Unit, Manitoba Health, Seniors and Active Living

I found my own practicum at Manitoba Health, Seniors and Active Living (MHSAL) in Winnipeg, Manitoba. MHSAL is the government body in charge of provincial health insurance, population health interventions and certain health organizations such as the provincial laboratory. As part of the Epidemiology and Surveillance Unit I took part in a variety of work related to sexually transmitted and blood borne infections (STBBIs). My main projects were contributing to the provincial annual sexually transmitted infections report (which focused on gonorrhea, chlamydia, and syphilis) and the provincial annual HIV report. Secondary projects included doing data entry, making infographics for the STIs and providing writing support and background statistics on STBBIs for a report by the Manitoba Harm Reduction Network. As part of my projects I also undertook a variety of data validation and data reconciliation work prior to analysing data. This practicum allowed me to put into practice concepts learned in class and improve my writing skills for broad audiences. It also allowed me to understand more of how government works and how public health work gets completed in a governmental context. Overall it was a very good experience.

R.L.
Infection Prevention and Control Unit, Public Health Ontario

The objective of this placement was to determine whether the discontinuation of vancomycin-resistant enterococcus (VRE) screening and isolation practices is associated with higher incidence of health care-associated Clostridium difficile infections (CDI) among acute care hospitals in Ontario. The overall sample of this project included 178 hospitals in Ontario that report Clostridium difficile cases and outbreaks, with known VRE screening status. Statistical analysis was restricted to 24 acute teaching hospitals. The results of this project showed that 31 acute care hospitals had discontinued screening and isolation practices at some point during January 2011 to July 2015. Among only the acute teaching hospitals, 10 hospitals changed VRE control practices in June 2012 followed by three individual hospitals in later in the study period and 11 hospitals kept VRE control practices, which were used as the control. Generalized estimating equation binomial regressions were used to test for significant changes in slope of incidence rate ratios of CDI cases before and after the discontinuation of VRE

screening and isolation. In the ceased screening cohort, the incidence rate ratio for C. difficile cases was 0.84 before the change and 0.91 after the change, which showed a 1.07 slope change, p=0.15 (95% CI: 0.97-1.20). In the screening cohort, the incidence rate ratio for C. difficile cases was 0.92 before the change and 0.91 after the change, which showed minimal slope change of 1.00, p=0.96 (95% CI: 0.81-1.22). The conclusion of this project was that the incidence rate of C. difficile cases did not change after VRE screening and isolation practice ended. This is the first study to examine this association and more evidence will be required to inform about value of VRE screening and isolation practices for C. difficile prevention.

D.L.
The Faculty of Kinesiology & Physical Education, University of Toronto

Sports-related concussion is a significant public health issue given the growing emphasis on physical activity, exercise, and recreational pursuits. Despite the growing evidence supporting aerobic activity post-concussion, a paucity of research has evaluated the optimal time to initiate aerobic exercise following acute concussion. The objective of this study is to investigate the relationship between the time to initiation of aerobic exercise following acute concussion and the time to full return to sport and school or work. A retrospective survival analysis of acute (<14 days) physician diagnosed concussion presenting to an academic sports medicine clinic was utilized. The main exposure variable was time (days) to initiation of aerobic exercise post-concussion. The main outcome variables were time (days) to full return to sport and school or work. A total of 144 acute concussions (median [IQR] age, 17 (6.0) years; 83 (57.6%) males) were included in this study. Multivariate Cox regression models identified time to aerobic exercise as the strongest predictor of faster return to sport and school or work. Exposure to aerobic exercise within 24 hours of injury was associated with the fastest return to school and school or work. Initiating aerobic exercise at 2 and 7 days following injury was associated with a respective 19.8% (HR, 0.80; 95% CI, 0.71-0.91) and 72.8% (HR, 0.27; 95% CI, 0.13-0.55, p <0.001) reduced probability of faster full return to sport; and a 44.8% (HR, 0.55; 95% CI, 0.35-0.86, p=0.001) and 97.0% (HR, 0.03; 95% CI, 0.002-0.40) reduced probability of faster full return to school/work. Aerobic exercise was the strongest predictor of faster full return to sport and school or work. The earlier the initiation of aerobic exercise the faster the recovery, with the fastest recovery observed for individuals exposed to aerobic exercise within 1 day of the injury.

R.L.
Applied Immunization and Evaluation Unit, Public Health Ontario

I completed my practicum with the Applied Immunization Research and Evaluation (AIRE) team at Public Health Ontario (PHO). PHO is a crown agency that works to provide the scientific and technical advice that shapes policies and practices in Ontario. The AIRE team is a cross-cutting, interdisciplinary team that works specifically on interdisciplinary, policy-relevant research to guide immunization programs in the Province. Throughout my practicum I worked

on three main projects; a manuscript on the seroepidemiology of varicella in Ontario, between 2013-2014, an environmental scan for Public Health Agency of Canada on research to policy pathways around immunization decision-making and contributed to a technical report for Provincial Infectious Disease Advisory Community on Immunization on maternal pertussis immunization during pregnancy. The diverse range of projects, in conjunction with the great learning opportunities at PHO, allowed me to improve my understanding of sampling procedures, study designs and vaccine preventable infectious diseases, specifically varicella. I was able to hone my data analysis skills on real data sets and gain a better understanding of the public health governance structures and institutions in Ontario, and specifically the pathway between evidence-based research to policy implementation around vaccinations. I further had the opportunity to compile and assess economic evaluations on pertussis immunization during pregnancy. Overall the practicum exposed me to the diverse areas in public health, gave me the opportunity to expanded my knowledge, specifically in infectious disease and seroepidemiology and strengthen my core competencies in public health.

