UNIVERSITY of GUELPH

Annual Report | 2018

Centre for Public Health and Zoonoses

CPHAZ
Centre for Public Health and Zoonoses

WELCOME
to the 2018 Annual Report for the Centre for Public Health and Zoonoses!

ONE HEALTH @ GUELPH

Providing focus, and leadership for research, education, and knowledge dissemination in animal-related aspects of public health.

One Health at Guelph.
CPHAZ
Centre for Public Health and Zoonoses

Funding support is provided by the Ontario Ministry of Agriculture, Food and Rural Affairs through the Veterinary Clinical Education Program

Ontario

Letter from the Director

Once again it has been a busy and productive year for CPHAZ members. In addition to record attendance at our spring symposium, we have continued our One Health newsletters, website and Twitter feed, as well as our annual One Health poster day. Recently, we introduced a weekly dissemination series to highlight publications by CPHAZ members. Check out our website for more details at www.cphaz.ca!

The CPHAZ faculty members and students are involved in One Health and public health activities across a wide range of topic areas, including antimicrobial stewardship and antimicrobial resistance, zoonotic disease research, environmental health, food and water safety, and comparative medicine. Our annual report highlights just some of the many activities by our members and collaborators!

This upcoming year will bring big changes to CPHAZ as I complete my term as CPHAZ director after almost twelve years. It has been a privilege to serve as the director of CPHAZ, and I look forward to continuing to be involved in this great Centre. I am also excited to work with the new Director of CPHAZ, Scott Weese, as we continue to develop an outstanding research program in the fields of public health and zoonoses.

Sincerely,

Jan M. Sargeant

A Farewell

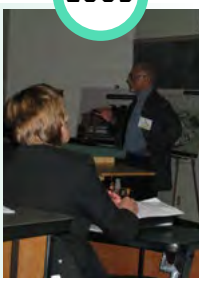
As the inaugural director of the Centre for Public Health and Zoonoses, Jan Sargeant had a daunting task in lauching CPHAZ. She began by acquainting herself with the myriad of initiatives in the dynamic public health and educational community. Jan brought expertise as a veterinary epidemiologist and food safety systematic review expert to her role as director.

After eleven years, Jan's tenure is ending with CPHAZ having collaborated with over 150 organizations in human, animal and environmental health across many countries and continents. Jan's networking strengths connected CPHAZ members with provincial, federal and regional public health colleagues, cementing our participation in countless cross disciplinary initiatives. This includes leading working groups within the Indigenous Health Adaptation to Climate Change Project to spearheading initiatives such as the STROBE-Vet Statement.

Kicking off with 78 students and 50 faculty members, throughout Jan's directorship CPHAZ has grown to boast 125 student members and over 65 faculty members.

We would like to recognize the vast amount of work that Jan has accomplished in her time as director. She brought researchers together and pushed the Centre to be an ongoing resource, promoting the work of our members as well as improving capacity building activities. This stroll through memory lane is by no means complete, but here is a highlight of the major accomplishments as we thank Jan for her dedication over our last decade in CPHAZ.

2009

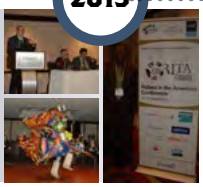


- CPHAZ official launch. Prominent leaders in government and academic programs in public health and zoonotic disease supported the launch at OVC including Mohamed Karmali, former Director of the Laboratory for Foodborne Zoonoses at the Public Health Agency of Canada (PHAC).
- The first scientific symposium was held with 150 attendees.
- Jan is awarded a Canadian Institute of Health Research applied public health chair. She is one of fourteen chosen nationwide.

2011

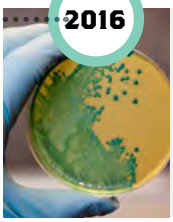
CPHAZ was successful in their application to the Canada Foundation for Innovation for a $1 million dollar grant to renovate existing space and create a state of the art research facility for members and collaborators. This facility provides shared working space for research in animal-related aspects of public health, particularly zoonotic diseases.

2013



CPHAZ co-hosts Rabies In The Americas (RITA) international multilingual conference in Toronto, ON, with the Public Health Agency of Canada. RITA brought over 400 delegates from more than 20 countries across five continents together with the common goal to advance knowledge of rabies surveillance, prevention and control.

2016



Jan was a principal investigator on the leadership team awarded $77 million from the federal government, the largest single federal research investment in UG history. The Canada First Research Excellence Fund goes toward the Food From Thought research project, which will use high-tech information systems to help produce enough safe food for a growing human population while sustaining the Earth's ecosystems.

2017

Jan was honoured with one of the highest prestiges within Canada's academic community. For her leadership and outstanding academic performance Jan was inducted as a Fellow with the Canadian Academy of Health Sciences.

2018

CPHAZ has their largest scientific symposium to date with over 250 people attending the one day conference to discuss public health and zoonotic disease reserach and ongoing initiatives around One Health, antimicrobial stewardship, food safety, emerging disease public health and ecohealth.

I'm happy to be able to both thank Jan for all her hard work and to introduce myself as incoming Director. I was around at the inception of CPHAZ and have seen it evolve from "do we need a centre" discussions to where CPHAZ is today. Jan has provided outstanding guidance to the Centre, developing strong collaborations, important initiatives, an excellent symposium and building a strong CPHAZ name. The Centre is well positioned to continue to have an impact on public health and zoonoses research, communication, collaboration and education.

