



UNIVERSITY OF MANITOBA

# ResearchLIFE

WINTER 2021 | VOLUME 1

## HIP TO HEPARIN

A new model for a global trial

## ON THE WING

Migratory birds impacted  
by lockdowns

## PANDEMIC FALLOUT

For newcomers and Indigenous People

## PREVENTING UNINTENDED DISASTER

Pandemic effects  
on mental health

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# Message

FROM THE VICE-PRESIDENT  
(RESEARCH AND INTERNATIONAL)



**I HOPE THAT AS YOU READ THIS** message, that you are well and that the pandemic has abated or is under control, wherever you are located.

As 2020 drew to a close and we were working on a COVID research themed issue of ResearchLIFE, I was and continue to be, heartened and inspired by the collective ‘coming together’ of scientists, scholars and artists to find solutions – to mitigate the impacts – of this global pandemic.

Thousands around the world sought or are seeking new ways to treat the virus and others worked or are rapidly working on vaccines in various stages of clinical trials: we all remain optimistic that we will be able to receive a vaccine inoculation in 2021.

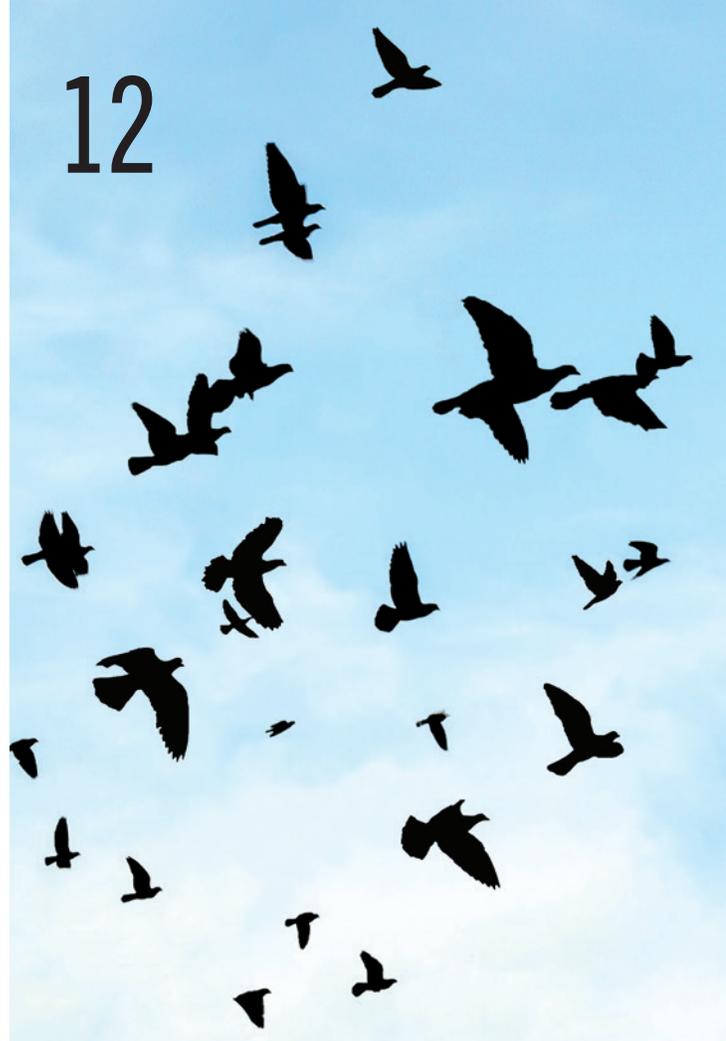
University of Manitoba researchers embraced the opportunities presented by the pandemic, shifting to remote work when necessary and continuing to move knowledge forward on all research projects in general but critical COVID research activities in particular.

One example in this issue is the clinical trial of the drug heparin in treating critically ill COVID patients, led by Ryan Zarychanski and his team, now ongoing in Canada, the U.S. and internationally. Another is Christine Leong and her team following the impacts of self-isolation and psychotropic drug use by those diagnosed with existing mental health disorders: findings that will influence public health policy.

Studying the societal and environmental impacts are two teams: Lori Wilkinson and Kiera Ladner, who are exploring the impacts on marginalized populations such as newcomers and Indigenous people in Canada, the U.S. and Mexico. Nicola Koper with a national and international network, is exploring the lockdowns and how those influenced bird migrations: findings that will form the basis of mitigation efforts to reduce species losses.

In addition to these stories, you will learn about further innovations taking place during the most difficult of times and how we are—together—finding a way forward.

—Digvir S. Jayas, OC, PhD, DSc, PEng, PAg, FRSC



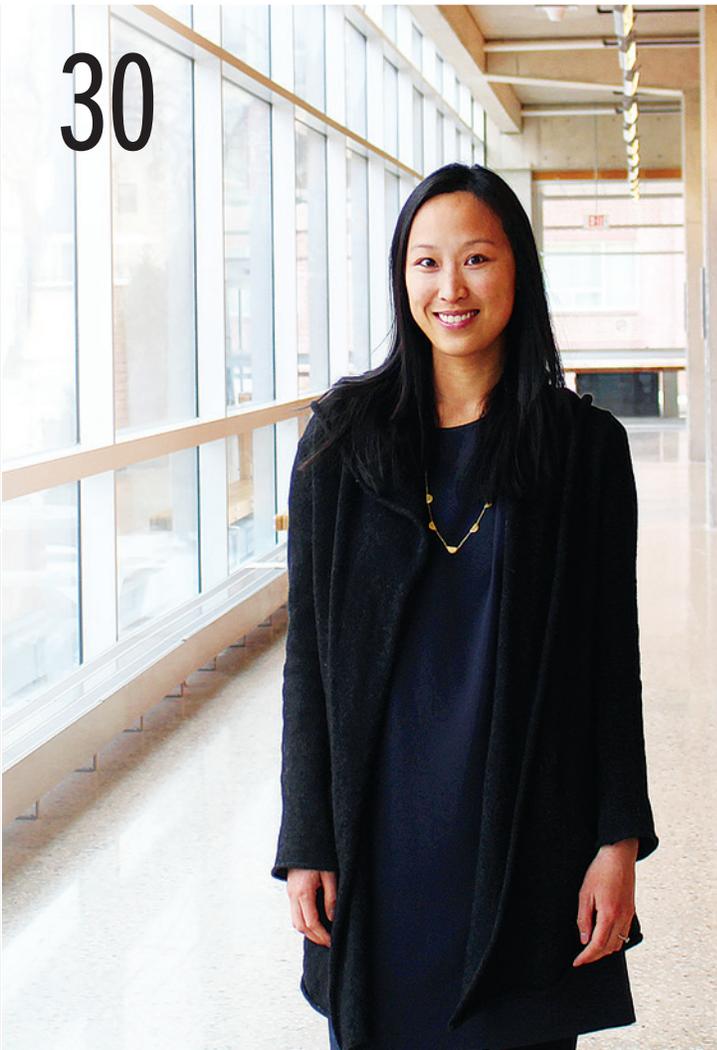
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**ResearchLIFE**

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# Leveraging Canada's Expertise

UM research teams are seeking to accelerate the development, testing and implementation of measures to mitigate the spread of COVID-19 and its negative impacts on people, communities and health systems. With funding from the Social Sciences and Humanities Research Council, Natural Sciences and Engineering Research Council, Canadian Institutes of Health Research, the Canada Foundation for Innovation, Research Manitoba and others, UM teams are tackling a variety of issues and impacts, including:

Research, scholarly work and creative activities underway related to the ongoing COVID-19 pandemic made up of as many investigations as there are impacts on our society. Despite the stoppage of on campus/in person research activities in March 2020, work continued remotely, with a phased resumption of those activities deemed essential as the pandemic allowed. UM prioritizes research related to all aspects of COVID-19 as essential.

FUNDERS

33

FUNDING

16  
MILLION +

RESEARCH LEADS

61

COLLABORATIONS

82+

PROJECT TEAMS

73

REGIONS

CANADA  
U.S.  
BRAZIL

MEXICO  
AUSTRALIA  
CHINA

UNITED  
KINGDOM



## VACCINE DEVELOPMENT

**Xiao-Jian Yao** (medical microbiology and infectious diseases) is leading a team developing two COVID-19 vaccine candidates. One approach involves generating virus-like particle vaccine coated with both COVID-19 spike protein and a dendritic cell-targeting RBD domain of COVID-19 from an FDA-approved cell-line. The second approach uses a viral vector called the vesicular stomatitis virus (VSV) and placing a dendritic cell-targeting RBD domain of COVID-19 into the VSV vector.



## OLDER ADULTS

**Verena Menec** (community health sciences) is leading the Manitoba platform of the Canadian Longitudinal Study on Aging COVID-19 Seroprevalence Study. Findings will provide a comprehensive picture of the prevalence and impact of the virus among older adults in Canada. Menec is former Canada Research Chair (CRC) in Healthy Aging.