E.B.
Population Health Analytics Laboratory, at the Dalla Lana School of Public Health

My practicum placement took place within the Dalla Lana School of Public Health, supervised by Dr. Laura Rosella. I worked with the Population Health Analytics Laboratory as part of the OPTIMISE research program, a multidisciplinary effort to investigate trends in Ontario mortality and inform health system decision-making.

The goal of my practicum project was to create a report, the Ontario Atlas of Mortality, 1992-2014, which describes adult mortality trends in Ontario Local Health Integration Networks (LHINs). The atlas uses data from ORG-D, a vital statistics databased linked to socioeconomic and demographic data at ICES. Between 1992 and 2014, 1,869,560 deaths were linked and mapped. The findings will be presented to health system leaders in the fall to inform future health system planning.

My placement was a phenomenal experience. I gained expertise using SAS and ArcGIS, and presenting complex quantitative data in form accessible to users. I will be continuing my work with the Population Health Analytics Lab this fall, conducting a regression-based spatial analysis of mortality trends at a sub-LHIN level.

A.R.
Institute for Work and Health

IWH has provided an opportunity for me to learn about determinants of health in a work context, through two projects: (1) an analytical project that involved conducting statistical inference on psychometric data from a sample of Canadian workers, and (2) participating in a systematic review relating to the risk of workplace injury or death for workers using CNS drugs. Outside of these two projects, IWH provided an opportunity to learn about a breadth of topics through weekly plenaries, where staff would present on current research within the field of

work and health. IWH also offered workshops to develop specific skills, including systematic review methods and knowledge transfer exchange. Overall, my experience at IWH has allowed me to build upon the skills learned during the first year of the MPH Epidemiology program and apply them to research in the field of work and health.

J.W.
Krembil Research Institute, Toronto Western Hospital

For my practicum I worked at the Krembil Research Institute at Toronto Western Hospital (TWH) in the Health Care and Outcomes Research group. My project was to utilize data from the Longitudinal Evaluation in the Arthritis Program (LEAP) study, ongoing at TWH, to analyze the association between self-reported and performance-based function, and whether this association differs by demographic variables, such as age and sex, health status, experience of pain, and mental health, in a clinical population with osteoarthritis (OA). My major responsibilities were: (1) carry out a literature review on the use of self-reported and performance-based measures in clinical populations, including OA, and what factors may influence these measures and their association; (2) clean clinical and self-reported data and transform into variables for model building; (3) build a regression model, in R, to examine the contribution of performance-based scores to self-reported scores, and consider the additional contribution of other factors to explaining variation in patient-based scores; and (4) draft a manuscript for peer-reviewed publication and prepare an oral presentation of my research findings. My practicum placement provided me with the opportunity to work alongside knowledgeable and helpful research staff to carry out my project. I gained skills in critical evaluation and synthesis of scientific literature, responsible use and handling of data, effective use of the statistical software R to carry out data cleaning and multivariable hypothesis testing analyses, and effective scientific communication skills through oral and written presentations of my findings.

H.H.
Infectious Disease Epidemiology Research Unit, Mount Sinai Hospital

Influenza immunization rates of Health Care Workers (HCW) in acute care facilities are well below the recommended national targets. An under-immunized health care workforce can put patients and staff at an increased risk for influenza infection, facilitating outbreaks in healthcare institutions. Therefore, this study aims to understand which predictors are indicators of vaccine uptake to help inform targeted approaches to workplace immunization programs, thus improving vaccination rates among HCWs and protecting patients as well as staff against seasonal influenza.

Cross-sectional surveys were collected from a sample of HCWs for 4 influenza seasons (2010/11, 2011/12, 2012/13, 2013/14) to obtain demographic/household characteristics, brief medical histories as well as occupational, behavioral and community risk factors for influenza. This data was then used to conduct a generalized estimating equations logistic regression

analysis to determine which predictors were associated with increased vaccine uptake in the current influenza season.

The results of this study showed that HCWs previously immunized every season in the past 3 years had the highest odds of vaccination uptake in the current season (OR=134.51, 95% CI 88.84-203.65, p<0.001). Nurses had the lowest odds of vaccination uptake compared to physicians (OR= 5.67, 95% CI 2.12-15.20, p=0.001) and administrative staff (OR= 1.90, 95% CI 1.44-2.50, p<0.001). HCWs identifying as black had lower odds of uptake compared to European/Caucasian HCWs (OR=0.44, 95% 0.26-0.75, p=0.002).

The conclusions of this study were that those not previously vaccinated, nurses and individuals identifying as black had the lowest odds of vaccination uptake. Immunization programs should implement multi-targeted approaches to address concerns of these groups to improve vaccination rates.

J.M.
Healthcare Associated Infections Unit, Public Health Agency of Canada

For my practicum, I worked with the Healthcare Associated Infections team at the Public Health Agency of Canada (PHAC). I worked on two main projects; the first was a surveillance project examining the incidence and response to Mycobacterium chimaera infections associated with heater cooler devices using the Canadian Nosocomial Infection Surveillance Program (CNISP). This project required the completion of descriptive analysis, formulation of a summary report, and the development of an abstract for submission to an international conference (ID Week). The second project involved an environmental scan and needs assessment for the revision of PHAC's 2002 guideline Prevention and Control of Occupational Infections in Health Care. The environmental scan involved searching for and examining provincial, territorial, national, and international guidelines and standards relating to occupational infections in healthcare. Literature obtained was then used develop a summary report and multiple comparison tables examining the main infection prevention and control components of an occupational health program. A needs assessment was concurrently disseminated to stakeholders nationwide for completion. I contributed to the development of the needs assessment questionnaire, and am currently in the process of analyzing and preparing a summary report based on the findings. Throughout this practicum, I gained experience using statistical software such as SAS, enhanced my appraisal and writing skills, and attended numerous learning opportunities such as seminars and meetings to gain a better understanding of the respective healthcare roles at the Federal and Provincial/Territorial levels in Canadian public health.