As I take on the role of Director, I thank Jan for getting us to where we are now and setting the scene for future successes. I look forward to the opportunity to continue current CPHAZ activities and launch some new initiatives, particularly around communication. We have a wealth of knowledge and expertise in important and prominent subject areas, and we can continue to have an impact in scientific education, communication with partners and fostering scientific literacy in the general public. CPHAZ is built around collaboration, and we continue to grow with more collaboration and networking, both within our established group and through engaging new people, facilities and areas of expertise. It's an exciting time in the public health and zoonoses realm, and CPHAZ is well positioned to be an important contributor.

CPHAZ is not a single entity but is the net strength of all of its participants, members and partners. I look forward to chatting with CPHAZ members and stakeholders in the coming months, but I encourage anyone that would like to discuss CPHAZ activities, collaborations or other aspects to contact me at jsweese@uoguelph.ca or 519-824-4120 ext 54064.

– Scott Weese

In 2018...

Symposium

The 2018 Centre for Public Health and Zoonoses scientific symposium took place on June 8th at the University of Guelph. Around 250 attendees packed Rozanski Hall - a 34% increase from last year - to make this event our most popular to date.

Dr. Craig Stephen, a professor at the University of Saskatchewan and the Executive Director of the Canadian Wildlife Health Cooperative, kicked off the day with an entertaining and insightful discussion on One Health and how One Health methods can impact various facets of our present and future.

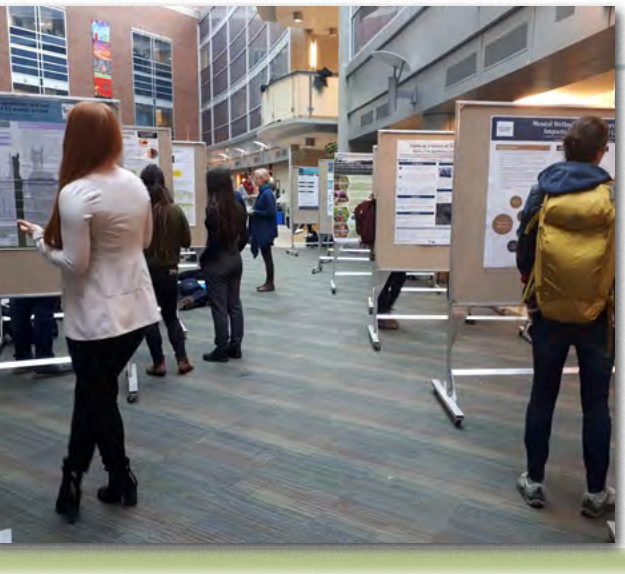
Twenty-two graduate students competed to present their research in two minutes or less, while also enticing the audience to visit the poster displays. All symposium participants could vote for the top three of these oral presentations. First prize went to Brendan Dougherty, a PhD student in Population Medicine; Genevieve Lumsden, an MSc student in Pathobiology was runner-up; and MSc student Nic Durish from the School of Computer Science was the third place winner.

Our annual symposium brings together individuals with an interest in one or many pillars of public health and zoonotic disease. The symposium represents a full day of presentations and posters on new research, emerging diseases, technological developments, and more. This year, topics ranged from antimicrobial resistance, One Health, and Northern health to Lyme disease surveillance and food safety. A total of 17 different speakers presented over the course of the day. Thank you to those who took part in this incredibly educational day!

T-B: Crowd photo during Dr. Craig Stephen's keynote presentation; Presentation slide by Dr. Danielle Julien; Winners of the student interactive sessions; Example of the new dissemination series; Students at the One Health Poster day talking with attendees amongst the posters.

One Health Poster Day

On November 2nd, CPHAZ members and the Guelph community filled the upper area of the Science Complex Atrium at the University of Guelph to view 34 posters describing One Health research, teaching initiatives, and club events. Attendees learned about the wide range of research being conducted at the University of Guelph that encompasses a One Health approach, and the implications of this approach to research for disease control, environmental management, community development, and food and water safety. Thank you to all participants for making our One Health Poster Day a resounding success!

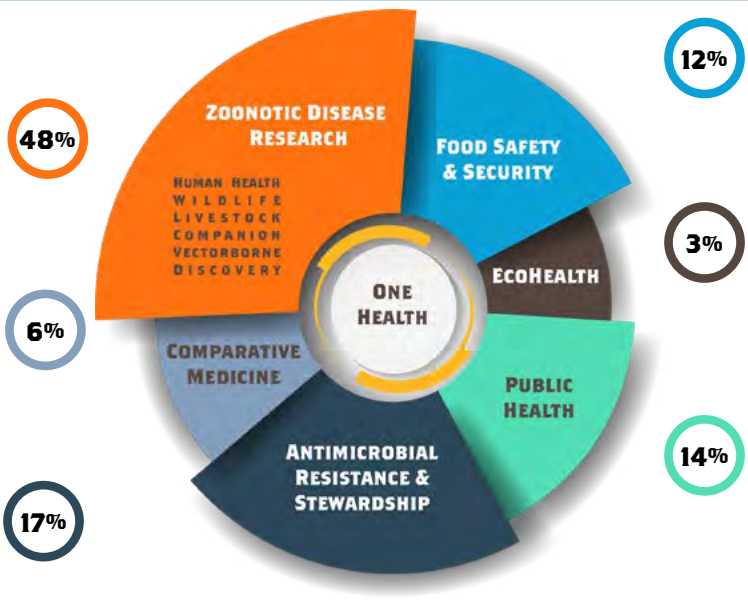


New Promotion for Members!