## CANADIAN POPULATIONS

**Michelle Driedger** (community health sciences) is examining public health COVID-19 outbreak management strategies. Her research focus is on how members of the general public, including special targeted populations like the Métis, understand public health communication efforts about how they can protect themselves and their families. Driedger is former CRC in Environment and Health Risk Communications.



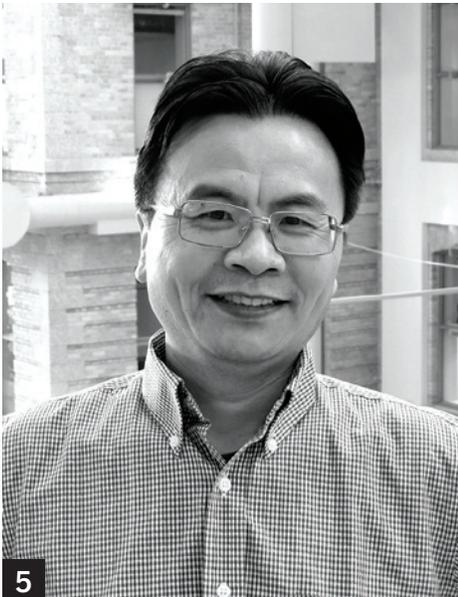
## YOUNG WORKERS

**Roberta Woodgate** (nursing) is partnering with NorWest Co-Op Community Health Inc. and its integrated youth service centre, NorWest Youth Hub, to detail the employment needs and challenges of young people in the COVID-19 era with the intent to identify solutions that will result in more supportive, responsive, safe and healthy workplaces. Woodgate holds a CRC in Child and Family Engagement in Health Research and Healthcare.



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# Ahead of the Curve



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## The 2019 recipients of the Terry G. Falconer Memorial Rh Institute Foundation Emerging Researcher Award winners are UM faculty members in the early stages of their careers who display exceptional innovation, leadership and promise in their chosen fields.

1

### APPLIED SCIENCES

**Guozhen Zhu (mechanical engineering)**, Canada Research Chair in Mechanical and Functional Design of Nanostructured Materials, aims to discover superior nanostructured materials by characterizing and tuning the atomic and electronic structures of nanoscale constituents embedded in crystalline materials (e.g., functional oxides, lightweight alloys, etc.). Her research strives to predict nanoscale constituents through thermodynamic models and their corresponding materials' behaviour. Her findings will guide the design of advanced materials, such as lightweight alloys and functional composites, for the aerospace, automotive and energy industries.

2

### HEALTH SCIENCES

**Kellie Thiessen (nursing/Children's Hospital Research Institute of Manitoba)** uses an evidence base to inform health policy and health services delivery on how to best utilize midwives and other health professionals while also optimizing patient and system level outcomes. She seeks to identify and describe exemplar maternity service delivery models that are integrated, cost-efficient, culturally appropriate, and ultimately, effective in supporting persons to maintain health and wellness in their own community.

3

### HEALTH SCIENCES

**Frederick Zeiler (Surgery)** is a clinician-scientist whose clinical practice focuses on the management of cranial neurotrauma. His research

program focuses on the application of multi-modal invasive/non-invasive cranial physiologic monitoring. This program integrates complex high-frequency signal processing, with neuroimaging, protein and genetic biomarkers with a goal of uncovering the molecular mechanisms involved in impaired cerebrovascular reactivity in Traumatic Brain Injury (TBI). This allows for the development of potential therapeutic targets directed at prevention and treatment of vascular dysfunction in TBI.

4

### HUMANITIES

**Jonathan Peyton (environment and geography)** is a human geographer who focuses on the social, economic and environmental effects of postwar energy, mining and infrastructure development megaprojects. His current research is on the initial stages of oil and gas development in the Canadian Arctic, focusing on the relationships between extraction and conservation spaces, scientific research and knowledge claims, and Indigenous activism and corporate industrial dreams.

5

### INTERDISCIPLINARY

**Pingzhao Hu (biochemistry and medical genetics, computer science, electrical and computer engineering)** conducts research on developing and applying artificial intelligence (AI) and large-scale statistical techniques for integrative analysis of multimodal health data for precision medicine. He works in an independent, multidisciplinary and collaborative

framework where his expertise in AI, statistics and bioinformatics complements that of his collaborators. His most current research interest is in developing interpretable and expandable deep learning models for radiogenomics and drug discovery.

6

### NATURAL SCIENCES

**Jacob Burgess (physics and astronomy)** conducts research that focuses on the creation and use of new microscopes capable of making movies of events that take place inside complex materials faster than a trillionth of a second and over distances below a billionth of an inch. By doing this, he aims to contribute to our understanding of how to connect atoms in materials in order to use quantum physics in every day devices to realize technologies like new high efficiency computers, perfect online privacy and lossless electricity transmission.

7

### SOCIAL SCIENCES

**Will Oxford (linguistics)** studies the structure of words and sentences in the Algonquian languages, a family of Indigenous languages that includes Ojibwe and Cree. He works with speakers of these languages to document and describe their unique grammatical patterns, such as an uncommon distinction between third person and fourth person. His theoretical research connects these patterns to deeper questions involving the nature of language change and the degree to which linguistic structures can vary across languages, with the overall goal of ensuring that linguistic theory is informed by the full diversity of the world's languages.

# Transforming Power Transmission for a secure carbon free future



**T**HE ELECTRICAL NETWORK OF TODAY IS UNDERGOING A great transformation. Gone are the days when electricity was generated close to population centres and essentially serviced only local loads. Today's networks are continent-wide and there is even talk of interconnecting multiple continents. Such an arrangement allows harnessing renewable energy sources such as wind, solar or hydroelectric energy and transporting it to distant populated destinations.

This is something that Distinguished Professor Aniruddha Gole [MSc/80, PhD/82], PEng has spent decades studying and developing innovations that allow society to enjoy the benefits of electrical energy. His research encompasses various aspects of DC transmission, power system simulation and power electronic applications. Products he has developed with collaborators are used in over 80 per cent of the world's high voltage DC systems.

**“The great increase in computing power means that real-time (RT) simulation is a reality. It can produce results as fast as in the real world, thereby permitting the testing of control hardware via connecting to a simulator instead of to the real system.”**

In recognition of his decades of outstanding research accomplishments Gole was awarded the 2019 Dr. John M. Bowman Winnipeg Rh Institute Foundation Award. Gole holds an NSERC Industrial Research Chair in Power Systems Simulation in the Price Faculty of Engineering.

Gole advises that the very complexity and size of the modern power grid makes its design and operation a great challenge. Experimentation is generally not possible the way it is for other industrial products. For this reason, the behavior of such networks is usually investigated using computer-based simulation tools.

For context, the Manitoba engineering community is a world leader in simulator development. Two of the world's leading manufacturers are based in Winnipeg. PSCAD™/EMTDC™ which, with a base of over

35,000 users internationally, is now the world's most widely used electromagnetic simulation program for power systems. It was originally developed by Dennis Woodford at Manitoba Hydro working with Gole and his graduate student Garth Irwin.

“The great increase in computing power means that real-time (RT) simulation is a reality,” says Gole. “It can produce results as fast as in the real world, thereby permitting the testing of control hardware via connecting to a simulator instead of to the real system.”

A team of researchers from the Manitoba HVDC research Centre and Gole's graduate students Dr. Trevor Maguire and Rudi Wierckx developed the world's first and the most widely used real-time simulator—the RTDS—which is now commercialized by RTDS Technologies of Winnipeg, located at UM's Smartpark. In the last two decades, PSCAD™ and RTDS have been used for the design of the majority of the world's high voltage DC transmission systems.

Research at the University of Manitoba has been and continues to be an indispensable component in maintaining the cutting edge of power simulator research.

*The Rh Awards are awarded by the Winnipeg Rh Institute Foundation to support the advancement of knowledge in all fields at UM. The Dr. John M. Bowman Memorial Winnipeg Rh Institute Foundation Award, established in 1997 and renamed in Dr. Bowman's memory in 2005, recognizes outstanding research accomplishments by a non-retired, established UM faculty member. *

# New Approach to an Old Method



**T**HE COVID-19 PANDEMIC HAS created havoc across many segments of society. Its impacts have been far-reaching and resulted in the need to look at new ways of doing things. It has been the impetus for innovation. One such project underway in Winnipeg involves developing a wastewater surveillance system.

“Wastewater surveillance of infectious diseases is an old method of monitoring disease,” says Qiuyan Yuan, assistant professor of civil engineering at the Price Faculty of Engineering. “When the pandemic began, researchers in other parts of the world began studying wastewater to determine if SAR-CoV-2 was present and a useful tool for monitoring the severity of an outbreak. In some cities they detected the virus before the first symptomatic cases were reported.”