A.C.
Environmental and Occupational Health Unit, Public Health Ontario

Over the course of fifteen weeks with the Environmental and Occupational Health group at Public Health Ontario, I had the opportunity to work on multiple projects responding to their

clients, including the Ministry of Health and Long Term Care (MOHLTC), Chief Medical Officer of Health (CMOH), Ministry of the Environment and Climate Change (MOECC), Ministry of Labour (MOL), the University of Toronto, Toronto's various hospital networks, as well as five of Ontario's thirty-six local public health units. I was able to improve my writing skills by preparing evidence briefs, educational materials, and a manuscript. My main project, a systematic review of the occupational health outcomes for wildland firefighters, was completed during the placement and is now being finalized for publication. By completing this, I was able to improve my research skills, complete data extraction and analysis of health outcomes, and learn about the publication process and selection of a journal for press. Furthermore, I had the opportunity to present the findings of this review to a working group for Occupational Health which included the Ministry of Labour, Institute for Work and Health, Public Health Ontario, and hospital networks. Public Health Ontario provided a well-supported learning environment with exposure to many health-systems partners and opportunity to work on many interesting and relevant projects.

M.P.
Urology Department, Hospital for Sick Children (SickKids)

Bladder and Bowel Dysfunction (BBD) is all too common in the pediatric population. Although BBD can usually be treated conservatively with basic bladder retraining and constipation management, it is often unrecognized as a multifaceted entity and is undertreated by primary care providers. We are currently seeing a growing number of BBD patients who are referred to pediatric urologists, where BBD alone encompasses an estimated 40% of pediatric urology consults. This leads to an excessive number of avoidable referrals, delays in booking visits, unnecessary ordered tests and overall compromised patient care. We aim to optimize the management of BBD by community pediatricians to decrease the number of urology visits and wait times by 50% over 6 months. To do this, we will: (1) Identify barriers preventing BBD care by pediatricians and (2) assess the impact on care from a pediatric BBD Network (BBDN), where children with BBD who are referred to the urology clinic in a single quaternary centre are re-referred to a network of community pediatricians closer to home with the support of the urology division.

As a practicum student, I was responsible for manually entering patient information, collected using a series of forms during initial and follow-up clinic visits, into a data capturing system (REDCap). I then analyzed the data using statistical software and reported results to the principle investigator. From there, I drafted manuscript suitable for publication in a scholarly journal with the help of the research team.

A.A.
Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada

In Canada, HIV/AIDS is a nationally notifiable disease. The national notification system is voluntary and receives cases reported through provincial or territorial departments of health.

The Surveillance and Epidemiology Division (SED) within the Centre for Communicable Diseases and Infection Control (CCDIC) with the Public Health Agency of Canada (PHAC) uses this data to publish findings in the form of surveillance reports that describe the epidemiology of HIV and AIDS in Canada. This is done through the identification of trends by geographic location, sex, age group, exposure category and race/ethnicity. HIV and AIDS surveillance and the presentation of epidemiological findings are critical in understanding the ways in which HIV and AIDS affect a given population, with the goal of improving the health status of infected individuals. In Canada, Indigenous people are over-represented in the HIV epidemic. Therefore, an independent project examining the demographic characteristics and risk factor distribution of HIV cases between these vulnerable populations was conducted as part of my practicum with PHAC. Working on the reports and project allowed me to develop critical thinking skills related to infectious diseases and knowledge about the health status of the Canadian population with respect to HIV and AIDS. I also gained the ability to analyze surveillance information to determine appropriate implications, uses, gaps and limitations, and contribute to team and organizational learning in order to advance public health goals. Completing my practicum with PHAC has exposed me to the skillsets involved in practicing public health and provided me with a better understanding of the challenges that accompany surveillance and infectious disease data.

F.B.
Surveillance and Epidemiology Division, Public Health Agency of Canada

My practicum placement was at the Public Health Agency of Canada (PHAC) under the supervision of Dr. Minh T. Do within the Surveillance and Epidemiology Division of the Health Promotion and Chronic Disease Prevention Branch. The primary project was an examination of concussion/mild traumatic brain injury (mTBI) trends in Canada using the Canadian Primary Care Sentinel Surveillance Network database. The objective was to explore ICD-9 based case definitions and to evaluate the feasibility of using this database for surveillance of epidemiologic trends of mTBI cases in Canada. Data was extracted from the database using an identified ICD-9 Case definition and a Poisson regression was performed to analyze temporal trends. Results were presented as an Average Annual Percent Change. Prevalence ratios were also calculated to examine age and sex trends. A secondary project was also pursued that involved the examination of injuries between rural and urban settings. This project required the analysis of eCHIRPP data and the calculation of proportionate injury ratios to compare rural and urban injuries. Both projects have resulted in the draft of reports with the potential of a manuscript for publication. This practicum experience had many learning opportunities and allowed me to build skills in statistical analysis using SAS, interpretation of results, and written communication.