New this year, CPHAZ has been releasing weekly one-page reports on Twitter. Each one of these releases describes a new publication by a CPHAZ member. In 2018, 17 reports were distributed in this manner, all of which can be found on the Dissemination Series page of our website. These reports – many of which incorporate One Health principles - included four papers on antimicrobial resistance (AMR), four papers on public health, four papers on zoonoses, two papers on food safety, one paper on water safety, and one paper each on climate and the environment.

Our members produced over 120 publications this year, so this is just the tip of the iceberg in terms of the fascinating and important research being conducted at CPHAZ. If you are interested in seeing more about what our members are up to, follow us on Twitter: twitter.com/cphaz.

Student Members



CPHAZ members published over 155 papers on all aspects of public health and zoonotic disease research this year. The thematic areas cover vastly different topics from Lyme disease surveillance to educational awareness around tanning salons. Connecting human, animal and environmental health issues in a one health approach is an underlying effort threading through many of these collaborative research projects.

We describe a handful of these initiatives over the next few pages. CPHAZ also highlights more research from our members in our newsletter, dissemination series and other many events throughout the year.

As you will read in the following pages, our student members engage in an exciting variety of public health activities. Along with promoting the work of our student members, CPHAZ also hosts networking events, shares professional opportunities, and sends student members to local conferences when possible. Here is our 2018 graduate student member list.

If you are a student at the University of Guelph interested in becoming a member, send an email to cphaz@uoguelph.ca

Biomedical Sciences
Human Health & Nutritional Sciences
Pathobiology
Master of Public Health
Population Medicine
Food Science
Clinical Studies

Shaimaa Abdelmegid
Rachel Ackford
Samantha Allen
Lauren Alonso
Ruxshin Amooyan
Dima Ayache
Adriana Bianco
Kate Bishop Williams
Angie Bosman
Gabrielle Brankston
Juan Medina Briceno
Amy Caughey
Brennan Chapman
George Charch
Katheryn Churchill
Kailyn Clarke
Ashley Cormier
Robert D'addazio
Kaitlyn Dawkins
Adrianna DeCorso
Antonia Degroot
Leann Denich
Emily Denstedt
Davinder Dhawan
Brendan Dougherty
Laura Duncan
Jennifer Dunn
Rebecca Egan
Reisha Fernandes
Rebecca Flancman
Russell Forrest
Shannon French
Rebecca Fung
Paul Gelis
Jolene Giacinti
Elissa Giang
Kimberly Gibbens
Julie Gill
Amber Gillespie
Hanne Goetz
Monika Goetz
Alessia Guthrie
Briana Hagen
Leah Hagerman
Nassim Haghighi
Benjamin Hetman
Kelsey Houston
Roksolana Hovdey
Saarah Hussain
Rachel Imai
Melissa Isada
Rachelle Janicki
Natasha Janke
Grace Jin
Danielle Julien-Wright
May Kamleh
Simer Khurana
Jonathan Kotwa
Kash Kuruppu
Nanette Lai
Steven Lam
Veronika Laskowski
Danyelle Liddle
Konrad Lisnyj
Yifan Liu
Erin Longo
Genevieve Lumsden
Myrene Lychek
Melissa MacKinnon
Gabriella Mallia
Jessica Mammone
Anna Manore
Sarah Martone
Stephanie Masina
Heather McClinchey
Erin McGill
Carrie McMullen
Julia Mielczarek
Jonathan Moffat
Tamara Morrill
Saranya Nair
Saranya Narayana
Megan Neely
Nicole Pachal
Katherine Paphitis
Shreya Patel
Kaitlin Patterson
Sydney Pearce
Emaleigh Peart
Amanda Perri
Nicole Pinto
Courtney Primeau
Elana Raaphorst
Aarabhi Rajendiran
Cassandra Reedman
Jessica Reimann
Mark Reist
Kristen Reynolds
Jocelyn Rivers
Daniella Rizzo
Tara Roberts
Sarah Robinson
Maria Rosales Gerpe
Tara Sadeghieh
Angela Saleh
Alexandra Sawatzky
Michael Sawras
Corinne Schut
Inthuja Selvaranam
Kevin Stinson
Shawna Sullivan
Alexandra Swirski
Andrea Thomas
Nicole Topakas
Laura van Lieshout
Jacob van Vloten
Taika von Konigslow
Nadine Vogt
Laura Weber
Mackenzie Wilson
Madison Wimmers
Nicole Winters
Lee Wisener
Xinyi Xu
Kaitlin Young

125 Members

Member Research

Unversity Emeritus Professor John Prescott, Department of Pathobiology, continues to be involved with One Health antimicrobial stewardship research. John is a member of a Canadian Academy of Health Sciences expert panel currently assessing the potential impact of antimicrobial resistance in Canada. In November 2018, he presented a talk at the National Centre for Antimicrobial Stewardship 2018 Forum in Australia entitled “No magic bullets: Will One Health save us? The challenges and politics of antimicrobial stewardship”, as well as a talk at the inaugural Australian Veterinary Antimicrobial Stewardship Conference entitled “Veterinary antimicrobial stewardship in North America”.

