Presenter's Name: Brar, Sukham

Additional Author(s): Vanin S, Hardy DB, Arany E

Abstract Title: Evaluating the effects of cannabidiol use during pregnancy on offspring pancreatic development and function in rats: potential impacts for human and environmental health

Abstract:

Introduction: Δ9-tetrahydrocannabinol (Δ9-THC) and cannabidiol (CBD) are the two main components of Cannabis sativa. In the United States, 1 in 20 women report consuming cannabis while pregnant, which is likely an underestimate due to self-reporting. A recent study has shown that in utero Δ9-THC exposure impairs female offspring glucose homeostasis and endocrine pancreatic development in the rat. Yet, contributions of in utero CBD exposure in pancreatic development and function remains largely unknown. This is concerning since CBD has become increasingly accessible and consumed since the legalization of cannabis in 2018 in Canada.

Project Goal and Objectives: A one health approach was used to investigate the potential effects of CBD use during pregnancy on offspring pancreatic development and function in a rat model, the effects of CBD consumption on other animal species and the impacts of CBD production on the environment. Key stakeholders interested in CBD consumption and production were identified and mapped.

Methods: Pregnant rats per treatment received daily intraperitoneal (i.p) injections of either a vehicle (1:18 cremophor: saline i.p), a low dose of CBD (3 mg/kg i.p), or high dose of CBD (30 mg/kg i.p) from gestational day 6 to parturition. Pancreatic development and function was assessed in male offspring at 3 weeks and 3 months of age through a glucose tolerance test and assessment of pancreas morphometry by immunofluorescence. A scoping review was conducted to provide an overview of current key findings related to the effects of cannabis cultivation on the environment and the effects of CBD as a therapeutic agent in domestic dogs. Key stakeholders were identified by reviewing grey literature and mapped using Kumu software.

Results: The preliminary findings at 3 months showed a significant increase in the area under the curve for blood glucose in offspring exposed to a low dose of CBD. No significant changes in fasting insulin concentration and indices of insulin resistance (HOMA-IR, HOMA-B, QUICK-I) were observed. It is expected that cannabis cultivation will negatively impact the environment and CBD consumption will have mixed effectiveness as a therapeutic agent in dogs.

Discussion: These findings indicate that fetal CBD exposure may predispose offspring to develop glucose intolerance. The potential adverse effects of CBD makes its consumption and production concerning for the health of humans, animals and the environment.

POSTER PRESENTATIONS 2
2B: ONE HEALTH

Presenter's Name: Huang, Sophia

Additional Author(s): Sun G, Northover A, Frisbee S

Abstract Title: Evaluative Approaches for Supportive Housing Communities in St. Thomas, Ontario

Abstract:

Substance use disorders and mental illnesses are mental disorders that affect a person's behaviour and can often hinder an individual's ability to complete daily tasks and exert control over substances; thus, posing a risk to their health. Homeless people are extremely vulnerable when considering their lack of access to stable housing and the social stigma surrounding their conditions. Homelessness has become an increasingly prevalent issue, especially in Southwestern Ontario. Despite the therapeutic benefits that companion animals may provide to recovery, homeless persons with companion animals have even less access to homeless services as many prohibit pets. As such, the challenge of solving homelessness is often related to the complex social and medical problems experienced by homeless people. Permanent supportive housing are housing communities that provide safe and stable housing to the homeless population that suffer from mental and substance use disorders. There is often support programming in these communities that equips users with resources to protect their well-being, including access to physicians and treatment. A challenge associated with these communities include a lack of standard approaches to evaluate these communities. As such, a scoping review of databases including MEDLINE, EMBASE, PsycINFO, SCOPUS and other grey literature sources will be performed to synthesize the body of knowledge in regards to factors that contribute to success, including the incorporation of pet-friendly housing, and evaluative approaches for supportive housing communities in Canada. This will further apply to the homeless population in St. Thomas, Ontario. Further, key criteria, stakeholders and programming for supportive housing communities will be discussed. Evaluative approaches for these communities can be separated into three categories: housing, support (mental disorders), and support (others). This study will provide supportive housing communities with approaches to evaluation in order to learn from other communities and make changes to better equip the homeless population to tackle substance use disorder and mental illness. The One Health approach recognizes the built environment of housing and social support services as well as companion animal health and other medical services as key parts in addressing homelessness and mental and substance abuse disorders. By protecting environmental health and animal health, human health outcomes are improved.