Yuan is undertaking her own research working with microbiologist Miguel Uyaguari, PhD student Kadir Yanac and City of Winnipeg wastewater engineer Michelle Paetkau - to develop a monitoring system to detect COVID-19 infection in wastewater. Their project will form the basis for occupational safety and health regulation for mitigating health risks to workers in sewage treatment plants. They received funding from the Natural Sciences and Engineering Research Council Alliance COVID-19 grant program which is intended to stimulate collaborations between university-based researchers and the public and not-for-profit sectors or industry, to find

Winnipeg treats

**270,000**

m<sup>3</sup> daily (metres cubed;  
1 cubic metre is  
1,000 litres)

Toronto treats

**1,500,000**

m<sup>3</sup> daily

**60%**

at the North End  
Sewage Treatment  
Plant - using a high  
purity oxygen system

**20%**

at the South End Sewage  
Treatment Plant - using a  
high purity oxygen system  
with upgrades underway  
to convert it to a biological  
nutrient removal system

**10%**

at the West End Sewage  
Treatment Plant - using  
a biological nutrient  
removal system

solutions to pandemic-related research and technical challenges.

Since the spring of 2020, wastewater samples from the inlets of the wastewater treatment plants (WWTPs) were collected to monitor SARS-CoV-2. Preliminary results show that when the number of daily cases were low (less than 20), it was not detected in any samples. When the number of daily cases were higher than 20 it was detected in all samples from the three WWTPs.

**“When the pandemic began, researchers in other parts of the world began studying wastewater to determine if SAR-CoV-2 was present and a useful tool for monitoring the severity of an outbreak. In some cities they detected the virus before the first symptomatic cases were reported.”**

“This showed that COVID-19 has spread all over the city,” says Yuan. “This allows us to use this data to develop a wastewater surveillance tool by establishing a correlation between number of cases, average amount of virus excreted by infected people and the virus concentration in the wastewater.” **IR**

# Research Resilience

BY MICHAEL BENARROCH

Learning, discovery and community engagement are at the core of the University of Manitoba's raison d'être. As our province's only research-intensive post-secondary institution, we strive to live up to our responsibilities and serve as a model of flexibility and innovation during these especially turbulent times.



Photo:  
Ms. Alia Youssef

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### **AM NOW MORE THAN SIX MONTHS INTO MY POSITION**

as the 12th president and vice-chancellor of the University of Manitoba, a role in which I am honoured to serve. As with every other jurisdiction on the planet, we have faced challenges we could not have foreseen a year ago: we have also found opportunities amidst the turmoil. Humans are resilient, and as they are the backbone of every organization, working together, we are forging ahead with resolve.

Our research enterprise has risen to the occasion to continue the research, scholarly work and creative activities necessary for discovery and to contribute to the local, national and international diaspora. Work continued remotely, with a phased resumption of those activities deemed essential, as the pandemic allowed. This has not been easy; the challenges associated with continuing research work in our current circumstances are considerable. I am proud of the way our research enterprise has found a way to continue its work, and excited about the many innovations and contributions that have resulted.

### **OUR RESEARCH ENTERPRISE HAS RISEN TO THE OCCASION TO CONTINUE THE RESEARCH, SCHOLARLY WORK AND CREATIVE ACTIVITIES NECESSARY FOR DISCOVERY AND TO CONTRIBUTE TO THE LOCAL, NATIONAL AND INTERNATIONAL DIASPORA.**

Community and collaboration are at the forefront of UM research activities. During the current health crisis, research related to COVID-19 is essential to both find treatments, including a vaccine, as well as the compounded impacts on communities here and around the world, many of them already known to be vulnerable and at-risk due to socioeconomic factors. One example, the project *kitatipithitamak mithwayawin*: an Indigenous-led planning and response to COVID-19, undertaken with professors Stephane McLachlan and Indigenous scholar Myrle Ballard at UM, is a collaboration that has developed innovative and culturally appropriate countermeasures to the pandemic to better serve Indigenous communities.

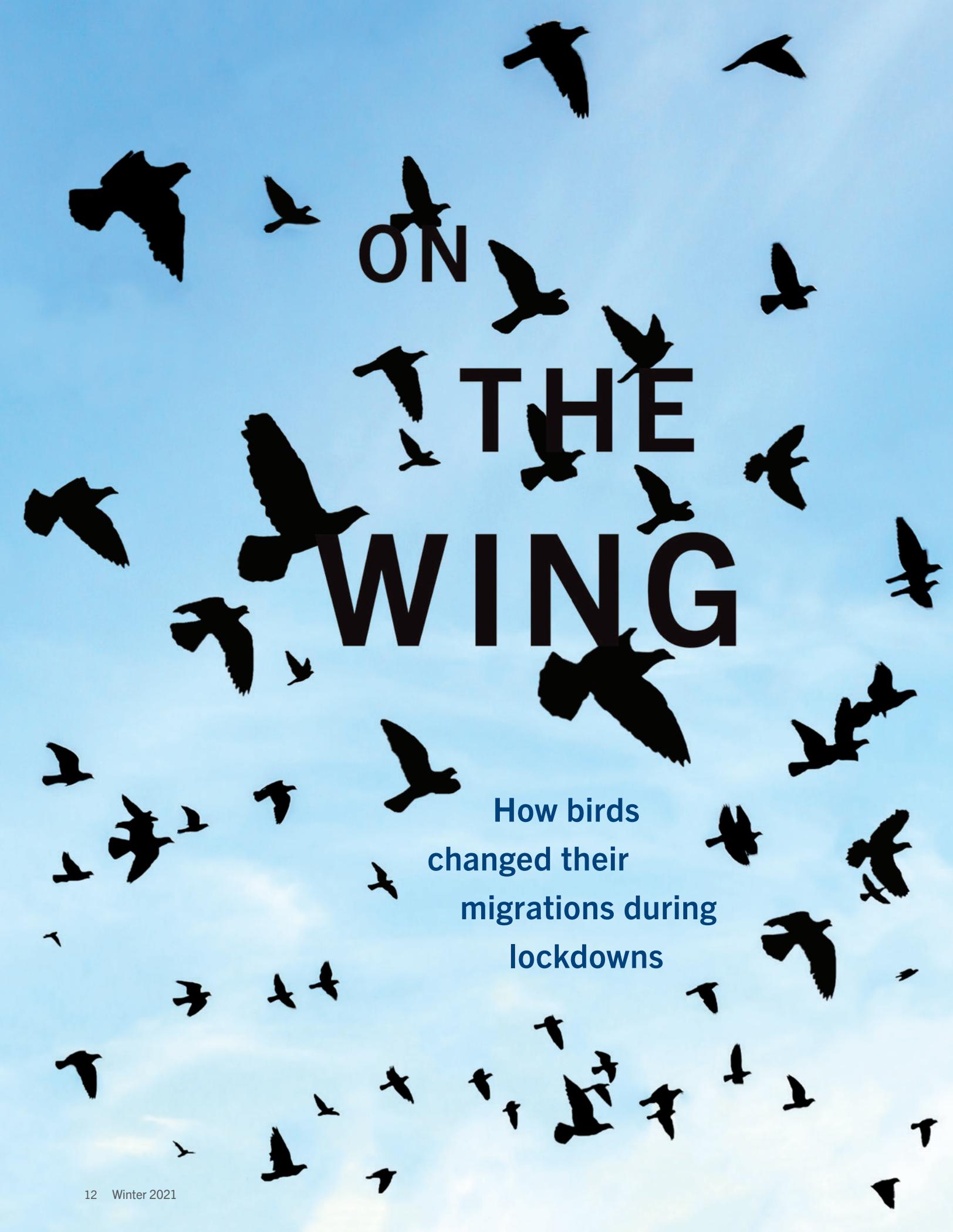
Another example is the work of RESOLVE Manitoba at UM, under the leadership of Kendra Nixon. The centre coordinates and supports research aimed at ending violence, especially violence against girls and women. She is undertaking research that partners with the Family Violence Prevention Program locally to explore the issues and impacts of the pandemic on intimate

partner violence experiences in a rigorous way—creating a body of knowledge for use by service providers and government policy-makers to mitigate these impacts.

Microbiology professor Brian Mark, who is a leading expert in the structural biology of viral proteins, is collaborating with colleagues in Toronto and the Netherlands, to develop antiviral drugs to fight the COVID-19 outbreak. Building on their previous research with viruses of the same family—SARS and MERS—Mark will use these blocking proteins to find candidates that block the activity of the viral enzyme in infected cells, which can then be developed as therapeutics.

Our collective contribution to the local and national economy is significant, with more than \$2.4 billion in economic impact to the Province of Manitoba annually and \$1.4 billion to the GDP. In 2020, we launched a new Manitoba Industry-Academia Partnership that brings together academic researchers and industry to discuss challenges they are facing and find solutions together. They held their first AIM™ Day event in October—focused on digital agriculture—resulting in new partnerships between companies and scientists who will use this new knowledge to create economic advantages and to help move knowledge out of the university into the community. Additional round-tables are underway with focuses on sectors such as heavy equipment, social sciences, aerospace and film and media.