D.F.
Centre for Global Health Research

Pneumonia and diarrhoea are the leading causes of premature death in children worldwide, and India contributes the largest share of this burden. In light of the Millennium Development Goals, improvements in sanitation, clean drinking water, and access to medicine have seen mortality declines for these diseases. However, greater understanding is now needed regarding the disparate etiologies of disease such as respiratory syncytial virus pneumonia and rotavirus diarrhoea. In this project, we use nationally representative verbal autopsy data from the Million Death Study to describe mortality trends for these two diseases. Specifically, we conducted a time series analysis to describe seasonal patterns and geographic differences of pneumonia and diarrhoea. Between 2005 and 2013, both diseases declined by nearly half among children aged 1 month to 14 years, though the mortality burden is subject to extreme seasonal variation. Both diseases peak twice yearly, with significant winter peaks for pneumonia and summer peaks for diarrhoea. Children under age 1 carry significantly greater pneumonia burden in the winter, indicative of respiratory syncytial virus. Similarly, children under age 5 exhibit greater diarrhoea risk, indicative of rotavirus. We also show substantial geographic disparities, and identify a unique summer pneumonia peak in the climate region containing the states of Uttar Pradesh and Bihar. This suggests a pneumonia etiology that is unique to this region. Our results will help to inform public health policy as vaccines are introduced to the national immunization program. Moreover, our findings of regional differences reinforce the need for greater surveillance of disease etiologies.

A.C.
Peter Gilgan Centre for Research and Learning, SickKids

I completed my 16-week practicum placement at the Peter Gilgan Centre for Research and Learning (PGCRL), in the department of Child Health Evaluative Sciences (CHES). Our team is currently in the process of developing, validating and implementing the Instrument for Reporting Planned Endpoints in Clinical Trials (InsPECT). InsPECT is a reporting guideline created to promote clarity and transparency of outcome reporting, facilitating the synthesis of evidence across clinical trials. This project is of particular importance in eliminating research waste, which arises when trials report outcomes inconsistently. I joined the team during the early stages of the development phase, and was responsible for contributing to the testing and refinement of InsPECT. For the testing process, my responsibilities included performing a literature review to identify articles within disease areas of interest, screening the results of my review and applying InsPECT to the selected material in order to test checklist items and examine the quality of published literature. For the refinement process, I was responsible for meeting with clinical trial methodologists and knowledge users to obtain their input on potential guideline revisions and improvements. In addition to these duties, I was also able to contribute to knowledge translation projects, such as creating an InsPECT web page outlining our team's research goals and activities. During this placement, I applied the knowledge obtained from my epidemiological studies in a number of ways, including my training in the design and conduct of systematic reviews and my knowledge of SAS software. Overall, I have

found this to be a highly enriching and positive experience, and would recommend this placement to any student with an interest in clinical research and knowledge translation.

D.W.
Krembil Research Institute, Toronto Western Hospital

I completed my summer practicum at the Krembil Research Institute at Toronto Western Hospital. The goals of my project were to measure the association between performance-based physical function and self-reported physical function in a representative population-based sample and assess whether this relationship was influenced by other demographic, psychosocial, or health related variables. I began my practicum by conducting a literature review in which I familiarized myself with the breadth of health outcome research that analyzed and compared self-reported and performance-based measures of functional ability. This literature review not only helped me better understand the research area but also formed the basis of the introduction of my final paper. Following this literature review, I began to analyze population-level data from the Canadian Longitudinal Study of Aging (CLSA). I conducted my analysis using R and in the early stages was required clean the dataset and transform numerous variables so that they could be used for modelling. I then conducted various descriptive analyses using the cleaned dataset and then ran a multivariate logistic regression to ultimately address my research questions. Following the analysis, I drafted a manuscript-style report intended for eventual submission to a peer-reviewed journal. I also created a poster for presentation at a scientific conference. Overall, my experience at Krembil was a great learning experience that I believe will be valuable to my career moving forward.

J.A.
Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital

Acetaminophen is the painkiller of choice among pregnant women, and while considered safer than aspirin and ibuprofen, some researchers have found associations between its use and the development of attention deficit hyperactivity disorder, negative neurodevelopmental outcomes including autism spectrum disorder, asthma, and male fertility issues. Preterm birth and low birthweight are both leading causes of neonatal morbidity and mortality, and predictors of later adverse developmental outcomes. The relationship between acetaminophen use pre-conception and during the first two trimesters pregnancy has not been previously explored in the Canadian population. This study aims to explore this relationship among members of the Ontario Birth Study, a pregnancy and birth cohort. Baseline and antenatal clinical data, as well as data on lifestyle factors was gathered from 1232 participants of the Ontario Birth Study. Associations between maternal acetaminophen use and risk of low birthweight, preterm birth, and small for gestational age. The results showed that acetaminophen use in the three months before pregnancy was associated with higher odds of the baby being small for gestational age; OR 1.695, 95% CI (1.147, 2.505). No other statistically significant associations were found. This study addresses a gap in the literature regarding the effect of acetaminophen use on birth outcomes, and provides preliminary data for further

analysis of early childhood neurodevelopment.