PhD student Lee Wisener (Advisor: Jan Sargeant) is undertaking two scoping reviews of existing research evaluating non-antibiotic approaches to beef and nursery pig production in North America. Scoping reviews are used to identify and describe, or map, the literature in an area of interest. Scoping reviews can also help to identify gaps in the current literature and can indicate areas where additional primary research may be useful. Lee’s research will help to identify and characterize the literature on the full range of non-antibiotic interventions in the livestock industries of interest, including vaccines, non-antibiotic feed supplements, and management factors related to biosecurity or low-stress weaning.

Rabbits, whether companions or food animals, can be sources of zoonotic pathogens. In particular, two pathogens are significant to both rabbit and human health: E. coli and Salmonella. If antimicrobial resistance (AMR) is also present, the risk to both human and animal health increases. Few studies have investigated the role that rabbits play in the development and transmission of AMR bacteria. DVSc student Jennifer Kylie and advisor Patricia Turner, along with Scott McEwen, Patrick Boerlin and Scott Weese, analyzed fecal samples from rabbits on commercial farms, from laboratories and shelters, as well as companion animals for resistant E. coli and Salmonella. In comparing these findings with antimicrobial use, Jennifer discovered AMR on commercial farms and in laboratories. The findings from this work was published in 2018. Rabbit populations, particularly in commercial production, could be a source for AMR transmission; this implies that education, awareness, biosafety, and safe handling procedures could be critical AMR prevention factors.

Antimicrobial Resistance & Stewardship

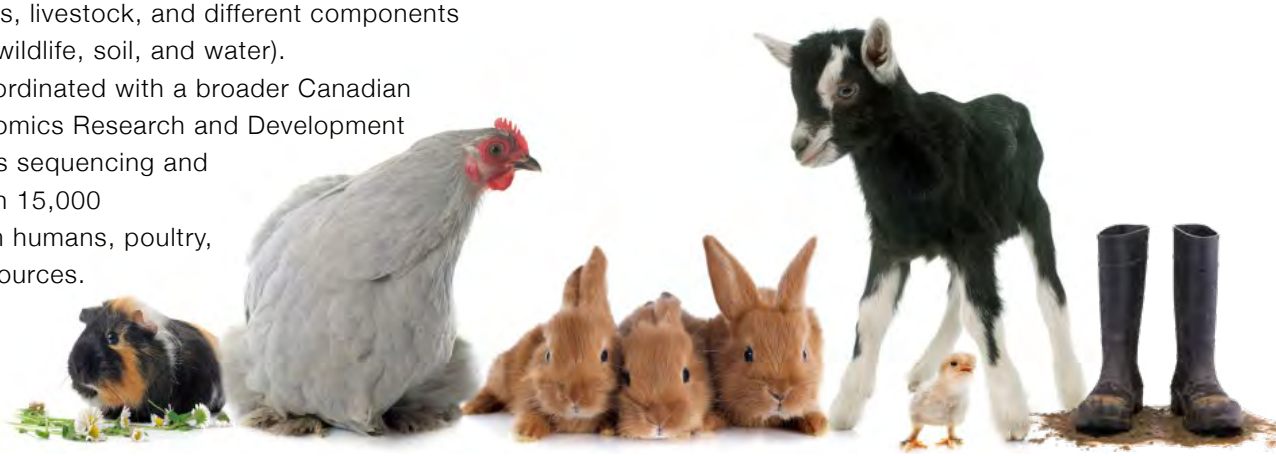
Prudent use of antimicrobials is increasingly essential in livestock management. CPHAZ members Jan Sargeant, Charlotte Winder, and Dave Kelton are working with collaborators at Iowa State University and the York Health Economics Consortium to conduct eight systematic reviews/network meta-analyses on the comparative efficacy of interventions intended to reduce the need to use antibiotics. The reviews cover four livestock groups (dairy cattle, beef cattle, swine, and broiler poultry) and address the efficacy of management practices to reduce illness and antibiotic use, as well as the efficacy of antibiotics that are currently used to prevent illness. This research is funded by the PEW Charitable Trusts and will be completed in 2019.

Charlotte Winder and Jan Sargeant conducted a network meta-analysis to examine the relative efficacy of antibiotic therapies for the treatment of clinical mastitis in lactating dairy cattle. Knowledge of relative efficacy allows veterinarians and dairy producers to avoid unnecessary use of ineffective treatments. In addition, practitioners may be able to select efficacious antibiotics that are of lesser importance to human health, thus potentially reducing the burden of antimicrobial resistance in pathogens that affect humans.

To demonstrate how antimicrobial resistance affects people, animals and the environment, Population Medicine faculty member Scott McEwen developed a method to illustrate how crucial it is to avoid the overuse or misuse of antimicrobials in livestock management. Inappropriate use of antimicrobials, particularly those that have shared uses in human and animal health or production, can lead to increased antimicrobial resistance in both humans and animals. Scott's educational initiative is part of a larger global program to improve awareness of antimicrobial resistance, not only in terms of the dangers for human, animal, and environmental health, but also to encourage reductions in and alternatives to the use of antimicrobials.