My focus for the remainder of 2021 and beyond is to continue to support our research community, to strengthen our ties with industry to forge new paths that will further contribute to Manitoba's economy and growth, and to respond to our world's changing needs – locally, nationally and internationally. 



# ON THE WING

How birds  
changed their  
migrations during  
lockdowns



BY SUSAN PETERS

Early in March 2020 during the COVID-19 lockdown, Nicola Koper was driving down Osborne Street when she noticed how empty the Winnipeg street was. That's when she realized the lack of traffic had created a unique research opportunity. "Normally, roads and noise aren't separate," explains Koper, a professor of conservation biology and associate head of the Natural Resources Institute, who has studied the effects of roads and noise on birds for more than 10 years. "It's hard to tell if bird species are reacting to the noise of traffic or to the road itself."



Northern flicker



Red-winged blackbird

**K**OPER IMMEDIATELY REACHED OUT TO ORNITHOLOGY colleagues across North America and the U.K. “We wanted to understand how COVID-19 lockdowns affected wildlife. We expected that less traffic might reduce vehicle collisions, noise and traffic and benefit birds, but there could be unexpected negative consequences, too.” Funding came from a \$50,000 COVID Alliance Grant from the Natural Sciences and Engineering Research Council of Canada (NSERC). Because COVID-19

lockdowns coincided with spring migration in North America, researchers were curious to see if cities with stronger lockdowns from March to May 2020 would attract more of the birds flying overhead, versus cities with lighter lockdowns. The research compared birds in rural and urban counties, near major roads and airports, contrasting where birds were detected in 2020 to the previous three years.

**RESEARCHERS WERE CURIOUS TO SEE IF CITIES WITH STRONGER LOCKDOWNS FROM MARCH TO MAY 2020 WOULD ATTRACT MORE OF THE BIRDS FLYING OVERHEAD, VERSUS CITIES WITH LIGHTER LOCKDOWNS.**

Coincidentally, ecologist Michael Schrimpf had approached Koper about postdoctorate work after he moved to Winnipeg in January 2020. The newly minted PhD (he virtually defended his thesis in April) had studied Antarctic birds for his dissertation at Stony Brook University, but pivoted to apply his skills in data analysis to the lockdown project. “It was mostly me staring at my computer screen,” says Schrimpf, explaining that unlike the popular image of field research, they were working with data from eBird, a citizen science effort that allows bird watchers to share their sightings: “In the past, a lot of ecological data came from a small team who could go out into the field and collect the data. In recent years, a number



Nicola Koper is principal investigator and director of the C19-Wild Research Group based at UM.





Cedar waxwing

of programs have been able to collect a lot of data: Big Data.” That meant the project had some 4.3 million observations of birds from Miami to Vancouver to crunch among 82 species from hummingbirds to red-tailed hawks, including Manitoba visitors like bald eagles, robins, red-winged blackbirds and barn swallows.

“This project was possible because of people’s observations before the pandemic: millions of observations of birds. There was already this army of volunteers making observations.” Schrimpf says the team relied on 16,405 people in Canada and the U.S. who entered sightings into eBird. “When there are millions of observations of birds, you have to filter data correctly. That requires careful statistical thinking—it’s a skill I’ve picked up over the years.” He is thankful to staff at Shared Compute (CC Cluster) at the University of Manitoba, who helped him run statistical models at a speed his laptop couldn’t match.



**Michael Schrimpf** is the postdoctoral fellow who is taking the lead on several papers on impacts of COVID-19 lockdowns on birds.

## THERE WAS ALREADY THIS ARMY OF VOLUNTEERS MAKING OBSERVATIONS. THE TEAM RELIED ON 16,405 PEOPLE IN CANADA AND THE U.S. WHO ENTERED SIGHTINGS INTO eBIRD.

At Environment and Climate Change Canada (ECCC), when Nancy Mahony heard about Koper’s project, the research biologist was eager to sign on along with her colleagues. The Edmonton-based scientist shares a research interest in grassland birds with Koper—“I have a study site not too far from Nicky’s in Alberta”—and has worked with Koper’s graduate students and collaborated on previous projects. “This was a unique opportunity. It’s an inadvertent experiment. You don’t get a chance to do this in field conservation research.” Less is known about migration than about breeding grounds, Mahony points out, when it comes to declining bird populations. On the practical side, the research has implications for mitigation efforts to protect birds, like figuring out if installing a sound barrier along a road will help or not.





Blue-winged teal

As well, Mahony notes that ECCC values the chance to work with university researchers. “They have connections and resources that we don’t,” says Mahony. “It gives us a chance to work with graduate students to help train the next generation of applied biologists and conservation biologists. We get a chance to work with people doing

**“IT GIVES US A CHANCE TO WORK WITH GRADUATE STUDENTS TO HELP TRAIN THE NEXT GENERATION OF APPLIED BIOLOGISTS AND CONSERVATION BIOLOGISTS. WE GET A CHANCE TO WORK WITH PEOPLE DOING CUTTING-EDGE RESEARCH.”**

cutting-edge research.” She wants to continue the collaboration, which next will involve untangling how different factors interact. Do birds normally avoid roads because of noise, because of collisions between low-flying birds and vehicles, or because the road changes the behaviour of predators like foxes and coyotes?

The team is submitting their results to journals, while they continue to analyze the data already collected. Koper wants to take a closer look at species at risk. She also wants to add data on air pollution, a new research direction that results from yet another inter-university collaboration, including her C19-wild.org website. “Through this project, I have met so many scientists that I would never have met,” says Koper. “We wanted to get something positive out of the tragedy of COVID-19.” IR



## CITIZEN SCIENCE IN A PANDEMIC

**PEOPLE’S LOCKDOWN PASTIMES MAY HAVE** inadvertently contributed to science. Nicola Koper’s project used data from eBird, an effort of citizen science—when ordinary citizens contribute their scientific observations to a greater project. While eBird was launched in 2002 by Cornell University and the National Audubon Society, it’s far from the only project to have birders record their sightings, allowing researchers to track where bird species live and how abundant they are. At ECCC, Nancy Mahony uses the North American Breeding Bird Survey (inaugurated in 1966) to judge long-term population trends. The earliest bird-related citizen science is the Christmas Bird Count, which started in 1900 as an alternative to the 19th century tradition of a Christmas hunt.

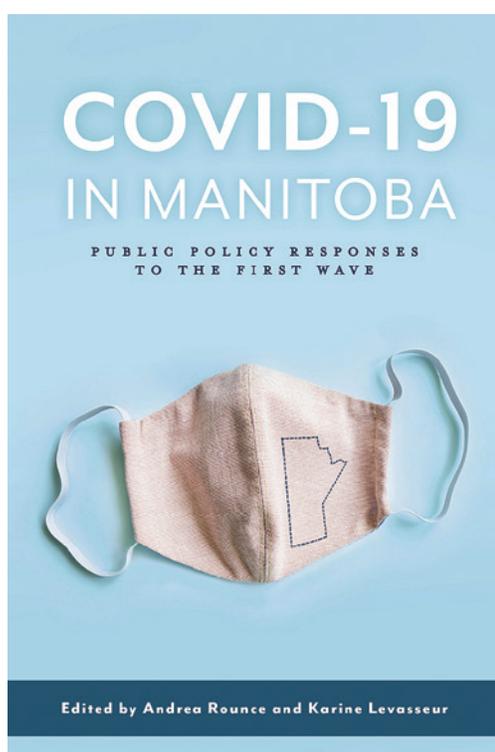
Koper believes more people than usual were bird-watching in spring 2020: “With lockdown, people were reaching out for something that would give them pleasure. There were all these people stuck at home who wanted to contribute to something bigger than themselves while also relieving their stress by immersing themselves in nature.”

Postdoctorate researcher Michael Schrimpf started contributing bird observations to eBird in the early 2000s, then became a volunteer data reviewer in 2012. “Some eBird contributors are professional scientists. But most aren’t, they’re people from all walks of life. For example, 15-year-old kids can be great at identifying birds. Even people who are just interested in the world around them can contribute to science.” And in the long run, citizen science can help to conserve birds.



# COVID-19 in Manitoba:

## Public Policy Responses to the First Wave



Edited by Andrea Rounce and Karine Levasseur  
(University of Manitoba Press, 2020)

**O** N 12 MARCH 2020 MANITOBA confirmed its first case of COVID-19. One week later, it declared a province-wide state of emergency, ushering in a new sense of urgency and rarely used government powers to protect Manitobans from the devastating global reach of the novel coronavirus. More than six months later, after lifting restrictions over a summer with relatively few cases, Manitoba shattered daily case records.