A.M.
Peter Gilgan Centre for Research and Learning, SickKids

It is widely acknowledged that the quality of how outcomes are reported in literature, particularly clinical trials, is important for researchers and stakeholders to replicate and/or make informed decisions based on research findings. Despite this acknowledgement, there is currently no standard guideline for outcome reporting in clinical trials and outcome quality remains poor. The main objective of my practicum experience at the Peter Gilgan Centre for Research and Learning was to play a role in the development of InsPECT, an Instrument for reporting Planned Endpoints in Clinical Trials (CT). The goal of InsPECT is to reduce research waste and facilitate better outcome reporting across all CT study designs. By doing so, the InsPECT checklist can ultimately help improve the utility of results that clinical trials provide and enable better decision making for health care providers. The research objectives for the InsPECT project include: developing literature reviews in specific disease areas to collect evidence on the reporting of outcomes in CTs; validating outcome reporting areas to include in the InsPECT guideline via Delphi survey procedures and empirical reliability/validity testing of the preliminary checklist within clinical trials of specific disease areas; and implementing the final checklist via publications, conference presentations, and following an integrated knowledge translation (iKT) plan. My practicum responsibilities included formulating search strategies and conducting literature reviews for multiple disease areas, designing and maintaining an online database for data collection, working in a collaborative group environment to develop a preliminary InsPECT checklist, and conducting iKT strategies to receive feedback and engage knowledge users throughout the development of InsPECT. Currently, a preliminary InsPECT checklist has been developed and we are working with an international team that includes reporting guideline developers, CT experts, and journal editors to refine and adapt the checklist and improve its adherence and usability among the broader research community.

D.D.
Association of Ontario Midwives

An epidemiology practicum experience was obtained at the Association of Ontario Midwives, within the Clinical Practice Guidelines program. The student was involved in epidemiological and statistical analysis of Better Outcomes Registry & Network (BORN) midwifery data and in primary research related to quality of midwifery data entry into the BORN Information System (BIS). BORN data was extracted from the BIS and used to update an annual infographic for 2015 fiscal year, a knowledge translation resource for midwives and clients of midwifery care. Primary research including key informant interviews regarding midwifery data entry into the BIS, allowed for qualitative analysis that informed the development of the BIS survey for midwives. Epidemiologic analysis and critical appraisal was applied to research summaries wherein GRADE methodology was utilized to assess risk of bias

in clinical outcomes relevant to midwifery care. An environmental scan on decision aids in maternity care, along with assistance in the development of a literature search strategy and subsequent title/abstract screening for a rapid review, informed the student's knowledge of midwifery care and scope of practice. Core skills in public health sciences were developed in this practicum, including epidemiological research methods, partnership/collaboration, professional communication and knowledge of health promotion/policy in applied health.

A.S.
Population Council

My MPH placement with Population Council (Nigeria) allowed me to utilize my newly developed epidemiological skills by providing research support to projects in two key areas: Reproductive Health and HIV Strategies for Key Populations.

In Reproductive Health, I analyzed data from a groundbreaking landscape analysis of pre-eclampsia/eclampsia in Nigeria and developed a first-author manuscript on the quality of antenatal care provided across the country. I found that despite high ratings of satisfaction among patients, quality of antenatal care is low and significant gaps exist in infrastructure, drug availability, and provider knowledge. These challenges are even greater in Primary Health Centers (PHCs) as opposed with hospitals. In HIV Strategies for Key Populations, I collaborated with a group of "key opinion leaders" in a community of Men who have Sex with Men (MSM), to develop and implement protocols for studying the feasibility of HIV self-test kits in this high-risk population. I also travelled to Lagos, Nigeria, to visit The Initiative for Equal Rights (TIERS), where I learned about their efforts to protect and promote the human rights of sexual minorities in Nigeria.

I am thrilled to have had the opportunity to gain "on-the-ground" experience with public health research within a resource-constrained setting. I successfully built skills in data analysis, report writing, and communication of scientific ideas, and gained content knowledge of health challenges that I am passionate about. Not only did my practicum placement allow me to grow as an academic and researcher, but it challenged me to think and work innovatively, and solidified my passion for public health.

X.B.
Infectious Disease Prevention and Control Unit, Public Health Agency of Canada

BACKGROUND: Antimicrobial resistance (AMR) is a global health issue that significantly increases disease burden in human bacterial infections. AMR bacterial infections are associated with more complex illnesses, extended hospital stays, greater treatment costs and even increased mortality rate compared to infections caused by antimicrobial susceptible pathogens. The excess use of antimicrobial agents in livestock production poses increased selective pressure to bacteria and is a crucial pathway for the emergence and spreading of AMR

pathogens in Canada. Quantitative microbial risk assessment (QMRA) and exposure assessment (EA) are important risk analysis tools that integrate available data on AMR bacteria through their development and transmission in order to provide quantitative estimate of human exposure and health risk. The assessment results may subsequently be used for risk management and risk communication, shaping national policies and regulatory measures on antimicrobial use.

OBJECTIVE: The present review aims to identify and summarize QMRA and EA models on foodborne antimicrobial-resistant bacteria and associated human health impact that had been published in recent years for knowledge update purpose.

METHOD: Detailed search strategies were developed and applied to relevant databases including Agricola, Google Scholar, Medline and Scopus in order to identify primary research articles from 2010 to time of search. Title and abstract screening was used to eliminate search results. Whole-article screening combined with exclusion criteria check further removed irrelevant and inappropriate studies and produced final list of articles for review.

RESULT: Seven (7) primary research articles containing detailed EA/QMRA models for foodborne AMR bacteria exposure and/or infection were identified and included for review, of which five (5) were QMRA models and two (2) were EA models, conducted in North America (n=4), Belgium, India and South Africa (each with n =1). Bacterium of interest included Campylobacter, Salmonella, Escherichia coli, and Staphylococcus, while antimicrobial resistance development had been observed among fluoroquinolone, cephalosporin and beta-lactam classes. Modeling approaches taken by reviewed studies are diverse, with four models employed formal risk assessment frameworks while others used unique approaches developed by the authors. Model assumptions were often used when data gaps exist, which are apparent in hazard characterization. Integration of AMR-specific risk characterization steps may further assist public health decision-making.