Presenter's Name: Keng, Isabelle

Additional Author(s): McKinley G, Olea-Popelka F

Abstract Title: Social Prescription Evaluation: Developing a Method for Evaluating Social Prescription as a Means of Supporting Individuals with Lived Experience with Substance Misuse in Whitefish River First Nation Community

Abstract:

Introduction: Colonization silenced indigenous voices in healthcare policies, leading to culturally inappropriate healthcare services and on average, indigenous peoples are disproportionately affected by substance misuse in Canada. This led researchers to develop services, like social prescription programs to help meet this need. However, these programs are new, and an evaluation plan is required to ensure it works in the context of indigenous health and substance misuse. The aim of this project is to create an evaluation plan for the pilot social prescription program taking place in the Whitefish River First Nation community that includes the environmental, animal, and human factors that influenced the observed community public health outcomes.

Methods: Kumu software will be used to create a stakeholder map. Apart from the individuals directly involved in the project additional stakeholders will be identified through literature analysis. A program logic model will be created following the W.G Kellogg (2004) 5 category model. Interviews of staff members involved in the project implementation will be conducted by myself under the supervision of Dr. Gerald McKinley. A qualitative analysis will be completed following the framework method by Gale et al., (2017) with modifications to the first and second steps.

Expected Results: I am expecting to identify factors that encouraged and deterred participant attendance. I am also looking to identify natural and built social environmental, and animal factors that influenced the observed outcomes, and to draw evaluative conclusions about the quality, value, and significance of the program to the community.

Significance: This project will help expand the applications of social prescription programs in Canada. Additionally, the social prescription program being evaluated has a large environmental and animal component, and as such, requires a one health approach to be fully comprehensive.

POSTER PRESENTATIONS 2
2B: ONE HEALTH

Presenter's Name: LaPenna, Ryan

Additional Author(s): Moyo I, Foggin C, Dawson J, Sabeta C, Olea Popelka F

Abstract Title: Assessment of Rabies Control In Rural Areas in Victoria Falls, Zimbabwe

Abstract:

Introduction: Rabies is a fatal viral disease transmitted to people from the saliva of infected animals. Rabies is widespread throughout Zimbabwe and human deaths are reported every year. To supplement the Government's effort on rabies control, Victoria Falls Wildlife Trust and Veterinarians for Animal Welfare Zimbabwe have joined forces to carry out dog rabies vaccinations in rural communities adjacent to the major tourist attraction of Victoria Falls (VF). This study aimed to determine the rabies immune status among rural dogs and collect information about Knowledge, Attitude and Practices (KAP) to better understand behaviours and interactions between dogs, people, and wildlife in rural VF.

Methods: From October–November 2020, blood was collected from a sample of 500 dogs for rabies serology testing during an annual rabies vaccination campaign in rural areas in VF. 498 of the 500 dog sera samples were tested successfully for rabies antibodies at the Onderstepoort Veterinary Institute, South Africa using the Rabies BioPro ELISA test kit. A protective rabies antibody titer was defined as a titer ≥0.5 IU/mL. Additionally, a KAP survey was implemented among dog owners (n=342) to collect information about the dog demographics, rabies vaccination history, and health behaviours in this community. KAP survey and serology data were merged for each dog sampled. Multivariable logistic regression was used to evaluate associations between protective rabies antibody status and selected risk factors at time of sampling.

Results: At time of sampling in 2020, 32.1% (160/498) of dogs had protective rabies antibodies (PrAbs). Among previously vaccinated dogs, 44.8% (133/297) had PrAbs. The proportion of dogs with PrAbs decreased with time since vaccination, with <1 year (87.5%), 1-2 years (45.1%) and >2 years (31.2%). The odds of having PrAbs at time of sampling was significantly associated with a dog being previously vaccinated against rabies ($p<0.001$, OR 5.1, 95% CI:3.1–8.3), age ($p=0.042$, OR 1.1, 95% CI:1.0–1.2), body condition ($p=0.043$, OR 8.6, 95% CI:1.1–69.3) and among dogs not used for herding cattle ($p=0.011$, OR 1.9, 95% CI:1.2–3.0).