Andrea Rounce



Karine Levasseur

The wide-ranging impacts of the pandemic have touched every facet of Manitoba society and provincial responsibility, including health, economic development, social services, and government operations. COVID-19 has challenged the conventional policy-making process—complicating agenda setting and policy formulation, adoption, implementation, and evaluation. At the same time, governments have been under pressure to make swift decisions in life-and-death matters. New programs must address urgent and shifting health and economic realities, but also anticipate future waves of COVID-19 and potentially significant repercussions for future governments.

**This open-access volume identifies policy gaps and successes of Manitoba’s early COVID-19 response to inform efforts to prepare for and curb oncoming waves of infection.**

*COVID-19 in Manitoba: Public Policy Responses to the First Wave* seeks to understand how Manitoba fared during the first months of the pandemic, with twenty-seven chapters that address key aspects of the pandemic and discuss how government policy can help lay the foundation for resiliency in the midst a continuing public-health crisis. This open-access volume identifies policy gaps and successes of Manitoba’s early COVID-19 response to inform efforts to prepare for and curb oncoming waves of infection. As the province contends with hundreds of new cases daily, hospitals near capacity, and our communities enter “code red” status, this book is a timely and essential resource for citizens and policy-makers alike. **IR**

# HIP TO HEPARIN



# A MANITOBA MODEL FOR CLINICAL TRIALS



BY CHANTAL SKRABA

A University of Manitoba research team is emerging as a global leader in COVID-19 anticoagulation trials thanks to their innovative, global trial studying different types of heparin, an anticoagulant (blood thinning) and anti-inflammatory drug. Early results released in January show full doses improved outcomes.



**T**HE ATTACC TRIAL (ANTITHROMBOTIC THERAPY to ameliorate complications of COVID-19), is an international multi-platform randomized control trial (mpRCT) led by Ryan Zarychanski, a hematologist, critical care physician and associate professor. He has partnered with Patrick Lawler, at the Peter Munk Cardiac Centre and Ewan Goligher, from the University Health Network, both assistant professors at the University of Toronto.

“The trial is evaluating if therapeutic anticoagulation with heparin will improve clinical outcomes in patients hospitalized with COVID-19,” says Zarychanski, also a scientist at CancerCare Manitoba. “With regard to issues of anticoagulation, our trial will inform best-practice on a global scale.”

**“THE TRIAL IS EVALUATING IF THERAPEUTIC ANTICOAGULATION WITH HEPARIN WILL IMPROVE CLINICAL OUTCOMES IN PATIENTS HOSPITALIZED WITH COVID-19. WITH REGARD TO ISSUES OF ANTICOAGULATION, OUR TRIAL WILL INFORM BEST-PRACTICE ON A GLOBAL SCALE.”**

Commonly given to hospitalized patients to prevent blood clots, heparins are being studied as a COVID-19 treatment for several reasons. For starters, blood clots have been observed in a significant proportion of patients in hospital with COVID-19.

Heparins also possess anti-inflammatory properties, and COVID-19 is associated with inflammation, which can increase the likelihood of venous clots in the legs or lungs, or arterial clots which can cause heart attacks or strokes.



Dr. Ryan Zarychanski, Max Rady College of Medicine.

TOP: Manitoba COVID-19 clinical trial team members - Sheri Stein, Emily Rimmer, Hessam Kashani, Nicole Marten, Gary Annable, Maureen Hutmacher, Lauren Kelly, Dayna Solvason, Nora Choi, Maggie Wilson, Brett Houston, Ryan Zarychanski, Glen Drobot.

MISSING: Quinn Tays, Soumya Alias, Rhonda Saliva, Terry Wurez, Sylvain Lothier, Gloria Vazquez Grande, Amila Heendeniya, Lisa Albensi.

Additionally, heparin has been shown to impair the ability of the SARS CoV-2 virus from binding to the surface of cells and thus may have specific antiviral properties.

“The goal of the trial is not just to reduce blood clots but more importantly to reduce mortality and prevent people from needing ICU level care or developing multi-organ failure,” says Zarychanski.

The trial originated as two separate trials, with ATTACC studying therapeutic anticoagulation in hospitalized moderately ill patients and the Randomised, Embedded, Multi-factorial, Adaptive Platform (REMAP) trial studying therapeutic anticoagulation in severely ill patients. Each trial has since extended their enrolment criteria and harmonized their protocols to form one large trial enrolling all eligible hospitalized COVID-19 patients.

Then, the National Institutes of Health (NIH), a U.S. government agency, decided to adopt the Manitoba-sponsored combined trial across the whole of the U.S. as part of the ACTIV (Accelerating COVID-19 Therapeutic Interventions and Vaccines) platform.

ATTACC, REMAP and ACTIV-IV have now merged to form a novel multiple platform RCT with sites in North and South America, Europe, India and Australia.

The ATTACC/REMAP/ACTIV trial, says Zarychanski, is a new type of clinical trial strategy: the mPRCT methodology allows independent networks or platforms to enroll patients using the harmonized protocol and analyze individual patient data as one unified trial.”

This allows patients to be enrolled with great speed so a trial conclusion can be made as quickly as possible.

So far, over 3,000 patients have been enrolled in the mPRCT. The ATTACC platform alone has 58 activated sites with 1,200 patients enrolled in Canada, U.S., Brazil and Mexico. REMAP has enrolled nearly 1,500 patients in Canada, U.S., E.U., U.K., Ireland, Australia, New Zealand and Saudi Arabia. The NIH sponsored ACTIV-IV platform has enrolled approximately 400 patients and is expanding rapidly.

Zarychanski says, “Over 300 sites have been activated in more than a dozen countries and we’ve recently expanded to include sites in low and middle income countries through our REMAP platform.”

## “OVER 300 SITES HAVE BEEN ACTIVATED IN MORE THAN A DOZEN COUNTRIES AND WE’VE RECENTLY EXPANDED TO INCLUDE SITES IN LOW AND MIDDLE INCOME COUNTRIES THROUGH OUR REMAP PLATFORM.”

“Launching the trial in multiple countries gave us the greatest ability to successfully complete enrollment,” he says.

To action a trial as large as ATTACC, the project team is large and necessarily international. Day-to-day trial management is lead by Lindsay Bond of Ozmosis Research in Toronto, ON who works collaboratively with Manitoba multi-site project managers Nicole Marten and Dayna Solvason. As the sponsor, UM expertly leads the processes of international contracting and payments.

“The trial is providing exciting opportunities for our local trainees and faculty,” says Zarychanski.

Brett Houston MD (PhD candidate), Gloria Vazquez Grande MD (PhD candidate), Sylvain Lother MD (MSc candidate), Vi Dao MD and Glen Drobot serve as local primary investigators for ATTACC/REMAP who work with a committed group of research coordinators to enroll patients at three hospitals in Winnipeg both on hospital wards and in the ICU.

ATTACC is funded by Canadian Institutes of Health Research (CIHR) (\$3.6 million), LifeArc Foundation (\$1.7 million), Peter Munk Cardiac Centre (\$250,000) and Thistledown Foundation (\$500,000). REMAP is funded by CIHR (\$1.1 million). Zarychanski credits Research Manitoba, CancerCare Manitoba, and the Victoria General Hospital Foundation with providing essential start-up funding that was leveraged to secure national and international funding.

Zarychanski’s team was able to quickly pivot to COVID-19 research due to their experience running clinical trials in hospitalized patients. As cases mount, they are working diligently to figure out whether heparin or other drugs will be effective treatments.

“It has been an exhausting experience for our research team – incredible responsibility and with an obvious expectation to finish the trials as soon as humanly possible,” he notes. “In the COVID world, two months feels like two years.” **IR**



## A NEW MODEL

WHILE WE WAIT FOR COVID-19 VACCINATIONS in 2021, researchers are racing to find ways to treat the virus and its ensuing complications. In direct response to the challenges presented by the pandemic, teams were required to create or adopt novel methods to design and run trials.

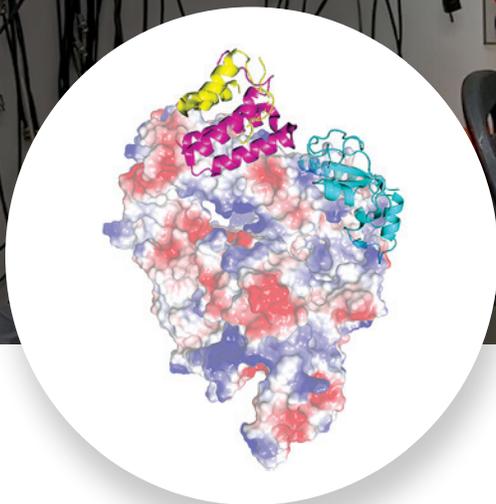
The ATTACC/REMAP/ACTIV-4 multi-platform trial is helping to put UM and Manitoba on the map in the world of clinical trials. Using innovative trial methods designed specifically to meet the needs of a global pandemic, the Manitoba co-led initiative is expected to have an indelible impact in the ways clinical trials are conducted.

