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 Summer 2018 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.

**H.S**

Hospital for Sick Children – Peter Gilgan Centre for Research and Learning

My practicum took place at the Peter Gilgan Centre for Research and Learning at the Hospital for Sick Children. I was independently involved in a project looking at the effect of screen time on cardiometabolic risk in young children aged 3-to-6 years. My project involved using dataset from the TARGet Kids (The Applied Research Group for Kids) cohort, which is a primary care practice-based research network in Toronto, Canada. In order to complete this project, I was required to plan a project by conducting a comprehensive literature review, critically appraise literature, conduct data management/analysis (compute new variables/missing data, clean dataset involving multiple variables, interpret data) using R statistical software, and prepare a manuscript for submission into an academic journal, an academic poster, and an oral presentation. This placement was a valuable opportunity to apply my knowledge and training in biostatistics, epidemiology, and scientific writing. My practicum experience has allowed me to build my knowledge and skills as a researcher, as well as challenge me to independently conduct a research project in the field of Child Health.

**B.S**

Public Health Agency of Canada (PHAC)

As one of the most harmful bacterial species on the planet, Salmonella presents a worldwide public health issue. Often known to cause diarrhea, nausea, abdominal pain, and in extreme cases, death, Salmonella infections are commonly associated with water or food. In North America, a specific subtype, Salmonella Heidelberg (S. Heidelberg), has proven difficult to manage given its recent resistance to antibiotics – specifically third generation cephalosporins. To evaluate the risks of S. Heidelberg, a Quantitative Microbial Risk Assessment (QMRA) was conducted to create a mathematical model of S. Heidelberg growth and proliferation in the poultry industry. This model, created by the Public Health Agency of Canada (PHAC) attempts to recreate the prevalence and transmission of S. Heidelberg throughout the farm-to-fork continuum using Monte Carlo Simulation in @Risk software v.7.0.1. Using this model, we compared current Canadian poultry processing standards to ideal “intervention” scenarios and identified important areas of focus in S. Heidelberg growth and contamination.

Primary modelling results suggest that the storage temperature of poultry at retail and in consumer households are important factors in minimizing the growth and proliferation of S. Heidelberg. Similarly, reducing cross-contamination during the defeathering of birds and other processing stages would likely result in a lower load and prevalence of the bacteria. These results may be used by policy makers to encourage proper sanitation and storage in grocery stores and at homes, potentially enforcing policy changes that punish violations of these regulations. This combined with novel measures at the farm level that minimize bird-to-bird contact and cross-contamination can lower the probability of S. Heidelberg-related foodborne illness in humans.

**M.O**

Population Health Analytics Lab

My practicum placement took place under the supervision of Dr. Laura Rosella in the Population Health Analytics Lab at the University of Toronto. My major project involved the application of a High Resource User Population Risk Tool (HRUPoRT) to the Ontario portion of the Canadian Community Health Survey. This tool encompasses clinical, sociodemographic, and health behaviour information in population survey data to predict who will become the top 5% of health care service users over a 5-year period. I created a descriptive report that summarized the rate of high resource use across Ontario Public Health Units according to several socio-demographic and health behavioural characteristics. These risk factors include: sex, age, income, food security, body mass index (BMI), smoking status, and number of chronic conditions.

In my placement I gained hands on experience using geospatial software (ArcGIS) to create maps that visually display the difference in rate of HRU across Ontario Public Health Units. The report is intended to be used by Public Health Units to assist with prevention and resource planning, to facilitate decision making, and to enhance our understanding of the distribution of risk among the population. Overall, this practicum enabled me to apply many of the core concepts and principles I learnt throughout my courses and was an invaluable learning opportunity in my public health training as an Epidemiologist.

**M.F**

Applied Immunization Research and Evaluation, Public Health Ontario

My practicum took place with the Applied Immunization Research and Evaluation (AIRE) team at Public Health Ontario (PHO). PHO is a crown agency devoted to using evidence based knowledge to implement policy and practice changes across Ontario. The AIRE team is focused on improving immunization coverage within Ontario. Throughout my practicum, I completed a systematic review on measles immunity for the World Health Organization. It has always been thought that individuals previously infected with the measles virus would have lifelong immunity. However, this may no longer be the case within countries that have achieved measles elimination. These individuals do not receive boosting to their immunity through the endemic circulation of the measles virus. Therefore, we sought to determine whether measles immunity is waning among previously infected individuals living in elimination settings. If so, at what rate? A total of 1,508 full text articles were screened, of these 7 articles met all of the inclusion criteria. From these articles the relationship between time since measles interruption in years and the percent of individuals considered to be immune to measles was assessed. Quality appraisal was accomplished using the MetaQAT tool and a risk of bias assessment was completed. Then a sensitivity analysis was achieved by removing data from the graphs determined to have a high risk of bias.