Nadine Vogt is a PhD student in the Department of Population Medicine (Advisor: David Pearl). Using whole genome sequencing (WGS) data, she will be examining the movement of the pathogens Salmonella and E. coli, as well as the associated antimicrobial resistance elements - within the southern Ontario ecosystem. This project will help to identify the potential for transmission of antimicrobial-resistant Salmonella and E. coli isolates between humans, livestock, and different components of the environment (i.e. wildlife, soil, and water).
This research will be coordinated with a broader Canadian initiative funded by Genomics Research and Development Initiative (GRDI), which is sequencing and characterizing more than 15,000 Enterobacteriaceae from humans, poultry, cattle, pigs, and other sources.

Brennan Chapman is a PhD student in the Department of Population Medicine who focuses his research on exploring the applications of whole genome sequencing (WGS) data in quantitative microbial risk assessment models. Under the supervision of Scott McEwen, and in conjunction with the RISK (Risk Integration Synthesis and Knowledge) and CIPARS (Canadian Integrated Program for Antimicrobial Resistance Surveillance) teams at the Public Health Agency of Canada, he is working to develop stochastic models and risk-science products to describe the risks posed to Canadians from foodborne, antimicrobial-resistant pathogens arising along the farm-to-fork continuum. These risk-science products - including a quantitative microbial risk assessment, an integrated assessment model, and a threat assessment - will be used to predict risks to Canadians and evaluate interventions that aim to improve human and animal health.



A One Health Approach

The parasite Cryptosporidium can cause cryptosporidiosis, which in turn results in diarrhea, nausea, vomiting, and abdominal pain in humans. In Ontario, the most common way people become ill with this infection is from direct exposure to animals or surface water. PhD student Gabrielle Brankston (Advisor: Amy Greer) investigated the ways in which animals, humans, and the environment might interconnect and play a role in the transmission of the parasite.

Data on human cases, Cryptosporidium-positive cattle farms, and environmental conditions such as temperature, precipitation, and daily water flow and level were examined for statistical relationships. Findings from this study led the researchers to believe that parasite transmission from farm animals to humans via the environment may play an important role in the biology of this illness in Ontario. This understanding may in turn improve our ability to protect human and animal health in the future.

A book written by Catherine Carstairs was released this year. Published with former graduate students Bethany Philpott and Sara Wilmshurst, Be Wise! Be Healthy! explores the history of public health in Canada from the 1920s to the 1970s. During that time period, campaigns from the Health League of Canada urged Canadians to drink pasteurized milk, immunize their children, and avoid extramarital sex. Health was presented as a responsibility of citizenship, with doctors and dentists as expert guides.

But public health campaigns also stigmatized marginalized populations by implying that poor health could be due to inadequate self-care, despite clear links between health and external factors such as poverty. Read more about public health in Canada over the last century by ordering the book from UBC press: https://www.ubcpress.ca/, or through Indigo or amazon.ca.

PhD candidate Briana Hagen (Advisor: Andria Jones-Bitton) is currently conducting research using mixed methods approaches to understand how Canadian farmers, their farms, and productivity are impacted by mental health outcomes in farmers including stress, anxiety, depression, and resilience. Guided by the results of this research and in partnership with an agricultural working group, a prevention program titled 'In the Know': a mental health literacy training (Get picture) has been developed for farmers and is currently being piloted. The goals of this program are to increase knowledge around mental health in farming, to change attitudes towards those who experience mental health struggles, and to positively impact behaviours when farmers experience or encounter someone who is experiencing a mental health issue.

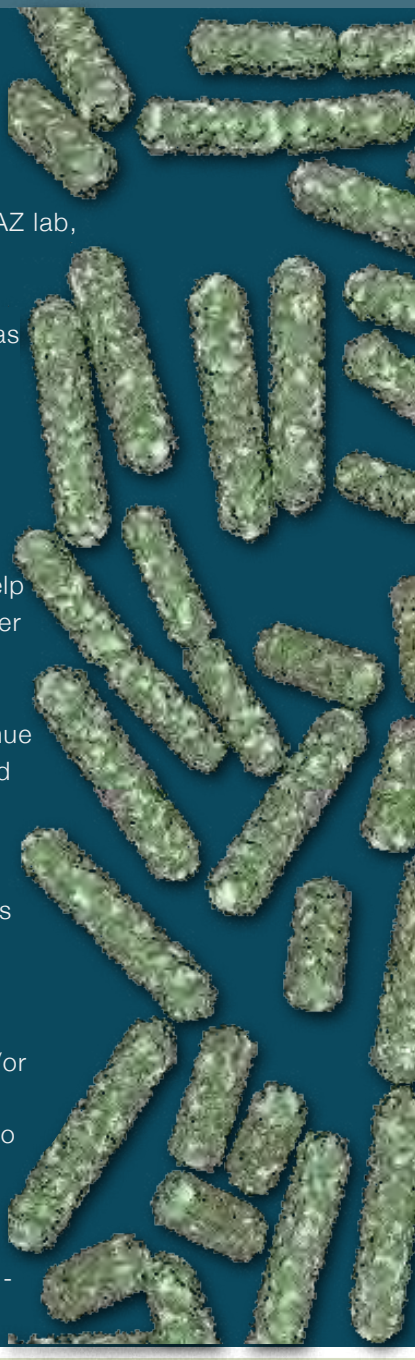
MPH Program Coordinator and Population Medicine department faculty member Andrew Papadopoulos is currently working in partnership with the University of Guelph Wellness Centre and the University's administration to conduct research on improving student mental health on campus. Data from the National College Health Assessment were analyzed to determine risk and protective factors regarding student mental health issues such as stress, anxiety, depression, poor sleep hygiene, and willingness to seek help. In the future, this work will be expanded to include additional university populations. Andrew's research also investigates academic program administration, including curriculum structure and community-engaged learning initiatives. Evidence suggests that community-engaged learning can increase the capacity of graduating students to connect with their communities, improve community health, and enhance the reputation of an institution within the broader community. Lastly, Andrew is focusing on food safety education by exploring the unique challenges that arise when dealing with older populations and their knowledge, attitudes, and beliefs, as well as the impact of food handler education and certification on restaurant inspections and food safety outcomes.