Discussion: Evaluating the rabies antibody levels in the dog population in rural communities around VF is important to guide the process to re-vaccinate these animals. Our findings support maintaining the current policy of annual rabies vaccinations in this area to protect dogs and thus prevent human infection and deaths.

Presenter's Name: Li, Duo

Additional Author(s): Frisbee S, Jaganathan S

Abstract Title: A One Health Approach to Localizing and Implementing Sustainable Development Goals in London, Ontario

Abstract:

The United Nations' 17 Sustainable Development Goals (SDGs) provide a framework for a sustainable future by recognizing the complex relationships between various topics in human health and the environment. However, many of the totalled 231 SDG indicators were created based on a global scale, and therefore, are not always applicable or available in data within specific cities. To properly use and benefit from the SDG framework in local areas, it is important to adapt the list of indicators to fit the city's unique state and needs. Additionally, the One Health approach is essential in understanding the importance of stakeholder collaboration and interconnections between human health, animal health, and the environment when implementing the SDG framework. Thus, the main goal of this thesis is to make recommendations on localizing the SDG framework with a focus on the city of London, Ontario. To achieve this, data sources that measure progress of London's existing localized indicators will be summarized in a report, different SDG localization methods in other cities will be explored, and various stakeholders involved in the SDG framework will be mapped using the software Kumu. Preliminary findings show that although a list of localized indicators has been created for London, around half of them do not have available or reliable data sources. Without data to measure progress within the indicators, this would call for modification of London's localized indicators or new initiatives that collect the SDG data needed on a local scale. Additionally, none of the localized indicators address animal health, an important pillar of the One Health paradigm. Thus, London will need to consider creating new indicators related to animal health to fill this gap. Ultimately, this project will help further the knowledge of how to localize and implement the SDG framework and provide London with its next steps in measuring SDG progress.

POSTER PRESENTATIONS 2
2B: ONE HEALTH

Presenter's Name: Liu, Peter

Additional Author(s): He F, Mallikarachchi M, Frisbee S

Abstract Title: Cardiovascular disease in neuroendocrine tumours

Abstract:

Patients with neuroendocrine tumours (NETs) commonly develop cardiovascular complications that can manifest as carcinoid heart disease (CHD). NET tumours may secrete diverse substances such as catecholamines, serotonin, arachidonic acid metabolites, and other neuroendocrine factors. Chronic exposure to vasoactive NET secretions may cause endothelial cell dysfunction, impair vascular network perfusion, and remodel heart structure or function causing poor clinical outcomes in these patients. Given that NET incidence is increasing worldwide and are now recognized as the fastest growing class of tumours, there is a critical need to understand the underlying mechanistic contributors that lead to CHD or NET development.

In this thesis project, a One Health approach is used to examine the interconnected environmental factors that play a role in animal and human NETs. A narrative literature review was conducted to investigate NETs in animal species, in addition to identifying environmental and socioeconomic factors that may be associated with NETs. Potential stakeholders within and beyond scientific research will be identified and visually mapped using Kumu. A scoping review was conducted to evaluate the existing primary literature about CHD in human NET patients.

A systematic search of the MEDLINE database was performed and 434 studies were extracted. After title and abstract screening, 273 studies were selected for full-text review and data extraction if eligible. Within these studies, 173 were identified as case reports and 94 as cohort studies of various designs. Currently, the cause and progression of CHD in NET patients is poorly understood and researched. Preliminary results show a lack of study designs investigating mechanistic changes underlying CHD before or after treatment. Although NETs have been reported in domestic dogs, cats, horses, and cows, the potential of animal NET research is unrecognized. A One Health perspective should be explored as it is well-suited to address the interconnection between carcinogenic processes in the environment that contribute to human and animal NETs.