**S.R**

Public Health Ontario, Immunization and Vaccine Preventable Disease Team

In Ontario, provincial-level immunization coverage estimates do not meet Canada’s national coverage goals for most antigens. However, immunization coverage among school pupils can vary by vaccine, age and public health unit, with some health units’ local coverage estimates surpassing national goals. Since 2017, Public Health Ontario (PHO) has assessed immunization coverage estimates annually at both the Public Health Unit and provincial level for school-aged children. These estimates help evaluate the effectiveness of childhood immunization programs, monitor trends in vaccine uptake over time and identify areas with inadequate coverage. My practicum involved producing coverage estimates at the Local Health Integration Network (LHIN)-level for the 2017-2018 school-year to be included into an upcoming immunization coverage interactive digital tool. LHIN-level estimates have not yet been produced for immunization coverage. Therefore, the objective of my practicum was to develop a method to assign over 600,000 Ontario school-aged children to a single residential address in order to assign them to an appropriate LHIN. Using SAS statistical software, I built an algorithm that would select a single residential address for each student based on various preferred address and eligibility flags identified by the Panorama database. I subsequently created and integrated various programs of SAS code that would calculate coverage estimates at the LHIN-level for each student in Ontario during the 2017-2018 school year. Immunization coverage of 25 age/antigen combinations were subsequently calculated for each age cohort and descriptive analyses was performed to assess immunization coverage of Ontario pupils aged 7, 12, 13 and 17 for each of the appropriate antigens immunized against by LHIN level. Based on the algorithm and SAS programs I developed during my practicum, LHIN-level coverage estimates can now be routinely calculated for annual immunization coverage assessments in Ontario school pupils.

**A.E**

Sanofi Pasteur, Pharmacoepidemiology

Sanofi Pasteur is a global company that produces vaccines for 20 different infectious diseases, and has locations in France, the United States, and in Canada. In Toronto, the Pharmacoepidemiology department responds to various requests from other teams within the company and external stakeholders, such as regulators. Working as part of the Pharmacoepidemiology team, I completed a literature review on the background incidence rates of adverse events of interest and common adverse events in infants born at 35 weeks of gestation or older. I extracted of over 1500 different results from a number of published studies to include in a database, including the effect measure (typically incidence), the population, time period, study design, confidence intervals of results, etc. I was able to present both of these projects to members of the Epidemiology department from different countries, as part of our overall risk standardization project. I worked on projects that will be used to ensure the impact of our team is well-known within the company, such as a tracker that allows the easy monitoring of key performance indicators for presentation to the global team, a structure organization of literature, and a summary of publications and citation impact for members of our team. This included creating summary statistics and automating the process so it can be easily produced in the future. This practicum allowed me to enhance core competencies required by public health professionals, such as understanding the system and public health science, identifying sources of information and critical appraisal, and epidemiological methods and analysis. I was able to meet most learning objectives outlined in my learning contract and was able to meet both objectives outlined in the practicum guidelines.

**C.S**

Sanofi Pasteur, Medical Affairs

Sanofi Pasteur, the vaccine business unit of the Sanofi Group, is the largest company dedicated entirely to vaccines. Working in the Medical Affairs team for Canada, I was able to gain insights into the different types of projects that a Medical Affairs division is involved in, which range from studying the burden of disease in Canada, to understanding the clinical value of a product, to analyzing and communicating the economic value of an immunization program. One aspect of this team that I was actively involved in is the weekly journal club where I was able to summarize the evidence in new scientific papers and present the work to the Medical team, providing insights on potential implications to Sanofi Pasteur. I was also able to work cross-functionally with the Policy and Commercial operation team, which provided a better understanding of the vaccination program implementation process in the Canadian market. Projects in the Policy team consisted of conducting economic impact models and writing policy briefs to be used in building a case for supporting the launch of a new vaccination program. Overall, this practicum experience improved not only my technical skills in understanding the vaccine industry and how to research or conduct projects for program and policy implementation, but also helped develop my soft skills in collaborating with a cross-functional team and presenting scientific evidence effectively.