“The uniqueness of COVID-19 urgently called for novel methods in design and conduct of clinical trials,” says Zarychanski. “Manitoba has had a significant leadership role developing new trial methods that are expected to change the landscape of clinical trials going forward.”

Zarychanski calls it a “welcome feather in Manitoba’s cap,” for a Manitoba-co-led and sponsored trial to be supported by the U.S. He expects the new methods incorporated into ATTACC/REMAP/ACTIV will inform the design and conduct of international clinical trials in a post-COVID world.

“It’s a compelling model for international collaboration, and I can see already that design elements and methods we’ve created are being translated into other clinical trials in non-COVID disease states,” says Zarychanski. “The experience conducting ATTACC and other COVID-19 trials is serving to increase UM’s research capacity and train the next generation of clinical trialists in Manitoba.”

# AI Lends a Hand



**A** TOM WISE, A LEADER IN USING ARTIFICIAL INTELLIGENCE (AI) for small molecule drug discovery, is supporting two researchers and their teams in exploring broad-spectrum therapies for the disease caused by SAR-CoV-2 virus (COVID-19) and other coronaviruses.

“It is crucial to gain a molecular understanding of how one particularly attractive protein target—nsp12—interacts with another key protein named nsp8,” says Jörg Stetefeld, chemistry professor in the Faculty of Science and Canada Research Chair in Structural Biology and Biophysics. “Once learned, this knowledge can be used to develop both new drugs and repurpose existing ones.”

Alongside associate professor Mark Fry (biological sciences), the duo received support through Atomwise’s Artificial Intelligence Molecular

Screen (AIMS) awards program, which seeks to democratize access to AI for drug discovery and enable researchers to accelerate the translation of their research into novel therapies.

“The current pandemic of COVID-19 is caused by a novel virus strain of SARS-

CoV-2,” says Stetefeld. “To develop the most efficient therapeutic strategies to counteract the infection, it is crucial to gain a better molecular understanding of the protein targets involved.”

Ben Bailey-Elkin, part of Stetefeld’s research team, is testing compounds provided by Atomwise’s AI team after they perform an *in silico* screen of millions of compounds and carry out the subsequent biochemical and biophysical characterization, significantly reducing the time it would traditionally take to carry out this process. They will use their proprietary AI software to search for promising direct-acting



Jörg Stetefeld, CRC in Structural Biology and Biophysics

ABOVE: Mark Fry, associate professor, chemistry – at work.

TOP LEFT: RNA polymerase at work: Surface is nsp12 and the blue/pink/yellow are helper proteins.

antivirals, which interfere with the function of the virus’s targeted proteins.

Fry’s lab is using Atomwise’s cutting edge AI to screen a panel of small molecules predicted to interfere with the cellular signaling pathway that is central to the “cytokine storm” associated with the development of the COVID-19 acute respiratory distress syndrome.

“Cytokines are a group of small proteins secreted by cells for the purpose of cell-to-cell communication, and in healthy individuals, these cytokines regulate key activities such as immunity, cell growth and tissue repair,” says Fry. “A large number of patients with COVID-19 will develop life threatening pneumonia, accompanied by the so-called “cytokine storm” where the body experiences excessive or uncontrolled release of a number of these molecules.”

Fry adds, “The cytokine storm is thought to play a major role in the development of COVID-19, and there is some evidence that drugs which inhibit key cytokines such as interleukin-6 may reduce the severity of the disease. It is important to note that many of these inhibitors are part of a therapeutic class called biological drugs. These can be expensive to make and supply may be limited. My hope is that we can develop a small molecule inhibitor of the cytokine storm that will be easy to synthesize and available to all who need it.” **IR**

# COVID-19 Anxiety in the Age of the Anthropocene

BY SARAH PARADIS

**“COVID-19 ANXIETY” IS AN INTENSIVELY COLLABORATIVE** creation-research project that I began working on over three stages extending from summer 2020 to summer 2021.

In response to the challenges brought about by the pandemic, I plan to create a video artwork exploring the Anthropocene, regarding the human impact on the Earth from an educational perspective. My video artwork will capture this unprecedented moment in time by focusing on how traditional learning environments, such as schools and classrooms have become impacted by the pandemic. The transition towards online learning environments, or digital ecosystems, has inspired me to portray these educational landscapes throughout my video artwork.

**My video artwork will capture this unprecedented moment in time by focusing on how traditional learning environments, such as schools and classrooms have become impacted by the pandemic.**

artwork on the topic of “COVID-19: Land, Refuge and Loss.”

In fall 2020, Stage 2 work segwayed, supported by a Canada Council Grant, to further expand upon the ideas surrounding the political, personal and societal situations located with our personal and collective responses to COVID-19.

The focus has been on the “anxiety of dissolution” as creativity is explored within indecisive agitation during the pandemic. I worked primarily on video editing during Stage 2.

During Stage 1, Drs. Black, Patterson, and artist Daniel Payne, worked at the Ontario College of Art and Design University (OCADU) with support from the OCAD university research seed grant program in order to produce



Sarah Paradis, master's student

TOP: This video still is composed of multiple layers including hands, curtains, street traffic and pink mask signage. The hands convey elements of intimacy and loneliness as they travel across the screen. The pink signage creates an additional dimension of complexity as it highlights the significance of wearing a mask. The distance between the street traffic and the camera itself creates a sense of isolation or separation from the people outside, reflecting further on the themes of anxiety and loss.

As I write this, we are heading into Stage 3 during the winter/spring of 2021, supported by a UM creative works grant, wherein we are further building upon our body of creative art with the aim to exhibit in two galleries located in Toronto during the spring/summer 2021.

Through a series of public talks, responses to contemporary literature, and gallery exhibitions at 113Research, OCADU and Gallery 1313 (Toronto), we will be able to share our experiences about making visual artwork in response to the pandemic from an Anthropocentric perspective. The collaborative and individual artworks convey anxiety, tension, and uncertainty while examining modes of cognizant reflections, personal/cooperative embodied awareness of feeling, conceptions and reflections about our current COVID-19 lived experiences.

*Participating artists on this project include: Drs. Joanna Black (UM) and Pam Patterson (OCADU); musician Daniel Payne (OCADU), Dorothy H. Hoover (OCADU) and graduate students Angie Ma (OCADU) and Sarah Paradis (UM). IR*



**PANDEMIC**

# FALLO

**NEWCOMERS AND**

**INDIGENOUS PEOPLE**

**SHOULDER HEAVIER**

**BURDEN**



BY HELEN FALLDING

Immigrants willing to be vaccinated against COVID-19 might help save the lives of people born in Canada, who are more likely to resist vaccination. Meanwhile, a third of Indigenous Canadians surveyed lost their jobs early in the pandemic – a higher proportion than people of colour, who were in turn more likely to lose their jobs than white Canadians.



**T**HESE ARE AMONG THE FINDINGS OF PRESCIENT research by a massive team led by University of Manitoba professors Lori Wilkinson and Kiera Ladner. They're friends who had never thought of researching together until COVID hit, cancelling Ladner's overseas research plans and a national conference Wilkinson was preparing to host.

Wilkinson and the Association for Canadian Studies had already commissioned a Leger survey focused on COVID and xenophobia that they planned to present at the March 2020 conference. Data collection started two days before the World Health Organization recognized we were in a pandemic. Now an expanded research team – including dozens of scholars across Canada, the U.S. and Mexico – can compare those early results with weekly online survey snapshots taken throughout the pandemic.

**“LOOKING BACK AT THIS PERIOD, I WANT TO KNOW THAT I DID SOMETHING USEFUL. IT WAS REALLY ABOUT ENSURING THAT INDIGENOUS VOICE, VISION AND DATA WERE INCLUDED.”**

When Wilkinson asked Ladner to help lead the COVID impacts research, the politics professor was working alone in her home office. She glanced over at the white board where she had scribbled: “What did I do?” as the pandemic ravaged the Navajo Nation and escalated suicide clusters in northern Canada.

“Looking back at this period, I want to know that I did something useful,” said Ladner, who is Canada Research Chair in Miyo we'citowin, Indigenous Governance and Digital Sovereignities. “It was really about ensuring that Indigenous voice, vision and data were included.”

By the time the pair received \$671,332 of rapid funding from the Canadian Institutes of Health Research in June, they already had three



Kiera Ladner  
(political studies)

RIGHT:  
Lori Wilkinson  
(sociology &  
criminology)

ABOVE:  
Masked migrant  
workers from  
Mexico waiting  
to be transported  
to Quebec farms  
after arriving at  
Trudeau Airport  
Tuesday April 14,  
2020 in Montreal.  
PHOTO: The  
Canadian Press/  
Ryan Remiorz

months of survey data on COVID-19's differential socioeconomic impact on Indigenous people and newcomers.