CONCLUSION: Development of EA/QMRA models designed specifically for foodborne AMR bacteria are still in flux. Efforts are greatly needed to bridge data gaps at various stages to allow improved human exposure/risk estimates. Integration of whole-genome sequencing (WGS) metagenomics data to microbial risk assessment may provide crucial information and fill in data gaps related to pathogen dissemination route, pathogen resistance and virulence, as well as their association with phenotypic characteristics.

G.K.
Centre for Global Child Health, SickKids

My first practicum took place over the course of 16-weeks at the Centre for Global Child Health at The Hospital for Sick Children (SickKids). As a part of Dr. Bhutta's research team, I worked on a variety of projects related to Global Child Health. Firstly, I developed content for an online, open-access course on an "Introduction to Global Child Health". Specially, my focus

was on morbidity, mortality and disease burden of school-age children and adolescents. In addition to working on this online course development, I also contributed to a meta-analysis on Micronutrient Supplementation in Pregnant Adolescents. Finally, the majority of my placement focused on an individual project related to stunting reduction in Peru. Here I was able to strengthen my data analysis skills, as I applied a hierarchical analysis to stunting indicators such as maternal stature, household wealth index, and place of residence in order to assess the potential indicators related to reduction of stunting. This was done using Peru's Demographic and Health Survey data, and gave me the opportunity to learn about survey analysis. Overall, I was able to meet my learning objectives to strengthen my data and research skills while working in an interdisciplinary team setting, and to gain experience in knowledge translation.

V.T.
Occupational Cancer Research Centre

INTRODUCTION: Historical exposure data can be utilized to describe the trends in exposure over time, assess how historical interventions influence exposure levels and provide valuable insight to improving primary preventative strategies. Although exposure measurements have historically been collected in the mining industry, there has been no comprehensive exposure database in place in order to assess exposures across the mining sector. The recently created Ontario Mining Exposure Database (OMED) collates and digitizes detailed occupational exposure measurements, providing an opportunity to analyze trends over time.

OBJECTIVE: The purpose of this study was to use the OMED to describe historical mean concentrations and time trends in Ontario's mining industry with a focus on gold, nickel, and uranium mines.

METHODS: Dust measurements were uploaded from the OMED. Descriptive statistics were generated to describe annual mean dust concentrations for the overall dataset and by mine types. Multiple linear regression models, adjusted for sample time, sample year, area versus personal sample, surface versus underground samples, and primary ore type, were constructed to describe historical time trends in the industry overall and stratified by mine type.

RESULTS: In total, there were 165 exposure agents identified in OMED and over 140,000 exposure measurements collected from approximately 1950 to 1999. There were 10,788 measurements when limited to respirable dust; removal of measurements that had missing concentrations or illogical units, not in the mining industry and aggregate measures, left 8323 measurements for inclusion in the analyses. Of these, 2718 (32.7%) were measurements with complete information. Concentrations in nickel, gold, uranium, and other mine types were 0.9 mg/m3, 1 mg/m3, 0.76 mg/m3 and 1.6 mg/m3, respectively. These means were similar in magnitude and rank order as means calculated using the full respirable dust dataset (n=8323). Adjusted linear regression models estimated a decrease of 8% per year (p<0.0001) in respirable

dust concentration. When stratified by mine type the time trends varied substantially. Annual change over time in each mine type was estimated to be -6% in nickel mines (p=0.05), -20% in gold mines (p<.0001), +6% in uranium mines (p=0.005) and -7% in all other mine types combined (p<.0001).

CONCLUSIONS: The findings suggest that historical mean dust concentrations were highest in gold mines, compared to nickel and uranium. The decreasing concentration trend over time in nickel, gold and other mines is consistent with that of other studies in the literature. OMED will be useful for the development of effective interventions in the mining industry. The database provides a detailed description of dust exposures in the mining industry and can be useful for future epidemiological studies assessing occupational mining exposures and disease.

A.P.
University Health Network

At the University Health Network (UHN), both excellence in research and healthcare are prioritized and promoted across all their hospitals and sites. Being a part of the Infection Prevention and Control (IPAC) department was an opportunity to witness the interdependence of different teams' roles when it came to running a hospital smoothly and safely for its patients. Although the nature of the IPAC team's roles is diverse, this experience at UHN was strictly research-oriented. Vancomycin-resistant enterococci (VRE) are nosocomial pathogens that have caused problems for certain populations in hospital settings. Previous studies have been conducted looking at the risk factors associated with its colonization, such as in the gastrointestinal tract, but few have specifically focused on VRE infections. With an observed increase in VRE-positive patients since the end of 2016 in this organization, a case-control study was conducted to investigate the risk factors that may be associated with clinical infections of VRE in the multi-organ transplant and intensive care units.

C.L.
Consumer Product Safety Directorate, Health Canada

Health Canada's Consumer Product Safety Directorate (CPSD) is responsible for protecting and promoting the health of Canadians by researching, assessing and collaborating in the management of health risks and safety hazards associated with consumer products that fall under the Canadian Consumer Product Safety Act (CCPSA). I completed my practicum in the Surveillance and Triage Unit (STU), which manages the reporting of product-related incidents to Health Canada from both industry and consumers, who report on a mandatory and voluntary basis, respectively. Once the incident case reports have been triaged, the surveillance team conducts analyses to identify product trends, emerging hazards, etc. My main deliverable was the Annual Report, which involved the validation and analysis of a dataset using SAS analytics software. The results were presented in a descriptive epidemiologic report, with accompanying

data visualizations. The report focused on findings from the most recent fiscal year, as well as six-year trends since the CCPSA came into force. I also participated in the Collaborative Surveillance Innovation Project (CSIP). Four projects emerged from an applied design-thinking workshop where interdisciplinary teams developed proposals to re-envision consumer product surveillance. While I came onboard towards the end of this process, I was involved in pitching a proposal to senior management and preparing other project deliverables.