Public Health

Guelph Family Health Study

David Ma is a new CPHAZ member in the Department of Human Health and Nutritional Sciences. Along with his group in the Guelph Family Health Study, he investigated which resources are the most effective at improving the eating habits of children. Providing targeted and useful information about healthy eating to families can help decrease the risk of childhood obesity and future health risks, and can also help families establish good eating habits. Ideally positive eating habits established in childhood will continue throughout adulthood, and possibly even into subsequent generations. The Guelph Family Health Study explores a number of other public health issues. More details about these programs can be found on their website

Food Safety



Through the research efforts of the group led by Food Science faculty member Keith Warriner, Chelsey Trimblay (MSc), Abdulhakeem Alzahrani (PhD), Xueyang Wu (MSc) and Heather Chan (BSc Hons) have shown that Shiga Toxin-producing E. coli (STEC) can enter a dormant state that enables the pathogen to survive harsh environmental conditions. The bacteria can then reawaken to their former state when conditions become more favorable. With funding from the Center for Produce Safety and the OMAFRA Food Safety and Innovation Program, while working in the CPHAZ lab, the researchers determined that various serotypes of STEC differ in their ability to enter a dormant state; the organic compound indole was found to be a key regulator. Within the dormant state, STEC were found to survive over extended periods in soil, and could also tolerate sanitizers such as hypochlorite. Interestingly, extract of romaine lettuce was found to break the dormant state. These results help to explain how STEC can survive in the environment, as well as one reason why leafy greens are often implicated in STEC outbreaks.

Andria Jones-Bitton, a professor in the Department of Population Medicine, collaborated with the University of Waterloo on a project evaluating the effectiveness of the existing food handling training program for Ontario high school students. Food safety education in schools is meant to help prevent foodborne diseases such as Salmonella by teaching the importance of handwashing, proper cooking temperatures, avoiding contamination, and other safe handling practices. The aim of this project was to understand if the resources and methods currently being taught in high schools are resonating and developing into safe handling practices, with the hope that these behaviours continue into adulthood. After the food safety education program, student participants significantly improved their food handling knowledge and techniques. Although there exist areas for improvement, food safety education in Ontario appears to be making a difference for Ontario's youth.

Food Science faculty member Jeff Farber and his laboratory are investigating bacterial communities from imported ready-to-eat foods, as well as endophytes from fruits and vegetables. The major objectives of the research program is:

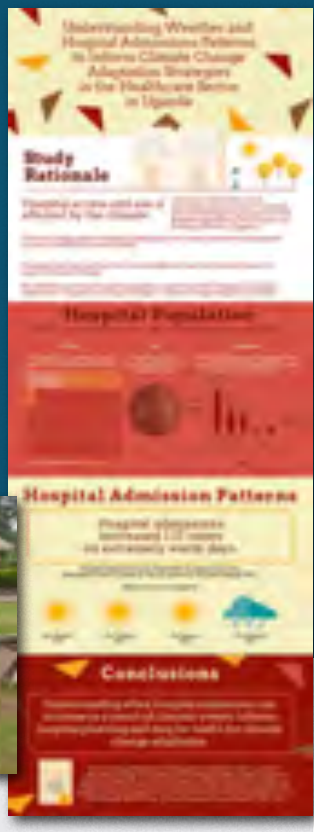
- to develop strategies to control foodborne pathogens;
- to discover new compounds and/or probiotics that turn off virulence genes, inhibit growth, and/or inactivate foodborne pathogens at the molecular level;
- and to determine the role of internal and external factors in the ability of foodborne pathogens to survive transit through the human GI tract and thus cause human disease.

Currently Jeff and his team are also studying the genes involved in the regulation of major virulence factors of the foodborne pathogens Listeria monocytogenes, Cronobacter sakazakii, and Salmonella spp. A novel simulated model of the human gastrointestinal microbial ecosystem (TWIN-SHIME) will be applied in the pathogen survival and genetic virulence factor studies.

Environmental Health & Climate Change

This past year, MSc student Di Wang (Advisor: Keith Warriner) completed her research into pathogen die off rates in manure added to soil as a fertilizer. Fertilizer that incorporates animal manure is a cost-effective strategy for supplementing the nutritional content of soil for crop growth. However, this method may pose a public health risk by introducing enteric pathogens capable of contaminating crops or washing into rivers into the environment. The survivability of Salmonella and E. coli O157, two major foodborne pathogens, was investigated across multiple seasons. Results suggested that surface application of manure promotes quicker pathogen death, but in turn poses a greater risk of disseminating pathogens into public water sources. This research helps to determine the best methods for use of manure in soil while reducing pathogen transfer and promoting public health.

