

Winter 2019 Practicum Abstracts

MPH Epidemiology students complete practica at a variety of organizations and on a variety of topics. Below you will find a selection of practicum abstracts from Winter 2019 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.

B.S.

Public Health Agency of Canada – National Microbiology Laboratory

For decades, flour was considered a microbiologically safe food item. However, in the past decade, there have been five major wheat flour-related *Escherichia coli* outbreaks contributing to a total of 184 cases globally. Despite flour being identified as the source of these outbreaks, it was difficult to establish when contamination was occurring during the wheat-flour production process. To address this, the Public Health Agency of Canada conducted a scoping review of available literature on sources of contamination in the wheat-flour production, processing, and distribution chain (farm-to-fork continuum). Distiller SR was used to identify relevant literature and data on sources of wheat contamination. This data was used to populate a probabilistic mathematical model built in @Risk Excel 2016. Initial iterations of the model suggest that consumer handling is the primary origin of *E. coli* contamination. Although the lack of a "kill-step" in processing results in the survival of some bacteria, wheat production presents a poor environment for bacterial growth, meaning residual bacterial growth must be propagated by inappropriate consumer preparation standards. Recent trends in raw flour consumption and preparation call for extended periods of storage at room temperature or higher, subsequently resulting in the proliferation of bacteria. This information can be used by policy makers to raise public awareness of proper baking preparation standards to minimize the risk posed by *E. coli* in flour-based products.

C.G.

Peel Public Health

I completed a 12-week practicum with Peel Public Health's Infection Prevention and Surveillance Division, under the supervision of Monali Varia and Gregory Kujbida. My main objective was to develop my epidemiological skills in communicable diseases (CD) in an applied public health setting. In my role here as a Co-op CD Epidemiologist, I was mainly responsible for conducting a survival analysis for the investigation of reactivation tuberculosis (TB) among Peel's latently TB infected population, known to public health over the last 35 years. In this analysis, I gained experience working with STATA software, the Integrated Public Health Information System, and the Cognos Net Report system. I completed a final report for Peel Public Health, which summarized my complete analysis including my main findings regarding independent risk factors for reactivation TB, the proportion of reactivation TB known to Peel Public Health, as well as limitations of the study, and recommendations and next steps to inform Peel's TB program area. I also supported data cleaning and analysis for three travel modules in Peel's Rapid Risk Factor Surveillance System regarding travel-related illness, working with both Excel and STATA software. I also was provided with several learning opportunities, such as a training course I completed for the ArcGIS Online Tool. I shared my main project of reactivation TB in Peel with key members of CD, including the Associate Medical Officer of Health, managers, an advisor, supervisor, public health nurses,

epidemiologists, and a health analyst. Overall, Peel Public Health offered an outstanding practicum experience, where I gained critical knowledge and skills in the area of CD as well as working in a local public health unit setting, while furthering my core public health competencies in my work accomplishments and collaboration with key team members.

H.S.

Public Health Agency of Canada – Centre for Surveillance and Applied Research

My practicum took place at the Healthy Living and Injury Surveillance Team (Centre for Surveillance and Applied Research) at Public Health Agency of Canada. I was independently involved in a project analyzing the Barriers to Physical Activity (BPA) module from the rapid response (RR) component of the Canadian Community Health Survey (CCHS). To complete this project, I was required to perform a comprehensive literature review, critically appraise literature, conduct data management/analysis. The quantitative management involved me using the statistical software, SAS, to clean dataset, derive new variables, and perform descriptive analyses and regression analyses. I was given the opportunity to prepare a manuscript that highlights the BPA results for submission into an academic journal, as well as an oral presentation. I was also given the opportunity to prepare a data blog for the Public Health Agency Infobase. This placement was a valuable opportunity for me to apply knowledge and training in biostatistics, epidemiology, and scientific writing, as well as how government works and the interface between science and policy.

M.C.

Leslie Dan Faculty of Pharmacy

Objectives: Influenza is an important public health concern, particularly among young children, older adults and immunocompromised patients. Since 2012, community pharmacies have been reimbursed to administer influenza immunizations to residents aged 5 years or older with a valid Ontario health card. The objective of this study was to describe use of community pharmacy influenza immunization services in Ontario over time and by region defined based on Local Health Integration Network (LHIN).

Methods: We identified all intranasal and injectable influenza immunization services claimed by community pharmacies from program launch to March 2018 using data housed at ICES. The mean number of claims were summarized overall, by influenza season (October-March), and by LHIN. Census data were used to adjust community pharmacy immunization rates for population size (ages 5 or more years) within each LHIN.

Results: A total of 5,979,333 immunizations were completed for 2,634,870 patients. The community pharmacy immunization rate increased over time (2012: 19.4/1000 persons, 2013: 59.5/1000 persons, 2014: 69.4/1000 persons, 2015: 66.3/1000 persons, 2016: 76.1/1000 persons, 2017: 88.8/1000 persons). Most immunizations were completed in November each season (52.6% overall; monthly mean=429,653, SD=176,748). Eastern areas had the highest community pharmacy immunization rates (e.g., 123.8/1000 persons in Champlain in the 2017 influenza season), while central densely populated regions had the lowest (e.g. 46.5/1000 persons in Central West and 67.8/1000 persons in Mississauga Halton in the 2017 influenza season).

Conclusion: Community pharmacy immunization services are common in Ontario, yet significant regional variation was identified.

M.P.