Where it's difficult to reach people online – including undocumented workers, people with limited English and those on First Nation reserves with poor Internet service – interviews will fill in the gaps and help answer questions raised by the survey results.

Why are established immigrants more afraid of catching the coronavirus than recent immigrants or people born in Canada? Why are Indigenous men more afraid of family members catching the virus than non-Indigenous men are?

An early U.S. study suggested that Indigenous people are more vulnerable to COVID infection when they live without full indoor plumbing and when information is unavailable in their own languages.

Language is also an issue for newcomers. Settlement agencies are aware they need to translate virus protection advice but Wilkinson's research highlights that newcomers trust national authorities more than they trust neighbours. “They would probably better receive the information if it came straight from the prime minister,” Wilkinson said.

Research results are presented weekly to federal government officials who use the information to help design pandemic programs, as well as to First Nation and community organizations delivering services.

Those organizations alert researchers to emerging issues so the research team can investigate how widespread those problems are.

“How do we get cloth masks that fit immigrant school kids when many of their families can’t afford them?” Wilkinson said. “Or not-for-profit agencies have no budget for plastic shields in front of their desks.”

The turnaround time between posing a research question and delivering results to affected communities is lightning fast compared to the pace of academic journal publication, where results sometimes ends up behind paywalls.

“I don’t think you can work with community any other way,” Wilkinson said. “People’s lives depend on what they do.”

Ladner is heartened by watching Indigenous communities exercise their sovereignty by limiting access by outsiders as well as exercising hunting, fishing and harvesting rights and growing and canning more food. She said it’s no coincidence that lobster wars have erupted again in Mi’kmaw territory.

**“I THINK THIS PROJECT AND COVID IN GENERAL POINT TO HOW PRECARIOUS OUR SOCIETY IS, IN TERMS OF HOW WE LOOK AFTER EACH OTHER AS HUMAN BEINGS.”**



“I think this project and COVID in general point to how precarious our society is, in terms of how we look after each other as human beings,” Wilkinson said.

Mainstream media have reported many of the research team’s weekly findings, which might not have happened before the anti-racist movement was so prominent.

“Society finally wants to know what’s really happening – at least I hope it does,” Ladner said.

The transcontinental research team that pulled together in three weeks might eventually break into smaller groups to focus on other cross-border issues post-pandemic. They’re already swimming in intriguing data on differences between Canadians and Americans. The researchers found that Americans trust Canadians more than they trust their fellow Americans. And Canadians are far more likely to trust public health officials than Americans are.

Many other University of Manitoba research teams also quickly pivoted to studying the pandemic, including efforts to end it or limit its impact. **IR**



## SOCIOECONOMIC IMPACT OF COVID-19

### SAMPLE SURVEY RESULTS

- Indigenous people are twice as likely as white Canadians to have difficulty meeting their financial obligations during the COVID-19 crisis. 47% of Indigenous men age 18 to 34 are having trouble paying their bills on time. (May 2020)
- Only a third of Indigenous people reported excellent or very good mental health compared to 43% of people of colour and 46% of white Canadians. (May 2020)
- 68% of immigrants are either very afraid or somewhat afraid of catching the virus. Their fear is higher than people born in Canada, among whom 57% are afraid. (August 2020)
- Immigrants (75%) are slightly more likely than those born in Canada (69%) to say they will take the new vaccine when it becomes available. (August 2020)
- Newcomers face additional challenges to getting a vaccine, including irregular work hours, working multiple jobs, difficulty with transportation and language barriers. They are also more susceptible to COVID-19 exposure due to occupation and living in overcrowded conditions.



## A Glimpse of the Future

**B** EING IN MY SENIOR YEAR OF HIGH SCHOOL, THE PRESSURE to decide what to do just builds up as graduation nears. It's a bittersweet feeling knowing I can finally start a new chapter of my life but there's also a lot of decisions to be made. There's this expectation that we should have at least somewhat of an idea of what we want to do for the rest of our lives. It's easy to lose sight of your goals in the midst of trying to make these difficult decisions.

I'm one of those people that always answer with a shrug when asked what my plans are for the future. There's too many to choose from, too

**I was excited to hear and see what scientists and engineers were currently working on because more likely than not, these projects were going to impact my life and career in the future.**

many doors wide open. There was one thing I knew though, I wanted to pursue a career in Science, Technology, Engineering or Math (STEM). It's brimming with fulfilling opportunities and endeavours. A career in this field meant

pushing boundaries further and further than ever thought possible.

I thought SET Day was the perfect opportunity to get a glimpse of the field. I was excited to hear and see what scientists and engineers were currently working on because more likely than not, these projects were going to impact my life and career in the future. I was excited to hear about the cutting-edge technologies being applied to current research. There's no one solution to the problems plaguing the Earth and our society. Every scientist, every data set and every research paper is just a small piece of this massive and complicated puzzle—and I wanted to hear about these people's puzzle pieces.

To read more about Pauline's SET Day 2020 experience visit [umanitoba.ca/setday](http://umanitoba.ca/setday)



Pauline Sison is the 2020 SET Day Essay Competition winner and was a grade 12 student at Maples Met School when she attended SET Day.



ABOVE & RIGHT: Students participating in SET Day 2020 hands on activities.



# Virtual Experience

**T**HE ANNUAL UNDERGRADUATE RESEARCH Poster Competition took place online due to the pandemic, but that did not hamper students from presenting their research in the new format.

The competition provides students with valuable experience in developing their communication skills via synthesizing their research, scholarly work and creative activities into a poster presentation. This year, they took the extra step of

**“Though a virtual competition, the experience gained in preparing a poster is an exercise in knowledge translation.”**

creating self-recorded oral video presentations to accompany their posters.

“Though a virtual competition, the experience gained in preparing a poster is an exercise in knowledge translation,” said

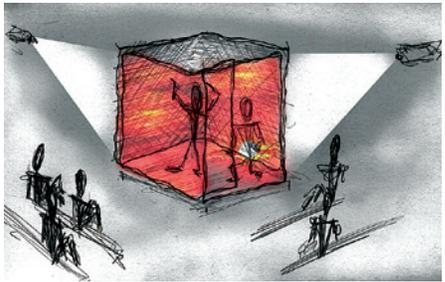
Dr. Digvir Jayas, vice-president (research and international) and Distinguished Professor. “One that makes research accessible to a broader audience than those working in the same discipline: to other students, faculty and the public. I thank and congratulate all of those students who embraced the new format and entered this year’s competition.”

Fifteen students took home cash prizes in five categories. To check out this year’s winners and their video presentations visit: [umanitoba.ca/postercompetition](http://umanitoba.ca/postercompetition)

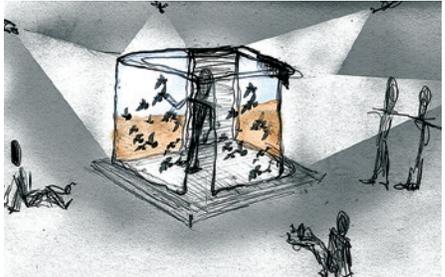
TOP & TOP RIGHT: Undergrad student poster competition winner Hannah Derksen with collaborators on impacts of pandemic on the charitable food sector (empty shelves).



RIGHT: Max Sandred (creative works winner) project titled: Theatres of Architectural Imagination, a miniature theatre centred around the use of projections.



IMAGES: Hannah Derksen, Max Sandred



P R E V E N T I N G

U N I N T E N D E D

D I S A S T E R





BY SEAN MOORE

A light rain fell on the morning of July 24, 1915, as the final passengers boarded the Eastland in Chicago, eager to enjoy a Saturday picnic at a park across Lake Michigan. The ship prepared to leave with its 2,573 passengers, and crucially, 11 lifeboats and 37 life rafts. The ship, however, was designed to carry only six lifeboats. An extra 40,000-pound burden of life rafts now hung from its decks because U.S. President Woodrow Wilson recently signed an act requiring more lifeboats on every ship to prevent another disaster akin to the Titanic, where many perished from a lack of them.

**A**ND BEFORE THE EASTLAND EVEN left the wharf, the lifeboats caused it to list, and then it capsized so quickly that one reporter said it rolled over like “a dead jungle monster shot through the heart.” Eight hundred and forty-four passengers died, a passenger death toll higher than the Titanic’s.

What was meant to save lives, ended up harming and killing many others. Indeed, in 1638, scientist Galileo Galilei warned in his final book that cautionary measures can in turn cause disaster.

When the COVID-19 virus first moved across the globe, governments quickly implemented lockdowns and social distancing rules. As supply chains broke, they worried about material shortages, including prescriptions drugs, and so enacted precautionary measures. In Canada, for instance, some patients received a one-month refill rather than the usual three-month extension. Factors such as this, and the general fear people have of contracting the virus in medical facilities, has changed how people are using the health care system, but we don’t know exactly who is being affected, or how. That, however, is about to change.