In July 2018, Indigenous Health Adaptation to Climate Change (IHACC) research team members Kate Bishop-Williams (PhD Candidate, Population Medicine) Didas Namanya (Uganda Ministry of Health), Grace Asaasira (Makerere University), and Bianca van Bavel (Leeds University) organized and facilitated a series of results dissemination meetings and a workshop in Buhoma, Uganda. Kate discussed and exchanged preliminary findings from her research with hospital staff, community members, government officials, non-governmental organizations, and others. These discussions included interpretations, relevance, and applications of the findings to the local setting. In October 2018, Kate, Dr. Sherilee Harper, Dr. Jan Sargeant, and several additional co-authors published one of the studies from this research project in the International Journal of Environmental Research and Public Health.



Zoonoses

Alveolar echinococcosis (AE), a disease resulting from infection with the intermediate stage of the Echinococcus multilocularis parasite, is typically fatal in humans and dogs when left untreated. Since 2012, six dogs, three lemurs, and a chipmunk have been diagnosed with AE in southern Ontario, a region previously considered free of the parasite. In light of these developments, Jonathon Kotwa and advisor Andrew Peregrine investigated the prevalence and distribution of E. multilocularis infection in 460 wild canids (416 coyotes and 44 foxes) across southern Ontario from 2015-2017. The researchers found a 23% infection prevalence widely distributed across southern Ontario, with a high prevalence hotspot in the central-west region (i.e. the region at the western end of Lake Ontario). Risk factor analyses are currently ongoing. The research team hopes to use this information to guide public health and veterinary prevention efforts as well as public education programs.

Shannon French (Advisors: Claire Jardine and David Pearl), a PhD candidate in Pathobiology, is examining the ecology of Baylisascaris procyonis (raccoon roundworm) in wildlife in Ontario. Raccoons are the primary host of this parasite, which can cause neurologic disease when the larval stage infects people and other animals. In addition to monitoring the prevalence of this parasite in Ontario to better understand host and environmental factors that influence the presence and spread of the parasite, Shannon is interested in the role that small rodents play in maintaining roundworm reservoirs in the environment. She is investigating which animals frequent raccoon latrines - the primary site of infection for rodents and other animals - and comparing this information to the species that have historically been submitted to the Canadian Wildlife Health Cooperation with fatal roundworm infections.

Tara Sadeghieh is a PhD student in the Department of Population Medicine (Advisor: Jan Sargeant) who is based in the National Microbiology Laboratory (Public Health Risk Sciences Division) in Guelph (Supervisor: Victoria Ng). With funding from the Public Health Agency of Canada, she is investigating the importation of Zika virus and yellow fever to Canada from Brazil under current and future climate conditions. Tara has completed a scoping review to characterize the literature describing predictive and importation models of vector-borne diseases. She has now begun developing an infectious disease model to investigate the recent outbreaks of Zika virus (2015/2016) and yellow fever (2016/2017) in Brazil. She will be investigating similar outbreak scenarios under various future climate conditions, and will then determine the potential importation rates of these diseases to Canada to aid in determining which regions in Canada may be at risk for future Zika or yellow fever outbreaks.

Megan Neely, an MSc student in Pathobiology (Advisor: Scott Weese), is studying the seroprevalence of antibodies produced in response to Borrelia burgdorferi infections in Ontario horses. The blacklegged tick (Ixodes scapularis), which transmits B. burgdorferi (the causative agent of Lyme disease), has undergone rapid range expansion in Ontario. There is limited understanding of Lyme disease in horses, and there exist many issues pertaining to the selection and interpretation of diagnostic tests for Lyme disease. The seroprevalence study also addresses possible risk factors associated with exposure to B. burgdorferi. The findings from this study will provide valuable information to aid in determining the clinical relevance of B. burgdorferi antibody testing in horses.

Madison Wimmers, a Master of Public Health (MPH) candidate, recently completed her practicum at the Ontario Ministry of Agriculture, Food, and Rural Affairs. During this time, along with Drs. Maureen Anderson and Scott Weese, she updated the Infection Prevention and Control for Small Animal Veterinary Clinics manual to reflect new infection prevention and control (IPAC) ideas and procedures. Originally published in 2008, this document provides veterinary personnel with the information and tools necessary to establish IPAC practices in their clinics. Establishing IPAC procedures helps to mitigate the negative effects of infectious diseases in small animal veterinary clinics, including issues of antimicrobial resistance.

PhD student Rebecca Flancman (Advisor: Scott Weese) is assessing the influence of antibiotics on the resistome (all of the antibiotic resistant genes) of companion animals. She will use shotgun metagenomic DNA sequencing alongside bioinformatics analyses to evaluate the presence of antibiotic resistance genes in the feces of dogs and their human contacts. Clostridioles (Clostridium) difficile from human-dog households will also be isolated, and the genetic profiles of positive households will be compared to determine if C. difficile is shared between species. With over 16 million pets in Canada and approximately 40% of Canadian households owning a pet (2016), it is important to understand the risks pets can pose to humans (and vice versa). This research will attempt to determine whether it is possible for pets to harbour potentially dangerous bacteria that could in turn make humans sick.