Ministry of Children, Community and Social Services

Completion of the 16 week summer practicum at the Ministry of Children, Community, and Social Services (MCCSS) was an extremely rewarding and unforgettable experience. Undertaking the role of an epidemiologist in training in the Policy Research and Analysis Branch's (PRAB) Social Assistance Analytics Unit (SAAU) allowed for the extensive application of statistical knowledge and skills, advancement of SAS programming language, and the opportunity to experience, and contribute to, the dynamics of a multi-disciplinary team. The main project assigned was to update the Special Diet Allowance (SDA) profile for March 2018. Via this project, application of skills from all aspects: data extraction, SAS programming, document formatting, data organization, reporting, and presenting, were required. Other small projects included updating the Autism Spectrum Disorder profile highlights, updating choropleth maps of Ontario, and analysis of the trends and patterns associated with medical conditions for which SDA was received and the health care professionals who submit the associated forms. Overall, the MCCSS practicum allowed for both the application and improvement of statistical knowledge and skills, and also the development of new skills related to reporting and presenting data appropriately. This particular summer experience was truly unique for a summer student since I was able to experience: 1. the move from a traditional cubicle workspace to a dynamic workspace provided with laptops, cell phones, flexible hours and a shift of focus from presence in the workplace to the actual work being done; and 2. the Ministry environment as it underwent a both the election period and the change in government. MCCSS provided an amazing experience and work place that I hope to return to in the future

N.T,

Cancer Care Ontario – Occupational Cancer Research Centre

Title: Acute Myocardial Infarction in Ontario Workers: Findings from an application of the Occupational Disease Surveillance System (ODSS)

Rationale: The workplace may be attributable to increased risks of acute myocardial infarction (AMI). However, the occupational burden of this disease continues to remain unclear.

Objective: Determine the risk of AMI in Ontario workers using the ODSS.

Methods: The study population was derived using provincial accepted time-loss workers' compensation claim data (1983-2014) linked to hospital discharge data (2006-2016). Dynamically, workers could enter the analytic cohort anytime between January 1, 2007 and December 31, 2014. Subjects with an AMI event in the year prior to cohort entry were excluded to establish a disease free population at baseline. At-risk workers were followed from the date of their first compensation claim to the earliest of either date of diagnosis, age 65, death, emigration out of province, or end of study period (December 31, 2016). Using the Canadian Institute for Health Informatics (CIHI) Discharge Abstract Database (DAD), AMI was defined as having at least one hospitalization for AMI (ICD-10 I21) within 12 months following cohort entry, or until the end of follow-up. The earliest claim date in DAD for AMI, indicated date of diagnosis. Sex- and age-adjusted Cox proportional hazard models were used to estimate disease occurrence by industry and occupation group at the Division, Major, and Minor levels.

Preliminary Results: Increased risks were observed among predicted industry groups including logging (HR 1.16, 95% CI: 1.00-1.35), investment and holding companies (HR 1.19, 95% CI: 0.88-1.60), and asphalt roofing manufacturers (HR 1.86, 95% CI: 1.03-3.35). Various occupation groups also demonstrated significant increased risks such as bartenders (HR 1.68, 95% CI: 1.17-2.40), supervisors (HR 1.32, 95% CI: 1.06-1.64), and water transporting occupations (HR 2.28, 95% CI: 1.09-1.77). Interestingly, a protective effect against AMI was observed across multiple groups including officers of para-medical personnel (practitioners) (HR 0.36, 95% CI: 0.15-0.86), occupations in performing and audio-visual arts (HR 0.58, 95% CI: 0.37-0.92), and the miscellaneous metal mines industry (HR 0.74, 95% CI: 0.62-0.88).

Conclusions: Administrative data linked to work history data successfully examined various associations between occupational risk factors and AMI, across a variety of industrial and occupational sectors. Further efforts dedicated to identifying industry and occupation groups at risk for AMI, are required to support effective disease prevention measures.

S.R.

Public Health Agency of Canada – Centre for Immunization and Respiratory Infectious Diseases

The Canadian Adverse Events Following Immunization Surveillance System (CAEFISS) is a collaborative effort between the federal, provincial and territorial public health authorities that continuously monitors the safety of marketed vaccines in Canada. The purpose of CAEFISS is to provide timely information on Adverse Events Following Immunization (AEFI) reporting profiles for vaccines marketed in Canada to help inform immunization-related decisions and identify signals of possible adverse events that warrant further investigation. CAEFISS is managed at the federal level by the Public Health Agency of Canada's Vaccine Safety Section. My practicum was situated within this team with the objective of extracting and analyzing data from CAEFISS to assess AEFIs reported to the surveillance system between July and December 2018. I began by sub setting the data extracted from the CAEFISS database to reports received by all jurisdictions between July 1st, 2018 and December 31st, 2018. The remaining data was then recoded in order to analyse both the total and average number of serious versus non-serious AEFIs by primary AEFI reported, time period, age group, and vaccine administered. Analysed data was then drafted into the public-facing Bi-annual AEFI report published by the Public Health Agency of Canada. Analysis of the reports received in the second half of 2018 suggests that no vaccine safety signals were identified during this period, as the number of AEFI reports submitted to the CAEFISS system was comparable to previous years. Of the 1372s reports received, only 8% were serious and were mainly reported amongst infants aged 0 to less than 1 year. The primary reasons for reporting were consistent with previous years, largely comprised of vaccination site reactions, allergic or allergic-like events and rashes with the highest proportion of serious reports following pneumococcal, measles, mumps, rubella, varicella (MMRV and MMR + V), meningococcal, and DTaP infant series vaccines.