**A UM TEAM LED BY ASSISTANT PROFESSOR CHRISTINE LEONG IN THE COLLEGE OF PHARMACY, IS STARTING A NOVEL STUDY TO SEE IF OUR CAUTIONARY MEASURES ARE ENABLING A DISASTER SOMEWHERE ELSE.**

Thanks to the anonymized administrative health data held in the Manitoba Centre for Health Policy (MCHP) at the University of Manitoba (UM), a UM team led by assistant professor Christine Leong in the College of Pharmacy, is starting a novel study to see if our cautionary measures are enabling a disaster somewhere else. We need to know because more pandemics are inevitable.

Leong and her collaborators received \$100,000 in funding from the Research Manitoba COVID-19 Rapid Response Grant to study the changes in medication dispensation, health service use (physician visits, hospital visits, emergency department visits), and death rates before—and during—the COVID-19 pandemic in the general population, and in those with a history of mental illness. And in Manitoba, the latter category holds a lot of people: A past UM study found that 28 per cent of our population (or roughly 300,000 individuals) has been diagnosed with a mental disorder within the last five years. So, the potential impact of these restrictions on our society is enormous.



“Obviously a lot of things have changed since COVID happened, and the ways in which people can access in-person health care has shifted, and visits to the Crisis Response Centre for example has gone down. Where are these individuals going? I felt like these changes are a very important area that needed to be looked at,” Leong says.

“I’ve done research in the past looking at health service use and psychotropic medication use in the general population. I was also a primary care pharmacist, working at the Family Medical Centre from 2014 up until it closed in 2019. And I’ve encountered many patients struggling with mental illness, and sometimes the resources available to them are quite limited. So when COVID-19 happened, I was quite interested in studying this further,” she says.

Leong and her team will use the rich data contained within MCHP to see the real-world effects the pandemic has had on those with a psychiatric diagnosis, and the general population.

A key aspect of this study is that it focuses on data from the past five years, including the four years leading up to the pandemic. This enables the research team to establish a solid baseline pattern—which is helpful to policy-makers concerned with everyday planning—and then see how things change during the pandemic, which is key information we need to prepare for the next pandemic. We need to know where to direct resources, both during, and after pandemics: when restrictions lift, people may flood into the system again, potentially creating new resource problems.



James Bolton, a professor of psychiatry at UM, has used MCHP data in other studies and is excited to be collaborating on this specific project.

“I think there’s huge potential for this study to really uncover a lot of important information about how the pandemic is influencing mental health,” he says. “The early signs are that people with mental illnesses are facing unique challenges during the pandemic. And so I think this study is extremely important to take a look at what happens with people’s medication use and their connections with services, to really see what the impacts of COVID are on mental health. And it’s hard to anticipate which direction things will go.”

**“I THINK THERE’S HUGE POTENTIAL FOR THIS STUDY TO REALLY UNCOVER A LOT OF IMPORTANT INFORMATION ABOUT HOW THE PANDEMIC IS INFLUENCING MENTAL HEALTH.”**

It’s possible the distress caused by social isolation is leading to more people seeking help. Or, the opposite: Because of COVID restricting our ability to connect, people might be avoiding treatments and not renewing prescriptions.

“I think this study will give us a story as to where vulnerable people are going and how they are impacted,” Leong says. “Even before the pandemic, how were they doing? I think this study is going to give us a clearer idea of how we can better care for these patients. This data will let us dig deeper into seeing how can we actually support these patients, whether we are in a pandemic or not.” 



## POPULATION-LEVEL EFFECTS

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**THE CORONAVIRUS DISEASE 2019** (COVID-19) pandemic is anticipated to have both short-and long-term effects on the mental health and wellbeing of individuals at a population level. Physical distancing, changes in financial circumstances and fears associated with the virus itself can impact mental health. Understanding the psychiatric effects of COVID-19 has become an important research priority. Many shifts in the way individuals access care have occurred.

Using health data from Manitoba, Leong and her team are studying changes in medication adherence, health service use and death rates before and during the COVID-19 pandemic in the general population and in those with a history of mental illness. This study will help us understand how the healthcare system can help individuals living with mental illness.

Leong’s team includes collaborators at the Rady Faculty of Health Sciences: Silvia Alessi-Severini, James Bolton, Daniel Chateau, Joseph Delaney, Sherif Eltonsy, Murray Enns, Jamison Falk, Kaarina Kowalec and Jitender Sareen.

# UM Café Scientifique Series

Join us online to learn about the latest developments in an array of research topics. These Café Scientifiques bring together experts with non-researchers—you, me, neighbours and friends—to talk about their research and the questions it raises. All discussions begin at 7:00 p.m. (CT) and end by 8:30 p.m. Pre-registration is not required.



**MARCH 15**  
**RESEARCH IN MOTION:**  
**The latest advances in**  
**Parkinson’s disease**

Drug treatments and surgeries can greatly enhance quality of life for patients with Parkinson’s disease. Our expert panel will share how they are using new technologies such as brain imaging and home-based digital rehabilitation programs to further improve brain function.

**APRIL 15**  
**BODY DONORS:**  
**The silent health**  
**educators**

Our expert panel will share the research and innovations of educating healthcare professionals with body donors and discover all the meaningful ways in which body donors can help to educate our students, to better serve our healthcare needs.

**MAY 12**  
**COMBATting**  
**MULTIPLE SCLEROSIS:**  
**from Different Angles**

Our expert panel of physicians and scientists will provide a timely update on exciting advances in MS treatments and the ongoing innovative research in Manitoba that provides hope for individuals affected by MS.

**JUNE 9**  
**MEET THE MUNCHIES:**  
**Manitoba’s Cannabis**  
**Research**

Our panel of experts will discuss hot topics on cannabis used for medical purposes, provide an update on current medical cannabis research happening in Manitoba and discuss barriers to the use of cannabis for medical purposes.

**TO VIEW ANY OF THE PAST OR UPCOMING CAFÉS VISIT:**  
**[UMANITOBA.CA/CAFESCIENTIFIQUE](http://UMANITOBA.CA/CAFESCIENTIFIQUE)**

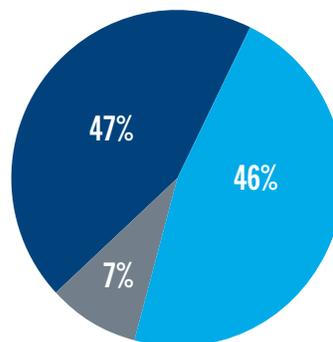
# By the Numbers

To learn more about the impact of the University of Manitoba, visit [umanitoba.ca/economicimpact](http://umanitoba.ca/economicimpact)

<h2 style="color: #00A69F;">31,068</h2> <p>Students (Fall 2020) – 26,665 undergraduate; 3,706 graduate; 697 post-graduate medical education; 6,369 international students (20.5%) and 2,554 self-declared Indigenous students (8.2%)</p>		
<h2 style="color: #E67E22;">5,241</h2> <p>Academic staff (2019/20) 1,163 full-time faculty; 4,078 support staff</p>	<h2 style="color: #005696;">85</h2> <p>Endowed and sponsored research chairs including an allocation of 52 Canada Research Chairs, a Canada 150 Research Chair, a CERC and a CERC Laureate</p>	<h2 style="color: #00A69F;">61</h2> <p>Royal Society of Canada Fellows (51) and Members (10)</p>
<h2 style="color: #00A69F;">49</h2> <p>Research centres, institutes, groups, shared facilities</p>	<h2 style="color: #808080;">30</h2> <p>Canadian Academy of Health Sciences Fellows</p>	<h2 style="color: #0070C0;">18</h2> <p>Canadian Academy of Engineering Fellows</p>

### SPONSORED RESEARCH INCOME BY SOURCE (2019/20)

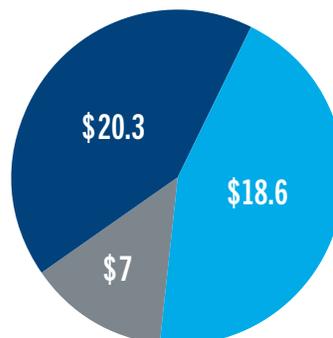
**TOTAL: \$192.2 MILLION**



- **FEDERAL GOVERNMENT**  
47%
- **OTHER**  
46%
- **PROVINCIAL GOVERNMENT**  
7%

### TRI-COUNCIL FUNDING 2019/20

**TOTAL: \$45.9 MILLION**



- **CIHR** (Canadian Institutes of Health Research)  
**\$20.3M**
- **NSERC** (Natural Sciences & Engineering Research Council of Canada)  
**\$18.6M**
- **SSHRC** (Social Sciences & Humanities Research Council of Canada)  
**\$7M**

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The Kratos x-ray photoelectron spectrometer located at the Manitoba Institute for Materials is just one experience for students at SET Day 2020. See story on page 28.



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