K.H.
Resources, Research, Evaluation and Development Division, Sudbury & District Health Unit

My placement was completed at the Sudbury & District Health Unit, reporting to the Manager of Population Health Assessment and Surveillance. I was working within the Resources, Research, Evaluation and Development Division, which plays both a key leadership and support role in the implementation of the Foundational Standard of the Ontario Public Health Standards. The main function of the division is to provide reliable information, share knowledge, and build capacity to support excellence in public health practice at the Health Unit. My primary responsibility during my practicum was producing the reproductive health section of the Health Unit's 2016 Population Health Profile. Data was obtained from the Better Outcomes Registry & Network (BORN) Information System for this report, and I was responsible for both preparation and management of the data, as well as producing graphs and tables, and writing the final report. I had the opportunity to assist in smaller assignments which used data from various sources, including: IntelliHealth, Canadian Community Health Survey, and the Census. I learned a significant amount about Stata and its capabilities during my practicum, as this was the program that was used for all data analysis. I was also able to attend monthly Evidence Informed Practice Working Group meetings during my practicum, where staff from various divisions at the Health Unit would share their current work. My placement allowed me to gain a better understanding of public health at a local level, in an applied setting.

Z.C.
Communicable Disease Unit, Public Health Ontario

Opioid-related harms in Canada are a critically important public health issue with unprecedented numbers of associated deaths: in the past 25 years, opioid-related mortality in Ontario has increased by 285 percent, with over 730 deaths in 2015 alone. Furthermore, opioid-related morbidity and mortality have been shown to be positively associated with social marginalization, including poverty and unemployment, which means that a large segment of the population in Ontario is likely to be at high risk for opioid-related harms.

The objective of this study was two-fold: to better quantify the burden of opioid-related harms in Ontario, and to investigate the relationship between opioid-related harms and neighborhood-level socioeconomic inequalities in Ontario. Three indicators were investigated: opioid poisonings, non-poisoning opioid-related events, and neonatal abstinence syndrome.

We found that neighborhoods with an increased proportion of low income residents experience higher rates of opioid-related harms. This should be taken into account when planning opioid-related public health interventions

K.J.
Occupational Cancer Research Centre, Cancer Care Ontario

Background: The Occupational Disease Surveillance System (ODSS) was established in Ontario, Canada by linking the Workers Safety and Insurance Board (WSIB) claims to administrative health databases. The aim of this study was to use ODSS to identify high-risk industry and occupation groups for lung cancer in Ontario.

Methods: Workers in the WSIB claims database eligible for inclusion (n=2,190,246) were linked to the Ontario Cancer Registry based on subjects' health insurance number, name, sex, birth date, and death date (if applicable). Several occupations and industries known to be at increased risk were outlined a priori to examine whether ODSS could replicate these associations. Disease risk was estimated with Cox proportional hazard models (adjusted for year of birth and stratified by sex) to compare the risk of cancers within one industry/occupation versus all other groups in the cohort. Prevalent lung cancer cases were excluded for analysis.

Results: A total of 34,646 lung cancer cases were identified, representing 16% of total cancers (n=214,821) captured in ODSS. Notable industries outlined a priori that showed significantly increased risks included quarries/sand pits and various industries in construction for both sexes, as well as metal mines, non-metal mines, non-metallic mineral products industries, and transportation industries for males. Noteworthy occupations with significantly increased risks involved drilling/blasting, other mining/quarrying, mineral ore treating, truck driving, painting, and various construction roles in both males and females.

Conclusions: This current system identified several established high-risk groups for lung cancer, and has shown potential as an ongoing surveillance tool for occupational disease in Ontario.

D.K.
Institute for Clinical Evaluative Sciences, Sunnybrook Health Sciences Centre

As a student of the CANHEART research team, my research topic was lipid screening and statin use predictors in Ontario primary cardiovascular disease (CVD) adults. The database used to conduct this research was the 2015 Canadian Community Health Survey (CCHS) Rapid Response component (N = ~7,200), which is an optional component provided to organizations interested in a particular health-related topic (CVD in this case). The objectives of my research were: 1) to re-evaluate previously identified predictors as well as to identify potential new predictors of lipid screening and statin use in primary CVD adults and 2) to build a predictive

model to help inform decision making related to lipid management in primary CVD adults. A sex-stratified cohort was created based on restriction by age: 40-75 years for males and 50-75 years for females as per the 2012 Canadian Cardiovascular Society (CCS) Dyslipidemia Guidelines, as well as by primary CVD prevention status (free of any history of myocardial infarction, stroke and revascularizations). Statistical analyses including age-standardized frequency tables and univariate/multivariate logistic regression analyses were conducted using SAS. For regression analyses, sequential modelling technique was used, in which we started with a simple, univariate model with lipid screening and statin use as outcomes and variables such as demographics, underlying health conditions and health-care usage factors as explanatory variables, and gradually increased the complexity of the model by adding potential confounders such as age, socioeconomic status, BMI and psychometrics. Our findings thus far suggest that lipid screening may be associated more with health care usage factors (e.g. having a regular health care provider) than with underlying medical conditions, while the opposite appeared to be the case for statin use. While our study has several advantages such as its large representative sample with high quality patient-level data, it also has a few limitations: difficulty to infer causality due to its cross-sectional survey design, non-response potentially necessitating imputation, and our assumption that all lipid-lowering agents reported on the 2015 CCHS were statins.