Presenter's Name: Sutherland, Janice

Additional Author(s): McKinley G, Frisbee S

Abstract Title: Evaluation of a One Health Education Program in Youth to Improve Their Health-Related Quality of Life

Abstract:

Health is impacted by many factors of which approximately eighty percent are non-clinical factors rooted in the social determinants of health shaped by the social and built environment that a person lives in. Social prescriptions are action-oriented plans that are aimed at addressing the social determinants of health that are impacting an individual's health. In particular social prescription programs are often associated with increasing participants sense of community and improving their feelings of social connectedness. One type of social prescriptions is green or park prescriptions. Green prescriptions are based on having participants interact with the environment while participating in outdoor activities such as park visits, nature walks or gardening. One Health is an area of study that examines the connections between humans, animals and the environment. For my thesis project I will be translating social prescription research in to a One Health training model to teach adolescents about the relationship between the natural environment, built environment, and human health in an urban setting. The goal of the social health program is to increase physical activity levels and adolescent's feelings of social connectedness within their community. In order to measure if participants overall health related quality of life improves after participating in the workshops pre-program and post-program data will be collected. Pre-program data collected will consist of the UCLA Loneliness Scale which will be used to assess the participants feelings of loneliness, the Perceived Stress Scale and Health Related Quality of Life will be used to assess the participants overall well-being, in addition physical health data will be collected to measure the participants BMI, and time spent outdoors will be collected by asking participants to self-report the amount of time they spend outdoors in their community. These measures will then be collected again at the conclusion of the workshops and then post-program at the 6-month time point. I hypothesize that participation in the One Health education program will increase participant's time spent outdoors in green spaces which will lead to an increased sense of belonging and feelings of social connectedness in their community and as a result there will be an improvement in the youth's overall health related quality of life.

POSTER PRESENTATIONS 2
2B: ONE HEALTH

Presenter's Name: Zhang, Joel

Additional Author(s): Leseni T, Olea Popelka F

Abstract Title: Evaluation of healthcare facilities and services provided for tuberculosis and zoonotic tuberculosis in Kajiado County, Kenya

Abstract:

Introduction: Tuberculosis (TB) remains the leading cause of death globally from a single infectious agent. An estimated 10 million people develop active TB and 1.4 million die from TB annually. While Mycobacterium tuberculosis is the primary infectious agent causing TB in humans, Mycobacterium bovis, the causal agent of bovine TB, can also be transmitted to humans, causing zoonotic tuberculosis (ZTB). In Kenya, specifically, in Kajiado County, the Maasai ethnic group is at an increased risk of ZTB due to their socio-cultural-economic practices and close interdependence with animals.

Objectives: To evaluate current capacities, logistics, and infrastructure in place for diagnosis and treatment of TB and ZTB within healthcare facilities located in rural Kajiado County, Kenya. Knowledge, attitudes, and practices (KAP) among healthcare workers were also explored as part of initial data collection.

Materials and methods: A questionnaire was developed and delivered by collaborators at Talaku- A Community Based Organization in Kajiado to 25 healthcare facilities. These healthcare facilities were selected purposively based upon accessibility in these remote areas. The questionnaire was given to three health workers at each healthcare facility during January-February, 2022. The questionnaire included twenty-six quantitative/qualitative questions regarding TB/ZTB diagnostic and treatment capacities, availabilities, and knowledge, attitudes, and practices regarding TB and ZTB among healthcare workers. Descriptive analysis for continuous and categorical data will be utilized.

Results: As of February 11, 2022, data collection was completed, and data are available from sixty-nine responders at 25 different facilities. Data formatting and cleaning is being conducted, analysis will take place in early March, and available results will be presented at PaLM research day.

Conclusions: We are confident that the results from this study will positively contribute to 1) create awareness for TB and ZTB, diseases that continue to be neglected, especially in marginalized rural communities, and 2), providing new information to key local stakeholders in Kenya, thus contributing by providing key knowledge and information to guide further work towards addressing the challenges poised by TB and ZTB, and thus improve healthcare facilities services and capabilities available to people in these rural and marginalized communities in Kenya.