Vectorborne Disease

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Pathobiology
Zoonoses: Livestock & Wildlife

Shane Bateman
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Human-Animal Bond; Companion Animal KTT

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Surveillance & Disease Outbreak

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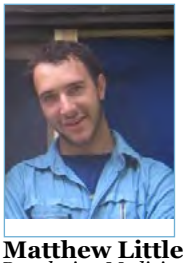

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David Ma
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Comparative Medicine

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Zoonoses

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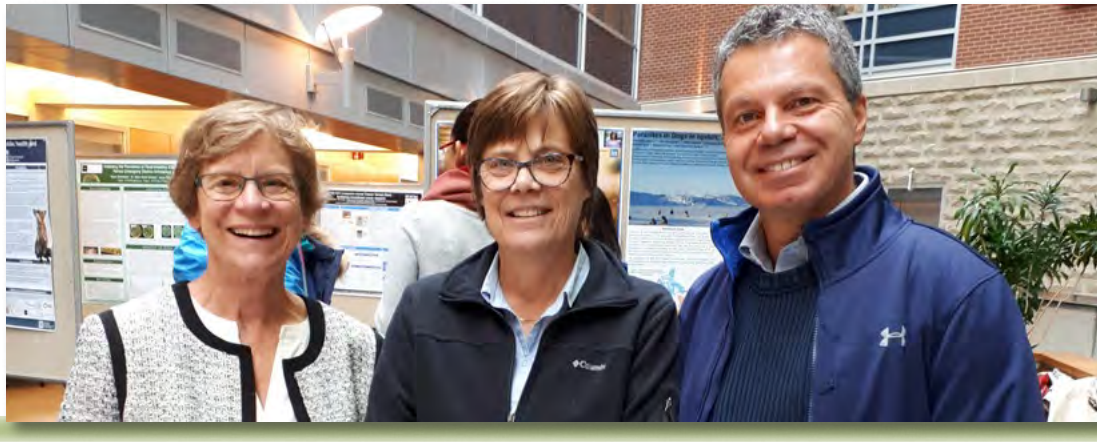

Master of Public Health Program Update

The MPH Program held its 10th annual Public Health Forum in November 2018. The keynote speaker, Dr. Heather Manson of Public Health Ontario, spoke about the role of evidence in public health policy decisions. Dr. Manson used recent examples including cannabis and e-cigarette legislation to illustrate that high-quality evidence plays a crucial role in the development of effective public policies. The Public Health Forum is also an excellent opportunity for MPH students to showcase their work. In all, 27 students presented their practicum placement work in three breakout sessions over the course of the day.

In addition, MPH student Rachel Goodland was this year's winner of the Dr. Robert Clarke Poster Award, which is sponsored by the OVC Alumni Association.

The second-year MPH students are the first expanded graduating class, with enrollment increased to 25 students per cohort. The expansion is part of an overall public health growth initiative that includes the addition of a Public Health field in the PhD program in Population Medicine. Plans are underway to further expand graduate programming in public health to also include a Masters of Science (MSc) option.

Rachel Goodland (centre), winner of the Dr. Robert Clarke Public Health Prize for the best MPH poster, with (from left): Dr. Andrew Papadopoulos, Coordinator of the MPH program; Melanie LeBlanc and Rochelle Parcells, from the Brant County Health Unit; and OVC Alumni Association secretary Dr. Maureen Anderson.

Do you have students that need bench top lab space?

Do you have containment level 2 research that you need a dedicated space for?

Do you need freezer storage?

Do you need isolates for your research, but cannot collect them?

CPHAZ welcomes members and collaborators to use the CPHAZ laboratories, a shared resource offering areas for bacteriology, cell culture, PCR, freezer storage and more!

The CPHAZ biobank is a resource of zoonotic isolates for members to use in their research. Contact us today for a list of isolates available. We are always accepting isolate donations!

For more details on the lab space, biobank, or to see a fee schedule, please visit our website: www.ovc.uoguelph.ca/cphaz/research-laboratories.

CPHAZ Steering Committee

Our steering committee members represent a range of interests and expertise in animal-related aspects of public health. Their participation and dedication to CPHAZ is fundamental to our success as part of the public health community.

Andrew Peregrine is an associate professor of parasitology in the Department of Pathobiology. His research interests include the epidemiology of parasitic infections and development of parasite control programs to reduce drug resistance.

Zvonimir Poljak is an associate professor in the Department of Population Medicine. His research focuses include examining the spread of infectious diseases in swine using a variety of quantitative methods.

Claire Jardine is an aassociate professor in the Department of Pathobiology. Her research interests include rodent and vector borne zoonotic diseases, the ecology of zoonotic diseases in wild animal populations and wildlife health.

Andrew Papadopoulos is an associate professor in the Department of Population Medicine and the coordinator of the Master of Public Health Program. His research focuses on environmental public health issues and public health policy administration.

Scott Weese is a professor in the Department of Pathobiology. His research focuses on multi-drug resistant bacteria (particularly MRSA), bacterial gastrointestinal disease, and transmission of infectious agents between animals and humans.

Peter Kim is a professor in the Department of Mathematics and Statistics. His research interests are in bioinformatics and biostatics, mainly in a clinical setting. Peters current research focus includes the gut microbiome and Clostridium difficile infection

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