M.A.
The Academic Model Providing Access to Healthcare

My practicum experience was with The Academic Model Providing Access to Healthcare (AMPATH) from April 28 – July 28, 2017. AMPATH is an academic medical partnership between North American academic health centers and the Moi University School of Medicine and Public Health located in Eldoret, Kenya. AMPATH seeks to provide comprehensive HIV care services through its three-way mission: care, research, and training. It currently serves 3.5 million people, with over 60 urban and rural clinics in Western Kenya.

Recognizing the impact of HIV epidemic in Western Kenya on the health systems and the quality of care delivered was one of the major epidemiology competencies I learned. The second competency I sought was to identify the relevant and appropriate sources of information, including community assets and resources for monitoring work progress and identifying if targets were met. Collecting the data and ensuring its quality was an eye-opening project which allowed understanding of how information resources can differ in low resources settings. And the final competency I sought was communicating the meaning of the information collected in a visualized and sustainable format. Through translating raw complicated paper format data into visually appealing graphs that convey the messages of the importance of quality in health care.

The overall learning experience of my practicum exceeded my expectations. This opportunity allowed me to gain a comprehensive understanding of health care systems in the

mature HIV epidemic in Kenya. This practicum opportunity not only allowed me to achieve my learning objectives, but also allowed me to have an independent and creative introduction to the field of applied epidemiology, quality improvement, and health system strengthening. This experience will influence my future career goals and objectives. Overall, as AMPATH is a leading model of health service delivery and the largest HIV care provider in Africa, being part of its team gave me an appreciation of the value of teamwork in a larger cause.

K.L.
Moi University, Kenya

Planetary health is an emerging multidisciplinary field focused on the interconnectivity between our planet's natural systems and its affect on human health and well-being. The focus of this 12-week practicum supervised by Dr. Paula Braitstein is planetary health and the sources of data that can be used for planetary health analyses. My main responsibility as a practicum student was to access available sources of planetary health data, assess the suitability for planetary health analyses, and input key information about the data into a database constructed for the purpose. The information in the database describes the nature of the data and the information it conveys, how it can be accessed, its limitations, and how it can be applied to address planetary health research questions. This information will provide students and researchers with a comprehensive list of sources that can be used for their research related to planetary health. Another goal of the practicum was to use these data sources for an epidemiological analysis relevant to planetary health. Using drought data as well as child malnutrition data from the Kenya Demographic and Health Surveys, I analyzed spatial relationships between drought and childhood stunting in Kenya. This requires use of the programs ArcGIS and R as well as utilization of statistical knowledge. This work has turned into a capstone project as part of my MPH degree.

K.Y.
Health Quality Ontario

One project I completed for my practicum at Health Quality Ontario was to conduct an environmental scan of tools used to incorporate the consideration of health equity into quality standard, clinical practice guideline, or policy development. The purpose of this project was to identify a tool which Health Quality Ontario could use to advance health equity through the development of its quality standards. Due to the scope of the project, a thorough search of the peer-reviewed and grey literature was done, with the grey literature searched using the CADTH Grey Matters tool. The results of the scan were mapped onto the current prioritization, development, and implementation process for the quality standards to demonstrate steps which were addressed by the tools. After synthesis of the results, it was found that none of the existing tools would adequately include equity considerations in the quality standards process, therefore a new template based on the synthesis of findings was designed. This project resulted in five key recommendations which HQO intends to incorporate into its processes.

J.F.
SickKids

Background: Hemodialysis is a primary intervention for end stage renal disease. Patients undergoing hemodialysis are at greater risk of cardiovascular (CV) death, particularly sudden cardiac death (SCD), than the general population. Frailty and abdominal adiposity are two predictors of mortality in the general population as well as hemodialysis populations. The independent influence of these two factors on the risk of all-cause mortality, CV death, and SCD in an incident hemodialysis population has not yet been investigated.

Objectives: i) To estimate the association of frailty and abdominal adiposity with the risk of SCD, CV mortality, and all-cause mortality in a prospective cohort of incident hemodialysis patients. ii) To investigate the interaction between abdominal adiposity and frailty, and its influence on the risk of SCD, CV mortality, and all-cause mortality.

Methods: Baseline characteristics were obtained from incident hemodialysis patients enrolled in the Predictors of Arrhythmic and Cardiovascular Risk in End Stage Renal Disease Study. Frailty and abdominal adiposity were assessed using the Fried frailty phenotype and waist-to-hip ratio (WHR), respectively. The primary outcomes were all-cause mortality, CV death, and SCD. Associations between these primary outcomes and frailty and/or WHR were estimated using Cox proportional hazards regression.

Results: 374 participants contributed 925.8 person-years of data to this analysis. During the study, 82 deaths occurred, of which 35 were CV deaths. Of these 35, 15 were SCD. After adjusting for possible confounders, frailty was associated with increased risk of all-cause mortality (HR: 1.24 95% CI: 1.01, 1.52); this association may be partly explained by nutritional status. Increased WHR was associated with increased risk of both CV mortality (0.1 increase, HR: 1.65, 95% CI: 1.02, 2.69) and SCD (0.1 increase, HR: 2.41, 95% CI: 1.15, 5.04), after adjustment for demographics characteristics, comorbidities, BMI, and serum albumin concentration. There was no evidence of interaction between frailty and abdominal adiposity on the risk of SCD, CV mortality, or all-cause mortality (all P > 0.05). Conclusion: Frailty was independently associated with increased risk of all-cause mortality but not CV mortality or SCD. WHR did not modify this relationship. Conversely, abdominal adiposity was independently associated with increased risk of CV mortality and SCD, but not all-cause mortality. Frailty status did not modify these relationships.